

BRISBANE WATER ESTUARY PROCESS STUDY

Recreational Activities and Foreshore Land Uses

Prepared for:

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Acknowledgments

GIS data issued by Gosford City Council has been used in the preparation of this report.

Limitations Statement

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

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Revision History

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1 Introduction

1.1 OVERVIEW

Brisbane Water is valued as a place to live and work, as an important commuter and retirement centre and as a tourist destination (Gosford City Council, 2000). The recreational and aesthetic environment of Brisbane Water is highly valued, in particular for water-based activities.

The total population of Gosford Local Government Area (LGA) at the 2001 Census was 154,654. Between 1981 and 1996, the Gosford LGA had one of the highest growth rates in NSW (Gosford City Council, 2000). While the growth rate has declined in recent years, the population continues to increase at a rate significantly higher than the NSW average (Gosford City Council, 2000).

The foreshore of Brisbane Water supports several different land uses, including residential, commercial, light industrial, National Park, reserves and open space. The estuary's catchment includes the major urban areas of Gosford in the north and Woy Woy/Ettalong/Umina in the south. Other smaller urban areas occur along the eastern foreshores including Green Point, Saratoga, Davistown, Empire Bay, Hardys Bay/Killcare and Pretty Beach.

The foreshore and waterway of Brisbane Water are used for a large variety of recreational and commercial purposes, including active-based and passive-based recreation.

Human use of the estuary has resulted in conflicts between users in relation to land use and the recreational use and enjoyment of the foreshore and waterway as well as degradation of the natural environment. High population growth and tourism has further exacerbated these conflicts.

Responsibility for management of Brisbane Water foreshore and waterway lies with a large number of government agencies.

An inventory of human uses has been prepared as a tool for identifying current patterns of foreshore and waterway use within Brisbane Water (see Appendix A). The inventory lists reserves, parks, beaches, boating and other recreational areas including marinas, jetties, moorings and wharves. Much of the information in this section is based on this inventory.

1.2 PURPOSE

The aim of the human use section of the study is to:

- identify the existing human uses of Brisbane Water, including foreshore land uses and waterway uses

- identify the facilities that support human use of Brisbane Water and the adequacy of those facilities
- identify conflicts associated with the human uses of Brisbane Water, including:
 - conflicts associated with foreshore and waterway uses
 - conflicts between recreational and commercial uses of the foreshore and waterway
 - impacts on the natural environment.

For the purposes of this section of the study, ‘human use’ refers to residential, commercial and industrial foreshore land uses, waterway uses and recreational activities. The impacts of human activities within Brisbane Water on the cultural and natural environments are addressed elsewhere in the Estuary Process Study.

2 Foreshore Land Ownership

Ownership of the Brisbane Water foreshore is a combination of Crown land, Council owned and managed land and freehold (private) land, as illustrated in Figure 1.1.

2.1 CROWN LAND

Crown land is generally controlled by the State government and is administered and managed under the provisions of the *Crown Lands Act 1989* and associated legislation, including the *Crown Land (Continued Tenures) Act 1989* and other Acts covering specific locations and Crown land functions.

The objectives of the *Crown Lands Act 1989* are to ensure that Crown land is managed for the benefit of the people of New South Wales, and under this Act the Minister may sell or lease Crown land, grant licences or permits in respect of Crown land, or grant easements or rights-of-way over Crown land. More commonly however, Crown land is reserved as a community resource by means of public areas, parks, nature trails, and car parks.

Most Crown land is assigned a specific use. This has occurred through either dedication for a public purpose or reservation from sale, grant of a lease or licence, or for future public requirements or other public purpose. In addition to these uses, the same land often serves additional purposes such as open space, wildlife habitat, and recreational areas, and may provide access to a waterway. Crown reserves are Crown land set aside on behalf of the community for a range of public uses including environmental and heritage protection, open space, recreation and sport, community halls and special events.

Under the *Crown Lands Act 1989*, there is a procedure for the assessment of Crown land to determine appropriate use of those lands. Additional restrictions may also be placed on Crown land by zoning and other provisions of environmental planning instruments made under the *Environmental Planning and Assessment Act 1979*, such as *Gosford Local Environmental Plan* (LEP) and the *Gosford Planning Scheme Ordinance 2004* (PSO). Crown land may also be subject to the provisions of State-wide plans and policies, including State Environmental Planning Policies (SEPPs) and Regional Environmental Plans (REPs).

The majority of Crown land surrounding the Brisbane Water estuary (Figure 1.1) is managed by Gosford City Council ('Council'), who is responsible for regulating its use and any associated maintenance.

Crown land identified within foreshore areas of Brisbane Water comprises Crown reserve and other Crown areas (see Figure 1.1), and includes the bed of the estuary up to the mean high water mark. As illustrated in Figure 1.1, approximately 140 portions of Crown land were identified within the Brisbane Water study area.

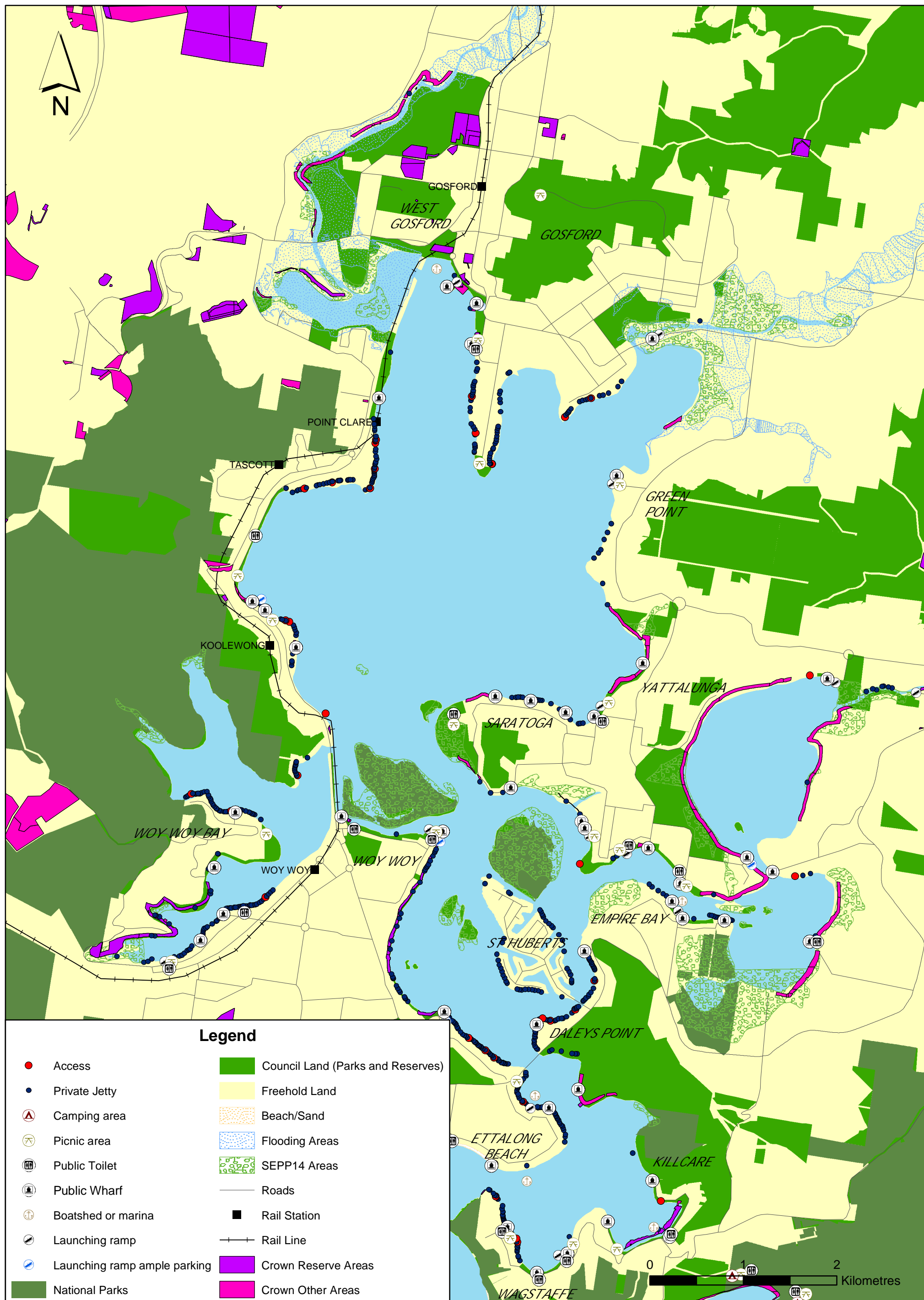


Figure 1.1 Land Ownership and Crown Land

KBR

Source: Waterways 2002, GCC 2004 and
Commonwealth of Australia (Geoscience Australia) 2003
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2.2 COUNCIL LAND

The *Plan of Management - Foreshore Parks* (Gosford City Council, 1996) document identifies 190 hectares of foreshore land around Brisbane Water owned by Council (Figure 1.1). This does not include Crown reserve of which Council has care, control and management. Council defines ‘foreshore parks’ as those with built improvements such as picnic tables and chairs, BBQ facilities, boat ramps, wharves, tidal pools and amenities blocks (Gosford City Council, 1996). Land not considered as a foreshore park under this definition includes natural areas, such as wetlands and bushland surrounding the waterway.

The Parks and Waterways division of Council is responsible for developing management policies and implementing maintenance programs for these land parcels at both regional and site specific levels. Council has commenced preparation of site specific Plans of Management, which has the advantage of targeting local issues and concerns for sites on a priority basis.

2.3 PRIVATE LAND

Privately owned land constitutes a large portion of the Brisbane Water foreshore (see Figure 1.1).

Protection of land and control of development within sensitive environmental areas in private ownership or under private lease from the Crown is achieved through zoning of land as ‘Conservation and Scenic Protection’ (zones 7(a) to 7(e)). Examples of this zoning are limited to certain areas adjoining Brisbane Water at Saratoga, Davistown, Empire Bay and Kincumber South.

Under the *Crown Lands Act 1989*, the Minister has issued leases, licences or permits for a number of local property owners to build and maintain private jetty structures or access-ways to facilitate easy use of Brisbane Water. Approximately 1,038 jetties around the waterway are identified as ‘Crown Structures’ due to them being built upon Crown land (Department of Lands, 2004).

Legislation for the management of private land is mostly generated by local councils. In this case the predominant planning instrument affecting private land along the Brisbane Water foreshore is the *Gosford Planning Scheme Ordinance 2004*.

2.4 PUBLIC ACCESS TO THE FORESHORE

Approximately 35% of the foreshore is publicly accessible land, comprising public reserves, National Parks and Nature Reserves. The most substantial areas of reserve along the foreshore occur between Blackwell Point and Pelican Island, within Woy Woy Bay, between Koolewong and Tascott, between Point Clare and West Gosford, and at Yattalunga, Saratoga and Killcare (see Figure 1.2). Areas on the Eastern side of the waterway also have publicly accessible foreshore but access is limited to right of ways as these parcels of land are bounded by the water on one side and private property on the other.

