



BOATING PLAN OF
MANAGEMENT

LAKE CONJOLA ESTUARY

March 2005

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BOATING PLAN OF MANAGEMENT

LAKE CONJOLA ESTUARY

EXECUTIVE SUMMARY

Background

This document provides the basis for a Boating Plan of Management that applies to the tidal waters of the Lake Conjola estuarine system, including Berringer Lake and Conjola Creek. This follows a determination by the NSW Maritime Authority that it will review the effectiveness and efficiency of the current Boating Plan.

Boating Plans of Management (BPoM) are designed to:

- Protect and sustain the recreational and environmental values of a waterway
- Ensure that boating practices maximise user safety, enjoyment, public safety and amenity
- Consider the needs of shore-based estuary users as well as boating-based activities
- Review shore-based boating-related facilities or infrastructure such as launching ramps
- Provide a framework for consultation

Building on earlier Boating Plans, this Plan incorporates detail of Lake Conjola's physical, environmental and cultural heritage attributes and considers impacts of boating activity on these attributes. This specifically includes analysis of threatened species impacts and other environmental issues, both aquatic and terrestrial.

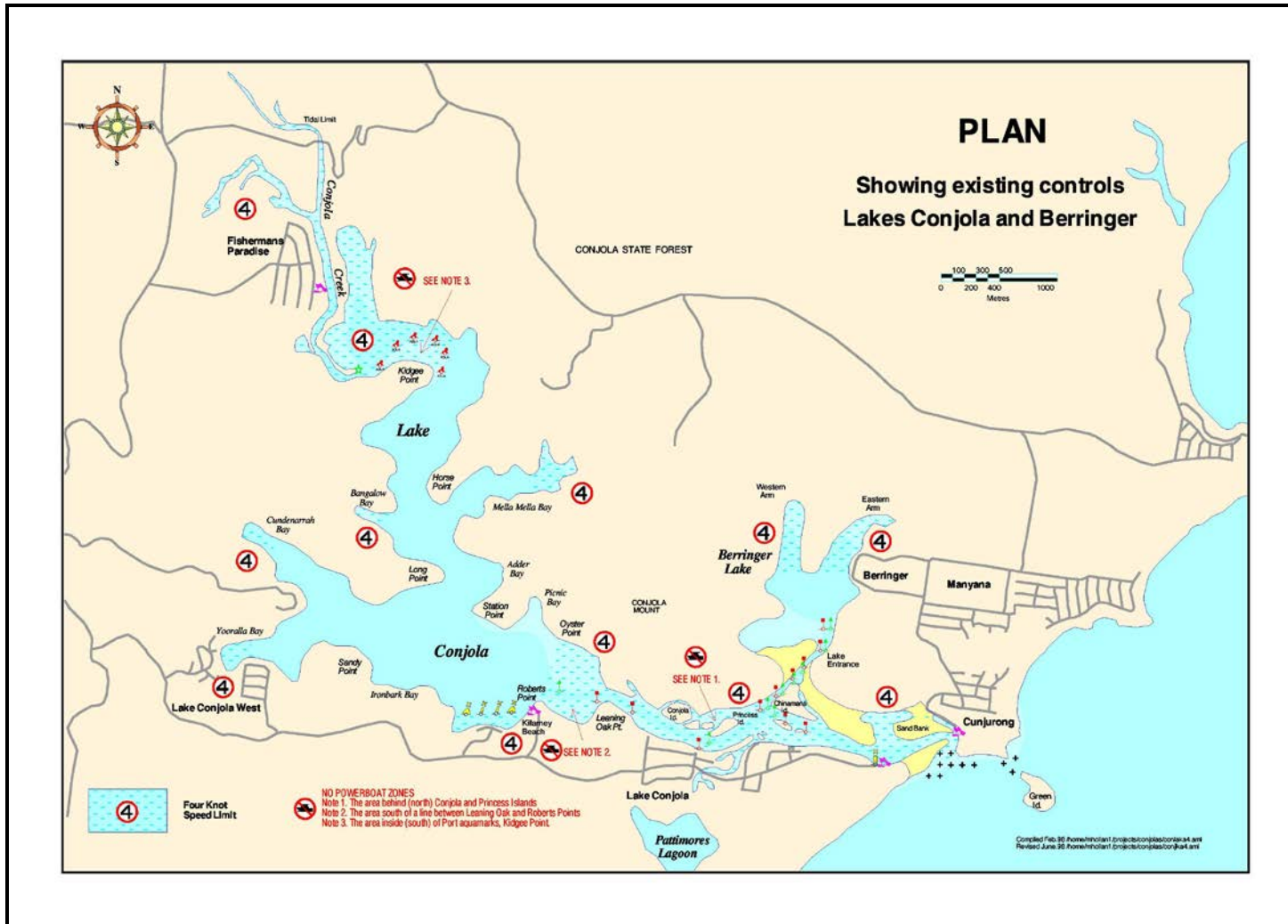
Management 'tools' available to NSW Maritime Authority to approach these issues can include:

- Four knot speed limits
- 'No Wash' zones
- 'No Skiing' restrictions
- Distance-off marks
- Restricted access
- Allocation of time or space to conflicting user classes

Current controls on the Lake Conjola estuary are depicted on **Figure 1** overleaf.

The NSW Maritime Authority is committed to promoting the sustainable and equitable use of NSW waterways for all users. The Authority's emphasis in relation to sustainable environmental management is on interagency co-operation, sharing responsibilities and developing a consultative approach to sustainable waterway management. In the context of holistic management of the Lake Conjola Estuary, the Boating Plan of Management will complement the existing Estuary Management Plan.

Figure 1 Current Waterway Controls - Lake Conjola Estuary



Process

The process of developing this Boating Plan of Management provides a number of opportunities for the Authority and stakeholders to share information and provide input to the plan. The following represents a summary of the planning process:

Seek Community Input

- Terms of Reference released and advertised in *Wavelength* (NSW Maritime Authority newsletter) and publicised via the NSW Maritime Authority Web site.
- Presentations by the Authority were made to a public meeting at Conjola, inviting public submissions to the terms of reference.

Prepare Draft Plan

- Identify values and issues arising from submissions received.
- Review existing data and relevant policies
- Conduct inspections of the estuary
- Develop a series of draft management strategies and actions.

Second Stage Public Consultation

- Draft plan placed on public display.

Finalise the Plan

- Analyse stakeholder submissions
- Review plan in light of stakeholders' responses.

Advertise, Implement, Monitor and Review Approved Plan

The strategies and actions adopted in the Lake Conjola Boating Plan of Management are designed to be responsive to changing priorities and conditions on the estuary, and will be subject to 5-yearly review.

Major Initiatives

The Lake Conjola Estuary Boating Plan of Management contains management strategies addressing values and issues relevant to both the entire estuary as well as location specific areas. The table overleaf summarises the major initiatives incorporated in the Lake Conjola Estuary Boating Plan of Management. It is noted that actions fall not only to the NSW Maritime Authority, but also to Shoalhaven City Council and NSW Department of Primary Industries (NSW DPI, previously NSW Fisheries). NSW Maritime's recommendations for the consideration of council and other agencies are made within the body of the Plan.

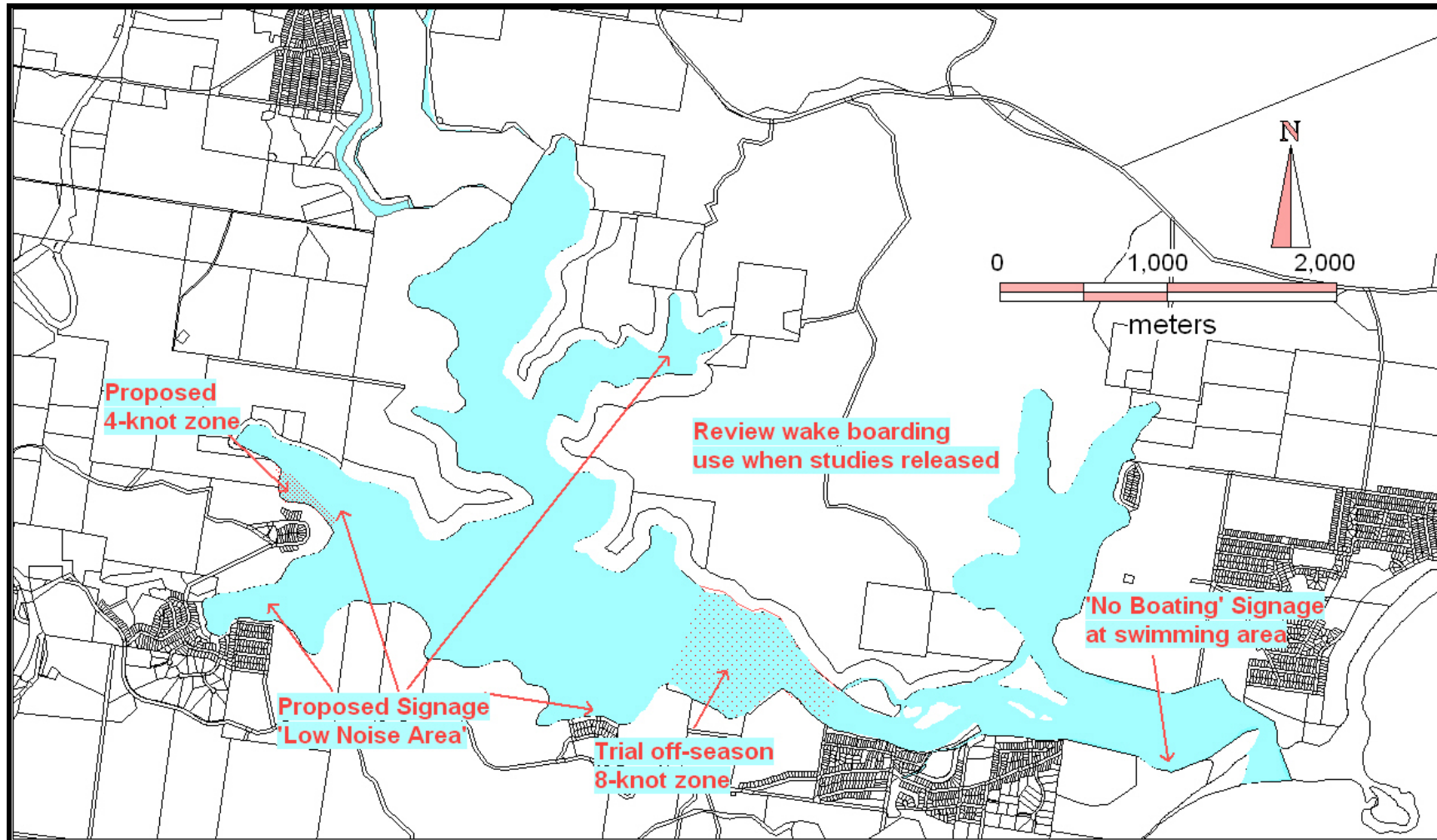
These initiatives will complement existing management strategies for the estuary. The timeframe for implementation proposes durations which are proposed loosely as:

