FINAL Report

Coastal Lakes

Independent Inquiry into **Coastal Lakes**

HEALTHY RIVERS COMMISSION

April 2002

Foreword

The many lakes along the NSW coast generate ecological, social and economic benefits that are enjoyed by the state community, as well as by the local communities that live, work or play near them. Unfortunately, one of the features common to coastal lakes is that we are placing increasingly intolerable demands on them. Many are now highly degraded while only *one* remains in a truly pristine condition. It is not only the environmental values of coastal lakes that are being threatened. The various human activities that depend on 'healthy lakes', such as tourism, fishing and oyster growing, are also being placed at risk.

There are so many public authorities making decisions and undertaking activities that affect coastal lakes that it could be said that they are under the management of almost 'everyone', but under the effective 'guardianship' of no one. There also is currently no agreed system for ensuring that decisions pay sufficient regard to the limitations of coastal lakes and their catchments. Similarly, there has been no agreed process for determining the desired outcomes for individual lakes or resolving conflicts among competing interests.

These trends cannot be allowed to continue. This Inquiry by the Healthy Rivers Commission has left no doubt that citizens expect strong and decisive action, by all levels of government, to protect remaining values, contain further damage and undertake targeted repair with a sensible ordering of priorities. A central theme of the Inquiry's findings and recommendations is that 'healthier lakes' will be achievable only if there is a fundamental change in the ways decisions are made.

The Commission advocates that the *existing* powers of decision makers must be applied with more rigour and on the basis of better information. The Commission has not suggested the creation of new regulatory powers, the imposition of a new range of restrictions on the rights of citizens or the curtailment of the roles of councils. The recommendations of this Inquiry, presented as a *Coastal Lakes Strategy: An Assessment and Management Framework*, are designed to assist those so empowered to make decisions affecting lakes that are better, stronger, more timely and effective over time.

I therefore welcome the NSW Government's recent *Action for the Environment: Environment Statement 2001* and the *Coastal Protection Package*. The latter package provides for a *Comprehensive Coastal Assessment* that will encompass assessments of coastal lakes and their catchments, as proposed in this Inquiry Report. In its *Action for the Environment Statement*, the Government has noted its intention to implement recommendations from this Inquiry as a means of protecting the fragile ecosystems of coastal lakes.

The Commission has drawn on the advice of many citizens and that of acknowledged experts, in preparing its strategy for improving the health of coastal lakes. The submissions received in response to the Commission's draft findings and recommendations demonstrated strong support with few exceptions. In fact, a number of submissions moved beyond the content of the recommended strategy for managing coastal lakes to address matters relating to its implementation and its potential extension to other estuaries.

The approach advocated by the Commission relates to *all* of the coastal lakes. While greater urgency applies in some particular cases (such as in the Shoalhaven and Great Lakes regions), there is *everywhere* a need to ensure that current and future decisions begin to 'turn the tide' and ensure that the remaining values of these natural assets are maintained.

The *Coastal Lakes Strategy* presents a pilot application of an integrated approach for managing natural resource and land use planning, particularly in terms of creating a context for assessing resource capabilities and determining and implementing management actions. The experience gained through preparing Sustainability Assessments and Management Plans for coastal lakes in the Shoalhaven and Great Lakes areas, in the first instance, would inform the wider application of the *Coastal Protection Package*.

I thank everyone who has been involved in this Inquiry for their participation and encourage anyone with an interest in coastal lakes to get behind the implementation of the *Coastal Lakes Strategy*. I also wish to thank Professor Bruce Thom, Chair of the Coastal Council of NSW for his commentary during the development of the strategy. The Commission looks forward to auditing the progress made by public authorities to implement the strategy two years after the Government announces its response to this Final Report.

Peter J Crawford
Commissioner

Contents

Coastal Lakes Inquiry: Recommendations

The Commission's principal recommendation is that the Government adopts a new comprehensive, and more effective set of over-arching arrangements for the management of coastal lakes and their catchments, through endorsement of the *Coastal Lakes Strategy: An Assessment and Management Framework* presented in this Final Report on the Commission's Coastal Lakes Inquiry.

The recommended *Coastal Lakes Strategy* builds on recent government decisions and proposals in its *Action for the Environment: Environment Statement 2001* and the *Coastal Protection Package*. A central element of the strategy is the preparation of Sustainability Assessment and Management Plans for coastal lakes, which themselves would constitute key elements of the *Comprehensive Coastal Assessment* that the Government has initiated. Other government policy announcements, and developments in progress, are also inter-related with this strategy, in that there is a real potential for the various initiatives to be mutually reinforcing.

The strategy incorporates the Government's decision to assign the Healthy Rivers Commission the task of auditing public authorities' implementation of government decisions in response to Inquiry reports.

The following key decisions by the Government would give effect to the *Coastal Lakes Strategy*. These decisions would require implementation of a range of primary and subsidiary actions, as specified in the strategy.

Decisions on Management

1. For all coastal lakes and their catchments, adopt the principles, management framework, classification of coastal lakes and requirements for preparing and implementing Sustainability Assessment and Management Plans, as specified in Sections 5 to 9 and Tables 1 to 6 in the *Coastal Lakes Strategy*.

2. Establish an Independent Coastal Lakes Expert Group under the oversight of the Chairperson of the Coastal Council to undertake the tasks specified in Section 9.2.

3. Establish processes to resolve disputes that might arise in the preparation of Sustainability Assessment and Management Plans for each coastal lake, as specified in Section 9.6.

4. Apply the following transitional arrangement to govern decisions about the management of coastal lakes, pending the preparation of the Sustainability Assessment and Management Plan for each coastal lake:

    - all relevant decisions made by public authorities (including the requirements for site specific environmental assessments) to be consistent with the primary outcome and indicative actions for each class of coastal lake, as presented in the management framework of the strategy; and
    - the Minister for Planning to call-in some specific development proposals, as specified in Section 10.1.

5. Formalise these management requirements by way of a State Environmental Planning Policy (SEPP) under the provisions of the *Environmental Planning and Assessment Act 1979*. (An indicative draft of a SEPP that would formalise these requirements and those for lake confirmation/reclassification and site specific assessments is presented in Appendix 3. The coastal protection SEPP that is currently in preparation might provide an appropriate mechanism for formalising the relevant components of the *Coastal Lakes Strategy*. Alternatively, they could be incorporated into a separate but linked SEPP.)

Decisions on Specific Coastal Lakes

6. For the coastal lakes specified below, adopt the specified outcomes (in addition to those that would be derived by applying the management framework) as the basis for decisions and actions taken by the relevant public authorities in respect of those coastal lakes:

    - for Wallis, Wagonga, Tuross, Merimbula, Conjola, Queens/Watson Taylor, Wonboyn and Pambula lakes, minimise the public health and economic risks for oyster growing; and
    - for Minnie Water and Hiawatha lakes, protect water quality to meet requirements as sources of drinking water.

Decisions on Resources and Priorities

7. Dedicate funding of the order of $2.2 million over three years (within the existing funding allocated for the *Comprehensive Coastal Assessment*) to the preparation of the *technical* component of the Sustainability Assessment and Management Plans for the nominated priority coastal lakes (coastal lakes in the Shoalhaven and Great Lakes areas and Cudgen, Innes-Cathie, Narrabeen, Coila, Tuross, Wagonga, Merimbula and Back lakes), and to provide for relevant activities of the Independent Coastal Lakes Expert Group. (This funding level has been estimated by the Commission after consultation with the Department of Land and Water Conservation and PlanningNSW.) The accountabilities and completion times for preparing assessment and plans for the nominated coastal lakes to be specified in the recommended State Environmental Planning Policy.

8. For the nominated priority coastal lakes allocate $1.6 million of 'seed' funding, over three years, to support the preparation of the *management* component of Sustainability Assessment and Management Plans. Negotiate provision of supporting funds and/or contribution of in-kind resources from the relevant council(s). (Suggested funding level has been estimated by the Commission after consultation with the Department of Land and Water Conservation and Planning NSW).

9. For other coastal lakes, develop a longer-term program for the completion of Sustainability Assessment and Management Plans, including priorities, completion times and the allocation of available funds.

10. Progressively review and apply statutory approval functions and existing agency funding programs in ways that support and reinforce the outcomes identified by the *Coastal Lakes Strategy* for the various classes of coastal lake, including preparation and implementation of Sustainability Assessment and Management Plans.

11. Ascertain longer-term funding requirements and arrangements (including arrangements for the sharing of costs with local government and other parties) for implementing actions specified in Sustainability Assessment and Management Plans, as components of the audit of implementation of the Government's announced decisions, to be undertaken by the Commission after two years.

12. Adjust the criteria for acquisition of private lands under the *Coastal Lands Protection Scheme* to provide for the purchase of properties (or parts of properties) where the health of coastal lakes and their catchments would be improved or protected, even if indirectly (as specified in Section 10.5).

13. 'Accredit' Sustainability Assessment and Management Plans, prepared in accordance with the requirements of this *Coastal Lakes Strategy*, as satisfying the requirements of local environmental studies, under the provisions of Section 57 of the *Environmental Planning and Assessment Act 1979*, and effect amendments to enable councils to obtain financial contributions *at a later date* from the proponents of new developments (as specified in Section 9.3).

Decisions on Implementation

14. Issue a notice(s) under Section 117 of the *Environmental Planning and Assessment Act 1979* requiring relevant councils to develop or review their local environmental plans to incorporate provisions that give effect to Sustainability Assessment and Management Plans (as specified in Section 9.7).

15. Apply the 'controlled activity' provisions of the *Water Management Act 2000* as the mechanism for governing decisions to open lake entrances artificially, with approvals determined by the Minister for Land and Water Conservation and the Minister for Planning (as part of their approval of Sustainability Assessment and Management Plans), as specified in Section 10.2. *State Environmental Planning Policy 35 – Maintenance Dredging of Tidal Waterways* should be amended to exclude its application to the management of coastal lake entrances. The responsible public authorities should develop and implement an education strategy to increase community understanding and acceptance of entrance management strategies.

16. Implement a range of other supporting initiatives as described in Section 10, relating to planning provisions for adaptation to changes in sea level and storm events, establishing reserves, enhancing processes for estuary management, exploring world heritage nomination, managing *Caulerpa taxifolia*, encouraging sustainable farming practices, investigating mechanisms for managing land in areas of outstanding conservation value and extending the management approach to estuarine creeks.

The Commission anticipates that the Government's response to this Inquiry into coastal lakes will be announced through the public release of a Statement of Intent that will incorporate decisions on the recommended *Coastal Lakes Strategy* (and thus on the following implementation matters). That Statement of Intent would confirm the lead responsibilities and implementations schedules. Indicative responsibilities and completion times for the agencies and councils with roles in implementing the *Coastal Lakes Strategy* as recommended, are presented in Table 7.

Recommended Coastal Lakes Strategy: Central Components

The *Coastal Lakes Strategy* is an over-arching set of arrangements designed to improve the management (by all relevant parties) of coastal lakes and their catchments so that progress towards the long term goal of *healthier* coastal lakes is achieved in a timely and cost effective manner. The strategy incorporates:

- principles for managing coastal lakes,
- a framework for managing major classes of coastal lake,
- a classification of coastal lakes,
- requirements for preparing and implementing Sustainability Assessment and Management Plans for each coastal lake,
- implementation arrangements, and
- a range of supporting initiatives.

For further guidance on the intent and application of the strategy, refer to the relevant section of the strategy presented in the subsequent section of this Final Report of the Coastal Lakes Inquiry.

Principles

The strategy requires that the responsible public authorities give effect to the following principles for managing coastal lakes.[1] The principles are particularly relevant in developing and implementing a Sustainability Assessment and Management Plan for each coastal lake.

- Each coastal lake and its catchment is to be managed as a whole system.

- Coastal lakes and their catchments are to be treated as assets with productive values to be sustained by carefully directed management. Decisions about coastal lakes must be governed by realistic assessments of their capabilities and recognition of their limitations.

- Management actions are to address the unique characteristics and interrelationships of ecosystems and human activities for each coastal lake, taking account of the degree of existing modification and the conditions sought.

- Management actions for coastal lakes must provide for further adaptation in light of the inherent scientific uncertainties and limited information bases.

- Management plans are to be sufficiently clear to create explicit obligations on the responsible public authorities with powers and resources that can be applied to coastal lake management.

- The responsibilities of public authorities and communities are to be clearly stated and outcomes achieved through partnership arrangements.

- The responsible public authorities are to be accountable for the condition of coastal lakes at the conclusion of each cycle of planning, action and assessment. They are to be accountable for the proper implementation of agreed management processes where actual outcomes are subject to a variety of uncontrollable external influences.

[1] The *Coastal Lakes Strategy* covers the waterbodies, catchments and tributary streams for each coastal lake.

Management Framework

The management framework provides the context and processes to guide public authorities in their decision making processes relating to four classes of coastal lakes, as specified in Tables 1 to 5. For each class of coastal lake, it indicates the outcomes sought and shows, in general terms, the typical types of actions necessary and how the relevant powers must be exercised and priorities set to achieve these outcomes. That is, for each class of coastal lake it establishes boundaries within which the lake managers (councils and agencies), together with citizens, are to determine the detailed actions for an individual lake, in light of its specific local circumstances and priorities.

The framework requires:

- Application, through location of a coastal lake within the specified classification system, of the *orientation*, or underlying intention, of management decisions;

- Determination, through reference to the classification system, of the primary (and other) *outcomes* sought for a coastal lake, that is, the results that would, ultimately, indicate success or failure of management decisions;

- Preparation of a *Sustainability Assessment and Management Plan* for a coastal lake (in accordance with the processes specified in Sections 6 and 8) to identify a coastal lake's capabilities (and limitations) and on that basis, to refine the outcomes sought for the lake, and determine the most effective management actions and tools; and

- *Implementation* of the Sustainability Assessment and Management Plan for a coastal lake, within an overall set of implementation arrangements that pertain to the *Coastal Lakes Strategy* (as specified in Section 9).

Comprehensive Protection (Management Orientation)

Management Framework For Coastal Lakes (Table 1)

Prepare and implement a *Sustainability Assessment and Management Plan* for each coastal lake and its catchment.

- Specify any other outcomes for each coastal lake that are consistent with *restoring and preserving all natural ecosystem processes*.
- Determine how existing and potential activities must be managed (ie encouraged, permitted, modified, not permitted) to achieve the intended outcomes. The indicative actions shown below should be addressed.
- Select and design the most appropriate set of management tools.
- Specify the responsibilities, timing and resources for each action.

Intended Outcomes	**Indicative Actions** — *those most likely to be necessary and effective*
Primary Outcome: • *All* natural ecosystem processes restored and preserved. ***Examples of Other Possible Outcomes:*** • Water quality for drinking water supply protected. • Existing villages maintained within current boundaries of developed areas.	• Limit any *new* urban and rural residential development to within the *existing* boundaries of such developed areas. Limit any other type of new development outside such areas to those that are determined to be sustainable, that is, to have a neutral or beneficial effect on natural ecosystem processes. Apply rigorous controls and monitoring to ensure that no other effects occur. • No new heavy industry, intensive agriculture, aquaculture or mining. • Implement a program to *retain/progressively reinstate natural entrance behaviour*. The program should include progressive removal or modification of *existing* assets and activities that are prone to water damage or create significant inconvenience or which may exacerbate public health problems when lake water levels are high. The sources of water quality problems should be treated. Require any *new* assets to be located and designed in ways that do not necessitate opening a lake entrance artificially. • *Progressively remove* (or substantially mitigate) sewage discharges and overflows from *existing* sewerage and on-site systems and boats. In cases in which this requires *new* sewage infrastructure, design and operate the system to prevent discharges, to minimise risks of overflows within the lake or its catchment and to minimise the ingress of groundwater. • Progressively implement stringent stormwater controls for existing developed areas. • Phase out forestry operations that have an adverse impact on lake health when forestry agreements are renegotiated. Cease broad acre vegetation clearing. • Mitigate sediment runoff from high risk sections of unsealed roads (such as sealing those sections with erodible, nutrient rich and acidic soils, particularly adjacent to water courses) and other sources. • Implement best farming practices commensurate with the risks to lake/catchment health. Promote conversion of specific farming activities that have an adverse effect on lake health to alternative, sustainable farming. • Phase out commercial fishing through existing structural adjustment processes; apply lake-specific gear and catch controls for recreational fishing; apply a 'no wash' speed limit for boating. Apply commensurate limits for other commercial and recreational uses. • Protect river flows in tributary streams and waters within a lake, including carefully assessed limitations on *existing* licences for water extraction for all flow levels. The limits should be commensurate with the risks to each lake's health and should satisfy the essential needs of water users. Prohibit *new* licences for water extraction or storage of stream flows or lake waters.

Significant Protection (Management Orientation)

Management Framework for Coastal Lakes (Table 2)

Prepare and implement a *Sustainability Assessment and Management Plan* for each coastal lake and its catchment.

