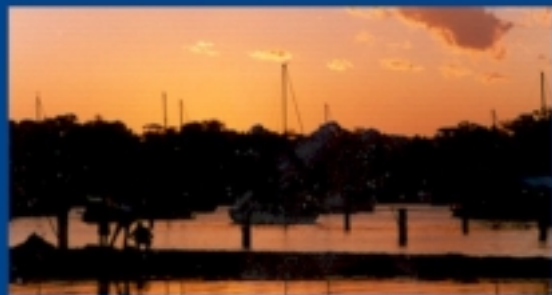


Waterways Authority Port Hacking Boating Draft Plan of Management



Photographs on front cover, from top

Low tide at Cabbage Tree Basin

Yowie Bay boat ramp and marina

Recreational vessel anchored at South West Arm

Gunnamatta Bay at sunset

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The Waterways Authority encourages agencies, individuals and groups to make written submissions regarding this boating draft plan of management for Port Hacking .

The draft plan is on exhibition at the following locations:

The Waterways Authority Unit 44-46 61-65 Glencoe Street Sutherland	(Open from 8.30am to 4.30pm Monday – Friday and 8.30am to 12 Noon on 1 st Saturday of each month)
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NSW Fisheries Cnr Harris and Water Streets Sans Souci	(Open from 8.30am to 4.30pm, Monday – Friday)
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The Waterways Authority Head Office James Craig Road Rozelle Bay	(Open from 8.30am to 4.30pm, Monday – Friday)
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All Sutherland Shire Council libraries	(Central Library open from 9.00am to 9.00pm, Monday – Friday; 9.00am to 4.00pm, Saturday and 12 noon to 4.00pm Sunday) Other branches: www.sutherland.nsw.gov.au)
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Royal National Park Visitors' Centre Farnell Avenue Loftus	(Open from 8.30am to 4.30pm, 7 days)
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The draft plan has also been placed on the Waterways Authority's Internet site at:
www.waterways.nsw.gov.au

Submissions will be received until the exhibition closes on **Friday, 30 March 2001**.

A written submission may be made in either of the following ways:

1. By writing to: Mr Christopher Isted
A/Operations Manager
Botany Bay/Port Hacking
44-46/61-65 Glencoe Street
Sutherland 2232

Telephone: 95454422
Facsimile: 95453648

By sending an e-mail message to: Enquiries@waterways.nsw.gov.au

Thank you for your interest in Port Hacking and the Waterways Authority.

/ Introduction

What is the NSW Government's Position?

The NSW Government is committed to the effective and responsible management of the state's waterways. The Government supports the development of boating plans of management by the Waterways Authority to achieve a balance between the level of community use and the environmental protection and conservation of NSW waterways.

What are the Responsibilities of the Waterways Authority?

The Waterways Authority (the Authority) is responsible for the safety of commercial and recreational vessels using NSW navigable waters which are those waters extending from the head of navigation to a distance of 3 nautical miles offshore.

The Authority is also responsible for the protection of the marine environment from degradation by vessel use and for the provision of the infrastructure required for safe, efficient and enjoyable vessel use (Waterways Authority, 1998).

These responsibilities are reflected in the Authority's vision and mission statements which are as follows:

Vision: To achieve the integrated management of navigable waters.

Mission: To lead and advocate the integrated use and management of NSW navigable waters for the community through a client focus in marine safety, environmental sustainability and infrastructure development.

These accord with the views of the local community as reflected in Sutherland Shire Council's vision statement which is expressed in its *Shape the Shire* document released in August 1997. The Council's vision also focuses on the concepts of safe, healthy and active lifestyles, sustainable development and respect for people and nature.

What is this Draft Plan of Management About?

The Reason for Preparing a Draft Plan

The purpose of this boating draft plan of management is to create a framework with which to guide boating and related activities on Port Hacking. The draft plan is designed to be relevant to all the agencies responsible for the Port and to be responsive to changing priorities and conditions.

The Aims of the Draft Plan

The overall aim of this draft plan of management is to ensure that boating management practices maximise user safety and enjoyment while simultaneously protecting the environment. In doing so the draft plan promotes the provision of appropriate infrastructure for the sustainable use of the Port.

Another aim of this draft plan is to develop a comprehensive body of information regarding boating and related activities on Port Hacking and the administrative structures within which these activities take place. Such information is essential to effective decision making by Government.

The Layout of the Draft Plan

This draft plan of management presents the strategies and actions proposed for Port Hacking and the key information, gathered from community and agency representatives, from which the strategies and actions were developed.

The bulk of the background information on which the draft plan is based is presented in a separate 'Research and Development Paper' with its associated 'Factsheets'. The Research and Development Paper documents the process involved in developing the draft plan of management and the principles upon which the draft plan is based.

The individual Factsheets provide detailed information regarding boating and related activities. They were designed to be read in conjunction with the draft plan to allow readers the opportunity to fully research the reasoning behind the proposals in the draft plan.

The Development of the Draft Plan

In 1999 the community was requested to provide the Authority with information relating to the characteristics of the Port which it values and to determine the issues which are associated with those values. The community was also asked to consider appropriate strategies and actions to resolve the issues and thereby maintain those values. A detailed explanation of the consultation process and the stakeholders who were consulted is contained in Research and Development Paper # 3.

From the information provided by the community a series of desired outcomes was developed. These outcomes were then translated into an 'action plan' to be supported by a regular monitoring and review process. Representatives of the Government agencies which provided input to the plan have reviewed, and agreed to, the draft action plan. To assist in developing the strategic action plan, Port Hacking was considered as an entity as well as a series of individual management units, based on the key processes operating in the Port.

The draft plan concludes with a list of 31 key initiatives which are either planned for the Port or have already commenced. The latter initiatives are incorporated in the draft plan because they are important steps in the achievement of the aims of the draft plan and/or were developed as a result of the planning process.

The Basis of the Proposals of the Draft Plan

The 31 initiatives, which are fully detailed in the Conclusion chapter of this draft plan, are based on two key principles:

- All human activities impact to some extent on the Port. This requires a holistic management approach which, through the planning process, the Authority has fostered with other relevant agencies. Within the context of boating and related matters, the Authority has reflected this approach in the draft plan; and
- Improvements to the Port environment are made on an iterative basis – in other words each initiative, irrespective of its implementation cost or scope, is an important step in the improvement process.

Future Directions

The draft plan of management is available to stakeholders for comment. At the conclusion of the exhibition period all written submissions will be considered and, where appropriate, incorporated into the final boating plan of management for Port Hacking.

Following its implementation it is anticipated that the plan will be regularly monitored and reviewed in accordance with the processes and procedures outlined in the Ongoing Management Chapter of this draft plan.

*P*rocesses

PROCESSES OPERATING IN THE PORT AND THE DEVELOPMENT OF 'MANAGEMENT UNITS'

What Processes are at Work in Port Hacking?

While it is recognised that the Port is a single entity it is useful, from an operational point of view, to also consider it as a number of 'management units'. These units are based on the processes which are at work on Port Hacking and the characteristics of the various parts of the Port, including their vessel traffic patterns.

The physical features of the Port are shaped by a number of natural processes and human activities. The key natural forces at work are:

- Foreshore, bank and channel erosion;
- Transportation of the eroded material primarily by winds, currents and tidal movements; and
- The subsequent deposition of this material.

These processes are exacerbated by land development practices and other human activities, including boating.

These processes have led to the creation of some areas of relatively deep water, which have become navigation channels, and other areas which are subject to shoaling. Each requires specific management measures and thus have been considered, for the purposes of the draft plan, as distinct management units.

The northern shore of the Port is dissected by a series of bays, most of which are relatively long and narrow. Given the topography of these bays, and the fact that the urban development process has created a specific set of conditions, the bays are considered, in the draft plan, as a management unit.

The southern shores, while urbanised in Bundeena and Maianbar, are not as heavily dissected by bays, are bounded largely by the Royal National Park and are subject to a particular set of forces related to conservation and tourism. The waters which are bounded by the National Park - Cabbage Tree Basin, South West Arm and the Hacking River upstream of Swallow Rock Reserve - form a further management unit.

Within these management units are a number of 'localities', each with their own particular uses and issues. The following table presents a description of the management units and 'localities' used in this draft plan. The attached map indicates the location of each of the 'localities' within Port Hacking.

Management Areas within Port Hacking

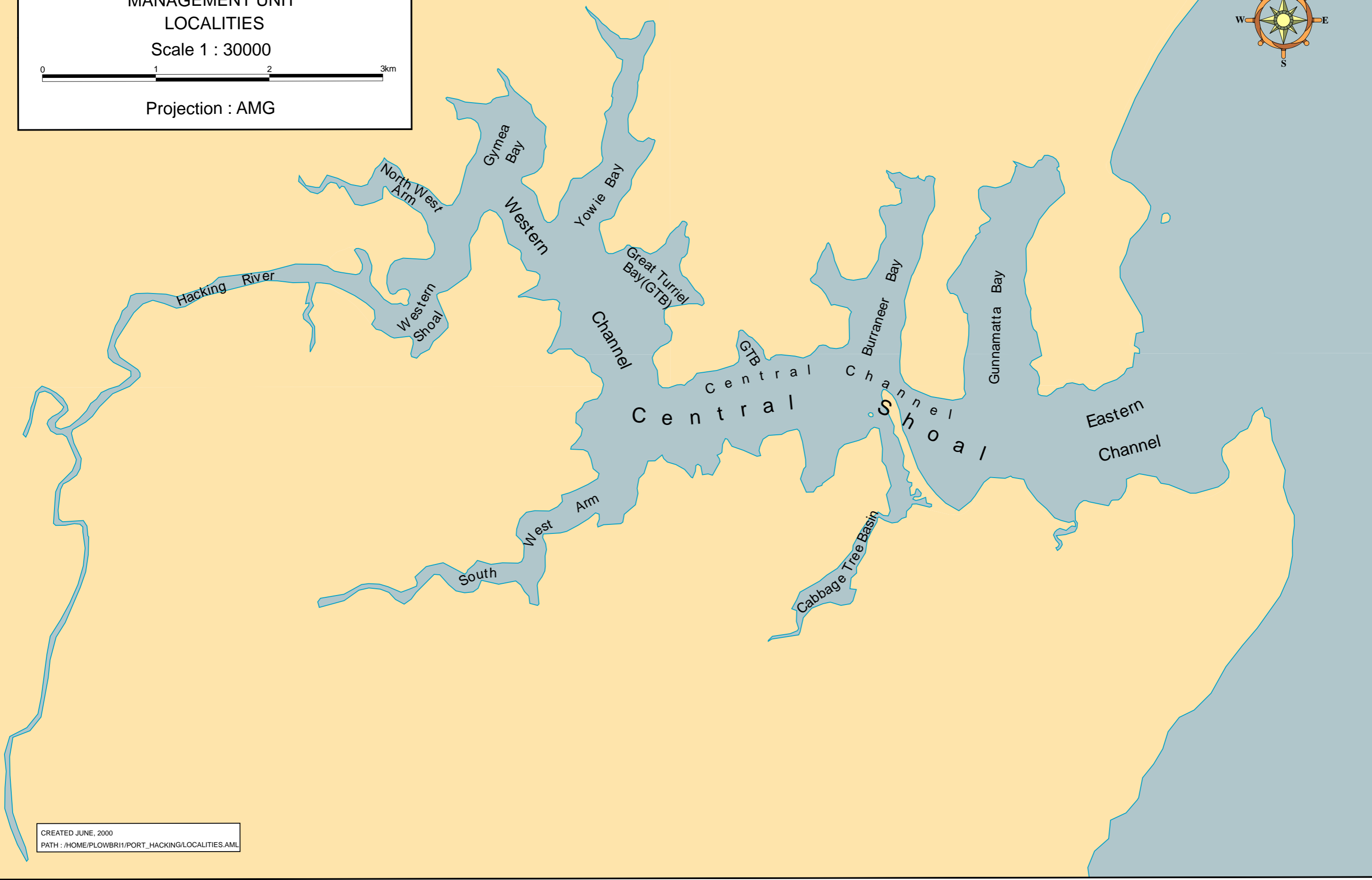
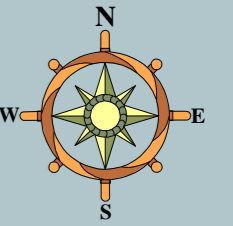
Management Unit	Locality	Section of Port Hacking
Navigation channels	Eastern channel	The area of relatively deep water from the Heads to a line between Hungry Point and Cabbage Tree Point, roughly corresponding to the limit of commercial fishing.
	Central channel	The navigation channel between Burraneer Point and Lilli Pilli Point.
	Western channel	The waters underlain by the mud basin between Lilli Pilli Point and Deer Park.
Shoaled areas	Central shoal	The shallow area from Simpsons Bay to Lilli Pilli Point, including Deeban Spit and Fishermans Bay; from Bells Point through to Costens Point and to Gogerleys Point.
	Western shoal	From Deer Point to Swallow Rock Reserve and including Mansion Bay.
Northern Bays	Gunnamatta Bay	Gunnamatta Bay
	Burraneer Bay	1. Burraneer Bay 2. Dolans Bay
	Great Turriel Bay	1. Great Turriel Bay 2. Little Turriel Bay 3. Gannons Bay
	Yowie Bay	Yowie Bay
	Gynea Bay	Gynea Bay
	North West Arm	North West Arm
National Park waters	Hacking River	From Swallow Rock Reserve to Audley Weir
	South West Arm	South West Arm
	Cabbage Tree Basin	Cabbage Tree Basin

PORT HACKING
MANAGEMENT UNIT
LOCALITIES

Scale 1 : 30000



Projection : AMG



C

ommunity Values & Associated Issues

COMMUNITY VALUES AND ASSOCIATED ISSUES

What is Valued by the Community?