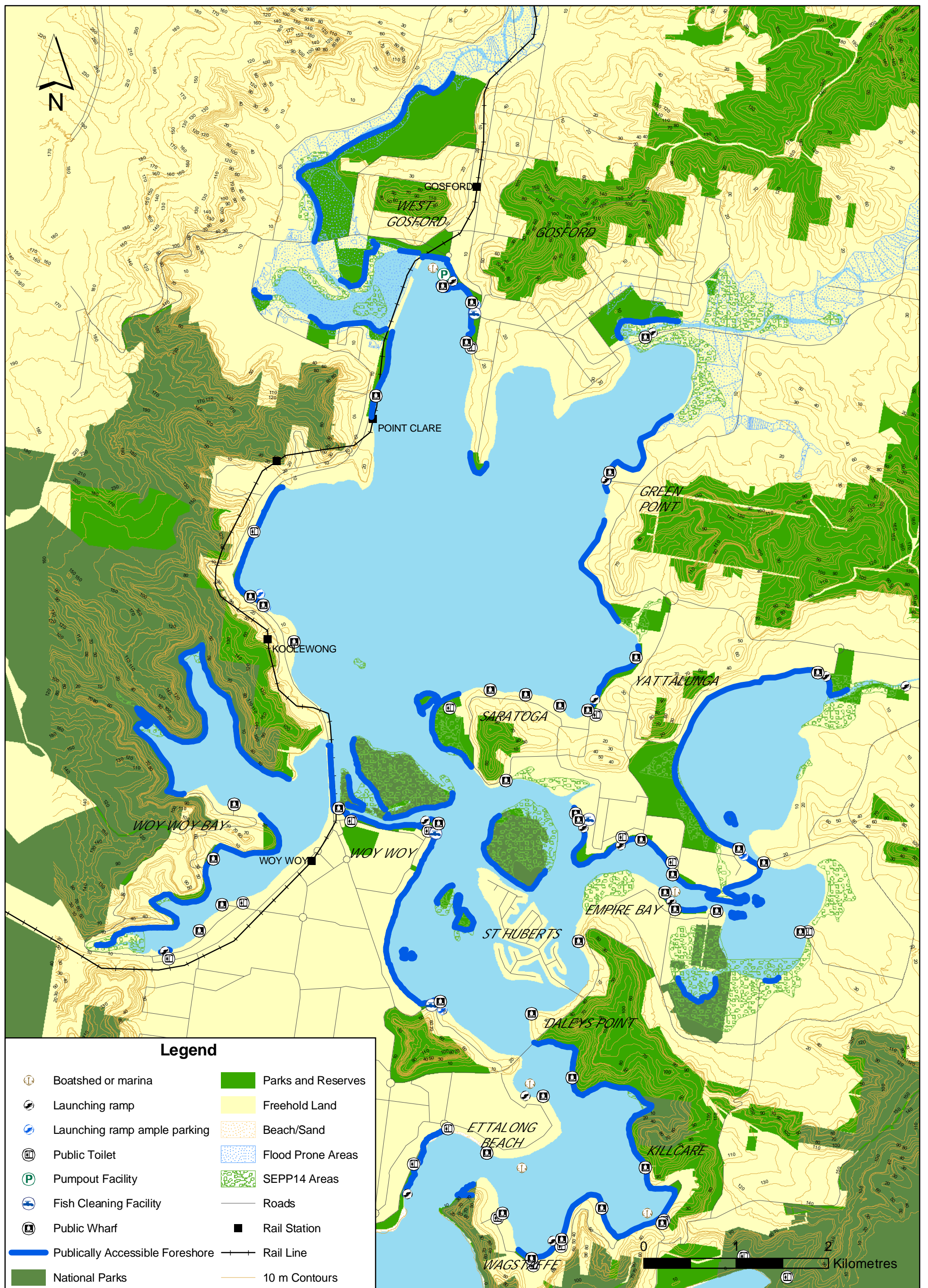


Figure 1.2 Publicly Accessible Foreshores

KBR

Source: Waterways 2002, GCC 2004 and
Commonwealth of Australia (Geoscience Australia) 2003
SEN450 LM 21 July 2005
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The rest of the foreshore land (approximately 65%) is either privately owned, Crown land under private lease to individuals, or Council owned land that is not publicly accessible, such as works depots, etc (see Figure 1.2).

At some locations, public access to large sections of the foreshore is not possible due to the presence of private property. In other locations, public access to the foreshore is limited to small reserves or areas of open space at the end of roads or access paths located between residential developments. An example of this occurs at Woy Woy Bay. Generally the level of public access is considered sufficient for local use, given that the majority of users are passive users.

The dimensions of the major parts of the foreshore, including Fagans Bay, Kincumber Broadwater and Woy Woy Inlet, are provided in Appendix B.

3 Foreshore Land Uses and Recreational/Commercial Activities

3.1 ZONING AND LAND USE

Brisbane Water foreshore land is zoned for a variety of purposes under *Gosford Planning Scheme Ordinance 2004*. The relevant zones within the Brisbane Water foreshore are shown in Figure 1.3 and are listed below:

- Non-Urban (1)
- Residential (2)
- Business (3)
- Industrial (4)
- Special Uses (5)
- Open Space (6)
- Conservation and Scenic Protection (7)
- National Parks and Nature Reserves (8)
- Restricted Development (9)

More detail on the sub-categories within these zones is provided Appendix B.

3.2 RESIDENTIAL

Large sections of the foreshore of Brisbane Water are zoned 2(a) or 2(b) Residential and consist of dwelling houses (see Figure 1.3). Foreshore residential development particularly occurs on the southern foreshore of Woy Woy Bay, between Tascott and Point Clare, at Gosford and at Green Point.

Due to environmental, physical and economic restraints, Council and the State Government have not identified any new areas of foreshore land for residential development (Gosford City Council, 2000). Demand for housing at Brisbane Water as a result of future population growth will be met primarily through development/redevelopment of medium density dwellings within existing residential zones. Areas most suitable for further residential development at Brisbane Water are Woy Woy peninsula and Gosford-Narara Valley (Gosford City Council, 2000).

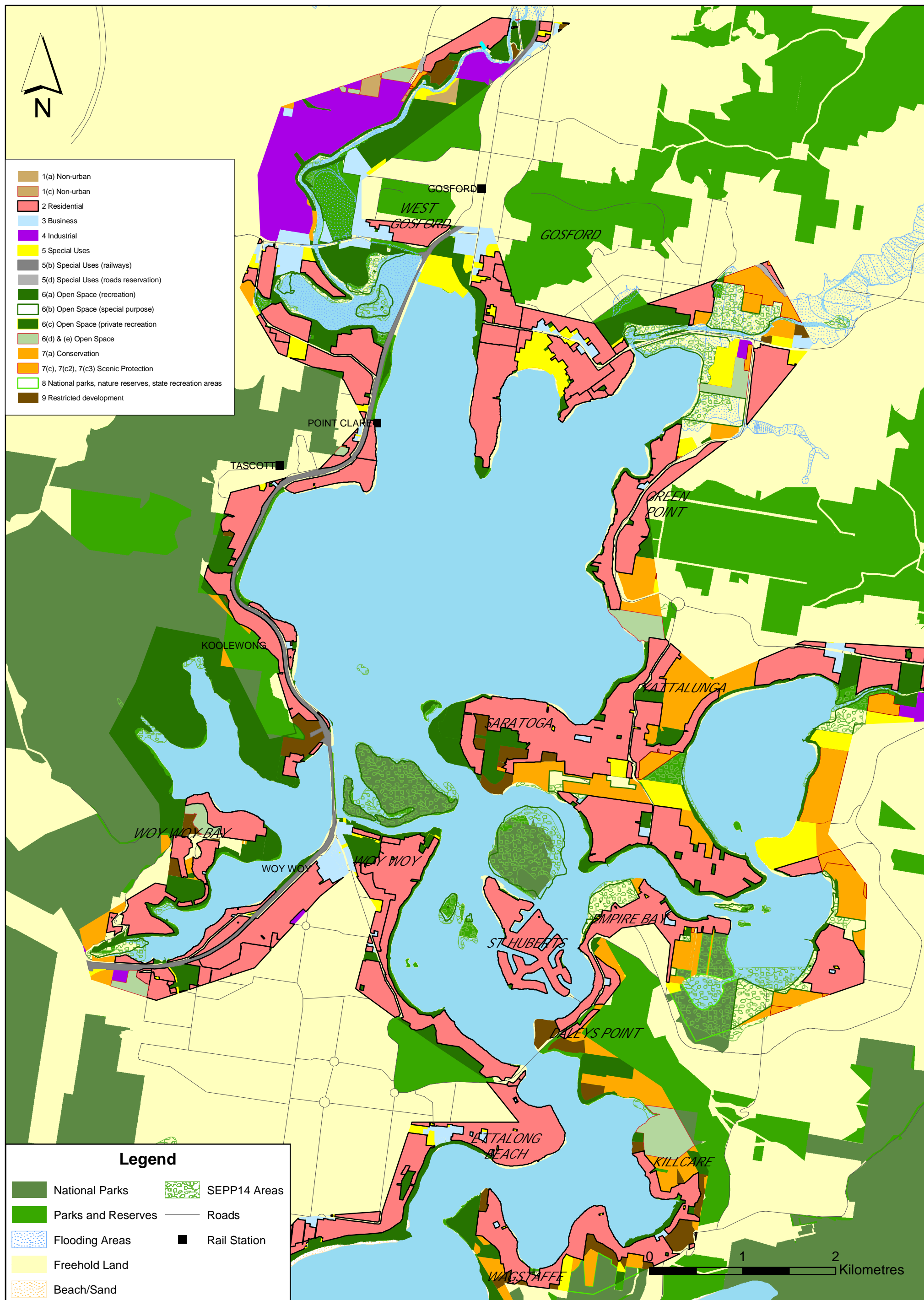


Figure 1.3 Land Use and Zoning

3.3 COMMERCIAL AND INDUSTRIAL

Major commercial centres near the Brisbane Water foreshore occur at Gosford and West Gosford in the north and Woy Woy/Ettalong/Umina in the southwest. Other smaller commercial centres occur along the eastern foreshores including at Green Point, Saratoga, Davistown, Empire Bay, Hardys Bay/Killcare and Pretty Beach.

Some areas of land near the foreshore are zoned 4(a) Industrial - General and 4(b) Industrial - Light, including along the western side of Narara Creek (see Figure 1.3). Land in this area is used for a variety of purposes ranging from general storage to motor vehicular sales to light production and manufacturing. Much of this land is flat and flood prone, which is illustrated in Figure 1.4.

3.4 RESERVES AND OPEN SPACE

Over 70 public reserves occur along the foreshore. Public reserves provide public access to large sections of the foreshore in some locations (see Figure 1.2).

Two National Parks occur along the foreshore: Brisbane Water National Park, which occurs along the foreshore at Woy Woy Bay, and Bouddi National Park, which occurs along the foreshore at Wagstaffe and Rileys Bay. Nature Reserves along the foreshore include Rileys Island Nature Reserve, Pelican Island Nature Reserve and Cockle Bay Nature Reserve.

The majority of the larger public reserves are equipped with public facilities, including toilets, rubbish bins, playgrounds, picnic facilities (tables and benches) and telephones. Cycle tracks occur along the foreshore in some reserves, including at Koolewong Foreshore Reserve and along Fagans Bay. Almost all of the launching ramps for Brisbane Water are located within or adjacent to public reserves.

In 1984, Council adopted the Coastal Open Space System (COSS), which aims to create a continuous system of open space with significant ecological values. COSS is to include private land (under voluntary agreements) as well as Council owned land and Crown land under Council's care and control. The implementation of COSS is similar to the concept of transferable development rights, whereby greater subdivision potential is allowed for land zoned 7(c2), subject to dedication of land or payment of money which is used to acquire other COSS lands.

3.5 CAR PARKING

A total of 20 formal car parks occur along the Brisbane Water foreshore. These generally occur at or adjacent to the larger public reserves and at sports grounds. At these areas, car parking is generally adequately provided for. Formal public car parks are provided on both sides of the estuary, but primarily on the western side, including: Ettalong Beach Reserve, Koolewong Foreshore Reserve, Lions Parks at Woy Woy Channel and Garnet Adcock Memorial Park. The smaller reserves typically do not have dedicated car parks and as a consequence, car parking occurs in nearby streets.

3.6 OTHER LAND USES

Several sports grounds occur near the foreshore, including football grounds, netball courts, cricket ovals, tennis courts, hockey grounds, baseball grounds, lawn bowls and a velodrome. Other sport-related land uses requiring significant quantities of land

surrounding the waterway include horse racing, showground, greyhound racing, golf courses and bicycle tracks. Other foreshore land uses include:

- Public swimming pools (eg Olympic Pool at Point Frederick)
- Navel Cadets and the Royal Volunteer Coastal Patrol at Point Clare
- Gallery and Art Centre at Peeks Point
- Council depot, pound and heliport at Erina Creek
- Schools
- Scouts/Sea Scouts
- Petrol stations
- Clubs
- Transport infrastructure (ie railway and main road at Woy Woy Channel).

3.7 TYPES OF USERS AND ACTIVITIES

There are a variety of human users of the Brisbane Water foreshore, which can be categorised into ‘active’ users (those users who require a vehicle, equipment or watercraft for their activity) and ‘passive’ users (those users not requiring a watercraft, vessel or specialised equipment).

The majority of the users of reserves and open space areas along the foreshore are passive users. As expected, peaks in human use along the foreshore occur on weekends and over the summer period. It is at this time that most pressure is placed on existing facilities resulting in a high chance of conflict amongst users.

The major foreshore-based recreational and commercial activities are identified in Table 1.1.