- Specify any other outcomes for each coastal lake that are consistent with *restoring and preserving critical natural ecosystem processes*.
- Determine how existing and potential activities must be managed (ie encouraged, permitted, modified, not permitted) to achieve the intended outcomes. The indicative actions shown below should be addressed.
- Select and design the most appropriate set of management tools.
- Specify the responsibilities, timing and resources for each action.

Intended Outcomes	**Indicative Actions** — *those most likely to be necessary and effective*
Primary Outcome: • *Critical* natural ecosystem processes restored and preserved. ***Examples of Other Possible Outcomes:*** • Minimal risk for existing oyster growing. • Existing villages maintained within current boundaries of developed areas. • Sustainable fishing.	• Limit any *new* urban and rural residential development to within the *existing* boundaries of such developed areas. Limit any other type of new development outside such areas to those that are determined as being sustainable, that is, those where any potential *minor* adverse impacts can be contained on site. Apply strong controls to ensure that effects are contained. • Implement a program to *progressively minimise intervention in natural entrance behaviour* (with a view to full reinstatement over a period as long as 50 years). The program should include progressive removal or modification of *selected existing* assets and activities, as opportunities and resources are realised, that are prone to water damage or create significant inconvenience or which may exacerbate public health problems when lake water levels are high. The sources of water quality problems should be treated. Require any *new* assets to be designed in ways that do not necessitate opening a lake entrance artificially. • *Progressively mitigate* (or remove) sewage discharges and overflows from *existing* sewerage and on-site systems and boats, as opportunities and resources are realised. In cases in which this requires *new* sewage infrastructure, design and operate the system to prevent discharges, to minimise risks of overflows within a lake or its catchment and to minimise the ingress of groundwater. • Progressively implement stringent stormwater controls for existing developed areas. • Implement best practices for forestry, including phasing out areas that have a *critical* adverse impact on lake health when forestry agreements are renegotiated. Apply stringent controls for other vegetation clearing. • Mitigate sediment runoff from high risk sections of unsealed roads (such as sealing those sections with erodible, nutrient rich and acidic soils, particularly adjacent to water courses) and other sources. • Facilitate the use of best farming practices, in light of the potential benefits to lake/catchment health. Promote conversion of specific farming activities that have an adverse effect on lake health to alternative, sustainable farming. • Control commercial and recreational uses of a lake waterbody in ways that are commensurate with protecting lake health and to ensure compatibility between different uses (eg fisheries, boating), including appropriate zonings. • Protect river flows in tributary streams and waters within a lake, including carefully assessed limitations on *existing* licences for water extraction during periods of very low and low stream flows. The limits should be commensurate with the risks to each lake's health and should be sufficient to satisfy the needs of water users. Prohibit *new* licences for water extraction or storage of low stream flows or lake waters.

Healthy Modified Conditions (Management Orientation)

Management Framework for Coastal Lakes (Table 3)

Prepare and implement a *Sustainability Assessment and Management Plan* for each coastal lake and its catchment.

- Specify any other outcomes for each coastal lake that are consistent with *rehabilitating and retaining key natural processes and/or modified values and determining appropriate types and sustainable levels of human uses*.
- Determine how existing activities must be managed (ie encouraged, permitted, modified), drawing on (but not limited to) the types of indicative actions shown below, to achieve the intended outcomes.
- Determine the capability and limitations of a lake and catchment to sustain new development (ie permitted or encouraged, permitted subject to conditions, not permitted pending further investigations, not permitted). Determine opportunities to harness new development to offset the impacts of existing development.
- Select and design the most appropriate set of management tools.
- Specify the responsibilities, timing and resources for each action.

Intended Outcomes	**Indicative Actions** — *those most likely to be necessary and effective*
Primary Outcome: • Key natural and/or highly valued modified ecosystem processes rehabilitated and retained. ***Examples of Other Possible Outcomes:*** • Urban/village/ rural residential areas maintained and/or expanded within defined limits.	• Apply and enforce controls for any new development (eg urban, rural residential, intensive agriculture, forestry, mining and aquaculture) to keep their impacts on lake/catchment health within limits that are determined to be sustainable for each lake. • Adjust entrance intervention to protect critical ecosystem processes (such as bird breeding events). Require any *new* assets that are prone to water damage, significant inconvenience or which may exacerbate public health problems when lake water levels are high, to be designed in ways that do not necessitate opening a lake entrance artificially, except where it is determined that reinstatement of natural processes in the longer term is not cost effective. In such cases, any new assets must be designed in ways that are commensurate with those determined for existing assets, subject to satisfying any additional requirements that may arise as a result of a predicted rise in sea (and lake) water levels. • Progressively implement an integrated, cost effective program to mitigate the impacts of *all existing* sources of wastewater. Exclude *new* industrial and sewage discharge or overflows and apply stringent controls for on site systems, boats and stormwater. • Progressively implement a program to rehabilitate natural riverine corridors. • Enhance management of fishing (such as by-catch devices). • Encourage use of best farming and forestry practices commensurate with the risks to lake/catchment health. • Control commercial and recreational uses of a lake waterbody in ways that are commensurate with protecting lake health and to ensure compatibility between different uses, including appropriate zonings. • Protect river flows in tributary streams and waters within a lake, including carefully assessed limitations on *existing* licences for water extraction during periods of very low and low stream flows. The limits should be commensurate with the risks to each lake's health and should be sufficient to satisfy the needs of water users. Prohibit *new* licences for water extraction or storage of low stream flows and freshwater within a lake. Apply stringent controls on any saline extractions.

Targeted Repair (Management Orientation)

Management Framework for Coastal Lakes (Table 4)

Prepare and implement a *Sustainability Assessment and Management Plan* for each coastal lake and its catchment.

- Specify any other outcomes for each coastal lake that are consistent with *creating a preferred condition through rehabilitation.*
- Determine the few targeted rehabilitation measures necessary to achieve the intended outcomes.
- Determine the capability and limitations of a lake/catchment to sustain any new development (ie permitted or encouraged, permitted subject to conditions, not permitted pending further investigations, not permitted). Determine opportunities to harness new development to offset the impacts of existing development.
- Select and design the most appropriate set of management tools.
- Specify the responsibilities, timing and resources for each action.

Intended Outcomes	**Indicative Actions** — *those most likely to be necessary and effective*
Primary Outcome • Habitat conditions for selected key species established. ***Examples of Other Possible Outcomes:*** • Frequency of algal blooms reduced. • Existing urban areas retained and/or expanded within defined limits. • Aesthetic value/amenity maintained.	• Design rehabilitation measures for nominated areas and modified ecosystem values (such as protecting selected species, opening a lake entrance, aerating a lake water body, implementing stormwater controls). These should be designed to close the gap progressively between actual and intended conditions. • Apply and enforce controls for any new development to keep their impacts on lake/catchment health within tolerable limits.

Management Tools

Management Framework for Coastal Lakes (Table 5)

Many management 'tools' could be used for all classes of coastal lake, while some tools are particularly suitable for a given class of coastal lake (as indicated below). The way in which each tool should be used will vary according to the classification, intended outcomes and actual actions assigned for each coastal lake. Within this context, the choice of the *best mix* and *use of tools* for an individual coastal lake is a matter for councils and agencies, with those decisions being informed by the results of lake specific Sustainability Assessment and Management Plans (including independent expert validation) and the views of interested parties.

The tool box includes (but is not limited to):

- Statutory environmental plans -- state environmental planning policies, regional environmental plans, local environmental plans (including controls for new and existing development, and land and waterway zoning)
- Non statutory environmental plans -- development control plans*
- Statutory local government management plans
- Statutory natural resource plans – catchment management blueprints, water management plans, vegetation management plans, national park plans of management and fisheries plans and strategies
- Non statutory natural resource plans -- estuary management plans, boating management plans
- Natural resource consents and regulations governing water extraction, wastewater, fishing and boating
- Targeted public funding programs -- *Stormwater Management, Country Towns Water Supply Sewerage and Drainage, Estuary Management, Floodplain Management, Coastal Management, Saltwater Fishing Trust, Coastal Lands Protection Scheme*
- Statutory reserves -- national park, aquatic reserve, marine park, crown land reserve#
- Partnerships -- eg voluntary conservation agreements, private sector mechanisms such as co-operative contracts
- Land use management -- eg down zoning, crown land swaps, transferable development rights #
- Market mechanisms -- eg water trading, 'green' offsets and trading, custodian payments
- World heritage listing#
- Education strategies
- Indigenous land use agreements
- Strategies developed in relation to international conventions -- eg *China-Australia Migratory Bird Agreement* (CAMBA), *Japan-Australia Migratory Bird Agreement* (JAMBA), *Convention of Wetlands of International Importance* (Ramsar), directory of important wetlands and wilderness status#

Notes:

* Applicable to all classes of coastal lake, particularly Healthy Modified Conditions and Targeted Repair

\# Applicable to all classes of coastal lake, particularly Comprehensive Protection and Significant Protection

Classification of Coastal Lakes

Classifying coastal lakes is a first step towards the identification of a set of realistic goals for each lake and a management plan able to achieve them cost effectively. Each coastal lake is classified according to its natural sensitivity, current condition of the water body and catchment, recognised ecosystem and resource conservation values, and other significant socio-economic factors.

Table 6: Classification of Coastal Lakes

Management Orientation	Coastal Lakes		
Comprehensive Protection	Arragan Bondi Bournda Brou Brunderee Durras	Hiawatha Meroo Minnie Water Nadgee Nargal Nelson	Saltwater Lake Tarourga Termeil Wollumboola
Significant Protection	Back★ Baragoot Bingie (Kellys) Bunga Cakora Candlagan Conjola (incl. Berringer) Corunna Cuttagee	Dalhousie Deep Goolawah Innes Meringo Middle (Tanja) Mummuga (Dalmeny) Myall Oyster	Queens Smiths Swan Lake Tabourie Wallagoot Wapengo Willinga Wooloweyah Wonboyn
Healthy Modified Conditions	Avoca Bullengella Burrill★ Brush (Swan) Cathie Cobaki-Terranora Cockrone Coila (Kyaily) Congo Cudgen Curalo Hearns	Kianga Killalea Kioloa Little (Wallaga) Long Swamp Merimbula Mullimburra Murrah Nangudga Narrabeen Narrawallee Pambula	Saltwater Lagoon St Georges Basin★ The Broadwater Tilba Tilba Tuross★ Wagonga★ Wallaga★ Wallis Wamberal Watsons Taylor Werri Woolgoolga
Targeted Repair	Ainsworth Bellambi Corindi (Pipe Clay) Curl Curl	Dee Why Illawarra Little (Narooma) Macquarie	Manly Terrigal Tuggerah (incl. Munmorah and Budgewoi)

★ Provisional classification that warrants more detailed assessment. Classes to be confirmed in light of the outcomes of Sustainability Assessment and Management Plans for each coastal lake.

Sustainability Assessment and Management Plans

Sustainability Assessment and Management Plans are to be prepared for each coastal lake within the context of the management framework (as specified in Sections 6 and 8). Each assessment and plan is to determine and record any other outcomes sought for a given coastal lake (in addition to those specified in the management framework), its capability and limitations to sustain existing and likely human activities, the actions to be implemented (including remedial actions) and the most appropriate selection and design of management tools. Each assessment and plan must identify the public authorities or private entities that are responsible for each specified action and the timing (including critical milestones and completion dates) and allocation of resources relevant to its implementation. The proponents of specific development proposals must prepare site assessments within the context of the relevant Sustainability Assessment and Management Plan.

The key factors to be addressed in each Sustainability Assessment and Management Plan are:

- key ecosystem processes and thresholds (eg lake type and maturity, entrance behaviour, nutrient loads, lake hydraulics, flooding, sea level and storm intensity change);
- catchment processes and characteristics (eg soils, vegetation, river flows);
- environmental and ecosystem values (eg water quality and river flow objectives, threatened species, representativeness, wetlands, aquatic and terrestrial weeds);
- Aboriginal values (eg access, food, spiritual, Native Title claims);
- sustainable (commercial) resource use and values (eg fish, oysters, tourism, forestry, boating, farming, water extraction, mining, aquaculture);
- citizen values (eg heritage, recreation, amenity, odours, fire hazard);
- public health implications of lake conditions (eg swimming, oyster cultivation and consumption, drinking water); and
- existing and possible public and private institutional, jurisdictional and management mechanisms, which could be used to implement actions.

Table 7: Implementation Responsibilities and Completion Times

The (indicative) responsibilities and completion times for implementing the major actions in the *Coastal Lakes Strategy* are presented below. Some actions require one or more subsidiary actions, as detailed in the strategy. All completion times to be effective from the date of the NSW Government's endorsement of the strategy. Initial funding arrangements are proposed in the recommended decisions by government, and ongoing funding provisions would be determined within state budgeting processes.

Actions	Lead Responsibility	Completion Time
Give effect to the principles for managing coastal lakes (as specified in Section 5 in the *Coastal Lakes Strategy*).	All relevant public authorities	Immediate and ongoing
Formalise the components of the *Coastal Lakes Strategy* by way of a State Environmental Planning Policy (as specified in Section 9.1).	PlanningNSW	3 months
Prepare Sustainability Assessment and Management Plans for the coastal lakes in the Shoalhaven area, namely Wollumboola, St Georges Basin, Swan, Conjola, Narrawallee, Burrill, Tabourie, Termeil, Meroo, Willinga, Brush (Swan), Kioloa and Durras (as specified in Section 9.8).	PlanningNSW, DLWC & the relevant council(s)	18 months
Prepare Sustainability Assessment and Management Plans for the coastal lakes in the Great Lakes area, namely Wallis, Smiths and Myall lakes (as specified in Section 9.8).	PlanningNSW, DLWC & the relevant council(s)	18 months
Prepare Sustainability Assessment and Management Plans for Cudgen, Innes-Cathie, Narrabeen, Coila, Tuross, Wagonga, Merimbula and Back lakes (as specified in Section 9.8).	PlanningNSW, DLWC & the relevant council(s)	3 years
Develop a program to prepare Sustainability Assessment and Management Plans for remaining coastal lakes covered by the *Coastal Lakes Strategy* (as specified in Section 9.8).	Coastal Council of NSW	2 years
Establish the Independent Coastal Lakes Expert Group (as specified in Section 9.2).	Chair, Coastal Council	3 months
In addition to the primary outcome for coastal lakes, specified in Tables 1 - 4, ensure that relevant decisions and actions be directed to achieve the following outcomes: • Minimising the public health and economic risks for oyster growing in Wallis, Wagonga, Tuross, Merimbula, Conjola, Queens/Watson Taylor, Wonboyn and Pambula lakes; and • Protecting water quality in Minnie Water and Hiawatha lakes as sources of drinking water (as specified in Section 6.2).	Relevant public authorities	Immediate and ongoing
Accredit Sustainability Assessment and Management Plans as satisfying the requirement of local environmental studies, under the provisions of Section 57 of the *Environmental Planning and Assessment Act 1979*, and effect amendments to enable councils to obtain financial contributions *at a later date* from the proponents of new developments (as specified in Section 9.3).	PlanningNSW	1 year
Apply the dispute resolution processes (as specified in Section 9.6).	Chair, Coastal Council	As necessary
Implement the actions identified in Sustainability Assessment and Management Plans for each coastal lake (as specified in Section 9.7).	Relevant state agencies and local councils	Ongoing

Actions	Lead Responsibility	Completion Time
Issue a notice under Section 117 of the *Environmental Planning and Assessment Act 1979* requiring relevant councils to develop or review their local environmental plans to incorporate provisions that give effect to Sustainability Assessment and Management Plans (as specified in Section 9.7).	PlanningNSW	As necessary
Review and apply statutory approval functions and public funding programs in ways that assist the development and implementation of Sustainability Assessment and Management Plans for each coastal lake (as specified in Section 9.7)	Relevant state agencies and local councils	Ongoing
Develop and manage a program to monitor and review progress towards achieving the outcomes sought for each coastal lake as contained in each Sustainability Assessment and Management Plan (as specified in Section 9.9)	DLWC	Ongoing
Apply the transitional arrangements for new development proposals for coastal lakes for which a Sustainability Assessments and Management Plan is yet to be completed (as specified in Section 10.1).	All relevant public authorities	Immediate and ongoing
Apply the 'controlled activity' provisions of the *Water Management Act 2000*, as the primary instrument for managing the opening of the entrances of coastal lakes artificially (as specified in Section 10.2).	DLWC	Immediate and ongoing
Amend State Environmental Planning Policy 35 (as specified in Section 10.2).	PlanningNSW	2 months
Assess the social, economic and ecosystem risks that may result from a rise in sea level and change in storm events for coastal lakes, and other coastal areas (as specified in Section 10.3).	PlanningNSW	1 year
Formulate management responses to prepare for predicted rise in sea (and lake) level and change in storm events (as specified in Section 10.3).	PlanningNSW	2 years
Declare the waterbody and bed of lakes classified as Comprehensive Protection as reserves (as specified in Section 10.4).	NPWS, MPA, DLWC	18 months
Declare specific areas of Crown land in any class of coastal lake, identified through a Sustainability Assessment as having *outstanding* conservation values, as reserves (as specified in Section 10.4).	NPWS, MPA, DLWC	Ongoing
Adjust the criteria for acquiring private lands under the *Coastal Lands Protection Scheme* (as specified in Section 9.5).	PlanningNSW	Immediate
Review the need for an enhancement of the funding allocated to the *Coastal Lands Protection Scheme* (as specified in Section 10.5).	PlanningNSW	3 years
Reform the membership and operations of estuary management committees (as specified in Section 10.6).	DLWC	6 months and ongoing
Incorporate relevant elements of the *Coastal Lakes Strategy* in the revised estuary and coastal management manuals (as specified in Section 10.6).	DLWC	1 year
Explore the possibilities for nominating a group of coastal lakes (and possibly other estuaries) on the South Coast, for World Heritage Listing (as specified in Section 10.7).	NPWS	2 years
Contain the spread of *Caulerpa taxifolia* (as specified in Section 10.8).	NSW Fisheries	Ongoing
Investigate innovative mechanisms for managing undeveloped land in areas with *outstanding* natural or human conservation values (as specified in Section 10.10).	PlanningNSW	1 year
Extend the *Coastal Lakes Strategy* to other estuarine creeks (as specified in Section 10.11).	DLWC	1 year (then ongoing)

Coastal Lakes Strategy: An Assessment and Management Framework

Incorporating the Healthy Rivers Commission's final findings and recommendations for the Coastal Lakes Inquiry (including notes on the intent and application of the Strategy)

This strategy is subject to consideration and endorsement by the NSW Government.