A 'values' based approach to the preparation of plans of management enables the consideration of the important features or the uniqueness of an area or resource. As new issues may arise during the life of a plan of management, those plans which are developed using a values based approach can be expected to remain valid for a longer period of time (Department of Land and Water Conservation, 1996). This approach is based on the assumption that community values change relatively slowly.

The features of Port Hacking which people value are discussed in detail in the accompanying Research and Development Paper. However the public consultation process has identified the following key values and issues as being common to the Port as a whole:

- **Water quality:** All stakeholder groups value clean, clear waters and associated issues relate largely to the impact of stormwater runoff and sewage pollution. It is recognised that the greatest contributors to poor water quality are the stormwater, septic and sewerage systems, however discharge of sewage and other pollutants from vessels also contributes to poor water quality and must be addressed.
- **Siltation:** The boating community, particularly the commercial sector, values the ability to move about the Port without the risk of grounding. The Hacking River Catchment Management Committee also views the dredging of the Port as necessary. The issue for all groups concerned is that current ad hoc dredging practices must be replaced by a properly managed dredging regime, based on environmental sustainability and cost effectiveness.
- **Provision of facilities:** All stakeholders value the provision of appropriate facilities to support the sustainable use of the Port by all users. Stakeholders cited, for instance, shore based facilities such as toilets, pump-outs, ramps and carparking as either required or in need of upgrading.
- **Sensitive areas:** All stakeholder groups recognised the value of protecting sensitive areas such as seagrass beds. The challenge here is to maintain an appropriate balance between education, legislation and enforcement.
- **Freedom to pursue activities without interference:** Most stakeholder groups cited the importance of the ability to pursue recreational (active or passive) or commercial activities without undue interference from other users. Hence the issues here revolve around striking a balance between regulation and enforcement on the one hand, and awareness and education on the other. Importantly, encouraging the intelligent, shared use of the Port is recognised as being necessary.

Each of the Port's management units and localities is valued for its individual features and qualities and these need to be reflected in management policies.

Management units

Navigation Channels

Eastern Channel: The Heads to Cabbage Tree Point and Hungry Point

Values

This part of the Port is valued by the boating community for its relatively deep and wide expanse of water, enabling the use of deep draught vessels. For this reason the area is used by the Royal Motor Yacht Club to conduct races and events. Jibbon Bay is highly valued as a popular area in which to enjoy swimming, relaxing and picnicking. In fact Jibbon Beach and its hinterland are part of the Royal National Park and are valued by the entire community for their natural qualities. In particular, seagrasses are highly prized for their habitat value and a significant meadow of *P. australis* is located on the bed of east Jibbon Bay.

Gunyah and Hordens Beaches, and their bays, are not particularly suitable for intensive boating activity but are valued chiefly by swimmers and picnickers. When conditions are favourable the 'bay surf' is popular with the surfing fraternity.

In addition, this locality has economic value to the commercial fishing industry (see Factsheet 7).

Current Issues

An issue which currently relates to this locality is potential seagrass damage or destruction through anchoring at Jibbon Bay although the recently completed study of seagrasses in Port Hacking has not indicated that such damage has actually occurred (Williams and Meehan, 2000). Nevertheless, arising from the concern over general seagrass destruction, some members of the boating community perceive that there is a risk of losing boating access to Jibbon Bay.

There is potential for conflict to occur between swimmers, bay surfers, other users of passive craft and power boat users. There are 'distance off' requirements in place to prevent such conflicts and a new four knot speed zone is in force at Gunyah and Hordens Beaches to protect swimmers. There is also the potential for conflict between operators of powered vessels and residents in this area, with infringements of 'distance off', wash and speed requirements and noise generation being the major causes.

Congestion, which can often occur during peak periods at Jibbon Beach, is another important issue, as is the alleged discharge of sewage from vessels. One of the key attractions of this area is its undeveloped beach and hinterland and overcrowding tends to compromise these qualities. It is an offence against the Protection of the Environment Operations Act to discharge sewage into NSW waters but for vessels using Port Hacking it is not compulsory to have a holding tank connected to any on-board toilet. This factor, and the lack of facilities at Jibbon Beach, make this an issue of concern to the community.

Resolving these issues will require an approach which balances the need to retain the natural qualities of the area with the need for proximate and clean facilities for all Jibbon Beach users

and, consistent with the Government's preferred approach, must include an equitable resolution to the issue of 'through the hull' disposal of waste.

Central Channel: Burraneer Point to Lilli Pilli Point

Values

The main body of the Port, from Burraneer Point westward to Lilli Pilli Point and past Turriel Point, is a discontinuous channel used by transiting vessels. The water depth is generally between 1-5m. The boating community values this area as a transit channel and one in which formal restrictions are minimal.

A special site within this locality is the Shiprock Aquatic Reserve, part of which is located within Burraneer Bay. The Reserve is a popular attraction for divers who value it for its uniqueness and species diversity. Approximately four hundred divers per month, beginners and professionals alike, use the reserve for both day and night dives. As the health of this aquatic environment depends on clean, clear waters, these attributes are valued by the diving community as well as by the general community.

Current Issues

One of the key issues for boaters is maintenance of the navigation channel. The Port is naturally shoaled and was most recently dredged in the summer of 1998-99 to ensure the safe passage of vessels through this channel. Within a few months, however, sediments had started to accumulate in the main channel at Lilli Pilli, Burraneer Point and also in Burraneer Bay. The Burraneer Point area, being a very dynamic one, is particularly subject to siltation. Some users claim that a wider, deeper channel is more likely to be self scouring and that this may reduce sedimentation which may, in turn, promote better flushing. A tidal delta study was prepared by Albani (1999) however the study did not incorporate an investigation of the nature and effectiveness of past and current dredging regimes.

Dredging raises a number of other issues, particularly those relating to impacts on seagrasses and other aquatic environments, including the Shiprock Aquatic Reserve (See Factsheet 6). Further issues arising from dredging activities include the costs and impacts of repeatedly dredging a channel which naturally tends to shoal and finding a suitable location in which to place the spoil. The impact which dredging has on promoting further shoaling is unknown although, clearly, a long term solution must be found to this problem. A constructed tombolo (a type of sand spit), investigated for this purpose by the then Public Works Department, was rejected by the community as a permanent solution to this problem.

To ensure that future dredging reflects the position of established, marked channels the Department of Land and Water Conservation has undertaken to fully consult with the Waterways Authority prior to conducting any further dredging activity.

As many divers using the Shiprock Aquatic Reserve enter the water from the shore they are not required by law to display a diver's flag. Additionally, given the currents in this area, it is common for divers to surface many metres from any flag which they may be using. This creates problems for boaters because they are unsure whether divers are present and, if so, of their locations. As NSW Fisheries does not permit the erection of signs in the Aquatic Reserve, some vessel operators may not be aware of the existence of the Reserve and its boundaries. Although there have not been any reported incidents involving a vessel and a

diver at Shiprock Aquatic Reserve it is important to ensure that all boaters are aware of the existence and location of the Reserve and of any divers who might be present. As an alternative, the Waterways Authority developed land based signage on behalf of the then Catchment Management Committee and Sutherland Shire Council. One of the signs, which is aimed at educating divers to take appropriate precautions, was recently erected by Council.

Signage to indicate the Reserve boundaries would also assist to prevent illegal fishing activities in the Shiprock Aquatic Reserve.

Western Channel: Lilli Pilli Point to Deer Park

Values

This locality is underlain by the original mud basin where the waters are up to 20m deep. The mud basin was formed prior to the drowning of the coastline following the end of the last ice age. To the east the channel is approximately 1km wide but narrows to the west in the vicinity of Deer Park. Given these characteristics, specific on-water restrictions do not apply to this part of the Port and thus it is valued by the boating community as a transit channel and as an area where activities such as aquaplaning, water-skiing and the like can be enjoyed. The deep holes also provide habitat for particular benthic (bottom dwelling) species and are thus intrinsically valuable, as well as providing good fishing grounds.

In addition Dark Bay, bounded by the National Park, is valued as a haven in which to drop anchor and relax.

Current issues

Traffic management is a major issue within this locality. There is the potential for conflict between drivers of fast moving ski boats or transiting vessels and other vessels to occur, although recent reported incident and infringement statistics indicate that such conflicts are infrequent.

Another key issue is the disposal of spoil from dredging activities to the deep holes. This alters the seabed in the vicinity and hence the natural habitat of a range of organisms, including fish species.

Shoaled Areas

Central shoal: the shallow area from Simpsons Bay to Lilli Pilli Point, including Deeban Spit; Fishermans Bay; from Bells Point through to Costens Point and to Gogerleys Point

Values

As this is a relatively shallow, four knot speed restricted area, particularly at low tide when the sandbar is exposed, some parts of this area do not attract large numbers of power boaters and hence do not pose significant, potential problems in terms of user conflicts. Nevertheless the Ballast Heap area is one of the most productive fishing grounds within the Port and is highly valued by the fishing fraternity.

Other areas however, such as Simpsons Bay and the waters east and west of Deeban Spit, are highly valued by boating and other families for swimming and relaxing. At Bonnie Vale,

vessels are launched from trailers off the sand to the west of the 'no boating' zone. The waters west of Deeban Spit provide a safe haven for users of passive craft such as canoes, as well as a sheltered anchorage in rough conditions. In addition, Fishermans Bay is the mooring area for Maianbar residents, with access to and from the main body of the Port being through a narrow channel.

The spit itself, particularly the dune and associated lagoon system, is also an intrinsically valuable feature of the Port environment.

Current issues

The 'no boating' zone at Simpsons Bay has recently been extended by 75m to protect swimmers in this area and this is a further restriction on boating activities within the Port.

There is only one boat launching site on the southern side of the Port and this involves the concentrated use of four wheel drive vehicles and trailers on the beach at Bonnie Vale. Such use is causing beach erosion (see Photograph 1). As a result of representations from boat users in Bundeena and Maianbar to establish a permanent, formal boat launching facility here in 1995, the National Parks and Wildlife Service commissioned consultants to prepare a draft Environmental Impact Statement to assess a number of options (National Parks and Wildlife Service, undated).



Photograph 1: Beach erosion at Bonnie Vale

The preferred option was to allow continued use of the beach for launching purposes through the construction of a moveable structure which could be laid across the sand without the need for concrete footings or extensive use of non-sand materials (Fathom Consulting, 1995). There are obvious environmental benefits of this proposal over the existing informal arrangements, however the original proposal did not consider impacts on nearby seagrass beds.

The management plan prepared for the Royal National Park (National Parks and Wildlife Service, 2000) recognises the importance of the foredune and the seagrass beds and states that the National Parks and Wildlife Service will encourage discussions between the Sutherland Shire Council and the Department of Land and Water Conservation. Such discussions will aim to provide a boat ramp on the southern shore. National Parks and Wildlife Service has commissioned consultants to prepare a Review of Environmental Factors for this proposal.

Community use of Deeban Spit and the sheltered waters to the west have contributed to environmental degradation. As Photograph 2 indicates there has been considerable dune erosion.



Photograph 2: Dune erosion at Deeban Spit

Noise, largely from personal watercraft, is an issue for some residents of the Sutherland Shire, particularly for some residents of Bundeena. According to a 1995 paper published by the Permanent International Association of Navigation Congresses, while newer personal watercraft are not any more noisy than other recreational vessels with similar speed and performance capabilities, the following issues appear to contribute to a personal watercraft-specific noise problem:

- Several craft operating in the same area: due to their small size and manoeuvrability, it is common for several personal watercraft to be operated in close proximity. It has been estimated that the noise level increases by 3 dB(A) when the number of identical sources is doubled. Thus, two personal watercraft, each operating at X dB(A) would have a combined noise measurement of X+3 dB(A) (Permanent International Association of Navigation Congresses, 1995);
- Personal watercraft operation in a confined area: According to the Permanent International Association of Navigation Congresses (1995) human reaction to noise is a function of three key factors - loudness, frequency spectrum and exposure time. When a personal watercraft operator rides continuously in the same area, even a quiet personal watercraft can, in time, cause noise nuisance.

In fact, the Permanent International Association of Navigation Congresses (1995) researched the literature available at the time and cited the findings of the most comprehensive study of vessel noise dissipation over water. The study found that sound levels are reduced by an average of approximately 5 dB(A) every time the distance from the boat to the listener is doubled. Thus a vessel recording a noise level of 70 dB(A) at 50m would be expected to record 65 dB(A) at 100m.

Given these and general safety issues, the Government sought to regulate the behaviour of personal watercraft riders by introducing a package of reforms in 1997 and a further package in January 2000. The 1997 package introduced, *inter alia*, a compulsory photo-licence for all

personal watercraft users on State waters. The laws were strengthened in 2000 to impose the following requirements:

- Personal watercraft must not be operated in an 'irregular' manner within 200m of the shoreline in the Sydney Region, which includes Port Hacking. Irregular driving includes driving in a circle or other pattern; weaving or diverting; and surfing down, or jumping over or across, any swell wave or wash. It does not include making any necessary turn or diversion (new provision);
- A \$320 on-the-spot penalty applies for failing to observe the correct distance from people in the water or for operating in an exclusion or surf zone (increased by \$160);
- Licence cancellation applies after two safety breaches within a two year period (reduced from three breaches per two year period);
- The range of offences to which automatic cancellation relates has been increased from nine to twenty three;
- Penalties for unlicensed riding have increased. The most severe penalty is for the third and subsequent offence which is a \$1200 fine and disqualification from holding any form of boat licence for life;

In June 2000, in response to the continuing concerns of local councils, the Government announced that the councils would, following consultations with the Waterways Authority on an individual site basis, be able to establish personal watercraft exclusion zones. These zones would operate in similar manner to the existing zone in Gunnamatta Bay. At this stage the Authority has had preliminary discussions regarding proposed zones with a number of councils.