Table 1.1 Foreshore-based Recreational and Commercial Activities

Recreational Activities	Commercial Activities
Passive use of reserves and open space	Boat hire
Shore-based recreational fishing	Boat repairs
Picnicking	Boat storage
Bushwalking	Marina operations
Sightseeing	Equipment sales
Bird watching	Food outlets
Walking and jogging	Oyster depuration plants
Cycling	Light industrial activities (manufacturing, general storage)
Dog exercising	Other commercial and light industrial activities
Horse training	
Organised/team sports (eg football, cricket, etc)	
Other recreational activities (eg yoga, tai chi, etc)	

Figure 1.4 shows the location of recreational facilities associated with Brisbane Water. This figure provides an understanding of the spatial distribution of areas used for recreation.

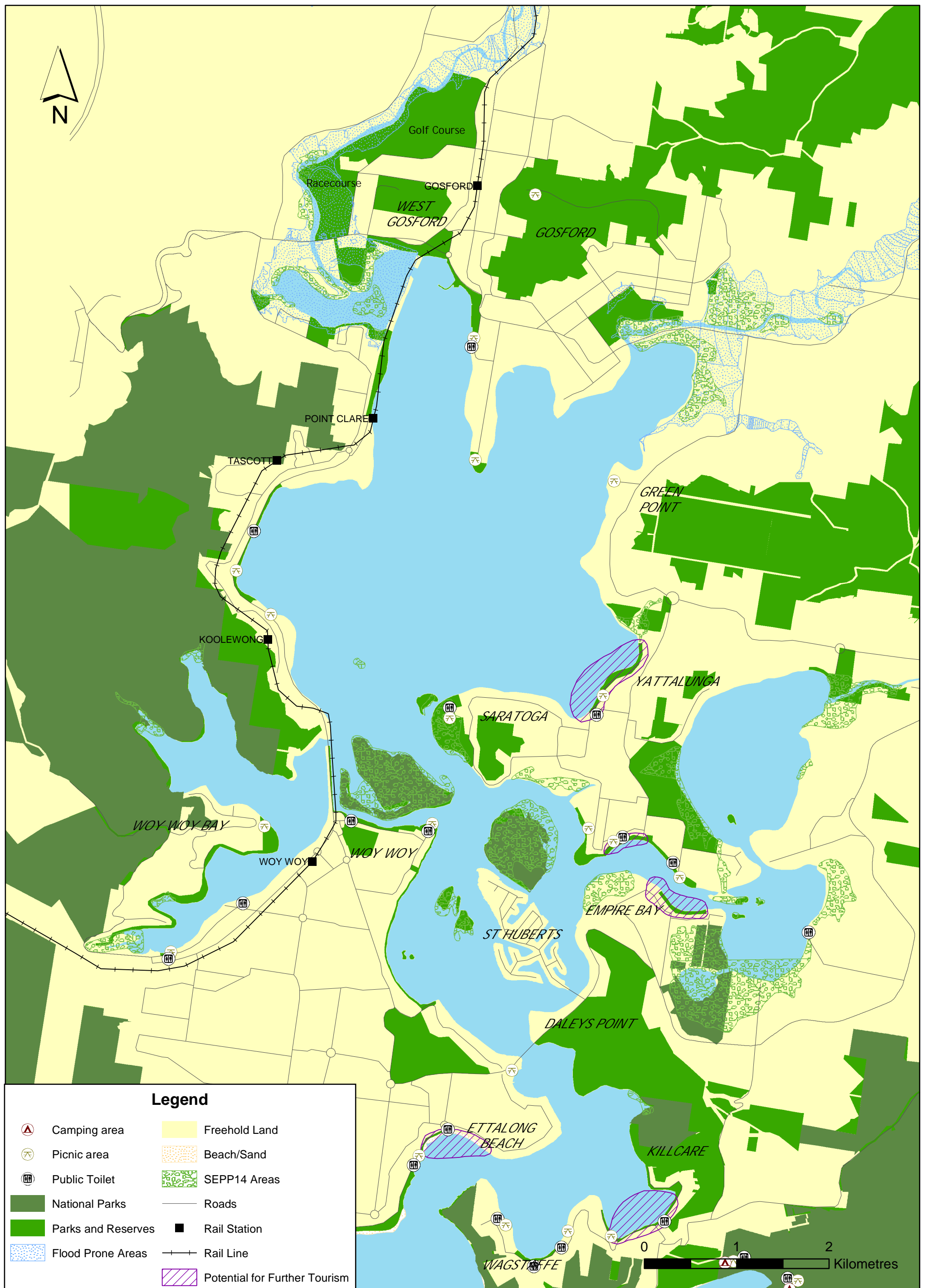


Figure 1.4 Foreshore Land Use and Facilities and Potential for Tourism Development

In January-February 2004, the parks of Gosford LGA were included in the *Park User Satisfaction Benchmark Survey* as part of an assessment of active and passive parks in the Sydney region (Integrated Open Space Services 2004). The survey was developed to measure user satisfaction with the level of park maintenance and to provide a confidential means for comparison of results on an intra-regional basis. The survey also provides information about park users and park usage.

Ten parks in Gosford LGA (including Adcock Park, Fagans Park, Frost Reserve, Gosford Edogawa Garden, Gosford Waterfront Lions Park, Kibble Park, Sensory Park, Terrigal Waterfront Reserve, Umina Oval, and Woy Woy Lions Park¹) were assessed using a total of 100 park user intercept surveys.

The predominant activities conducted in parks in Gosford LGA by survey participants were relaxing (17%), walking (15%), or walking a dog (12%). The results of this survey indicate that the majority of activities conducted in parks are passive.

Furthermore, the surveys indicate that the reasons for users visiting parks in Gosford LGA include outdoor/landscape amenity (25%), transient activities (16%), aquatic recreation (13%), exercise (12%), social/family outing (12%), exercising animals (12%), other recreation activities (7%), sport (7%) and outdoor dining (4%). These results indicate that people are utilising parks in the LGA for a broad range of activities and highlight the potential for conflict amongst park users. Such conflicts are potentially higher in parks along the Brisbane Water foreshore which supports both water-based and land-based recreational and commercial activities (Chapter 4).

¹ Note: not all of the 10 parks are located within the study area.

4 Waterway Uses and Recreational/Commercial Activities

The major water-based recreational and commercial activities are identified in Table 1.2 and are described in further detail below. Figure 1.5 illustrates the various water-based facilities located around Brisbane Water to service the recreational and commercial activities discussed in the following sections.

Table 1.2 Water-based Recreational and Commercial Activities

Recreational Activities	Commercial Activities
Power boating (including personal water craft and jet skiing)	Oyster farming
Sailing	Boat tours
Paddling (including canoeing/kayaking, rowing)	Boat charters
Swimming (including wading, bathing)	Ferry operations
Windsurfing	
Kite surfing	
Diving (including scuba diving and surface snorkelling)	
Boat-based recreational fishing	
Shoreline fishing	

4.1 BOATING

Boating activities, which include power boating, sailing, paddling, kayaking and rowing, are very popular within Brisbane Water. Patterson Britton & Partners (1999) identified that the type and size of the crafts using the waterway can be categorised as a function of the geographic locations within the waterway. The report found the determining factor of vessel size utilisation on the waterway was primarily The Rip Bridge (see Figure 1.6). In general, larger vessels were concentrated on the downstream side of The Rip Bridge so as to allow access to Broken Bay, the Hawkesbury River and the open ocean (ie Tasman Sea), whereas smaller vessels utilised the sections upstream of the Bridge.

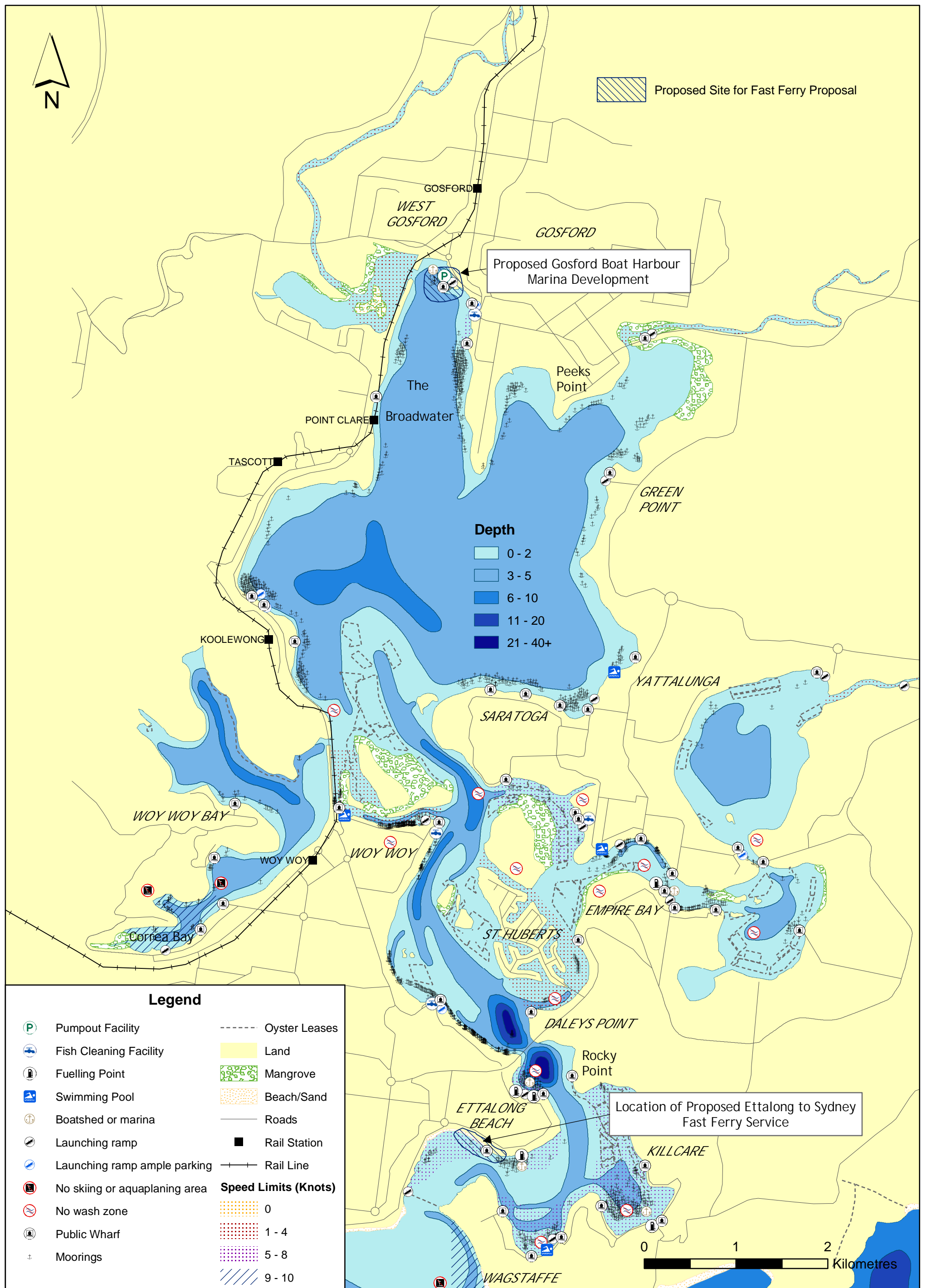


Figure 1.5 Waterway Use and Facilities



Figure 1.6 Booker Bay and Rip Bridge (view north from Booker Bay)

Boating Facilities

The numbers of public boating facilities, such as public wharves, boat launching ramps and marinas/boatsheds, within Brisbane Water are listed in Table 1.3, and their location is shown in Figure 1.1.

A total of 43 public wharves are present within Brisbane Water, with 13 located on the western side of the estuary, 26 on the eastern side and four on the northern side (Figure 1.1). A substantially greater number of private 'jetties' is present along the foreshore of the estuary, particularly between Ettalong and Woy Woy and at Woy Woy Bay (Figure 1.1).

A total of 19 public boat launching ramps are located within Brisbane Water (see Figure 1.1). Six occur on the western side of the estuary, nine occur on the eastern side of the estuary and three occur at the northern end of the estuary.

The five marinas/boatsheds at Brisbane Water are located at Ettalong Beach, Booker Bay, Gosford, Empire Bay, and Hardys Bay. Four of these marinas/boatsheds (not Gosford) provide Brisbane Water's five fuelling points (two fuelling points are located at Booker Bay).