Coastal Lakes: Facing the Challenge

1 Fundamental Realities

The independent Coastal Lakes Inquiry, undertaken by the Healthy Rivers Commission, identified and confirmed several fundamental realities that must be faced in our efforts to improve the health of coastal lakes.

Many coastal lakes are treated as if they have limitless capacity to support human activities.

The evidence is clear enough on that point — whether assessed in terms of community or scientific opinion. For example, the 1997 contamination of oyster growing waters in Wallis Lake, with its public health implications, provided graphic evidence of the failure to recognise the limitations of natural systems. It demonstrated that an insufficient understanding of the impacts of development has compromised not only the ecological condition of some coastal lakes, but also the continuing viability of some commercial activities that are dependent on healthy coastal lakes. Other typical examples include:

- the occurrence of blue green algal blooms in Lake Ainsworth and Myall Lake — which phenomenon can only be rectified in the longer term;
- the impacts of significant urban areas in the catchments of coastal lakes and the often enormous remedial costs, as is the case for Manly, Curl Curl, and Macquarie lakes;
- the emergence of proposals to develop new urban and rural residential areas in the catchments of several highly sensitive coastal lakes, where the current assessment of the impacts on lake ecosystems or the human activities that are dependent on it, has been inadequate, for example, in Burrill, Merimbula and Cudgen lakes and St Georges Basin;
- the inevitable demand to construct major works to 'repair' some coastal lakes where development pressures have been significant, such as the construction of a permanent entrance to 'ventilate' Lake Illawarra, thereby further changing the character of a lake's ecosystem and resource base; and
- the common practices for opening the entrances of many coastal lakes, regardless of the significant differences in their ecosystem condition, conservation value and the scale of human assets subject to inundation at high water levels - for example, the near pristine Durras Lake and the highly developed Terrigal Lagoon are both opened artificially.

The resulting problems generally can be attributed to a lack of credible assessments of the human activities that coastal lakes can sustain, a lack of clarity in the outcomes sought for each lake, a lack of processes to ensure balanced decision making, a lack of consistency in management actions and a lack of accountability for the decisions affecting lakes. In many instances, there is a combination of all five shortcomings.

Citizens and their governments face a fundamental choice regarding the natural ecosystems of coastal lakes.

Only one coastal lake in New South Wales remains in truly pristine condition. Nadgee Lagoon situated on the far south coast, survives today not because of a conscious decision to protect it but because the lake and its catchment were not developed by European settlers. For other coastal lakes the available choices *are* now extremely limited by the inheritance of past decisions, such as those that allowed inappropriate patterns of urban and rural development in sensitive lake catchments, located assets in areas prone to water inundation when lake water levels are high, or situated homes in foreshore areas that are exposed to pungent odours.

The condition of coastal lakes ranges from 'near pristine' to 'highly modified'. There is some opportunity to 'hold the line' or even restore coastal lakes that are in a near pristine condition, such as Durras Lake. However, this would require immediate action to place the natural ecological health of these coastal lakes at the centre of future planning and management decisions.

Protection in a *relatively* pristine condition remains a viable option for some coastal lakes, and for them the choice may be between various *levels of protection*. For most lakes, however, the only choice now is between acceptance of the limitations inherent in more sustainable management and acceptance of significant further damage, which will be often irreversible.

The inevitability of those choices must be recognised in all planning and decision making relating to coastal lakes. In order to make *informed* choices, public authorities and citizens require credible assessments of lakes' capacities, and processes for understanding the possible trade- offs and choosing among them.

Coastal lakes are the most sensitive of all estuaries to human interventions.

This sensitivity largely relates to the geomorphic character of coastal lakes. Sensitivity is greatest in coastal lakes that have entrances that are mostly closed or have irregular shapes, due to the limited exchange of fresh or saline water moving through a lake.

Human interventions, such as the entry of wastewater from urban areas and the artificial opening of entrances, can have profound impacts on the ecology of coastal lakes. Further, these systems are terminal sinks for many contaminants, which present particular challenges for water quality management.[2]

The ecosystems of many coastal lakes display pronounced natural 'boom and bust' variations (both spatially and temporally). For example, the recorded levels of total nitrogen in Lake Wollumboola range between 5 and 24,000 micrograms per litre.

Each coastal lake is unique in its ecology, human values and interrelationships.

Although they vary so much, the prevailing management approach has tended to treat coastal lakes as if these are all the *same* or even that they are all like well-flushed estuaries, such as Sydney Harbour. That is, decisions about land uses, fishing, roads, forestry, sewerage and the openings of lake entrances have given little attention to the natural differences in coastal lakes, their varying sensitivity to human uses or the dependencies of human uses on healthy lakes. Much degradation has resulted.

Some coastal lakes have broadly similar geomorphic characteristics, but significantly different capacities to assimilate pollutants, as is the case for Manly and Curl Curl lagoons. Human values that are dependent on the ecosystems of individual coastal lakes often vary markedly, as demonstrated by differing patterns of tourism, fishing, oyster cultivation and settlement.

In other cases, human activities have created modified conditions that are highly valued. For example, the creation of a more 'stable' salt water environment in Wallis Lake, through the construction of a permanent entrance, has created conditions more favourable for oyster cultivation. Similarly, relationships have evolved between various coastal lakes and rivers.[3]

Such ecosystem and human relationships are poorly understood. Appropriate assessments have not been undertaken for most coastal lakes, despite the acknowledged value of these systems as environmental assets to regional economies and their contribution to community well being. Additionally, many natural resource management plans address specific matters, rather than dealing comprehensively with the ways in which coastal lakes are affected by the interplay between broader ecosystem processes and human activities.

The opportunity to *restore* coastal lakes that are highly modified has generally now passed.

In managing all natural systems it is often technically more difficult and financially prohibitive to mount restoration efforts rather than protection efforts. This is particularly true of coastal lakes. Once conditions in a coastal lake have passed certain threshold levels, such as critical levels of nutrient enrichment, the management challenges are greatly magnified. For example, the occurrence of blue green algal blooms in Lake Ainsworth has led to a requirement for mechanical aeration of the water body, at significant cost, to reduce the release of nutrients accumulated in lake sediments.

For some highly modified lakes, such as Manly and Dee Why lagoons, restoration to a near pristine condition is now widely accepted as an unrealistic goal, given the dramatic changes to existing patterns of development that would be required.

However, even the most degraded coastal lakes offer some opportunity to move towards a *healthier* modified system. Citizens clearly expect that action will be taken in that regard. The challenge is to

[2] Sinclair, Knight, Merz (1997) *Preliminary Assessment of Nutrient Discharges from Estuaries,* Report to the Environment Protection Authority.

[3] For example, the production of oysters in the Hastings River has been affected adversely by discharges from acid sulfate soils, but the river remains capable of growing healthy spat. Oyster growers in the region have become somewhat dependent on selling spat to growers in healthier coastal lakes on the South Coast.

identify the most realistic strategies to achieve useful improvements, at tolerable cost.

There are divergent views about the 'best' ways to manage coastal lakes.

Local citizens, visitors and the broader state community engage in many debates about the best ways to manage coastal lakes. Differing views are often based on perceptions and personal experiences, captured in comments such as: '*there used to be lots of fish until the entrance closed/opened*', '*opening the entrance will solve odour problems*', and '*commercial/recreational fishers take all the fish*'. In some instances, community views have been *strongly* divided and key differences remain unresolved, as is the case for Wollumboola and Cathie lakes.

Many people involved in managing coastal lakes believe that a lack of access to independent and high quality expertise on coastal lake processes and management, and a lack of processes to ensure balanced decision making and to mediate disputes, undermine efforts to gain the trust and support of citizens.

Emerging pressures present new threats and opportunities for coastal lakes, depending on how these are managed.

Areas around coastal lakes are highly sought after places to live, work and play. New development provides some opportunity to drive remedial actions, by providing additional revenue for funding works such as reticulated sewerage to existing urban areas and/or raising the level of buildings in flood prone areas. However, care must be taken to ensure that 'the cure' is not counter-productive. For example, the creation of additional sources of stormwater contaminants from new urban areas could offset much of the benefit achieved by sewering older areas.

New proposals, such as aquaculture, fish stocking, plantation forestry and recreational activities warrant careful assessment to determine whether these can be sustained by the ecosystems of coastal lakes, and whether these are compatible with other valued human activities.

2 Pre-Conditions for Effective Management

Improved planning and management of coastal lakes is urgent. It will take time and resources to overcome existing problems and to reverse deteriorating trends in lake health. 'Good management' must balance the future health of lake ecosystems, the needs of people whose activities are dependent on it and the interests of others.

The Coastal Lakes Inquiry identified several pre-conditions for securing the health of coastal lakes.

A stronger overall framework is required to determine the orientation of management decisions and the type of strategies for managing coastal lakes. The framework must ensure that there is better recognition of the unique ecosystems and human values of each coastal lake, and of each lake's capability to support human activities. There must be credible and practical requirements and processes for assessing the capabilities (and limitations) of coastal lakes and their catchments. Management decisions must be informed by the findings of those assessments.

Appropriate planning tools, sufficient powers, resources and relevant specialist expertise must, of course, be available to councils and agencies so that they can exercise their natural resource management responsibilities more effectively. Community awareness and education strategies must provide citizens with sound information about the key ecological processes, human activities and their interrelationships with coastal lakes, as well as offering effective ways for citizens to participate in decision making.

There must be more skilful *selection* and use of the management 'tools' best able to achieve the outcomes sought for each coastal lake. State agency and council programs must be designed and delivered in ways that are consistent and mutually reinforcing, through careful specification of the priorities and design criteria for matters such as sewerage and stormwater works, road construction, fisheries, plantation forestry and mining. An effective management framework would enhance managers' efforts to make the best choices.

Finally, efforts to improve the health of coastal lakes must be backed by effective accountability arrangements. The framework must provide a platform against which the actions of agencies, councils, developers and interest groups can be audited by an independent entity, and due diligence demonstrated.

3 A Strategic Response

The *Coastal Lakes Strategy* provides an effective basis to respond to the challenges faced by citizens and their governments. The strategy includes:

- *principles* for managing coastal lakes;
- a *management framework* for major classes of coastal lakes, with the flexibility to address the needs that arise in specific lakes;
- a *classification* of coastal lakes;
- preparation of *assessments* to determine the capabilities and limitations of each coastal lake to sustain human activities;
- preparation of *management plans* for existing and new activities and to guide the expenditure of public funds, based on the results of assessments;
- arrangements for *implementation*, including assignment of responsibilities, processes to involve councils, state agencies and citizens, processes to resolve disputes, monitoring and review, and dedication of resources; and
- a range of *supporting initiatives*.

Implementation of the strategy would, over time, deliver healthier coastal lakes. That is, the few coastal lakes that remain in near pristine condition would be protected; highly degraded lakes would receive specific repairs and other lakes between the two extremes would receive attention appropriate to their condition.

The strategy applies to the coastal lakes listed in Table 6.[4]

[4] The *Coastal Lakes Strategy* covers the waterbodies, catchments and tributary streams for each coastal lake.

4 Relationship to other Government Policies

The *Coastal Lakes Strategy* has been designed to *reinforce* the many other planning, policy development and decision making processes that have implications for coastal lakes and their resources. Such processes include assessments comprising the *Comprehensive Coastal Assessment*, classifications of water bodies under the *Water Management Act 2000*[5], declarations of national parks, reviews of regional forestry agreements and designations of recreational fishing areas. (The findings of several of those other processes have informed the classification of coastal lakes that is part of the strategy.)

The strategy creates an *integrated context* within which those processes can be refined and implemented in ways that pay appropriate attention to the needs and challenges associated with managing coastal lakes.

In some cases, those other processes themselves provide mechanisms through which the actions advocated in the *Coastal Lakes Strategy* may be implemented. For example, among the actions proposed by the strategy for lakes in the Significant Protection and Comprehensive Protection classes are some changes in forestry practices, which have been substantially achieved already, in some cases, through recent regional forestry agreements.

Recognition of the *Coastal Lakes Strategy* in the NSW Government's *Action for the Environment Statement* and *Coastal Protection Package* will assist in ensuring that the management requirements of coastal lakes are adequately addressed in future, as related current processes are reviewed, and new processes developed, over time.

[5] The provisions of the *Water Management Act 2000* require all 'water sources' to be classified according to their 'stress', 'risk' and 'conservation values'. These factors align with those used by the Commission in its system for *assessing* coastal lakes at a state wide level, according to their 'natural sensitivity', 'existing condition' and 'conservation value'.

Coastal Lakes Strategy

5 Principles

The strategy requires that the responsible public authorities give effect to the following principles for managing coastal lakes. The principles are particularly relevant in developing and implementing a Sustainability Assessment and Management Plan[6] for each coastal lake.

- Each coastal lake and its catchment is to be managed as a *whole system*.
- Coastal lakes and their catchments are to be treated as *assets* with productive values to be sustained by carefully directed management. Decisions about coastal lakes must be governed by realistic assessments of their capabilities and recognition of their limitations.
- Management actions are to address *the unique characteristics* and interrelationships of ecosystems and human activities for each coastal lake, taking account of the degree of existing modification and the conditions sought.
- Management actions for coastal lakes must provide for further *adaptation* in light of the inherent scientific uncertainties and limited information bases.
- Management plans are to be sufficiently *clear to create explicit obligations* on the responsible public authorities with powers and resources that can be applied to coastal lake management.
- The responsibilities of public authorities and communities are to be clearly stated and outcomes achieved through *partnership arrangements*.
- The responsible public authorities are to be *accountable* for the condition of coastal lakes at the conclusion of each cycle of planning, action and assessment. They are to be accountable for the proper implementation of agreed management processes where actual outcomes are subject to a variety of uncontrollable external influences.

[6] The title 'Sustainability Assessment and Management Plan' is used in this Final Report to emphasise that their preparation and implementation will involve technical assessments, *as well as* decisions and action.

6 Management Framework

It is both necessary and possible to group the coastal lakes into broad classes that share some important characteristics, in terms of their current and desired conditions, the constraints and opportunities associated with them, and the typical management actions most likely to achieve the desired outcomes.[7]

The central component of the *Coastal Lakes Strategy* is a framework that is specifically designed to recognise the important differences among coastal lakes that necessitate different management actions.

Each coastal lake is classified into one of four classes: Comprehensive Protection, Significant Protection, Healthy Modified Conditions or Targeted Repair. For each class, the framework provides guidance as to:

- the *orientation*, or underlying intention, of management decisions;
- the scope of *Sustainability Assessment and Management Plans* required to refine the outcomes sought and indicative actions;
- the intended *outcomes* of decisions, that is, the results that would, ultimately, indicate success or failure;
- the *indicative types* of actions most suited to each class of coastal lake; and
- the selection and use of the management '*tools*' most appropriate to implementing the actions.

The classification of each coastal lake is the *starting point* for the design of an effective management plan for each lake.