Western shoal: from Deer Point to Swallow Rock Reserve and including Mansion Bay

Values

Part of this area is valued as a transit channel from the popular launching ramp at Swallow Rock to the easterly parts of the Port. However it is also a shallow, environmentally sensitive area with seagrass beds and extensive mangrove stands. Swallow Rock Reserve is a local picnic area and is used by the scouting movement for a range of activities, including boating.

Current Issues

Being a narrow channel, speed, wash and congestion are key issues. In addition, there is a small area of restricted visibility in the narrow channel in the vicinity of Point Danger. Due to the potential dangers posed by water-skiing type activities in this area, a proposal to restrict these activities in this area was supported by the Waterways Authority User Group in late 1999.

Northern Bays

Gunnamatta Bay

Values

Gunnamatta Bay is arguably the most popular of the northern bays in Port Hacking as there are a plethora of facilities and amenities located on its shores, each valued by different sectors of the community.

For Bundeena and Maianbar residents, Gunnamatta Bay is valued for its commuter transport facilities. The ferry wharf in Gunnamatta Bay is a short walk to the train station and the bus depot. These commuters would otherwise have to travel great distances by car. Likewise, charter vessel operators value Gunnamatta Bay for its tourism opportunities - the public wharf adjacent to Cronulla Marina is regularly used as a departure and provisioning point for scenic cruises along Port Hacking.

Gunnamatta Park and baths are also valued for their convenient location. The park is regularly enjoyed by picnickers, whilst the baths are often used by swimmers. There is also a sailing club located at the head of Gunnamatta Bay and club members and visitors value the provision of a boat rigging area next to Gunnamatta Park. Vessel users value the facilities provided in the vicinity of Tonkin Park – parking, food, fuel, a privately owned pump-out facility and a launching ramp are all provided at, or adjacent to, Cronulla Marina. Boat owners also value the opportunity to store, berth or moor their vessels at the Cronulla Marina, the sailing club or at the Royal Motor Yacht Club.

The wider sections of Gunnamatta Bay are popular for on-water recreational activities such as water-skiing, aquaplaning and sail racing. In other parts of the bay families value the safe, shallow waters and the parks and beaches. Darook Park, for instance, is a popular venue for picnicking, swimming and relaxing and is a personal watercraft exclusion zone. However there is an eight knot speed restriction in the narrow access channel off Burraneer Point. This channel must be used to enter and exit the bay by all but the shallowest draught vessels, particularly at low tide.

Current issues

Given the range of boating and related activities which are conducted on Gunnamatta Bay, and the urban development along its shores, water quality and its impact on seagrasses and other benthic organisms is an important issue in the bay. Fuels and oils, antifouling chemicals, sewage from vessels and from sewage system overflows, stormwater and residential run-off and garbage are all potential contributors to poor water quality.

Traffic congestion problems can arise in the bay due to the number of moored vessels, water-skiers, ferry charters, transiting and racing vessels and, occasionally, from seaplane activities. Such congestion may lead to conflicts between users of passive and powered craft and between boaters and swimmers, picnickers and residents.

For commercial operators the issues here relate to restrictions, particularly those concerning refuelling activities, clear identification and signposting of public rights-of-way to the Port and the availability of commercial moorings. The major issue however is the maintenance of the

navigation channel at Burraneer Point, and at other locations within the Port, to ensure that charter vessels, even the shallow draught ones, are able to maintain timetables and commitments.

NSW Fisheries has recently announced that a new noxious weed, a marine algae known as *Caulerpa taxifolia*, has been found in Gunnamatta Bay. Only three hectares of this popular aquarium plant has been found in Port Hacking but it is an invasive species which can spread rapidly, smother seagrass beds and alter marine habitats. It spreads vegetatively through fragmentation from a stolon (or stem) which can be up to 3 metres in length with up to 200 fronds (Woodfield, 2000). *C. taxifolia* is thought to have originated as a marine pest in the Mediterranean Sea following the release, 15 years ago, of aquarium water from the Oceanographic Museum in Monaco (Simons, 2000). Its ability to reproduce vegetatively and to survive up to a week out of water means that it can be spread by fishing equipment, ropes, chains, anchors and diving gear. The Waterways Authority and NSW Fisheries are working together to resolve this issue (see Chapter 4 of this draft plan).

Burraneer Bay and Dolans Bay

Values

This expanse of water is highly regarded for its relatively wide channels and numerous amenities - clients of Burraneer Bay and Dolans Bay marinas value this area as a berthing/mooring site for their vessels. Boat ramps located at Water Street (Burraneer Bay) and Port Hacking Road South (Dolans Bay) enable vessel owners to launch their craft and are thus valued by the boating community.

These bays are also valued as a recreational resource for a variety of on-water activities such as diving, sailing and water-skiing. For others, Burraneer Park, situated at the head of Burraneer Bay, is valued as a place where people can undertake activities such as picnicking while enjoying the view of Burraneer Bay and its environs. Additionally, Burraneer Bay is a popular fishing spot.

Current issues

The waters of Burraneer Bay, and Dolans Bay in particular, are congested with moored vessels. Free navigation within these areas is likely to be hampered by the number of moored craft and, although formal speed restrictions do not apply, there are 'distance off' requirements.

The lack of parking facilities for vehicles at the Water Street boat ramp means that many boat owners are forced to park their vehicles (most with trailers attached) in surrounding streets. This places an imposition on residents living in the immediate vicinity in terms of safety and accessibility - the increased number of vehicles in this area during weekends and public holidays may increase the likelihood of accidents or conflict between residents and members of the boating community in relation to parking arrangements. Residents may also have difficulty entering and exiting their driveways.

Great Turriel Bay, Little Turriel Bay and Gannons Bay

Values

Given the size and configuration of these bays they are mainly used as mooring areas. However an enclosed swimming area near Gannons Bay provides bathers with access to the waters of Port Hacking, whilst protecting them from sharks and vessel activity.

Foreshore activities such as cycling, bushwalking and picnicking are also popular pastimes at Lilli Pilli and Little Turriel Bay Reserves, both located within this area.

Current issues

The key issue in this area is to ensure that all existing activities can be enjoyed in harmony.

Yowie Bay

Values

Yowie Bay is highly valued by boaters as a launching, berthing and mooring site. A boat ramp located at the end of Wonga Street in Yowie Bay provides access to Port Hacking and is thus highly valued by boaters as a launching site. On and off street parking, trailer parking, toilet and telephone facilities, marina and refuelling facilities and shopping facilities are available in close proximity to the ramp.

The relatively deep and wide southern portion of Yowie Bay is an area valued by water-skiers. The majority of moorings are located in the northern half of the bay and in Neales Inlet, elsewhere providing a relatively free area for skiing, aquaplaning and similar activities.

Current issues

An issue in Yowie Bay is the relatively recent extension of the eight knot speed limit to encompass the area from the Wonga Street ramp to Neales Inlet. One of the factors which precipitated this extension was the practice of some water-skiers skiing right up to the ramp. Given the volume of traffic in this area this was considered to be dangerous.

Another important issue is head of bay siltation and investigations are being conducted by Sutherland Shire Council regarding the dredging and rehabilitation of the area.

GyMEA Bay

Values

The waters of GyMEA Bay and its nearby swimming enclosure (GyMEA Baths) are valued by families and water sport enthusiasts who enjoy activities such as water-skiing, swimming, kayaking, sailing and the like. Additionally, members of the fishing community value GyMEA Bay for its supplies of bream, leatherjacket, tailor and whiting.

Current Issues

The key issue in this area is to ensure that all existing activities can be enjoyed in harmony.

North West Arm

Values

This is a popular mooring area.

Current Issues

The major issues relating to North West Arm are the waiting list for moorings, the policing of the eight knot speed zone and head of bay siltation.

National Park Waters

Hacking River: From Swallow Rock Reserve to Audley Weir

Values

The reach of the Hacking River from Audley Weir to Reids Flat is used by visitors to the Royal National Park for swimming and relaxing. Although this is a relatively developed part of the park it has significant natural qualities which must be preserved, especially as habitat for a range of species, including water birds. To protect the fragile banks, a 'No Wash' zone has been established along the entire reach from Swallow Rock Reserve and this area is also subject to an eight knot speed limit and a 'no water-skiing' restriction.

Being a relatively quiet, shallow reach this part of the Port is also valued by the users of unpowered craft, particularly kayakers. The Lilli Pilli Kayak Club conducts regular events on this reach.

Current Issues

The key issue here is the wash created by powered vessels and potential impacts on bank stability. The 1996 and 1998 reports of the Healthy Rivers Commission relating to the Williams and Hawkesbury-Nepean Rivers respectively, cited wind waves, weir operations, flooding and fast boating activities, such as water-skiing, as contributors to bank erosion. However the level of impact which each of these factors has on bank erosion at Port Hacking is unknown as each waterway has its own specific soil profiles, flooding regime, vessel traffic patterns and other differing characteristics.

It has also been contended that the Swallow Rock Reserve ramp is poorly designed and vessels being launched and retrieved are subject to damage from wash. In addition, the Lilli Pilli Kayak Club has submitted that the safety of swimmers using the small beach to the west of the launching ramp is compromised (see Photograph 3).

Given these matters, and that a vessel travelling on this reach at eight knots is capable of producing a significant 'wall of water' (see Photograph 4), it may be appropriate for the Authority to reconsider the boating restrictions in this area and to conduct a thorough study of the impacts of boat wash.



Photograph 3: Swimmers in the vicinity of Swallow Rock ramp



Photograph 4: Wash emanating from a vessel travelling at eight knots on the Hacking River

South West Arm

Values

The tranquil, natural setting of this long, narrow bay with its clear waters, is the main attractions for boaters. Given its relative isolation, the boating community is the predominant user group.

In addition South West Arm is one of two estuarine protected areas within the Royal National Park, providing a small area of seagrass beds and nursery grounds for juvenile fish and benthic organisms. Being a particularly shallow and protected area and a nursery ground, South West Arm is also valued by the fishing community.

As well as being valued for the abovementioned reasons, South West Arm is intrinsically valuable for its natural and aesthetic qualities.

Current Issues

There is the potential for conflict between those boaters, be they in kayaks or motor cruisers which have been 'rafted up' for a relaxing weekend, and those who prefer more active boating pursuits such as personal watercraft riding and water-skiing, with noise and wash being the key issues. Generally, however, the two groups use different sections of South West Arm – the

water-skiers being confined to the eastern section in which formal speed restrictions do not apply while the former group prefers the shallower, western part in which the four knot and 'no wash' restrictions apply.

Given the environmental sensitivity of this area water pollution and noise are also major issues. The closest toilet and garbage disposal facilities are located at Lilli Pilli baths, 2-3km from the mooring areas and holding tanks are not compulsory on Port Hacking. The sewage pollution issue can be addressed under the Government's proposed strategies (see Chapter 4).

The National Parks and Wildlife Service has flagged in its plan of management for the Royal National Park that it will seek the agreement of the Authority to reduce, to four knots, the speed limit throughout South West Arm. The rationale for this proposal is to reduce potential damage to the foreshores and seagrasses of South West Arm.

The sediments of the shallow sections of South West Arm may potentially be subject to damage from vessel propellers irrespective of the speed at which the vessels are driven.

A number of Royal Motor Yacht Club moorings in South West Arm were originally licensed by the Maritime Services Board (a predecessor of the Waterways Authority). Control of these moorings subsequently passed to the National Parks and Wildlife Service which did not remove the moorings nor did it renew the licences as it considered them to be inappropriate for the National Park. The result was that these moorings, which Club members continued to use, became unauthorised. The Club put down further unauthorised moorings in South West Arm to cope with 1998/99 Christmas season demands but these were removed by the National Parks and Wildlife Service. Since that time the National Parks and Wildlife Service has released its plan of management for the Royal National Park which states that the existing moorings will be retained to minimise the damage to seagrasses caused by anchoring activities. The moorings will now be available to the public and subject to a twenty four hour occupancy limit.

Cabbage Tree Basin

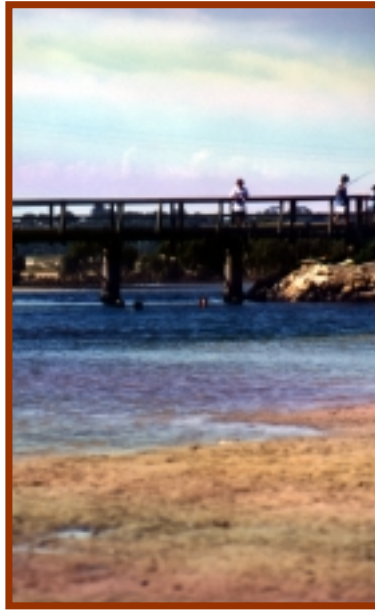
Values

Being part of the Royal National Park and an estuarine protected area, Cabbage Tree Basin must be protected from environmental degradation. The importance of estuarine protected areas, and their seagrass beds and fringing mangrove stands, as nurseries for marine organisms and habitat for migratory birds is documented in the Royal National Park draft plan of management (National Parks and Wildlife Service, undated).

Due to its four knot speed restriction, shallow waters and the protection it offers, Cabbage Tree Basin and its shores are also valued for swimming, relaxing, bushwalking, fishing and picnicking activities as well as by kayakers and canoeists.

Current Issues

A water supply pipeline and footbridge which connects Bonnie Vale with the township of Maianbar crosses Cabbage Tree Basin. As Photograph 5 indicates this bridge prohibits most craft from entering the southern section of the Basin. Passive users such as kayakers and canoeists are able to access this portion of the Basin, as are personal watercraft users and operators of small runabout vessels.



