

Batemans Bay & Clyde River Estuary Management Plan *FINAL REPORT*

Prepared For: Eurobodalla Shire Council

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Synopsis:	<p>This document presents the Estuary Management Plan (EMP) for Batemans Bay and the Clyde River. The EMP is a “working document” that provides a program of strategic actions to assist nominated parties in managing the waterways, foreshores and catchments of this estuary. Management aims for this estuary are to, over the long-term, achieve the “vision” for the estuary, which encapsulates community values surrounding the estuary.</p>	

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FOREWARD

The estuaries of NSW provide a priceless natural resource. Collectively, they are immensely valuable from an ecological, social and economic perspective.

NSW has over 130 estuaries that vary in size from small coastal creeks and lagoons to large lakes and rivers. Estuaries contain diverse ecosystems that form the foundation of the coastal food chain. They provide important habitats for a variety of marine and terrestrial plants and animals.

Estuaries have a special place in the lives of most Australians. Many people want to live near estuaries and if they can't, they want to take their holidays there. In NSW, over 75% of the population live and work in towns or cities near estuaries. A high proportion of the State's commercial activity occurs near estuaries as they provide an important focus for industry, tourism and recreational activities. This high level of development pressure means that estuaries are subject to range of direct and indirect impacts due to land use in the catchment, changes to hydrology and tidal processes, and the direct use of the estuary waterway. In recognition of the need for future sustainable use of these threatened resources, the NSW Government is implementing a number of key strategic initiatives, one of which is the Estuary Management Program. The Estuary Management Program was commenced in 1992 to assist local government to better manage estuaries through a strategic process outlined in the NSW 'Estuary Management Manual'.

The Batemans Bay and Clyde River estuary is solely contained within the Eurobodalla Shire Council bounds. Almost half of the catchment (upstream of the tidal limit) is contained within the Shoalhaven City Council Local Government Area. The Estuary Management Plan for the Batemans Bay and Clyde River estuary has been prepared on behalf of the Batemans Bay and Clyde River Estuary Management Committee to fulfil the requirements of the NSW Estuary Management Policy (1992) and NSW Coastal Policy (1997). The Plan provides a program of strategic actions to assist government authorities and other stakeholder groups to sustain a healthy estuary through appropriate waterway, foreshore and catchment usage and in the longer-term achieve the "vision" for the estuary. The Plan presents an integrated suite of management strategies, giving due consideration to the complex interactions between estuary processes and functions.

The Plan also aims to strike a balance between addressing current issues and maintaining the already high environmental values of the region. This has been achieved through the balanced implementation of strategies to ensure that current issues are addressed while still attending to the longer-term preservation of the estuary's environmental values.

The Plan is designed to be a dynamic document. That is, as the needs or conditions of the estuary change in the future, then the management options and strategies can be adjusted to suit.

The Plan has been prepared in consultation with the Estuary Management Committee which is formulated of key stakeholder group representatives such as Eurobodalla Shire Council, State Forests, DPI (Fisheries), NSW Maritime Authority, Department of Infrastructure, Planning and Natural Resources, National Parks and Wildlife Service as well as a range of community group representatives and interested individuals. A large quantity of consultation has occurred (over the past several years) between WBM (and other consultants), the Estuary Management Committee and the public in the preparation of the studies that have formed part of the Estuary Management Plan.

1 INTRODUCTION

This document presents the Estuary Management Plan (EMP) for Batemans Bay and the Clyde River. The EMP has been prepared by environmental consultants WBM and Peter Spurway and Associates, under the direction of the Batemans Bay and Clyde River Estuary Management Committee, Eurobodalla Shire Council and the Department of Infrastructure, Planning and Natural Resources.

1.1 The Batemans Bay and Clyde River Estuary

The study area comprises the tidal waterway, foreshore and adjacent land of Batemans Bay (extending east as far as the Tollgate Islands) and Clyde River, including its entrance and major tributaries to their tidal limits. Consideration has been given to the wider catchment, insofar as it may affect the issues to be addressed in this EMP. Figure 1-1 presents salient locality details of the study area. Batemans Bay and the entrance of the Clyde River is shown in the inset.

The Clyde River is one of the larger rivers in NSW, covering a waterway area of 30km² and draining a catchment of approximately 1800 km². The catchment is mainly undeveloped and is in a predominantly forested state (approximately 95%). A large number of SEPP 14 wetlands are located on the Clyde River, containing significant areas of mangroves, seagrass and saltmarsh.

The northern section of the entrance of the Clyde River has a mobile sand bed, while the southern section of entrance is relatively stable, dominated by a training wall. Considerable sand movement occurs on the northern side of the entrance with an elevated sandy shoal south of Surfside, often exposed at low tide.

Batemans Bay is the largest bay between Jervis Bay to the north and Twofold Bay at Eden to the south. The dominant habitats recorded within the Bay include rocky reefs and sandy unvegetated areas, although there are some areas of seagrass. The estuary supports some of the most extensive and productive oyster leases on the south coast of NSW.



The Clyde River is navigable up to the junction of Cockwhy Creek, some 38 km from the entrance. The tidal limit is located upstream of Shallow Crossing, a causeway 4 km upstream of the navigable limit. The Clyde River has several major tributaries in the tidal zone including Nelligen, Waterfall, Currowan, Cyne Mallowes Creeks and the Buckenbowra River.

Development in the catchment is concentrated at the entrance of the bay, with the major coastal town of Batemans Bay being located immediately south of the Clyde River entrance. The southern foreshore is more densely developed than the northern shore, and it forms a focus for water orientated development including the CBD foreshore area of Batemans Bay, marinas, the main fishing wharves and jetties.

1.2 Current Environmental Condition

The Batemans Bay and Clyde River estuary is in a near pristine condition, with several of its sub-catchments (mainly those located along the banks of the river) receiving a 'High Conservation Value' rating in the Clyde River Catchment Stressed Rivers Assessment (DLWC, 1999). This rating indicates that the sub-catchments have special conservation values, which are likely to relate to the presence of highly valued species or wetlands, high biodiversity or the pristine or near pristine condition of the rivers.

The Batemans Bay and Clyde River estuary contains nationally significant wetlands. The whole of the Clyde River estuary (downstream of Cyne Malloves Creek) is listed as nationally important wetlands in "A Directory of Important Wetlands in Australia" (Environment Australia, 2001) owing to the relatively large areas of mangrove, saltmarsh and seagrasses. The Batemans Bay and Clyde River estuary also contains a nationally significant chenier sand plain, which forms part of the Cullendulla wetlands. The estuary also contains a regionally important oyster industry, which produces the fifth largest quantity of the Sydney rock oysters of any estuary along the NSW coast annually. Batemans Bay and the Clyde River estuary have regional significance as a centre for tourism. The estuary also contains regionally significant places of Aboriginal and European cultural heritage.

It is believed that the high environmental values of the Clyde River are primarily protected by its relatively undeveloped nature. Some 95% of the catchment remains forested (from DLWC mapping in 1997) and a vast proportion of this is protected in National Parks or State Forests. Overarching management goals for the whole of the South Coast region are contained in the South East Catchment Blueprint (SECMB, 2003), which in its introduction states, "*we live in a region of great productivity and rare beauty. We all recognise that our natural resources need to be managed in a sustainable way. We want to protect what exists now, fix up the damage from the past and continue to improve current practices.*"

This statement clearly identifies the need to protect what presently exists in the region (this includes the Batemans Bay and Clyde River estuary) in addition to repairing areas of past damage. Consequently, this Estuary Management Plan has aimed to give equal priority to maintaining the high environmental values of the region, while also addressing current areas of degradation.

Protection of existing natural resources requires a proactive long-term strategic planning approach. This approach must be able to dedicate adequate resources to the identification and control of potential threats to prevent them from becoming real issues (i.e. irreversible or difficult/expensive to fix). The planning process also needs to have sufficient emphasis to be able to mitigate any future impacts by the implementation of soundly based planning controls and guidelines for sustainable development.

Estuary Management Plans are by necessity dynamic documents in that "any issue may become more or less important in response to an activity at any time" (E. McLean, pers. comm. 2004) and as such require regular review and updating.

1.3 Purpose and goal of the EMP

The EMP is a “working document” that provides a program of strategic actions to assist responsible parties in managing the waterways, foreshores and catchments of this estuary. The long-term management aims for this estuary should achieve the “vision” for the estuary. This vision was developed as part of the Estuary Management Study (EMS) and it captures the community values and aspirations. The **vision statement** for the Clyde River and Batemans Bay is:

“The catchments, waterways and tributaries of the Clyde River estuary and Batemans Bay will be protected and enhanced to preserve their environmental, social and cultural (both Aboriginal and European) features that are of local, regional and national significance. Environmentally sustainable recreational and economic uses of the Clyde River estuary and Batemans Bay will be encouraged, to ensure that the waterway remains a viable natural resource that can be appreciated in the same way by future generations.”

The EMP has been prepared in a manner such that it can be incorporated into the planning frameworks of relevant agencies. The EMP prioritises and details management objectives and associated management strategies for implementation by nominated parties, and provides an indicative schedule for their implementation. The EMP also provides estimates of the costs for implementing management strategies (and possible funding options) and performance measures for each management strategy to assist in determining progress in implementing the strategies.

1.4 The Estuary Management Process

The adoption and implementation of this EMP will fulfil the requirements of the NSW Estuary Management Policy (1992) and the NSW Coastal Policy (1997). The EMP will need to be reviewed and updated, on an approximate five-yearly basis, to maintain its relevance and usability. Figure 1-2 provides a flowchart of the steps required to prepare an Estuary Management Plan under the NSW Government’s Estuary Management Policy and provides an indication of where this EMP lies in the overall process.

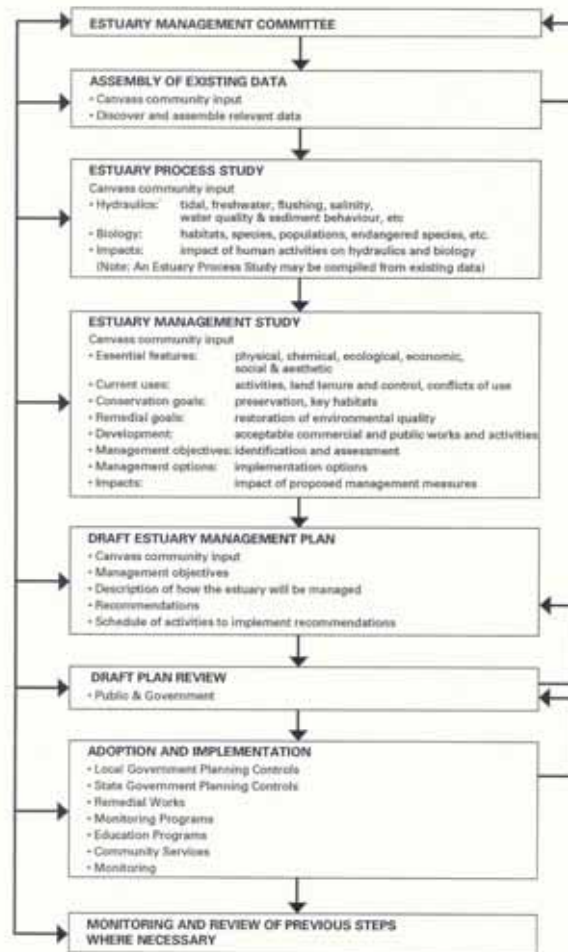


Figure 1-2 NSW Government's Estuary Management Process

1.5 Acknowledgements

The Batemans Bay and Clyde River Estuary Management Plan has been prepared by environmental consultants WBM Oceanics Australia (Damion Cavanagh: Project Manager). Assistance was provided to WBM by Peter Spurway particularly in relation to the preparation of the Waterway Users Management Plan. Significant input to the preparation of this Plan has been provided by all members of the Estuary Management Committee, particularly Errol McLean (DIPNR), Jeff Morgan and Catherine Potter (Eurobodalla Shire Council).

Acknowledgement is also given to all stakeholders and community members who dedicated their time to talk to the study team during the community consultation program for the study, and to those that provided written comments on the draft documents presented to the public.

2 COMMUNITY CONSULTATION

2.1 Overview of Consultation Activities

Community consultation was carried out by WBM Oceanics Australia as a first step in developing an Estuary Management Plan for Batemans Bay and the Clyde River Estuary. Consultation work that has been undertaken to date in relation to this study includes:

- An initial public meeting (April 2003);
- Distributing a discussion paper to the local and greater community (May 2003);
- Consulting with landowners, interested community members and key stakeholders (throughout the study);
- Inspecting the estuary and river with landowners, interested community members and key stakeholders (April to June 2003);
- Maintaining a high profile in local media (throughout the study);
- Maintaining a free call number and a project website (throughout the study);
- Preparing a background document for a public workshop and holding a public workshop to identify key management issues for the estuary (August 2003);
- Presenting the draft Estuary Management Study to the Estuary Management Committee (March 2004);
- Placing the draft Estuary Management Study on display and addressing relevant comments (March to April 2004);
- Presenting the draft Estuary Management Plan to the Estuary Management Committee (August 2004);
- Placing the draft Estuary Management Plan on public exhibition and addressing relevant community comments (September/October 2004); and
- Preparation and distribution of Community Brochures (June 2003, August 2003 and a future one in October 2004).

Further details and results of the community consultation undertaken for this project are summarised and included in Information Brochures No. 1 and No. 2 in Appendix A of this report.

Brochure No. 1 titled 'Community Usage, Values and Issues of Concern' details the main uses, values and items of concern provided by respondents to the Discussion Paper distributed to the community in May 2003.

Brochure No. 2 titled 'Management Options/Objectives Workshop Summary' provides a summary of the management workshop held in August 2003. The aim of this workshop was to identify priority management items.

A third community brochure titled implementing the Estuary Management Plan was distributed to the community in December 2003.

2.2 Public Exhibition of the Draft Estuary Management Study

The draft Estuary Management Study was distributed to key government departments and made available in Council Chambers for viewing by the Public (its availability for viewing was advertised by Council in the Bay Post). The document was also made available on the project website for viewing or downloading from early March to early April 2004.

In total, WBM received 6 written submissions in relation to the draft Estuary Management Study (EMS). Comments were incorporated into the final EMS document released in June 2004. It is presently available on Council's website at <http://www.esc.nsw.gov.au/Estuaries/Policies.htm>

2.3 Public Exhibition of the Draft Estuary Management Plan

The draft Estuary Management Plan for Batemans Bay and the Clyde River was placed on Public Exhibition by Council from mid December to end of January 2005.

In total, WBM received 4 written submissions in relation to the draft Estuary Management Study (EMS). These submissions were reviewed and appropriate changes to the Estuary Management Plan have been made.

3 STRATEGIES FOR FUTURE MANAGEMENT

3.1 Key Management Issues

Significant issues regarding the Batemans Bay and Clyde River estuary that require future management were derived from a range of sources, including the Estuary Management Committee, the broader community (through consultation) and from previous scientific/management studies performed in relation to the estuary. Future management of the estuary should allow for the:

- Preservation of existing estuary values;
- Addressing of concerns identified by the community; and
- Addressing of concerns identified through the assessment of existing estuary processes.

Table 3-1 includes a summary of estuarine values and identified key management issues.

Table 3-1 Existing Estuarine Values and Identified Key Management Issues

Existing values	Community-identified issues	Science-identified issues
<ul style="list-style-type: none"> • Natural surroundings (i.e. native flora and fauna) • Recreational opportunities • "Good" water quality • Access to waterway • Peace and tranquillity 	<ul style="list-style-type: none"> • Commercial overfishing • PWC/powerboat usage requires additional regulation and policing • Future coastal development may increase rates of marine based pollution • PWC and powerboat usage causing excessive bank erosion • Excessive number of water polluting activities in catchment and river • Excessive and poorly managed land clearing in catchment • Poorly managed oyster farming practices • Insufficient fish habitat areas and other protected aquatic reserves • Batemans Bay bar depth is presently insufficient to meet the needs of all the boating fraternity • Increased protection and/or enhancement of riparian corridors and other ecologically sensitive areas 	<ul style="list-style-type: none"> • Conservation of key faunal and floral habitats including wetlands, seagrasses, riparian corridors and other vulnerable ecosystems • Ensuring linkages of habitat areas, especially for threatened species • Limiting quantities of catchment-based contaminants to maintain high water quality that is needed to support local aquaculture and fishing industries • Lack of data in key areas relating to estuarine health, threatened species populations, key estuarine habitats, impacts of oyster industry on sedimentation and estuarine ecology, impacts of commercial and recreational fishing on estuarine ecology

As can be seen from the above, similar issues were identified by the community and in the scientific investigations.

3.2 Prioritisation of Management Objectives

A range of management objectives has been prepared for the estuary, foreshores and contributing catchments of Batemans Bay and the Clyde River that targeted the needs of the various issues identified in Table 3-1. These objectives were identified as part of the Estuary Management Study process and are detailed later in this section.

In order to prioritise these management objectives, a workshop was held in August 2003 with estuary management committee members, stakeholders and other interested members of the public. In part, the aim of the workshop was to discuss the existing uses and values of the estuary, and also to identify threats and conflicts in this current use and how this is affecting the way people value the estuary. The other aim of the workshop was to get attendees to identify their high-priority objectives for management of the estuary, i.e. what “issues” require immediate management. This process clearly identified four objectives which were considered by the attendees as a high priority for immediate management. These objectives are listed below:

1. Develop Fish Habitat Protection Plan for areas of Batemans Bay and the Clyde River;
2. Maintain of water quality in Batemans Bay and the Clyde River;
3. Initiate cost/benefit analyses of bar dredging (and other works) to investigate enhancement of navigability and bar safety; and
4. Better management of stormwater and water quality impacts of future development.

Full details of the outcomes of the workshop and the priority objectives identified are included in the Estuary Management Study and in Brochure No. 2 in Appendix A.

In order to better articulate the major objectives and improve the structure of the EMP, the project team and Eurobodalla Shire Council staff then applied their collective professional judgement to the results of the workshop to better balance the current stakeholder “issues” versus strategic long-term priorities. This process relied on the knowledge and experience of the project team and Council staff in having studied and dealt with the estuary, and other similar estuaries, over the past several years.

The final grouping of prioritised objectives is detailed below. Objectives have been grouped as being either of a high or medium priority for implementation. Objectives have been provided under six major headings, relating to diverse yet related aspects of the estuary. Where required these major objectives have been further divided to provide additional focus in particular areas. Included in parentheses is a descriptor used to identify particular strategies/objectives for ease of reference in the document.

This final set of objectives is intended to provide equal priority to maintaining the high environmental values of the region, while also addressing more pressing issues affecting the estuary.

3.2.1 High Priority Objectives

High priority objectives for the Estuary Management Plan are:

Objective 1 Maintain the existing high water quality standards of Batemans Bay and the Clyde River (WQ)

Objective 2 Ensure recreational and commercial uses of the estuary are sustainable:

- Maintain safe, navigable waterways (NW);
- Protect fish resources (FR);
- Maintain a socially and environmentally sustainable oyster industry (SOI);
- Promote waterway and foreshore based activities consistent with appropriate social and environmental impacts and waterway capability (WM); and
- Maintain visual amenity of estuary, foreshores and outlooks (VA).

Objective 3 Consider implications of coastal foreshore hazards and other ocean impacts in development planning (FHOI)

3.2.2 Medium Priority Objectives

Medium priority objectives for the Estuary Management Plan are:

Objective 4 Protect and enhance ecological communities and habitats:

- Protect, and where appropriate rehabilitate, riparian vegetation corridors (RV);
- Protect and enhance health and extent of existing seagrasses, saltmarshes, mangroves and other key estuarine habitats (SSM); and
- Protect and enhance vulnerable vegetation ecosystems, key fauna habitats and linkages (VV).

Objective 5 Improve the scientific knowledge base to support management of the estuary (SKD)**Objective 6 Integrate aspects of the Estuary Management Plan with the Southern Rivers Catchment Action Plan (SRCAP)**

3.3 Management Strategies

In order to achieve a management objective, which essentially represents the broad goal or outcome desired, the Estuary Management Plan provides a set of management strategies. A management strategy is the general approach to be pursued in order to achieve the objective. There are many management strategies that may contribute to the achievement of the objective.

The degree to which a particular management strategy contributes to the achievement of the objective will depend on a number of factors. Mostly it will be related to the success of a nominated responsible agency in implementing the strategy (which in turn is a function of how difficult the strategy has been to implement and may relate to the costs of implementation, availability and adequacy of staff to implement actions, etc). More detail on factors leading to the successful implementation of management strategies is provided in Section 3.3.1.

Consequently, management strategies (for each objective) were assessed for their overall feasibility based on cost (capital and operational), practicality of implementation, environmental impact, social acceptability and their likely effectiveness in addressing the management objective. The result is the prioritisation of all management strategies for each management objective.