While providing a context for decision making on a class by class basis for the various lake classifications, the framework requires recognition of variations *within* the classes. It provides sufficient flexibility for actions to be fine-tuned, in light of the results of Sustainability Assessment and

[7] For technical details, see Roy,P.S., Williams,R.J., Jones,A.R., Yassini,I., Gibbs,P.J.,West,R.J., Coates,B.P., Scanes,P.R., Hudson,J.P. & Nichol,S., *Structure and Function of Southeast Australian Estuaries*, (2001) in Estuarine, Coastal & Shelf Science; Vol. 53, No. 3, 1/9/01; Harris,G., (undated), *Anthropogenic Impacts on Coastal Lakes and Lagoons*; and the National Land and Water Resources Audit.

Management Plans for individual coastal lakes, to address any local or unique ecosystem and human use requirements.

Public authorities must use their judgement, within the boundaries set by the management framework, to determine the timing and intensity of implementation of specific actions designed to protect and restore any given coastal lake. Those decisions must have regard to considerations of urgency and priority, cost effectiveness, natural resource capabilities, opportunities, impacts on citizens, and the relationships of possible actions with other, existing, management initiatives and uses of funds and other resources.

The framework for managing coastal lakes is presented in Tables 1 - 4. Each table addresses one class of coastal lake, the types of outcomes sought and indicative actions that would be typically implemented. A range of management tools are presented in Table 5.

6.1 Application of the Framework in Practice

The framework provides clear *guidance* to public authorities in their decision making processes relating to coastal lakes. For each class of coastal lake, it indicates the typical types of actions necessary, and how the relevant powers must be exercised, to achieve the outcomes sought for each class of coastal lake. That is, for each class of coastal lake it establishes 'boundaries' of discretion, within which the lake managers (councils and agencies), together with citizens, may determine the detailed actions for an individual lake, in light of its specific local circumstances and priorities.

Managers' discretion in determining outcomes and actions for specific lakes is greatest for those coastal lakes classified as Healthy Modified Conditions, given the potential capability of many such systems to sustain some further development, and often, the presence of human factors that entrench their status. However, the degree of discretion will be limited in some cases, for example in creek lines and foreshore areas and in poorly flushed embayments, for which particularly careful planning and management will be essential.

The specific outcomes to be determined for each lake in this classification will provide greater direction for managers. For example, adoption of 'maintenance of the conditions needed for growing oysters' as an essential outcome for Wallis Lake would immediately establish some management priorities and directions for that lake.

The coastal lakes that are in the Significant Protection class warrant more stringent management, in order to contain the risks posed by a variety of existing and potential activities. The extent of management discretion must be somewhat less for this class of coastal lake because the options are narrower, if lake health is to be maintained and/or restored.

Management discretion is inevitably narrower again for coastal lakes classified as Targeted Repair and Comprehensive Protection. Coastal lakes in the Targeted Repair class are typically situated in highly urbanised catchments and are significantly degraded. Therefore opportunities to improve their natural ecosystems are often highly constrained to the 'art of the possible'. Nonetheless, many of those lakes are of high importance to local citizens, and management efforts must be directed towards identifying key rehabilitation options, such as protecting selected species, managing entrance openings, aerating water bodies and implementing improved stormwater controls.

Finally, management discretion for coastal lakes in the Comprehensive Protection class is constrained by the overriding intention to protect the health of these pristine/near pristine and/or highly sensitive lakes and their catchments. There is no choice but to manage such coastal lakes within tightly confined parameters. Thus the actions that are proposed for such coastal lakes, such as 'limiting any new development to within the existing boundaries of developed urban or rural residential areas' are often explicit and *necessarily* prescriptive. Some such actions can be identified immediately while others, such as those to manage the behaviour of lake entrances and those intended to promote adoption of best farming practices, may require time, further assessment and negotiation before being fully formulated.[8]

Specific detail is provided in Section 11 regarding application of the framework to two key matters, lake entrance management and new development.

[8] Many of the actions to achieve Comprehensive Protection would be relatively simple to implement *immediately* because the relevant coastal lakes are often situated, fully or in large part, within national parks or previous government decisions have paved the way (eg the responses to planning Commissions of Inquiry, court decisions and forestry agreements in many catchments).

6.2 Outcomes Sought for Specific Coastal Lakes

The management framework for coastal lakes contains a primary outcome for each class of coastal lake, as well as guidance and processes for determining other outcomes sought for *individual* coastal lakes. For the lakes listed below some specific outcomes are recommended, additional to those that would be derived by applying the framework. In each case, the specified outcomes are of particular importance and must be explicitly addressed in all decision making by the relevant public authorities.

- for Wallis, Wagonga, Tuross, Merimbula, Conjola, Queens/Watson Taylor, Wonboyn and Pambula lakes, minimise the public health and economic risks for oyster growing; and

- for Minnie Water and Hiawatha lakes protect water quality to meet requirements as sources of drinking water.

6.3 Selection of Management Tools

State agencies and local councils have a range of 'tools' that can be applied in managing coastal lakes. These include regulatory powers, incentives, funding and pricing systems, capital works, voluntary schemes and the other activities that are grouped together as management 'programs'.

These many tools could be applied to coastal lake management in various combinations. Some tools are applicable to all classes of coastal lake, while others are more suitable for a specific class of lake. For example, the declaration of areas as national parks, and use of development control plans are likely to be most suitable for coastal lakes in the Comprehensive Protection and the Healthy Modified Conditions classes, respectively. Further, the way in which a *given* tool is used may vary across lake classes, reflecting the different outcomes sought for the lakes in each class.

Within the framework, the choice of the best *mix* and *use* of tools to be applied to a specific coastal lake is a matter for councils and agencies. Those decisions would be informed by assessments of a lake's capabilities, necessary management actions and the interests of affected parties. This would be done as part of the preparation of a Sustainability Assessment and Management Plan for each coastal lake.

Table 5 provides guidance on the types of tools that would *typically* be effective and appropriate for different classes of coastal lake.

Comprehensive Protection (Management Orientation)

Management Framework for Coastal Lakes (Table 1)

Improved planning and management of coastal lakes is urgent. 'Good management' must balance the future health of lake ecosystems, the needs of people whose activities are dependent on it and the interests of others. Public authorities must use their judgement, within the boundaries set by the management framework, to determine the timing and intensity of implementation of specific actions for any given coastal lake, in light of considerations of cost effectiveness, natural resource capabilities, opportunities, impacts on citizens, existing initiatives and resources.

Prepare and implement a *Sustainability Assessment and Management Plan* for each coastal lake and its catchment.

- Specify any other outcomes for each coastal lake that are consistent with *restoring and preserving all natural ecosystem processes*.
- Determine how existing and potential activities must be managed (ie encouraged, permitted, modified, not permitted) to achieve the intended outcomes. The indicative actions shown below should be addressed.
- Select and design the most appropriate set of management tools.
- Specify the responsibilities, timing and resources for each action.

Intended Outcomes	**Indicative Actions** — *those most likely to be necessary and effective*
Primary Outcome: • *All* natural ecosystem processes restored and preserved. ***Examples of Other Possible Outcomes:*** • Water quality for drinking water supply protected. • Existing villages maintained within current boundaries of developed areas.	• Limit any *new* urban and rural residential development to within the *existing* boundaries of such developed areas. Limit any other type of new development outside such areas to those that are determined to be sustainable, that is, to have a neutral or beneficial effect on natural ecosystem processes. Apply rigorous controls and monitoring to ensure that no other effects occur. • No new heavy industry, intensive agriculture, aquaculture or mining. • Implement a program to *retain/progressively reinstate natural entrance behaviour*. The program should include progressive removal or modification of *existing* assets and activities that are prone to water damage or create significant inconvenience or which may exacerbate public health problems when lake water levels are high. The sources of water quality problems should be treated. Require any *new* assets to be located and designed in ways that do not necessitate opening a lake entrance artificially. • *Progressively remove* (or substantially mitigate) sewage discharges and overflows from *existing* sewerage and on-site systems and boats. In cases in which this requires *new* sewage infrastructure, design and operate the system to prevent discharges, to minimise risks of overflows within the lake or its catchment and to minimise the ingress of groundwater. • Progressively implement stringent stormwater controls for existing developed areas. • Phase out forestry operations that have an adverse impact on lake health when forestry agreements are renegotiated. Cease broad acre vegetation clearing. • Mitigate sediment runoff from high risk sections of unsealed roads (such as sealing those sections with erodible, nutrient rich and acidic soils, particularly adjacent to water courses) and other sources. • Implement best farming practices commensurate with the risks to lake/catchment health. Promote conversion of specific farming activities that have an adverse effect on lake health to alternative, sustainable farming. • Phase out commercial fishing through existing structural adjustment processes; apply lake-specific gear and catch controls for recreational fishing; apply a 'no wash' speed limit for boating. Apply commensurate limits for other commercial and recreational uses. • Protect river flows in tributary streams and waters within a lake, including carefully assessed limitations on *existing* licences for water extraction for all flow levels. The limits should be commensurate with the risks to each lake's health and should satisfy the essential needs of water users. Prohibit *new* licences for water extraction or storage of stream flows or lake waters.

Significant Protection (Management Orientation)

Management Framework for Coastal Lakes (Table 2)

Improved planning and management of coastal lakes is urgent. 'Good management' must balance the future health of lake ecosystems, the needs of people whose activities are dependent on it and the interests of others. Public authorities must use their judgement, within the boundaries set by the management framework, to determine the timing and intensity of implementation of specific actions for any given coastal lake, in light of considerations of cost effectiveness, natural resource capabilities, opportunities, impacts on citizens, existing initiatives and resources.

Prepare and implement a *Sustainability Assessment and Management Plan* for each coastal lake and its catchment.

- Specify any other outcomes for each coastal lake that are consistent with *restoring and preserving critical natural ecosystem processes*.
- Determine how existing and potential activities must be managed (ie encouraged, permitted, modified, not permitted) to achieve the intended outcomes. The indicative actions shown below should be addressed.
- Select and design the most appropriate set of management tools.
- Specify the responsibilities, timing and resources for each action.

Intended Outcomes	**Indicative Actions** — *those most likely to be necessary and effective*
Primary Outcome: • *Critical* natural ecosystem processes restored and preserved. ***Examples of Other Possible Outcomes:*** • Minimal risk for existing oyster growing. • Existing villages maintained within current boundaries of developed areas. • Sustainable fishing.	• Limit any *new* urban and rural residential development to within the *existing* boundaries of such developed areas. Limit any other type of new development outside such areas to those that are determined as being sustainable, that is, those where any potential *minor* adverse impacts can be contained on site. Apply strong controls to ensure that effects are contained. • Implement a program to *progressively minimise intervention in natural entrance behaviour* (with a view to full reinstatement over a period as long as 50 years). The program should include progressive removal or modification of *selected existing* assets and activities, as opportunities and resources are realised, that are prone to water damage or create significant inconvenience or which may exacerbate public health problems when lake water levels are high. The sources of water quality problems should be treated. Require any *new* assets to be designed in ways that do not necessitate opening a lake entrance artificially. • *Progressively mitigate* (or remove) sewage discharges and overflows from *existing* sewerage and on-site systems and boats, as opportunities and resources are realised. In cases in which this requires *new* sewage infrastructure, design and operate the system to prevent discharges, to minimise risks of overflows within a lake or its catchment and to minimise the ingress of groundwater. • Progressively implement stringent stormwater controls for existing developed areas. • Implement best practices for forestry, including phasing out areas that have a *critical* adverse impact on lake health when forestry agreements are renegotiated. Apply stringent controls for other vegetation clearing. • Mitigate sediment runoff from high risk sections of unsealed roads (such as sealing those sections with erodible, nutrient rich and acidic soils, particularly adjacent to water courses) and other sources. • Facilitate the use of best farming practices, in light of the potential benefits to lake/catchment health. Promote conversion of specific farming activities that have an adverse effect on lake health to alternative, sustainable farming. • Control commercial and recreational uses of a lake waterbody in ways that are commensurate with protecting lake health and to ensure compatibility between different uses (eg fisheries, boating), including appropriate zonings. • Protect river flows in tributary streams and waters within a lake, including carefully assessed limitations on *existing* licences for water extraction during periods of very low and low stream flows. The limits should be commensurate with the risks to each lake's health and should be sufficient to satisfy the needs of water users. Prohibit *new* licences for water extraction or storage of low stream flows or lake waters.

Healthy Modified Conditions (Management Orientation)

Management Framework for Coastal Lakes (Table 3)

Improved planning and management of coastal lakes is urgent. 'Good management' must balance the future health of lake ecosystems, the needs of people whose activities are dependent on it and the interests of others. Public authorities must use their judgement, within the boundaries set by the management framework, to determine the timing and intensity of implementation of specific actions for any given coastal lake, in light of considerations of cost effectiveness, natural resource capabilities, opportunities, impacts on citizens, existing initiatives and resources.

Prepare and implement a *Sustainability Assessment and Management Plan* for each coastal lake and its catchment.

- Specify any other outcomes for each coastal lake that are consistent with *rehabilitating and retaining key natural processes and/or modified values and determining appropriate types and sustainable levels of human uses*.
- Determine how existing activities must be managed (ie encouraged, permitted, modified), drawing on (but not limited to) the types of indicative actions shown below, to achieve the intended outcomes.
- Determine the capability and limitations of a lake and catchment to sustain new development (ie permitted or encouraged, permitted subject to conditions, not permitted pending further investigations, not permitted). Determine opportunities to harness new development to offset the impacts of existing development.
- Select and design the most appropriate set of management tools.
- Specify the responsibilities, timing and resources for each action.

Intended Outcomes	**Indicative Actions** — *those most likely to be necessary and effective*
Primary Outcome: • Key natural and/or highly valued modified ecosystem processes rehabilitated and retained. ***Examples of Other Possible Outcomes:*** • Urban/village/ rural residential areas maintained and/or expanded within defined limits.	• Apply and enforce controls for any new development (eg urban, rural residential, intensive agriculture, forestry, mining and aquaculture) to keep their impacts on lake/catchment health within limits that are determined to be sustainable for each lake. • Adjust entrance intervention to protect critical ecosystem processes (such as bird breeding events). Require any *new* assets that are prone to water damage, significant inconvenience or which may exacerbate public health problems when lake water levels are high to be designed in ways that do not necessitate opening a lake entrance artificially, except where it is determined that reinstatement of natural processes in the longer term is not cost effective. In such cases, any new assets must be designed in ways that are commensurate with those determined for existing assets, subject to satisfying any additional requirements that may arise as a result of a predicted rise in sea (and lake) water levels. • Progressively implement an integrated, cost effective program to mitigate the impacts of *all existing* sources of wastewater. Exclude *new* industrial and sewage discharge or overflows and apply stringent controls for on site systems, boats and stormwater. • Progressively implement a program to rehabilitate natural riverine corridors. • Enhance management of fishing (such as by-catch devices). • Encourage use of best farming and forestry practices commensurate with the risks to lake/catchment health. • Control commercial and recreational uses of a lake waterbody in ways that are commensurate with protecting lake health and to ensure compatibility between different uses, including appropriate zonings. • Protect river flows in tributary streams and waters within a lake, including carefully assessed limitations on *existing* licences for water extraction during periods of very low and low stream flows. The limits should be commensurate with the risks to each lake's health and should be sufficient to satisfy the needs of water users. Prohibit *new* licences for water extraction or storage of low stream flows and freshwater within a lake. Apply stringent controls on any saline extractions.

Targeted Repair (Management Orientation)

Management Framework for Coastal Lakes (Table 4)

Improved planning and management of coastal lakes is urgent. 'Good management' must balance the future health of lake ecosystems, the needs of people whose activities are dependent on it and the interests of others. Public authorities must use their judgement, within the boundaries set by the management framework, to determine the timing and intensity of implementation of specific actions for any given coastal lake, in light of considerations of cost effectiveness, natural resource capabilities, opportunities, impacts on citizens, existing initiatives and resources.

Prepare and implement a *Sustainability Assessment and Management Plan* for each coastal lake and its catchment.

- Specify any other outcomes for each coastal lake that are consistent with *creating a preferred condition through rehabilitation.*
- Determine the few targeted rehabilitation measures necessary to achieve the intended outcomes.
- Determine the capability and limitations of a lake/catchment to sustain any new development (ie permitted or encouraged, permitted subject to conditions, not permitted pending further investigations, not permitted). Determine opportunities to harness new development to offset the impacts of existing development.
- Select and design the most appropriate set of management tools.
- Specify the responsibilities, timing and resources for each action.

Intended Outcomes	**Indicative Actions** — *those most likely to be necessary and effective*
Primary Outcome • Habitat conditions for selected key species established. ***Examples of Other Possible Outcomes:*** • Frequency of algal blooms reduced. • Existing urban areas retained and/or expanded within defined limits. • Aesthetic value/amenity maintained.	• Design rehabilitation measures for nominated areas and modified ecosystem values (such as protecting selected species, opening a lake entrance, aerating a lake water body, implementing stormwater controls). These should be designed to close the gap progressively between actual and intended conditions. • Apply and enforce controls for any new development to keep their impacts on lake/catchment health within tolerable limits.