Photograph 5: Footbridge over Cabbage Tree Basin

The draft plan of management for the Royal National Park (National Parks and Wildlife Service, undated) pointed to the importance of Cabbage Tree Basin's sheltered waters, seagrass beds, mangrove communities and its diverse benthic communities as a nursery ground for juvenile fish and invertebrates and as a habitat for migratory birds. The draft plan of management also pointed to the use of the Basin by small craft, including personal watercraft, as a cause of physical damage to this important habitat. However the Authority's local Boating Service Officer has indicated that personal watercraft users are no longer a problem in Cabbage Tree Basin, possibly due to the risk of engine damage by seagrasses which can block the impeller and ruin the engine. It is noted that this issue was not mentioned in the final National Parks and Wildlife Service plan of management for the Royal National Park.

In early 1999 the Authority discussed, with the Port Hacking User Group, the option of banning powered vessels from Cabbage Tree Basin. The User Group indicated at the time that it would only support a ban on all vessels from Cabbage Tree Basin. Since that time the Authority has received information regarding the impacts of a variety of users on migratory birds and other organisms. Dr Thomas Ballestero of the Environmental Research Group, University of New Hampshire, (1990) surveyed the available literature relating to motor boat and personal watercraft impacts and this research indicated that a number of human activities, such as bushwalking, boating, birdwatching and shore-based angling, impact on migratory birds and other organisms. Ballestero cites studies which indicate that the transitory disturbance caused by boating on weekends is less detrimental to nesting success than continual disturbance from daily bushwalks.

Ballestero concluded that to isolate any one activity is over-simplifying the cause and effect relationship. In particular, regulating one class of one activity (eg canoeing or personal watercraft use) does not address the overall issue.

While it is accepted that operators of powered vessels do use Cabbage Tree Basin, given the results of field investigations by the Waterways Authority and the research cited by Ballestero, the following are considered to be reasonable conclusions:

- The incidence of boating activity in Cabbage Tree Basin is dependent on the vessels being small enough to pass under the footbridge and on the right combination of favourable weather and tide conditions occurring on the weekend and such use is hence relatively infrequent when compared with the incidence of other, less restricted activities such as bushwalking and shore-based angling.
- In the case of personal watercraft, it is typically the novice operator who will try riding in Cabbage Tree Basin. Upon realising that seagrasses can block the vessel's impeller these operators are unlikely to return.
- To ensure an equitable approach to the issue of appropriate use of Cabbage Tree Basin the Waterways Authority maintains that all groups impacting on the Basin should share in its protection. This would be consistent with the approach being taken by the Government with respect to sewage pollution from vessels – despite the relatively small contribution of vessels waste to total water pollution, the Authority and other relevant government agencies have prepared and exhibited a discussion paper from which a Statewide strategy to address the problem of sewage from vessels will be developed.

*D*esired
Outcomes

What are the Desired Outcomes and the Opportunities for, and Constraints on, Achieving these Outcomes?

From the community input relating to values and issues, a series of desired outcomes emerged. Opportunities for, and constraints on, the achievement of those desired outcomes exist and these are also highlighted for each of the previously mentioned management units and for the Port as a whole.

The Entire Port

Desired Outcomes

The major desired outcomes for the Port as an entity are:

- High, and improving, water quality in all parts of the Port;
- Development of a sustainable dredging regime;
- Provision of appropriate and adequate boating facilities;
- Appropriate protection of sensitive areas; and
- Minimisation of user conflicts.

Opportunities and Constraints

The recent employment (by the Waterways Authority and Sutherland Shire Council on a 3:1 funding basis) of a Riverkeeper for Port Hacking is an opportunity to augment and reinforce the work already being conducted by various enforcement agents, particularly that of the local Boating Service Officer and the Authority's Ride Smart Team. The latter is a team of Boating Service Officers which undertakes targeted personal watercraft education and enforcement programs.

The preparation of this draft plan of management, and the release of the National Parks and Wildlife Service plan of management for the Royal National Park, provide the opportunity for the Authority to review boating restrictions on Port Hacking.

A constraint on achieving better water quality for Port Hacking, at least in the short term, is the overflow from septic tanks. However Sydney Water will commence work on the sewerage of Maianbar and Bundeena following the upgrading of the Cronulla Sewage Treatment Plant to tertiary treatment capability, due for completion in 2001.

The Government's discussion paper on sewage pollution from vessels has been released and this presents an opportunity for community participation in the resolution of this issue. The discussion paper, and the submissions received as part of the consultation process, will be

used to develop a Statewide strategy for dealing with sewage pollution from vessels. The key proposals of the discussion paper, as they relate to Port Hacking, are as follows:

- The discharge of untreated sewage from vessels should continue to be prohibited in NSW;
- The use of a risk management approach to the control of sewage pollution from vessels should be adopted. This provides for a broad strategic framework at the State level and for specific waterway management at the local level, based on local waterway conditions and local community values;
- The discharge of treated or untreated sewage should be prohibited from all vessels in or near bathing, mooring, anchorage and marina areas and areas identified as sensitive ecosystems or as designated marine parks. These areas are to be designated as 'No Discharge Zones';
- Hire vessels (Class 4) over 6m in length, and which are likely to be hired for extended periods, and all 'passenger carrying' (Class 1) commercial vessels, should be required to have a toilet and holding tank fitted and to discharge the contents of the holding tank into an approved pump-out facility;
- The penalties for non compliance should be consistent with those specified in the Protection of the Environment Operations Act, 1997;
- Land based or mobile pump-out facilities should be made available on waterways where No Discharge Zones occur;
- The Waterways Authority should initiate discussions with local councils regarding the provision of adequate shore based toilet facilities;
- A monitoring system for pump-out usage should be developed to enable compliance by commercial operators to be gauged;
- Recreational vessel operators should be required to manage sewage disposal in accordance with the restrictions applying to the waterway on which they are operating, the length of the journey and the type of activity being undertaken;
- A co-ordinated approach should be developed to determine funding priorities for pump-out facilities;
- Training should be provided to relevant Authority staff in the administration of the new provisions; and
- Education programs should be developed for delivery to the recreational and commercial boating communities.

Navigation Channels

Eastern Channel: The Heads to Cabbage Tree Point and Hungry Point

Desired outcomes

- A continuing, viable commercial fishing industry;

- Continued use of Jibbon Beach by the boating community;
- Use of Jibbon Beach in a responsible and sustainable manner by the community to protect sensitive ecological units;
- Shared use of Jibbon Bay, particularly through a high degree of compliance with 'distance off' requirements.

Opportunities and constraints

Jibbon Beach is within the Royal National Park and this is a constraint to the development of shore-based facilities for boaters, swimmers and other visitors. Indeed, a significant part of the attraction of Jibbon Beach is its natural, unspoiled quality. Land for facilities, such as a toilet block, in neighbouring Bundeena is scarce and expensive. According to Stevens (1999) a contract between agencies might be the appropriate method of dealing with the issue of the toilets in the Royal National Park at Jibbon Beach. This is an opportunity worth exploring and officers of the Department of Land and Water Conservation have already expressed a willingness to discuss funding arrangements with officers of the National Parks and Wildlife Service.

As seagrass meadows provide habitat for a variety of aquatic species they are key to the maintenance of a healthy ecosystem and, in turn, a viable commercial fishing industry. *Posidonia australis* seagrasses are sensitive and difficult to re-establish once damaged. Data on the extent of the seagrasses at Jibbon Bay has been provided by NSW Fisheries (Williams and Meehan, 2000). While such data indicated that there has not been a decline in seagrass coverage in this area, as a precautionary measure, the Waterways Authority has commenced a trial of two 'seagrass friendly courtesy moorings' at Jibbon Bay. The trial is fully supported by NSW Fisheries and offers an opportunity to assess their effectiveness and on-going maintenance costs, with a view to making recommendations for general use by the boating community.

In NSW, the National Parks and Wildlife Service is the lead agency for the administration of the National Mooring Program. The capital costs of establishing environmentally sustainable courtesy moorings will be provided under the Program with the on-going maintenance costs being the responsibility of the Waterways Authority. The grants are available only for the establishment of the moorings in environmentally sensitive areas. Additionally the moorings are to be accessible to the public and designed for use by commercial and private vessels.

Using these grant funds, and the results of the Authority's current seagrass friendly mooring trials, a further six such courtesy moorings are proposed for Jibbon Bay in 2002-03. This will represent an opportunity for the National Parks and Wildlife Service, NSW Fisheries and the Waterways Authority to work co-operatively to further protect the seagrass beds at Jibbon Bay.

Central Channel: Burraneer Point to Lilli Pilli Point

Desired Outcomes

- Maintenance of the navigation channel in a manner which is cost effective and which does not adversely impact on the Port environment or other natural systems;
- All boaters be made aware of the existence and boundaries of the Shiprock Aquatic Reserve in a manner which does not compromise the aquatic or visual environment; and

- All boaters be made aware when divers are present, and of their locations, in the Port as a whole but particularly in the vicinity of the Shiprock Aquatic Reserve.

Opportunities and Constraints

The maintenance dredging works which were completed in 1999 provide the opportunity to monitor the impacts of dredging on the stability of the channels and on the general environmental qualities of the Port. A detailed study of these impacts is being conducted by the Department of Land and Water Conservation.

Works involving improvements to the Shiprock Aquatic Reserve have received funding under the Coastcare Program and these works provided the opportunity to erect signage which is intended to educate divers, to assist in enforcing fishing restrictions in this sensitive area and to improve access to the site. Signage, which was prepared by the Waterways Authority, has recently been erected by Sutherland Council. A template of the signage produced for the Aquatic Reserve follows:



Western Channel: Lilli Pilli Point to Deer Park

Desired outcomes

- Maintain the current uses in a safe manner without the need for the introduction of formal on-water restrictions; and
- Maintain the deep holes as a significant aquatic habitat.

Opportunities and Constraints

A constraint to achieving the latter outcome is the cost of disposal of dredging spoil to sites other than the deep holes. The reported success of the enrichment program for Cronulla Beach is a significant opportunity but the long term success or otherwise of this project requires independent monitoring and assessment.

Shoaled Areas

Central shoal: the shallow area from Simpsons Bay to Lilli Pilli Point, including Deeban Spit; Fishermans Bay; from Bells Point through to Costens Point and to Gogerleys Point

Desired outcomes

- Use of Simpsons Bay, Deeban Spit and surrounding waters in a responsible and sustainable manner by the community; and
- Safe and orderly navigation of vessels in the narrow channel in the vicinity of Gogerleys Point.

Opportunities and constraints

The National Parks and Wildlife Service has commissioned consultants to prepare a Review of Environmental Factors for a proposed boat launching facility on the southern shore of the Port. It is understood that the consultants' report is due for completion in late 2000 and that it will subsequently be placed on public exhibition.

While it has been suggested in submissions to this draft plan that personal watercraft and other small powered vessel use be heavily restricted in this area, the Authority is mindful of the fact that any usage restrictions placed on one part of the Port can lead to negative impacts on residents and users of other parts of the Port and of other waterways in the area.

Notwithstanding, the results of field investigations by the Authority's staff revealed that vessel noise is most intrusive at dawn and dusk. There are three initiatives which may assist to alleviate this problem. Firstly, an opportunity exists to introduce night patrols on Port Hacking. Secondly the employment of the Riverkeeper has greatly enhanced the Authority's enforcement capabilities. More importantly the recent amendments to the personal watercraft legislation prohibit irregular riding within 200m of the shore (see Factsheet 1 and Chapter 2 of the draft plan of management).

Western shoal: from Deer Point to Swallow Rock Reserve and including Mansion Bay

Desired outcomes

The key outcomes for this part of the Port are the safe transit of all vessels in this area and the protection of the mangroves and seagrasses in the area.

Opportunities and constraints

This draft plan of management itself provides the opportunity to investigate and determine whether any changes to current boating practices and/or restrictions are required to maintain the health of the mangroves and seagrasses in this area.

Northern Bays

Desired outcomes

- Efficient flow of vessel traffic;
- Resolution of the problem of head of bay siltation in a sustainable and cost effective manner;
- Access to, and sustainable and efficient use of, ramps, wharves, marinas, car parks and other facilities, both on-water and shore based;
- The existence of appropriate and effective boating restrictions; and
- Control of the marine pest, *Caulerpa taxifolia*, which was recently found in Gunnamatta Bay.

Opportunities and Constraints

The Authority applied for Coast and Clean Seas funding for a waste reception facility 'needs analysis' of Port Hacking. A report prepared by PPK Environment and Infrastructure P/L has recently been released and its findings and recommendations are useful in determining appropriate strategies for developing waste disposal facilities. The report concluded that there is a need for the construction of further pump-out facilities and for the development and delivery of programs aimed at educating boaters in the use of pump-out facilities and of options for disposal of oily bilge waste (such as the use of absorbent material in the bilge and the need for regular engine servicing).

The proprietor of the Yowie Bay Marina also applied to have a needs analysis conducted by PPK. The report recommended that signage be developed to advertise the availability of the marina's existing oily waste reception facilities, to indicate the appropriate bins for noxious liquids disposal and to advise of garbage recycling disposal procedures. The report also recommended that the provision of a sewage pump-out facility be considered as part of the proposed marina upgrade and that the slipway be upgraded to improve solid and liquid waste collection.

The Yowie Bay Estuary Management Committee of Sutherland Shire Council has undertaken core drilling to investigate the nature of the head of bay siltation with a view to the eventual

removal of the spoil. It has been estimated that removal of two metres of silt would return the bay to 1950 levels (Schreiber, 1999).

In addition Council's stormwater management plans represent opportunities to make significant improvements to water quality in the Port and the formal seagrass mapping exercise being undertaken by NSW Fisheries is an opportunity to assess impacts of antifouling chemicals, moorings and the like in these northern bays. Standen (1999) has cited preliminary research by Dr Marcus Camel of University of NSW which indicates that since active tributyltin has been removed from antifouling preparations, the impacts of antifouling chemicals has been reduced markedly. The use of tributyltin is regulated federally under the Environmentally Hazardous Chemicals Act. Additionally, under the Protection of the Environment Operations Act, all large marinas were required to be licensed by the Environment Protection Authority from 1 April 2000. These pieces of legislation represent further opportunities to improve water quality in these bays.