- Short term One year
- Medium term Two to three years
- Long term Four to five years

ACTION	RESPONSIBILITY	TIMEFRAME
1. BOAT LAUNCHING ISSUES		
1.1 Provide additional washdown facilities at boatramps: <ul style="list-style-type: none"> • Cundenarrah Bay (<i>if launching is to continue</i>) • Sandra Street (off Havilland Street) • Prior Street • Norman Street • Berringer Crescent, Berringer Lake 	NSW DPI and Council	Short term
1.2 Close Aney Street Boatramp (<i>subject to 1.3</i>)	Council	Long term
1.3 Select site for alternative town ramp, prepare concept design and seek funding <ul style="list-style-type: none"> • Construct ramp prior to Aney Street closure 	Council (NSW Maritime to consider funding application)	Short term Medium term
1.4 Consider options for Cundenarrah Bay access track	Council	Short term
1.5 Upgrade vehicle approaches and formalise ramps for <i>Caulerpa</i> control at: <ul style="list-style-type: none"> • Sandra Street (off Havilland Street) • Prior Street • Norman Street • Entrance ramp (carpark) • Berringer Crescent, Berringer Lake 	Council (NSW Maritime to consider funding application)	Long Term
1.6 Concept designs for new ramp and parking at Havilland Street	Council	Long term
2. ADDITIONAL CAULERPA CONTROLS <ul style="list-style-type: none"> • Expand washdown facilities to all affected boat retrieval points and formalise launching points (see 1.1) • Clarify direction signage at West Conjola 	NSW DPI and Council	Short term
3. ADDITIONAL BOATING CONTROLS <ul style="list-style-type: none"> • Implement trial off-season 8-knot zone from Norman St to Roberts Point, and assess impact on boating safety • Consider signage for 'Low Noise Areas' • Install 'No Boating' sign at swimming area • Consider need for controls on wakeboarding when studies released • 4-knot zone along southern shore of Cundenarrah Bay 	NSW Maritime NSW Maritime NSW Maritime NSW Maritime NSW Maritime	Short term
4. THREATENED SPECIES PROTECTION <ul style="list-style-type: none"> • Maintain 4-knot zone around estuary islands • Consider seasonal 'no boating area' at spit (if requested by Parks Service for shorebird breeding management) 	NSW Maritime NSW Maritime	Ongoing Ongoing

Figure 2 on the following page depicts by location the changes to waterway controls on the Lake Conjola Estuary introduced by this plan.

Figure 2 Amendments to Boating Controls - Lake Conjola Estuary



BOATING PLAN OF MANAGEMENT LAKE CONJOLA ESTUARY

1. Overview

1.1 Terms of Reference

The following Terms of Reference were provided to the public by publication on the NSW Maritime Authority's Website and through a public meeting held at Lake Conjola.

The Authority will examine the degree to which the current plan ensures the safe and responsible use of Lake Conjola.

The review will consider:

(a) the effectiveness of the plan in promoting the safety of vessels and waterway users on Lake Conjola

(b) the degree to which the plan addresses actual or potential conflicts between different waterway activities, and in particular between high-speed power boats and passive waterway users

(c) the degree to which the plan addresses the possible environmental impacts of vessel activity, with reference to:

- noise
- wash and foreshore erosion
- wash and mooring areas
- waste disposal
- the fragmentation and spread of *Caulerpa taxifolia*
- the protection of aquatic flora and fauna

(d) the degree to which management arrangements within the plan complement the roles of other government agencies, including with respect to other plans or strategies applying to Lake Conjola

(e) whether the plan adequately addresses the availability and appropriateness of boating-related facilities or infrastructure around the lake

(f) the degree to which the plan still reflects current patterns of vessel use and current environmental, social and economic issues on Lake Conjola

(g) the degree to which management arrangements specified within the plan have been implemented.

The approach to waterway management in this Plan considers a number of factors in detail. The Terms of Reference have been broadened in response to values and issues raised in public submissions and in consultation with Council and State agencies.

1.2 Guiding Principles

This plan is underpinned by the following principles, and as such will seek to:

- develop strategies that promote the safety of all waterway users.
- promote sustainable and equitable use of the waterway with the minimum of regulatory measures necessary to achieve this aim.
- manage boating activities to minimise detrimental environmental impacts and protect aquatic flora and fauna in accordance with the principles of Ecologically Sustainable Development (as defined in the Environmental Planning and Assessment Act 1979).
- ensure best use of Government and community investment.
- contribute to sustainable resource management.

The NSW Maritime Authority, in line with the objectives of the Intergovernmental Agreement on the Environment (1992), adopts a partnership approach to the management of the Conjola estuary. The Authority shares the responsibility for protecting the environment and for providing public infrastructure in connection with the use of vessels on the State's waterways with other natural resource and environment management agencies and local government.

Strategies and actions identified in this Boating Plan of Management are to be consistent with those responsibilities for which the NSW Maritime Authority has jurisdiction. In accordance with the Ports Corporatisation and Waterways Management Act 1995, the Authority has jurisdiction over navigable waters. The Act defines navigable waters as '... all waters that are from time to time capable of navigation and are open to or used by the public for navigation'.

The NSW Maritime Authority is committed to interagency co-operation, sharing responsibilities and developing a consultative approach to sustainable waterway management. Accordingly, Shoalhaven City Council has co-funded the preparation of this Plan. There are actions identified in the Plan that depart from NSW Maritime Authority responsibilities which fall under the jurisdiction of Council.

2. Lake Conjola Estuary

An aerial view of Lake Conjola and Berringer Lake (1998 photograph) is depicted on **Figure 3**.

Figure 3 Aerial view of Lake Conjola estuary



2.1 Regional Setting

General

Lake Conjola is located in Shoalhaven City Council Local Government Area on the South Coast of NSW, approximately 15 kilometres north of Ulladulla. The Shoalhaven Coast is a popular tourist destination. Tourism is seasonally based around the strong summer period, with Easter providing a second peak. Tourism promotions are successfully extending this season into the March to May period. Seasonal boating trends on Lake Conjola would be expected to follow this holiday pattern.

2.2 Conjola Estuary Physical Profile

The Lake Conjola entrance separates the townships of Cunjurong Point to the north and Lake Conjola village on the southern bank. The lake is mostly open to the ocean and untrained, and provides ocean access in calm conditions.

The total tidal waterway area is 660 hectares distributed as follows (**Table 1**):

TABLE 1 Lake Conjola Estuary Waterway Areas

Estuary Zone	Total Area (hectares)
Tidal Creeks	27
Lake Conjola (to Chinamans Id)	502
Berringer Lake	77
Entrance area (d/s Chinamans Id)	54
TOTAL AREA	660

The lower estuary comprises a series of shifting channels around marine sands which extend into Berringer Lake and in Lake Conjola upstream almost to Roberts Point. The main Conjola Lake basin has depths in excess of 10 meters. A number of embayments contain water depths of around 5 meters. The major tributary of the lake is Conjola Creek which connects the village of Fishermans Paradise to the main lake body.

2.3 Lake Conjola Ecological Environment

Estuary Overview

The catchment of Lake Conjola comprises 95% undeveloped, forested land, with broad areas of lake foreshore falling under National Park. The lake's foreshores are in general steep and rocky, and as a result the riparian vegetation comprises mainly dry sclerophyll forest. There are opportunities for Swamp She-oaks in flatter areas such as the floodplain deposits along Conjola Creek and at the heads of some embayments.

Aquatic habitats of significance include small areas of seagrass (mainly *Zostera* meadows estimated at about 50 hectares in 1979). The current area of *Zostera* seagrass is not known.

Areas of fringing aquatic vegetation such as saltmarsh are very limited around the lake. The foreshore gradient does not suit the development of this species, which requires flat or gently sloping semi-saline areas just above Mean High Water Mark.

A handful of sandy beaches exist around the lake shoreline. These are popular ski beaches where located in or near sheltered waters.

Caulerpa taxifolia Invasion

Shallow parts of the estuary including most seagrass areas are vulnerable to incursion by the invasive *Caulerpa* seaweed. This weed is listed as a noxious marine vegetation and it presents a serious threat to estuarine ecosystems in NSW. The largest occurrence of the weed on the NSW South Coast occurs on the Conjola estuary system. It is essential that this Plan complements the NSW Department of Primary Industries (previously NSW Fisheries) *Caulerpa taxifolia* Control Plan and is consistent with its control strategies.