One public liquid waste 'pump-out facility', is available for the entire estuary at the marina at Gosford, as shown on Figure 1.2.

Dinghy storage in the Brisbane Water region is currently under review by Council. Presently, dinghy storage is allowable in any foreshore park with permission from council, but records of approved facilities are incomplete (B. Cameron, Gosford Council, *pers. comm.* 29 July 2004).

The NSW Maritime Authority (formerly NSW Waterways Authority) controls the total number of moorings (private and commercial) within the waterway and administers the use of private moorings (P Lowbridge, Maritime Authority, *pers. comm.* 1 June 2004). Commercial moorings are administered by commercial operators within the waterway. Of the 1071 private moorings, 982 (approximately 92%) are registered to boats, with the remainder unregistered.

Table 1.3 Boating Facilities within Brisbane Water

Boating Facility	Number
Public wharves	43
Boat launching ramps	19
Marina/commercial boatshed	5
Fuelling points	5
Public vessel pump-out facility	1
Dingy storage capacity	Unknown
Private moorings	1071
Commercial moorings	462
Casual/visitor moorings	4

This Information is based on field investigations and mapping data from NSW Maritime Authority and Gosford City Council.

Power Boating

Power boats are used within Brisbane Water for fishing and waterskiing, as well as in conjunction with other recreational events, such as sailing and rowing regattas and training. They are also used by officials to move about the course during races and often by coaches during training.

Personal water crafts (PWC), often referred to as 'jet skis' are used on the waterway for recreational purposes. It is likely that the PWC activity on Brisbane Water has increased in recent years as a result of the banning of their use within Sydney Harbour.

Water Skiing

Water skiing is prohibited within the Correa Bay area of Woy Woy Inlet (see Figure 1.5) and speed restrictions occur in some parts of the waterway. However, in general, water skiing is permitted throughout the central parts of Brisbane Water (the largest area of open water).

Gosford Water Ski Club runs regular ski races throughout the year. The water ski race course is located in the centre of the waterway and overlaps with the sailing race course (Gosford City Council, 1995). Water skiing races have been a regular occurrence in previous years but have declined in frequency in recent times, primarily due to high insurance costs.

Sailing

A number of sailing clubs, including Gosford Sailing Club, Saratoga Sailing Club and Woy Woy Sailing Club, occur within Brisbane Water and regularly use the waterway for sailing regattas (Table 1.4).

The race courses for each of the sailing clubs overlap. The courses are all located within the central parts of Brisbane Water, between Saratoga, The Broadwater, Peeks Point and Rocky Point. Sailing clubs also provide regular sailing tuition throughout the year.

While the peak sailing season occurs during the summer months, particularly during the day-light savings period, racing occurs throughout the year (Table 1.4).

Table 1.4 Sailing Clubs and Activity Days within Brisbane Water

Club	Activity Days
Gosford Sailing Club	Wednesday during daylight saving - yacht twilight 5:30pm Saturday all dinghy classes Yachts each alternate Sunday
Saratoga Sailing Club	Sundays
Woy Woy Sailing Club	Saturdays

Kayaking/Paddling/Rowing

Kayaking, paddle skis and out-rigger canoes are popular activities within Brisbane Water for both recreational and competitive purposes. There are a number of races held on the waterway each year for the various paddling categories. Paddling activities are more prevalent in the summer months, but guided tours and private kayaking activities occur throughout the year. Two outdoor adventure companies located around the foreshore operate year-round with peak usage primarily on weekends during summer.

The Brisbane Water Rowing Club has recently been established and is currently operating out of the Davistown RSL club. Rowing is usually carried out in the early hours of the morning. All day regattas can occupy large sections of the waterway during events.

4.2 BEACHES AND TIDAL SWIMMING POOLS

Thirteen beaches and coves and four tidal swimming pools occur at Brisbane Water. Popular beaches include Ettalong Beach, beaches at Woy Woy inlet, a beach at Yattalunga, and the beach at Couche Park at Koolewong. A list of tidal pools managed by Council is provided in Table 1.5 (Gosford City Council, 2004).

Many of the beaches and tidal swimming pools occur near recreational facilities such as picnic areas and toilets, boating facilities and car parks. The tidal swimming pool at Woy Woy is adjacent to recreational facilities within Memorial Park, a commercial area, some moorings and a large number of private wharves. A public wharf is located at the beach at Couche Park.

Peak usage periods for beaches and tidal swimming pools are during the weekend and summer periods.

Table 1.5 Tidal Swimming Pools

Location	Suburb	Usage
Pine Avenue	Davistown	Lap swim at high tide
Pretty Beach Road	Pretty Beach	Lap swim at high tide
Brick Wharf Road	Woy Woy	Good mid tide access
Mundoora Avenue	Yattalunga	Lap swim at high tide

Source: Gosford Council 2004

4.3 RECREATIONAL FISHING

Popularity

Brisbane Water was one of the first waterways in NSW to be closed to commercial fishing and as a result, Brisbane Water provides some of the best recreational fishing in Australia (NSW Fisheries, 2004).

The Sydney region, which includes Brisbane Water, has substantially the highest number of recreational fishers in NSW, although the proportion of the NSW population by region that fishes is lower in Sydney compared to other regions (NSW Fisheries, 2002a). Recreational fishing is a very popular activity in Brisbane Water, but no specific information has been collected on the number of anglers and catch sizes at an Estuary level (B Vanderwalt, Department of Primary Industries - Fisheries, *pers. comm.* 9 July 2004).

Fishers are attracted to the area particularly from the Central Coast and Sydney. Estimates of annual expenditure by Sydney anglers for day trips and overnight trips to the Gosford region were estimated to be in the order of \$2.6 million in 2002 (Dominion Consulting, 2003). The popularity of fishing is highlighted by the running of a Fishing Expo at Gosford Showground and the existence of a number of amateur fishing clubs in the area. In January 2004, the Brisbane Water Bream Fishing Classic was held and attracted fishers from across NSW.

Popular Fishing Areas

Species commonly targeted at Brisbane Water are bream, whiting, luderick, flathead, mulloway, mullet, mud crabs and blue swimmer crabs. Popular fishing areas identified through stakeholder consultation are displayed in Figure 1.7 and include the following:

- the area between Paddy's Channel and The Rip Bridge
- Lintern Channel
- Ettalong Beach
- Fagans Bay
- Point Clare
- oyster leases (particularly for black bream)
- washes, rock gutters, holes and kelp beds off rocky headlands

- sand and mud flat areas throughout the waterway
- channel 'drop-offs' north of Paddy's Channel (particularly for flathead)
- Coorumbine Creek (particularly for mullet).

Fishing Restrictions

The Department of Primary Industries (DPI) - Fisheries controls recreational fishing within Brisbane Water and has established the following rules for the waterway (NSW Fisheries, 2004):

- No spears or spear guns are permitted
- All traps are banned (including lobster pots and witch's hats)
- All nets are banned (except landing net or prawn dip/scoop net)
- No more than six hooks are permitted on any one line
- No foul hooking or jaggling of fish is permitted.

Fishing restrictions within Brisbane Water are shown in Figure 1.8. No shellfish collecting is permitted at Saratoga foreshore, including within the intertidal zone and 200 m seaward. Bait collecting is restricted to using a 'yabby pump' only within a significant area of the waterway between Ettalong and Booker Bay, as well as all of Cockle Broadwater and Cockle Channel.

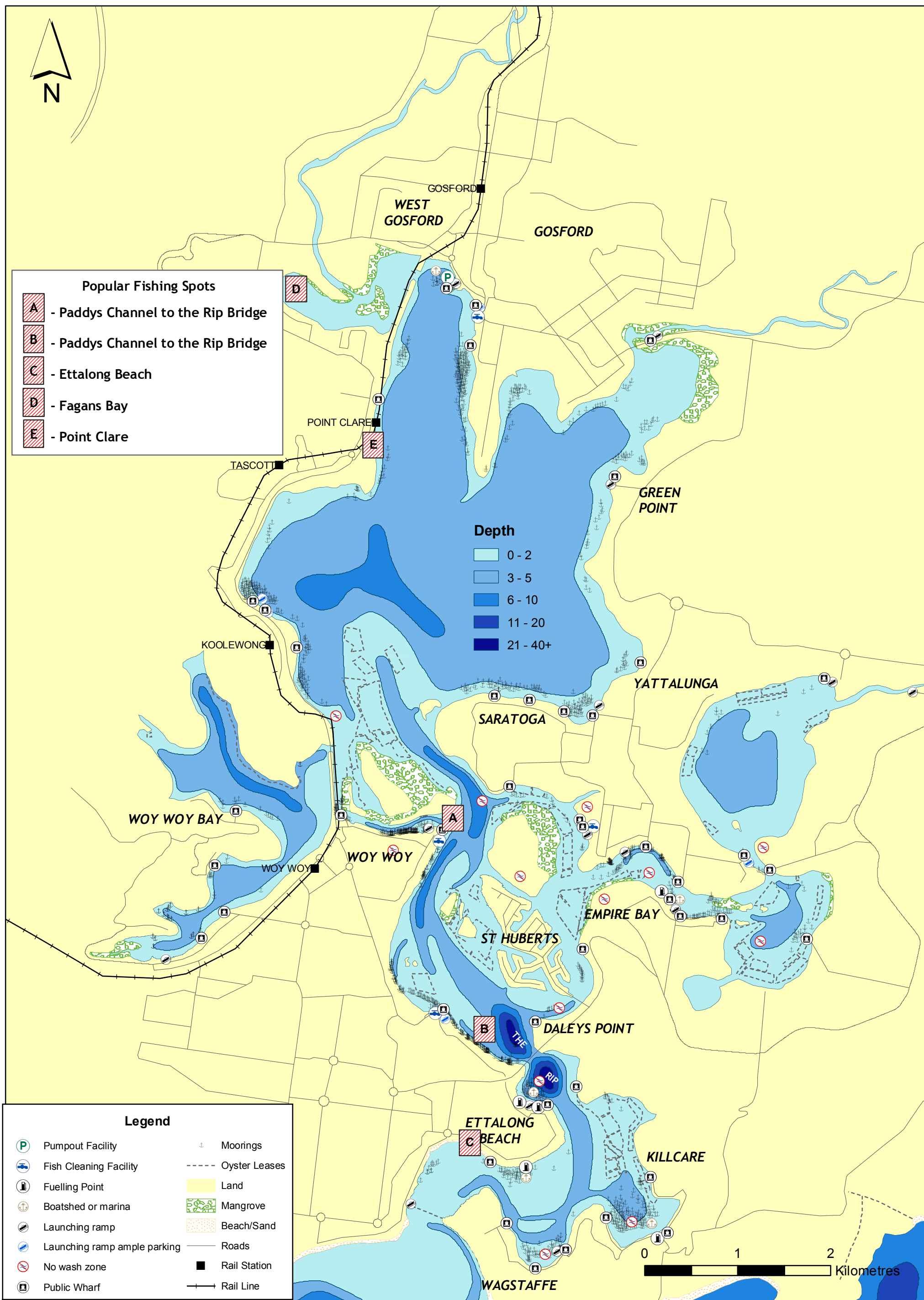


Figure 1.7 Popular Fishing Areas



Figure 1.8 Recreational Fishing Closures in Brisbane Water

4.4 COMMERCIAL OPERATIONS

Aquaculture

The oyster industry is an important part of local industry production in the Brisbane Water area and contributes approximately \$3,315,000 annually to the region (NSW Fisheries, 2002b) (refer Table 1.6).

Table 1.6 Sydney Rock Oyster Sales from Brisbane Water

Maturing Method Description	Total Production (Bags)	Total Production (Dozens)	Total Value \$	Proportion of Maturing Method by Total Area
Baskets	35	1,094	15,142	0.46
Raft	18	1,900	8,607	0.26
Rock/Other	58	63,800	26,432	0.80
Stick	60	6,100	30,845	0.93
Tray	7,373	846,252	3,233,825	97.55
Total	7,544	919,146	3,314,851	100

Source: NSW Fisheries 2002b

The location of oyster leases within the waterway is shown in Figure 1.5. Most of the oyster leases (approximately 75%) within Brisbane Water are used by oyster farmers from other estuaries within NSW to fatten their oysters in the last nine to 12 months before sale (Patterson Britton & Partners, 1999).

Ferry Services

Brisbane Water is an important waterway for commercial water-based transport. Two ferry services operate within the waterway.