Strategies proposed to address the objectives are listed in tables in the following section, which provides details of the:

- Justification of the strategy;
- Indicative ranking for implementation of strategies in comparison to other strategies;
- Specific management actions;
- Organisations responsible for implementing the strategies;
- Expected outputs and measurables relating to the implementation of the strategy. For example, how progress towards the achievement of the objective will be measured to ensure that the proposed action program is moving towards desired outcomes. Measurables may include deliverables, outputs, outcomes and performance indicators. Ongoing monitoring and reporting against these measures will enable the progressive refinement of the action program if necessary; and
- Cost estimates, approximate capital and operational costs.

3.3.1 Overview of Management Strategies

Forty-nine strategies (as shown in Table 3-2) have been recommended for implementation in order to maintain the existing values of Batemans Bay and Clyde River, and to remediate certain aspects of the estuary identified through scientific assessments and consultation with the local communities and relevant stakeholder organisations. Note that of the 49 strategies identified 16 of these were derived from the Waterways Users Management Plan.

The priority of all strategies, relative to each other, is included in the “Overall Priority of Strategy” column of Table 3-2. This has been provided to enable Council and others to identify the priority strategies (i.e. what strategies should be implemented first), without being overly prescriptive. If the priority ranking were too prescriptive it is unlikely that they would be able to be implemented in exactly that fashion.

Table 3-2 Recommended Strategies Descriptions

Strategy ref. & Indicative Implementation Ranking	Management Strategy Description	Overall Priority of Strategy
High Priority Objectives		
Objective 1 - Maintain the existing high water quality standards of Batemans Bay and the Clyde River		
WQ1	Control future activities (including landclearing, construction of roadways and new urban and rural development) that may affect the ability of the estuary to meet its water quality objectives.	H
WQ2	Enhance the current water quality-monitoring program and water quality database development.	H
WQ3	Continue to monitor sewage pollution and occurrence of illegal discharging from vessels in Batemans Bay and the Clyde River.	H
WQ4	Install pumpout facility on floating pontoon at Batemans Bay Marina.	H
WQ5	Control and monitor clearing and report in Council's State of the Environment Report.	M
WQ6	Revise Water Quality Objectives (WQO) for Batemans Bay and the Clyde River.	M
WQ7	Control litter from Batemans Bay CBD.	M
WQ8	Progressively seal and improve drainage on gravel roads at creek crossings or at locations where road drainage directly enters the Clyde River or its tributaries.	M
WQ9	Regularly review the sewer spill response plan.	L
WQ10	Develop a local contingency plan for vehicle accident / oil or contaminant spill on major bridges crossing the estuary.	L
WQ11	Install additional grey water / portable toilet waste dump point.	L
WQ12	Consider need for additional sewage pumpout facilities.	L
Objective 2 - Ensure recreational and commercial uses of the estuary are sustainable		
NW 1	Proactively monitor and report on bar depth and channel alignment.	H
NW 2	Determine the cost/benefit relationship of improving the navigability of the ocean bar in Batemans Bay.	H
FR1	Scientifically assess the potential impacts of commercial and recreational fishing on the aquatic habitats and species of Batemans Bay and the Clyde River.	H
SOI 1	Improve the visual and safety aspects of oyster farming.	M
SOI 2	Review the Statement of Intent if released by the NSW Government as a result of the Healthy Rivers Commission (now defunct) Independent Inquiry into Oysters.	L
SOI 3	Determine the impacts of the local Pacific oyster populations on estuarine ecology.	L
SOI 4	Gain improved understanding of the possible effects of oyster leases in promoting sedimentation in tributaries.	L
WM1	Clearing of dunal vegetation around the bar lead lights.	H
WM2	Support study into enhancing navigability and safety of Batemans Bay bar.	H
WM3	Design of all future public wharf facilities should consider disabled access requirements.	H
WM4	Install a 4-knot zone in Cullendulla Creek.	H
WM5	Use signage to improve boating safety adjacent to Cullendulla beach and Cullendulla shoal.	H
WM6	Alter boat speed limits around Budd Island/McLeods Ck.	H
WM7	Relocate PWC usage areas and assess benefits.	H
WM8	Maintain accurate complaint records regarding PWC usage.	H
WM9	Encourage the provision of a purpose built refuelling facility at the Batemans Bay Marina.	H
WM10	Expand existing marina at Batemans Bay as a regional centre.	M

Strategy ref. & Indicative Implementation Ranking	Management Strategy Description	Overall Priority of Strategy
WM11	Identify additional safe mooring areas in Batemans Bay and/or Clyde River.	M
WM12	Monitor boat usage in the upstream reaches and tributaries of the Clyde River.	M
WM13	Enforce the Maritime Authority Sewage Plan when introduced.	M
WM14	Monitor impacts of informal foreshore camping.	L
WM15	Promote commercial and recreational activities sympathetic with the nature and capabilities of the estuary.	L
WM16	Examine potential for improved facilities for public use of State Forest foreshores.	L
VA 1	Ensure development controls are sympathetic to the visual amenity of the estuary, foreshore and outlooks so that these are retained.	H
VA 2	Remove unauthorised riverbank protection works around Nelligen and Sheep Station Creek.	L
Objective 3 - Consider implications of coastal foreshore hazards and other ocean impacts in development planning		
FHOI 1	Integrate objectives of Batemans Bay Coastline Hazard Management Plan with the Estuary Management Plan and ensure these are implemented in development planning and approvals.	H
FHOI 2	Consider potential impacts of sea level rise on estuarine and foreshore structures and ensure these are implemented in development planning and approvals.	H
Medium Priority Objectives		
Objective 4 -Protect and enhance ecological communities and habitats		
RV 1	Protect riparian vegetation through the implementation of planning controls.	H
RV 2	Enhance areas of riparian vegetation that will assist in improving stormwater quality, faunal movement or provide key habitat.	H
RV 3	Address any poor management practices that may be occurring on Crown Land Leases, particularly those fronting onto the estuary and its tributaries.	M
RV 4	Review alternatives for slashing riparian vegetation in power line easements at wetland and creek crossing locations.	L
SSM 1	Verify extent and condition of existing key estuarine habitats and identify trends in extent and condition to enable formulation of appropriate protective instruments.	M
SSM 2	Continue public awareness program to reduce opportunities for Caulerpa taxifolia and other invasive aquatic species being introduced to the estuary.	M
VV 1	Utilise existing planning instruments to protect vulnerable (terrestrial) vegetation ecosystems and key faunal habitats/linkages. Where possible these habitats/linkages should be enhanced.	M
VV 2	Investigate the inclusion of Snapper Island into National Parks estate and improve management to protect penguin colony and for breeding of the Sooty Oyster Catcher.	L
Objective 5 - Improve the scientific knowledge base to support management of the estuary		
SKD 1	Determine the status of shorebirds (includes migratory birds) and terrestrial fauna species utilising the estuary and integrate this data with Council's GIS planning databases.	M
Objective 6 - Integrate aspects of the Estuary Management Plan with the Southern Rivers Catchment Action Plan		
CAP 1	Work to ensure that the priority actions of the EMP are integrated into the forthcoming Southern River Catchment Action Plan (SRCAP) and that funding for implementation of the SRCAP helps support implementation of priority actions from the EMP.	M

3.3.2 Timing for Implementation of Strategies

The priority of objectives and internal ranking of strategies generally defines the timing required for implanting strategies. This is to say that high priority objectives should be addressed first, and within the high priority objective, the higher ranked strategies should generally be implemented first.

However, some of the management strategies for lower priority objectives, which typically relate to the protection of existing estuarine values, should not be neglected. This is application of the precautionary principle, i.e., it is more effective to prevent environmental degradation than to try to repair it and to stop ecosystems from becoming endangered, rather than to try to bring them back from a point of critical threat.

If some of these actions, which in many cases can easily be incorporated into existing management practices of Council and other stakeholders, are ignored may lead to a situation whereby, irreversible negative change occurs in the estuary.

3.4 Factors Leading to Successful Implementation of Plan

The overall success of the Estuary Management Plan should be gauged through its ability to achieve its designated targets. The overarching targets are the Management Objectives for the Plan as outlined in Section 3.2. However, the timeframe for achieving some of these targets is long (given the slow rate of riparian vegetation establishment and growth, for example).

Other factors affecting the successful implementation of elements of the include:

- Agreement on the objectives, strategies and actions associated with the Plan by all State and Local Government agencies, stakeholder groups and the general community;
- Understanding and acceptance of responsibilities by the various organisations who will implement the Plan;
- Commitment by those organisations involved to dedicate the time and resources necessary to implement the Plan; and
- Sourcing of appropriate funding, through Council rate income and levies, State and Commonwealth government grants, Catchment Management Authority support, industry contributions and in-kind contributions from the community.

A major stakeholder in natural resources management is the Southern Rivers Catchment Management Authority (SRCMA). The SRCMA will shortly be amalgamating Catchment Blueprints within its region into a Catchment Action Plan (CAP). The CAP will determine the future priority of funding for natural resource management projects across the region. It is essential for the continued health of the Clyde River and Batemans Bay that this Estuary Management Plan be brought to the attention of the SRCMA and that the priority strategic actions are reflected in the CAP.

The information provided in this Section should be read in conjunction with the Batemans Bay and Clyde River Estuary Management Study, which provides a more detailed description of the various objectives and strategies developed for the estuary.

To gain a better appreciation for the relative success of the Plan, a series of performance measures can be assessed on a periodic basis. These performance measures are aimed at measuring the key aspects of the Plan, including the rate of implementation, specific outputs or deliverables from the Plan, and the overall outcomes resulting from the implementation of the Plan (which can be measured against the Plan objectives, and thus measure its overall success).

3.4.1 Measuring the Performance of the Plan

To gain an appreciation for the performance of the Plan, a series of performance measures can be assessed on a periodic basis. These performance measures are aimed at measuring the key aspects of the Plan, including the rate of implementation, specific outputs or deliverables from the Plan, and the overall outcomes resulting from the implementation of the Plan (which can be measured against the Plan objectives, and thus measure its overall success).

These different types of performance measures are discussed in more detail below.

3.4.1.1 Primary Performance Measures

The first set of performance measures should ascertain whether the strategies are being implemented within the timeframe designated in the Plan. As such, the primary performance measures are simply a *measure of implementation*.

The large number of strategies proposed by this Plan means that a number of strategies will be implemented concurrently. In some cases, strategies will be implemented completely independently by different organisations, while in other circumstances, the same organisation will be responsible for the implementation of several independent and/or integrated strategies. Organisations will therefore need to review the Plan carefully and ensure that adequate resources are allocated to the implementation of the various strategies to ensure that the timeframe for implementation is maintained.

Clearly, a high degree of co-ordination will be required to manage the successful implementation of all the strategies within the designated timeframe. Council should facilitate this co-ordination with recommendations from the Estuary Management Committee, who would be required to meet regularly to discuss and manage the implementation of the estuary management strategies.

If it is determined that the strategies are not being implemented to the nominated timeframe then one or both of the following *contingencies* should be adopted:

- Determine the cause for the delay in implementation. If delays are funding based, then seek alternative sources of funding, including a formal request to Council to increase contributions to the Plan. If delays are resource-based, seek additional assistance from stakeholder agencies and/or consider using an external consultancy to coordinate implementation of the Plan; and
- Modify and update the Estuary Management Plan to reflect a timeframe for implementation that is more achievable. The revised Plan would need to be endorsed by all relevant stakeholders and agencies responsible for implementation.

3.4.1.2 Secondary Performance Measures

The second set of performance measures relate to *measuring specific outputs* from the individual strategies, as appropriate. The specific outputs from each action, or step, of each strategy, are provided within the Implementation Schedules under the ‘expected outputs and measurables’ column. This column defines what the specific outcome from each action should be. If these outputs are delivered as defined, then the action (or strategy) is considered to have been successful.

In some cases, the nominated ‘measurable’ also identifies a specific tool for gauging the rate of implementation of specific actions. For example, the rate of implementation of rehabilitation works can be ‘measured’ by determining the *area of land rehabilitated*. In other cases, a one-off output is identified as the ‘output’, such as a specific report.

If the specific outputs are not generated from implementation of the Plan then the following *contingencies* need to be adopted:

- Determine the reason for not producing the specified output. If the reason involves a lack of funding or resources, then similar contingency measures to those described for the primary performance measures (refer Section 3.4.1.1) should be adopted. If the reason is of a technical nature, then expertise in the area should be consulted to overcome the technical problem. DIPNR and other government agencies should have the necessary in-house expertise to assist in most cases; and
- Review the appropriateness of the specific output of the management strategy, and if necessary, modify the output described in the Plan to define a more achievable product.

3.4.1.3 Tertiary Performance Measures

The third set of performance measures are aimed at *measuring the outcomes of the Plan*, and as such relate to the specific management objectives of the Plan (as described in Section 3.2), and how implementation of the Plan has made a difference to the physical and social environment of the Batemans Bay and Clyde River (e.g. reduction in pollutant loads, reduction in user conflicts, increase in biodiversity of environments, etc). The main mechanism for gauging whether these objectives have been achieved, or not, is monitoring. Therefore, monitoring of various elements of the physical, biological and social environment of Batemans Bay and the Clyde River is an essential component of assessing the overall success of the Estuary Management Plan.

If, after a reasonable period of time, the specific objectives of the Plan are not being achieved by the strategies being implemented, then the following contingencies should be adopted:

- Carry out a formal review of the implemented management strategies, identifying possible avenues for increasing the effectiveness of the strategy in meeting the Plan objectives; and
- Commence implementation of additional management strategies that may assist in meeting Plan objectives (possibly ‘fast-track’ some longer term strategies as necessary).

Reconsider the objectives of the Plan to determine if they set impossible targets for future estuary conditions, and adjust the Plan, as necessary. Any such changes to the Plan would need to be endorsed by the stakeholders and relevant government agencies, as well as the public.

3.4.2 Annual Review of Plan

Eurobodalla Shire Council will undertake an annual review on the implementation of the EMP. The annual review will detail implementation progress for all management objectives and associated management strategies. The annual review should also include details of any salient observations or occurrences within the bounds of the estuary. Details of any current investigations/studies/research or otherwise occurring within the estuary should be noted with relevant contact details recorded. This information will form an important database for successful implementation of the Plan and can be used in the periodic review/update of the plan.

These annual reviews should cover the topics described in Table 3-3. This table also outlines who is responsible for conducting the periodic reviews.

Table 3-3 Basis for Annual Plan Review

Review Period	Review tasks	Responsibility
Annual	<ul style="list-style-type: none"> Assess primary, secondary and tertiary performance measures, and determine appropriate contingencies if performance measures do not meet targets Review funding arrangements and allocations for current and future management strategies Review resourcing and staffing allocations for current and future management strategies Provide report on progress of Estuary Management Plan implementation, results of annual review, and any modifications required to the Plan coming out of the review 	<p>Batemans Bay and Clyde River Estuary Management Committee</p> <p>To be coordinated through Council and reported to Council, relevant stakeholders and government agencies</p>

It is possible that the NSW Government's Estuary Management Program, under which this Plan has been prepared and will be implemented, may change in the future. A new Coastal Zone Management Manual is currently in preparation, and will combine and replace the existing Estuary Management Manual (1992) and the Coastline Management Manual (1990). Also, the role of the Southern Rivers Catchment Management Authority (SRCMA) in managing the coastal zone, including estuaries, is not yet clear. Therefore, on-going liaison between Council, SRCMA and DIPNR is necessary to ensure that the aims and objectives of the Batemans Bay and Clyde River Estuary Management Plan continue to be achieved in the future.

3.4.3 Five Year Review of Plan

Eurobodalla Shire Council should perform a comprehensive review of the EMP every 3 to 5 years. The review will need to consider the status and success of implementation of the objectives of the Plan. This may be achieved by a review of Annual Reports, State of the Environment Reports and from interpretation of other data being collected within the estuary.

Also, management strategies, which have been implemented, should be removed from the Plan, while newly identified issues (from results of current/future studies, or identified by various stakeholder groups or the public) should be included appropriately into the plan. The review should also ensure that management strategies proposed are still "best practice".

These five yearly reviews should cover the topics described in Table 3-4. This table also outlines who is responsible for conducting the periodic reviews.

Table 3-4 Basis for Five Year Plan Review

Review Period	Review tasks	Responsibility
5 Yearly <i>(first review to be completed by mid 2010)</i>	<ul style="list-style-type: none"> • Assess the overall effectiveness of each management strategy implemented to date • For strategies requiring on-going commitment, assess the value in maintaining implementation of those strategies • Reconsider the management options that were not short-listed and included in the original Plan • Provide implementation details of additional strategies that are to be included in the subsequent 5 year Plan • Update the Estuary Management Plan document to reflect proposed strategies for implementation over the next 5 year period, and seek endorsement by stakeholders, government agencies and the community 	Batemans Bay and Clyde River Estuary Management Committee To be coordinated through Council and reported to Council, relevant stakeholders and government agencies

4 HIGH PRIORITY OBJECTIVES

Objective 1 Maintain the existing high water quality standards of Batemans Bay and the Clyde River

Table 4-1 Maintain high water quality (WQ)

Strategy Description	Overall Priority of Strategy	Discussion of strategy	Specific actions	Responsible organisation(s)	Expected outputs and measurables	Timing	Cost
WQ. 1 Control future activities (including landclearing, construction of roadways and new urban and rural development) that may affect the ability of the estuary to meet its water quality objectives.	H	<p>Future activities (including landclearing, construction of roadways and new developments) in the catchment should be under strict regulation to ensure the environmental values of this near pristine estuary are not compromised. Further development should be controlled to prevent any future usage that results in high pollutant loads to the estuary.</p> <p>There are several major developments underway and proposed and adjacent to the Clyde River foreshores. These developments need to be controlled through application of relevant planning controls such as Council's Development Control Plans, Coastline Hazard Management Plan, etc. Major developments will also need to comply with all State policies/ legislation that are triggered by the development proposal.</p>	Impose sustainable planning controls on subdivision activities in growth areas including riparian buffer widths recommended in the Estuary Management Study [see also element RV-1].	ESC	Cessation of inappropriate subdivision designs that degrade the integrity of the estuary by destruction of riparian zones.	2005 onwards	Minor
			Promote the appropriate use of Water Sensitive Urban Design (WSUD) techniques for new urban development. The ESC's Urban Stormwater Quality Management Plan needs to be updated every three years to provide details of WSUD best practices for urban development, such as the Managing Urban Stormwater: Urban Design guidelines recently released by the DEC.	ESC	Improvement in the design of new developments that brings about a reduction in pollutant export during the operational phases of these facilities.	2005, 2008 and three yearly afterwards	\$5,000 every two years
			Ensure adequate erosion and sediment controls are being implemented on site during landclearing and construction activities for new developments. Major developments should invoke the requirements for erosion and sediment control plans to be submitted and approved by Council prior to construction. These plans should be in accordance with ESC's Urban Stormwater Quality Management Plan for erosion and sediment control during construction. These plans should identify the need for water quality testing downstream of the construction site pre/during/post construction.	ESC	Reductions in pollutant exports from landclearing and construction activities associated with new developments.	2005 ongoing	Cost born under existing ESC programs
			Two yearly reviews of the erosion/sediment control requirements and pollutant reduction requirements in the Urban Stormwater Quality Management Plan for construction and post-construction phases of new developments to ensure that they allow for the Water Quality Objectives for Batemans Bay and Clyde River to be achieved. The review should incorporate/coordinate with the water quality interpretation report produced from the water quality database. In particular the review should aim to identify any obvious reductions in water quality and linkages to developments occurring in the catchment.	ESC	Updates (as required) of elements of the Urban Stormwater Quality Management Plan to reflect the goal of maintaining existing high water quality levels in Batemans Bay.	The timing of this review should coordinate with the release of water quality interpretation report (refer to item WQ1)	\$5,000 every two years
WQ. 2 Enhance the current water quality-monitoring program and water quality database development.	H	<p>Water quality monitoring has been performed in the Batemans Bay and Clyde River for several years by a number of agencies/stakeholders (i.e. ESC and Oyster Growers). Water quality data should continue to be collected. This strategy aims to streamline the data collection processes and enhance the value of water quality data gathering by creating a purpose built water quality data base which can be used to produce regular water quality interpretation reports. It is intended that these reports can be used to identify issues and serve as a mechanism for changing existing catchment management practices.</p>	Develop a Memorandum of Understanding (MOU) between government agencies i.e. DIPNR, DEC, DPI (Fisheries), NSW Food Authority and the Oyster Growers Association regarding water quality data sharing.	ESC	MOU should aim to identify requirements of respective agencies in relation to water quality information. MOU should aim to overcome concerns regarding ownership of water quality data and establish protocols for provision of data to Council who maintains a central WQ database.	2005	Minor
			Regular collection/provision of water quality data (and any other eco-system health data) by/to Council on a regular basis for inclusion in the database.	NSW Food Authority or Oyster Growers Association	Streamlining of water quality monitoring data collection (avoid unnecessary duplication of effort).	Post MOU agreement	Minor as data already needs to be collected, seek CMA funding is monitoring needs to be enhanced