This weed can grow in very shallow water, and has been recorded in NSW growing down to a depth of about 10 meters. It occurs in mainly sandy sediments but has established at Lake Conjola on rocky

substrate. Coverage of the weed can increase by a factor of ten times over a single summer growing season.

The spread of *Caulerpa* is closely related to boating activity and also to natural estuary bed disturbance from storms and wind. Propellers moving over infected shallow areas will cut the plant into fragments, which can drift into other areas and start new outbreaks.

Mapping by NSW DPI shows that in February 2004, *Caulerpa* has spread to cover 165 hectares of Lake Conjola and Berringer Lake. It now covers most of the shallow foreshore areas of the estuary system including most of Berringer Lake. The increase from February 2003 (156 hectares) to February 2004 represents 9 hectares or 6% of the 2003 coverage by area. However the density of the weed has increased significantly in that period, with 'dense' (as opposed to 'sparse') deposits growing from 58 hectares in 2003 to 148 hectares in 2004.

This suggests that activity such as boating has already allowed the weed to spread to areas where it is suited. The further spread of weed within the estuary would seem inevitable, possibly with or without boating activity. The few foreshore areas with a lack of dense coverage in February 2004 could be expected to develop the weed due to its rapid growth.

Areas of the lake where NSW DPI mapping show absence of *Caulerpa* include the deep basins and the entrance area, possibly where shifting sand deposits under higher tidal velocities have prevented its establishment.

NSW Department of Primary Industries has developed a Control Plan for *Caulerpa* in NSW waters. The Control Plan has been implemented at Conjola by Council and NSW DPI. Issues relating to boating in the *Caulerpa* Control Plan have been reviewed as part of this Plan.

Relevant issues for *Caulerpa* management are:

- Spread of *Caulerpa* from ocean currents transporting the weed to another estuary is difficult to manage. Infestations around estuary mouths are at highest risk of spreading to the ocean and have a high priority for salt treatment.
- Shallow-water infestations around boat ramps provide a high level of risk of spread to other estuaries from boat trailers and propellers dragging the bed at time of boat retrieval. Entanglement on boat hulls is less likely.
- Well-equipped washdown areas can assist to combat the spread of the weed to other estuaries. Shallow launching and retrieval areas are most vulnerable.

Threatened Bird Species

The extent of shorebird species has been researched from the Parks and Wildlife Division, Department of Environment and Conservation database. Threatened species of birds and their status under the Threatened Species Conservation Act 1995 have been recorded around the estuary as follows (**Table 2**):

Also noted within the Lake Conjola catchment is the presence of top order consumers, such as large forest owls. This indicates that the habitat within the catchment is sufficiently varied to support populations of prey species such as possums and native rodents. However, the incidence of these species has no impact on boating management considerations.

TABLE 2 **Threatened species of birds around Lake Conjola**

Common Name	Scientific Name	Status under TSC Act 1995	Location on Estuary
Osprey	<i>Pandion haliaetus</i>	Vulnerable	Nests suspected in Conjola National Park
Sooty Oystercatcher	<i>Haematopus fuliginosus</i>	Vulnerable	Foraging around entrance area
Pied Oystercatcher	<i>Haematopus longirostris</i>	Vulnerable	Nesting on islands near Chinamans Island and on Entrance Spit
Hooded Plover	<i>Thinornis rubricollis</i>	Endangered	Entrance Spit
Little Tern	<i>Sterna albifrons</i>	Endangered	Entrance Spit
Australasian Bittern	<i>Botaurus poiciloptilus</i>	Vulnerable	Foraging near Fishermans Paradise boatramp
Black Bittern	<i>Ixobrychus flavicollis</i>	Vulnerable	Head of Mella Mella Bay

2.4 Lake Conjola Cultural Environment

Aboriginal people have close associations with Lake Conjola. The Department of Environment and Conservation has recorded some 24 sites of Aboriginal cultural significance or Aboriginal objects within one kilometer of the lake. These include open camp sites and burial sites.

Boating activity could potentially impact on sites if they were in the immediate lake foreshore and were suffering direct damage from boat launching or indirect damage from boat wash. There appear to be no sites under these categories. Consequently there are no requirements for boating controls based on Aboriginal cultural significance.

3. Waterway Usage

3.1 Water Craft

Power boating, water skiing and wake boarding are very popular on Conjola due to its relatively steep and forested catchment areas, which provide opportunities for these activities sheltered from prevailing onshore winds. Estuary boat fishing is a popular recreational pastime, particularly as the estuary is one of the declared Recreational Fishing Havens in NSW.

Other craft use the estuary apart from powerboating activity. One of the more recent arrivals on the watercraft scene are Personal Water Craft (or PWC), the term used to describe craft with trade names such as Jet Skis, Waverunners and Sea Doos.

A small hire boat facility operates out of Lake Conjola near the Post Office. This appears to be low key and has no particular obvious operational difficulties.

The upper reaches of embayments on Lake Conjola provide an ideal environment for passive waterway uses such as fishing, canoeing and kayaking. These passive use areas are zoned 4 knots to provide opportunity for the safe enjoyment of passive activities and to protect the environment.

3.2 Navigability Issues

Waterway use at the Entrance Boat Ramp and in the reach upstream of the Entrance Boat Ramp is limited in places by shoals and a meandering channel. This sand is of marine origin, and will continue to migrate up the channel at varying rates under incoming tides whenever the entrance is open. Ongoing inspection of markers for this channel is operational practice for NSW Maritime Authority Boating Officers.

Even shallow-drafted vessels have trouble negotiating the Berringer Lake entrance from Lake Conjola. The lake bed in the channel between the marker beacons shows clear signs of propeller damage. Use of this shallow entrance inevitably will chop up and spread *Caulerpa* seaweed. This is largely unavoidable.

3.3 Growth Projections

Analysis of growth figures for boating licences and registered craft numbers has been carried out by NSW Maritime Authority for the Nowra to Ulladulla region (see **Table 3**). These suggest an average annual growth rate of 5.5% for boating licences has occurred over the last four years since June 2000. There are 9,220 people in the region with a boat licence as at 1st June 2004.

Similarly boating registrations have increased from 4,955 in June 2000 to 6,055 in June 2004. This represents an average annual growth rate of 5.1% since June 2000.

It is difficult to apply these statistics directly to boat usage on Lake Conjola as there are many estuaries that these boats may use in the region. Further, the majority of peak holiday users are visitors and tourists. One limiting factor for areas such as Conjola will be the available level of tourist accommodation within a short drive to the lake.

Local submissions suggest that boating numbers have decreased since the 1970's, when powerboat clubs were in full operation, attracting competitors to the lake for both local and regional events. One

would expect that regardless of statistical projections and with or without powerboat clubs, boat ownership and boat use will continue to increase in the region.

TABLE 3 Boating Licences and Registrations - Nowra to Ulladulla

As at Date	Boating Licences	Boating Registrations	Annual Growth	Boating Licences	Boating Registrations
01-06-2004	9220	6055			
01-06-2003	8735	5753	2003 to 2004	5.6%	5.2%
01-06-2002	8208	5428	2002 to 2003	6.4%	6.0%
01-06-2001	7849	5184	2001 to 2002	4.6%	4.7%
01-06-2000	7452	4955	2000 to 2001	5.3%	4.6%
Average	8292.8	5475	Average	5.5%	5.1%

3.4 Estuary Capacity for Boating Activities

NSW Maritime Authority considers that a total of 200 vessels may be visible at peak times, however not all would be in use simultaneously - many would be beached. Public submissions consider that 40 ski boats on the lake would be a busy day. This number could well have been greater with organised ski races when the Highlands Ski Club was operating.

This plan makes an estimate of the sustainable number of boats that the estuary could support concurrently. This estimate is based on the area available for waterskiing, based on an average area of 5 hectares water space per vessel. It also makes allowance for passive uses, based on an allowance of 1.2 hectares per vessel over the balance of the waterway. These figures are derived from historical boating studies and, although generic, provide a theoretical approximation of waterway capacity.

Based on waterway area figures derived elsewhere in this plan, there are 306 hectares suitably zoned for waterskiing / wake boarding and a residue of 354 hectares is available solely for passive uses. Naturally, not all of these areas may be suitable concurrently, dependent on prevailing wind conditions. Also clearly passive uses can utilise the whole lake. The capacity calculations based on zoned and residue areas therefore provide an estimate of a potential maximum number of waterskiing vessels.

BOATING CAPACITY: The capacity of the Lake Conjola estuary system - based on its waterway area and the current level of boating controls - is estimated at **300 passive use vessels** (fishing, low-speed pleasure boating, canoeing, kayaking, sailing, windsurfing etc) and **60 waterskiing boats**.

3.5 Boating Safety

Regulations provide guidance on proper behaviour on the water, however safety should not be totally reliant on regulations only. Boating safety awareness is paramount as attendance by boating officers cannot be permanently guaranteed.

NSW Maritime considers that a reasonably high level of regulation on Lake Conjola exists at present, far more than on many other coastal lakes and estuaries. Much of this regulation is related to protection of environmentally sensitive areas. Other regulation that has regard to boating safety relating to boating congestion solely would be relevant at peak usage periods only. This issue is further discussed later in the Plan.

A compiled history of boating incidents on Lake Conjola recorded by NSW Maritime database shows a total of five reported events since 1997. The most serious injury occurred in December 1997 but this was due to lack of judgment rather than any factors requiring waterway regulation or controls.

While a number of unreported incidents are likely, the available data clearly suggests that dangerous incidents causing serious injury are relatively uncommon on the waterway. NSW Maritime continue to monitor this situation by recording details of reported incidents.

4. Community Consultation

The NSW Maritime Authority is aware that this Boating Plan of Management must reflect community values and address as far as possible community issues.

The BPoM review has been preceded by a number of submissions to NSW Maritime Authority from both local and remotely-based holiday estuary users. Submissions from the public consultation process provided the Authority with a broad range of information relating to the characteristics which the community values about the estuary and the associated issues which impinge upon these values.