The Palm Beach Ferry Service runs ferries from Palm Beach (on the tip of the northern beaches of Sydney) to Ettalong and Wagstaffe, connecting the waterway more directly to Sydney. From Ettalong, the service runs almost hourly on weekdays between the hours of 6:30am and 5:40pm, every hour or hour and a half between 8:00am and 6:40pm on Saturdays and every hour or hour and a half on Sundays (Palm Beach Ferry Service, 2003).

The Central Coast Ferry service operates daily servicing Woy Woy, Saratoga, Central, Davistown and Empire Bay. The service runs from 5:25am until 7:15pm, connecting the various locations within Brisbane Water for both commuter travel and tourist sight seeing (Central Coast Tourism pers. com. 24 May 2004).

In September 1998 the Ettalong Beach to Sydney Fast Ferry Service Environmental Impact Statement (EIS) was published by GHD. This EIS detailed the current use of the waterway and the impact that its operation would have on the environment with the risks being segregated as Maritime Related Risks and Fuel Storage Risks. The location of this proposed infrastructure is shown on Figure 1.5.

Patterson Britton & Partners in 1999 prepared the Gosford CBD - Circular Quay SuperShuttle Ferry Service and Gosford's Boat Harbour Marina & Tourist Development - Environmental Impact Statement. This document highlighted the requirements for the development of the Gosford Boat Harbour Marina and tourist

development for the city of Gosford. Council has now progressed with this project, exploring all options.

Other Commercial Operations

There are a number of other commercial operators at Brisbane Water that use the waterway on a regular basis. The majority of commercial operators cater for active users of the waterway, such as boat hire/charter, boat repairs and equipment hire/sales.

Other commercial operations include:

- boat hire/charter
- sailing/boating tuition
- marinas/boat sheds/repairs
- moorings
- equipment hire/sales, including fishing, kayaking, canoeing, diving
- oyster depuration plants.

5 Human Use and Environmental Conflicts

In order to establish an understanding of the existing and potential conflicts associated with human use of the waterway, the following was undertaken:

- an evening community meeting on 1 July 2004 at the Community Centre (within Erina Shopping Centre) to discuss the study
- question/comments sheet distributed at the community meeting. The sheet covered the following:
 - does your operation use the Brisbane Water waterway?
 - what facilities and infrastructure do you use?
 - when is your peak weekly/seasonal use of the waterway?
 - do you have any comments on the condition of available facilities at Brisbane Water?
 - have you experienced or identified any conflict between users of the waterway?
 - have you noticed any environmental impact as a result of human use of the waterway?
- telephone interviews with operators and various other user groups located on and adjacent to Brisbane Water. These interviews were based on contact details obtained from stakeholder lists compiled at the community meetings and internet searches of local organisation aimed at providing a representative sample of waterway users. Interviews covered the types of questions outlined above in the questions/comments sheet.
- Council was also consulted to help gain an appreciation for current issues.

5.1 CONFLICTS AND IMPACTS MATRIX

Existing and potential conflicts associated with human use of Brisbane Water foreshore and waterway is provided in Table 1.7. Major existing and potential conflicts are expanded upon in Sections 5.2 to 5.14.

In Table 1.7, each activity/user was ranked comparative to the other activities/users based on KBR's opinion and experience. 'L' means 'Low', 'M' means 'Medium' and 'H' means 'High' with '+' indicating a positive impact and '-' indicating a negative impact.

Table 1.7 Brisbane Water User/Activity Conflict and Impact Matrix

			Potential Environmental Impact						
Activities/ Users	Potential conflict with other users	Potential conflict with foreshore/waterway	Water quality	Air quality	Noise amenity	Visual amenity	Soil stability and health	Impact on flora/fauna	Economic impacts
WATERWAY USE									
Sailing	<p>All other boating activities.</p> <p>Rigging and launching from same areas.</p> <p>Navigation hazards- awareness of rules and regulations.</p> <p>Congestion of car parks and traffic.</p> <p>Occupy considerable space with moorings and restricts access to some areas of the waterway for other users.</p> <p>Access to some areas of the waterway restricted by oyster leases</p> <p>Waterway congestion through navigation channels.</p> <p>Mooring space.</p>	<p>Potential to cause erosion and vegetation destabilisation from not using designated boat ramps.</p> <p>Impact of possible contamination of sediment by antifouling agents.</p> <p>Boat wash causes erosion of foreshore.</p> <p>Sedimentation decreases depth of waterway causing navigation hazard.</p> <p>Lack of space causes parking in streets or on grassed areas.</p> <p>Potential for pump outs of bilge water or other oil spills etc.</p> <p>Potential for gross pollutants (ie. general household rubbish) due to lack of rubbish bins in reserves or at wharfs or rubbish going overboard.</p> <p>Dredging for navigation can degrade benthic fauna and water quality.</p> <p>Anchoring of vessel to foreshore and sea-floor may damage seagrasses and other potential fish habitats.</p>	-M	Neutral	Neutral	-L	-L	-L	+M

			Potential Environmental Impact						
Activities/ Users	Potential conflict with other users	Potential conflict with foreshore/waterway	Water quality	Air quality	Noise amenity	Visual amenity	Soil stability and health	Impact on flora/fauna	Economic impacts
		Dinghy storage on foreshore may damage native habitats and cause erosion.							
Power boating	<p>All other boating users and foreshore activities (swimming, fishing, diving etc).</p> <p>Not complying with NSW Maritime Authority rules.</p> <p>Local residents due to noise and potential nuisance.</p> <p>Mooring space.</p> <p>Waterway congestion through navigation channels.</p> <p>Restricts access to some areas of the waterway for some users such as swimmers and divers.</p> <p>Access to some areas of the waterway restricted by oyster leases</p>	<p>Potential to cause erosion and vegetation destabilisation from use of undesignated launch sites and beaching vessels.</p> <p>Boat wash causes erosion of foreshore.</p> <p>Sedimentation decreases depth of waterway causing navigation hazard.</p> <p>Impact of possible contamination of sediment by antifouling agents.</p> <p>Potential to reduce the visual quality of the waterway.</p> <p>Anchoring of vessel to foreshore and estuary bed may damage seagrass and fish habitats.</p> <p>Dinghy storage on foreshore may damage native habitats and cause erosion.</p>	-M	-M	-H	-L	-L	-L	+M
Paddling	<p>All other boating users and divers.</p> <p>Not complying with NSW Maritime Authority rules.</p> <p>Car parking.</p> <p>Access to some areas of</p>	<p>Potential to cause erosion and vegetation destabilisation from use of undesignated launching sites.</p> <p>Increased access to and potential disturbance (trampling) of environmentally sensitive</p>	Neutral	Neutral	Neutral	-L	-L	-L	+L

			Potential Environmental Impact						
Activities/ Users	Potential conflict with other users	Potential conflict with foreshore/waterway	Water quality	Air quality	Noise amenity	Visual amenity	Soil stability and health	Impact on flora/fauna	Economic impacts
	the waterway restricted by oyster leases	areas.							
Windsurfing	All other boating users, swimmers and divers and foreshore activities at launching sites. Not complying with NSW Maritime Authority rules. Car parking. Access to some areas of the waterway restricted by oyster leases	Potential to cause erosion and vegetation destabilisation from undesignated launching sites. Increased access to and potential disturbance (trampling) of environmentally sensitive areas.	Neutral	Neutral	Neutral	-L	-L	-L	+L
Diving	All other boating activities. Not complying with NSW Maritime Authority rules.	Potential for minor disturbance to aquatic habitat. Increased access to and potential disturbance of environmentally sensitive areas.	Neutral	Neutral	Neutral	Neutral	Neutral	-L	+L
Swimming	All other boating users and fishers. Not complying with NSW Maritime Authority rules.	Potential for minor disturbance to aquatic habitat at swimming sites.	Neutral	Neutral	Neutral	Neutral	Neutral	-L	Neutral
Fishing	All other boating users, swimmers, divers. Not complying with NSW DPI - Fisheries rules. Access to some areas of the waterway restricted by oyster leases.	Potential for fishing line waste; other waste (plastic bait bags). Potential for disturbance to aquatic habitat. Potential decrease in juvenile fish stocks and biological diversity.	-L	Neutral	Neutral	-L	-L	-M	+M

			Potential Environmental Impact						
Activities/ Users	Potential conflict with other users	Potential conflict with foreshore/waterway	Water quality	Air quality	Noise amenity	Visual amenity	Soil stability and health	Impact on flora/fauna	Economic impacts
		Potential loss of benthic fauna from hand haul netting. Vehicle access on beaches may destabilise dunes (eg Ettalong Beach).							
Aquaculture	All other boating users. Not complying with government authority rules. Restricts access by some other users to some areas of the waterway.	Transfer of oysters for 'fattening' between estuaries increases the risk of spreading diseases. Potential impacts of new leases on seagrass beds.	-L	Neutral	-L	-M	Neutral	-M	+H
Commercial Fishing Operators	All other boating users. Not complying with NSW Maritime Authority rules. Navigation hazards – fishing boats using channel at night with no lights. Noise. Waterway congestion through navigation channels. Local residents due to noise on weekend and congestion in local streets. Restricts access to the foreshore in some locations.	Potential to cause erosion and vegetation destabilisation from not using designated boat ramps. Boat wash may cause erosion of foreshore. Potential to impact water quality. Noise and congestion impacts on local residents. Lack of space causes parking in streets or on grassed areas.	-M	-L	-M	-M	-L	-M	+H

			Potential Environmental Impact						
Activities/ Users	Potential conflict with other users	Potential conflict with foreshore/waterway	Water quality	Air quality	Noise amenity	Visual amenity	Soil stability and health	Impact on flora/fauna	Economic impacts
	Access to some areas of the waterway restricted by oyster leases.								
FORESHORE USE									
Recreational use of parks, reserves and other open space	Facilitates access to the foreshore. All boating users due to lack of space, parking in reserves, storing dinghies in reserves. Foreshore activities (including walkers, cyclists, picnickers and fishers). Local residents due to noise on weekend and congestion in local streets.	Potential for general litter to wash into waterway from users and overflow of rubbish from bins. Potential erosion of access tracks and impacts on flora and fauna. Impact on visual quality of the environment in peak times. Need for public amenity blocks. Need for maintenance of facilities.	-L	Neutral	-L	-L	-L	-L	+L
Picnicking	Other reserve/open space users - congestion in peak periods. Car parking congestion.	General litter washing into waterway. Food waste disposal and feeding native animals.	-L	Neutral	-L	-L	-L	-L	Neutral
Bushwalking	Cyclists using same tracks/paths as bushwalkers.	Potential to cause erosion and impact on flora and fauna from not keeping to marked tracks. Increased access to and potential disturbance (trampling) of environmentally sensitive areas. General litter.	-L	Neutral	Neutral	-L	-L	-L	+L

			Potential Environmental Impact						
Activities/ Users	Potential conflict with other users	Potential conflict with foreshore/waterway	Water quality	Air quality	Noise amenity	Visual amenity	Soil stability and health	Impact on flora/fauna	Economic impacts
Walking	Cyclists using same tracks/paths as bushwalkers.	Potential to cause erosion and impact on flora/fauna from not keeping to marked tracks. Increased access to and potential disturbance (trampling) of environmentally sensitive areas.	-L	Neutral	Neutral	Neutral	-L	-L	Neutral
Cycling	Other parks/reserve users, bushwalkers/ walkers using walking paths and tracks.	Potential to cause erosion and impact on flora/fauna from not keeping to marked tracks. Increased access to and potential disturbance (trampling) of environmentally sensitive areas.	-L	Neutral	Neutral	Neutral	-L	-L	+L
Car parking	Congestion at peak times in reserves/open spaces areas. Boating facilities due to parking and congestion around major mooring sites and boat ramps. Local residents due to congestion and parking in local streets.	General litter washing into waterway. Potential run-off of oils, petrol, lubricants and other car related spills. Lack of space causes parking in streets or on grassed areas.	-M	-M	-M	-H	-M	-L	+M
Dog exercising	Uncollected dog faeces - odour/visual impact on other users. Public safety due to dog attacks.	Potential for dog faeces to pollute waterways and impact swimming areas and flora and fauna. Potential impact on fauna due to dog attacks. Potential impact on public	-M	Neutral	-L	-L	-L	-L	Neutral

			Potential Environmental Impact						
Activities/ Users	Potential conflict with other users	Potential conflict with foreshore/waterway	Water quality	Air quality	Noise amenity	Visual amenity	Soil stability and health	Impact on flora/fauna	Economic impacts
		safety due to dog attacks. Potential to cause erosion and impact on flora/fauna from not keeping to marked tracks.							
Sports -Horse race track -Golf course -Showground	Restricts access to the foreshore. Noise to surrounding area during events. Traffic congestion during events.	Nutrient leaching, from fertiliser used on grounds. Potential leachate from sporting ovals that have been filled adjacent to waterway. Car parking requirements during large events may result in parking on unsealed surfaces	-M	Neutral	-M/H	-M	-L	-M	+M
Brisbane Water National Park and Boudi National Park	Dog exercisers due to conflict with National Park entry rules. Facilitates access to the foreshore.	Potential to cause erosion and impact on flora and fauna from not keeping to marked tracks in National Park. General rubbish left behind by campers, bushwalkers etc	-L	Neutral	Neutral	Neutral	-L	-L	+M
Commercial and industrial operators	Amenity. Restrict access to foreshore in some locations. Car parking congestion.	Potential run-off of oils, petrol, lubricants and other car related spills. Potential disturbance of amenity for local residents. General litter.	-H	-M	-M	-M/H	-L	-M	+H

5.2 POWER-BOATING AND PERSONAL WATERCRAFT

The use of power boats and personal watercraft (PWC) is a concern for both the health of aquatic ecosystems and also the general community. Brisbane Water is a popular location for a wide variety of boating activities, as is evident by the large number of boat ramps and wharfs. PWC, if not complying with regulations, can cause extreme nuisance to other users of the waterway. The main social conflicts are due to noise, disturbance of the peace, 'chopping-up' water, public safety and disturbance of foreshore activities, such as swimming and fishing. The banning of PWC usage in Sydney Harbour from October 2001 has the potential to increase their usage in Brisbane Water due to the proximity of the waterway to Sydney and the number of boat ramps in the area.