Strategy Description	Overall Priority of Strategy	Discussion of strategy	Specific actions	Responsible organisation(s)	Expected outputs and measurables	Timing	Cost
			Preparation of two yearly water quality interpretation reports using the water quality database. Reports to be sent to stakeholders and other Government departments as determined as part of the MOU process for review.	ESC	Preparation of biannual water quality interpretation reports for the information of other natural resource managers in the estuary.	Two yearly post MOU agreement	Costs of report preparation using WQ database is expected to be about \$5000
			Amend water quality interpretation reports and/or water quality monitoring program according to comments received.	ESC	Improvements to the layout, format and content of the water quality reports to make as useful as possible to the agencies and stakeholders which receive them.	After review of first water quality report	Minor
			Where possible, water quality Issues will be identified in the water quality reports, with recommendations for actions.	ESC to nominate, various parties to implement	Modifications to the way estuary/catchments are managed to ensure that current high water quality levels are maintained.	Include biannual water quality reports	N/A
WQ. 3 Continue to monitor sewage pollution and occurrence of illegal discharging from vessels in Batemans Bay and the Clyde River.	H	The release of ballast waters is likely to be deleterious to water quality and may potentially cause exceedences of adopted WQO. Sewage ballast releases may lead to the contamination of oysters. As waterway usage is expected to increase with redevelopment of BB Marina, it is critical to strengthen policing of illegal discharges from vessels. Facilities provided on the Clyde River need to be suited to the types of vessels (and their waste disposal requirements) and any future increases in boating numbers.	Continue to investigate measures to reduce sewage pollution from vessels.	Maritime Authority/ESC	Identification of management options to reduce swage pollution from vessels.	2006 onwards	Would require an increase in Maritime Authority staffing – potential cost \$80,000 p.a.
			Regularly audit commercial vessels for compliance	Maritime Authority	Reduction in the illegal discharge of ballast waters	2005 ongoing	
			Increase effort for policing of illegal dumping from all vessels, especially as waterway usage increases with redevelopment of BB marina	Maritime Authority	Reduction in the illegal discharge of ballast waters	2005 ongoing	
			Undertake education campaigns regarding potential pollutant generation from boating.	Maritime Authority	Education of the boating fraternity as to the requirements for disposal of on-board water waste material and impacts of this material on aquatic life if disposed of inappropriately	2005 ongoing	N/A
WQ 4 Install pumpout facility on floating pontoon at Batemans Bay Marina	H	Waterway usage on Batemans Bay and the Clyde River is continually increasing and there is a critical need for a pumpout facility at the Batemans Bay marina to deal with current and future demand. It is understood that the appropriate monies have already been set aside for the installation this facility.	Install a pumpout facility for the Batemans Bay marina. Significant planning and design work has already been completed in relation to the pumpout facility. Funds need to be made available to ensure that the facility is constructed. Design/capacity of the facility should consider potential future boat usage quantity and boating types.	Department of Lands	Pumpout facility in the Batemans Bay Marina	Required urgently	Some funds already allocated for its construction. Additional funding from Lands Department.
WQ. 5 Control and monitor land clearing and report in Council's State of the Environment Report.	M	Landclearing activities are recognised as key mechanisms for the contamination of stormwater. Landclearing may also impact on vulnerable vegetation ecosystems and key fauna habitats and linkages. There is a need to maintain an awareness of where and how much land is being cleared. There is a need to integrate the requirements of this element with outcomes arising out of the NSW Government's Native Vegetation Reforms. The Native Vegetation Act/Regulation provide a framework for ending broadscale clearing in NSW, unless landclearing can be demonstrated to improve or maintain environmental outcomes. This legislation also aims to encourage revegetation and rehabilitation of land with native vegetation. The legislation also rewards farmers for good land management.	Review the <i>Native Vegetation Act, 2003</i> and the <i>Native Vegetation Regulation, 2004</i> when finalised. Update relevant planning controls, i.e. DCP's, Rural and Urban LEPs to be consistent with the requirements of this legislation.	DIPNR/ESC/CMA	Potential revisions to Council's planning legislation to accommodate requirements of the <i>Native Vegetation Act, 2003</i> and the <i>Native Vegetation Regulation, 2004</i>	When finalised	Core function of ESC
			Until the Native Vegetation Act and Regulation are finalised, landclearing is to be regulated through Council current planning controls i.e. DCP's Rural and Urban LEPs.	ESC	Cessation in any inappropriate land clearing in the catchment	Ongoing	Cost born under existing ESC programs
			Calculate the levels of landclearing in the catchment of the Clyde River estuary. Estimates should be prepared every-four years and reported in the State of the Environment Report. Actual locations of landclearing should be calculated by reviews of aerial photography or satellite imagery. Inclusion of Shoalhaven City Council would allow a whole of catchment assessment to be reported.	ESC and potentially DIPNR	Provides an up-to-date register of land-clearing trends in the catchment	2005 and every four years afterwards	\$25,000 every four years. Photography may potentially be sourced from DIPNR as part of implementing the Native Vegetation Act and Regulation
WQ. 6 Revise Water Quality Objectives (WQO) for Batemans Bay and the Clyde River.	M	To ensure that the high water quality of Batemans Bay and the Clyde River are maintained for the current end-uses (i.e. aquatic ecosystems, oyster growing, primary recreation, etc), it is important to develop appropriate Water Quality Objectives for management purposes.	Develop appropriate WQO for Batemans Bay and Clyde River (and tributaries) based using the water quality database using the methods outlined in the ANZECC (2000) guidelines, with the aim of establishing localised trigger values for all major tributaries of the Clyde River.	ESC in consultation with DEC	The use of site specific WQO (i.e. trigger values) will enable the ready identification of exceedences, allowing for mitigation strategies to be put in	After the water quality database has been established and when sufficient water quality data is available to	\$5,000 to develop WQO for each major tributary of the Clyde River

Strategy Description	Overall Priority of Strategy	Discussion of strategy	Specific actions	Responsible organisation(s)	Expected outputs and measurables	Timing	Cost
		Site-specific (as opposed to generic) WQO should be defined for the Clyde River and its tributaries using recorded water quality data [see element WQ-1]. WQO should be developed using accepted national guidelines. At present the WQO for Batemans Bay and the Clyde River are the interim values set by the NSW EPA several years ago.	trigger values for all major tributaries of the Clyde River.		place quicker. This will assist in maintaining the near pristine qualities of the estuary	develop specific criteria.	when sufficient data has been amassed
WQ. 7 Control litter from Batemans Bay CBD.	M	There is an identified need to control the generation of gross pollutants from the Batemans Bay CBD area. The specific actions proposed relate primarily to 'softer' management type approaches to control litter, rather than 'harder' engineering style of approaches, such as implementation of gross pollutant traps. Litter is a form of visual pollution and if found in a waterway may degrade its aesthetic appeal and potentially present a risk to aquatic organisms. Litter is most easily controlled by capture near its source.	Review a range of soft and hard control techniques for the control of litter in the CBD area, these may include such things as improved public education in regards to the impact of litter on waterways (plants, animals and humans), and reviews of bin locations and cleaning frequencies, signage and signage/policing of littering.	ESC	Reduced litter generation from the Batemans Bay CBD area to waterways	2005	\$5,000 for review, cost of implementation N/A
WQ. 8 Progressively seal and improve drainage on gravel roads at creek crossings or at locations where road drainage directly enters the Clyde River or its tributaries.	M	Sediments derived from the erosion of gravel roads (including drainage lines) are entering the Clyde River and its tributaries in stormwater. This reduces water quality and may have a range of impacts on aquaculture and existing flora and fauna in the estuary (e.g. smothering sea-grasses etc). The issue can only be addressed by upgrading these roads to prevent excessive erosion. This typically involves improving roadside drainage and road sealing. There are approximately 450km of unsealed gravel roads in Eurobodalla Shire. At present ESC allocates a small sum of money to drainage improvements on these unsealed gravel roads. This is aimed directly at improving the level of service to the community and reducing long-term maintenance costs. As a side benefit the road sealing activities may address erosion and sedimentation impacts. ESC current works program allows for the sealing/drainage of the first length of River Road (near the Kings Hwy). However, due to the large cost burden to ESC in sealing/draining all roads within the catchment, it is unlikely that there will be any significant additional works undertaken by ESC in the next 10-years. Additional funding will be required from external sources to complete priority road upgrading projects.	To assist in identifying areas which are eroding and contributing sediments, a review of information contained in the water quality database should be performed to identify suspended sediment concentrations in different sections of the river and tributaries after rainfall events. Field verification of erosion may be required during or immediately after large rainfall events to identify actual roads which are eroding and contributing sediments.	SRCMA and ESC (in consultation with State Forests, NPWS and Shoalhaven City Council).	Identification of key priorities for road upgrading from the perspective of maintaining the high water quality in Batemans Bay and Clyde River	2007	\$10,000 for review of data and identification of priorities
			Roads identified as contributing sediments should be inspected and the current design configuration of the road noted. Additionally, the key mechanisms of erosion for these roads should be noted as part of the review, i.e. road slopes, inadequate drainage, lack of sealing, etc. Indicative details of works required (and costs) to address the issue should be provided.	ESC	Indicative details of works required and costs	2007	\$10,000 for review of road condition and identification upgrading requirements
			Details of priority sections of road to be upgraded should be documented in a report, backed up by water quality data and photographic evidence. This report can be used to apply for environmental grants to address environmental issues in the estuary. Any special requirements for future fish passage at creek crossings should be identified. If required contact with DPI (Fisheries) should be made to identify potential design solutions.	ESC	A report summarising the finding of the review, with a series of clear recommendations on road which are considered a priority for upgrading.	2007	Prices provided above (i.e. \$20,000 total to produce priority report)
WQ. 9 Regularly review the sewer spill response plan.	L	The discharge of sewage into Batemans Bay and/or the Clyde River may lead to the contamination of oysters.	Perform a five yearly review of the sewer spill response plan. The review aim to ensure that attention is given to controlling spills in critical areas of the estuary that may lead to widespread contamination of oysters. The first review should occur after the adoption of the Batemans Bay Sewer Plume Modelling Report, which is currently being prepared for the ESC. Future reviews should reassess the current sewer loadings in respect of potential and actual urban growth in the Batemans Bay Sewerage Scheme catchments.	ESC	Reduced potential for oyster contamination as a result of sewage spills	2006 and every five years afterwards	\$20,000 to review loading projections
WQ. 10 Develop a local contingency plan for vehicle accident / oil or contaminant spill on major bridges crossing the estuary.	L	The potential contamination of the waters of the Clyde River and Batemans Bay should be minimised through the development of a contingency plan for a vehicle accident (especially bulk goods transporters) on the Princes Highway bridge crossing at Batemans Bay and the Kings Highway crossing at Nelligen.	Develop a range of contingency measures that can be deployed in the event of an accident that causes the spillage of potentially harmful substance to water quality. Contingency measures may include use/deployment of mobile barriers to collect and contain spills both on the bridge and on the surface of the waterway. Ensure any future bridge widening or works make suitable allowances for contaminant containment.	ESC/RTA	Reduced potential for an environmental incident as a result of suitable contingency methods and bridge design	2007	Minor cost to review adequacy of contingency measures. Cost to prepare new inventory measures N/A

Strategy Description	Overall Priority of Strategy	Discussion of strategy	Specific actions	Responsible organisation(s)	Expected outputs and measurables	Timing	Cost
WQ 11 Install additional grey water / portable toilet waste dump point	L	Installation of additional grey water / portable toilet waste facilities suited to the needs of a portion of the boating fraternity without pump-out facilities.	Make application for funding to install grey water / portable toilet waste dump point at the Nelligen public toilet block. It is as an ideal location as, although unsewered, it incorporates a storage tank that can be accessed by pumpout truck.	ESC	Improved level of service for portable toilets on vessels operating in the Nelligen area.	2006	\$50,000 with possible funding from NSW Government
WQ 12 Consider need for additional sewage pumpout facilities	L	The illegal dumping of ballast/sewage wastes is a major water quality issue and sufficient disposal facilities need to be provided to suit the numbers of boats expected to use different sections of the bay and estuary. Also a variety of facilities need to be provided in convenient locations for the different styles of on-board facilities they have. Long term planning should be performed to ensure sufficient facilities are provided in appropriate. This planning should consider the potential future requirements for: <ul style="list-style-type: none"> Additional houseboat hire businesses. As a minimum requirement, these facilities should be located in areas with pumpout truck access. Ideally, they should install pumpout infrastructure. A second marine pumpout facility located in Batemans Bay (e.g. Fishermans Jetty) to cater for larger vessels that cannot readily access the marina facility, should this prove necessary; and A third pumpout facility located at Nelligen. 	Consider in the longer term additional sewage pumpout facilities at Fishermans Jetty and Nelligen.	ESC	Better access to sewage pumpout facilities on the estuary.	2010 to 2012	\$1.0M from State Programs

Objective 2 Ensure recreational and commercial uses of the estuary are sustainable

Table 4-2 Maintain safe, navigable waterways (NW)

Management strategies	Overall Priority of Strategy	Discussion of strategy	Specific actions	Responsible organisation(s)	Expected outputs and measurables	Timing	Cost
NW. 1 Proactively monitor and report on bar depth and channel alignment	H	Formulate a proactive bar depth monitoring and reporting procedure to provide the Royal Volunteer Coastal Patrol (RVCP) with detailed bar depth and channel alignment information to pass on to mariners. Implementation of this strategy will assist in addressing current concerns regarding the ability of the bar depth to meet the needs of all of the boating fraternity.	Continue support for bar depth monitoring and formalise reporting procedures	Maritime Authority	Up to date information on bar depth and channel alignment held by RVCP available for all stakeholders.	Activity has already commenced. It should be continued indefinitely.	Minor amendment to ongoing practices
NW. 2 Determine the cost/benefit relationship of improving the navigability of the ocean bar in Batemans Bay.	H	The improvements to the bar may potentially improve boating safety (particularly for larger vessels) during entry and exit from Batemans Bay. This may serve to promote boating within the Batemans Bay region and may potentially increase tourism. However, the cost benefit relationship of such improvements needs to be considered.	Initiate a technical review of the navigability of the ocean bar in Batemans Bay, backed up by field-data collection as required. If the technical review identifies that the navigability of the bar should be improved, then feasible options for improving bar navigability should be identified and costed. Operational, advisory and safety improvements need to be investigated as part of this review.	Maritime Authority and ESC	Report to be prepared providing details of the review performed of feasible options for improving bar navigability. Report to identify preferred options for further assessment.	2005/2006	\$60,000 for technical review and report
			Identify and where possible cost any benefits to the community, resulting from improvements to the bar. Prepare a cost benefit analysis report for consideration of ESC and distribution of outcomes of the investigation to wider community.	Maritime Authority and ESC	Report detailing likely costs and benefits of options. Report should identify preferred option for environmental assessment.	2005/2006	\$10,000 for cost / benefit analysis and reporting
			Undertake environmental assessments of recommended improvements to the bar prior to implementation.	ESC in consultation with DIPNR, Maritime Authority, DPI (Fisheries), Dept of Lands and other stakeholder departments	Environmental assessment report that assesses the potential environmental impacts of the preferred option and makes recommendations on the suitability of this option.	2005/2006	\$50,000 for environmental assessment
			Implement any necessary outcomes of the assessment when sufficient resources become available.	Maritime Authority and ESC	N/A	N/A	N/A

Table 4-3 Maintain a socially and environmentally sustainable oyster industry (SOI)

Management strategies	Overall Priority of Strategy	Discussion of strategy	Specific actions	Responsible organisation(s)	Expected outputs and measurables	Timing	Cost
SOI. 1 Improve the visual and safety aspects of oyster farming	M	There are some potential visual and safety issues with current oyster farming practices, particularly those relating to the excessive congestion of tributary entrances by oyster leases and management of abandoned / unused oyster leases and oyster rack materials.	Encourage oyster farmers (via the Oyster Growers Association) to voluntarily improve local oyster growing practices (where required), including the appropriate siting and signage of oyster lease areas and appropriate storage/removal of oyster racks in between and after usage.	DPI (Fisheries) and individual oyster growers	Maintain the oyster industry's public and visitor image. Improved safety and navigability in some waterways. Also potential reductions in rates of sedimentation around unused leases when they are removed.	2005 ongoing	Varies for oyster growers
SOI. 2 Review the Statement of Intent if released by the NSW Government as a result of the Healthy Rivers Commission (now defunct) Independent Inquiry into Oysters.	L	The Final Report was released in March 2003 and contained five key recommendations relating to the prioritisation of oyster growing in certain areas, and the interrelationship of oyster growing with catchment management.	Review Statement of Intent and implement specific outcomes (as required) in the Batemans Bay and Clyde River estuary.	DPI (Fisheries)/ DIPNR / ESC	N/A	N/A	N/A
SOI. 3 Determine the impacts of the local Pacific oyster populations on estuarine ecology.	L	The Pacific oyster is an introduced species that is capable of out-competing and displacing natural populations, including the native Sydney rock oyster. Pacific oysters have been listed as a noxious species in all NSW waters except Port Stephens under the <i>Fisheries Management Act 1994</i> . To prevent the further spread of Pacific oysters, NSW DPI Fisheries has issued guidelines to oysters growers with respect to inspections of oyster leases and complying with rules regarding the movement of oysters between estuaries.	Continuation of self-monitoring of Pacific oysters in leases.	Oyster Growers	Reduce the spread of Pacific oysters within and outside Batemans Bay.	2005 ongoing	Part of regular operation
			Continue reminders for lease inspections	DPI (Fisheries)	Continued surveillance of Pacific oyster populations within Batemans Bay.	2005 ongoing	Part of current agency responsibilities
SOI. 4 Gain improved understanding of the possible effects of oyster leases in promoting sedimentation in tributaries.	L	The possible effect of oyster leases in promoting sedimentation is presently unknown. In certain low tidal energy locations of the estuary (such as tributaries), oyster racks may be causing excessive sedimentation, leading to gradual shallowing.	Conduct research possible impacts of oyster leases in promotion of sedimentation. If insufficient information is found during research, initiate a scientific study to investigate sedimentation impacts. This study may involve comparisons of a control and active use site over a number of years. If significant impacts are identified, review locations of oyster leases in tributaries of the Clyde where sedimentation effects may have a significant impact on tidal flushing characteristics (and hence water quality). Possible alterations to leasing structures may thereafter be required to mitigate impacts.	DPI (Fisheries)	Increased understanding of the impacts of oyster leases in promoting sedimentation which may lead to a readjustment of lease boundaries/locations to improve tidal flushing characteristics of tributaries.	2006/07	Minimal in collaboration with University student research

Table 4-4 Promote waterway and foreshore based activities consistent with appropriate social and environmental impacts and waterway capability (WM) **