Initial public responses to NSW Maritime Authority announcing a review of boating controls were followed by a series of publicly held meetings at Conjola. Concern was voiced about the perceived possibility of closure of a number of areas on the estuary, effectively confining waterskiing to the main lake basin. A number of submissions were received by the Authority, leading up to a public meeting at Conjola called by NSW Maritime Authority early in June 2004. At this meeting, further public submissions relating to the terms of reference were invited. This attracted a total of 54 submissions from estuary users and local residents. This round of submissions produced further detail such as estuary use patterns and detailed information covering the terms of reference. Information provided has allowed a greater depth of coverage of these issues.

A summary of common issues raised within public submissions is presented in tabular form below. By necessity this summary is brief and does not detail every point made in every submission. It follows the format of the Terms of Reference for clarity.

TABLE 4 Issues raised in public responses to NSW Maritime Authority

Issues Raised in Submissions	Plan Response
Safety Issues	
Lake is considered 'safe' by the majority of users and as evidenced by a lack of serious boating incidents over the last five years.	Evidence of no serious boating-related accidents is accepted.
30 metre 'distance off' regulation is most often contravened, of concern to safety of passive users.	Enforcement issue
NSW Maritime Authority presence is an issue, necessary to enforce 30m zone and 4-knot limits.	Enforcement issue
Concentration of powerboating at fewer locations would be more dangerous at peak times.	No proposal for more concentration of powerboating activity.
Strategic locations with intense skiboat use such as Killarney would benefit from specific safe boating signage.	New signage depicting anticlockwise travel, safe departure and arrival directions and give way rules supported.

Issues Raised in Submissions	Plan Response
Conflicts between Active and Passive Users	
Wide range of passive uses – snorkeling, swimming, surf-ski / kayak paddling, shore-based fishing and sightseeing as well as traditional boating activities.	Plan addresses all uses.
User conflicts and passive estuary uses	Plan covers this issue to the level of available information
Environmental Impacts of Vessel Activity	
<u>Noise</u>	
Problem of inboard stereos and louder engines	Consideration of additional signage proposed.
Expect noise (and traffic congestion) around boat launching points.	Boatramp locations addressed in detail.
Boating noise at foreshore houses inevitable and ongoing for many decades.	Agreed.
<u>Wash and Foreshore Erosion</u>	
Erosion mainly due to high lake levels when lake closed or from king tides.	Previous erosion study is supported by this Plan..
Cundenarra Bay erosion escalated – increase in ‘erratic’ boating maneuvers in the bay.	Area inspected and reviewed in detail.
<u>Mooring areas</u>	
Effects of wind waves on moored boats can be more extreme than boat wash.	Agreed, no action necessary.
<u>Waste Disposal</u>	
Less rubbish noted on Mella Mella Bay inner beaches since 4-knot zone introduced.	Result of decreased use as a ski beach is implied.
Quote “ <i>Waste disposal remains a concern to all Australians in all environments. It is a matter of education.</i> ”	Agreed
<u>Spread of <i>Caulerpa taxifolia</i></u>	
Problem could be addressed more aggressively by responsible agencies.	Recommended responses to <i>Caulerpa</i> are covered in the Plan.
Boat washing is more likely routine if facilities located at retrieval point.	NSW Maritime supports washdown facilities at at-risk boatramps.
<u>Aquatic flora and fauna</u>	
Sydney Port Corporation took these factors into account in the last review of boating controls.	This review largely concurs with the view of Sydney Ports Corporation.
Complement roles of other Agencies	
No comments received.	Mandatory role of plan, not requiring public input.

Boating facilities and infrastructure	
Need for boat ramp accessing deep water	Agreed, plan covers options for this issue in detail
Need for more jetties to fish from, tie up to and board boats without associated degradation of the foreshore.	Investigations for a new boatramp with holding jetty are recommended for Council consideration.
Propose that regional boatramps be provided at eastern and western ends of estuary with amenity blocks, parking, fish cleaning and BBQ facilities.	Plan addresses to a limited extent based on natural constraints and availability of suitable land.
Current lake access areas should be upgraded and maintained	Usage reviewed within environmental limits.
Patterns of Vessel use, social and economic Issues	
Large proportion of multi-purpose recreational watercraft replacing inboard speedboats / skiboats. Used for a variety of activities - fishing, waterskiing, general pleasure boating.	Shift in boating usage pattern concurred with.
Importance of all passive uses, fishing and boating to tourist population. Association with tourist trade and stability of local economy.	Comments agreed with.

Following the exhibition of the Draft Boating Plan of Management in January 2005, a further 45 submissions were received by NSW Maritime. Comments raised therein have been taken into account in reviewing and finalising the Plan.

This round of submissions provided more detailed information on local issues than earlier submissions. A total of 23 submissions supported the draft with no or minimal comment on specific issues. Four (4) of these submissions were critical of the timing of the Draft Plan exhibition.

A total of nine (9) supporters of the 'status quo' commented about unenforceable noise controls and signage proposed under the Draft. NSW Maritime supports trialing this signage despite these objections.

Berringer Lake received more attention in this round of submissions, with three (3) requests for further speed zonings and/or boating or launching bans. NSW Maritime does not support these requests but will continue to intermittently monitor boating activity on Berringer Lake.

Five (5) submissions called for investigation into the possible launching ramp at the Public Reserve east of the end of Havilland Street. While this is a matter for Shoalhaven City Council to pursue, the Plan supports the provision of additional launching facilities if environmental impacts are sustainable and if they can be associated with trailer parking.

The issues of boating controls and access to Cundenarra Bay was raised by a total of fifteen (15) submissions. Environmental issues and conflicts with swimmers in Cundenarra Bay were also raised. This bay appears to be the most controversial area for boating conflicts, and accordingly the draft Plan's recommendations have been reviewed in detail, with an additional 4-knot zone to be established along the bay's southern foreshore (**Figure 2**). Public access issues to the foreshore of the bay will be dealt with by Council and the Department of Lands in a negotiation process outside the scope of this Plan.

5. Estuary-Wide Issue Discussion

Estuary-wide issues are dealt with in the following discussion. Area-specific actions which are aimed at reducing the impact of boating are detailed in the respective area management sections. These loosely follow the Terms of Reference but are grouped for convenience under the headings:

1. Safety and Equity
2. Protection of Eroding Estuary Foreshores
3. Habitat Protection
4. Provision of Infrastructure
5. Social and Economic Issues

5.1 Safety and Equity

Interactions with Passive Waterway Users

The nature of the upper reaches of Lake Conjola estuary is suited to passive uses such as canoeing, fishing, sightseeing and picnicking. There are unspoilt upper estuarine environments at the heads of the estuary's bays that are a natural attraction worthy of preservation. Excessive boat wash is a safety issue while passive waterway uses are experienced nearby.

NSW Maritime has examined the waterway area available for passive uses (**Table 5**). The following areas are suited solely for passive use by way of either current speed restrictions or by the regulations' definition of the 30 metre wide 'distance off' exclusion:

TABLE 5 Areas of Passive Use Zones - Lake Conjola & Berringer Lake

Estuary Zone	Area (hectares)
4 knot zone in Creeks	27
4 knot zones in bays	55
'Barefoot Alley' 4 knot zone	61
4 knot zone from lake entrance upstream to Roberts Point	136
30 metre 'distance off' zone around lake perimeter	75
TOTAL PASSIVE USES	354

The total area of the Conjola estuary is 660 hectares, so approximately 54% of the waterway is specifically available for passive uses. This proportional split appears adequate for the concurrent needs of both active and passive user groups based on most public submissions.

As a check, estimates of boating capacity suggest that 1.2 hectares of waterway area per vessel is required on average for passive uses. The 354 hectares of available area would have capacity for almost 300 vessels engaged in passive uses. This number of passive use vessels would never be reached under current usage patterns.

Naturally passive uses are not excluded from any parts of the estuary. NSW Maritime considers there to be appropriate opportunity for safe passive uses on the estuary under its current zonings.

Swimming in the estuary is reported to conflict with boating activity in the area of the spit immediately downstream of the entrance ramp. The waterway area below the steep sand hill has been targeted by the Plan as a *'No Boating Area'* to address safety issues. NSW Maritime supports this proposal. Conflicts between swimmers and powerboats in Cundenarra Bay are discussed in Section 6.

Vessel Speed

Speeding is the main compliance issue on the estuary and enforcement action has ensued where offences have been detected.

Speed limits have been imposed under previous boating reviews in 1997 and 2000 with the aims to protect seagrass beds and sensitive locations / passive use areas at the heads of bays. Vessel speed impact on bank erosion was also investigated in these past reviews, and is discussed in that section. Speed controls also allow for safe navigation in congested areas and in the entrance area with its shifting channels.

Accordingly, vessel speed is regulated by signage to 4 knots in a number of locations. These locations are discussed in detail in their respective management sections.

Within 30 meters from estuary shorelines (the 'distance off' zone) a generic 10 knot limit is set by regulation. This speed limit is possibly the one most often disregarded by the boating public. However it provides a zone around the estuary of total area 75 hectares for equitable passive estuary uses.

Noise

Noise from boating activity affecting foreshore residents is an issue raised by a small number of submissions. Submissions point out the natural amphitheatre effect of the steep estuary catchment. Other submissions made comment that to live on an estuary goes hand in hand with an expectation of boat noise. Some foreshore residents commented that boating noise has been a normal part of the lifestyle for many decades. This view is largely concurred with.

Comments by the public are also made about loud stereo systems aboard boats. NSW Maritime Authority officers can deal with issues of noise from vessels under the Protection of the Environment Operations (POEO) Act. To reinforce this issue with the boating public, the Authority is prepared to consider signage requesting consideration of residents when entering residential waterfront areas. Signage stating *'Low Noise Area'* will be considered for implementation by NSW Maritime at a number of localities noted on **Figure 2**.