NSW Fisheries is currently assessing methods of controlling *Caulerpa taxifolia* in Gunnamatta Bay. It is already an offence to possess this plant in mainland coastal waters but the NSW Government will be consulting with all relevant stakeholders (including local communities, fishing interests, the aquarium industry and government agencies) to develop further control measures (NSW Fisheries, 2000). NSW Fisheries has already met with Waterways Authority representatives to discuss strategies for controlling the spread of *C. taxifolia* in Port Hacking and the Authority has offered assistance to 'buoy off' the infested area and to co-operate with NSW Fisheries in developing and implementing further control strategies.

Shallow waters and vessel traffic congestion in some of these bays presents a constraint on any relaxation of on-water restrictions and controls.

Considering that the surrounding suburbs are developed for residential and commercial purposes, finding a short term solution to the problem of off-street parking associated with boat ramps and wharves may be difficult for Sutherland Council which is the responsible agency.

National Park Areas

Hacking River: From Swallow Rock Reserve to Audley Weir

Desired outcomes

- Protection of the river banks from erosion;
- Improved facilities for the various user groups;
- The safety of all users in this popular, but shallow, reach; and
- The construction of the Audley Fish Ladder.

Opportunities and constraints

A constraint on achieving the protection of the river banks in this reach is the fact that there are many causes of bank erosion, vessel wash being one of them. Given that 'wind waves',

the Audley Weir and flooding events play a role, it is possible that any further restrictions on vessel use may not significantly reduce the rate of bank erosion along the Hacking River.

It is worth noting that the Authority is involved in bank revegetation and rehabilitation works on the Seaham Weir Pool on the Williams River north of Newcastle. The Authority will closely monitor this program, and the impacts of boating activity, and will use the results in any further general studies of the impacts of boat wash.

In addition the Riverkeeper will assist in educating boaters on the impacts of wash. The Authority will also better educate the boating community on the relationship between vessel characteristics and appropriate speeds in 'No Wash' zones in which speed limits also apply. Variations in vessel design will cause some vessels travelling at four knots to produce unacceptable wash while others may not. To achieve this goal the Authority will utilise its licence testing procedures by incorporating a question specifically designed to test candidates understanding of this relationship.

To assist fish to enter the upper reaches of the Hacking River, a fish ladder is planned for the Audley Weir. A fish ladder is a device designed to assist the passage of fish into the reaches of a waterway which are upstream of a weir. A constraint on the installation of the fish ladder is the number of agencies involved in the planning and construction phase. However NSW Fisheries, the lead agency, has advised that this can be achieved in the short term.

South West Arm

Desired outcomes

- Use of South West Arm in a responsible and sustainable manner by the community;
- The roles, rights and responsibilities of the various agencies be clearly communicated to the community; and
- All impacting users share in any restrictions which may be proposed for South West Arm.

Opportunities and constraints

The National Parks and Wildlife Service plan of management for the Royal National Park incorporates a strategy for dealing with jurisdictional issues within the Port, including that of the unauthorised moorings within the National Park.

The preliminary results of a seagrass mapping exercise, conducted by NSW Fisheries, has assisted in determining the extent of any damage to seagrasses from small vessel propellers in the sediments of South West Arm. This study indicates that there was less than 2ha of seagrass coverage in South West Arm in 1951 and that this coverage has been maintained in the intervening forty eight years. Nevertheless the preparation of this boating draft plan of management represents an opportunity to further promote the responsible use of South West Arm to ensure the seagrass coverage continues to be maintained.

Cabbage Tree Basin

Desired outcomes

It is desirable that Cabbage Tree Basin also be used in a responsible and sustainable manner by the community and that all impacting users share in any restrictions which may be proposed for the Basin.

Opportunities and constraints

Again the seagrass mapping exercise, conducted by NSW Fisheries, has assisted in determining the extent of damage to seagrasses in Cabbage Tree Basin. While the extent of *P. australis* coverage has increased slightly there has been damage to the *Zostera* and mixed species beds.

Additionally the appointment, by the Waterways Authority and Sutherland Shire Council, of the Riverkeeper provides an opportunity to develop, enhance and deliver environmental education programs for users of the Port.

S

Strategies &
Actions

Introduction

From the values and issues which were obtained during the consultation phase of the development of the draft plan of management, a series of desired outcomes for the Port were developed as discussed in the previous chapter. The following strategies and actions were developed in order to produce the desired outcomes. The achievement of these outcomes is subject to a number of opportunities and constraints which have also been outlined earlier in this draft plan. The strategies and actions, which have been discussed in consultation with the local community and relevant government agencies, are presented for each management unit and for the Port as a single entity in the following action table.

The following information is provided to assist in interpreting the action table:

Timeframe

Short term: This indicates that the project/initiative is anticipated to be implemented within one year of the adoption of the draft plan.

Medium term: This indicates that the project/initiative is anticipated to be implemented within five years of the adoption of the draft plan.

Long term: This indicates that the project/initiative has been identified as desirable but is not expected to be implemented within the first five years cycle of the draft plan.

On-going: This relates to projects which are implemented on a recurring and/or 'as required' basis.

Costs and Funding

Information regarding the expected costs of developing and/or implementing projects is incorporated in the action plan where relevant and where it has been estimated, or is capable of being estimated at this stage, by the relevant agency.

Abbreviations

The following abbreviations are used in the action plan:

WA	Waterways Authority	STP	Sewage Treatment Plant
NPWS	National Parks and Wildlife Service	IPA	Intertidal Protected Area
EPA	Environment Protection Authority	MOU	Memorandum of Understanding
SSC	Sutherland Shire Council	GPT	Gross Pollutant Trap
CMB	Catchment Management Board ¹	BSO	Boating Service Officer
RTA	Roads and Traffic Authority	AR	Aquatic Reserve
SW	Sydney Water	PWC	Personal Watercraft
SPC	Sydney Ports Corporation	WP	Waterways Program
DLWC	Department of Land and Water Conservation	WADAMP	Waterways Assets Development and Management Program

¹ Since this draft plan of management was developed, the Department of Land and Water Conservation has amalgamated a number of Catchment Management Committees and replaced them with Catchment Management Boards.

Action Plan

Management Unit: Port Hacking as a whole

Valued for: High water quality
Sustainable and cost effective dredging plan
Appropriate facilities
Protection of sensitive areas
Fair and equitable access and use

Outcome	Strategies	Actions	Responsibility	Timeframe	Performance Indicators	Capital Cost	Sources of Funding	
High, and improving, water quality in all parts of the Port	• Address stormwater issue	• Implement Stormwater Management Plan	SSC, EPA	Medium	See Plan for timetable of works Monitor results	See Plan	NSW Stormwater Trust (\$138,000)	
		• Extend streetsweeping and source control in accordance with Stormwater Management Plan	SSC	Medium				
		• Design and construct GPTs on basis of water sampling results	SSC	Short-Medium				
	• Minimise sediment disturbance	• Investigate mooring numbers and locations to minimise sediment disturbance	WA, EPA	Medium	GPTs operating successfully re water quality monitoring results Investigation completed	\$1.3m	SSC	
		• Address sewage outflow/overflow issue	• Upgrade Cronulla STP for tertiary treatment	SW				Medium
	• Address issue of antifouling chemicals, marina waste and fuel spillage entering water	• Address sewage outflow/overflow issue	• Extend sewerage system to Bundeena and Maianbar	SW	Medium	Sewerage connected Negotiations completed Plan implemented Mains refurbished	\$2m	SW SW
			• Complete pollution licence renegotiations	SW, EPA	Short			
			• Implement WaterPlan 21	SW	On-going			
			• Carry out refurbishment of foreshore sewer mains on Hacking and Georges Rivers	SW	Short			
			• Carry out works at Gynea and Yowie Bays and North West Arm and other areas of Port Hacking including cleaning and closed circuit television camera inspections	SW	Short			
• Address issue of antifouling chemicals, marina waste and fuel spillage entering water	• Address issue of antifouling chemicals, marina waste and fuel spillage entering water	• Conduct audit of marinas in Sutherland Shire	EPA	Medium	Audit complete			
		• Implement licensing system for large marinas from 1 April 2000	EPA, marina industry	Short	Marinas licensed			

Outcome	Strategies	Actions	Responsibility	Timeframe	Performance Indicators	Capital Cost	Sources of Funding
	<ul style="list-style-type: none"> Develop a properly scheduled and costed dredging plan Accurate marking of navigation channels 	<ul style="list-style-type: none"> within MOU Dredging plan developed Extend consultation with WA re future dredging episodes Identify suitable strategy by which to dispose of spoil Investigate optimum channel alignment and design Continued maintenance of channel markers to ensure accuracy and visibility 	<ul style="list-style-type: none"> DLWC, SSC DLWC, SSC, WA DLWC, SSC DLWC WA 	<ul style="list-style-type: none"> Medium On-going Medium-Long On-going On-going 	<ul style="list-style-type: none"> Plan developed and implemented Detailed consultations conducted Strategy adopted Channels more stable Markers relocated/ repaired as safety requires 	<ul style="list-style-type: none"> \$250 per marker; \$1,500 per light to replace 	<ul style="list-style-type: none"> DLWC DLWC WA
Appropriate protection of sensitive areas	<ul style="list-style-type: none"> Establish new procedures for determining mooring ceilings throughout Port Hacking Study distribution and health of seagrasses Educate boating community of impacts on sensitive areas, including National Park foreshores 	<ul style="list-style-type: none"> Conduct full environmental assessment when investigating changes to mooring ceiling, in addition to standard Part 5 assessment which now takes place at time of issuing individual mooring licences Continue to implement Habitat Protection Plan #2 Finalise formal seagrasses study for which funding was granted under Coast and Clean Seas program Use results of seagrass study to guide management decisions Make results of interim and formal studies available to boating community, erect signs/alter maps Rationalise moorings in seagrass areas or replace with seagrass friendly moorings, depending on results of trial Continue boater education and enforcement program incorporating night patrols, Ride Smart Team and Riverkeeper 	<ul style="list-style-type: none"> WA NSW Fisheries NSW Fisheries, CMB NSW Fisheries, WA NSW Fisheries, WA WA, NSW Fisheries, Mooring licensees WA, SSC 	<ul style="list-style-type: none"> On-going On-going Short Medium Short Medium- On-going On-going 	<ul style="list-style-type: none"> Procedures developed and implemented Net increase in seagrass coverage Study completed Decisions based on study Information disseminated; signs erected; maps altered Reduction in number of moorings in seagrass areas Program implemented 	<ul style="list-style-type: none"> \$40,000 	<ul style="list-style-type: none"> Environment Australia, NSW Fisheries WA, NSW Fisheries WA, SSC

Outcome	Strategies	Actions	Responsibility	Timeframe	Performance Indicators	Capital Cost	Sources of Funding
		activities; targeting 'distance off' requirements, wash, noise and speed					
		<ul style="list-style-type: none"> Incorporate more environment related information in Safe Boating Handbook 	WA	Short	Information incorporated		WA
		<ul style="list-style-type: none"> Incorporate questions re impact of boating activities on environment in all Boat Licence tests 	WA	Short	Questions incorporated		WA
		<ul style="list-style-type: none"> Monitor cost effectiveness of seagrass friendly moorings trial 	WA, NSW Fisheries	Short	Monitoring completed		WA
		<ul style="list-style-type: none"> Make results of trial available to boating public 	WA, NSW Fisheries	Short	Information disseminated		WA
		<ul style="list-style-type: none"> Implement education program for sustainable use of National Park foreshores in accordance with Royal National Park plan of management 	NPWS, DLWC, WA, SSC	On-going	Program implemented, reduced impacts on foreshore		NPWS, DLWC, federal funding programs
	<ul style="list-style-type: none"> Develop foreshore clean-up program 	<ul style="list-style-type: none"> Riverkeeper to develop foreshore clean-up program 	WA, SSC	Medium-Long	Program developed		WA, SSC
	<ul style="list-style-type: none"> Reduce noise impacts on ecologically sensitive areas, particularly in bird nesting season 	<ul style="list-style-type: none"> Investigate additional noise training for enforcement officers 	EPA, WA	Short	Training investigated		WA, EPA
	<ul style="list-style-type: none"> Boating related developments to be designed and located to protect sensitive marine and riparian communities 	<ul style="list-style-type: none"> Review Port Hacking plan of management to ensure appropriate location of boating related developments 	SSC	Medium	Plan reviewed		SSC
		<ul style="list-style-type: none"> Provide funding for projects which are designed and located to enhance environmental qualities 	Various agencies	On-going	Funding provided		Various agencies
		<ul style="list-style-type: none"> Construct energy dissipative rock walls rather than wave reflective type 	DLWC	On-going	Walls constructed if required		
		<ul style="list-style-type: none"> Continue to implement Habitat Protection Plans #1 & #2 	NSW Fisheries	On-going	Habitat increase		NSW Fisheries
		<ul style="list-style-type: none"> Continue education and enforcement campaigns 	NSW Fisheries	On-going	Improved compliance		NSW Fisheries
	<ul style="list-style-type: none"> Educate fishing community re IPAs and legal fish catches and enforce restrictions 	<ul style="list-style-type: none"> Commission environmental consultant to revise and update environmental assessment guidelines for BSOs 	WA	Short	Revised and updated guidelines being implemented	\$6,500	WA
	<ul style="list-style-type: none"> Increase environmental component of BSO training program and review environmental assessment processes 	<ul style="list-style-type: none"> Consultant to deliver supplementary environmental 	WA	Short	Training provided	\$1000	WA