NSW Maritime Authority controls the use of PWCs and has published PWC rules outlining the distances that PWC are allowed from the foreshore and from other vessels both non-powered and powered. The Authority website also details the rules governing other usage and the waterway rules of all users. A number of community members expressed concerns with the use of PWCs on Brisbane Water due to their "nuisance" value to other waterway activities, particularly fishing.

NSW Maritime Authority also controls the speed of watercraft throughout the waterway, including zoning areas as "No Wash" zones and banning water skiing in certain areas (Figure 1.5). These management policies are designed to limit the impact of the various boating activities on the surrounding environment and other waterway users. Paddy's Channel has been identified through community consultation as an area of high boating activity and congestion. Speed and associated wakes from larger vessels are a source of major conflict between different users of the channel and can impact on the waterway itself through erosion and scour.

As long as the boating rules and restrictions are obeyed, the various uses of watercraft should not conflict with other waterway uses and the natural environment. The NSW Maritime Authority does, however, need to be aware of any socially and environmentally offensive behaviour and especially mindful of areas of known seagrass and sensitive aquatic habitat populations.

The main environmental conflict associated with the use of powerboats and PWC is the degradation of seagrass, saltmarsh, mangrove and other aquatic habitats. There are a number of mangroves located within Brisbane Water, which are recognised for their ecological significance, including their value as fish nurseries. Through the restriction of boating activities within these regions, conflicts will be minimised.

5.3 SMALLER WATERCRAFT/DINGHIES

Council has released a poster titled *Protecting Our Waterway Foreshores - A Guide for Residents in Foreshore Areas*, (Gosford City Council, 2004) which identifies boat launching and storage as a possible conflict for waterway users. A number of small boats such as dinghies, kayaks, runabouts and trailers are stored, anchored or attached to fixtures along the foreshore reserves. If their purpose is for commuter use, their storage may be contrary to the provisions of *Crown Land Act 1989* and the *NSW Local Government Act 1993*. The poster identifies that these boats and other types of vessels

damage foreshore vegetation and restrict access to the foreshore. This conflict may be controlled through the provision of boat-storage facilities and launching ramps.

Council has provided dinghy storage in some reserves to accommodate moored vessels. *Protecting our Waterway Foreshores* states various positions on managing the foreshores. Council has adopted a policy of installing dinghy storage racks in strategic locations. The *Plan of Management - Foreshore Parks* (Gosford City Council, 1996), states that “Boats/Dinghies may be stored along foreshore parks where there are designated storage areas. Any boats/dinghies outside of these areas may be removed by Council”. Currently, these storage facilities are not adequate, as shown by the large number of dinghies stored informally in foreshore parks and other areas around the waterway, with formal facilities at capacity (Figure 1.9).

The issue of storing or leaving dinghies along the foreshore or at wharf points for extended periods requires management to ensure that services are not jeopardised by congestion, public safety is not compromised and ensuring the environment is not degraded. Insufficient dinghy storage encourages boat owners to store their dinghies in various locations around the foreshore as to allow easy access to their moored vessel (Figure 1.9).

Dinghy storage in the Brisbane Water region is currently under review by Council. One possible solution to dinghy storage practices that Council is investigating is based on the Pittwater Council model, in which a number of designated locations are identified, managed and regulated by Council rangers (Lawson & Treloar, 2003). The system would involve the provision and allocation of dinghy storage facilities in a more efficient manner than what currently exists, with a registration and fee charged for dinghy storage which in turn would allow for the up-keep of these various facilities. With this system, dinghies stored outside of these designated areas would be prohibited and rangers would be given the authority to remove these unauthorised dinghies in due course following a notice period (B Cameron, Gosford City Council, *pers. comm.* 29 July 2004).



Figure 1.9 Informal dinghy storage at Yattalunga

The Council's Protecting our Waterway Foreshores publication notes that "the storage of privately owned items on reserves can expose their owner to legal liability should an accident or injury occur as a result of their presence" and fines up to \$2,200 are enforceable under the *NSW Local Government Act 1993*.

5.4 BOAT LAUNCHING

A number of marinas and boatsheds around the estuary have boat-slipping facilities (Figure 1.2). These facilities allow for large vessels to be taken out of the water for cleaning and maintenance purposes. These facilities are located in areas of intensive boating activities due to the large number of moorings and marina berths in the waters surrounding the marina. Conflicts may arise in these locations between other waterway users due to space requirements and possible pollutants and by-products of the cleaning and maintenance activities.

There are 19 boat ramps located around the estuary to facilitate smaller boat launching activities, in particular trailer boats (Appendix B; Figure 1.2). These launching ramps experience peak usage during the summer months, particularly on weekends. Ramps in the lower reaches of the waterway have been identified (through community consultation) as experiencing extreme congestion during these peak periods. The main conflicts at these locations appear to arise from inappropriately sized boats attempting to use these facilities for rigging and launching purposes where insufficient ramps and parking facilities are available. In some cases, larger vessels may be using these public boat launching ramps in order to avoid fees and charges required for the use of marina or boatshed facilities.

A number of boat launching ramps located on the eastern side of the waterway have experienced loss of amenity in recent years as a result of sedimentation. Sedimentation around the ramps restricts boat launching, because the water depth is not adequate at the end of the ramps. The flow-on effect of ramps affected by this process is that other ramps and car parks throughout Brisbane Water experience increased usage and ultimately congestion. Congestion and traffic problems at these ramps affect many waterway users, both on the water and on land, owing to time delays, parking availability and impacts on local resident access.

Due to congestion and location of the formal public boat launching facilities, illegal and undesignated boat launching activities may occur around Brisbane Water. These activities may lead to scour and erosion of the foreshore and damage native habitats on land and in the near shore region. The cumulative effects of the undesignated boat launching can cause an increase in sedimentation and a loss of foreshore amenity and land through erosion.

5.5 COMMERCIAL FERRY OPERATORS

There are specific onshore and offshore impacts that can occur with cargo wharves and commercial ferry operators.

Onshore Effects: Commercial wharves used to load and unload supplies and passengers can conflict with a number of other waterway users at wharf locations. Noise and air quality may be impacted in these areas due to the idling of large diesel engines for prolonged periods of time. Local residents and the general public can be affected in these areas as a result of traffic congestion and lack of parking. Conflicts

can arise between the users of car parks and ferry services and the commercial vehicles and trucks that provide goods and services to the area. The associated social impacts are loss of amenity through litter and noise and the inconvenience associated with insufficient parking.

Offshore Impacts: Ferry Operators service the residents and tourists attracted to Brisbane Water. The operations of large ferries may cause adverse impact on the water quality and natural environment through the disruption of sensitive species located in various parts of the waterway. High boat traffic close to the shoreline may result in scouring and foreshore erosion due to the turbulence and wakes created by the larger vessels.

5.6 COMMERCIAL AND RECREATIONAL FISHING

Commercial fishing activities are restricted within Brisbane Water, but are allowed in the surrounding waters of Broken Bay and off-shore. Conflicts which may arise between commercial operators and other users of the waterway may include the launching, storage and movement of the generally larger commercial vessels in some parts of the estuary. Even though commercial fishing is not allowed within the waterway, many commercial operators store their boats in various locations around Brisbane Water and also frequent the fuelling and pump-out facilities.

Recreational fishing is a popular past-time for many locals and visitors to the area. Various types of fishing are popular on and around the foreshore, which may lead to congestion of local streets and car parking facilities in times of peak usage, typically the summer months. Trailer boats are often used by recreational fisherman, and as such, in times of peak usage, may lead to congestion at the boat launching ramps and car parks around Brisbane Water.

DPI - Fisheries regulates bag and haul sizes for recreational fishing on NSW waters in order to limit the depletion of fish stocks. Information regarding the legal requirements for bag and haul sizes are posted in a number of locations around the waterway, but some visitors may be unaware of these rules. The rules need to be made more readily available to members of the public, to increase the awareness both amongst visitors and locals, as to what the requirements are and why they are in place.

Navigation rules are set and policed by the NSW Maritime Authority. Fishers using the waterways are required to be aware and follow these rules in order to limit their impact on other users and the waterway as a whole. There are a number of exceptions for some concession card holders, but in general, recreational fishing licences are required for people over the age of 18 fishing within Brisbane Water (NSW Fisheries, 2004).

Noxious Marine Vegetation

Gosford City Council is a member of the Lower Hunter Noxious Weeds Committee. Weed mapping is the current group objective. Council is also a foundation member of the Lantana Biological Control Taskforce. The aim of this taskforce is to fund research into biological agents for Lantana control.

As part of the Flora component of the Estuary Process Study, information on the possible occurrence and location of noxious marine weeds which may be of concern

within the waterway will be identified. In managing the foreshore parks, it is important to appreciate the existence of any noxious marine vegetation which may exist in the area and the impact different management practices on these weeds and the surrounding environment.

5.7 SEDIMENTATION AND FORESHORE EROSION

The *Brisbane Water Plan of Management* (Gosford City Council 1995), on the basis of hydrographical data collected between 1901 and 1992, concluded that sediment processes within the waterway are in balance:

“there is recent sedimentation occurring at the outlets of drains and creek systems entering Brisbane Water, however no identifiable trend suggests that Brisbane Water is steadily accreting material or being eroded to any degree of concern. On the whole, the extent of the estuary appears to be stable”.

Stormwater runoff and sewage overflows entering the waterway have been identified as contributing factors of sedimentation in some stretches of Brisbane Water. This issue has been raised both through the 1995 *Plan of Management* and recent community consultation for the current study. These impacts are of particular concern when they affect the amenity of the waterway in terms of waterway depth near the foreshore.

Water depth, particularly at mooring and wharf locations is an important consideration for boat and waterway users alike. Sedimentation associated with the outlets of creek and drainage systems may affect boat usage due to navigational and access hazards. The conflicts that might arise would be due mostly to human use and intervention associated with development and continuing use of the waterway.

Community consultation has highlighted several issues of concern in regard to sedimentation and erosion. The St Hubert’s Island Residents Association and the Killcare Pretty Beach and Wagstaffe Youth and Community Association have identified several sites on the eastern side of the waterway experiencing sedimentation and erosion, leading to a loss of public amenity and conflict between various users. These concerns conflict with the findings of the 1995 Plan of Management in relation to the stability of the waterway.

Boat wash is a significant cause of bank erosion in Brisbane Water. The NSW Maritime Authority has imposed a number of speed restrictions around the waterway to limit this impact and has also prohibited water-skiing in the Correa Bay region of Woy Woy Creek (Figure 1.5).