PWC Usage

Typical issues raised in other areas with PWC use related to

- noise,
- reckless and dangerous riding, and
- environmental issues.

Boating regulations define legal operating conditions for PWC's. They are not permitted to operate irregularly within 200 meters of the shoreline where a residence is visible. They must maintain a

minimum 60 meters from persons in the water, when traveling at speeds of 10 knots or more. These regulations define the legal limits of interaction between PWC's and swimmers / surfers.

Based on submissions received, there have been isolated incidents with PWC's interfering with swimmers in the entrance area. However these incidents are covered by current legislation. There would not appear to be a need for any further controls placed on PWC use on the estuary.

5.2 Protection of Eroding Estuary Foreshores

The causes of bank erosion can include flooding, wind-wave action, human and cattle activities, bank susceptibility, vessel traffic and the size, speed and distance-off of vessels. The following overview extracted from the Authority's Tweed River Plan includes a number of considerations relating to bank erosion that were common in a wide range of studies. Those aspects appropriate to Lake Conjola are:

- Erosion from vessel wake contributes more to bank erosion when the structure and composition of banks are considered to have high erosion potential e.g. loose soil composition; and areas with no natural protection such as trees.
- When vessels plane, the wake waves produced are lower and have less energy than those of semi-planing or displacement hulled vessels.
- Larger, displacement and/or semi-planing vessels operating at speeds between 6 and 20 knots produce waves with the highest potential to erode banks.
- Water-skiing vessels and PWCs, to be effective, operate best while planing.
- Water-skiing vessels produce a larger and more intense wake when conducting power turns e.g. when returning to pick-up fallen skiers.
- The further a craft is from shore, the less impact its waves will have.

Boat Wash

It is generally accepted that it is not possible to quantify with any certainty the extent to which boat wash contributes to bank erosion, due to the confounding effects of wind waves, elevated lake levels during closure and flood damage. The 1997 Lake Conjola Boating Review by the Sydney Ports Corporation provided a technical assessment of the impacts of vessel speed / boat wash combinations on erodible shorelines. Wave energy from boat wash was compared to the average wind wave climate using standard wave energy calculations. Conservative assumptions on boat use frequency were made in order to produce an estimate of wave energies from boat wake. The assumptions used are consistent with similar technical studies on other South Coast estuaries, and although estimates are by their nature not exact, they are supported by NSW Maritime as the best available.

The management recommendations by Sydney Ports Corporation, which NSW Maritime supports, were that impacts of boat wash on the Conjola estuary were largely considered minimal in the main lake basin where there are rocky shores and long fetch distances for wind waves to develop.

Most recommendations for speed controls arising from the 1997 study were for 8 knot zones in a number of locations where the shoreline was determined to be potentially erodible. For the eroding banks of Conjola Creek, boat wash is a significant issue, the creek comprising low-strength silts and is not subject to wind waves. Consequently on Conjola Creek and at Yooralla Bay, both areas were recommended for 4-knot zones, which produces significantly less wash (and hence much less wave

energy) than an 8 knot speed. However the subsequent 2000 review determined the existing 4-knot zone in the head of Yooralla Bay to provide reasonable protection. Additional recommendations for signage requiring 'no irregular navigation or riding' to manage boat wash inside the entrance of Yooralla Bay in the 2000 review were considered impractical and have not been followed up.

The area where boat wash appears to be an issue, albeit very localised, is at the boat launching point on Cundenarrah Bay. Here localised bank erosion and undercutting would appear to be exacerbated by powerboat landings onto the bank. Public submissions suggest that erosion along the bay's southern foreshore is an ongoing issue, exacerbated by boats passing by close to the shoreline. This area is discussed further in the area-specific management section for Cundenarrah Bay.

Wake Boarding

Wake boarding is becoming more and more popular on Lake Conjola as the sport grows. Current evidence from studies undertaken is inconclusive as to whether the impacts of wakeboarding on foreshore erosion has a greater impact than that of water skiing.

The plan recommends that NSW Maritime review the outcomes of relevant wakeboarding studies as they are published to determine the need for any appropriate controls.

5.3 Habitat Protection

Sensitive Areas

Sensitive environmental areas of the estuary are the intertidal flats and adjoining estuarine wetlands around Chinamans, Princess and Conjola Islands. Threatened shorebird nesting (see discussion below) is occurring seasonally on some of these islands (L Shields Parks and Wildlife Division Department of Environment and Conservation pers. comm.) The sensitivity of these areas related to potential boating impacts is currently adequately addressed by the 4-knot zone along this area.

The current 4-knot zones established in the heads of embayments will have benefits to the environmental characteristics of these parts of the estuary. There are no environmental attributes that warrant extension of 4-knot zones beyond their current location. No extension of these 4-knot areas is proposed.

Potential Shorebird Impacts

Boating activity is considered to not interfere with bird foraging activities. If disturbed, birds will simply relocate to a more convenient or quieter part of the shoreline. Many of the sightings of threatened species of birds described earlier in this review would reflect one-off visits for foraging.

Boating impacts on management of migratory and threatened birds on this estuary would be confined to repeated noise in localities with the potential to interfere with breeding activity. The localities of estuarine breeding areas are reasonably well understood, based on suitable habitat requirements. The possibility for potential boating conflicts with threatened bird species are described in **Table 6** below.

TABLE 6 Potential boating impacts on threatened shorebirds

Common Name	Breeding Location	Comment re Boating
Osprey	High in dead trees or dead crowns of trees (mostly in National Park within 1 km of the coast).	Interference with bird activity not likely.
Sooty Oystercatcher	Offshore islands only	Foraging activity on rocky coastline and in estuary. Interference with breeding activity not likely.
Pied Oystercatcher	Lower estuary islands and Conjola Entrance Spit.	Foraging in intertidal zone. Interference with breeding activity not likely within 4-knot zones.
Hooded Plover	Conjola Entrance Spit	Human and dog / fox impacts are the greatest current threats.
Little Tern	Conjola Entrance Spit	Human and dog / fox impacts are the greatest current threats.
Australasian Bittern	Freshwater wetlands with dense vegetation	No breeding habitat near estuary.
Black Bittern	Dense riparian vegetation such as Swamp She-oaks and mangroves overhanging the water	Breeding habitat near estuary limited. No boating impacts on breeding birds expected.

The most significant areas at Lake Conjola for threatened bird species' breeding activity are at the entrance sand spit and on islands within the lake near the entrance. The sand spit is one of the major breeding sites on the South Coast for Hooded Plover and Little Tern. Little Tern breed locally from October to March, while Hooded Plover may be present in breeding pairs from August / September through to March. The lake's islands are valuable habitat in providing safe refuge from foxes, and contributed to two fledgling Pied Oystercatchers from two resident pairs in the 2003/04 breeding season. Pied Oystercatcher breeding season can extend from August to January.

There have been recorded losses of both eggs and fledglings at the Entrance Spit to foxes and storm surge in the 2003/04 breeding season. Attempts at breeding at these sensitive locations does not seem to be impacted by boating activity. The existing 4-knot zone encompasses the entrance spit along the extent of breeding areas. This is considered an appropriate level of protection at this site. However, should breeding be more successful in future seasons, there is some doubt that boating activity associated with beach visits is totally appropriate.

If it were to prove necessary in future to provide more protection to shorebird breeding pairs at this location, the proposed 'no boating area' at the sand dune (proposed at the western end of the spit) may need to be temporarily extended over the breeding season further along the back-beach area. This would depend on the exact locations of nests on the spit and the success of fences to restrict pedestrian activity.

Boating Impacts on Seagrass Beds

Seagrass beds are important estuarine habitats. They provide habitat diversity, stabilise the sediments and provide shelter for juveniles of many fish species. As well as providing protection for small fish, these beds contain high densities of invertebrate animals such as shrimps, prawns, crabs and worms, on which fish feed. Major seagrass habitat areas are protected by the existing 4-knot zone upstream of Kidgee Point.

There are four potential sources of boating damage to seagrass beds.

Mooring Damage

Moorings can cause scouring and thus loss of seagrass beds. Chain drag around a mooring can kill the adjacent seagrass. Such problems are unlikely to occur in this estuary.

Groundings

When boats are grounded on seagrass beds on low tide, they can crush the plants and animals in the seagrass. As most boats used in the lake are small, this is not an extensive problem.

Anchoring

Anchors can damage the plants and dig them out when being retrieved. This is a limited problem on the estuary.

Propeller Damage

Potentially the biggest boating problem for seagrass on Lake Conjola is damage from propellers. Studies have found that propeller scars may take several years to recover, potentially because damage recurs on a regular basis. Furthermore, where there are high currents, propeller damage can initiate erosion and the permanent loss of seagrass beds.

The area in the estuary where propeller damage to seagrass is occurring regularly is in the creek at the Aney Street boat launching ramp. Healthy beds of *Zostera* seagrass are located on either side of the launching area, and further into the shallow creek. These areas provide potential quality fish breeding environments.

NSW Maritime recommends to Council that alternative arrangements for boat launching in this section of the estuary be investigated urgently, with a view to closure of this access point in the short- to medium- term.

Caulerpa Taxifolia (Invasive Seaweed)

NSW Department of Primary Industries has listed *Caulerpa* as a noxious marine vegetation. All State agencies and Shoalhaven City Council recognise the invasion of *Caulerpa* seaweed as a major threat to estuary habitat biodiversity. All efforts should be made to prevent its spread to other unaffected estuaries.