Outcome	Strategies	Actions	Responsibility	Timeframe	Performance Indicators	Capital Cost	Sources of Funding
		training to BSOs					
Minimisation of user conflicts	<ul style="list-style-type: none"> Develop and enhance mutual respect amongst users Encourage participative management Ensure Waterways Authority User Group is appropriate and representative 	<ul style="list-style-type: none"> Consult with user group re management issues on needs basis 	WA, User Group	On-going	Consultation occurring		WA
		<ul style="list-style-type: none"> Reassessment of membership on needs basis 	WA, User group	On-going	User group membership reassessed		WA
Provision of appropriate facilities and infrastructure	<ul style="list-style-type: none"> Upgrade ramps, toilets, wharves Provide additional toilets, parking facilities, boat holding and boarding facilities, fish cleaning facilities, boat washing facilities and the like Upgrade swimming enclosures 	<ul style="list-style-type: none"> Riverkeeper to review facilities and develop program of maintenance and improvement 	WA, SSC	Short	Program developed		WA, SSC
		<ul style="list-style-type: none"> Implement Yowie Bay Estuary Management Plan 	SSC	Short	Plan implemented		SSC
		<ul style="list-style-type: none"> Extend estuary management plan initiative to Gynea and Gunnamatta Bays 	SSC	Long	Plans developed		SSC
		<ul style="list-style-type: none"> Make applications for funding for infrastructure improvements 	Community	On-going	Applications made		
		<ul style="list-style-type: none"> Assess applications for funding 	Various agencies	On-going	Applications assessed		Various agencies
		<ul style="list-style-type: none"> Where appropriate, consider impacts on environment in assessment process 	Various agencies	On-going	Environment considered in assessments		Various agencies
		<ul style="list-style-type: none"> Repair swimming enclosures as required 	SSC	On-going	Enclosures repaired		SSC

Action Plan (continued)

Management Unit: Navigation Channels: Eastern Channel

Valued for: Deep, wide expanse of water for deep draught vessels
 Popular anchorage at Jibbon Bay
 Natural qualities of Jibbon Bay, beach and hinterland
 Swimming, relaxing at Gunyah and Hordens Beach
 Bay Surf when running
 Commercial fishing grounds

Outcome	Strategies	Action	Responsibility	Timeframe	Performance Indicators	Capital Cost	Sources of Funding
A continuing, viable commercial fishing industry	<ul style="list-style-type: none"> Infrastructure and restrictions relating to recreational boating to be compatible with commercial fishing activities 	<ul style="list-style-type: none"> Consider needs of commercial fishing industry in all decisions affecting the eastern channel 	WA, NSW Fisheries, commercial fishing industry	On-going	Needs considered in decisions		
The use of Jibbon Beach by the community in a responsible and sustainable manner to protect ecologically sensitive areas	<ul style="list-style-type: none"> Implement user education program aimed at protecting seagrasses off Jibbon Bay Complete seagrass friendly mooring trial at Jibbon Bay Resolve issue of provision and maintenance of toilets Develop education program to promote rubbish removal by visitors 	<ul style="list-style-type: none"> Finalise seagrass mapping project, for which funding has been provided Disseminate findings to community Erect seagrass advisory signs Consider anchoring restrictions in light of findings of studies and amend maps Develop education program based on results of mapping project Monitor success of seagrass friendly moorings Publicise results of seagrass friendly moorings monitoring program Consider additional seagrass friendly moorings as part of National Mooring Program Discussions held re possible funding assistance for provision of toilets at Jibbon Beach Implement education program 	NSW Fisheries NSW Fisheries, WA NSW Fisheries NSW Fisheries, WA NSW Fisheries WA, NSW Fisheries WA WA, NSW Fisheries, NPWS DLWC, NPWS NPWS, DLWC, WA, SSC NPWS, DLWC,	Short Short Short Short-Medium Medium Medium Medium Medium Short Short On-going	Mapping completed Information disseminated Signs erected Decision on restriction made; maps amended Program developed Monitoring completed Information disseminated Moorings installed Discussions completed; toilet facilities provided Program implemented Reduced litter		Environment Australia, NSW Fisheries, CMB NSW Fisheries, WA NSW Fisheries WA NSW Fisheries NSW Fisheries, WA NSW Fisheries, WA NPWS under National Mooring Program DLWC, NPWS DLWC, NPWS, WA, SSC, federal funding programs NPWS, DLWC, WA,

Outcome	Strategies	Action	Responsibility	Timeframe	Performance Indicators	Capital Cost	Sources of Funding
		<ul style="list-style-type: none"> Disseminate educational information 	WA, SSC		waste		SSC
Respect shown for the rights of all users, particularly through a high degree of compliance with 'distance off' requirements	<ul style="list-style-type: none"> Implement education program Implement targeted enforcement of 'distance off' requirements 	<ul style="list-style-type: none"> Continue boater education and enforcement program incorporating night patrols, Ride Smart Team and Riverkeeper activities; targeting 'distance off' requirements, noise and speed 	WA, SSC	On-going	Program implemented		WA, SSC
		<ul style="list-style-type: none"> Monitor 4 knot zones at Hordens and Gonyah Beaches 	WA	Short	Monitoring completed		WA
		<ul style="list-style-type: none"> Utilise Ride Smart team, Riverkeeper and BSO to target specific safety and environmental issues 	WA, SSC	On-going	Decline in issue of infringement notices		WA, SSC

Action Plan (continued)

Management Unit: Navigation Channels: Central Channel

Valued for: Transit channel
Absence of formal restrictions
Natural qualities of Shiprock Aquatic Reserve

Outcome	Strategies	Action	Responsibility	Timeframe	Performance Indicators	Capital Cost	Sources of Funding
All boaters are made aware of the existence and boundaries of the Shiprock AR in a manner which does not compromise the aquatic or visual environment	<ul style="list-style-type: none"> Develop appropriate signage regime 	<ul style="list-style-type: none"> Placement of signs which have been prepared specifically for land in vicinity of Shiprock AR 	SSC	Short	Signs placed		SSC
All boaters are aware of the presence of divers and their locations in the Port as a whole, but particularly in the vicinity of the Shiprock AR	<ul style="list-style-type: none"> Investigate proposal for divers to use flag at all times while diving 	<ul style="list-style-type: none"> Consult diving community Educate diving community Change relevant legislation if required If legislation changes, initiate education campaign to assist in implementing new requirements 	WA, diving community WA, diving community WA, diving community WA, diving community	Medium Medium Medium Medium-Long	Consultations held Program developed Legislation changed Campaign developed		WA WA, diving community WA WA

Action Plan (continued)

Management Unit: Navigation Channels: Western Channel

Valued for: Transit channel
 Deep holes for intrinsic value and fishing grounds
 Suitable for water-skiing and the like

Outcome	Strategies	Action	Responsibility	Timeframe	Performance Indicators	Capital Cost	Sources Funding	of
Maintain the current uses in a safe manner without the need for the introduction of further formal on-water restrictions	<ul style="list-style-type: none"> Develop education program Implement targeted enforcement of 'distance off', speed and noise requirements 	<ul style="list-style-type: none"> Implement education program for Port Hacking, targeting 'distance off', speed and noise requirements 	WA	Medium	Program implemented		WA	
		<ul style="list-style-type: none"> Utilise Ride Smart team, Riverkeeper and BSO to conduct campaigns in addition to regular patrols 	WA, SSC	On-going	Decline in issue of infringement notices		WA, SSC	
Maintain the deep holes as a significant habitat in their own right	<ul style="list-style-type: none"> Dredging activities to be conducted in accordance with processes embodied in refined MOU 	<ul style="list-style-type: none"> Develop strategy for disposal of dredging spoil 	SSC	Medium-Long	Strategy adopted		SSC	
		<ul style="list-style-type: none"> Dispose of spoil to support Cronulla Beach renourishment program 	SSC, DLWC	Medium-Long	Renourishment of beach		DLWC	

Action Plan (continued)

Management Unit: Shoaled Areas: Central Shoal

Valued for: Fishing grounds
Mooring area - Safe haven for vessels
Safe swimming for small children/families
Picnicking, walking
Spit and lagoon environment

Outcome	Strategies	Action	Responsibility	Timeframe	Performance Indicators	Capital Cost	Sources of Funding
Simpsons Bay, Deeban Spit and surrounding waters used in a responsible and sustainable manner by the community	<ul style="list-style-type: none"> Develop access facilities which are socially and environmentally responsible Assess effectiveness of current boating restrictions Implement new policies on PWC use in NSW 	<ul style="list-style-type: none"> Investigate boat ramp on southern shore 	NPWS, DLWC, SSC WA	Medium Short	Issues resolved, Ramp constructed	\$100	NPWS, DLWC, SSC
		<ul style="list-style-type: none"> Replace 'no boating' sign chain or relocate blocks to avoid damage to seagrasses 	WA	Short	Chain removed or blocks relocated		WA
		<ul style="list-style-type: none"> Monitor and assess compliance in 'no boating zone' at Simpsons Bay 	WA	On-going	Monitoring conducted over 12 month period		WA
		<ul style="list-style-type: none"> Continue policing/surveillance of abovementioned areas 	WA	On-going	Regular surveillance occurring		WA
		<ul style="list-style-type: none"> Monitor effectiveness of new statewide PWC policies 	WA	Short	Policies implemented and monitoring completed		WA
		<ul style="list-style-type: none"> Reconsider policing/surveillance regime in light of monitoring program 	WA	Medium	Regime reconsidered		WA
Safe and orderly navigation of vessels in the narrow channel in the vicinity of Gogerleys Point	<ul style="list-style-type: none"> Monitor effectiveness of current boating restrictions 	<ul style="list-style-type: none"> Convene inter-agency working group to discuss PWC related issues with a view to establishing mutually agreed outcomes 	WA, EPA, SSC, NPWS, DLWC, NSW Fisheries, CMB, PWC manufacturers, PWC user groups, resident groups	Short	Group formed and meeting on an as required basis		WA
		<ul style="list-style-type: none"> Monitor compliance in channel 	WA	Short	Monitoring conducted		WA
		<ul style="list-style-type: none"> Reconsider policing/surveillance regime in light of monitoring program 	WA	Medium	Regime reconsidered		WA
		<ul style="list-style-type: none"> Implement new policies for PWC use in NSW 	WA	Short	Policies implemented		WA

Outcome	Strategies	Action	Responsibility	Timeframe	Performance Indicators	Capital Cost	Sources of Funding
		<ul style="list-style-type: none"> • Monitor effectiveness of new PWC policies • Assess noise impacts of new PWC restrictions to determine need for further restrictions on PWC use in Port 	WA WA	Short Short	Monitoring completed Assessment completed; decisions made and implemented		WA WA

Action Plan (continued)

Management Unit: Shoaled Areas: Western Shoal

Valued for: Transit channel
Environmentally sensitive areas

Outcome	Strategies	Action	Responsibility	Timeframe	Performance Indicators	Capital Cost	Sources of Funding
Safe launching, transiting and retrieving of all vessels in this area	<ul style="list-style-type: none"> Enhance safety for all users in vicinity of Point Danger Enhance safety for all users of Swallow Rock ramp 	<ul style="list-style-type: none"> Erect sign to restrict water-skiing at Point Danger 	WA	Short	Sign erected	\$1,000	WA
		<ul style="list-style-type: none"> Enforce new restrictions on water-skiing 	WA	On-going	Compliance rate		WA
		<ul style="list-style-type: none"> Design and implement improvements to Swallow Rock ramp 	SSC, boating community, DLWC	Medium-Long	Ramp improvements completed		SSC, WP, WADAMP and the like
Protection of the mangroves and seagrasses in the area	<ul style="list-style-type: none"> Develop program for minimising impacts of boating on mangroves and seagrasses in area 	<ul style="list-style-type: none"> Finalise formal seagrasses study for which funding has been provided 	NSW Fisheries, WA	Short	Study finalised	\$40,000	Environment Australia, NSW Fisheries
		<ul style="list-style-type: none"> Use results of seagrass study to guide management decisions 	NSW Fisheries, WA	Medium	Decisions made		NSW Fisheries, WA
		<ul style="list-style-type: none"> Make results of interim and formal studies known to boating community; erect signs/alter maps 	WA, NSW Fisheries	Short	Information disseminated, signs erected; maps altered		
		<ul style="list-style-type: none"> Complete study of mangroves and saltmarshes 	CMB	Short	Study completed		Environment Australia
		<ul style="list-style-type: none"> Devise and implement education program in light of findings of studies 	WA, NSW Fisheries, NPWS, CMB	Medium	Program implemented		NPWS, NSW Fisheries, CMB, WA

Action Plan (continued)

Management Unit: Northern Bays

Valued for: Range of amenities and facilities (recreational and commercial)
Range of activities (on-water and shore based)
Transit channels
Environmental qualities