Management strategies	Overall Priority of Strategy	Discussion of strategy	Specific actions	Responsible organisation(s)	Expected outputs and measurables	Timing	Cost
WM 1 Clearing of dunal vegetation around the bar lead lights	H	Improvement of the visibility of bar lead lights to those trying to cross the Batemans Bay bar.	Provide approval to Maritime Authority for the sensitive clearing of dunal vegetation around the bar lead lights.	ESC	Improved visibility of lead lights.	Activity currently underway. Lead light visibility should be reviewed annually	Nil
WM 2 Support study into enhancing navigability and safety of Batemans Bay bar	H	See element NW 2	Support the Estuary Management Committee to seek agency funding for a study into enhancing the navigability and safety of the Batemans Bay bar.	See element NW 2	See element NW 2	See element NW 2	See element NW 2
WM 3 Design of all future public wharf facilities should consider disabled access requirements	H	Any new boating facilities need to consider disabled access requirements.	Consider disabled access when planning new boating facilities in Batemans Bay.	ESC	Improved boarding and disembarking for the elderly, infirm and disabled.	The Batemans Bay Foreshore Design is underway	No cost identified
WM 4 Install a 4-knot zone in Cullendulla Creek.	H	There is an identified need to regulate speeds in Cullendulla Creek to maintain its environmental values.	Install a 4-knot zone in Cullendulla Creek.	Maritime Authority	Reduce disturbance to wildlife, reduce wash and allow boaters time to observe and avoid shallow seagrass beds	A 'No Powerboat Area' has been designated by NSW Maritime	Existing funding program
WM 5 Use signage to improve boating safety adjacent to Cullendulla beach and Cullendulla shoal.	H	There is an identified need to inform boat/PWC users of risks of using vessels adjacent to Cullendulla beach and Cullendulla shoal.	Install south cardinal mark (defining a line beyond which boating activity shall be carried out with extreme caution) to limit boat and PWC use adjacent to Cullendulla beach and Cullendulla shoal.	Maritime Authority	Limit vessel use in shallow waters adjacent to Cullendulla Beach	Signage currently underway	Existing funding program
WM 6 Alter boat speed limits around Budd Island/McLeods Ck	H	Vessel speed is at present regulated to 4 knots in McLeods Creek and the oyster harvest area on the southern side of Budd Island. McLeods Creek is a very sensitive wetland with a quite narrow channel and healthy seagrass beds and mangrove communities. Their protection from wash or damage by a 4-knot limit is justified. However, a 4-knot limit in the concentrated oyster working area at Budd Island would be better replaced with a No Wash Zone. This would allow oyster growers to operate at speeds that do not cause wash, without unduly restricting their operations. It will also provide discouragement for private and hire vessels to enter this shallow and at times congested channel. A No Wash Zone at this location is to be recommended by this Plan.	Convert the existing 4-knot zone south of Budd Island around the oyster sheds to a 'No Wash' zone and maintain 4-knot zone in McLeods Creek upstream of the entrance.	Maritime Authority	More practical routine oyster barge movements in work areas.	2005	Existing funding program
WM 7 Relocate PWC usage areas and assess benefits	H	The Maritime Authority receives numerous complaints regarding PWC noise from residents near Corrigans Beach which needs to be by use of increased exclusion zones and ongoing monitoring of the success of this exclusion.	Extend the 200-metre exclusion zone to 300 metres from the PWC hire area to the southern end of Corrigans Beach. Relocate PWC hire area buoys to 300 metres off Corrigans Beach and assess impacts on PWC behaviour and noise.	Maritime Authority	Allow assessment of potential improvement in noise levels and hired PWC operator behaviour.	2005	Nil
WM 8 Maintain accurate complaint records regarding PWC usage	H	The Maritime Authority receives numerous complaints regarding PWC noise, the details of future complaints needs to be accurately recorded for future reference.	Actively manage PWC usage and monitor complaint numbers by locality.	Maritime Authority	Maintain high visibility in managing PWC usage and record incidents.	Complaints currently being recorded	Minor amendment to ongoing practices
WM 9 Encourage the provision of a purpose built refuelling facility at the Batemans Bay Marina	H	There is an identified need for refuelling facilities to be constructed at the Batemans Bay Marina to cater for the refuelling requirements for current and future expected usage levels.	Encourage the provision of a refuelling facility at the Batemans Bay Marina, once construction of the marine pumpout jetty is completed.	Dept Lands	Public boating access to refuelling to decrease the risk of spillages.	2005	Minor
WM 10 Expand existing marina at Batemans Bay as a regional centre	M	There is an identified need for additional marina berths in the Batemans Bay area. Expansion should address the needs of the wider boating community in the short and long term.	Given the recent growth of Batemans Bay as a regional centre and current waiting list for marina berths, high priority should be given to expansion of the marina by the Department of Lands. The expansion should address the needs of the wider boating community in the short and long terms and be consistent with the social and environmental objectives of this Plan.	Dept Lands	More berths within marina.	Current action	To be determined
WM 11 Identify additional safe mooring areas in Batemans Bay and/or Clyde River	M	A lack of sufficient safe mooring areas has been identified in Batemans Bay and the Clyde River. To avoid an ad hoc and potentially dangerous approach being taken to boat mooring planning for expected future usage needs to occur.	Carry out Environmental Review for proposed new mooring area in the lee of Square Head south of the Cullendulla shoal.	Maritime Authority	Clarify environmental issues and constraints to potential new mooring area.	A NSW Maritime investigation is currently underway	\$70,000

Management strategies	Overall Priority of Strategy	Discussion of strategy	Specific actions	Responsible organisation(s)	Expected outputs and measurables	Timing	Cost
WM 12 Monitor boat usage in the upstream reaches and tributaries of the Clyde River	M	Accurate details of levels of boat usage and mooring locations in potentially sensitive areas of the Clyde River need to be monitored to allow for identification of potentially related impacts.	Monitor boat use in the estuary above Cockwhy Creek and in the estuary's tributaries.	Maritime Authority	Casual observation of boating numbers in these areas for future plan updates.	Ongoing.	Additional staff may be involved
WM 13 Enforce the Maritime Authority Sewage Plan when introduced	M	The Maritime Authority Sewage Plan will prohibit the disposal of untreated sewage. Commercial and recreational vessels will need to meet different requirements under the Sewage Plan. In the preparation of this Plan commercial vessels were identified as posing the greatest sewage pollution risk as they carry a significant number of passengers on board, or as in the case of houseboats, have people living on board for extended periods, and as such are subject to the most extensive regulation.	Enforce the Maritime Authority Sewage Plan when introduced. In particular it is likely that this plan will place the following controls on sewage pollution from vessels: <ul style="list-style-type: none"> Commercial vessels (Class 1 and Class 4 e.g. ferries and houseboats) will need to install toilets and holding tanks. Owners / operators of Class 2 or 3 vessels (eg fishing vessels) will be required to undertake the necessary steps to ensure that no sewage is dumped in the water (eg: small portable toilet). Owners of Class 2 or 3 vessels will not necessarily need to install holding tanks; and Recreational boaters are not required to install tanks or portable toilets. Where toilets are not available and the boat is to be used for a long period, recreational boat owners can take a small portable toilet such as those used for camping. 	Maritime Authority	Maintain compliance with plan.	Ongoing.	Would require an increase in Maritime Authority staffing – potential cost \$80,000 p.a.
WM 14 Monitor impacts of informal foreshore camping	L	Monitor impacts of informal foreshore camping on those parts of the estuary foreshore above Nelligen.	Continue to monitor camping and associated toilet facilities on those parts of the estuary foreshore above Nelligen utilised informally as waterskiing camps to ensure this camping and associated activities are not having an adverse impact on water quality, bank stability, riparian vegetation or other key habitat areas (for flora and fauna).	ESC	Informal monitoring of these uses for pollution potential.	Ongoing annually	Minimal with water quality monitoring trips
WM 15 Promote commercial and recreational activities sympathetic with the nature and capabilities of the estuary	L	Certain types of commercial and recreational usage are more sympathetic to the capacity of the river, the river environment and adjacent landowners.	Promote passive recreation activities within the upper Clyde estuary around Shallow Crossing & Currowan.	ESC	Public information on the natural values of these parts of the estuary.	2010	\$10,000
			Ensure that the proposed Regional Boating Strategy is consistent with the requirements of this EMP. Any increases in boating may increase impacts in the areas of: <ul style="list-style-type: none"> water quality (high concern) demand for boat storage (high concern) bridge raising (high concern) demand for mooring (medium concern) demand for access (medium concern). noise/visual impacts (low concern) 	ESC	Increased boating levels which do not negatively impact on the existing highly valued aspects of the Clyde River and Batemans Bay (see Appendix A).	2005 ongoing	Minimal
WM 16 Examine potential for improved facilities for public use of Public Lands, e.g. National Parks and State Forest foreshores	L	Existing informal foreshore camping areas in National Parks and State Forests could potentially be improved to better cater for existing and potentially increased future usage. This strategy requires an examination of the feasibility of formalising/improving existing facilities to reduce any adverse environmental/social impacts and to potentially promote additional usage of these facilities with locals and tourists to the area.	Examine the potential for water based recreation development in National Parks and State Forests including funding sources.	ESC, DIPNR, State Forests and DEC	Improved facilities for public use of National Parks and State Forest foreshores.	2008 to 2012	Feasibility assessments \$20,000 - \$30,000

** Full version of Waterway User Management Plan included in Appendix B

Table 4-5 Maintain visual amenity of estuary, foreshores and outlooks (VA)

Management Strategies	Overall Priority of Strategy	Discussion of strategy	Specific actions	Responsible organisation(s)	Expected outputs and measurables	Timing	Cost
VA. 1 Ensure development controls are sympathetic to the visual amenity of the estuary, foreshore and outlooks so that these are retained.	H	Aims to reinforce community values placed on aesthetic appreciation of the estuary and its foreshores. The strategy also aims to address concerns regarding current/future coastal development by aiming to minimise the scale and style of development at highly visual locations from the estuary. This strategy is consistent with the State Government's Coastal Policy.	Ensure compliance of proposed coastal developments with the recently adopted Residential Development Control Plan requirements and in particular height limits and building style.	ESC	Consistency of approved developments with current local and regional planning controls.	2005 ongoing	Minor, already part of DA process
			Identify highly visual and/or sensitive locations from the Bay and river, which should be protected against development, or may require sympathetic styles of development (e.g. maintenance of existing vegetation or special building types, sizes or colours). Document visual/aesthetic requirements.	ESC	Documentation identifying highly visual and/or sensitive locations from the estuary and river, with recommendations on how these areas should be protected.	2006	\$20,000
			Based on results of assessments, modify planning controls (e.g. local Development Control Plans DCP's or planning guidelines) and incompatible work practices (such as material dumping on foreshores), in highly visual or sensitive areas, to minimise the scale and style of development and other foreshore works.	ESC	Updated planning legislation that protects highly visual or sensitive areas from visually inappropriate/unsympathetic development	2006	Development of planning controls part of core role of Strategic Planning section
VA. 2 Remove unauthorised riverbank protection works around Nelligen and Sheep Station Creek	L	A number of unauthorised foreshore structures have been built on private land around Nelligen and Sheep Station Creek. Unauthorised structures will gradually be removed and foreshore lands rehabilitated.	Identify landowners around Nelligen and Sheep Station Creek with unauthorised riverbank protection works. Unauthorised works are to be gradually removed to allow for the future rehabilitation of the riverbank and improvement of the aesthetic qualities of the Clyde River and its tributaries. No structures should be removed without full consideration of potential impacts of exposing sections of the riverbank to erosional processes.	Council (Lands Department to get involved with structures in the bed of the river or below the MHW mark)	Preservation of scenic amenity	2010	N/A

Table 4-6 Protect Fishery Resources (FR)

Management strategy	Overall Priority of Strategy	Discussion of strategy	Specific actions	Responsible organisation(s)	Expected outputs and measurables	Expected timing	Indicative cost
FR. 1 Scientifically assess the potential impacts of commercial and recreational fishing on the aquatic habitats and species of Batemans Bay and the Clyde River.	H	Scientifically assess the potential impacts of commercial and recreational fishing on the aquatic habitats and species of Batemans Bay and the Clyde River. Future development of management controls may be required to address any identified issues to ensure the long-term viability of fish habitats/populations and productivity for commercial and recreational purposes.	Undertake creel surveys and a review of existing data to assess patterns in fishing effort and catches in the estuary. This survey should consider the relative impacts of recreational and commercial fishing. The study should employ best practice survey design and sampling techniques, and be undertaken by an appropriately qualified marine ecologist with a strong background in fisheries science. Assessments should also identify any significant impacts to key aquatic habitats (i.e. seagrasses) to the breeding cycle of fish [as detailed in element SSM 1] occurring from boat usage (e.g. moorings or boat passage) [as detailed in element WM 11]. Consideration should be done to assessing impacts on a region wide (eg catchment management authority scale or Local Government Area scale) so as to potentially address impacts occurring in other estuaries, e.g. issue in Moruya River. Transference of results of studies to the broader community to educate community as to the impacts of recreational/commercial fishing and associated boating activities.	ESC and DPI (Fisheries)	Better understanding of the impacts of recreational and commercial fishing and boating activities on fish stocks and key fisheries habitats in Batemans Bay and the Clyde River. Protection of areas of the estuary (as required) by suitable mechanisms (such as Fishing Closures) to promote sustainable usage of the estuary and address community concerns. Better informed community that appreciates impacts of recreational/commercial fishing and associated boating activities.	2005 to 2007	\$40,000 to \$50,000, but may apply for funding from DPI (Fisheries) Saltwater Recreation Fishing Trust Fund as two of this fund's priorities are: • Recreational fisheries research • Recreational fisheries' sustainability and habitat improvement.
			If as a result of these investigations there are identified impacts resulting from recreational and/or commercial fishing/prawning activities or, Council will approach DPI (Fisheries) to undertake actions to manage impacts (e.g. by declaring additional Fishing Closures or creation of new Fish Habitat Protection Plans 1 or 2).	DPI (Fisheries) to apply appropriate protections if necessary	Additional protected areas within Batemans Bay and/or the Clyde River	Post 2007	Part of current Fisheries role

Objective 3 Consider implications of coastal foreshore hazards and other ocean impacts in development planning

Table 4-7 Foreshore Hazards and Ocean Impacts (FHOI)

Management strategies	Overall Priority of Strategy	Discussion	Specific actions	Responsible organisation(s)	Expected outputs and measurables	Timing	Cost
FHOI. 1 Integrate objectives of Batemans Bay Coastline Hazard Management Plan with the Estuary Management Plan and ensure these are implemented in development planning and approvals.	H	<p>The impacts of ocean surges, storm waves, tidal waves and other foreshore hazards are of particular relevance to past, present and future development in the low-lying estuarine foreshore areas of Batemans Bay. The cost of remediation works to address coastal hazard impacts on existing development is usually borne by the community through local council and state government funds.</p> <p>The Batemans Bay Vulnerability Study identified coastline hazards, which require addressing. The BB Coastline Hazard Management Plan (BBCHMP) provides details of actions, which can be implemented to address the identified issues in foreshore and back beach areas. It considers climate change, aesthetics, recreational amenity, and social, economic and ecological issues. It proposes preferred management options including voluntary purchase of land, building setbacks, minimum floor levels, foreshore building protection, and relocation of assets.</p> <p>Implementation of specific coastal hazard management options that are consistent with the EMP objectives will result in design of future developments that are minimally impacted by coastal hazards, and that do not create more coastal problems.</p>	<p>Document any inconsistencies between the objectives of the EMP and the proposed actions in the BBCHMP, and develop proposals to resolve any inconsistencies.</p> <p>Ensure that assessments of development applications fully consider the implications of foreshore hazards and that development approvals require consistency with the actions in both the EMP and the BBCHMP.</p> <p>Specific actions identified in the BBCHMP which overlap with this EMP include (by area):</p> <ul style="list-style-type: none"> • Central Business District – Incorporate training wall repairs and reshaping as part of foreshore redevelopment; • Wharf Road - Monitor beach movement and need for foreshore protection or voluntary purchase of property; • Surfside Beach – Monitor beach behaviour and current Emergency Response Plans; • Cullendulla Beach – monitor the need to relocate sewer rising main; • Long Beach (central third) – Monitor need for dune raising and beach nourishment on the Sandy Place frontage and a revetment wall with beach nourishment on the Bay Road frontage; • Corrigans Beach – Monitor and plan for retreat of first row of foreshore caravan parks development at southern end; and • Caseys Beach – Hazard-proof seaward face of vulnerable development on Beach Road by planning controls as redevelopment occurs. 	ESC and DIPNR	<p>Consistent implementation of actions included in the BBCHMP and this EMP.</p> <p>Future developments that do not create further coastal hazard problems and that are impacted minimally by coastal hazards and ocean inundations.</p> <p>Less cost to the community of works to protect foreshore developments.</p> <p>Less alienation of foreshore land from public access.</p>	2005 ongoing	Existing role of ESC
FHOI. 2 Consider potential impacts of sea level rise on estuarine and foreshore structures and ensure these are implemented in development planning and approvals.	H	<p>The full potential impacts of climate change are still being assessed. However, sea-level rise is one potential outcome of this process and irrespective of the degree of sea-level rise there is a need for the coastal and foreshore planning around the Clyde River and Batemans Bay estuary to take into consideration the potential impacts of sea level rise.</p>	<p>Review outcomes of the Comprehensive Coastal Assessment (CCA) when available. The CCA is presently being undertaken by DIPNR. The primary aim of the CCA is to collate information for use by the NSW State Government, local governments, industry and community to inform strategic planning and local decision-making.</p> <p>Part of the CCA process includes the 'Coastal Lands Risk Assessment', which identifies which lands are most vulnerable to extreme weather events and the effects of other coastal processes.</p>	DIPNR and ESC	Altered planning and design of foreshore structures and areas to accommodate potential impacts of climate change and associated sea level rises.	2005 ongoing	Existing role of ESC and DIPNR
			<p>Based on the outcomes of the review, planning policy and/or approaches should be altered in order to minimise the potential for loss of life and foreshore assets (and may include the use of development setbacks, strategic retreats or buybacks, altered design, etc).</p> <p>In the interim period until the results of the CCA are available, the precautionary principle should be applied in the assessment of coastal developments.</p>	DIPNR and ESC	Altered planning and design of foreshore structures and areas to accommodate potential impacts of climate change and associated sea level rises.	2005 ongoing	Existing role of ESC and DIPNR

5 MEDIUM PRIORITY OBJECTIVES

Objective 4 Protect and enhance ecological communities and habitats, and overall estuarine health

Table 5-1 Protect, and where appropriate rehabilitate, riparian vegetation corridors (RV)

Management strategies	Overall priority of Strategy	Discussion of strategy	Specific actions	Responsible organisation(s)	Expected outputs and measurables	Timing	Cost
RV. 1 Protect riparian vegetation through the implementation of planning controls.	H	The protection of riparian vegetation is recognised to assist in maintaining water quality in waterways, whilst also potentially providing habitat and allowing for the movement of faunal species throughout the estuary and its catchment. The Clyde River estuary presently has reasonable riparian vegetation coverage throughout the catchment, although approximately a quarter of the riparian coverage is considered sparse or absent. This strategy is consistent with community concerns regarding the need to protect riparian corridors and other sensitive areas.	Controls should be placed on any further clearing of riparian corridors along the Clyde River to a minimum distance of 100m from the bank. Possible mechanisms are by Development Control Plan (DCP) amendment or by the creation of a riparian reserve zone in the Rural Local Environmental Plan (LEP) (currently under review).	ESC	Amendment of existing LEP's, planning policies and Development Control Plans etc to prevent any further clearing of riparian vegetation along the Clyde River and its tributaries.	2005/06	Core component of Council's Strategic Planning role; part of current review of LEPs and associated planning controls
			<ul style="list-style-type: none"> Identify a 100 metre riparian corridor width in the Nelligen Creek Rural 1c zone for preservation. Apply Strategic Environmental Assessment Tool for analysis of suitability of land for development 	ESC/DIPNR	Amendment of existing LEP's, planning policies and Development Control Plans etc to prevent any further clearing of riparian vegetation along Rural 1c sections of Nelligen Creek.	2005 – currently in use	As above
			Identify and document appropriate riparian corridor widths for lower order streams (i.e. tributaries) in developing areas, suggested widths listed in the EMS are: <ul style="list-style-type: none"> 40 metres from the top of each bank for permanent tributaries 20 metres from the top of each bank for intermittent tributaries 	SRCMA	Prevention of any further clearing of riparian vegetation along the Clyde River and its tributaries.	2005/06	Minor
RV. 2 Enhance areas of riparian vegetation that will assist in improving stormwater quality, faunal movement or provide key habitat.	H	Improvement of riparian vegetation in specific areas may assist in improving stormwater quality, faunal movement or provision of key habitat.	Identify areas where riparian vegetation improvement is likely to have significant benefit in improving stormwater quality, faunal movement or provision of key habitat. Priorities should be documented in a report to provide for a basis for the planning of future rehabilitation requirements. Documenting priorities will facilitate future funding applications.	ESC	Report identifying priority areas for rehabilitation.	2007 onwards	\$10,000
			Disseminate information to landowners and Landcare groups for implementation.	CMA	Widespread understanding of priority rehabilitation areas and rehabilitation requirements.	2007 onwards	Minor
			Coordinate on-ground rehabilitation works including re-planting and fencing to keep livestock out of riparian zone	DIPNR (through Landcare)	Areas of riparian vegetation fenced, and replanted. Increased quantity and quality of riparian vegetation and associated water quality and biodiversity benefits.	2007 onwards	Potential for future Envirofund and Landcare grants when groups form
RV. 3 Address any poor management practices that may be occurring on Crown Land Leases, particularly those fronting onto the estuary and its tributaries.	M	The Estuary Management Study (Table 3.5) identifies several Crown Land Lease Licences (LI) or Permissive Occupancies (PO) that appear to allow for landuse that may be inconsistent with best practice estuary management principles, such as waterfront grazing of cattle. Management of these lands should not compromise the health of the estuary.	Review and amend all Licences (LI) or Permissive Occupancies (PO) of Crown Lands on the foreshores of Batemans Bay and/or the Clyde River (and its tributaries) that may be compromising the health of the estuary. This may require discussions with the current leasees and review of on-site management practices. Table 3.5 of the Estuary Management Study includes a review of all current LI and PO of concern to the estuary.	Department of Lands and ESC	Improved protection of riparian zone under lease arrangements.	2007/08 onwards	Incorporate within Department work program.
RV. 4 Review alternatives for slashing riparian vegetation in power line easements at wetland and creek crossing locations.	L	Clearing to the waterline can place unnecessary environmental pressure on the estuary.	Negotiate with Country Energy to reach an agreement on retaining suitable riparian vegetation strips in powerline corridors.	Country Energy/ESC	Reduced silt load to estuary, creeks and wetlands from power easements	2006	Minor