NSW Primary Industries' February 2004 mapping of Conjola and Berringer Lakes shows weed infestation to cover most of the estuary's shallow areas along the foreshores. The following boat launching points were inspected in early August 2004 and are confirmed to be affected :

- **Cundenarra Bay** (informal launching area) – *Caulerpa* at sand launching area in very shallow water almost to water's edge. A small remnant patch of *Zostera* exists at the launch site.
- **Yooralla Bay** (both Sandra Street and Valley Drive ramps) – *Caulerpa* at both these sites is in deeper water than at Cundenarra Bay.
- **Prior Street**, with *Caulerpa* at sand launching area and immediate surrounds.
- **Killarney**, inspected from Prior Street, appears to be similarly impacted.
- **Conjola Lakeside Van Park** (private ramp), inspected from Norman Street, appears to be similarly impacted.
- **Norman Street** , *Caulerpa* clear of sand launching area in winter 2004 but is growing immediately adjacent to and on both sides of the launching area in very shallow water.
- **Berringer Crescent, Berringer Lake** has *Caulerpa* at sand launching area in shallow water and some remnant patches of *Zostera*.

Boat retrieval at shallow infected areas has major potential for spreading the weed by entanglement on the boat propeller or on the trailer. The presence of *Caulerpa* at a large number of shallow boat retrieval points suggests that an urgent review of washdown facilities is required as part of this plan. NSW Maritime considers that washdown areas need to be conveniently located at all infected boat launching sites, to give maximum opportunity for combating the spread of invasive weed.

Of the above affected launching ramps NSW Maritime recommends that the following areas, which have inadequate washdown facilities, be considered jointly by Council and NSW Department of Primary Industries for action as follows:

- **Cundenarra Bay** (informal launching area) has no washdown facility. As the nearest facility is at West Conjola, this area should have a facility installed if public use for boat launching is to continue.
- **Sandra / Havilland Street** has no washdown facility. This area is remote from other washdown areas and requires such a facility.
- **Prior Street** similarly has no washdown facility and requires such a facility due to its remoteness.
- **Norman Street** has no washdown area and should have a facility installed or alternatively be closed.
- **Berringer Crescent, Berringer Lake** has no washdown area and should have a facility installed.

Overall the level of *Caulerpa* information signage is suitable for its purpose. In specific locations such as West Conjola on the main road entering the area, clearer signage directing users to the nearest washdown facility would add value to the *Caulerpa* control strategy.

Incidents of missing or vandalised hoses and taps are difficult to manage and require good reporting mechanisms and response times. A number of logical additional washdown facilities are proposed. Detailed recommendations to Council lists these proposals in the executive summary of this document.

5.4 Provision of Boating Infrastructure

Review of Boat Launching Facilities

The lake has a number of boat launching ramps (both formal and informal), located around the estuary. Their locations are depicted on **Figure 1** along with current boating controls. These facilities were inspected over the period May to September 2004 and are described in **Table 7** on the following pages.

Under this Plan, NSW Maritime makes recommendations for upgrading or closure of boat launching facilities for Shoalhaven City Council's consideration. Upon approach from Council, NSW Maritime will be available to further discuss these issues and offers assistance in formulating a WADAMP application for 50% grant funding of proposed improvements or additions to boating infrastructure under the plan.

TABLE 7 Review of Current Boat Launching Facilities

Description	Condition	Parking	Environmental	Washdown Facilities	Main Issues
Fishermans Paradise					
Excellent concrete ramp suited for most sizes of vessel. The minor inconvenience for the lake user who may choose to launch here is a long trip down Conjola Creek, wholly within a 4-knot zone, before reaching the lake's unrestricted waters.	Excellent. Scour on both sides of the ramp itself could use minor repairs.	Sealed parking area adequate.	Nil.	Tap and hose in parking bay at exit of parking area. Improved drainage required on road shoulder downslope to prevent long-term road pavement damage.	Nil
Lake Conjola West (Valley Drive)					
A small ramp, part bitumen sealed and part sand / gravel. Location at the head of Yooralla Bay in reserve, adjoining quiet residential area on Valley Drive. Holding jetty 16m long with 5m long T-head also provides access for recreational fishing.	Appropriate for use and location.	Very limited formal parking. Traffic conflicts in cul-de-sac head. Need to monitor informal parking on slope in reserve. Eventual damage to reserve could require bollards to protect grass cover. Usage to date sustainable.	Heavy <i>Caulerpa</i> infestation in this part of the estuary.	Tap and hose in cul-de-sac head. Directional signage on main road requires clarification.	Limited parking will restrict usage with no opportunities for expansion.

Description	Condition	Parking	Environmental	Washdown Facilities	Main Issues
Cundenarrah Bay (off Lakeside Drive)					
An informal launching point for small craft is located on privately owned (Aboriginal) land (previously Crown Reserve subject to a Native Title land claim granted by the Minister for Lands). It is accessed from a gravel track off Lakeside Drive.	Boat access shallow but reasonable, access track degraded. Foreshore erosion evident, very localised to launching area.	Degraded bush area suited to 2 or 3 vehicles. Vehicle access track degraded, requires scour protection and gravelling.	Erosion of track producing fine sand and some clay material, and some localised impact on the bay during heavy rainfall is likely. Some bank undercutting below She-oaks. Foreshore nearby mostly sandstone shelf. Heavy <i>Caulerpa</i> infestation in this part of the estuary in very shallow water.	None provided. Existing general NSW DPI <i>Caulerpa</i> signage insufficient. The nearest (West Conjola) washdown point is not convenient for users of this launch point. Additional washdown facility required here.	Ineffective erosion controls on access track. Retention as a launching site would require necessary maintenance to access track, stabilised parking area and a local washdown facility. Continued public use is understood to be under negotiation. Washdown facilities are required if access is to be continued.
Sandra (Havilland) Street (Yooralla Bay)					
Twin gravel tracks at Sandra Street (off Havilland Street) provide access to a short concrete ramp. A sandy holding beach is located nearby.	Adequate. Eastern track very steep, requires drainage and gravelling.	Limited opportunities for roadside parking will limit ramp usage.	Heavy <i>Caulerpa</i> infestation in this part of the estuary.	None provided. Suggest washdown area should be provided.	Track access and lack of washdown facilities both require attention. Potential new launching ramp and trailer parking area in the reserve to the east of Havilland Street warrants consideration.

Description	Condition	Parking	Environmental	Washdown Facilities	Main Issues
Prior Street					
Access along a reserve to sound gravel / sand ramp. Confusing signage associated with previous ramp closure requires removal.	Some local scour of access track in steep section immediately off sealed road.	On street only.	Sand build-up caused by log groyne will be preventing sand drift towards Killarney. Insignificant erosion downdrift was noted. Minor erosion upstream of ramp has been managed by placement of bricks and rubble to stabilise undercutting below She-oaks. Heavy <i>Caulerpa</i> infestation in this part of the estuary.	None provided. Suggest washdown area should be provided.	Track access and lack of washdown facilities both require attention. Removal of signage previously closing this ramp.
Killarney (private)					
Private concrete ramp with gravel approaches. Long sandy holding beach / ski beach and swimming area.	Private facility. Rough gravel entrance and approach road.	Paid entry and ample parking on private land.	Heavy <i>Caulerpa</i> infestation in this part of the estuary.	Adequate – tap and hose provided on sealed lay-by on access road.	Private ownership and access which could be closed. This would make unmanageable demands on other existing launching facilities for large boats.

Description	Condition	Parking	Environmental	Washdown Facilities	Main Issues
Conjola Lakeside Van					
Park (private) Old short concrete ramp provides good access to lake for park users. A newer concrete ramp in excellent condition cannot be used due to potential seagrass impacts.	Adequate.	Used by park patrons only, no parking necessary.	Heavy <i>Caulerpa</i> infestation in this part of the estuary.	A hose adjacent to the launching ramp will shortly be relocated at the rear of the park to manage noise issues associated with motor flushing. This may not encourage wash-down prior to leaving the area. However a large number of regular users store boats at the caravan park, so transfer of weed to other estuaries is less likely.	Nil.
Norman Street					
Informal access to lake via sandy foreshore at the end of Norman Street,. Shallow water would limit use to small boats.	Poor - 0.3m drop-off from pavement to scoured sandy beach would suit four-wheel drive use only.	Limited parking along road verge.	Heavy <i>Caulerpa</i> infestation in this part of the estuary. Water very shallow at launch site.	None evident, NSW Maritime would recommend provision of tap and hose nearby.	No washdown, limited launching access due to scour. NSW Maritime recommends that Council review use and either upgrade to a sealed access and concrete ramp and provide washdown facility or close off to public use if funding is unavailable.

Description	Condition	Parking	Environmental	Washdown Facilities	Main Issues
Aney Street					
Track through low she-oak forest gives access to gravel launching area on shallow tidal creek. Popular all-year launching for local small tinny use. Also utilised daily in peak season by nearby caravan park users.	Ramp itself is adequate for usage. However access track and parking is over flat, boggy degraded soils that will continue to destabilise in wet weather.	Limited in wet weather by poor drainage.	Damage to <i>Zostera</i> seagrass beds in creek either side of launching area is noted. Seagrass also likely at shallow creek entrance to lake. Vehicle damage to She-oak forest and wetland fringe by soil compaction and trackside parking. No mapped <i>Caulerpa</i> infestation in this part of the estuary at present.	None nearby.	Environmental degradation (marine and terrestrial) makes continued use unsustainable. NSW Maritime recommends that Council consider closure.