Management Tools

Management Framework for Coastal Lakes (Table 5)

Many management 'tools' could be used for all classes of coastal lake, while some tools are particularly suitable for a given class of coastal lake (as indicated below). The way in which each tool should be used will vary according to the classification, intended outcomes and actual actions assigned for each coastal lake. Within this context, the choice of the *best mix* and *use of tools* for an individual coastal lake is a matter for councils and agencies, with those decisions being informed by the results of lake specific Sustainability Assessments (including independent expert validation) and the views of interested parties.

The tool box includes (but is not limited to):

- Statutory environmental plans -- state environmental planning policies, regional environmental plans, local environmental plans (including controls for new and existing development, and land and waterway zoning)
- Non statutory environmental plans -- development control plans*
- Statutory local government management plans
- Statutory natural resource plans – catchment management blueprints, water management plans, vegetation management plans of management, national park plans and fisheries plans and strategies
- Non statutory natural resource plans -- estuary management plans, boating management plans
- Natural resource consents and regulations governing water extraction, wastewater, fishing and boating
- Targeted public funding programs -- *Stormwater Management, Country Towns Water Supply Sewerage and Drainage, Estuary Management, Floodplain Management, Coastal Management, Saltwater Fishing Trust, Coastal Lands Protection Scheme*
- Statutory reserves -- national park, aquatic reserve, marine park, crown land reserve#
- Partnerships -- eg voluntary conservation agreements, private sector mechanisms such as co-operative contracts
- Land use management -- eg down zoning, crown land swaps, transferable development rights #
- Market mechanisms -- eg water trading, 'green' offsets and trading, custodian payments
- World heritage listing#
- Education strategies
- Indigenous land use agreements
- Strategies developed in relation to international conventions -- eg *China-Australia Migratory Bird Agreement* (CAMBA), *Japan-Australia Migratory Bird Agreement* (JAMBA), *Convention of Wetlands of International Importance* (Ramsar), directory of important wetlands and wilderness status#

Notes:

* Applicable to all classes of coastal lake, particularly Healthy Modified Conditions and Targeted Repair

\# Applicable to all classes of coastal lake, particularly Comprehensive Protection and Significant Protection

7 Classification of Coastal Lakes

Classifying coastal lakes is a first step towards the identification of a set of realistic goals for each lake and a management plan able to achieve them cost effectively. The framework provides that after the initial classification, the processes of preparing Sustainability Assessment and Management Plans (according to the guidelines provided for each class of lake) will help to clarify a lake's capabilities and refine the goals in that light, and to identify the management actions most likely to achieve the goals.

Each coastal lake has been assessed and classified (within a state level classification system), according to how it 'rates' on several factors. The factors include a lake's natural sensitivity, the current condition of the water body and catchment, and recognised ecosystem and resource conservation values. Other significant factors used to inform the classifications include existing patterns of settlement and natural resource use, key government or court decisions, the potential for restoration or rehabilitation, and opportunities for and constraints on development around other coastal lakes and estuaries within a region. (Refer to Appendix 4 for further details.)

The judgements underlying the assessments and classifications are influenced by the availability of relevant information, which is often limited for many coastal lakes. In particular, the classifications have been informed by data collected and analysed by the Department of Land and Water Conservation in its *Estuaries Inventory* (which draws on the results of estuary studies) and on the information collated under the Commonwealth Government's *National Land and Water Resources Audit: Estuaries Program*. Some additional data have been obtained from universities, independent experts, other state agencies and local councils.

This information has been augmented by that supplied in submissions to the Coastal Lakes Inquiry, where it has been possible to validate the significance and effect of such information. The Healthy Rivers Commission applied its independent *judgement* to determine the classifications, particularly in situations in which conflicting expectations about the use of a coastal lake require a balanced assessment and decision, or where there is limited information.

Table 6 presents the classifications for the coastal lakes covered by the *Coastal Lakes Strategy*. A 'provisional' classification has been assigned to a few coastal lakes, for example, St Georges Basin and Wallaga Lake, given that the limited available information suggests that these lakes lie on the borderline between two different classifications. In all cases, the findings of Sustainability Assessment and Management Plans will be used to confirm these classifications, or to suggest any reclassifications.

Table 6: Classification of Coastal Lakes

Management Orientation	Coastal Lakes		
Comprehensive Protection	Arragan Bondi Bournda Brou Brunderee Durras	Hiawatha Meroo Minnie Water Nadgee Nargal Nelson	Saltwater Lake Tarourga Termeil Wollumboola
Significant Protection	Back★ Baragoot Bingie (Kellys) Bunga Cakora Candlagan Conjola (incl Berringer) Corunna Cuttagee	Dalhousie Deep Goolawah Innes Meringo Middle (Tanja) Mummuga (Dalmeny) Myall Oyster	Queens Smiths Swan Lake Tabourie Wallagoot Wapengo Willinga Wooloweyah Wonboyn
Healthy Modified Conditions	Avoca Bullengella Burrill★ Brush (Swan) Cathie Cobaki-Terranora Cockrone Coila (Kyaily) Congo Cudgen Curalo Hearns	Kianga Killalea Kioloa Little (Wallaga) Long Swamp Merimbula Mullimburra Murrah Nangudga Narrabeen Narrawallee Pambula	Saltwater Lagoon St Georges Basin★ The Broadwater Tilba Tilba Tuross★ Wagonga★ Wallaga★ Wallis Wamberal Watsons Taylor Werri Woolgoolga
Targeted Repair	Ainsworth Bellambi Corindi (Pipe Clay) Curl Curl	Dee Why Illawarra Little (Narooma) Macquarie	Manly Terrigal Tuggerah (incl Munmorah and Budgewoi)

★ Provisional classification that, in particular, warrants more detailed assessment. Classes to be confirmed in light of the outcomes of Sustainability Assessment and Management Plans for each coastal lake.

8 Sustainability Assessment and Management Plans

Sustainability Assessment and Management Plans are pivotal components of the *Coastal Lakes Strategy*. Each assessment and plan will determine and record any other outcomes sought for a given coastal lake (in addition to those specified in the strategy), its capability and limitations to sustain existing and likely human activities, the actions to be implemented (including remedial actions), and the most appropriate selection and design of management tools.

That is, the assessments and plans will specify the actions to be taken by state agencies, and criteria for them to satisfy in exercising their statutory approvals functions, in the delivery of programs and in setting parameters for funding and resourcing. The Sustainability Assessment and Management Plans will also lead to the specification of explicit provisions in councils' local environmental plans.

The assessments will enable local councils and state agencies to make better decisions about the development and management actions that are sustainable for each coastal lake. That is, the findings would provide a key basis for decisions about whether, or to what extent, a proposed activity with potential impacts on a coastal lake should occur. An activity might, for example, be 'permitted or encouraged', 'permitted subject to conditions', 'not permitted, pending further investigations' or 'not permitted'.

The classification of lakes within the framework provides the context for the work of local council(s) and state agencies in preparing Sustainability Assessment and Management Plans. The management orientation for each class of coastal lake, together with any other specific outcomes sought would influence the nature and scope of an assessment for a specified lake.

For example, assessments for coastal lakes classified as Comprehensive Protection would focus on identifying the actions required for restoring and preserving natural processes. In comparison, the assessment for coastal lakes classified as Targeted Repair might focus on the conditions needed by selected species and how to sustain them, or on the factors that are creating adverse events, such as algal blooms, and ways of mitigating them. Figure 1 presents an illustrated example of a component of an assessment for a coastal lake in the Healthy Modified Condition class.

Lake specific assessments are to be based on the following key factors:

- key ecosystem processes and thresholds (eg lake type & maturity, entrance behaviour, nutrient loads, lake hydraulics, flooding, sea level and storm intensity change);
- catchment processes (eg soils, vegetation, river flows);
- environmental and ecosystem values (eg water quality and river flow objectives, threatened species, representativeness, wetlands, aquatic and terrestrial weeds);
- Aboriginal values (eg access, food, spiritual, Native Title claims);
- sustainable (commercial) resource use and values (eg fish, oysters, tourism, forestry, boating, farming, water extraction, mining, aquaculture);
- citizen values (eg heritage, recreation, amenity, odours, fire hazard);
- public health implications of lake conditions (eg swimming, oyster cultivation and consumption, drinking water); and
- existing and possible public and private institutional, jurisdictional and management mechanisms, which could be used to implement actions.

Existing estuary, flood, forestry, river flow, fisheries, sewage, stormwater, boating, soils, vegetation and other relevant studies (including those in progress) will provide valuable inputs in the preparation of Sustainability Assessment and Management Plans. Particular attention should be given to ascertaining the extent to which other existing initiatives (such as current regional forestry agreements, fisheries controls and estuary management studies and plans) might meet the requirements of the assessment and management plans.

In some cases, decisions will need to be made on the basis of limited information and 'best judgements' about the likely impacts of various activities. The framework provides guidance to the appropriate approach to risk management. That is, the closer a coastal lake is to the Comprehensive Protection end of the continuum, the more precise the risk management strategies will need to be and the clearer the signals for action in response to any deviation from the expected results. For coastal

lakes closer to Targeted Repair, a higher level of risk could be accepted.

If activities are judged to result in 'tolerable' (ie sustainable) impacts on lakes, the basis for those judgements and the resulting decisions, must be made clear. Unless there is virtual certainty that the impacts *will* remain within the tolerable range, some risk management or 'damage control' measures should be specified in advance, with agreed triggers for their implementation.

Some benchmarks must be specified in advance for this purpose. These would be the reference points against which subsequent monitoring could confirm (or otherwise) that the outcomes are within the anticipated range. Results outside the range would signal a need for previous decisions to be reviewed and the plan and actions possibly to be adapted. The process provides for early attention to any adverse impacts, as well as generating information on which to base future decisions.

In all cases, the Sustainability Assessment and Management Plans would identify the public authorities or private entities that are responsible for each specified action and the timing (including critical milestones and completion dates) and allocation of resources relevant to its implementation.

8.1 Aboriginal Values and Significance

A key component of each Sustainability Assessment and Management Plan relates to Aboriginal values and significance.

A desktop assessment of known Aboriginal values (eg access and use) and significance[9], is to be undertaken by the key state agencies, drawing on available information, including local council knowledge and archival information. Priority interests and outcomes will be tentatively identified from this assessment, to guide further consultation with Aboriginal communities, to ascertain the validity and completeness of the initial assessment. (It is essential that adequate time is provided for this consultation.)

This approach will serve as a pilot for Aboriginal consultation and involvement as part of the *Comprehensive Coastal Assessment* for the remainder of the coastal zone. This will assist in fulfilling the Government's decision, as part of its *Coastal Protection Package*, to investigate and enhance consultation with Aboriginal communities and their participation in coastal management.

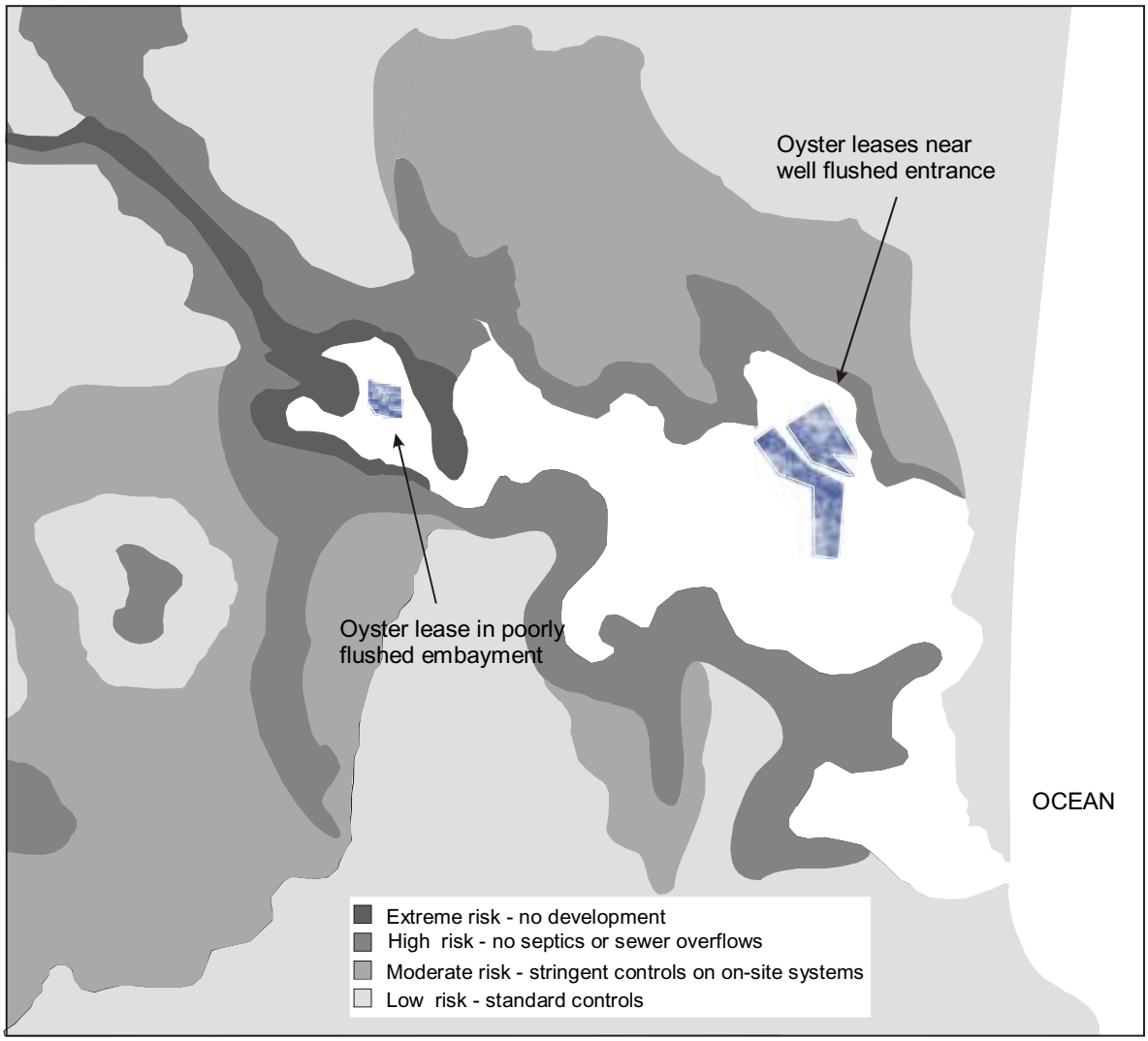
8.2 Site Specific Assessments

The Sustainability Assessment and Management Plan prepared for each coastal lake will create the context for more detailed *site assessments* for specific development proposals. The proponents of development proposals will undertake such assessments, thereby fulfilling (or partially fulfilling) their existing obligations to prepare various types of environment impact assessments.

Site assessments will be directed towards demonstrating how a particular development proposal would satisfy performance conditions specified in the management plan and assist in achieving the intended outcomes. Those assessments will provide the basis for council and agency decisions on the detailed design features of a proposed development, including mitigative and/or the best methods or approaches to managing the development. The findings of site assessments will also contribute to ongoing processes of confirmation or fine-tuning of the Sustainability Assessment and Management Plan.

[9] The importance of a place to Aboriginal peoples is not limited to cultural heritage 'items'. It includes other matters associated with spiritual and utilitarian significance such as access to traditional foods, medicinal plants and token fauna and flora. Some knowledge about these matters may be gained from a review of historical records of early settlers and explorers.

Figure 1: Sustainability Assessment: An Illustrated Example



Consider an assessment for a coastal lake with a management orientation of Healthy Modified Conditions, with an outcome to provide minimal risk to oyster growing. A critical aspect of the assessment would involve identifying areas in which on-site sewage disposal would present high risks, such as sites with unsuitable soils, in close proximity to oyster leases or draining to poorly flushed embayments. It also would identify low risk areas, such as those with suitable soils located away from oysters or where the water body is well flushed.

Such findings would be incorporated as provisions into local environmental plans to exclude on-site disposal in high risk areas and permit it in lower risk areas (subject to appropriate design and operational controls). Adaptive management would ensure that regular feedback led to necessary adjustments in controls and procedures.

Similarly, the Sustainability Assessment and Management Plan would identify and address other critical uses of the lake and catchment (eg areas subject to flooding, sewage effluent disposal from boats and fishing practices).

Table 7: Implementation Responsibilities and Completion Times

The (indicative) responsibilities and completion times for implementing the major actions in the *Coastal Lakes Strategy* are presented below. Some actions require one or more subsidiary actions, as detailed in the strategy. All completion times to be effective from the date of the NSW Government's endorsement of the strategy. Initial funding arrangements are proposed in the recommended decisions by government, and ongoing funding provisions would be determined within state budgeting processes.