Table 5-2 Protect and enhance overall estuarine health and health / extent of existing seagrasses, saltmarshes, mangroves and other key estuarine habitats (SSM)

Management strategies	Overall Priority of Strategy	Discussion of strategy	Specific actions	Responsible organisation(s)	Expected outputs and measurables	Timing	Cost
SSM. 1 Verify extent and condition of existing key estuarine habitats and identify trends in extent and condition to enable formulation of appropriate protective instruments.	M	Saltmarsh, mangroves and seagrass communities (which are often contained in wetlands in estuarine areas) have extensive habitat values and are recognised as contributing to the overall health and biodiversity of estuaries. Many of these communities have been significantly degraded in many estuaries along the NSW coast as a result of historical actions in the catchments of estuaries. These communities are now protected under various legislation, however, their geographic distribution needs to be monitored to allow for the identification of trends in their extent and condition. Armed with this knowledge appropriate protective instruments can be developed and implemented. However, this relies on the collection of sufficient habitat information. Also, saltmarsh has recently been listed as an endangered ecological community under the NSW Threatened Species Conservation Act, therefore in this catchment, the development of appropriate protective instruments is a high priority.	Obtain GIS layers (available 2005) and data from DPI (Fisheries) that have recently been created as part of the Comprehensive Coastal Assessment program that has mapped the extent of saltmarsh, mangrove and seagrass communities in 101 NSW estuaries. These layers should be incorporated in ESC's GIS database.	ESC/DPI (Fisheries)	Establishment of a comprehensive database of saltmarsh, mangrove and seagrass in Council's GIS database.	2005 ongoing	Minor
			Verify and record the condition of saltmarsh, mangroves and seagrass communities (and wetlands) within the estuary. Identify any threats to these key estuarine habitats by analysis of historical data on the extent and condition of these communities. Results of the assessment should be documented and uploaded to be included in Council's GIS database.	ESC	Establishment of a database of information on the condition of key estuarine communities that can be used to identify long-term trends and threats	2006/07	\$30,000 - 40,000
			Develop planning and management actions to protect threatened key habitat areas. Examples may include updating Council Development Control Plans, entering into conservation management agreements with private landholders, implementing on the ground works such as fencing out livestock, etc.	ESC/DIPNR	Outcomes may include: <ul style="list-style-type: none"> • Planning/management agreements established for key estuarine habitats • Onground works to protect habitats, including fencing, improved stormwater treatments, removal of weeds or other pest species, etc 	2006/07	Possible funding from NSW environmental grants
			Undertake regular (3-4 yearly), rapid biological assessments surveys of the extent and condition of key estuarine habitats. This should include seagrass health (maximum depth) assessments, as well as mapping studies (with ground-truthing) of key estuarine vegetation extent and condition. Database of extent/condition should be interrogated during assessments to identify any habitat degradation.	ESC	Maintenance of a database of information on the condition of key estuarine communities that can be used to identify long-term trends and threats	2009/10 and 3 to 4 yearly after that	\$30,000 - 40,000 per survey
SSM. 2 Continue public awareness program to reduce opportunities for <i>Caulerpa taxifolia</i> and other invasive aquatic species being introduced to the estuary.	M	If present in the estuary, the invasive marine plant, cold tolerant <i>Caulerpa taxifolia</i> would threatens coastal ecosystems in NSW. By growing quickly, it overruns seagrasses and alters marine habitats. <i>Caulerpa taxifolia</i> can easily be spread from infected estuaries. Because of the threat it poses, <i>Caulerpa taxifolia</i> is listed in NSW as noxious marine vegetation under the Fisheries Management Act. The management strategy for <i>Caulerpa taxifolia</i> allows for all other Natural Resource Management Agencies to assist DPI (Fisheries) in its control.	Continue as a high priority the implementation of the NSW Control Plan for the noxious marine weed <i>Caulerpa taxifolia</i> in NSW Waters. The control plan was released in February 2004 and is available at: http://www.fisheries.nsw.gov.au/thr/species/caulerpa/pdf/caulerpa-control-plan.pdf	DPI (Fisheries) has the primary responsibility. Council, DEC, NPWS, Maritime Authority and DIPNR may be required to assist.	Prevent the introduction of <i>Caulerpa taxifolia</i> to the Batemans Bay and Clyde River estuary.	2005 ongoing	Current program is ongoing. Incorporate into NSW - wide program.
			Vigilance by agencies and waterway users especially with future increases in waterway usage and redevelopment of the Batemans Bay marina	Boating community / DPI (Fisheries) / Maritime Authority	Prevention of marine weeds entering Batemans Bay. Early identification of infestations	2005 ongoing	None

Table 5-3 Protect/enhance vulnerable (terrestrial) vegetation ecosystems and key fauna habitats and linkages (VV)

Management strategies	Overall Priority of Strategy	Discussion of strategy	Specific actions	Responsible organisation(s)	Expected outputs and measurables	Timing	Cost
VV. 1 Utilise existing planning instruments to protect vulnerable (terrestrial) vegetation ecosystems and key faunal habitats/linkages. Where possible these habitats/linkages should be enhanced.	M	<p>Previous scientific investigations have identified vulnerable terrestrial vegetative communities, key faunal habitats and key linkages (for fauna) between vegetative communities.</p> <p>Inappropriate development including subdivision/urban development, commercial development, rural development, road, powerline or pipeline construction activities may infringe on these vulnerable communities or may sever faunal linkages between habitat areas. To maintain existing vulnerable communities and faunal linkages, these areas need to be identified in Council GIS mapping databases and specific development controls need to be triggered when considering any form of development in the catchment. Where it is identified that vulnerable communities have been degraded or faunal linkages damaged, selected works should be undertaken to enhance their values.</p> <p>The Plan is primarily interested in vulnerable vegetative communities and linkages which exist in the foreshore or riparian zones of the estuary.</p>	Protect existing vulnerable ecosystems and key fauna habitats and linkages through planning controls including the review of the Rural LEP and associated DCPs.	ESC	Protection of existing vulnerable terrestrial vegetation areas, key habitat areas and/or key faunal movement corridors.	2005 ongoing	Existing role of ESC
			Where required, refine key habitat areas and/or key faunal movement corridors. This information should be updated to Council's GIS database [see also SKD-1].	ESC	Refinement of existing scientific data on vulnerable vegetation communities, key faunal habitats and linkage paths. Updated GIS mapping databases.	2005/2006 for development of material and planning review.	N/A depends of quality of existing information
			Once the ecological mapping layers have included on Council's GIS database system. An information package should be prepared for distribution to landowners/Government departments who have been identified as having vulnerable vegetation communities, key habitats and/or key faunal movement corridors located on their property. The information package should outline location of the vegetation/habitat/linkage and what the implications of this are for the land owners.	ESC	Widespread education of landowners within the catchment in relation to vulnerable vegetation communities, key faunal habitats and linkage paths that exist on their properties and the implications of this for them.	2006	\$10,000
			Interrogate the vulnerable vegetation, key habitat and/or key faunal movement corridor mapping layers as part of the development assessment process [integrate with SKD-1]. Where conflicts exists, appropriate planning controls and/or management actions should be applied to control potential impacts of development on these areas.	ESC	Avoidance of unsuitable or incompatible development with the requirements of the vulnerable vegetation communities, key faunal habitats and faunal linkage paths.	2006 ongoing	Existing role of ESC
			Continue to expand the Eurobodalla Flora and Fauna Habitat Recovery and Incentives Program in to the Clyde catchment.	ESC	Greater rates of habitat recovery through additional funding to landowners.	2006 ongoing	\$100,000 over next five years continue to seek CMA and NHT grants to support program.
			Where sections of the riparian zone of the Clyde River and its tributaries have been identified as vulnerable vegetation, potential key habitat areas and/or key faunal movement corridors, these areas should be prioritised for protection and if degraded, rehabilitated [see also SSM 1 and RV2].	ESC	Areas of riparian vegetation fenced, and replanted with suitable species to improve its habitat potential and suitability for faunal movement.	2006 ongoing	See above.
VV. 2 Investigate the inclusion of Snapper Island into National Parks estate and improve management to protect penguin colony and for breeding of the Sooty Oyster Catcher.	L	Improved data on Snapper Island's flora and fauna would assist to determine appropriate management options and the best management organisation.	Perform flora and fauna surveys of Snapper Island utilising NPWS expertise in order to develop specific management guidelines for public access and use of the island.	ESC/NPWS	Improve management of the island's natural resources.	2008 to 2010	\$5,000

Objective 5 Improve the scientific knowledge database relating to Batemans Bay and the Clyde River

Table 5-4 Improve the scientific knowledge database (SKD)

Management Strategies	Overall Priority of Strategy	Discussion of strategy	Specific actions	Responsible organisation(s)	Expected outputs and measurables	Timing	Cost
SKD 1 Determine the status of shorebirds (includes migratory birds) and terrestrial fauna species utilising the estuary and integrate this data with Council's GIS planning databases.	M	<p>The Estuary Processes Study – Ecology Component (WBM, 2000) identified a lack of information (and hence need for further investigation) on shorebirds and terrestrial fauna at and adjacent to the study area (see Figure 1-1), although the area is thought to be an important site for at least five protected wading bird species.</p> <p>More detailed information on important areas and habitats for protected/threatened/rare shorebirds and terrestrial fauna will assist managers in identifying current/future threats and provide data to the ongoing management of this aspect of the estuary.</p>	<p>Initiate systematic shorebirds and terrestrial fauna surveys in representative habitats in the estuary. This information should be integrated with the requirements of element VV-1. Use also information gathered under element VV-2.</p>	NPWS	More detailed scientifically based ecological data for use in planning and management decisions.	2005/06	\$20,000 - 40,000
			<p>Liaise with the Eurobodalla Natural History Society to add its threatened fauna and migratory birds records to Council's threatened species GIS layer (where it provides data additional to that already supplied by the NPWS threatened species database).</p>	ESC	Historical/current details of species and their distribution in the estuary. Will add to NPWS data, and may also be used in determine trends from this information.	2006/07	Minor
			<p>Collate all new data with NPWS data onto ESC's GIS system to develop a comprehensive database of critical habitat (for protected/rare/threatened species). Note that critical habitats will be protected under element VV-1 which requires that development proposals are assessed for their potential impacts on vulnerable vegetation, key habitat and/or key faunal movement corridor</p>	ESC	Comprehensive database on critical habitats which will be used by ESC Council to exclude any deleterious activities and developments, etc.	2006/07	\$10,000

Objective 6 Integrate aspects of the Estuary Management Plan with Southern Rivers Catchment Action Plan

Table 5-5 Integrate with Southern Rivers Catchment Action Plan (CAP)

Management strategies	Overall Priority of Strategy	Discussion	Specific actions	Responsible organisation(s)	Expected outputs and measurables	Timing	Cost
CAP 1 Work to ensure that the priority actions of the EMP are integrated into the forthcoming Southern River Catchment Action Plan (SRCAP) and that funding for implementation of the SRCAP helps support implementation of priority actions from the EMP	M	<p>The South East Catchment Blueprint contained number of recommendations related to the Clyde River and Batemans Bay estuary and catchment (refer to WBM, 2004, Appendix A). The Blueprint is soon to be superseded by the Southern Rivers Catchment Action Plan (SRCAP). Many of these recommendations contained in the SRCAP are likely to overlap with the objectives of this Estuary Management Plan. Implementation of the SRCAP's recommendations is essential to the long-term sustainable management of the unique ecological and social values of this estuary.</p> <p>Also, the Clyde River was identified in the South East Catchment Blueprint as a high conservation river, and as a result various processes have been prioritised. The Estuary Management Plan needs to take into account the timing requirements for actions recommended in the SRCAP.</p> <p>The EMP should align with the objectives of a SRCAP, requiring a review of the EMP when the SRCAP is released.</p>	<p>Work closely with the Southern Rivers Catchment Management Authority (CMA) and state agencies to encourage integration of EMP and SRCAP, and funding of parts of the EMP through SRCMA processes. The SRCMA and State Natural Resource Agencies to continue to implement the recommendations of the SRCAP. State Natural Resource Agencies to ensure that the requirements of the Estuary Management Plan do not override any specification in the SRCAP but operate concurrently with its requirements.</p>	Southern Rivers CMA and other State Natural Resources agencies	<p>Integration of SRCAP and EMP outcomes and work towards achievement of these outcomes through Cap funding support.</p> <p>Consistent implementation of the SRCAP requirements for the Batemans Bay and Clyde River Estuary.</p>	2005 ongoing	May be an avenue for additional funding through the SRCMA.

6 ADDITIONAL CONSIDERATIONS

6.1 Funding Requirements

The funding requirements for full implementation of the Estuary Management Plan is expected to be in the range \$0.5M to \$0.7M, with a further \$150K to \$200K as ongoing expenditure over the next ten years (operational works costs are highly influenced by potential extra staff resources required by the Maritime Authority and ongoing dirt road sealing). Cost estimates are indicative only and are spread across several Government agencies. Costs do not take into consideration any government grants or external funding which is further discussed in Section 6.2.

Also, it should be noted that the costs for some actions have not been included in the above totals, as they have been assumed to fall into existing Departmental budgets.

6.2 Possible Funding Sources

There are a number of Federal and State government grants that can be obtained for works relating to Estuary Management. These include:

- Australian Government Envirofund grants, for activities that fit within:
 - Landcare;
 - Bushcare;
 - Rivercare; and
 - Coastcare.
- Australian Government Natural Heritage Trust funding, assessed and distributed regionally through the Southern Rivers Catchment Management Authority (SRCMA);
- National Landcare Program, also to be assessed as regional funding through the SRCMA;
- Department of Infrastructure, Planning and Natural Resources (DIPNR) Estuary Management grants;
- DIPNR Coastline Management grants;
- DEC's Environment Trust Grants for:
 - Restoration and Rehabilitation;
 - Research; and
 - Education;
- Maritime Authority's Waterways Asset Development and Management Program (WADAMP) grants for waterways infrastructure; and
- DPI (Fisheries) Saltwater Recreational Fishing Trust.

State Agencies including DPI (Fisheries), NPWS, Maritime Authority and DIPNR may also be able to provide in-kind contributions, if projects align with their program priorities, aims and objectives.

Other in-kind contributions could also come from various educational institutions (such as universities, who could use the estuary for specific data collection or research projects), as well as volunteer community groups, such as local Landcare or Creekcure groups.

A number of the actions in the Plan comprise the core work of different sections of Council. Some actions will not require additional funds (eg strategic planning) while other actions (eg road works) will require dedicated budgets within Council's Management Plan.

Eligibility for matching funding under either State or Federal Government grants programs, outlined above, should be examined. In addition to these, all works outlined in this Estuary Management Plan are eligible for part funding under the NSW Government's Estuary Management Program, administered by DIPNR.

Table 6-1 details potential grant funding sources for various strategies nominated in the Plan.

Table 6-1 Potential Grant Funding Applications

Strategy	Details	Funding Source	Funding Estimate
FR 1	Assess impacts of commercial and recreational fishing	Recreational Fishing Trust	\$50,000
WQ 2	Enhance water quality monitoring program	CMA	\$20,000 p.a.
WQ 8	Gravel road upgrading in priority areas	NSW Government funding	Undetermined
NW 2	Technical review and assess cost/benefits of bar improvements.	WADAMP	\$70,000
CAP 1	Integration of EMP with CMA's CAP.	CMA	Undetermined
RV 2	Enhance riparian vegetation and encourage new Landcare groups by public education.	Envirofund / Landcare	\$20,000 education program
SSM 1	Seagrass, saltmarsh and mangrove health assessment and management	Envirofund	Undetermined
WQ 11 WQ 12	Marine pumpout facilities and portable toilet waste facility at Nelligen	NSW Government funding	\$400,000
VV 1	Improve fauna corridors, key habitats and vulnerable vegetation including public education.	Envirofund / Landcare	Undetermined

7 REFERENCES

- ANZECC (2000), *Australian Water Quality Guidelines for Fresh and Marine Water Quality*.
- DLWC (1999), *Stressed Rivers Assessment Report*, NSW State Summary.
- DLWC (2000), *Vulnerability Assessment of Estuaries in Eurobodalla and Bega Valley Shires*, draft report. Report prepared for Eurobodalla and Bega Valley Shires.
- Department of Environment and Conservation (2004), *Managing Urban Stormwater: Urban Design*, draft report.
- Eurobodalla Shire Council (2001), *Urban Stormwater Quality Management Plan*.
- Environment Australia (2001), *A Directory of Important Wetlands*.
- Healthy Rivers Commission (2003), *Independent Review of the Relationship between Healthy Oysters and Healthy Rivers*, Final Report.
- NSW Government (1992), *Estuary Management Policy*.
- NSW Government (1997), *Coastal Policy*.
- South East Catchment Management Board (2003), *South East Catchment Blue Print*.
- WBM (2000), *Batemans Bay and Clyde River Estuary Processes Study*. Report prepared for Eurobodalla Shire Council.
- WBM (2003), *Batemans Bay/Clyde River Community Workshop Background Document*. Unpublished report prepared for Eurobodalla Shire Council.
- WBM (2004), *Batemans Bay and Clyde River Estuary Management Study*. Report prepared for Eurobodalla Shire Council.
- Webb, McKeown and Associates (2003) *Batemans Bay Coastline Hazard Management Plan*. Report prepared for Eurobodalla Shire Council

7.1 Suggested Further Reading on Estuary Management

- Scheltinga DM, Counihan R, Moss A, Cox M, Bennett J (2004) *Users' guide to Estuarine, Coastal and Marine Indicators for Regional NRM Monitoring* Report prepared for DEH, MEWG, ICAG by the CRC for Coastal Zone, Estuary and Waterway Management (Coastal CRC)
- Smith TF, Sant M, Thom B (2001) *Australian Estuaries: A Framework for Management*, Prepared by Cooperative Research Centre for Coastal Zone, Estuary and Waterway Management (Coastal CRC)
- Peirson WL, Bishop K, Van Senden D, Horton PR and Adamantidis CA (2002), *Environmental Water Requirements to Maintain Estuarine Processes*, School of Civil and Environmental Engineering, University of New South Wales.