Description	Condition	Parking	Environmental	Washdown Facilities	Main Issues
Entrance Boat Ramp					
Council facility provides boat launching for small to medium vessels. Concrete ramp with bitumen approach road accessed through Lake Conjola Entrance Tourist Park. Public toilets located here.	Ramp and approaches good.	Informal parking on irregular gravel carpark area does not lend to effective trailer parking. Vehicles parking on grass beyond the gravel carpark were evident at time of inspection. Could use further bollards to limit vehicle access to grassed recreation areas.	No <i>Caulerpa</i> infestation in this part of the estuary.	None provided, none necessary.	Removed from main lake basin by shallow flood-tide delta and long 4-knot zone. Shallow water limits use for larger vessels. Sand shoals will continue to move around. Confusion at Tourist Park entrance for non-locals. Directional signage to public ramp could be improved. NSW Maritime recommends that Council consider sealing the gravel carpark and parking arrangements formalised for more effective vehicle and trailer parking and to prevent vehicles parking on grass. Opportunity exists for landscaping and grassed trailer parking spaces.
Cunjurong Point					
Concrete ramp on northern shore of Lake Conjola located near entrance.	At the time of inspection, marine sand build-up limits use to small to medium vessels at higher tides.	Bitumen roadside parking with overflow parking along gravel access road if needed.	No <i>Caulerpa</i> infestation in this part of the estuary.	None provided, none necessary.	Ramp mostly unusable at medium tides or lower. Boat turning circle area requires signage to prevent illicit parking.

Description	Condition	Parking	Environmental	Washdown Facilities	Main Issues
Berringer Lake					
Informal soft access and landing area at end of Berringer Crescent provides the only public launching point into Berringer Lake. Multiple launch points used as holding and ski beaches. Some conflict of usage expected at peak times.	Reasonable conditions for launching, beach stable. Approach tracks require better definition. Maneuverability limited amongst trees. Long reversing required.	Parking amongst trees for up to six vehicles. Overflow parking along roadway available.	Heavy <i>Caulerpa</i> infestation in this part of the estuary. Sand launching area shallow. Small patches of healthy <i>Zostera</i> seagrass in shallow water adjacent launching areas.	None provided - nearest facilities on Inyadda Drive out of Manyana. Local washdown area required considering level of existing usage and shallow water.	Standard of vehicle access and tight maneuvering around trees unacceptable, given the level of use at this location. NSW Maritime recommends that Council consider sensitive improvements to the launching and vehicle maneuvering area, to limit launching to a single formalised ramp and to provide a turn-around area. NSW Maritime also recommends that washdown facilities be installed adjacent to this launching site to encourage usage.

Caravan Parks

No description of boating infrastructure in the area would be complete without a mention of the four lake-frontage caravan parks that provide holiday accommodation to visitors to the area. These provide a varying but significant level of boating-related facilities that assist with meeting boating demands in peak periods. The issues relevant to boating infrastructure and management are as follows:

Conjola Lakeside Van Park is largely self-contained as far as boating facilities are concerned. That is, it provides boat storage, a concrete launching ramp and incorporates a washdown facility on site. This relieves somewhat the load that would otherwise be placed on public facilities around the estuary. Park users generally do not moor their boats overnight as launching and retrieval is convenient within the park.

Patrons of Lake Conjola Caravan Park (Lake Conjola Deepwater Resort) launch boats generally from the Norman Street or Aney Street ramps (see over for discussion of launching ramp sites). Overnight moorings are available along the park's lake frontage and in the creek behind the park. This means that most park users would launch (and later retrieve) their boats only once during a stay. A plan to upgrade the park's lake frontage will allow for improved mooring, canoe launching and recreational access.

Island View Caravan Park has creek frontage but no launching facility. Park users would commonly launch their vessels at the Aney Street site located at the park entrance. Most users of this park would retrieve and launch their boat daily, despite moorings in the creek being available. Overnight security is the biggest concern. The park has a boat wash facility near the park entrance.

Lake Conjola Entrance Tourist Park has lake frontage but no mooring or launching access. Boat owners are directed to the various launching ramps in town, or in the case of large vessels, to Killarney. A bitumen public road through the park accesses the Council Entrance Boat Ramp, a graveled parking area and walking access beyond to the beach and lake swimming areas along Conjola Beach spit.

New Boat Launching Facilities

Existing boat launching facilities have been detailed in the previous section and various issues have been highlighted. Perhaps the most evident issue that was also raised in the Lake Conjola Estuary Management Plan is a lack of public boatramp facilities accessing deep water, suited to the majority of boats.

The Lake Conjola Estuary Management Plan makes mention of a potential new boat ramp on Reserve for Public Recreation east of Havilland Street, specifically on Part Lot 7002 DP 1075136. This land has an area of about 3.2 hectares and a water frontage of about 220 meters. Shoalhaven city Council has the responsibility of determining the suitability of this parcel for boat launching and trailer parking, consistent with its environmental values and potential impacts.

NSW Maritime would consider a secondary 'boating facilities' issue to be the lack of boatramp car and trailer parking at most locations. This is evident at West Conjola, which is serviced with two ramps,

both of which would be difficult to park at or near in peak holiday periods. The Entrance ramp has excellent facilities but is too far to the eastern end of the estuary to suit many lake users. It is also inconveniently located with regard to navigation to other areas with its intervening sand shoals. The numerous smaller facilities around Lake Conjola village have little or no parking and generally poor vehicular access.

NSW Maritime's recommendation to Council that the popular Aney Street ramp be closed would suggest that a new centrally located replacement facility would, quite reasonably, be demanded by the boating public. In particular a new facility should be ideally within or close to Lake Conjola village, in order to service the focus of boating activity derived from this residential community and the patrons of the four caravan parks situated east of Milham Street. It should also ideally provide for deepwater access. This issue is also one for Shoalhaven City Council to determine.

Navigation Aids

Among the NSW Maritime Authority's prime statutory responsibilities is the achievement of the highest possible standards for the safety of all users of NSW navigable waters. A major contributor in meeting this responsibility is the provision of aids to navigation on each of the state's navigable waters. Navaids as they are commonly known, are the road signs and traffic lights of waterways. They include buoys and beacons for marking channels, signage announcing special conditions and restrictions, and navigational lighting marking dangerous water and safe boating zones.

The Authority uses both the technical expertise and experience of its on-water staff as well as data gleaned from its management systems and feedback from the community when reviewing navaid requirements. The existing configuration on the Conjola Estuary has evolved from monitoring both boating activity, changing channel conditions, and feedback from the boating community.

5.5 Social and Economic Issues

South Coast villages such as Lake Conjola have a heavy reliance on tourism for their livelihood. There is no question that tourist visitors holiday at Lake Conjola because of the beaches and waterways. Clearly from our discussion with tourist accommodation proprietors, and from the broad coverage of submissions received, a majority of the visitors to Lake Conjola are boating enthusiasts. NSW Maritime sees it as essential to consider the social and economic impact of the Plan on boating controls.

It is evident that the estuary supports a number of waterway activities. With the all-purpose watercraft available today, boaters can enjoy fishing, water skiing, sightseeing etc from the one vessel on the same day.

The economy benefits from tourism by a number of possible outlets:

- Accommodation
- Grocery, take-away food shops and restaurants
- Fuel suppliers and mechanical repairs
- Bait and fishing equipment outlets
- Sports and hardware stores
- Clubs

The economic benefits of boating activity are difficult to allocate to specific local areas. For instance not all the above commercial outlets are available from within the villages of Conjola, Fishermans Paradise, Manyana and Bendalong. However public submissions notably provide strong support for the activity's importance to the local economy. The cumulative benefits of boating pursuits to the regional economy is undoubtedly also very significant.

NSW Maritime recognises these relevant issues and aims to maintain sustainable boating activity in all its forms on Lake Conjola for future generations.

6. Area-Specific Actions

6.1 Conjola Entrance Area

Main issues in this reach are the shifting navigation channels in response to incoming marine sand. This is a natural process for open estuaries and could be expected to continue. This reach contains a boatramp at Cunjurong Point, which is rendered almost unusable at present due to shoaling. On the southern shore, the Entrance Boatramp serves lower estuary users.

NSW Maritime recognises the risks associated with navigation in this area by the current appropriate 4-knot zone. NSW Maritime's strategy is to maintain the existing zoning.

6.2 Berringer Lake

Berringer Lake is a shallow basin of approximate area 77 hectares. It forms the sole practical waterway access for boating activities to residents of Manyana, Cunjurong Point and Bendalong.

The Berringer Crescent informal boat launching point is in need of upgrading to meet anticipated demands from these areas. Loss of remnant foreshore vegetation should be minimized with sensitive design. Boat access requires redesign to replace the multiple random accesses and incorporate a single formalised launching and retrieval point. A concrete ramp would considerably decrease the risk of *Caulerpa* entanglement on props and trailers.

Boating activity on Berringer Lake is sustainable despite its shallowness and heavy infestation of *Caulerpa*. However it requires the installation of local washdown facilities as a priority.

Entry to Berringer from the entrance area is via a narrow marked channel which is extremely shallow. The existing markers are appropriate and require no amendments.

East Arm and West Arm

Both arms of the upper part of Berringer Lake have been zoned with a 4-knot limit to reflect their environmental sensitivity. This suits the area's passive uses. NSW Maritime's strategy is to maintain the existing zoning.

6.3 Lake Conjola Village Reach

This reach extends from the eastern end of Chinamans Island to the main lake basin at Roberts Point. It is characterised by a narrow navigation channel and shallow marine sands. The flood-tide delta drops into the main basin at the upstream extremity of this reach.

Most of the southern foreshore is under rock protection. Tidal flows are relatively high and westerly winds can generate large wind waves. This reach is mostly unaffected by *Caulerpa*, apparently due mainly to strong sediment movement. However NSW DPI maps indicate a sparse cover spreading into the more protected areas and increasing in density from Roberts Point to Leaning Oak Point.

This reach contain a focus of general boating activity, with five caravan parks generating high peak season boating use. It contains three launching ramps, one private formal ramp at a caravan park and two informal access points. NSW Maritime recommends to Council that investigations into a deep water ramp in this reach be initiated.