Actions	Lead Responsibility	Completion Time
Give effect to the principles for managing coastal lakes (as specified in Section 5 in the *Coastal Lakes Strategy*).	All relevant public authorities	Immediate and ongoing
Formalise the components of the *Coastal Lakes Strategy* by way of a State Environmental Planning Policy (as specified in Section 9.1).	PlanningNSW	3 months
Prepare Sustainability Assessment and Management Plans for the coastal lakes in the Shoalhaven area, namely Wollumboola, St Georges Basin, Swan, Conjola, Narrawallee, Burrill, Tabourie, Termeil, Meroo, Willinga, Brush (Swan), Kioloa and Durras (as specified in Section 9.8).	PlanningNSW, DLWC & the relevant council(s)	18 months
Prepare Sustainability Assessment and Management Plans for the coastal lakes in the Great Lakes area, namely Wallis, Smiths and Myall lakes (as specified in Section 9.8).	PlanningNSW, DLWC & the relevant council(s)	18 months
Prepare Sustainability Assessment and Management Plans for Cudgen, Innes-Cathie, Narrabeen, Coila, Tuross, Wagonga, Merimbula and Back lakes (as specified in Section 9.8).	PlanningNSW, DLWC & the relevant council(s)	3 years
Develop a program to prepare Sustainability Assessment and Management Plans for remaining coastal lakes covered by the *Coastal Lakes Strategy* (as specified in Section 9.8).	Coastal Council of NSW	2 years
Establish the Independent Coastal Lakes Expert Group (as specified in Section 9.2).	Chair, Coastal Council	3 months
In addition to the primary outcome for coastal lakes, specified in Tables 1 - 4, ensure that relevant decisions and actions be directed to achieve the following outcomes: • Minimising the public health and economic risks for oyster growing in Wallis, Wagonga, Tuross, Merimbula, Conjola, Queens/Watson Taylor, Wonboyn and Pambula lakes; and • Protecting water quality in Minnie Water and Hiawatha lakes as sources of drinking water (as specified in Section 6.2).	Relevant public authorities	Immediate and ongoing
Accredit Sustainability Assessment and Management Plans as satisfying the requirement of local environmental studies, under the provisions of Section 57 of the *Environmental Planning and Assessment Act 1979*, and effect amendments to enable councils to obtain financial contributions *at a later date* from the proponents of new developments (as specified in Section 9.3).	PlanningNSW	1 year
Apply the dispute resolution processes (as specified in Section 9.6).	Chair, Coastal Council	As necessary
Implement the actions identified in Sustainability Assessment and Management Plans for each coastal lake (as specified in Section 9.7).	Relevant state agencies and local councils	Ongoing

Actions	Lead Responsibility	Completion Time
Issue a notice under Section 117 of the *Environmental Planning and Assessment Act 1979* requiring relevant councils to develop or review their local environmental plans to incorporate provisions that give effect to Sustainability Assessment and Management Plans (as specified in Section 9.7).	PlanningNSW	As necessary
Review and apply statutory approval functions and public funding programs in ways that assist the development and implementation of Sustainability Assessment and Management Plans for each coastal lake (as specified in Section 9.7)	Relevant state agencies and local councils	Ongoing
Develop and manage a program to monitor and review progress towards achieving the outcomes sought for each coastal lake as contained in each Sustainability Assessment and Management Plan (as specified in Section 9.9)	DLWC	Ongoing
Apply the transitional arrangements for new development proposals for coastal lakes for which a Sustainability Assessments and Management Plan is yet to be completed (as specified in Section 10.1).	All relevant public authorities	Immediate and ongoing
Apply the 'controlled activity' provisions of the *Water Management Act 2000*, as the primary instrument for managing the opening of the entrances of coastal lakes artificially (as specified in Section 10.2).	DLWC	Immediate and ongoing
Amend State Environmental Planning Policy 35 (as specified in Section 10.2).	PlanningNSW	2 months
Assess the social, economic and ecosystem risks that may result from a rise in sea level and change in storm events for coastal lakes, and other coastal areas (as specified in Section 10.3).	PlanningNSW	1 year
Formulate management responses to prepare for predicted rise in sea (and lake) level and change in storm events (as specified in Section 10.3).	PlanningNSW	2 years
Declare the waterbody and bed of lakes classified as Comprehensive Protection as reserves (as specified in Section 10.4).	NPWS, MPA, DLWC	18 months
Declare specific areas of Crown land in any class of coastal lake, identified through a Sustainability Assessment as having *outstanding* conservation values, as reserves (as specified in Section 10.4).	NPWS, MPA, DLWC	Ongoing
Adjust the criteria for acquiring private lands under the *Coastal Lands Protection Scheme* (as specified in Section 9.5).	PlanningNSW	Immediate
Review the need for an enhancement of the funding allocated to the *Coastal Lands Protection Scheme* (as specified in Section 10.5).	PlanningNSW	3 years
Reform the membership and operations of estuary management committees (as specified in Section 10.6).	DLWC	6 months and ongoing
Incorporate relevant elements of the *Coastal Lakes Strategy* in the revised estuary and coastal management manuals (as specified in Section 10.6).	DLWC	1 year
Explore the possibilities for nominating a group of coastal lakes (and possibly other estuaries) on the South Coast, for World Heritage Listing (as specified in Section 10.7).	NPWS	2 years
Contain the spread of *Caulerpa taxifolia* (as specified in Section 10.8).	NSW Fisheries	Ongoing
Investigate innovative mechanisms for managing undeveloped land in areas with *outstanding* natural or human conservation values (as specified in Section 10.10).	PlanningNSW	1 year
Extend the *Coastal Lakes Strategy* to other estuarine creeks (as specified in Section 10.11).	DLWC	1 year (then ongoing)

9 Implementation

Effective implementation arrangements are critical to the success of *any* strategy, and in this instance, the expectations of citizens and the government for healthy coastal lakes will not be realised unless there are strong implementation arrangements for the agreed strategy. For that reason the Commission has incorporated a set of (broadly defined) implementation arrangements as an integral part of its recommended *Coastal Lakes Strategy*. The Commission's recommendation that the Government endorse 'the strategy' thus embodies a set of recommendations for its implementation.

Appropriate arrangements for implementing the strategy must provide:

- an effective means of formalising *the relevant components of the Coastal Lakes Strategy*, particularly with regard to deciding the outcomes sought for each lake and the actions necessary to achieve them;

- a means of undertaking *credible assessments* of the current condition of each coastal lake (and catchment) and its ability to sustain human activities, particularly with regard to determining the circumstances in which existing activities must be modified;

- appropriate ways of *involving state agencies, councils, natural resource and planning advisory groups and citizens in assessments and decisions* about the management of each coastal lake, particularly to ensure that there is sufficient commitment to common goals and approaches at all levels;

- a credible means of *resolving conflicts* about the current condition of coastal lakes, about the outcomes sought for each lake and about the most effective actions for achieving those outcomes;

- a clear *assignment of responsibilities* and relationships amongst relevant state agencies and local councils for implementing components of the *Coastal Lakes Strategy*;

- a means of ensuring that *local councils and state agencies act in ways consistent* with the results of Sustainability Assessment and Management Plans when making decisions, such as those concerning planning for developments, issuing consents and implementing relevant state agency programs;

- a *strengthening of existing processes* and relationships that are available to local councils and state agencies in the exercise of their powers and the application of their resources;

- a process for *monitoring results and evaluating management actions* to confirm achievement of the outcomes sought and identify any necessary management adjustments; and

- *accountability mechanisms* (including key milestones) to ensure that councils, state agencies, committees or other nominated groups with the powers to make decisions affecting coastal lakes are held *responsible* for the results of those decisions.

The arrangements described below (and in the subsequent section on Supporting Initiatives) have been designed to satisfy these criteria for effectiveness.

Pilot applications of the assessment, planning and implementation processes to the identified priority lakes in the Great Lakes and Shoalhaven regions (and to the other priority lakes), may suggest some refinements to the processes as initially designed. The Commission would examine the need for any refinements as part of its audit of implementation efforts, which will occur two years after release of the Government's Statement of Intent in relation to the *Coastal Lakes Strategy*.

The experience gained through preparing Sustainability Assessment and Management Plans for the coastal lakes in the Shoalhaven and Great Lakes areas will inform assessments of other lakes and contribute significantly to the wider application of the Government's *Coastal Protection Package*.

9.1 Formalising the Management Framework, Classifications and Requirements for Decision Making

Following government endorsement of the recommended *Coastal Lakes Strategy,* it will be necessary to formalise relevant components. This would be best accomplished by way of a State Environmental Planning Policy (SEPP) prepared under the provisions of the *Environmental Planning and Assessment Act 1979*. This could be achieved by either absorbing it directly into the proposed 'coastal protection SEPP' or a separate but linked SEPP.

The policy would establish clear boundaries for decision making affecting coastal lakes and require all agencies and councils to give effect to the

principles, management framework, classifications, requirements for preparing and implementing Sustainability Assessment and Management Plans and other requirements for decision making in their priority setting, planning, approval and operational programs. (An indicative draft of a SEPP that would formalise these requirements is presented in Appendix 3.) If the SEPP, as a means of formalising components of the *Coastal Lakes Strategy,* is not adopted it will be necessary to identify an alternative arrangement that would fulfil these functions.

Any subsequent arrangements for implementing the *Coastal Lakes Strategy* that may result from current planning reform (as described in *PlanFirst*) or to improve natural resource management (for example, revision of the Coastal Management Manual) must equally satisfy these needs.

9.2 Preparing Credible Sustainability Assessment and Management Plans

The preparation of *credible* Sustainability Assessment and Management Plans, and application of their findings by all relevant public authorities, is critical to the successful management of coastal lakes.

An Independent Coastal Lakes Expert Group is required to strengthen, and in some cases restore, public confidence in the many decisions that are being made which have implications for coastal lakes.[10] Independent people with the highest level of expertise would help to ensure that decisions are objective and credible, particularly in areas where there are long standing problems and conflict. They would do so by:

- establishing the technical criteria and methodology for preparing cost effective and practical Sustainability Assessment and Management Plans for each coastal lake;
- reviewing and providing advice on the technical merit of the assessment findings (including the likely effectiveness of proposed management actions against the primary and other outcomes sought for each lake);
- identifying cost effective ways to address any critical gaps in the knowledge of lake ecosystems;
- providing clear and expeditious guidance for the management of major threats to the health of coastal lakes;
- advising on public and private institutional mechanisms that could be used to implement strategies; and
- providing performance indicators and monitoring protocols.

The group would facilitate the completion of rapid and less expensive assessments.[11] Access to such advice would assist councils and agencies in their decision making, as the judgement of the group would help to bridge the many existing gaps in the information available on estuarine and catchment ecosystem processes, human activities and their interplay.

Advice provided by the Independent Coastal Lakes Expert Group, and results of the Sustainability Assessment and Management Plans would be made available to the public, together with any resultant planning or management instruments. The group's advice also would form an input to the Coastal Council's annual report to Government on implementation of the *NSW Coastal Policy*.

The credibility of the Independent Coastal Lakes Expert Group will be central to acceptance of its advice by agencies, councils and citizens. The group must therefore be appointed through a transparent and merit based process, and overseen by the Chairperson of the Coastal Council of New South Wales. The group would comprise independent people with, collectively, recognised specialist expertise in ecosystem, social, cultural, economic or planning issues relevant to coastal lakes. State agency and local council specialists should be coopted to support the group, where necessary.

Similarly, effective processes are required to involve the relevant local council(s), state agencies and citizens in the preparation of Sustainability Assessment and Management Plans for each coastal lake, particularly with regard to accessing the historical knowledge of local citizens and understanding community values. This must include public exhibition and a call for comment on

[10] For further information on matters that should be considered in formulating effective expert panels, see (for example) *Issues in Science and Technology, Spring 2000, Can Peer Review Help Resolve Natural Resource Conflicts?* http://www.nap.edu/issues/16.3/p_brosnan.htm

[11] Rapid assessment techniques are increasingly being used in other areas of natural resource assessment, in particular, in relation to river flows. Such techniques would apply the judgment of recognised experts, using the best available technical data for a coastal lake (and comparable lakes) combined with local information to identify appropriate management actions for *immediate implementation*, design any subsequent detailed investigations to fill *critical information gaps*, and determine future *monitoring and review requirements* that are well targeted and linked to adaptive management processes.

each draft Sustainability Assessment and Management Plan, and the public release of the final document. It is essential that citizen involvement include education and participation in decision making.

9.3 Resourcing Sustainability Assessment and Management Plans

Preparation of Sustainability Assessment and Management Plans for coastal lakes will involve an iterative process of assessment and decision making. Funding and advice must be sourced from a variety of separate, but linked programs and agencies.

Recent decisions by the NSW Government provide for the *technical* assessments of coastal lakes and their catchments to be undertaken as part of the *Comprehensive Coastal Assessment*. $8.6 million has been allocated to undertake the first stage of the *Comprehensive Coastal Assessment* over the next three years. From that allocation, a dedicated amount in the order of $2.2 million over three years (requirement estimated by the Commission after consultation with the Department of Land and Water Conservation and Planning NSW) would enable the completion of the *technical* component of the assessments for the priority coastal lakes identified in the strategy[12], including provision for the operations of the Independent Coastal Lakes Expert Group.[13] (Coastal lakes in the Shoalhaven and Great Lakes areas, followed by several other lakes, are assigned the highest priority in the strategy.)

Additional 'seed' funds of $1.6 million over three years (preliminary requirement estimated by the Commission after consultation with the Department of Land and Water Conservation and Planning NSW) would assist public authorities to develop the management component of the Sustainability Assessment and Management Plan for the priority lakes.[14] The responsible council(s) should also contribute funds or in-kind resources commensurate with their responsibilities.

The preparation and *implementation* of Sustainability Assessment and Management Plans for coastal lakes should also be supported and reinforced through a more aligned direction of existing state and local government funding programs, such as the *Estuary Management Program*, *Stormwater Management Program*, *Country Towns Water Sewerage and Drainage Program* and the *Floodplain Management Program*. Additionally, greater utilisation of available sources of information[15] and the raising of supplementary funds, through, for example, environmental levies[16] should be evaluated.

Properly formulated Sustainability Assessment and Management Plans would warrant 'accreditation' as satisfying the requirement of local environmental studies, under the provisions of Section 57 of the *Environmental Planning and Assessment Act 1979*. Amendment of the Act to enable councils to obtain financial contributions *at a later date* from the proponents of new developments is warranted given that the preparation of Sustainability Assessment and Management Plans entails some possible redistribution of costs and risks between councils and developers.[17]

Ultimately, there is likely to be a need for some additional funds for *implementation* of the management plans prepared within the strategy. The amounts involved, and the appropriate allocations of costs among the agencies, councils and private entities cannot be quantified until Sustainability Assessment and Management Plans have been prepared.

Government endorsement of the *Coastal Lakes Strategy*, incorporating its implementation arrangements will imply an 'in-principle' commitment to allocate future available funds in

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[12] Eurobodalla Shire Council prepared *land* capability assessments for four lake catchments for approximately $120,000. The Department of Land and Water Conservation has advised in its submission that *land and water* assessments might cost around $100,000 for each lake.

[13] Some local councils also noted that this group would be seen as a demonstration of Government's commitment to enhance the capacity of local councils.

[14] This would cover the cost to engage suitably qualified planners and to meet the cost of public consultation. The skills and the experience of the planners must be commensurate with the task at hand, namely, driving the implementation of a new approach that entails addressing the often competing interests of multiple local councils, state agencies (at a senior level) and citizens.

[15] For example, Eurobodalla Shire Council, in conjunction with PlanningNSW and the Department of Land and Water Conservation, has used *available* soil, landscape and climate data to assess the capability of the lands in the catchments of Coila, Tuross and Corunna lakes to support further rural residential development. This included assessing potential nutrient loads, risks associated with on site sewage systems, bushfire risks, vulnerable ecosystems and erosion potential — all at a modest cost of around $20,000 each. Sustainability assessments for these coastal lakes would involve reviewing this information within the context of each lake's capacity to sustain existing and further development, for example its vulnerability to nutrient enrichment.

[16] The approach used to improve the condition of Lake Macquarie provides a useful example, particularly with regard to the use of environmental levies supported by state programs.

[17] Alternatively, a mechanism needs to be developed to allow councils to recoup some of their costs associated with undertaking Sustainability Assessment and Management Plans by broadening the developer contributions provisions of Section 94 of the *Environmental Planning and Assessment Act 1979*.

accordance with the priorities established by the strategy.

The Healthy Rivers Commission would provide further advice on overall funding needs and cost sharing arrangements, as a component of the audit of implementation to be conducted two years hence.

9.4 Reclassifying Coastal Lakes

Important new information and knowledge about the ecosystems of coastal lakes, dependent human activities and interrelations with other lakes and estuaries is likely to emerge through the process of undertaking, implementing and reviewing Sustainability Assessment and Management Plans.[18]

A coastal lake may be reclassified only in circumstances where there is compelling evidence to justify a change. A rigorous process for determining any reclassification must apply, involving:

- advice by the Independent Coastal Lakes Expert Group on the technical evidence supporting reclassification;
- referral to the Chairperson of the Coastal Council for public exhibition and subsequent advice to the Minister for Land and Water Conservation and Minister for Planning; and
- endorsement by the Minister for Land and Water Conservation and Minister for Planning.