7.2 Suggested Relevant Web-Sites

<http://www.batemans-ems.com.au>

<http://www.coastal.crc.org.au>

<http://www.dlwc.nsw.gov.au/care/water/estuaries/estuaries.html>

<http://www.dec.nsw.gov.au>

<http://www.dipnr.nsw.gov.au>

<http://www.dpi.nsw.gov.au>

<http://www.eurocoast.nsw.gov.au>

<http://www.fisheries.nsw.gov.au>

<http://www.ga.gov.au>

<http://www.hrc.nsw.gov.au>

<http://www.nationalparks.nsw.gov.au>

<http://www.nambucca-ems.com.au>

<http://www.nlwra.gov.au>

<http://www.ozestuaries.org>

<http://www.safefood.nsw.gov.au>

<http://www.maritime.nsw.gov.au>

7.3 Glossary of Terms and Acronyms

Algae	Single celled aquatic organisms, that grow by uptaking nutrients
Alluvial	Relating to the sedimentation process resulting from catchment erosion
Aquatic	Relating to the water
Aquatic community	The ecological community that exists within the water
Artificial opening	Opening of a closed estuary entrance using manual techniques, such as bulldozers, excavators etc
Bacteria	Water-borne microscopic organisms
CAMBA	China Australia Migratory Bird Agreement
Catchment	Total area that drains to a particular receiving waterbody
Catchment Action Plan	Formal plan outlining objectives and strategies for long term management of a catchment (is proposed to replace the existing SECB)
CMA	(Southern Rivers) Catchment Management Authority
Contaminant	Substance that can contaminate or influence an environment

Critical habitat areas	Areas within the catchment and around a waterway that provide essential value to the ecological communities that reside within the area
DEC	Department of Environment and Conservation (formerly Environment Protection Authority and National Parks and Wildlife Service)
Degraded sensitive areas	Sensitive areas that are degraded through a lack of vegetation for example
Depositional zone	Part of an estuary where sediment from the catchment settles to the bed because of slow water movement
DIPNR	Department of Infrastructure, Planning and Natural Resources (formerly Land and Water Conservation and Planning NSW)
DPI	Department of Primary Industries (formerly NSW Fisheries and NSW Agriculture)
Ecologically Sustainable Development (ESD)	Development within or around an environment that is designed to ensure that the environment is not degraded in the future by the development specifically
Environmental Flows	Minimum flows within a waterway that required to maintain ecological functions
ESC	Eurobodalla Shire Council
Estuary	Coastal waterway that is subject to tidal processes either permanently, or on an intermittent basis
Estuary Processes Study	A study carried out under the NSW Government's Estuary Management Program that describes all estuary processes and their interactions
Estuary Management Plan	A formal planning document prepared under the NSW Government's Estuary Management Program that describes a series of strategies to improve the long-term sustainability of an estuary
Estuary Management Study	A study carried out under the NSW Government's Estuary Management Program that formulates and assesses a range of options to improve the long-term sustainability of an estuary
Estuarine processes	The physical, chemical and biological processes that occur within an estuary
Faecal contaminants	Contaminants that are derived from faeces
Fin-fish	Aquatic fauna species that contain fins (ie fish) – differs from other species such as crustaceans
Flora and fauna	Plants and animals
Hydrology	Relating to the movement of water
Hydrological range	The range that water levels can vary within an estuary. This is different from the tidal range as it pertains to not just tidal processes, but also bulk water storage when the estuary entrance is closed
Implementation	The carrying out of strategies or actions
Implementation schedules	A series of tables that outline the specific details of how strategies and actions are to be carried out
Intertidal zone	Part of an estuary that is located between high tide and low tide (and thus is inundated intermittently and regularly)
JAMBA	Japan Australia Migratory Bird Agreement
Key Management Issues	Issues of significant concern that have been identified for the estuary that require future management
LEP	Local Environment Plan (Primary Council planning instrument)
Littoral rainforest	Rainforest that is located along the coast and contains specific coastal species
Management Objectives	The main targets for the Estuary Management Plan
Management Strategies	The actions required to fulfil the Estuary Management Plan)
Mangrove	Large aquatic plant that lives within the intertidal zone
Maritime Authority	Formerly Maritime Authority Authority
Measurables	Tools to measure the success of implementation of the management strategies and actions
Midden	Aboriginal archaeological site that contains an accumulation of shells and other artefacts

Multi-criteria assessment	Assessment whereby information is considered against a number of different criteria
Nutrients	Water quality parameters that are the basic building blocks of carbon-based life
On-site sewage treatment	The treatment of sewage waste by individual on-site systems (<i>see also septic system</i>)
Pollutant	Substance that has a degrading influence on the environment
Recreational amenity	The value of an environment that is afforded to recreational pursuits
Recreational Fishing Haven	Area established by NSW Fisheries (now DPI) that have no commercial fishing and are dedicated to enhancing recreational fishing
Reticulated sewerage system	System used in urbanized areas where sewage is transported via sewer pipes to a central treatment facility
Riparian vegetation	Vegetation that is contained within the riparian zone
Riparian zone	The area around the fringe of a waterway (with vegetation communities usually related to the presence of the adjacent waterway)
Runoff	The flow/drainage of water (and other substances) from an area (usually a catchment)
Seagrass	Aquatic plants that grow from the bed of an estuary
Sedimentation	The accumulation of sediment
Semi-urban	Rural-residential development (typically 1 acre lots or larger)
Sensitive areas	Areas within the catchment and around the waterways that are naturally sensitive, due to steepness, soil type etc (<i>see also degraded sensitive areas</i>)
SEPP-14	(NSW) State Environmental Planning Policy No. 14 – Coastal Wetlands
SEPP-26	(NSW) State Environmental Planning Policy No. 26 – Littoral Rainforest
SEPP-35	(NSW) State Environmental Planning Policy No. 35 – Maintenance Dredging of Tidal Waterways
SEPP-62	(NSW) State Environmental Planning Policy No. 62 – Sustainable Aquaculture
Septic system	Form of sewage treatment utilized by individual developments (<i>see also on-site sewage treatment</i>)
SEWQP	South East Water Quality Project
Shoaled entrance	Entrance of an estuary that is 'choked' by sand (<i>see also scoured entrance</i>)
SoE	State of Environment (report)
South East Catchment Blueprint (SECB)	A planning document that sets out objectives and strategies for the long-term sustainability of the south-east area of NSW (will be replaced by the Catchment Action Plan)
Southern Rivers CMA / SRCMA	Southern Rivers Catchment Management Authority
Southern Rivers CAP / SRCAP	Southern Rivers Catchment Action Plan
Sustainability	To ability of a system to remain healthy and viable in the long-term
Terrestrial	Relating to the land
Terrestrial vegetation	Vegetation that cannot tolerate sustained inundation by water
Tidal flushing	The ability of an estuary to exchange water with the ocean via tidal processes
Tidal range	The variability in water level within an estuary that is related to tidal processes
Turbidity	Dissolved and suspended sediment within the water
Water extraction	Removal of water (usually freshwater) from a waterway for external use (eg irrigation, stock watering, domestic supply)
Water Sharing Plan	A Plan between water extractors that is designed to ensure equitable use of water resources, including maintaining environmental flows
WSUD	Water Sensitive Urban Design

APPENDIX A: COMMUNITY BROCHURES

Batemans Bay and Clyde River Estuary Management Plan

Information Brochure
No. 1 June 2003

Community Usage, Values and Issues of Concern

This is the first of a series of community information brochures that will be prepared as part of the Batemans Bay and Clyde River Estuary Management Plan. This brochure provides you with feedback on the results of community consultation work recently completed by WBM.

Consultation work that has been undertaken to date in relation to this study includes:

- Holding a public meeting (early April)
- Distributing a discussion paper to the local and greater community (during May)
- Consulting with landowners, interested community members and key stakeholders
- Inspecting the estuary and river with landowners, interested community members and key stakeholders
- Maintaining a high profile in local media
- Maintaining a free call number and a project website

So far we have received a good response from the community in relation to the study. The future health and preservation of the estuary is a high concern to most.

Forty-seven (47) people completed the discussion paper and we also received several written submissions. This has provided us with some very useful insights into the community's uses, values and perceptions as to what are the key threats facing the estuary/river.

Approximately 90% of respondents to the discussion paper were permanent residents in the local area, and the remaining 10% of respondents spend several weeks a year in the local area.

Results of the responses to specific questions asked in the questionnaire are outlined below.

Estuary/River Usage

The respondent's most common uses of Batemans Bay and the Clyde River were:

- Recreational fishing (81%)
- Swimming (57%)
- Riding and/or walking (53%)
- Picnicking (45%)
- Power boating (34%)
- Birdwatching (26%)
- Canoeing and/or kayaking (23%)
- Sailing (13%)
- Views (11%)
- Oystering (9%)
- Scientific study (6%)
- Prawning (4%)

Of these primary uses, 52% put recreational fishing as their **number one priority**, 15% for riding and/or walking, 6% for sailing and 6% for power boating.

Respondents indicated (by use of the map provided in the discussion paper) that the most highly utilised areas included the stretch of the Clyde River spanning from the Princes Highway Bridge up to Nelligen. This region is primarily used for fishing, boating and oystering. The northern and southern foreshores of Batemans Bay were also highly used for riding, walking and swimming. The relative usage of Batemans Bay (between Snapper Rock and the Tollgates) and the Clyde River (upstream of Nelligen as far as Shallow Crossing) was minor compared to the section between the Bridge and Nelligen.

Estuary Values

The values of the estuary and river to respondents are varied. The most commonly valued aspects of the estuary and river are detailed below:

- Natural surroundings (i.e. native flora and fauna) (85%)
- Recreational opportunities (65%)

- "Good" water quality (60%)
- Access to water (54%)
- Peace and tranquility (48%)
- Aesthetic appreciation (i.e. views) (35%)
- Unspoilt pristine environment (15%)
- Income potential (8%)
- Tourist attractions (6%)
- Heritage and cultural items (2%)

Of these the **number one priority** was the ability to use the estuary for recreational opportunities (23%) followed by "good" water quality (19%), natural surroundings (15%), aesthetic appreciation (15%) and access to water (13%).

Threats and Conflicts

Respondents provided a written reply on the discussion paper when asked what were their views as to the main threats and conflicts presently faced and to be faced by the estuary. The most commonly identified threats and conflicts from these written responses are detailed below (in order of priority):

- Commercial overfishing presently occurring (more than half of the people surveyed identified this as an issue)
- Current PWC and powerboat usage (used for water-ski, wake boards etc) requires additional regulation and policing
- Increased potential for marine based pollution resulting from future developments
- Current levels of PWC and powerboat usage causing excessive bank erosion
- Over-development of Batemans Bay region
- Currently too many water polluting activities occurring in catchment and river
- Rate and style of present day land clearing an issue
- Current oyster farming practices need improvement
- Insufficient fish habitat areas and other protected aquatic reserves
- Present day rates of bank erosion an issue
- Batemans Bay bar depth is presently insufficient to meet the needs of all the boating fraternity
- Increased protection and/or enhancement of riparian corridors and other ecologically sensitive areas is required

Summary

This survey aimed to gain an insight into community uses and values of the estuary and to also appreciate what the community perceives as the main issues. It must be recognised that only a relatively small number of people have responded to the survey (mostly recreational users) and this limits how "representative" the data is of the whole community. However, the recreational users regularly visit most parts of the estuary for a range of activities and hence their applied observations over time are of great use in the identification of issues.

What Next?

The information obtained from this community survey and from stakeholder consultation provides us with a clear picture of community / stakeholder values and issues regarding the estuary. This information will be used to help formulate formal management objectives and strategies for the estuary.

A workshop will be held in Batemans Bay in July/August to formulate these objectives and actions. The community will be asked to comment on the proposed management objectives and remediation actions for Batemans Bay and the Clyde River before they are incorporated into a formal Council Plan.

Want More Information?

More information about the Batemans Bay and Clyde River Estuary Management Plan can be obtained by calling WBM's Community Liaison Officer, Mr Damion Cavanagh, toll free during business hours on **1800 79 70 79** or visiting the project website at www.batemans-ems.com.au

Upcoming Community Information Brochures

- ❑ Understanding Estuarine Processes (August 2003)
- ❑ Management Objectives and Strategies (late 2003)
- ❑ Summary of the Batemans Bay and Clyde River Estuary Management Plan (early-mid 2003)

Batemans Bay and Clyde River Estuary Management Plan

Information
Brochure No. 2
AUGUST 2003

Management Options/Objectives Workshop Summary

This is the second in a series of community information brochures that are part of the Batemans Bay and Clyde River Estuary Management Plan (EMP) development process. This brochure provides feedback on the results of a workshop recently facilitated by WBM and Peter Spurway, which aimed to identify key areas of management that will later be addressed in the EMP.

To identify the "key areas" for management, broad or holistic management options/objectives were developed to address previously identified conflicts, threats, information gaps, etc. The management options/objectives were then assessed and prioritised by the workshop participants.

Workshop Details

The workshop was conducted in the afternoon of 7th August 2003 at the Catalina Country Club in Batemans Bay. There were approximately 30 people in attendance, which included estuary management committee members, stakeholders and other interested members of the public.

The format of the workshop included a presentation of all management options/objectives developed for Batemans Bay and the Clyde River. These management options/objectives were previously detailed in the 'Community Workshop Background Document' which was distributed prior to the workshop. One additional management option was included for consideration at the workshop following discussion amongst workshop participants.

Management Options/Options

The management options/objectives put forward for consideration at the workshop were derived from diverse sources including community and stakeholder consultation, previous engineering and scientific investigations within the catchment and from our own previous estuarine management experience. Specific management

options/objectives are detailed below (*under the broad management areas shown in italics*):

Conservation/enhancement of ecological communities and habitats:

- **E1** - Protect/enhance vulnerable vegetation ecosystems and key faunal habitats and linkages;
- **E2** - Manage future development (rural, urban or semi-urban) in areas of high conservation value within the Clyde River catchment;
- **E3** - Protect, and where appropriate rehabilitate, riparian vegetation corridors;
- **E4** - Protect and enhance existing wetlands, saltmarshes, mangroves and other key estuarine habitat areas; and
- **E5** - Perform regular estuarine 'health' monitoring.

Maintenance/improvement of water quality by minimisation of catchment (diffuse) loads and point-source pollutant loads:

- **WQ1** - Ensure water quality within the estuary remains suitable for its current and future usages (including primary and secondary human contact, aquatic habitats and edible seafood);
- **WQ2** - Impose best management practices for water quality (including sediment from erosion) control practices on future development (rural, urban or semi-urban) in the Clyde River catchment;
- **WQ3** - Encourage best management of riparian buffers and other practices to manage potential pollutant loads to the estuary associated with human activities within the catchment;
- **WQ4** - Support and integrate aspects of the Estuary Management Plan with the recommendations of the South East Catchment Blueprint; and

- **WQ5** - Continue to implement stormwater controls and education programs to proactively manage the quality of urban runoff entering the estuary.

Sustainable commercial and recreational uses of estuaries and visual amenity:

- **S1** - Promote NSW Fisheries to develop a Fish Habitat Action/Management Plan of the existing Clyde River estuary and other areas of Batemans Bay;
- **S2** - Maintain the standard of socially and environmentally acceptable oyster farming practices in Clyde and continue to support the oyster industry's sustainable growth;
- **S3** - Maintain visual amenity of estuaries, foreshores and outlooks, by the promotion sympathetic developments to limit visual impacts;
- **S4** – Prepare water sharing agreements for the Clyde River;
- **S5** - Promote water and foreshore based recreational, commercial and tourist-oriented activities within the confines of social impacts, waterway capability and other EMP recommendations.
- **S6** – Perform cost/benefit analysis of bar dredging and additional studies to investigate enhancement of navigability and bar safety (this option was included for consideration as a result of discussions held during the preceding Estuary Management Committee meeting).

Results

After all the workshop items had been discussed with workshop attendees and agreed wording changes made to the options, attendees were then requested to rank the objectives by voting for those they considered to be most important (i.e. highest priority). The results are provided in the following table:

Option	Score	Option	Score	Option	Score
E1	1	WQ1	25	S1	33
E2	3	WQ2	11	S2	0
E3	0	WQ3	1	S3	5
E4	1	WQ4	0	S4	0
E5	2	WQ5	2	S5	5
-	-	-	-	S6	15

Discussion

The workshop identified options S1, WQ1, S6 and WQ2 as high priority items for consideration in the preparation of the Estuary Management Plan. These results were generally consistent with the findings of previous community consultation work (refer Brochure 1).

What Next?

Management strategies aimed at addressing the identified management objectives are presently being prepared. The management strategies developed will be considered in terms of their:

- Potential benefits and impacts;
- Approximate capital and operational costs;
- Responsible organisations to perform task;
- Ability to address the identified management option/objective.

A shortlist of practical and achievable management strategies will be prepared and documented in the draft Estuary Management Study. The draft Estuary Management Study document will be presented to the Estuary Management Committee, stakeholders and the interested public later this year (around September). The draft document will be amended as required to reflect the results of the presentation and comments received during the review period.

Want More Information?

More information about the Batemans Bay and Clyde River Estuary Management Plan can be obtained by calling WBM's Community Liaison Officer, Mr Damion Cavanagh, toll free during business hours on **1800 79 70 79** or visiting the project website at www.batemans-ems.com.au

Previous Community Information Brochures

- ❑ Community Usage, Values and Issues of Concern (*June 2003*)

Upcoming Community Information Brochures

- ❑ Management Objectives and Strategies (*late 2003*)
- ❑ Summary of the Batemans Bay and Clyde River Estuary Management Plan (*early-mid 2004*)

Batemans Bay and Clyde River Estuary Management Plan

*Information
Brochure No. 3
December 2004*

Implementing the Estuary Management Plan

This is the third and final information brochure in a series of community information brochures that have been prepared as part of the Batemans Bay and Clyde River Estuary Management Plan (EMP) development process. This brochure provides you with details of the final EMP document. It also summarises how the community has helped in preparing the EMP, and how suggestions by the community on the previous documents have been considered and included into the draft EMP.

A brief history.....

Since 1996, Eurobodalla Shire Council and the Batemans Bay and Clyde River Estuary Management Committee (which includes representatives from both government and the community) has been working towards the development of an EMP. The estuary management planning process has several key milestones which includes the preparation of a:

Data Compilation Study – produced in 1997, this study provided a scientific, social and economic review of the status of Batemans Bay and the Clyde River estuary, which has served as a basis for completing subsequent studies.

Estuary Processes Study – produced in 2000 this study involved detailed investigation into several significant estuarine processes which were identified as knowledge gaps in the Data Compilation Study. This study primarily focused on hydrodynamics, water quality, sedimentation processes, habitat characteristics, fauna communities, fisheries and aquaculture.

Estuary Management Study (EMS) – produced in 2004, this study assessed existing land tenure and usage and current impacts, as well as future usage and associated impacts. The document also reviewed estuary management from a statutory context perspective and identified the regional significance and values of the estuary.

As part of the preparation of the EMS, consultation was performed with the local community and Estuary Management Committee to obtain information on how individuals use and value the estuary and also to identify the problems that it faces now and in the future. The results of the consultation were the subject of the two previous information brochures.

Over March/April 2004, the EMS was made available for comment to members of the Committee and interested individuals. As a direct result of these comments, several of the suggested strategies in the EMS were modified, and have now been incorporated into the draft EMP.

Estuary Management Plan – The EMP represents the culmination of all previous estuary management planning work. The Plan presents a variety of broad management objectives, e.g. maintaining the existing high water quality of Batemans Bay and the Clyde River estuary, backed up with a number of strategies (or actions) to enable the objective to be achieved. Various parties are nominated as being responsible for implementing the strategies and indicative timing schedules are provided based on the priorities for action.

Following feedback from the community the draft EMP will be revised and a final EMP endorsed by Council. The focus will then be on implementation of the EMP by Council, government agencies and stakeholders (including landholders and the general community). In fact, a few of the strategies in the Plan have already been implemented or commenced.

What is the aim of the EMP?

The main goal of the EMP is summarised in the **Vision Statement** for the estuary as detailed below:

“The catchments, waterways and tributaries of the Clyde River estuary and Batemans Bay will be protected and enhanced to preserve their environmental, social and cultural (both Aboriginal and European) features that are of local, regional and national significance. Environmentally sustainable recreational and economic uses of the Clyde River estuary and Batemans Bay will be encouraged, to ensure that the waterway remains a viable natural resource that can be appreciated in the same way by future generations.”

How will this aim be achieved?

The Batemans Bay and Clyde River estuary is in a near pristine condition, which is rare and of significant importance. A significant portion of the estuary has been nominated by the State Government as having a ‘High Conservation Value’.

The estuary also supports a variety of commercial activities (such as oyster farming) that are dependent upon its existing high environmental values.

Consequently, this EMP and many of its objectives and strategies provide a significant focus on protecting/maintaining the existing values of the estuary, while also trying to repair areas of past damage and preventing future degradation

The Estuary Management Plan has been developed to address five key management objectives. These are ranked as high, medium-high or medium importance for implementation.

High Priority Objective

Objective 1 - Maintain the existing high water quality standards of Batemans Bay and the Clyde River (WQ)

Medium to High Priority Objectives

Objective 2 - Ensure recreational and commercial uses of the estuary are sustainable:

- Maintain safe, navigable waterways (NW)
- Maintain a socially and environmentally sustainable oyster industry (SOI)
- Promote waterway and foreshore based activities consistent with appropriate social and environmental impacts and waterway capability (WM)
- Maintain visual amenity of estuary, foreshores and outlooks (VA)

Objective 3 - Protect and enhance ecological communities and habitats:

- Protect fish habitats (FH)
- Protect, and where appropriate rehabilitate, riparian vegetation corridors (RV)
- Protect and enhance health and extent of existing seagrasses, saltmarshes, mangroves and other key estuarine habitats (SSM)
- Protect and enhance vulnerable vegetation ecosystems, key fauna habitats and linkages (VV)

Medium Priority Objectives

Objective 4 - Improve the scientific knowledge base to support management of the estuary (SKD)

Objective 5 - Integrate aspects of the Estuary Management Plan with the Southern Rivers Catchment Action Plan (CAP)

In order to achieve these objectives a total of 46 management strategies have been developed, 19 of which are outcomes of the Waterway Users Management Plan, which has been prepared in parallel to the EMP by Peter Spurway and Associates.