This reach incorporates Killarney, a popular launching point and ski beach for waterskiers. Although a privately-owned facility, NSW Maritime recognises the long-term importance of this area to boating activities on the lake. It is essential that owners of this facility be encouraged to participate in waterway planning issues on the estuary. Informal signage on water-ski etiquette and regulations at this site is in need of renewal. Its presence adds to the education of waterway users that utilise this area.

NSW Maritime considers the 4-knot zone from the lake entrance extending upstream to Roberts Point to be in need of review. This reach is extremely long, extending some 3.5 kilometres or 2 nautical miles. A journey from the spit to Roberts Point, traveling strictly at 4 knots would take 30 minutes. The 2000 Boating Review proposed a relaxation of the 4-knot limit upstream from Leaning Oak Point but did not mention seasonal changes.

NSW Maritime Authority Boating Officers have observed repeated breaches of the 4-knot limit in this area. NSW Maritime would consider a relaxation to an 8-knot limit over part of this area in non-peak periods to be a reasonable compromise. However there are a number of constraints which must be taken into account.

- It is essential that the 4-knot limit be retained from the eastern tip of Chinamans Island to the western end of Conjola Island, for the protection of threatened and migratory shorebirds. These birds are present during the summer tourist peak.
- The lake entrance upstream to Chinamans Island should be retained as a permanent 4-knot zone due to the periodic rapid shifts in the navigation channel from marine sand ingress. Safe navigation would be compromised, particularly for those unfamiliar with the estuary's latest channel configuration, under anything above a 4-knot limit. NSW Maritime's strategy is to maintain the existing zoning in this part of the reach.

NSW Maritime proposes the area west of Norman Street upstream to Roberts Point as suited to an 8-knot zone outside peak tourist periods. Although this area is shallow due to marine sand, it does not tend to shift in configuration as rapidly as the downstream reach. It would retain its current 4-knot limit at peak usage times. NSW Maritime proposes that this 8-knot zone be introduced on trial for the period 1st May to 31 November 2005. Should boating safety not be compromised, subject to assessment by the Authority, this would become either a permanent or a seasonal arrangement.

6.4 Conjola Lake Basin

The Plan defines the main lake basin as extending from Roberts Point upstream to Kidgee Point. It contains the deepest water in the estuary and comprises mainly estuarine muds and sandy muds. The edges of the basin suit the colonization of *Caulerpa* which covers most of the shallow water in non-rocky foreshore areas in a dense cover.

The study finds that existing controls in the lake basin are achieving the necessary level of management and control.

The main issues associated with the basin are considered to be within its embayments as follows:

Ironbark Bay

There are no known issues with this location.

Yooralla Bay

Yooralla Bay contains a dense cover of *Caulerpa* in the shallow inner bay area. The majority of the upper bay foreshore supports residential development, and a 4-knot zone exists in this part of the bay. NSW Maritime's strategy is to maintain the existing zoning and to enforce the 4-knot limit.

Two boat launching points service West Conjola boat users, one with a useful holding jetty which provides recreational fishers with access to slightly deeper water in the bay.

Changes proposed under the Plan are to improve access to the Sandra Street boatramp and provide local washdown facilities.

Cundenarrah Bay

This shallow bay contains a short residential area along its southern shore near the bay entrance. Noise issues at these residences are related to boating use and on-board stereo systems. A 4-knot zone at its head provides protection to environmental values. NSW Maritime finds reasons put forward in submissions for an extension of the 4-knot zone across the whole bay to be outweighed by its use as a quality sheltered waterskiing area. However submissions to NSW Maritime have documented in detail conflicts between powerboats and swimmers or shore-based fishers along the southern foreshore. There is also documented evidence of erosion along this foreshore in a number of locations. NSW Maritime's strategy is to maintain the existing zoning and to introduce a new 4-knot limit along the southern foreshore for reasons of safety and environmental protection.

In response to noise issues at the residential area, the Authority proposes to investigate the installation of signage designating the bay a '*low noise area*' and requesting that boat users respect the rights of residents when entering this bay.

The bay contains an informal boat launching site which NSW Maritime considers to not be sustainable in its present form due to parking, access and localised bank and foreshore erosion issues. Shoalhaven City Council is currently in negotiation with relevant stakeholders in an effort to resolve many of these issues.

Bangalow Bay

This bay wholly comprises a 4-knot zone for protection of its natural environment. The bay is short (250 meters) and any reduction in the 4-knot zone would prove to be ineffectual. NSW Maritime's strategy is to maintain the existing zoning and to enforce the 4-knot limit.

Mella Mella Bay

Mella Mella Bay is the largest bay on the eastern shore of the lake basin, and is surrounded by Conjola National Park. The head of Mella Mella Bay is zoned a 4-knot zone in recognition of environmental values and for passive uses.

The upper bay area contains three sandy beaches, one of which is still used as a ski beach. The beach at the head of the bay is unsuited for skiing access as it is situated well inside the 4-knot zone. A second beach just inside the 4-knot zone is used for skiing although this usage is believed to have reduced considerably since the zone was introduced.

The 2000 boating Review by the Sydney Ports Corporation examined the need for further boating controls in Mella Mella Bay. Its findings are concurred with, namely that no other areas of the bay require boating controls to manage boat wash.

The southern arm of Mella Mella Bay is reported to be an area of suitable habitat for threatened bird species, although site inspection suggests that habitat is not suited to locally listed threatened species. The disparity may be due to apparent clearing of riparian vegetation at the head of the bay within the National Park. The head of the northern arm has far more environmental values, and is adequately protected by the current 4-knot area. There are no threatened species or other environmental issues that would require an extension of the 4-knot zone further out across the bay. NSW Maritime's strategy is to maintain the existing zoning in both arms of Mella Mella Bay and to enforce the 4-knot limit.

Adder Bay

There are no known issues with this location.

Picnic Bay

There are no known issues with this location.

6.5 'Barefoot Alley'

This area was effectively closed to skiing as a result of the last boating review. This closure was effected by introduction of a 4-knot zone from the extremity of Kidgee Point extending upstream to the estuary's tidal limits. A series of port marks now define shallow seagrass beds which provide a key fish habitat area on the estuary.

The aims of this 4-knot zone were to better manage shoreline erosion at the creek entrance spit and on grazing land on the northern foreshore, to manage seagrass beds at Conjola Creek entrance spit and to avoid shallow water on the inside of the bend north of Kidgee Point. This will protect the estuary's environmental attributes including healthy seagrass beds, has safety benefits, and reduces boat wash at the turning area near the tip of the creek entrance spit, which threatened to breakthrough. NSW Maritime's strategy is to maintain the existing zoning and to enforce the 4-knot limit.

6.6 Conjola Creek

At Fishermans Paradise, the boatramp that provides access to the lake via the creek is an excellent facility. This area is part of the 4-knot zone discussed above. Lake access is via a long 4-knot zone which would provide some frustration to regular users.

This 4-knot zone has been reviewed, however NSW Maritime finds no opportunity to rezone this reach due to a combination of hazards associated with boat wash and the narrow boating channel. For instance, if unrestricted by speed zoning, boating activity would still be limited to less than 10 knots, as the 30m 'distance off' regulation cannot be met. This speed would amplify boat wash in most vessels to a far more damaging level. Hence alternatives such as a No Wash Zone would be unworkable. Further, boating at speed would compromise safety at a number of blind bends in the creek.

Conjola Creek suffers from bank erosion, with the primary causes likely to be flooding and boat wash. Excessive boat wash could overtop the spit that divides the creek from the remainder of the estuary. Speeding vessels close to the bank would exacerbate existing bank undercutting and could eventually destabilise the spit. NSW Maritime's strategy is to maintain the existing zoning and to enforce the 4-knot limit.

7. Plan Review

Distribution of the Plan for the purpose of consultation has been undertaken by the NSW Maritime Authority as follows:

LOCAL

- Shoalhaven City Council outlets
- Southern Shoalhaven Natural Resource & Floodplain Management Committee
- Jerrinja Local Aboriginal Land Council
- Advertisement of availability for comment in local newspapers
- Download from NSW Maritime Authority Website www.maritime.nsw.gov.au

STATE AGENCIES

- Department of Infrastructure Planning and Natural Resources
- NSW Dept of Primary Industries
- Parks and Wildlife Division, Department of Environment and Conservation

The Lake Conjola Boating Plan of Management will be subject to review on a five yearly basis, both internally by NSW Maritime Authority and with reference to Shoalhaven City Council and the Southern Shoalhaven Natural Resource & Floodplain Management Committee. If significant redrafting of the Plan and resultant waterway restrictions were to occur, public comment would be sought at that time.

8. References

- Healthy Rivers Commission **Independent Inquiry into Coastal Lakes** (2000)
- Keating, J. & Jarman, M. **South Coast Shorebird Recovery Program Breeding Season 2003/04** Report prepared by the then NSW National Parks & Wildlife Service
- NSW Dept of Primary Industries **Website** www.fisheries.nsw.gov.au
- NSW Dept of Primary Industries **NSW Control Plan for the Noxious Marine Weed *Caulerpa taxifolia* in NSW Waters** (February 2004)
- NSW Dept of Primary Industries **NSW Fisheries Policy and Guidelines** (1999)
- Shoalhaven City Council **Lake Conjola Estuary Management Plan**
- Sydney Ports Corporation **Recreational Boating Controls on Lake Conjola** (1997 and 2000 papers)
- West R. J., *et al* **An Estuarine Inventory for New South Wales, Australia.** Report prepared for NSW Department of Agriculture, Division of Fisheries NSW. Published in Fisheries Bulletin No. 1 (1985)
- NSW Maritime Authority **Corindi River Boating Plan of Management** (November 2002)
- NSW Maritime Authority **Tweed Estuary Boating Plan of Management** (Draft August 2004)
- NSW Maritime Authority **Website** www.maritime.nsw.gov.au

Figure 4 ***Caulerpa taxifolia***

(Photograph courtesy of NSW Dept of Primary Industries website)