9.5 Assigning Key Responsibilities (and Relationships)

Preparation of the *technical component* of Sustainability Assessment and Management Plans would most appropriately be managed by PlanningNSW, given that agency's current responsibility for preparing the *Comprehensive Coastal Assessment*.[19] The Department of Land and Water Conservation would most appropriately have the lead responsibility, at a state level, for preparing the management component for each coastal lake. Sustainability Assessment and Management Plans must be prepared in partnership with the relevant local council(s).

'Sign off' on Sustainability Assessment and Management Plans must be completed by relevant state agencies and local councils, with 'final approvals' issued by the Minister for Land and Water Conservation with the concurrence of the Minister for Planning.

PlanningNSW, the Department of Land and Water Conservation and the relevant local council(s) must ensure that other state agencies, natural resource and planning committees and community members are provided appropriate opportunities to participate in the preparation of the Sustainability Assessment and Management Plans.[20]

Figure 2 presents a diagrammatic representation of the overall arrangements for implementing the *Coastal Lakes Strategy*, particularly with regard to preparing and implementing Sustainability Assessments and Management Plans.

9.6 Resolving Conflicts

The Sustainability Assessment and Management Plans will identify specific outcomes sought, actions required and the best mix of management tools for each coastal lake. In that process, disputes might arise among citizens, local councils and state agencies.

Resolution of such disputes would be facilitated through reference to the Chair of the Coastal Council for mediation, given his/her independent role and understanding of coastal management. In the event of a high level dispute on issues of state importance that remains unresolved after such mediation, the Chairperson would need to refer the matter to the Minister for Land and Water Conservation for decision (with the concurrence of the Minister for Planning).

9.7 Applying Actions for each Coastal Lake

Actions identified in the Sustainability Assessment and Management Plan for each coastal lake create implementation obligations for all relevant public authorities. The following measures would ensure that these public authorities implement and reinforce the relevant actions in a consistent way.

[18] For example, any potential re-classification for an individual coastal lake in the Narooma (eg Mummuga - Corunna lakes), Shoalhaven (eg Wollumboola - Tabourie) or Great Lakes (Wallis - Myall) areas should be considered within the context of the possible implications for other local lakes.

[19] PlanningNSW would also have an essential role from the outset in developing any management actions, particularly in terms of ensuring that regional and local land use planning considerations are addressed in the preparation of each plan.

[20] Participation should be informed by the Department of Land and Water Conservation's recent experience in preparing water sharing plans.

- Local councils must develop or review their local environmental plans to incorporate provisions that give effect to the findings of Sustainability Assessment and Management Plans, by way of notices issued by the Minister under the provisions of Section 117 of the *Environmental Planning and Assessment Act 1979*.[21]

- Local environmental plans (supported by development control plans) affecting coastal lakes must include clear provisions requiring development to be consistent with the outcomes sought for each coastal lake and the actions necessary to achieve them (as identified in the relevant Sustainability Assessment and Management Plan).

- State agencies and local councils must progressively review and apply their statutory approval functions and public funding programs in ways that are consistent with the outcomes sought for each coastal lake and the actions necessary to achieve them.

9.8 Holding Accountable, Authorities with Responsibility (including Key Milestones)

The coastal lakes framework and arrangements for its implementation are designed to ensure that councils and agencies with the powers to make decisions affecting coastal lakes are better equipped to make the 'best' decisions, and that they are accountable for the results of those decisions.

The (indicative) responsibilities and completion times for the agencies and councils with roles in implementing the *Coastal Lakes Strategy* are presented in Table 7. (These require finalisation as part of government decisions on the strategy.)

In particular, the Department of Land and Water Conservation, PlanningNSW and the responsible local council(s) are to prepare Sustainability Assessments and Management Plans according to the following priority staging[22]:

1. Coastal lakes in the Shoalhaven[23] and Great Lakes[24] local government areas to be completed within 18 months of the Government decision in response to the Coastal Lakes Inquiry;
2. Cudgen, Innes-Cathie[25], Narrabeen, Coila, Tuross, Wagonga, Back and Merimbula lakes to be completed within three years of the Government decision; and
3. other coastal lakes to be competed in accordance with priorities determined by the Coastal Council and in light of available funding.

PlanningNSW and the relevant local councils are to revise regional and local plans relating to coastal lakes and their catchments to incorporate the findings and actions identified in each Sustainability Assessment and Management Plan.

9.9 Monitoring and Reviewing Implementation

Processes to monitor and review progress towards the outcomes sought for each coastal lake are to be established in each Sustainability Assessment and Management Plan. The Department of Land and Water Conservation must ensure that such monitoring and review facilitates adaptive management, and must undertake a high level appraisal of results. For practical purposes, the results of monitoring and reviews, relevant to council activities, should be incorporated directly into their state of the environment reports.

A further necessary step to ensure implementation and effectiveness of the *Coastal Lakes Strategy* is longer term review at a coast wide scale. In keeping with previous Government decisions and the need to separate audit and operational functions, those reviews would most appropriately be conducted by the Healthy Rivers Commission, given its independent status.

[21] Joint plans would be preferable for situations involving multiple council areas within the catchment of a single coastal lake.

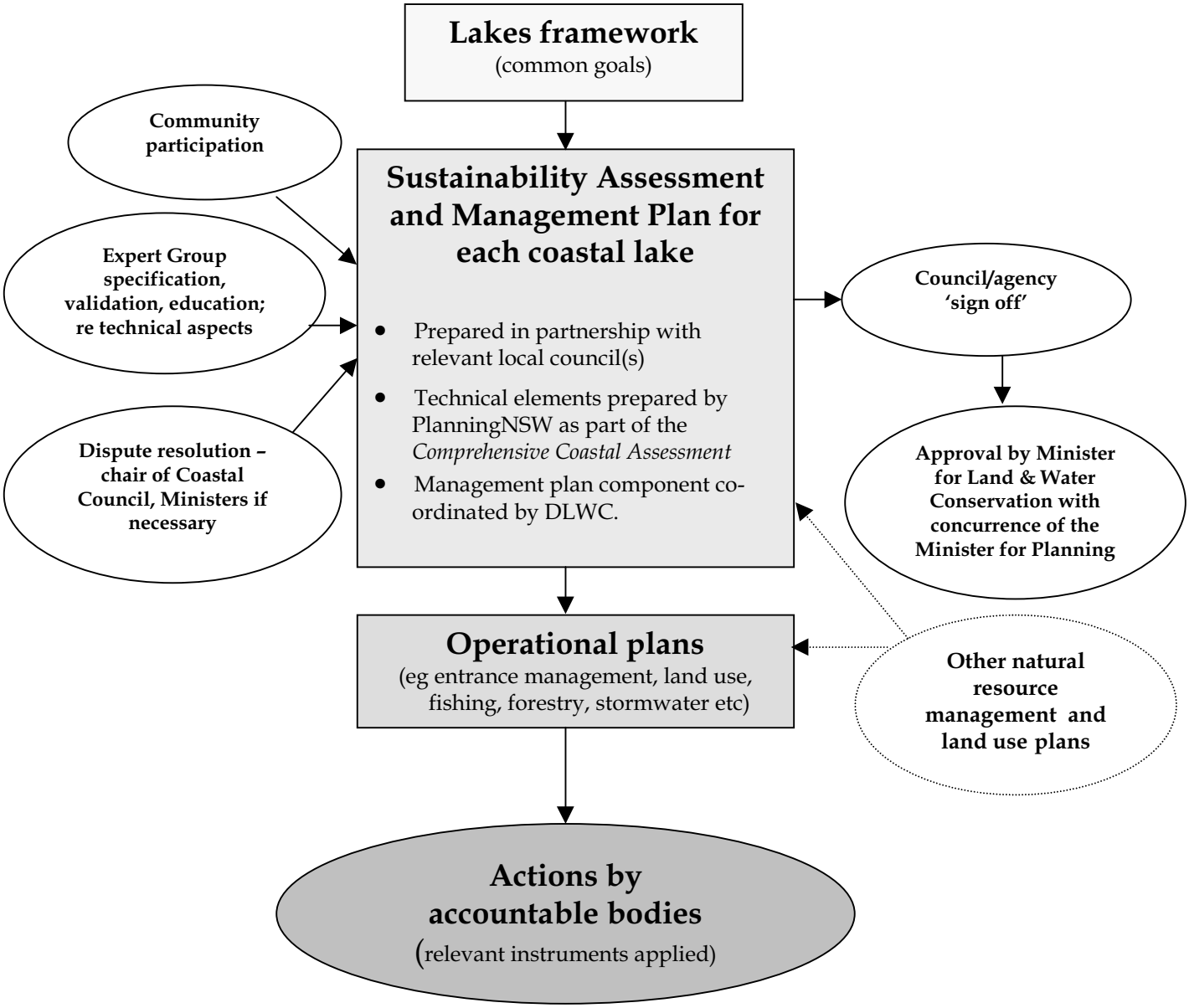
[22] Priority regions and lakes have been chosen based on their sensitivity to human interventions, significance to regional economies, high population growth and associated pressures and the need to resolve ongoing community conflicts. It is neither feasible nor practical to prepare Sustainability Assessment and Management Plans for all coastal lakes at the same time.

[23] The Commission welcomes the Shoalhaven City Council's offer, in its submission, to support pilot assessments being undertaken within its area of responsibility. The relevant coastal lakes are Wollumboola, St Georges Basin, Swan, Conjola, Narrawallee, Burrill, Tabourie, Termeil, Meroo, Willinga, Brush (Swan), Kioloa and Durras.

[24] The Commission notes Great Lakes Council's advice, in its submission, that a variety of existing studies are available for Wallis and Smiths lakes. The relevant coastal lakes are Wallis, Smiths and Myall lakes.

[25] Whilst lakes Innes and Cathie, and Queens and Watson Taylor have been classified separately, due to major differences in these waterbodies and their catchments, their interconnectedness necessitates that one Sustainability Assessment and Management Plan be prepared for each of these two systems.

Figure 2: Implementation Arrangements



10 Supporting Initiatives

The following general and specific initiatives are designed to strengthen and reinforce the *Coastal Lakes Strategy.*

10.1 Applying Transitional Arrangements

It will be necessary to manage some proposed developments before completion of the Sustainability Assessment and Management Plans that will *ultimately* provide the basis for such decision making. Even at this early stage, however, the framework offers opportunities for improved decision making, by classifying the lakes into classes for which primary outcomes and preferred management approaches are specified. Transitional arrangements must therefore ensure that decisions (including the requirements for site specific environmental assessments and the management of lake entrances) are consistent with the primary outcome and indicative actions for each class of coastal lake, as presented in the management framework of this strategy.

There should be provision for the Minister for Planning to 'call-in' a development affecting a coastal lake, if the Minister considers that the proposed development:

- may not have a neutral or beneficial effect on natural ecosystem processes in cases where the lake is classified as Comprehensive Protection;
- may not be able to contain potential adverse impacts on site in cases where the lake is classified as Significant Protection; or
- would not be consistent with the primary outcome specified for a given lake, irrespective of its classification.

10.2 Managing Lake Entrances: Regulatory Processes

The Coastal Lakes Inquiry found that it is common practice to open the entrances of many coastal lakes artificially, with inadequate or *no* assessment or monitoring of the impacts on lake ecosystems or dependent human activities. Management is often 'ad hoc' and even where arrangements for opening coastal lakes have been agreed, these are sometimes disregarded. The current statutory arrangements governing entrance openings also involve multiple overlapping instruments, including the *Crown Lands Act 1989*, *State Environment Planning Policy 35 - Maintenance Dredging of Tidal Waterways*[26], *Environmental Planning and Assessment Act 1979*, *Fisheries Management Act 1994* and the *Water Management Act 2000*.

The *Coastal Lakes Strategy* provides for more effective regulatory processes that require all relevant public authorities to assess, monitor and review the impacts of artificially opening lake entrances on both lake ecosystems and dependent human uses, as well as ensure that public authorities comply with decisions. Specifically, the 'controlled activity' provisions of the *Water Management Act 2000,* to commence in July 2002, represent the most appropriate mechanism for governing decisions to open lake entrances artificially.

Application of this mechanism must provide for:

- decisions to approve entrance openings to be subject to approvals that are informed by and consistent with the findings of Sustainability Assessment and Management Plans;
- an agreed entrance opening *regime* (ie a series of opening events over time), given the need to ensure that councils can respond promptly when protection is needed for assets subject to water damage and/or public health requirements;
- a program of actions to reinstate (partially or fully) the natural entrance behaviour, in those cases for which lake specific Sustainability Assessment and Management Plans determine this to be practicable and necessary; and
- an education strategy to increase community understanding and acceptance of entrance management strategies.

Arrangements for managing the entrance of an individual coastal lake would be subject to approval by the Minister for Land and Water Conservation and the Minister for Planning, as part of their approval of Sustainability Assessment and Management Plans.

With improvement of the assessment and regulatory processes for coastal lakes, *State Environmental Planning Policy 35* should be amended to exclude its application to the management of coastal lake entrances.

[26] One of the key recommendations from the ICOLLs (Intermittently Closed and Open Lakes and Lagoons) Forum (1998) held by the Coastal Council was the need to review the provisions and application of SEPP35.

10.3 Adapting to Changes in Sea Level and Storm Events

Councils and agencies have adopted different 'standards', or in some cases no standard, to guide their planning responses to predicted rises in sea level[27] and resultant rises in the levels of lake water[28] or entrance sand plugs.[29] Even a modest rise in sea level *might* be enough to cause flooding of some existing assets in low-lying areas around several coastal lakes, such as Lake Tabourie[30]. Similarly, predicted changes in the intensity of storm events may exacerbate existing risks or create new ones.[31] Any new approvals to locate assets prone to water damage or inconvenience in low lying areas could increase the potential risks and costs and further entrench existing pressures to open the entrances of some lake entrances or intervene in others. A more precautionary approach is warranted.

The *Coastal Lakes Strategy* requires that early action is taken to assess the social, economic and ecosystem risks that may result from a rise in sea level and change in storm events for coastal lakes (and other coastal areas); and to formulate commensurate management responses. The latter would require all public authorities to adopt a common approach for a predicted rise in sea (and lake) water level in all their planning and management activities relating to coastal lakes, particularly for any new developments.

PlanningNSW would incorporate assessments and responses into the *Comprehensive Coastal Assessment*.

[27] The CSIRO estimates that sea level is projected to rise by 9 to 88 centimetres by 2100, or 0.8 to 8.0 centimetres per decade, with regional variations. The observed rise over the 20th Century was 1 to 2 centimetres per decade. (CSIRO, 2001, *Climate Change: Projections for Australia*, Canberra).

[28] Water levels in open coastal lakes are typically higher than sea level due to the processes of tidal conveyance. That is, more water enters a lake entrance during high ocean tides than exits during low tides.

[29] The 1999-2000 Annual Report of the Coastal Council provides a summary of council responses to sea level changes.

[30] The entrance of Lake Tabourie is currently opened when lake water levels reach a height of 1.17 metres Australian Height Datum (Shoalhaven City Council, 1999, *Draft Lake Tabourie Entrance Management Policy and Review of Environmental Factors*).

[31] CSIRO, 2001, *Climate Change: Projections for Australia*, Canberra.

10.4 Establishing Reserves

The establishment of reserves represents an important tool for ensuring the long-term protection of important coastal lakes and their catchments.

For many coastal lakes classified as Comprehensive Protection, much of the catchment and water body is already within a reserve. For protection of the remaining areas, the relevant state agency must take immediate action to declare the lake body and beds as reserves under the provisions of the *National Parks and Wildlife Act 1974* (lake bed), the *Marine Parks Act 1997* or the *Crown Lands Management Act 1989*.

Additionally, specific areas of Crown land (within a lake catchment or comprising a lake bed) in any class of coastal lake, identified through the Sustainability Assessments as having *outstanding* conservation values, must be afforded appropriate protection, through its declaration as a reserve by the relevant agency.

10.5 Protecting Ecosystems through Land Acquisition

The *Coastal Lands Protection Scheme* is a valuable state program that provides funds for the purchase of selected private properties with important assets, traditionally related to scenic, access and recreation values.

The criteria for acquisition of private lands under the *Coastal Lands Protection Scheme* should be adjusted by PlanningNSW to allow also for the purchase of properties (or parts of properties) that would *indirectly* improve or protect the health of coastal lakes and their catchments. This is consistent with the intent of recent amendments to the program criteria to include acquisition of properties to link coastal reserves, secure areas of habitat/ conservation value and protect estuaries.

A modest, one off enhancement of the funding allocated to the program would permit the purchase of the few key properties likely to be identified in the priority Sustainability Assessment and Management Plans.[32] The broader review of funding of all coastal land acquisition programs, being undertaken as part of the *Coastal Protection Package* should address those opportunities.