Uncontrolled access to the foreshore accompanied by insufficient protection of open stretches of vulnerable shoreline leads to localised erosion in some sections of the waterway. A number of seawalls have been constructed around the foreshore by Council and residents to aid in the protection of the foreshore, but a sound working knowledge of estuarine processes is required prior to the installation of any such infrastructure.

5.8 DREDGING

Dredging has been carried out on a number of occasions in the past in order to ‘open’ different parts of the waterway for larger boating activities. Due to the relative stable

nature of the waterway, as described above, dredging is only required sporadically as the sedimentation rate is primarily influenced by deposits from the creeks and drainage systems entering the waterway.

Locations identified in the *Plan of Management* as requiring dredging include; Wagstaffe, Point Clare, Gosford (inside the breakwater), Cockle Channel, Paddy's Channel, Saratoga Channel and Woy Woy Channel. A number of these locations have had previous dredging, including Woy Woy Channel and Correa Bay which have needed to be dredged on occasions in the past due to sedimentation resulting from Woy Woy Creek. Under section 201 of the *Fisheries Management Act 1994*, no dredging and reclaiming is to be carried out without a permit. The Act stipulates it is an offence to dredge/reclaim in any waters and/or affect marine vegetation without permits from DPI - Fisheries. Penalties of up to \$55,000 for an individual and/or up to \$110,000 for a company or Local Government Agency can apply plus full site remediation costs.

5.9 IMPACTS ON ESTUARINE PLANT COMMUNITIES

The main estuarine plant communities present around the waterway include Swamp Oak Forest, Grey Mangrove Forest, Salt Marsh and Seagrass (Gosford City Council, 1995). The main human use impact on these communities is associated with traversing multiple tracks, for use by mountain bike riders, walkers/bushwalkers, dog exercisers and local residents. Other conflicts identified include vandalism, mowing and the removal of saplings or trees for views. The conflict arises due to the consequence of such actions resulting in the degradation and loss of the natural habitat and weed invasion. Multiple tracking can also expose the shoreline to further erosion and lead to the trampling of seedlings/pneumatophores.

Council has a number of policies governing the use and management of the various types of native vegetation and habitats surrounding the waterway. Council's Biodiversity Information Sheet No. B1- Wetlands document states "Council has a policy that no development activity will result in a direct loss of a wetland" (Gosford City Council, 2004). A number of bicycle and footpaths are located around the foreshore areas to facilitate recreational pursuits whilst trying to minimise human activity on the natural environment in the form of multi-tracking. An example of the cycleway/footpath linking Point Clare to Gosford is shown in Figure 1.10.



Figure 1.10 Cycleway/footpath linking Point Clare to Gosford

These paths and trails are not present in all locations and additional paths may be required in areas of new and existing development. It will be important to contain high pedestrian and bicycle activity in order to protect the estuarine vegetation in these locations.

Responses from the community consultation also highlighted the need for Council monitoring of foreshore parks adjacent to residential properties. There was a concern that there may be conflicting interests existing between the wellbeing of the natural environment and the value of surrounding real-estate.

5.10 CAR PARKING AND TRAFFIC CONGESTION

Car parking and traffic congestion is a major conflict between user groups around Brisbane Water. There seems to be a compromise between visitors and local residents adjacent to boat and ferry services, with many facilities not providing specified parking areas. Many reserves and parks surrounding Brisbane Water have insufficient car parking capacity to meet the demand created by the sheer number of people attracted to the waterway during peak periods, with major sporting facilities such as the Racecourse and Grahame Park experiencing local traffic congestion before and after events. Both the Racecourse and the Showground provide only off-street parking during events.

A number of the car parks and marinas (eg Woy Woy Wharf, Booker Bay, Gosford Sailing Club and Empire Bay) become very congested on weekends and in peak summer periods due to the high number of boat users. Parking and general traffic often impact on local residents in respect to both noise and access associated to increased traffic volumes during these times.

Watercraft of varying sizes often require trailer transportation, thus increasing the pressure on parking facilities located in close proximity to foreshore sites with direct waterway access. The NSW Maritime Authority have identified five boat launching ramps containing “ample parking” out of the 15 public ramps available around the waterway (Figure 1.5).

The banning of PWCs on Sydney Harbour is likely to have caused an increase in usage on Brisbane Water, serving to exacerbate pre-existing car parking and traffic congestion problems.

The lack of ample car parking near to waterway access points leads to parking outside the grounds of clubs, on road easements and often across local residents’ driveways resulting in various conflicts.

In general, car parking causes direct conflict for user groups for the entire Brisbane Water foreshore area, especially around boating clubs and mooring hubs. Parking on unsealed land close to popular waterway facilities causes erosion and land degradation and decreases visual amenity.

Another conflict for the clubs includes congestion of boat rigging areas near the boat launching facilities.

5.11 SPORTING FACILITIES

Major sporting facilities such as the Race Course, Golf Course and Showground restrict public access to the foreshore and waterway in the area of Narara Creek due to the land requirements and location of these facilities.

Nutrient leaching and associated runoff from large sporting facilities may conflict with other users due to its impact on Brisbane Water’s water quality. Nutrient imbalances in the waterway may lead to increased growth of weeds and algae in the waterway.

5.12 LIGHT INDUSTRY

Various parts of the Brisbane Water catchment contain commercial activities, in particular light industry. The light industry located near the foreshore and tributaries is primarily concentrated within the Fagans Bay and Narara Creek region of the estuary. The various land usages within these regions may conflict with other users due to the traffic and transportation requirements surrounding these activities.

Conflicts are also present between this use and other waterway users due to foreshore access availability and water quality. The land surrounding the commercial land ultimately drains into the waterway, thus any activities on this land, if not managed correctly, will impact on the health and sustainability of the waterways ecosystems. Stormwater management plans need to be in place for all activities with the potential to adversely impact the water quality in Brisbane Water, due to the potential impacts from pollution to the natural environment and other water users.

5.13 DOG EXERCISE AREAS

Under the *Companion Animals Act* 1998, all Local Councils have a responsibility to productively manage dog exercise in their area. Dog exercising is a popular activity amongst the Brisbane Water community and as such, Council has specified 200 parks

where dogs may be exercised, 44 of which have been identified as ‘off-leash’ exercise areas, including Ettalong Beach. In general, the ‘Dog Exercise Areas Policy H4.07’ specifies on-leash dog exercise is permitted on all parks unless specifically signed posted as a dog exclusion area, or specifically prohibited by the *Companion Animals Act 1998*.

The presence of dogs on foreshores has both an environmental conflict and a human user conflict. Environmental conflicts include dog faeces which can contaminate the water of the estuary and in turn result in poor water quality for primary and secondary contact recreational uses such as swimming and fishing. Dog exercise areas near migratory bird habitat may also impact on bird ecology and other wildlife if exercised ‘off-leash’. Human user conflicts occur to a lesser degree, however in some cases residents living close to such areas have made complaints about animals on their property. The main focus for Council is mitigation, rather than reduction in dog walking areas, given the high number of users that identified dog exercise as their primary use of the foreshore parks.

A potential conflict between dog exercisers and the environment on the foreshore reserves surrounding Woy Woy Bay may be present due to the potential access between the reserves and Brisbane Water National Park. *National Parks and Wildlife Act 1974* stipulates dogs and other domestic pets may not be taken into National Parks. National Parks do not allow the entry of companion animals as they can catch and kill or wound native animals and birds.

5.14 PUBLIC SAFETY ISSUES IN RELATION TO RECREATIONAL ACTIVITIES

Public safety issues that may arise due to the various recreational activities carried out on and around the waterway primarily stem from congestion and space requirements. Car parks and boat ramps located in various parts of the waterway are potential hazards to pedestrians and other motorists in times of peak patronage. Drivers of vehicles towing trailer boats often suffer from obstructed or limited vision, which when combined with high traffic flows and congestion has the potential to impact on public safety.

Adequate lighting at boat ramps and car parks has also been raised through community consultation as a public safety concern. Many fishers and other boat users launch their crafts in times of limited sunlight (dawn and dusk) on ramps containing no lighting. One possible solution suggested is sensor lighting or focused lighting for the boat ramp areas to limit the risk of accidents.

Public safety is also of concern in areas of the waterway which are utilised by a variety of users. Conflicts and safety issues may arise due to the differing speeds and sizes of the vessels using the waterway. To control and mitigate these safety concerns, the NSW Maritime Authority enforces speed restrictions in various parts of the waterway (Figure 1.5) and also controls the issue of licences and permits for organised use of the waterway.

6 Potential Areas for Increased Tourism

The tranquillity and natural environment of Brisbane water attracts many visitors to the region each year. The tourism dollar is important to local communities in the region through the provision of infrastructure and jobs for many local residents.

Tourists are attracted to the area for a number of reasons, ranging from the relaxed country lifestyle in comparison to the metropolitan hubs, to the various recreational activities the waterway and its various facilities provide.

Careful management of facilities and uses is required in order to achieve equitable outcomes for the various interest groups using the waterway and its surrounds. Tourism activities in many areas are restricted due to parking space limitations and accessibility to the foreshore.

Areas identified as potential sites for future tourism developments, including eateries, land- and water-based activities and accommodation, were identified during site inspections and on the basis of information obtained during preparation of this report, as illustrated on Figure 1.4. These locations are preliminary suggestions only - no formal assessment of the feasibility of these sites has been conducted as yet.

As outlined above, increased tourism can impact on local communities, both beneficially and adversely, due to the nature of the various uses. As such, a cost-benefit analysis would be required in the identified areas to fully appreciate the impact of any such plans both at the local and regional level.

7 Summary of Recreational Activities and Foreshore Land Uses

This section of the processes study has investigated the human uses and activities, both water and land based, of the Brisbane Water estuary and has detailed the potential user and environmental conflicts and threatening processes associated with these uses.

A range of conflicts have been identified which have the potential to reduce the value of recreational experiences but also have the potential to threaten the ecological sustainability of the estuary. The magnitude of these conflicts increases in peak periods. These periods are at weekends throughout the year but more so in the summer months, as is to be expected for a coastal destination.

A major constraint to the use of Brisbane Water is the lack of car parking required for the numbers and types of people using the waterway. Traffic access to different parts of the waterway is restricted due to the geographical constraints of the surrounding terrain. Users of the waterway have varying requirements for car parking (trailers, cars etc.) that causes conflict and traffic congestion during peak usages.

A variety of differing land uses and developments exist around the foreshore of the waterway, including recreational, residential, National Park, commercial, light industry and Council reserves and parks. A number of these differing land uses contribute to the existing conflicts that currently exist between users of the waterway and between human use and the natural environment of the estuary.

Human use conflicts, such as recreational pursuits, urban stormwater runoff and sewage overflows, can lead to processes such as sedimentation, contamination of sediments, poor water quality and general loss of amenity. This in turn has a direct effect on the compatibility and sustainability of waterway uses.

The conflicts that have been identified in this report by discussions and existing literature require further assessment and investigation in order to form appropriate management objectives and actions as part of the management study. Plans of management exist for a small number of reserves around the foreshore. The management values, objectives and actions identified in these plans accompanied by other research and consultation undertaken throughout the study, will be used in the next phase of the estuary management process to guide the formation of a comprehensive plan for the entire Brisbane Water estuary.