Strategy reference and ranking	Management Strategy Description
High Priority	
WQ1	Control future activities (including landclearing, construction of roadways and new urban and rural development) that may affect the ability of the estuary to meet its water quality objectives.
WQ2	Enhance the current water quality-monitoring program and water quality database development.
WQ3	Continue to monitor sewage pollution and occurrence of illegal discharging from vessels in Batemans Bay and the Clyde River.
WQ4	Monitor levels and locations of land clearing and report in Council's State of the Environment Report.
WQ5	Revise Water Quality Objectives (WQO) for Batemans Bay and the Clyde River.
WQ6	Control litter from Batemans Bay CBD.
WQ7	Regularly review the sewer spill response plan.
WQ8	Develop a local contingency plan for vehicle accident / oil or contaminant spill on major bridges crossing the estuary.
WQ9	Progressively seal and improve drainage on gravel roads at creek crossings or at locations where road drainage directly enters the Clyde River or its tributaries.
Medium-High Priority	
NW 1	Proactively monitor and report on bar depth and channel alignment.
NW 2	Determine cost/benefit relationship of improving the navigability of the ocean bar in Batemans Bay.
SOI 1	Review the Statement of Intent if released by the NSW Government as a result of the Healthy Rivers Commission (now defunct) Independent Inquiry into Oysters.
SOI 2	Improve the visual and safety aspects of oyster farming.
SOI 3	Determine the impacts of the local Pacific oyster populations on estuarine ecology.
SOI 4	Improve understanding of possible effects of oyster leases in promoting sedimentation in tributaries.
WM 1 - 19	Implement strategies included in Waterway Users Management Plan.
VA 1	Ensure development controls are sympathetic to the visual amenity of the estuary, foreshore and outlooks so that these are retained.
VA 2	Remove unauthorised riverbank protection works around Nelligen and Sheep Station Creek.
FH 1	Scientifically assess the potential impacts of commercial and recreational fishing on the aquatic habitats and species of Batemans Bay and the Clyde River.
RV 1	Protect riparian vegetation through the implementation of planning controls.
RV 2	Address any poor management practices that may be occurring on Crown Land Leases, particularly those fronting onto the estuary and its tributaries.
RV 3	Review alternatives for slashing riparian vegetation in power line easements at wetland and creek crossing locations.
RV 4	Enhance areas of riparian vegetation that will assist in improving stormwater quality, faunal movement or provide key habitat.
SSM 1	Verify extent and condition of existing key estuarine habitats and identify trends in extent and condition to enable formulation of appropriate protective instruments.
SSM 2	Continue public awareness program to reduce opportunities for <i>Caulerpa taxifolia</i> and other invasive aquatic species being introduced to the estuary.
VV 1	Utilise existing planning instruments to protect vulnerable (terrestrial) vegetation ecosystems and key faunal habitats/linkages. Where possible these habitats/linkages should be enhanced.
VV 2	Investigate the inclusion of Snapper Island into National Parks estate and improve management to protect penguin colony and for breeding of the Sooty Oyster Catcher.
Medium Priority	
SKD 1	Determine the status of shorebirds (includes migratory birds) and terrestrial fauna species utilising the estuary and integrate this data with Council's GIS planning databases.
CAP 1	Work to ensure that the priority actions of the EMP are integrated into the forthcoming Southern River Catchment Action Plan (SRCAP) and that funding for implementation of the SRCAP helps support implementation of priority actions from the EMP.

Implementation of the strategies

Implementation of the strategies of the EMP fall into a variety of categories such as community education, monitoring, modifying existing planning controls, on-the-ground works, etc. Many of the strategies can be actioned in-house by Council or other government agencies, however, some of the strategies are likely to require significant funding.

It is expected that government grants will be sought to fund some of the 'big-ticket' items in the EMP, such as sealing of gravel road creek crossings; installation of grey water/portable toilet waste facilities at Nelligen for boat users; or assessment of the costs and benefits of improvements to the navigability of the Batemans Bay bar.

Nonetheless, it is hoped that local landholders and the community will also contribute to other aspects of the EMP through volunteer labour, materials, maintenance, etc.

What's next?

The Batemans Bay and Clyde River EMP will be placed on public exhibition during December 2004 and January 2005. Copies of the Plan can be viewed at the Council office in Moruya and local libraries (Batemans Bay, Moruya and Narooma).

The draft Plan can also be viewed on the project website:

www.batemans-ems.com.au/comm_consult.htm

or under "Estuaries" on Council's website:

www.eurocoast.nsw.gov.au

The local community and holidaying public are encouraged to view the document and provide constructive feedback.

Public open days

Two open days will be held to allow individuals to meet with study team members and discuss the Plan.

- Thursday **December 16 2004**, between 9am and 3pm at Stockland Shopping Centre, Batemans Bay; and
- Wednesday **January 12 2005**, between 9am and 3pm at Stockland Shopping Centre, Batemans Bay.

You may also contact WBM's Community Liaison Officer, Mr Damion Cavanagh, toll free during business hours on **1800 79 70 79** or visit the project website for further information:

www.batemans-ems.com.au.

Written comments on the draft EMP should be sent by post to the:

**General Manager
Eurobodalla Shire Council
PO Box 99
Moruya NSW 2537**

or email by Friday 28 January 2005:

council@eurocoast.nsw.gov.au

Previous Community Information Brochures

- ❑ No. 1 - Community Usage, Values and Issues of Concern (*June 2003*)
- ❑ No. 2 - Management Objectives and Strategies (*late 2003*)

APPENDIX B: WATERWAYS USERS MANAGEMENT PLAN

As adopted by the Eurobodalla Shire Council in June 2004.

Background

This document provides the basis for a Waterway User Management Plan that applies to all the waters of Batemans Bay and the Clyde River estuarine system including its tidal tributaries. This Plan is prepared as a sub-plan of the Estuary Management Plan for Batemans Bay / Clyde River.

Waterway User Management Plans are designed to:

- Protect the recreational and environmental values of a waterway;
- Ensure that boating practices maximise user safety and enjoyment; and
- Provide a framework for consultation.

The approach to waterway user management considers a number of factors. These are:

1. Safety;
2. Boat wash impacts;
3. Bank erosion;
4. Protection of environmentally sensitive areas;
5. Effects of propeller wake on subtidal seagrass beds;
6. Noise and other forms of pollution;
7. Water quality issues; and
8. Conflicts between differing user classes.

Management 'tools' available to the Maritime Authority include:

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

Please note this Plan does not pretend to provide a list of all waterway facilities required on Batemans Bay / Clyde River. The Draft Batemans Bay Waterway Infrastructure Strategy addresses the need for public waterway infrastructure to assist in long-term waterway planning in far greater detail than this Waterway User Management Plan.

Site Description

Batemans Bay and the Clyde River Estuary is located in Eurobodalla Shire on the South Coast of NSW, 300 km south of Sydney. The Bay and River system is a focus for recreational boating in the north of the Shire.

The Clyde River has an overall length of 115 kilometres, and is tidal for approximately 40 kilometres upstream of the highway bridge. The river channel in its lower reaches is deep and incised, typical of a drowned river valley. Further upstream the river bed grades into progressively coarser sediment, and becomes shallower upstream of Cockwhy Creek.

Batemans Bay forms the drowned entrance to the Clyde River, extending over 8 kilometres from the Princes Highway bridge out to its mouth at the Tollgate Islands. At this point, it is over 6 kilometres wide.

Major sediment features of the river delta are:

- A deep main river channel immediately adjacent to the southern bank training wall;
- A 'ramp margin shoal' flanking the channel along its northern side; and
- A well developed relatively shallow river-mouth bar.

The estuary's major tributaries and approximate distances upstream of the Princes Highway bridge are:

- Cullendulla Creek;
- Waterfall Creek (4.5 km);
- Buckenbowra River (6 km);
- Sheep Station Creek (11 km);
- Nelligen Creek (14 km);
- Cyne Mallowes Creek (15 km);
- Currowan Creek (28 km); and
- Cockwhy Creek (31 km).

Each of these tributaries is tidal for some distance to the base of steeper catchment areas. The largest is the Buckenbowra River, which is tidal for some 11 kilometres from its confluence with the Clyde River. Where each tributary enters the river, a sandy / gravelly delta extends out into the river.

Waterway Usage & Facilities

Growth Projections

The Batemans Bay area is a focus for urban and rural residential growth. Batemans Bay is an area with strong links to its waterways. Predictably, boat ownership and waterway usage is on the increase. The waterways around Batemans Bay and the Clyde River are the focal point of the tourist industry.

Analysis of growth figures for registered craft has been carried out by Council. These projections suggest an average annual growth rate of 3.9% over the last decade. Boat ownership per head of population appears to be growing with 1997 statistics suggesting 31.3 craft per 1000 people.

On the broader front, a number of issues may become relevant, dependent on the increased demand for some activities. Growth in tourism, as the shire's major industry is predicted. Tourist-related waterway uses such as ferry and charter boat trips and houseboat hire are expected to increase, and continuation of the trend of new vessels introduced onto the estuary is inevitable. In the case of some of these estuary users, there are water quality implications discussed later in this report.

Boat Launching

This estuary has a number of launching ramps, located around the estuary in order of usage as follows:

- The Regional Boat Ramp at Hanging Rock caters mainly for offshore boating users with some estuary users launching here. This ramp provides access to offshore fishing and diving sites. Maritime Authority estimates peak user numbers at this ramp in 2002 to be about 400 vessels per day. This number would be exceeded on a major fishing tournament event. A need for toilet facilities has been identified;
- The old punt ramp on the southern shore at Lions Park is now used as a boat launching ramp and is most suited for estuarine users;
- On the northern shore, the punt approach is known as Jamiesons Ramp. This is known to be subject to constant sand build-up, which limits its use to four-wheel drive vehicles over most of the year;
- At Nelligen the four old ferry approaches on both eastern and western shores are utilised as boat launching ramps;
- A private facility at the Nelligen Van Park is a good quality ramp favoured by park users and water-skiers. It is available for public use for a small fee;
- On the Clyde upstream of Nelligen are a number of informal launching ramps in varying condition. These are mainly used by residents or in season by campers, many of whom are water-skiers; and
- At Maloneys Beach a board-and-chain ramp has provided ocean access at times. This is a no longer usable facility, following repeated episodes of beach erosion.

Council estimates the launching ramps on this estuary to have a maximum combined daily capacity of 360 to 480 vessels. Estimates of waterway usage at peak tourist time suggest a potential peak usage rate of up to 1100 vessels from the Batemans Bay area and Nelligen. There are currently about 400 registered craft at in the area from Maloneys Beach to Malua Bay (ESC 2002 estimates).

It is understood that Council is currently reviewing the number of public boatramps at Nelligen with a view to rationalising the number of ramps to be retained for use.

Wharves and Jetties

The following wharves and jetties are located on the estuary:

- Nelligen Wharf is of historical significance. It is used by the tourist ferries as a stopover. It was recently purchased by Council and refurbished;
- Mays Wharf, near the Buckenbowra River entrance, is a historic feature under private licence;
- On the southern shore in the Batemans Bay CBD, in order from the bridge downstream, we have:
 - The Fishermans Jetty nearest to the bridge is owned by the Department of Lands. This working jetty was originally provided for commercial fishing and now is shared by a ferry, charter boats and fishing boats;
 - The Coalbunker Wharf is now closed to boating, with an unstable substructure. It previously serviced for boarding access for charter boats and ferries, which have relocated to the Town Wharf;
 - The private Innes Wharf adjacent the Innes fish shop services that family's seagoing fishing fleet and is a significant tourist attraction;
 - The Ampol Wharf (also known as the Town Wharf) serves as a loading and refuelling point for ferry cruises; and
 - The Mara Mia Walkway Pier is utilised by charter boats for boarding, but its main use is as a tourist attraction and fishing platform in conjunction with the foreshore walkway;
- At the upstream end of Lions Park, a small pontoon is used by the Batemans Bay Oyster Growers. It is available for emergency services use;
- On the north shore at Wray St are a number of private jetties and boatsheds used by boat and houseboat hire businesses; and
- The Regional Boatramp at Hanging Rock incorporates a small holding jetty and floating pontoon.

One feature lacking at the Batemans Bay CBD is a facility suitable for people with a disability, to assist with access to boating facilities. Small boat owners are also disadvantaged, with existing wharf facilities unsuitable for embarking or disembarking from small boats over a range of tides. The need for a new floating pontoon-style jetty (in addition to the one at Hanging Rock Boat Ramp) to overcome these shortcomings is identified in Council's Waterway Infrastructure Strategy (see following discussion).

Infrastructure Upgrading Plans

The capacity of boat launching facilities, wharves and jetties is a major issue across the Shire, considered by Council in its Waterways Infrastructure Strategy (June 2002). This strategy prioritises expansion works across the Shire for boat ramps, wharves and jetties.

It proposes, subject to funding, the prioritised upgrading of infrastructure on the estuary as follows.

Facility	Project	Estimated Cost	Priority
Maloneys Beach	Replaced damaged boards	\$ 5,000	1
Hanging Rock	Toilet block	\$ 50,000	1
Batemans Bay CBD	Demolish Coalbunker & Ampol Wharves and construct new wharf	\$100,000+	2
Nelligan	Jetty in conjunction with eastern ramps	\$ 25,000	4
Upstream of Batemans Bay Bridge	New disabled-friendly floating pontoon jetty	\$ 60,000	5

In the longer term, the capacity of broader waterway facilities in the study area will need to be addressed. Council has commissioned consultants Webb McKeown and Associates to produce a Batemans Bay Waterway Infrastructure Strategy. This strategy investigates potential growth and details projected infrastructure requirements over a 25-year timeframe.

Preparation of a Foreshore Masterplan for the Batemans Bay CBD is planned at present by Council. This will further investigate a concept for upgrading the Coalbunker Wharf, and ultimately linking or consolidating the existing wharves in the area from Ampol Wharf to the Fishermans Wharf. The potential impacts of these facilities on the waters of Batemans Bay will require detailed investigation. The Waterway User Management Plan will require an update to reflect the Foreshore Masterplan, when Council adopts it.

Batemans Bay Marina

The Batemans Bay marina (Boat Harbour) occupies Port Reserve R180070 and is operated day-to-day by a user's co-operative as agent for the Department of Lands. The co-operative operates a slipway at the western end of the marina under Licence L303028 issued by the then DLWC. The Department of Lands has control of the marina leases.

Facilities available at the marina include pontoon berthing, a slipway and a drystand repair area. A marine pumpout system is proposed. Onshore toilets and showers are adjacent to the hardstand area at Rotary Park, which provides public carparking.

The marina has insufficient berths to meet current demand. Expansion is possible but limited funding for construction works has limited this growth.

Two levels of expansion are possible:

- About 10 more berths could be made available by an extension of the proposed finger wharf for the marine pumpout facility; and

- A major downstream expansion of the marina onto the sandflat.

Expansion of the marina would slow the unsustainable growth in swing moorings and cater for the growth of boating on the south coast. The Department of Lands are currently considering a number of proposals for expansion of the Marina, including future Marina operation arrangements.

Moorings

Moorings in Batemans Bay along the side of the channel up to the bridge are at full capacity. Sand movement along the northern (Wharf Road) shoreline is understood to have forced the temporary relocation of some moorings to upstream of the bridge. The Maritime Authority is responsible for the approval of mooring locations, ideally plans should be developed to identify requirements for additional moorings and suitable sites.

In the event of a major river flood, boats on swing moorings in these localities are at risk. The shortage of suitable areas for expansion of moorings in Batemans Bay requires consideration in this Plan.

Yachting

The Batemans Bay Sailing Club is a significant user of the estuary and contributor to the area's economy. The club has an active membership and sponsors both keel boat sailing and off-the-beach sailing. An annual 'off the beach' regatta attracted over 100 entrants in 2002. The club has 34 keelboats on its register that are kept in the estuary. It would typically hold some 30 events annually. The club uses four areas of the estuary as listed below:

1. Competitive sailing takes place south-east of Square Head and off Corrigan's Beach;
2. Some events are held in the river between the bridge and the marina;
3. The section from the bridge to the seaward side of the bar is used for access to the outer bay by keel boats; and
4. The river between the bridge and Nelligen is regularly cruised by members and visiting boats.

The club encourages cruising yachts to visit the estuary - these vessels average one a week and would commonly stay for up to a few nights. Re-provisioning, repairs and maintenance add to the local economy. Continued growth in sailing from both local and visiting boaters is expected.

Personal Water Craft (PWC)

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.

Boating regulations define legal operating conditions for PWC's. They are not permitted to operate irregularly within 200 metres of the shoreline where a residence is visible. They must maintain a minimum 60 metres from persons in the water including surfers, when travelling at speeds of 10 knots or more.

Formal complaints to Maritime Authority of PWC activities provide an indication of levels of use in various areas around the bay. The following table represent the locality and numbers of formal complaints received by Maritime Authority since January 2001:

Locality	Number of formal complaints (PWC's) since January 2001	Proportion of complaints
Corrigans Beach	8	47%
Maloneys Beach	1	6%
Surfside	1	6%
Other areas (within ESC south to Moruya)	7	41%
Total	17	100%

PWC use in the Shire is currently under review by a sub-committee of Council. This committee in June 2002 invited and received over 50 public submissions from the public on PWC use across the Shire. Submissions relating to the Batemans Bay / Clyde River study area were received as follows:

Location of Submission	Number of Submissions
Clyde River Bridge to Shallow Crossing	1
Cullendulla	2
Surfside	2
Long Beach / Maloneys Beach	1
Corrigans Beach	7 + petition
Swimming Beaches across the Shire generally	10

Specific issues raised in submissions related to:

- Noise;
- Petrol fume odours;
- Reckless and dangerous riding; and
- Environmental issues such as threatened species impacts, general pollution, spread of aquatic weeds, impact on seagrass and fish breeding and bank erosion.

This activity became popular at a PWC-hire area at Cullendulla some years ago, until the road access was closed. Reports of noise complaints were noted from Surfside residents at that time. Corrigans Beach now provides a buoyed area 225 metres offshore for PWC hire craft. PWC use at this locality has been well regulated by the Maritime Authority in recent times.

Corrigans Beach, as the major area of PWC use by hire vessels in particular, now clearly attracts the majority of attention from the public. Issues here are both noise related and, in the past but less of an issue recently, safety issues such as distance from swimmers.

The local Maritime Authority Boating Officer may direct non-hire PWC users to a number of locations considered suited to this activity, namely the Tollgates **, Maloneys Beach, the middle part of Long Beach (away from houses), and the northern end of Corrigans Beach. This approach is supported while it remains practical, and PWC users have been cooperative over the past boating season. This management approach requires active monitoring and patrolling by a Maritime Authority presence on the water over the holiday season in particular.

** *DPI (Fisheries) note that the Tollgates have been listed as Critical Habitat for Grey Nurse Sharks under Part 7A of the Fisheries Management Act 1994.*

Other Water Craft

A charter boat industry operates out of Batemans Bay, predominantly servicing demand for offshore fishing, diving and whale watching in season. This industry is a significant tourism attraction and contributes significantly to the local economy. Any charter boat operations which require the Batemans Bay bridge to open more frequently are likely to have adverse impacts on traffic flow/congestion (and related socio-economic impacts) in Batemans Bay.

Two commercial ferries ply the river from Batemans Bay to Nelligen. Regular daily tours provide an opportunity for visitors to the area to view the estuary and hear some of the local folklore.

Houseboat and small 'tinny' self-drive hire businesses operate from just upstream of the Princes Highway Bridge. These provide another significant attractor of tourists. Houseboats can use the river from the bridge to their upstream limit at the old jetty near Currowan Creek.

Estuary fishing tours provide advice on fishing techniques and 'hot spots', attracting locals and visitors alike.

Water skiing is common on the river's reaches that are more sheltered from prevailing winds, notably on the bends upstream of Nelligen. Most intense use is over January and Easter.

The upper reaches of the Clyde River above Cockwhy Creek provide an ideal environment for passive waterway uses such as canoeing and kayaking. These passive uses should be encouraged and should be possible in safety.

Issue Discussion and Recommendations

The following issues are relevant to this Plan. These issues have been raised by the committee over recent years or been identified by public submissions in May 2003 to the Estuary Management Study.

- Navigation;
- Control of vessel speed for safety;
- Protection of shorelines from boat wash;
- Management of Personal Water Craft;
- Protection of sensitive and passive use areas;
- Signage;
- The Bar;

- Shortage of moorings;
- Batemans Bay Marina;
- Refuelling; and
- Water quality considerations.

These issues are dealt with in the following discussion, which provides a background to the recommended actions listed in the next section.

Navigation

Ease of navigation on the estuary below Nelligen has been a focus of the Maritime Authority over the past year. The channel is now well marked by a set of day leads and lit beacons from the Princes Highway bridge all the way to Nelligen. The Maritime Authority will install one final beacon on the bend just downstream of Nelligen shortly. The lit markers are essential to cater for the growth in houseboat hire, waterway users typically unfamiliar with the estuary.

Navigation aids from the outer bay to guide mariners towards the bar leads may become a future issue. In particular, a mark at Acheron Ledge will warrant future consideration by the Maritime Authority as visiting mariner numbers increase. It is noted that the Maritime Authority plans in the near future for a mark on Snapper Island.

Vessel Speed

Vessel speed is at present regulated to 4 knots in McLeods Creek and the oyster harvest area on the southern side of Budd Island. McLeods Creek is a very sensitive wetland with a quite narrow channel and healthy seagrass beds and mangrove communities. Their protection from wash or damage by a 4-knot limit is justified. However, a 4-knot limit in the concentrated oyster working area at Budd Island would be better replaced with a No Wash Zone. This would allow oyster growers to operate at speeds that do not cause wash, without unduly restricting their operations. It will also provide discouragement for private and hire vessels to enter this shallow and at times congested channel. A No Wash Zone at this location is to be recommended by this Plan.