Outcome	Strategies	Action	Responsibility	Timeframe	Performance Indicators	Capital Cost	Sources of Funding
Efficient flow of vessel traffic	<ul style="list-style-type: none"> Develop mooring management strategy Develop estuary management plans for northern bays based on Yowie Bay Estuary Management Plan model Develop sustainable dredging plan for Burraneer Point 	<ul style="list-style-type: none"> Discussions to further mooring management proposals in the Yowie Bay Estuary Management Plan 	SSC, WA	Short	Plan implemented	See Plan	
		<ul style="list-style-type: none"> Prepare mooring management plan for Port Hacking 	WA	Short	Plan prepared and implemented		WA
		<ul style="list-style-type: none"> Extend estuary management plan initiative to Gynea and Gunnamatta Bays 	SSC	Medium	Plans developed		SSC
		<ul style="list-style-type: none"> Investigate alternative mooring arrangements in light of seagrass study and Estuary Management Plans 	WA	Medium	Investigations completed		
		<ul style="list-style-type: none"> Continue to rationalise mooring locations in Yowie Bay to reduce congestion 	WA, Mooring licensees	On-going	Improved traffic flow		
		<ul style="list-style-type: none"> Continue 12 month monitoring study of most recent dredging episode 	DLWC	Short	Monitoring completed		DLWC
Resolution of the problem of head of bay siltation in a sustainable and cost effective manner	<ul style="list-style-type: none"> Develop estuary management plans for northern bays based on Yowie Bay Estuary Management Plan model 	<ul style="list-style-type: none"> Use results to refine dredging processes in MOU 	DLWC, CMB	Medium	MOU refined		DLWC, CMB
		<ul style="list-style-type: none"> Implement relevant provisions of Yowie Bay Estuary Management Plan 	SSC, various agencies	Short	Plan implemented	See Plan	SSC
		<ul style="list-style-type: none"> Extend estuary management plan initiative to Gynea and Gunnamatta Bays 	SSC, various agencies	Medium	Plans developed		SSC
		<ul style="list-style-type: none"> Ensure proper protection/transplanting of seagrasses if necessary 	SSC, NSW Fisheries	Long	Seagrasses protected/transplanted successfully		

Outcome	Strategies	Action	Responsibility	Timeframe	Performance Indicators	Capital Cost	Sources of Funding
Access to, and efficient use of, ramps, wharves and other facilities, both on-water and shore based	<ul style="list-style-type: none"> Develop estuary management plans for northern bays based on Yowie Bay Estuary Management Plan model 	<ul style="list-style-type: none"> Implement relevant provisions of Yowie Bay Estuary Management Plan 	SSC	Short	Plan implemented	See Plan	SSC
		<ul style="list-style-type: none"> Extend estuary management plan initiative to Gynea and Gunnamatta Bays 	SSC	Medium	Plans developed		SSC
	<ul style="list-style-type: none"> Utilise funding programs available for infrastructure development 	<ul style="list-style-type: none"> Riverkeeper to conduct audit of infrastructure facilities and requirements 	WA, SSC	Short-Medium	Audit completed		WA, SSC
		<ul style="list-style-type: none"> Make applications for funding for infrastructure improvements Assess applications for funding 	Community, SSC Various agencies Various agencies	On-going On-going On-going	Applications made Applications assessed Impacts considered		WADAMP and the like
		<ul style="list-style-type: none"> Where appropriate, consider impacts on environment in assessment process 	SSC, Commercial operators SSC	On-going	Proposals considered		Commercial operators
	<ul style="list-style-type: none"> Provide appropriate access for commercial operators to wharves and refuelling facilities 	<ul style="list-style-type: none"> Assess condition of all wharves and implement program of improvement 	SSC, Commercial operators SSC	Medium-On-going	Program implemented		SSC
		<ul style="list-style-type: none"> Examine land based signage and assess appropriateness and condition 	SSC	Medium-on-going	Assessment completed		SSC
Control spread of the marine pest known as <i>Caulerpa taxifolia</i>	<ul style="list-style-type: none"> Develop pest control strategies 	<ul style="list-style-type: none"> Support national approach to controlling marine pests Consult stakeholders Develop and implement education programs 	NSW Fisheries	On-going	Strategies and education programs developed		

Action Plan (continued)

Management Unit: National Park Areas: Hacking River

Valued for: Swimming, relaxing, kayaking area
Environmental qualities
Sightseeing
Tranquillity and nature appreciation

Outcome	Strategies	Action	Responsibility	Timeframe	Performance Indicators	Capital Cost	Sources of Funding
Protection of the river banks from erosion	<ul style="list-style-type: none"> Undertake boat wash study Review 8 knot speed limit/no wash restrictions in area west of Swallow Rock Ramp Implement erosion control works as necessary 	<ul style="list-style-type: none"> Initiate study of impacts of boat wash on bank erosion 	WA	Medium	Study completed		WA
		<ul style="list-style-type: none"> Consider study findings with respect to implementation on Port Hacking 	WA	Medium-Long	Findings considered and implemented		WA
		<ul style="list-style-type: none"> Investigate introduction of 4 knot zone and educate users Implement if appropriate 	WA, User Group WA	Short	Restriction investigated and implemented, if appropriate		WA
		<ul style="list-style-type: none"> If relevant, Riverkeeper to monitor impact of new speed restriction 	WA, SSC	Short-Medium On-going	Monitoring occurring		WA, SSC
		<ul style="list-style-type: none"> Riverkeeper to identify areas requiring erosion control works Seek funding for works program 	WA, SSC NPWS	Medium and On-going Medium	Areas identified Funding secured		WA, SSC DLWC
Improved facilities for sustainable use of this sub-unit	<ul style="list-style-type: none"> Conduct needs assessment on a sustainable use basis and in line with plan of management for Royal National Park Utilise available funding programs to provide facilities 	<ul style="list-style-type: none"> NPWS to co-ordinate audit of infrastructure facilities and requirements 	NPWS, WA, SSC	Short-Medium	Audit completed		WA, SSC
		<ul style="list-style-type: none"> Make applications for funding for infrastructure improvements Assess applications for funding 	NPWS	On-going	Applications made		NPWS
		<ul style="list-style-type: none"> Finalise design of Audley Fish ladder and install 	Various agencies NPWS, NSW Fisheries, DLWC, RTA, CMB	On-going Short	Applications assessed Ladder installed		DLWC, various agencies, NPWS Various agencies
The safety of all users in this narrow, shallow, reach	<ul style="list-style-type: none"> Review 8 knot speed limit in area west of Swallow Rock Ramp 	<ul style="list-style-type: none"> Investigate introduction of 4 knot zone and educate users Implement if appropriate 	WA, User Group WA	Short	Restriction investigated and implemented, if appropriate		WA
		<ul style="list-style-type: none"> If relevant, monitor impact of new speed restriction 	WA, NPWS	Short-Medium On-going	Monitoring occurring		WA

Action Plan (continued)

Management Unit: National Park Areas: South West Arm

Valued for: Swimming, relaxing, kayaking area
Environmental qualities
Tranquillity and nature appreciation

Outcome	Strategies	Action	Responsibility	Timetable	Performance Indicators	Capital Cost	Sources of Funding
South West Arm used in a responsible and sustainable manner by the boating community	<ul style="list-style-type: none"> Implement user education program aimed at protecting environment, particularly seagrasses in South West Arm 	<ul style="list-style-type: none"> Finalise seagrass mapping project for which funding has been provided 	NSW Fisheries	Short	Project completed	\$40,000	Environment Australia, CMB
		<ul style="list-style-type: none"> Disseminate interim and formal study findings to community 	WA, NSW Fisheries, NPWS	Short	Information disseminated		NSW Fisheries, WA
		<ul style="list-style-type: none"> Erect seagrass advisory signs Consider anchoring restrictions in light of findings of study and alter maps if necessary 	NSW Fisheries NSW Fisheries WA	Short Medium	Signs erected Decisions made		NSW Fisheries
	<ul style="list-style-type: none"> Address issue of waste reception facilities in Port Hacking 	<ul style="list-style-type: none"> Develop integrated education program based on results of mapping project 	NSW Fisheries, NPWS, WA	Medium	Program developed		NSW Fisheries, NPWS, WA
		<ul style="list-style-type: none"> Consider recommendations of waste reception study and take appropriate action 	Environment Australia, WA	Short	Recommendations considered and action plan developed		Environment Australia, WA
		<ul style="list-style-type: none"> Introduce water monitoring program for South West Arm 	CMB	Short- On-going	Water quality readings commenced and showing improvement		CMB
	<ul style="list-style-type: none"> Develop education program to ensure compliance with relevant legislation and plans of management 	<ul style="list-style-type: none"> Prepare and disseminate educational information Enforcement to ensure compliance Monitoring of program and compliance 	NPWS, WA, SSC	Short	Information disseminated		NPWS, WA, SSC
			NPWS, WA, SSC	On-going	Enforcement program conducted		WA, NPWS, SSC
			NPWS, WA, SSC	On-going	Compliance measured and showing improvement		NPWS, WA, SSC
			NPWS, WA, SSC	On-going	Compliance measured and showing improvement		NPWS, WA, SSC

Outcome	Strategies	Action	Responsibility	Timetable	Performance Indicators	Capital Cost	Sources Funding	of
The issue of the unauthorised moorings in South West Arm resolved in a manner which promotes responsible boating activities on Port Hacking	<ul style="list-style-type: none"> Plan of management for Royal National Park addresses this issue 	<ul style="list-style-type: none"> Administer moorings in accordance with NPWS plan of management 	NPWS	Short-Medium	Recommendations of plan of management implemented		NPWS	

Action Plan (continued)

Management Unit: National Park Areas: Cabbage Tree Basin

Valued for: Swimming, snorkelling, relaxing, kayaking area
Environmental qualities
Tranquillity
Undeveloped setting

Outcome	Strategies	Action	Responsibility	Timeframe	Performance Indicators	Capital Cost	Sources of Funding
Cabbage Tree Basin used in a responsible and sustainable manner by the community	<ul style="list-style-type: none"> Implement general environmental education program 	<ul style="list-style-type: none"> Develop education program for Port Hacking targeting 'distance off', speed and noise requirements 	WA	Medium	Program developed		WA
		<ul style="list-style-type: none"> Disseminate educational information 	WA, SSC, NPWS	On-going	Information made available		WA, SSC, NPWS
	<ul style="list-style-type: none"> Implement targeted enforcement of 'distance off', speed and noise requirements 	<ul style="list-style-type: none"> Utilise Ride Smart team, Riverkeeper and BSO to conduct campaigns in addition to regular patrols 	WA, SSC	On-going	Patrols conducted		WA, SSC
		<ul style="list-style-type: none"> Finalise seagrass mapping project for which funding has been provided 	NSW Fisheries	Short	Project completed		Environment Australia, NSW Fisheries, WA
	<ul style="list-style-type: none"> Implement user education program aimed at protecting Cabbage Tree Basin 	<ul style="list-style-type: none"> Disseminate interim and formal study findings to community 	NSW Fisheries, WA	Short	Information disseminated		NSW Fisheries
		<ul style="list-style-type: none"> Erect seagrass advisory signs Consider anchoring restrictions in light of findings of study and alter maps if necessary 	NSW Fisheries; WA	Short- Medium	Signs erected Decisions made; maps altered		WA
	<ul style="list-style-type: none"> Develop integrated education program based on results of mapping project 	WA, NSW Fisheries	Medium	Program developed		NSW Fisheries, WA	

*O*n-going

Management

ON-GOING MANAGEMENT

Key factors in the success of any plan of management are its monitoring and review processes and procedures. It is important to ensure that the plan is being effectively implemented and that the elements of the plan remain relevant.

To ensure this the Authority is committed to the following process:

- The implementation of the plan will be monitored annually by the Authority with input from the organisations responsible for its specific actions; and
- The plan will be fully reviewed, by the Authority in consultation with key stakeholders, on a five yearly basis.

The general monitoring procedure to be adopted will require the Authority to canvass the organisations responsible for implementing actions. These organisations will be required to report annually on progress as assessed against the stated performance criteria. An indicative format of the agencies' annual report to the Authority is found in the table below:

Action referred to in Boating Plan of Management	Contribution Toward or Work Done to Implement Action as at 31 August	Status of Action as at 31 August (for example completed, carried forward, ongoing or deferred)	Brief explanation if Action is carried forward or deferred

Should it appear from the annual reporting process that performance targets are not being met, the Authority will facilitate action whereby the constraints on achieving the targets are investigated and will attempt to resolve the matter with the relevant organisation(s). Where resolution is not possible in the short term the matter may be identified for further investigation as part of the regular review process.

Following adoption of this draft plan of management, it is anticipated that responsibility for the annual reporting, on-going monitoring and review processes would be devolved to the local community, under the leadership of the Authority's regional staff. Subsequent plans would be reviewed by an inter-agency panel with final approval for the plan being the responsibility of the Minister for Transport.

C

onclusion:

Initiatives

What Initiatives are Being Implemented or Planned for Port Hacking?

The 31 key initiatives which have been proposed in this boating draft plan of management are described below. These initiatives will significantly enhance the social, economic and environmental sustainability of the Port.

Riverkeeper Joint Venture

A Memorandum of Understanding has been implemented between the NSW Government and Sutherland Shire Council. The Memorandum of Understanding outlines the roles and responsibilities of both agencies with respect to the management and administration of a Riverkeeper Program for Port Hacking.

The Riverkeeper commenced duties in November 1999 and is implementing the recommendations of the Council's 1992 Port Hacking Plan of Management, under the guidance of the Port Hacking Management Panel, which replaced the Port Hacking Planning and Advisory Committee.

While the majority of tasks and actions performed by the Riverkeeper are environmentally oriented, the Riverkeeper has enforcement powers pursuant to Waterways legislation and has the power to issue infringement notices. In addition the Riverkeeper will have enforcement powers under delegation from the Environment Protection Authority and National Parks and Wildlife Service. While it is recognised that the Riverkeeper may need to receive specialised training in these matters, officers of these agencies have welcomed such assistance.

The budgeted cost to establish and maintain the Riverkeeper Program is shared between the Waterways Authority and Council on a 3:1 basis. The Riverkeeper has been allocated a vessel which is capable of navigating close to shore and in shallow waters. This capability will assist in undertaking actions required by Sutherland Shire Council's Port Hacking Plan of Management.

The Riverkeeper program will also augment other education and enforcement initiatives to be introduced by the Authority and other relevant agencies.