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Appendix A

**HUMAN USES AND ACTIVITIES
INVENTORY FOR
BRISBANE WATER**

Human Usage and Activities Inventory						
Human Usage and Activities	Easting (MGA)	Northing (MGA)	Mapping Code	Type/Current Use	Peak usage period	Infrastructure /Facilities & Other comments
Reserves and Parks						
Brisbane Waters National Park			1	walking; view point; historic interest	weekend, summer	
Lemon Grove Park	345022	6289880	2	Netball	Weekend, winter	Netball Courts
Ettalong Beach Reserve	345314	6290152	3	walking, picnics and boat launching	weekend, summer	Toilet block, bike track, picnic facilities, car parking and boat ramp
Lance Webb Reserve	345748	6290126	4	walking & picnics	weekend, summer	Toilet block, bike track & picnic facilities
Governor Phillip Memorial Reserve	346128	6290126	5	Lookout	all year round	Memorial
Kitchener Park (Blackwall Mountain)	345418	6291100	6	Lookout & Walking	all year round	Walking track
Un-named	344822	6292420	7	general recreation uses - walking and dog exercise & boat ramp	weekend, summer	boat ramp and car park
Lions Park	345152	6293534	8	walking, picnics and boat launching	weekend, summer	Toilet block, bike track, picnic facilities, playground, car parking and boat ramp
Memorial Park	344618	6293594	9	walking, picnics & swimming	weekend, summer	Toilet block, bike track, picnic facilities & playground
Austin Butler Memorial Oval	344510	6293324	10	sporting	weekend	Cricket and Soccer
Correa Bay Reserve	342332	6292158	11	picnics and boat launching	weekend, summer	Toilet block, picnic facilities and boat ramp
Un-named	343390	6293240	12	open space	weekend, summer	Public reserve between Correa Bay and Fagans Bay
Gurdon Reserve	343466	6293560	13	open space	weekend, summer	Playground
Couche Park	343784	6295534	14	open space	weekend, summer	Toilet block, picnic facilities, playground and limited dinghy storage
Koolewong Foreshore Reserve	343332	6296590	15	walking, picnics and boat launching	weekend, summer	Toilet block, bike track, picnic facilities, car parking, boat ramp & dinghy storage
Goodaywang Reserve	344770	6298528	16	open space	weekend, summer	Bike track
Un-named Island	344648	6299174	17	restricted use	-	-
Fagans Park	344130	6298838	18	sporting	weekend, summer	Toilet block, bike track, picnic facilities, playground, cricket and soccer
Fagans Bay Reserve	343982	6299032	19	open space	weekend, summer	Bike track & playground
Un-named	344928	6301320	20	open space	weekend, summer	Foreshores reserve along western side of Narara Creek
Gavenlock Oval	345992	6301950	21	sporting	weekend, summer	Toilet block, playground and basketball courts
Sensory Park	346134	6302048	22	open space	weekend, summer	bike track & picnic facilities
Paddy Clifton Oval	346266	6302222	23	sporting	weekend, summer	Toilet block, cricket & skate park
Victoria Park Reserve	345164	6301500	24	sporting	all year round	Showground, golf course, tennis

Human Usage and Activities	Easting (MGA)	Northing (MGA)	Mapping Code	Type/Current Use	Peak usage period	Infrastructure /Facilities & Other comments
Reserves and Parks (cont'd)						
Gosford Race Course	344204	6300330	25	Horse Races	weekend, all year round	race track and grand stands
Garnet Adcock Memorial Park	344464	6299660	26	sporting	weekend, all year round	AFL, hockey, netball, baseball, velodrome, toilets and car parking
Carawah Reserve	344772	6299764	27	open space	weekend, summer	Bike track
Graham Park	345388	6299666	28	Football Oval	weekends, winter	Football Stadium
Leagues Club Field	345534	6299666	29	sporting	weekends, winter	rugby league
Lions Park Reserve	345726	6299266	30	open space	weekend, summer	Toilet block, picnic facilities, playground and parking
Pioneer Park	345758	6297472	31	open space and cemetery	all year round	Cemetery and picnic tables
Edogawa Commemorative Gardens	346644	6298354	32	open space	weekend, summer	playground and car parking
Hargraves Park	347118	6298312	33	open space	weekend	playground
Hylton Moore Park	347504	6299042	34	sporting	weekend, all year round	toilet blocks, playground, baseball, soccer and car parking
Recreation Reserve	347872	6298784	35	open space	weekend, summer	-
Un-named	348848	6299034	36	open space	weekend, summer	-
Un-named	346316	6299058	37	open space	weekend, summer	-
Un-named	348154	6297852	38	open space	weekend, summer	-
Un-named (Ironbark Point)	347570	6297702	39	open space	weekend, summer	Boat ramp and memorial
Blessington Reserve	347378	6296862	40	open space	weekend	-
Un-named (Green Point)	346928	6296322	41	open space	weekend, summer	-
Un-named (Mundoora Ave)	347528	6295350	42	walking, picnics and boat launching	weekend, summer	Boat ramp & picnic facilities
Jirramba Reserve	347068	6294752	43	open space	weekend, summer	Toilet block, picnic facilities & playground
Saratoga Oval	345456	6294850	44	sporting	weekend, all year round	Toilet block, picnic facilities, AFL, cricket, tennis & sailing
Mount Pleasant Lookout Reserve	345894	6294338	45	lookout and open space	weekend, all year round	Walking track, lookout
Riley's Island Nature Reserve	346252	6293352	46	Nature reserve	-	-
Pelican Island Nature Reserve	345068	6294088	47	Nature reserve	-	-
Un-named (Lintern Street)	346944	6293592	48	open space and boat launching	weekend, summer	boat ramp
Illoura Reserve	347188	6293244	49	walking, swimming & boat launching	weekend, summer	boat ramp & baths

Human Usage and Activities	Easting (MGA)	Northing (MGA)	Mapping Code	Type/Current Use	Peak usage period	Infrastructure /Facilities & Other comments
Reserves and Parks (cont'd)						
Broadwater Park	349058	6295716	50	walking and open space	weekend, all year round	-
Un-named (Carrak Rd)	349744	6295288	51	open space	weekend, all year round	-
Frost Reserve	350372	6295162	52	sporting	weekend, summer	Toilet block, picnic facilities, skate ramp, tennis courts and parking
Flora & Fauna Wetlands Reserve	350238	6294996	53	Nature reserve	weekend, all year round	-
Un-named	349744	6292540	54	Open Space	weekend, summer	Toilet block
Cockle Bay Nature Reserve	348358	6292272	55	Open Space	weekend, summer	Bike track
Un-named (Kendall Rd)	347748	6292850	56	walking, picnics and boat launching	weekend, summer	Picnic facilities and boat ramp
Un-named (Myler Av)	347172	6292842	57	Open Space	weekend, summer	-
Palermo Reserve	347018	6291888	58	Open Space	weekend, summer	-
Oyster Islet	346848	6291886	59	Reserve	-	-
Retention Islet	346354	6291776	60	Reserve	-	-
Un-Named (Mercator St)	346002	6292080	61	Playground	weekend, all year round	Playground
Un-Named (Luderick Av)	346374	6292562	62	Playground	weekend, all year round	Playground
Un-Named (Beachfront Pde)	346014	6292930	63	Open Space	weekend, all year round	-
Daleys Point Recreation Reserve	347398	6291090	64	Open Space	weekend, summer	-
Bouddi National Park	347702	6290424	65	Open Space	weekend, summer	-
Fletchers Glen Park	348164	6289972	66	Open Space	weekend, summer	-
Turo Reserve	346388	6288814	67	Playground	weekend, summer	Toilet block & playground
Beaches						
Ettalong Beach	345524	6290162	68	Swimming, dog exercising and boat launching	weekend, summer	Beach access ramp
Boating marinas and sailing clubs						
Anderson's Boatshed	346282	6289966	69		weekends, summer	General Boatshed - maintenance and berths/moorings
Booker Bay Marina	346212	6290662	70		weekends, summer	General Boatshed - maintenance and berths/moorings
Empire Bay Marina	347900	6292704	71		weekends, summer	General Boatshed - maintenance and berths/moorings
Gosford Marina	345539	6299440	72		weekends, summer	General Boatshed - maintenance and berths/moorings

Human Usage and Activities	Easting (MGA)	Northing (MGA)	Mapping Code	Type/Current Use	Peak usage period	Infrastructure /Facilities & Other comments
Boating marinas and sailing clubs						
Killcare Marina	347688	6289284	73		weekends, summer	General Boatshed - maintenance and berths/moorings
Machan's Marina	346286	6290618	74		weekends, summer	General Boatshed - maintenance and berths/moorings
Gosford Sailing Club	345756	6298904	75		weekends, summer	Club house and storage
Saratoga Sailing Club	345382	6294842	76	Sailing Club	weekends, summer	Club house and storage
Boat Launching Ramps						
Blackwall, Blackwall Rd	345336	6291640	77	Deepwater	weekends, summer	
Davistown, Amy St	348656	6293288	78	Deepwater	weekends, summer	
Davistown, Lintern St	346904	6293580	79	Deepwater	weekends, summer	
Davistown, Restella Av	347392	6293372	80	High Tide	weekends, summer	
Empire Bay, Kendall St	347892	6292664	81	Deepwater	weekends, summer	
Ettalong, The Esplanade	345004	6289474	82	Deepwater	weekends, summer	
Gosford, Dane Drive	345528	6299444	83	Deepwater	weekends, summer	
Gosford, Mason Pde	345706	6296196	84	Deepwater	weekends, summer	
Green Point, Orana St	347200	6297304	85	High Tide Only	weekends, summer	
Koolewong, Brisbane Water Dr	343168	6296196	86	Deepwater	weekends, summer	
Pretty Beach, Pretty Beach Rd	346648	6289020	87	Deepwater	weekends, summer	
Saratoga, Centennial Av	347046	6294844	88	High Tide	weekends, summer	
St Huberts Island, Luderik Av	346464	6292588	89	Shallow	weekends, summer	
South Woy Woy, Woy Woy Rd	342310	6292170	90	Deepwater	weekends, summer	
Woy Woy, Nth Burge Rd	345372	6293474	91	Deepwater	weekends, summer	
Other Recreational Facilities						
Gosford Racecourse (Gallops)	344348	6300332		20 Race Meets per annum	Monday, Wednesday, Thursday and Sundays	Car Parking, grandstands, stables and function rooms
Gosford Racecourse (Greyhounds)				40 meets per annum	Tuesday, Wednesday and Thursday evenings	Car Parking, grandstands and kennels
Gosford Golf Course	345152	6301088		Golf - 1700 members, with competitions occurring most days of the week.	Weekends	Golf course, club house, pro-shop, restaurant, parking, 1700 membership
Gosford Showground	345624	6301376		Various - Gosford Show, Orchid show, Swap Meeting (General market with between 15000 - 20000 attendees), and various other shows and markets	Weekend and (May - Show and June - Swap Meet	Showground, Car park (800 capacity) + on street parking, Grandstand and function rooms.

Appendix B

VARIOUS DATA ON BRISBANE WATER

Table B1 Physical dimensions of Brisbane Water Estuary

Section of Waterway	Area (Hectares)	Length of Mainland Foreshore (km)	Length of Island Foreshore (km)	Total length of Foreshore (km)
Entrance Reach	313	11	0	11
Woy Woy Reach	467	11	16	27
Kincumber Broadwater and Cockle Creek	393	16	0	16
Brisbane Water and Fagans Bay	1366	27	2	29
Woy Woy Bay and Woy Woy Inlet	229	16	0	16
Total	2768	81	18	99

Source: Gosford Council (1995)

Table B2 Zoning Categories under Gosford Planning Scheme Ordinance (Figure 1.3)

Gosford Planning Scheme Ordinance (GPSO)		
1a Non-urban	3a Business (general)	6a Open Space (recreation)
1b Non-urban	3b Business (special)	6b Open Space (special purpose)
1c Non-urban	3c Business (central)	6c Open Space (private recreation)
1d Non urban (village)	4a Industrial (general)	6d Open Space (regional)
2a Residential	4b Industrial (light)	6e Open Space (proposed)
2b Residential	4c Industrial (extractive)	8 National parks, nature reserves, state recreation areas
2c Residential	4d Industrial (offensive or hazardous)	9a Restricted development flood prone land
2d Residential	5a Special Uses	9b Restricted development special residential
2f Residential (beach frontage)	5b Special Uses (railways)	9c Restricted development (steep land)
	5d Special Uses (roads reservation)	
	5e Special Uses (arterial road – proposed)	

Source Gosford Council 2004

Table B3 Boat Launching Ramps within Brisbane Water Estuary**Boat Launching Ramps**

Locality	Address	UBD Ref	Access
Blackwall	Blackwall Rd	107 D6	Deepwater
Davistown	Amy Street	98 B16	Deepwater
Davistown	Lintern Street	97 K14	Deepwater
Davistown	Restella Avenue	97 M15	High Tide
Empire Bay	Kendall Street	107 P2	Deepwater
Ettalong	The Esplanade	107 B14	Deepwater
Gosford	Dane Drive	87 E7	Deepwater
Gosford	Masons Parade	87 E8	Deepwater
Green Point	Orana Street	87 L15	High Tide Only
Koolewong	Brisbane Water Drive	96 K4	Deepwater
Pretty Beach	Opposite School	107 J16	Deepwater
Saratoga	Centennial Avenue	97 L9	High Tide
St Huberts Island	Luderick Avenue	107H2	Shallow
South Woy Woy	Woy Woy Road	106 G4	Deepwater
Woy Woy	Lions Park - Nth Burge Road	97 C14	Deepwater

Source: Gosford Council (2004)