The Batemans Bay Marina also is zoned with a 4-knot limit. Boating regulations limit speed adjacent to moored vessels in other parts of the bay, and at the bridges at Nelligen and the Princes Highway. These limits do not require signage.

A proposed 4-knot limit in Cullendulla Creek is further discussed in the following section - "Sensitive and Passive Use Areas".

Boat Wash

There are shorelines along the Clyde River upstream of Nelligen that are susceptible to erosion. The Batemans Bay / Clyde River Estuary Processes Study (WBM, 2002) concluded that for these areas of the estuary, the impact of boat wash on bank erosion is minimal. Other factors such as floods and natural meander processes are far more significant as the primary cause of this erosion. Secondary disturbances such as groundwater seepage, wind waves and boat wash may exacerbate the continuation of this erosion. However, the limitation of boating activity alone would have very little

impact in the long term on erosion rates. There are no recommendations for boating controls due to bank erosion on the estuary upstream of Nelligen.

In the estuary downstream of Nelligen, submissions from oyster growers note damage to racks and trays from large displacement-hull vessels. Racks and trays would be particularly vulnerable at spring low tides. There may be scope on two levels to address this issue:

- Oyster growers with leases in the worst-affected locations to amend their work practices and/or install wave barriers; and
- Schedules for these vessels could be varied fortnightly to avoid the lower end of spring tides.

These management aspects could be negotiated by the respective parties, with assistance from the committee if required. Intervention by legislative controls is not considered a practical option.

PWC Usage

Much of Batemans Bay is considered ideal for this pastime by users of PWC's. Major use areas are:

- Corrigans Beach (PWC hire area and other PWC users);
- Long Beach;
- Maloneys Beach;
- Tollgates; and
- Nelligen and upstream reaches.

The Maritime Authority has closely monitored the management of PWC use on the estuary in the past few years. The response of PWC owners has been encouraging. However complaints persist, mainly noise disturbance at Corrigans Beach, which is one of the focal points for the activity. Noise is an issue particularly for residents of the southern caravan parks and the elevated area of Batehaven south of Corrigans Beach when prevailing summer north-easters direct noise from boating activity including PWC use to the residential areas.

This issue is seemingly not possible to resolve by compromise. If PWC use continues, there will be occasions when noise from continual use will cause annoyance, even with legal PWC operations. If PWC use were banned, one local hire business would be closed or forced to relocate. There are no obvious alternative sites for this business.

It is to be recommended that PWC activities around Batemans Bay be permitted to continue but closely monitored by the Maritime Authority. Directing PWC users to suitable areas is supported. This approach is preferable to over-regulation of the waterway but it requires a regular Maritime Authority presence on the estuary. If justifiable complaints were to increase to unacceptable levels, a more formal zoning system should be implemented by the Maritime Authority.

It is possible to lighten noise levels at Corrigans Beach by operating the PWC hire area 300 metres offshore. This should be trialled with cooperation from the hire proprietor next summer.

In conjunction with this action, the Maritime Authority is able to extend the standard setback distance from the shoreline of 200 metres a further 100 metres in order to also regulate non-hire PWC users in

this area. It is recommended that the Maritime Authority extend the PWC exclusion zone to 300 metres, from the PWC hire area to the southern end of Corrigans Beach.

Council's PWC Committee is currently considering PWC controls on waterways in the Shire. The Committee recently requested that the Minister for Transport place a ban on PWC in Batemans Bay northwards of a line from the southern tip of Square Head to the south western end of Surfside Beach. Outcomes from this request can update this Plan if necessary.

Sensitive and Passive Use Areas

Sensitive environmental areas of the estuary are:

- Broad areas of healthy subtidal seagrass beds on the tributaries;
- The upper estuary above Cockwhy Creek; and
- Cullendulla Creek.

Seagrass Beds

Seagrass beds provide highly productive fish nursery and feeding habitat. The disturbance or destruction of subtidal flora such as seagrass is considered possible when the underkeel clearance is reduced to less than 0.5 metres. Vessel access should be limited over these shallow areas.

The majority of seagrass is to be found in the mouths and sheltered waters of the estuary's many tributaries. Present usage in these areas is generally low, and boat speed in these tributaries is considered largely self-limiting, due to their entrance shoals, shallow depth and narrow channels. Four-knot zones are a future possibility, should usage increase, but for the above reasons are not proposed at this stage.

The impacts of this decision should be monitored to ensure the effective protection of these tributary areas from excessive boat speed. The preservation of seagrass beds can reasonably be assured by limiting speed, which can act as a deterrent to boating activity entering the tributary areas. If this does not prove successful, power vessel access can, in the extreme case of high activity and regular environmental damage, be limited or banned. This need can only be determined by vigilance and further seagrass health monitoring.

The exception is the Cullendulla Creek area, where seagrass loss has been noted by the Estuary Management Committee. This creek is proposed to be subject to a four-knot limit as discussed below.

Seagrass beds are located along the edge of Batemans Bay CBD. Impacts of wharves and jetties on seagrass beds is an issue for Council's Foreshore Masterplan for the Batemans Bay CBD.

Upper Estuary

The nature of the upper estuary beyond Cockwhy Creek is suited to passive use. The unspoilt estuarine environment is a natural attraction that is worthy of preservation.

This Plan has considered whether a 4-knot limit should be imposed over the upper estuary to provide a balance between power boating and activities that are more passive. This would serve to give

additional notice to power vessels that the estuary is in parts shallow and unpredictable. It would also minimise any negative interactions between passive users and powerboats. A suitable location could be the just upstream of the old wharf, 1 kilometre upstream of the Cockwhy Creek junction.

We conclude that the estuary at this point is self-limiting for boat speed, with the shallow gravel bed and gravel shoals immediately obvious on approach. Furthermore, boating numbers in this part of the estuary are very low. There is, however, the potential for a future increase in powerboat use as boating traffic on the upper estuary increases. The usage situation should be monitored by the Maritime Authority and provide feedback to the Estuary Management Committee, should this low level of vessel usage change.

Cullendulla Creek

Passive uses in accordance with the area's National Park status are appropriate on Cullendulla Creek. Unrestrained powerboat use in the creek is considered inconsistent with the area's natural values. It is proposed under this Plan to impose a 4-knot limit inside the mouth of Cullendulla Creek over its full navigable length. This will provide for quieter boating activities to reduce disturbance to wildlife in sensitive areas, reduce wash and allow boaters time to observe and avoid shallow seagrass beds.

The waters offshore from Cullendulla Beach are shallow with a flat bed, and better delineation of this hazard is recommended. A south cardinal mark is recommended (defining a line beyond which boating activity shall be carried out with extreme caution) to limit vessel use adjacent to Cullendulla Beach. The line shall be defined approximately from Hawkes Nest to the southern extremity of the Cullendulla Shoal.

Signage

One issue that has arisen on other estuaries and is considered relevant is undesirable proliferation of signage. Too many signs can be confusing and unsightly, particularly in the largely natural reaches of the estuary beyond Nelligen. It is accepted that regulation of heavy boating traffic below Nelligen requires both signage and channel markers.

For this reason, the signage proposed under this Plan on the estuary beyond Nelligen is recommended to be kept to a minimum required for safety and clarity of regulation. For instance, unmarked hazards in the shallow regions of the upper estuary or its tributaries, such as shoals and snags, are not considered an issue requiring signage or markers.

The Maritime Authority's Boating Plan indicates that caution must be shown upstream of Nelligen as shoals and snags are unmarked. The vessel master will be required to maintain a proper lookout in these areas.

The Bar

Bar depth has been reported over the last few decades as varying between 0.6 metres deep up to 1.5 metres on rare occasions. The depth of water over the bar is about 1.1 to 1.2 metres. (Maritime Authority Boating Officer, pers. comm. May 2003). The Batemans Bay Sailing Club checked the bar depths in April 2003. They estimated that the shallowest point on the best approach was 0.86 metres. Club members confirm that the bar depth has slightly improved over the intervening period.

Bar depths at various tides are approximated as follows. MLW and MHW refer to Mean Low Water and Mean High Water.

Tide	Water Depth over Bar (metres)
ISLW (zero on tide chart)	1.1 to 1.2
MLW Springs	1.3 to 1.4
MLW Neaps	1.6
MHW Neaps	2.4
MHW Springs	2.7

The largest draft vessel presently on the bay is a yacht that draws almost 1.9 metres (Maritime Authority Boating Officer, pers. comm.). A number of other yachts draw 1.7 metres. These vessels must avoid low tides before attempting a bar crossing.

Past dredging of the bar for navigation by the then Public Works Department was routinely carried out for coastal steamers until 1951. From 1951 to 1964, dredging was intermittently done on three occasions.

The bar was typically dredged to depths of 2.1 to 2.4 metres. Reports of these past dredging exercises confirm that the channel would shoal rapidly within 4 months to 1.5 metres depth; thence more slowly to 1.2 metres, a depth which was retained for several months. This behaviour is consistent with experience elsewhere and expectations based on the mobility of bar sediments under wave and current action. (WBM Oceanics October 1999).

Submissions to the Estuary Management Study have proposed further technical studies into bar depth and options for management intervention. There have been a number of technical studies of estuary processes and these would provide a useful basis for a scientific and cost-benefit analysis of bar dredging and/or other techniques of improving bar safety and depth. The Estuary Management Committee supports a study into enhancing the navigability of the Batemans Bay bar. This would consider other initiatives to improve the safety of bar crossings including the local dissemination of information to mariners.

Precise (survey-accurate) bar soundings are not routinely gathered on the NSW coastline. The Maritime Authority takes local soundings on a regular basis and in response to complaints. The sailing club routinely takes bar depths in the sailing season. It is suggested that, given the bar's dynamic nature, a proactive monitoring and reporting procedure should be formulated by the State Agencies responsible for small ports and marine safety. This information could provide regularly updated data to allow the Maritime Authority, or Royal Volunteer Coastal Patrol members, to respond in detail to requests for information on the bar, noting that charts recommend that mariners seek local information before undertaking a bar crossing.

It is noted that the eventual relocation of the RVCP headquarters will provide improved line of sight to vessels crossing the bar, allowing improved verbal assistance while crossing the bar. It will also improve response times in the case of incidents.

A further possibility is a web-based database of NSW bars, noting that legal liability issues make it essential to provide the best available information.

Lead lights marking the bar crossing location are in need of a larger range of movement. The current best channel alignment is currently just south of the new leads. Leads will continue to require regular reassessment by the Maritime Authority to reflect the latest bar dynamics. The information database referred to above would assist in identifying when leads require adjustment. Sensitive clearing of dunal vegetation will at times be necessary in accordance with past practice to maintain visibility.

Shortage of Moorings

There is a shortage of moorings in Batemans Bay. The most recent moorings have been issued upstream of the bridge. If large vessels were routinely moored in this area, this practice could lead to increased demand for opening the Princes Highway Bridge. Further, large river floods would place these vessels at some risk. The practice is not considered sustainable for large vessels in the long term.

Consideration of a new mooring area for offshore users is warranted in the partial lee of Square Head, south of the end of the Cullendulla shoal. This area is considered suitable for approximately 20 new moorings (Maritime Authority, pers. comm.). Impacts on seagrass along the edge of the shoal will need to be managed in the design of the mooring area. Environmental assessment procedures should be rigorous, considering both on-site and potential off-site aspects. Discussions should take place with staff from DPI (Fisheries) and other state agencies early in the concept design phase of this project, should this proposal proceed.

It is noted that this mooring area would provide offshore access without involving a bar crossing. However it has no nearby dinghy access or parking for vehicles. It would be ideal for those offshore vessels that may be used irregularly.

Batemans Bay Marina

The marina has insufficient berths to meet current demand. Two levels of expansion are possible:

- About 10 more berths could be made available by an extension of the proposed finger wharf for the marine pumpout facility. This facility will provide two temporary berths for access to pumpout equipment and ultimately for refuelling. It is currently (June 2003) delayed pending resolution of non-domestic sewage connection approvals. This expansion would utilise the recently dredged area immediately upstream of the Harbour Marine lease site; and
- A major downstream expansion of the marina onto the sandflat would require an Environmental Impact Statement addressing all environmental issues. It could either be motivated privately, which would require a public expression of interest process to initiate selection of tenderers for the project, or by a public trust. Ability to access major sources of funding will probably determine this issue.

Expansion of the marina would slow the unsustainable growth in swing moorings and cater for the growth of boating on the south coast. The Department of Lands are currently considering a number of proposals for expansion of the Marina, including future Marina operation arrangements. It is to be recommended that, given the recent growth of Batemans Bay as a regional centre, the expedition of

marina expansion be given the highest priority by the Department of Lands. It is considered that this expansion should only occur after sewage pumpout facilities are fully operational at the marina.

Previous discussions about a Trust to operate the marina have not led to any result. The concept of returning all revenue from mooring fees etc to the marina is sound. However, concerns about the age of the facility and the costs of essential repairs and maintenance have not been addressed.

The concept of a trust for the marina should be further investigated after a detailed report has been prepared on the state of all marina assets. The trust format should allow primarily for the needs of the local boating industry.

Any future redesign of the marina should consider the findings of the Coastline Hazard Study (for Batemans Bay) which has identified that the Beach Road area is subject to coastal inundation as a result of waves overtopping the training wall during major infrequent storm/tide events which may potentially result in significant wave impact damage to boats and infrastructure around the boat harbour.

Refuelling

The issue of lack of refuelling facilities at the Marina is in need of attention. The proposed jetty to house the marine pumpout has been designed with allocated space for fuel bowsers. Harbour Marine previously had ownership of the only in-ground fuel tanks in the immediate locality. These have been removed under a Workcover requirement.

Once the pumpout jetty was completed, it would be timely to advertise for fuel supply businesses to tender for a card-operated bowser facility at the Marina. It is not clear who would have this responsibility. Certainly refuelling is an integral part of boat ownership, so it is suggested that the Marina owners should take a proactive role in encouraging the development of a suitable facility.

Water Quality Considerations

The Clyde River is recognised by the NSW Government as one of the State's most pristine estuaries. It is the State's third-largest oyster producing estuary, an industry that relies on good water quality, with particularly human-sourced bacteria and viruses the major threat.

It is essential to actively manage these key attributes of the estuary and to reduce potential boating impacts on the waterway's excellent water quality record. The significance of the local oyster industry and the potential impact of increased waterway use must be carefully managed.

All boating activity is to comply with the Protection of the Environment Operations Act 1997 (PoEO Act) legislation. This makes it an offence to pollute the estuary. The issue is relevant for the Clyde River, the Estuary Processes Study pointing to areas above Nelligen as being particularly poorly flushed.

All boating activity is to be carried out on the estuary in compliance with the PoEO Act. Human waste in particular should be collected and disposed of responsibly. This is a major consideration for the granting of moorings for vessels involving human habitation that are new to the waterway.

The Maritime Authority plans to introduce its Waterways Sewage Plan, which will prohibit disposal of untreated sewage. Commercial and recreational vessels will need to meet different requirements under the Sewage Plan. The Maritime Authority propose that, by the next peak boating season, the following controls on sewage pollution from vessels will be applicable:

- Commercial vessels (Class 1 and Class 4 eg ferries and houseboats) will need to install toilets and holding tanks. Commercial vessels were identified as posing the greatest sewage pollution risk as they carry a significant number of passengers on board, or as in the case of houseboats, have people living on board for extended periods;
- Owners / operators of Class 2 or 3 vessels (eg fishing vessels) will be required to undertake the necessary steps to ensure that no sewage is dumped in the water (eg: small portable toilet). Owners of Class 2 or 3 vessels will not necessarily need to install holding tanks; and
- Recreational boaters are not required to install tanks or portable toilets. Where toilets are not available and the boat is to be used for a long period, recreational boat owners can take a small portable toilet such as those used for camping.

Existing houseboat hire businesses based at Batemans Bay are well serviced by pumpout truck, which operates on demand in line with the booking schedule. If further houseboat hire businesses are proposed in future, they should also have a sustainable method of waste disposal. As a minimum requirement, they should be located in areas with pumpout truck access. Ideally, they should install pumpout infrastructure.

Clearly in order for the Sewage Plan to be feasible, accessible infrastructure is required. The following points are relevant:

- The provision of a sewage pumpout facility at the Batemans Bay Marina is proposed shortly to address vessels based on the lower estuary;
- A new dump point for grey water and portable toilets should be installed to service the Nelligen area. The Nelligen toilet block has been suggested as an ideal location as, although unsewered, it incorporates a storage tank that can be accessed by pumpout truck;
- A second marine pumpout facility could eventually be located at the Fishermans Jetty to cater for larger vessels that cannot readily access the marina facility, should this prove necessary; and
- In the longer term, should the demand arise, a third pumpout facility located at Nelligen would be warranted.

Monitoring by Council of informal camping and associated toilet facilities should continue. This refers to those parts of the estuary foreshore upstream of Nelligen that are utilised as waterskiing camps.

Consultation and Review

Distribution of the Draft version of this Plan for the purpose of consultation was undertaken by Eurobodalla Shire Council as follows:

LOCAL

- Batemans Bay / Clyde River Estuary Management Committee;

- Eurobodalla Tourism;
- Coastwatchers Assn Inc.;
- Batemans Bay Local Aboriginal Lands Council;
- Council's PWC Advisory Committee; and
- Advertisement of availability for public comment in local newspapers.

STATE AGENCIES

- Department of Infrastructure Planning and Natural Resources;
- DPI (Fisheries);
- Maritime Authority;
- National Parks; and
- State Forests.

This final version of the Plan has been amended to reflect submissions made, with responses ratified by the Estuary Management Committee at its meeting of 11 March 2004.

The Batemans Bay / Clyde River Waterway Users Management Plan will be subject to review on a five yearly basis, both internally by the Maritime Authority and with reference to Eurobodalla Shire Council and the Batemans Bay / Clyde River Estuary Management Committee. If significant redrafting of the Plan and waterway restrictions were to occur, public comment may be sought at that time.

If the outcomes of Council's review of PWC activities by its PWC Committee were to propose revision of the content of this Plan, the appropriate revisions shall be made without further consultation. This Plan considers the level of consultation by this Council committee to be representative and appropriate, given the level of public involvement to date.

Recommended Actions

Arising from this plan, the following actions are appropriate. Those actions located in the lower estuary are depicted on Figure B-1 at the end of this document.

- Objective 1 Carry out a full Environmental Review for proposed new mooring area in the lee of Square Head south of the Cullendulla shoal.
- Objective 2 Install a 4-knot zone in Cullendulla Creek.
- Objective 3 Install south cardinal mark (defining a line beyond which boating activity shall be carried out with extreme caution) to limit boat and PWC use adjacent to Cullendulla Beach and Cullendulla shoal.
- Objective 4 Convert the existing 4-knot zone south of Budd Island around the oyster sheds to a 'No Wash' zone and maintain 4-knot zone in McLeods Creek upstream of the entrance.

- Objective 5 Extend the 200-metre exclusion zone to 300 metres from the PWC hire area to the southern end of Corrigans Beach. Relocate PWC hire area buoys to 300 metres off Corrigans Beach and assess impacts on PWC behaviour and noise.
- Objective 6 Actively manage PWC usage and monitor complaint numbers by locality.
- Objective 7 Monitor boat use in the estuary above Cockwhy Creek and in the estuary's tributaries.
- Objective 8 Enforce the Maritime Authority Sewage Plan when introduced.
- Objective 9 Formulate a proactive bar depth monitoring and reporting procedure to provide RVCP with detailed bar depth and channel alignment information to pass on to mariners.

These actions fall under the operational jurisdiction of the Maritime Authority. Action 9 may have additional funding or survey / data collection components associated with estuaries that involve the Department of Infrastructure Planning and Natural Resources.

- Objective 10 Provide approval to the Maritime Authority for the sensitive clearing of dunal vegetation around the bar lead lights.
- Objective 11 Make application for funding to install grey water / portable toilet waste dump point at the Nelligen public toilet block.
- Objective 12 Consider in the longer term possible additional sewage pumpout facilities at Fishermans Jetty and Nelligen.
- Objective 13 Continue to monitor camping and associated toilet facilities on those parts of the estuary foreshore above Nelligen utilised informally as waterskiing camps.
- Objective 14 Support the Estuary Management Committee to seek agency funding for a study into enhancing the navigability and safety of the Batemans Bay bar.

These actions fall under the jurisdiction of Eurobodalla Shire Council.

- Objective 15 Encourage the provision of a refuelling facility at the Batemans Bay Marina, once construction of the marine pumpout jetty is completed.
- Objective 16 Given the recent growth of Batemans Bay as a regional centre, expedition of marina expansion should be given the highest priority by the Department of Lands. This should only occur once the marine pumpout facility is operational.

NOTE:

Although marina-refuelling infrastructure does not fall within any state agency's responsibility, it is logical for the Marina owner, i.e. Department of Lands, to be proactively encouraging environmentally appropriate infrastructure at a focus of boating activity.

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