Statewide Personal Watercraft Restrictions

In 1997 the NSW Government introduced a package of measures aimed at reducing the social and environmental impacts of personal watercraft. These measures resulted in a significant statewide fall in the number of complaints against personal watercraft riders. However, personal watercraft users were still receiving 19% of all penalty notices issued despite representing only 6% of all registered vessels in NSW. To further improve the safe use and management of personal watercraft the Government introduced the additional measures as indicated in Chapter 3. These came into force on 1 January 2000.

In June 2000 and in response to continued concerns from local councils, the NSW Government announced that councils would, following consultation with the Waterways

Authority, be able to establish personal watercraft exclusion zones, similar to that which exists in Gunnamatta Bay.

The Authority has discussed relevant issues with personal watercraft manufacture and sales representatives, personal watercraft user group representatives and community representatives.

Seagrass Mapping

Through a Coast and Clean Seas Grant to the Port Hacking Catchment Management Committee, NSW Fisheries has been able to identify the current extent of seagrasses in the Port. Given the importance of this issue, and its potential impacts on boating activities within the Port, the Waterways Authority is assisting in this project by making its 'state of the art' Geographic Information System available to NSW Fisheries. Sutherland Shire Council also assisted in the project by making available a historic series of aerial photographs of the Port.

Prior to the completion of the study, NSW Fisheries and the Waterways Authority also conducted field research to identify the most sensitive and threatened seagrass areas of Port Hacking.

The results of these two seagrass mapping projects will be incorporated into the Authority's Boating Maps to ensure that recreational boaters are aware of the location of the seagrass beds. NSW Fisheries may also use the results to signpost the most sensitive areas.

Additionally the proprietor of the Yowie Bay Marina commissioned a marine ecologist to map seagrasses in the vicinity of the marina to determine the impact of a proposed marina upgrade. The marine ecologist established that the proposed additional marina berths will not encroach on existing seagrass areas.

Courtesy Moorings at Jibbon Bay

The Authority is trialing two types of 'seagrass friendly' moorings in the area of Jibbon Bay which is colonised by *Posidonia australis*. These are of the Seaflex and Alkira brands and have been established as courtesy moorings. In addition the Authority has provided a standard courtesy mooring in an area of Jibbon Bay which is well outside the seagrass area.

The placement of seagrass friendly moorings at Jibbon Bay is part of a wider trial of seagrass friendly moorings being conducted by the Authority. In consultation with NSW Fisheries, the Authority is monitoring the success of the moorings and the cost of maintaining these types of moorings. If the experiment succeeds the number of courtesy moorings in State waters may be increased to protect sensitive environments and the results will be provided to the boating community so that it can make informed decisions regarding the future use of private mooring apparatus.

National Mooring Program

In NSW, the National Parks and Wildlife Service is the lead agency for the administration of the National Mooring Program. The capital costs of establishing environmentally sustainable courtesy moorings will be provided under the Program with the on-going maintenance costs being the responsibility of the Waterways Authority. The grants are available only for the establishment of the moorings in environmentally sensitive areas. Additionally the moorings are to be accessible to the public and designed for use by commercial and private vessels.

Using these grant funds, and the results of the Authority's current seagrass friendly mooring trials, a further six such courtesy moorings are proposed for Jibbon Bay in 2002-03. This will represent an opportunity for the National Parks and Wildlife Service, NSW Fisheries and the Waterways Authority to work co-operatively to further protect the seagrass beds at Jibbon Bay.

Draft Sewage Strategy

In April 2000 the Minister for Transport released, for public comment, a discussion paper which proposes a range of options to manage sewage discharge from vessels in NSW. A final suite of policies will be developed by early 2001, following consideration of public submissions. These policies and any associated regulations will, of course, apply to the users of Port Hacking.

Needs Analysis of Waste Reception Facilities

Following an application by the Waterways Authority, Environment Australia conducted needs analyses of waste reception facilities on various waterways in NSW, including Port Hacking. The results of the studies will be used to develop appropriate waste management measures for those waterways. The recommended actions for Port Hacking are planned for implementation within 5 years of the adoption of this boating plan of management.

Needs Analysis of Waste Reception Facilities for the Yowie Bay Marina

Independently of the Waterways Authority's application, the proprietor of the Yowie Bay Marina also made an application to Environment Australia to conduct a needs analysis of the on-site waste reception facilities. This initiative was taken to ensure that the marina would operate in an environmentally sustainable manner. The recommendations of the study will be best implemented upon the recently approved marina upgrade.

Waterfront and Foreshore Owners' Association to Publicise Pump-Out Facilities

The Sutherland Shire Waterfront and Foreshore Owners' Association has offered to publicise pump-out facilities (their location, operation etc) in its regular newsletter. This is a positive initiative in the spirit of the plan of management and is most welcomed.

Holding Tanks for Houseboats

The proprietor of Cronulla Houseboats, based at Gunnamatta Bay, is voluntarily upgrading his rental fleet to fit 'porta potties'. This is another important initiative on the part of a key stakeholder in the Hacking River catchment.

Sewage Treatment Plant Upgrade and Connection to Bundeena and Maianbar

In 2001 Sydney Water is expected to complete the upgrading of the Cronulla Sewage Treatment Plant to enable tertiary treatment. This project will include, and be followed by, the connection of the suburbs of Bundeena and Maianbar to the sewage system. This initiative will be an important one in efforts to improve water quality in Port Hacking.

Sewer Licensing Program and Mains Refurbishment

Sydney Water is improving its network through WaterPlan 21 and the Environment Protection Authority's overflow licensing program. This is being achieved through projects such as the refurbishment of foreshore sewer mains on the Hacking and Georges Rivers, with \$2m to be spent on this initiative over three years.

Stormwater Management Plan

Pursuant to the Protection of the Environment Administration Act, Sutherland Shire Council has prepared the Hacking River Stormwater Management Plan which identifies a range of projects aimed at improving water quality and reducing sedimentation. Council officers advised that \$1.3m was budgeted for water quality devices for its rivers and creek systems during the 1999-2000 financial year. Council also expects to install up to four new Gross Pollutant Traps and nine new Net Tech devices across the Shire, to improve street and gutter cleaning services and to provide artificial wetlands. Council will also be providing educational information to the community about stormwater and will be issuing development consents which contain more stringent conditions relating to stormwater disposal.

Yowie Bay Estuary Management Study and Plan

Sutherland Shire Council has prepared a long term plan of management for Yowie Bay. The plan aims to rehabilitate the Bay by improving water quality, reducing siltation at the head of the bay, increasing biodiversity including the re-establishment of seagrass beds, minimising boating impacts and providing for environmental education programs. The draft plan also provides for the upgrading of boatramp facilities.

The Council is planning to extend this program to rehabilitate both Gynea and Gunnamatta Bays. The Waterways Authority will be co-operating with Sutherland Shire Council and other relevant agencies in the development and implementation of these plans.

Environment Protection Authority Requirements for Marinas

From 1 April 2000, 'large' marinas were required to be licensed by the Environment Protection Authority under the Protection of the Environment Operations Act, 1997. Licences will be reviewed every three years. A large marina is one which has storage for eighty vessels; is able to repair five vessels simultaneously or is capable of handling vessels which are 25m or more in length.

Local Councils will continue to be responsible for smaller marinas and Councils have been given new powers under the Act to require any necessary upgrading of these marinas. The Environment Protection Authority convenes special meetings of Sydney waterfront Councils, including Sutherland Shire Council, to develop a united approach to protecting the marine environment as it relates to large marinas and is planning to assist the same Councils to develop a similar approach to smaller marinas and boat repair facilities (Environment Protection Authority, 2000).

Environment Protection Authority Audit of Marinas

In 1999 the Environment Protection Authority conducted a pilot marina and slipway audit in conjunction with Woollahra Council. The audit was designed to facilitate the introduction of

the licensing system described above. As a result of the preparation of the draft plan of management, officers of the Environment Protection Authority advised that this audit process could be extended to the marinas and slipways of the Sutherland Shire.

Marine Oil Spill Plans

In 1997 the then Minister for Ports approved the introduction of the NSW Marine Oil Spill Contingency Plan. This plan provides, *inter alia*, a comprehensive system for responding to a marine oil pollution incident, or potential incident, and applies to NSW State waters and adjacent foreshores, including those of Port Hacking.

At the local level, the Botany Bay/Port Hacking Marine Plan addresses emergencies, including oil and chemical spills, in all of the navigable waters in the area. This Marine Plan is linked to the Sutherland Shire Local Disaster Plan and the Georges River District Disaster Plan and their resources can be activated as required to support any marine incident response.

Stocks of specialist equipment such as booms, barges, dispersants and skimmers are maintained nearby at Port Botany and Kurnell. Sydney Ports Corporation would begin deploying relevant units of this equipment together with trained personnel immediately upon notification of any incident.

Waterways Authority's Fleet Upgrade

While the Environment Protection Authority has responsibility for determining the type of fuel which is permitted to be used on NSW waterways, the Waterways Authority has begun converting its statewide fleet of approximately fifty patrol vessels to four stroke engines or to fuel/oil efficient two stroke engines which do not produce the environmental impacts of conventional two stroke engines. It is hoped that this action by the Authority will provide an important lead for both private and commercial vessel operators.

Noxious Weed Control

NSW Fisheries has acted quickly to notify the public of the existence of the marine pest *Caulerpa taxifolia* in NSW waters, including Port Hacking. The NSW Government supports a national approach to the control of the pest and NSW Fisheries will be consulting with stakeholders to develop control strategies. Preliminary discussions with the Waterways Authority have already taken place and the Authority has agreed to assist in the early stages of control by placing advisory buoys to indicate infested areas.

Detailed Monitoring of Recent Dredging Works

Following the 1998-99 dredging of the navigation channels in Port Hacking, the Department of Land and Water Conservation has developed a comprehensive monitoring program, the results of which will guide future dredging activity in the Port. The Department of Land and Water Conservation has undertaken to fully consult with all relevant agencies, including the Waterways Authority, prior to commencing any future dredging programs.

National Parks and Wildlife Service Plan of Management

A final plan of management for the Royal National Park was released in March 2000. The plan addresses the issue of the unauthorised moorings located in South West Arm, as well as

making recommendations relating to speed restrictions and waste disposal in South West Arm. The National Parks and Wildlife Service has commissioned consultants to prepare a Review of Environmental Factors for a proposed boat ramp for the southern shore.

Program of Facilities Upgrade and Maintenance

The Riverkeeper, whose activities are funded by the Waterways Authority and Sutherland Shire Council, is conducting a review of wharf and ramp facilities to assist Council to develop a maintenance and improvement program.

Funding Programs

In 1998 the Government established the Waterways Assets Development and Management Program (WADAMP) through which \$2m is provided annually, on a 50:50 basis with Councils, for boating facilities. Since its introduction, WADAMP has provided funds for boating infrastructure to the value of \$5.5m. Each year councils or third parties may apply for WADAMP funding.

Under the Waterways Program, the Department of Land and Water Conservation committed a further \$3m for sustainable waterways infrastructure development projects during the 1999-2000 financial year.

Senior officers of the Waterways Authority and the Department of Land and Water Conservation are currently working together to rationalise the approach and protocols involved in administering the two funding programs.

Shiprock Aquatic Reserve Signage

Signage was prepared by the Waterways Authority for the then local Catchment Management Committee. The new signs, one of which has been erected in the vicinity of the Shiprock Aquatic Reserve, warn of the presence of divers in the area and of the dangers of diving without a diver's flag. The signs also inform of the fishing and spearfishing restrictions at Shiprock Aquatic Reserve. It is understood that the other sign prepared by the Authority will be erected by Council following completion of improvements to the access track between the Aquatic Reserve and Shiprock Road.

Extension of No Boating Area in Simpsons Bay

In mid 1999 the 'No boating' area of Simpsons Bay was extended by approximately 75m in an easterly direction to provide a greater area for exclusive use by bathers, particularly children. The level of compliance with this restriction is being closely monitored by the Authority's staff.

Four Knot Zones at Gunyah and Hordens Beaches

A four knot boat speed restriction was introduced in mid 1999 at two other popular swimming beaches, namely Gunyah and Hordens Beaches on the southern shore of Port Hacking. The level of compliance with this restriction is being closely monitored.

Review Speed Restrictions on Hacking River

The Waterways Authority User Group will consider the introduction of a four knot zone from Swallow Rock Reserve to the Audley Weir to further protect swimmers, kayakers and the river banks. Should this change be implemented, the shallow sections of the three Royal National Park reaches (being South West Arm, Cabbage Tree Basin and the Hacking River) would all be subject to a four knot speed restriction.

Additional Environmental Assessment to Alter Mooring Numbers

To determine whether a vessel may be attached to an existing private mooring, the Waterways Authority currently performs a full assessment of matters under Part 5 of the Environmental Planning and Assessment Act, 1979. To alter the mooring numbers in a bay in Port Hacking the Authority currently consults with Sutherland Shire Council.

At this stage the Authority does not plan to increase the agreed mooring numbers in Port Hacking. Should the Authority, in the future, reconsider mooring numbers in any bay within the Port, it will undertake a full environmental assessment in addition to its standard consultations with Sutherland Shire Council.

Review of Environmental Assessment Policies and Procedures for Waterways Authority Field Staff

The Authority reviews its policies and procedures on an on-going basis. The Authority is currently reviewing and updating its environmental assessment guidelines to ensure that they are in line with 'best practice'.

Expanded Environmental Component of Safe Boating Handbook and Licence Tests

To complement the information presented on its website, the Waterways Authority will include more environmental protection guidelines into its Safe Boating Handbook, which is a key resource for NSW boaters. In addition boat licence candidates will be tested on environmental issues such as anchoring in seagrass beds.

Boat Wash Study

As a long term project identified in the action plan, the Waterways Authority will commence a comprehensive study of the impacts of boat wash on river and estuary banks, and on structures such as seawalls. From the study it is anticipated that a series of recommendations to minimise the impacts of boat wash will be developed for several applications including Port Hacking.

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