[32] For example, it would be possible to counter the need to open or substantially raise the water level at which Coila Lake is opened artificially to the ocean, hence protecting extensive and valuable ecosystems around the lake edge, by purchasing a couple of residential blocks and a few hectares of a farm.

10.6 Enhancing Processes for Estuary Management

Estuary management committees have important strengths. However, there is some evidence that the potential contribution of estuary management committees has in some instances been curtailed through inappropriate management practices. The *Coastal Lakes Strategy* establishes membership and management practice requirements for estuary management committees that would reinforce a high level of council commitment to their effective functioning, within the context of the *joint* state and local government responsibility for managing estuaries.

The Department of Land and Water Conservation and others have initiated significant advances in the functioning of committees and boards for management of vegetation, water and catchments. The success of these committees is attributable, in part, to the establishment of clear obligations and protocols for all committee members and the appointment, by the responsible Minister, of people with a range of interests as well as an independent chairperson.

The *Coastal Lakes Strategy* would require such an approach to be extended to all estuary management committees. *Independent* chairpersons (excluding people with very direct interests) and members should be selected and appointed by the relevant council(s), with the concurrence of the Minister for Land and Water Conservation. The appointment of suitable chairpersons should be considered within the context of the outcomes sought for a particular estuary, past management practices and the range of interests engaged (including the degree of conflict), and the obligations of chairpersons specified in *Support Package for River, Groundwater and Water Management Committees*. Where a council proposes to appoint a councillor or council officer, such a proposal must be justified in writing to the satisfaction of the Minister.

The obligation to ensure that each estuary management committee functions in a fair and effective way resides equally with the Department of Land and Water Conservation and the relevant council(s). Application of the framework for managing different classes of coastal lake and the decision making processes for preparing Sustainability Assessment and Management Plans for each lake would provide a further safeguard, by establishing the boundaries within which local estuary management committees would operate. (More broadly, the revised manual(s) for estuary and coastal management should incorporate and reinforce all relevant elements of the *Coastal Lakes Strategy*.)

The Healthy Rivers Commission's future audit of the implementation of the *Coastal Lakes Strategy* will incorporate a review of the effectiveness of the arrangements listed above.

10.7 Exploring World Heritage Nomination

Within the strategy, the possibilities for nominating the catchments and waterways of a group of coastal lakes (and possibly other estuaries) on the South Coast for World Heritage Listing (and/or National Heritage Listing[33]) are to be explored, with investigations of the ecological, social and economic implications of such nominations. These considerations should include, but not be limited to, Wollumboola, Swan, Conjola, Burrill, Tabourie, Termeil, Meroo, Willinga, Durras and Wallaga lakes and St Georges Basin.[34]

Exploring World Heritage nomination is *one* way of providing stronger protection for the unique ecosystem and human values associated with selected coastal lakes, while also generating regional economic growth in the longer term.[35] Such an approach would *demand* thorough investigation and careful consideration of the likely ecological, social and economic implications, leading to informed community discussion. The recent addition of the Greater Blue Mountains area to the World Heritage List provides a useful opportunity to assess the *results* of such listing.

As a first step, the National Parks and Wildlife Service should initiate discussion between Shoalhaven, Eurobodalla, Bega and Blue Mountains councils, with a view to developing community understanding of the actual implications of World Heritage listing.

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[33] The Commonwealth Government proposes to create an (*Australian*) National Heritage List, as an alternative or as a step towards World Heritage Listing. A national list would replace the existing Register of the National Estate, which includes Durras, Willinga, Meroo, Termeil and Wollumboola lakes.

[34] The Regional Forest Agreement for the Southern Region, signed on 24 April 2001, includes an agreement between the Commonwealth and NSW Governments that any future World Heritage nominations would come from the Comprehensive, Adequate and Representative (CAR) Reserve System. Many of these lakes have substantial parts of their catchments in the CAR Reserve System.

[35] Total exclusion of human activities is not a condition of World Heritage Listing. Rather, stringent controls to protect natural and human values consistent with the criteria for World Heritage areas would be applied.

10.8 Managing Caulerpa Taxifolia

The aquatic weed *Caulerpa taxifolia* presents a significant threat to the ecosystems of coastal lakes and their dependent human activities. NSW Fisheries and other public authorities have implemented several actions to investigate the weed's behaviour and to better manage it, through prohibiting its sale, controlling fishing and educating citizens.

Efforts to investigate the impacts of the weed on coastal lakes (and other estuaries) must be further strengthened, particularly with regard to identifying its preferred environmental conditions, spread and control. The possible need for additional State funds to be allocated for this purpose will require consideration.

In the interim, pending the outcomes of the above investigations and preparation of a longer term strategy, as part of the implementation of this *Coastal Lakes Strategy*, action is required to contain the spread of the weed both within and between estuaries, such as through appropriate and consistent management of boating and fishing activities.

Any future strategy to manage this weed must include cost-effective actions to mitigate any *human induced* environmental conditions that favour its growth, for example, nutrient inflows from catchment activities. Additionally, any control actions, for example, opening the entrances of coastal lakes, must be assessed carefully and designed to avoid any possible outcomes that might present greater threats to lake ecosystems and dependent human uses.[36]

10.9 Encouraging Sustainable Farming Practices

Many farmers wish to implement more sustainable farming practices. Some have already begun to do so. There has been much recent consideration of the ways in which incentives and sanctions might be used to encourage beneficial or discourage poor farming practices.[37] In addition to other initiatives, the Department of Land and Water Conservation is investigating various options in this regard as part of the Government's *Statement of Intent for the Clarence River.* A thorough review of such opportunities and an assessment of their potential effects has also been advocated by NSW Fisheries[38], the NSW Farmers Federation and the Australian Conservation Foundation. Such a review is timely after more than a decade of 'landcare'.

The framework for managing coastal lakes broadly identifies the circumstances in which public authorities could better reward farming practices that contribute to sustaining lake health, and thus provides some guidance for the investigations. Investigations of these opportunities should draw also on the experience of farmers, public authorities and other interested citizens involved in landcare, as well as building on recent initiatives to pilot new mechanisms. Particular attention should be given to identifying ways in which the powers and resources of *all public authorities* can be applied, including ways to fill any gaps in the existing range of incentives and sanctions.

The Sustainability Assessment and Management Plans prepared for individual lakes will incorporate any incentives that are identified as appropriate and practicable. Agencies such as the Department of Land and Water Conservation and NSW Agriculture would then assume implementation obligations, as outlined in previous commentary on the functions of the Sustainability Assessment and Management Plans and agency responsibilities for implementation.

10.10 Investigating Mechanisms for Managing Land in Areas of Outstanding Conservation Value

In some cases, the completion of Sustainability Assessment and Management Plans may lead to a conclusion that existing zoning of land with outstanding conservation value is inappropriate. The current zoning and development potential for such land may vary, although, in most cases it will not have been approved for residential or rural residential development. Mechanisms are required to preserve such land, whilst addressing the rights and expectations of landholders. The most appropriate agency for assessing possible mechanisms is PlanningNSW.

Protection mechanisms for such land that warrant further exploration, and possible testing in pilot applications, include:

- exchanging Crown land of low ecosystem value and high development potential for

[36] Commensurate action should be taken for other aquatic weeds, such as alligator weed.

[37] Department of Land and Water Conservation (2001) *Environmental Services*; Allen Consulting Group (2001) *Repairing the Country: Leveraging Private Investment*, prepared for the Business Leaders Roundtable. The Healthy Rivers Commission has engaged the University of New England to examine whether sustainable farming practices are profitable.

[38] NSW Fisheries particularly noted the need to address gaps in the current range of incentives, such as those involving stock access to saltmarsh.

freehold land with outstanding conservation values (within or between catchments)[39];

- transferring existing development entitlements for freehold land from unsuitable to suitable sites, via market mechanisms[40]; and
- 'down zoning' old 'paper subdivisions' in unsuitable areas.[41]

The findings of the Sustainability Assessment and Management Plans for specific coastal lakes would assist the identification of the most effective mechanisms for land associated with each lake.

10.11 Extending the Management Approach to Estuarine Creeks

The approach for managing coastal lakes should be applied, under the leadership of the Department of Land and Water Conservation, to estuarine creeks with entrances that open and close intermittently. This should be done in conjunction with the *Comprehensive Coastal Assessment*.

11 Application of the Framework: Further Explanatory Notes

11.1 Managing Lake Entrances: Decision Making

Many coastal lakes are, or would be, intermittently open and closed, (some being mostly open and others mostly closed) as a result of *natural* processes. In general, the condition of many coastal lake ecosystems would be improved if there were a more natural pattern of opening and closing.[42]

Human intervention in the behaviour of lake entrances occurs for a variety of reasons. A common reason is to mitigate any potential *damage, health risks and/or inconvenience* to low lying properties and other assets, such as yards, access roads, septic tanks and homes, when water levels in a closed coastal lake are high.[43] The need to open coastal lakes for this reason is the result of poor planning decisions in the past. Some coastal lakes are also opened to 'improve' lake amenity by alleviating actual or perceived water quality problems or to create preferred conditions, such as those relating to odours, swimming, recreational fishing, boating, irrigation and foreshore conditions.

There are some circumstances where opening lake entrances may be warranted. However, such action typically has occurred regardless of the significant differences in the ecological condition, conservation and resource values (natural and/or dependent enterprises), the type and scale of human assets subject to water inundation or changes in water quality, and with inadequate or no assessment or monitoring of the impacts. Thus a near pristine coastal lake with few affected assets, such as Durras Lake, has too frequently been treated in the same way as a degraded lake with multiple affected assets where opening represents a 'last resort', such as Terrigal Lagoon. Management is often 'ad hoc' and even where arrangements for opening coastal lakes have been agreed, these have been disregarded sometimes (eg Lake Cathie).

Careful and balanced examination of the impacts of opening entrances artificially on a coastal lake's ecosystem and its existing dependent uses, relative to the actual risks to assets or water quality, to determine what action is cost effective and over what timeframe is required. It may be appropriate, cost effective and achievable to raise or modify selected *existing* assets immediately or over time and/or 'live' with higher lake water levels.[44]

The framework for managing coastal lakes provides for orderly decision making by public authorities in respect of interventions in the natural processes of lakes' entrances. It requires that those decisions are consistent with the outcomes sought for each class of coastal lake.

- For the majority of the coastal lakes classified as Comprehensive Protection, there is no insurmountable reason not to discontinue

[39] The opportunities for such exchanges on a *broad scale* have been reduced as a result of Government action to dedicate substantial areas of Crown Land as park reserves (in light of their *direct* ecological value). However, such opportunities should be assessed on a lake by lake basis, in areas where suitable Crown Land is available.

[40] Such a mechanism is foreshadowed in the draft *Sustaining the Catchments Regional Plan* (DUAP, 2000), and noted in *PlanFirst* (DUAP, 2001).

[41] Several paper subdivisions exist along the NSW coast, including a parcel of land in the catchment of Lake Wollumboola.

[42] Opening the entrances of coastal lakes artificially has profound adverse impacts on lake ecosystems, such as through changes in salinity regimes and patterns of water inundation in wetlands. However, little research has been undertaken to develop a better understanding of the ecological processes and full consequences of such interventions.

[43] In some cases, it must be recognised that local council action is likely to be necessary to mitigate the risks associated with substantial flooding (eg 1 in 100 year event), *regardless* of whether or not an entrance is opened artificially.

[44] For example, Great Lakes Council has initiated action, in conjunction with affected parties, to raise the level at which Smiths Lake is opened. In particular, the operator of a caravan park has adapted to higher water level events and council has installed reticulated sewerage in some local villages. Council advises that the entrance behaviour of Smiths Lake could be reinstated to near natural conditions, if a jetty and tea house on Crown Land were raised at modest cost.

artificial entrance openings, given that these are often largely or fully within national parks. Durras Lake, is an illustrative case.

- For coastal lakes classified as Significant Protection, it should be possible to *minimise* intervention in entrance behaviour in the short term. In many cases, this is likely to require modest, cost effective actions, such as 'renting' farmland that is inundated by water or raising a section of a local road to avoid inundation. Such actions could often be achieved through better direction of existing funds. It *may* be possible to further raise or even reinstate fully the natural entrance regime over the longer term.

- For coastal lakes classified as Healthy Modified Conditions or Targeted Repair, present land use and economic implications typically remove the possibility of returning to a natural entrance regime. In some cases, human modification of these coastal lakes and catchments is such that there is often little choice but to open entrances to improve lake health. However, it may be possible to make some adjustments to current practices for opening entrances to protect selected natural or modified ecosystem processes. Where opening an entrance represents a last resort approach to improving water quality, application of the framework would ensure that catchment improvements received earlier and more stringent attention, so that the water quality problems are better contained *at source*.

Detailed decisions about entrance management for individual coastal lakes would be determined in the course of preparing Sustainability Assessment and Management Plans. However, a requirement for any *new* assets that would otherwise be prone to water damage or inconvenience to be set above high lake water levels (under natural entrance conditions) is a *commonsense* approach that warrants immediate adoption. A possible exception *might* apply for a few of the coastal lakes classified as Targeted Repair or Healthy Modified Conditions where there are strong grounds for maintaining an open entrance condition over the long term.

11.2 Undertaking New Development

The framework provides opportunities for certain forms of new development[45], even for those coastal lakes in the Comprehensive Protection class. A number of villages have been established within the catchments of several such lakes and that these places are often valued highly by members of local communities and visitors.[46] Whilst *expansion* of these villages would impact adversely on the ecosystems of such coastal lakes, the framework would not preclude citizens' undertaking activities such as home building within the *existing boundaries of developed* urban and rural residential areas, subject to appropriate conditions.

Additionally, the framework would allow for some 'sustainable' developments, even outside existing developed areas, in the catchments of coastal lakes in the Comprehensive Protection class. For example, it is reasonable to expect that basic visitor facilities of the type found in many national parks and reserves could be provided, given adequate environmental safeguards to ensure that the intended outcomes remained achievable. In such cases, the test would be whether new developments are likely to have a neutral or beneficial effect on lake or catchment health. Such an approach is consistent with the NSW Government's development and piloting of 'green offsets', as described in its *Action for the Environment Statement*.

Similarly, the framework would allow the development of eco-tourism facilities and activities (eg education centres and retreats) around coastal lakes classified as Significant Protection. It recognises that such developments may be desirable means of ensuring that some coastal lakes are used in ways that contribute more to the social and economic well being of regional communities, provide incentives for existing land holders to pursue alternative business opportunities, and generate a broader set of interests dedicated to protecting lake health over the longer term. In such cases, the emphasis would be on developments where any potential *minor* impacts can be contained on site.

However, effective management requires that such approaches are carefully evaluated and not used as a convenient loop-hole to gain approval of *high* impact developments under the guise of 'green development' or with 'green trappings'. The framework's processes for assessing the capabilities and limitations of individual coastal lakes, including independent expert validation, would assist the identification of developments that could *accurately* be described as 'sustainable' in a given situation.

[45] The term 'development' is used in a broad way, rather than listing the many specific types of activities that are used by planners or derived from legislation.

[46] Well known examples include Culburra and North Durras in the catchments of Wollumboola and Durras lakes, respectively.

Appendix 1: Commentary by the Commission: Key Matters and Responses in Submissions

The overwhelming weight of evidence presented to the Coastal Lakes Inquiry demonstrated the need for a better way to manage coastal lakes.

The 135 submissions received in response to the Commission's draft findings and recommendations, as presented in the Draft Paper for the Coastal Lakes Inquiry, demonstrated strong support with few exceptions. In fact, a number of submissions moved beyond the content of the recommended strategy for managing coastal lakes to address matters relating to its implementation and its potential extension to other estuaries.

The Commission's findings and recommendations concerning the *key* matters relating to the management of all coastal lakes are presented below. The final *Coastal Lakes Strategy*, as presented in the previous section of this report, has incorporated changes based on these findings, along with other modest adjustments.

The key matters raised in submissions concerning the draft *Coastal Lakes Strategy* related to:

- formalising the relevant elements of the *Coastal Lakes Strategy* via a State Environmental Planning Policy;
- clarifying the responsibilities for preparing and implementing Sustainability Assessment and Management Plans for each coastal lake;
- determining arrangements to provide the resources and funds needed in the preparation and implementation of Sustainability Assessment and Management Plans;
- specifying accountabilities and completion times for preparing Sustainability Assessment and Management Plans, as well as other elements of the *Coastal Lakes Strategy*;
- confirming the selection of coastal lakes to be covered by the strategy and their classifications;
- consultation processes relating to Aboriginal values and significance;
- determining the most effective regulatory processes for the management of artificial openings of coastal lake entrances;
- establishing transitional arrangements for handling new development proposals pending the preparation of Sustainability Assessment and Management Plans; and
- enhancing processes for estuary management.

A list of the people who made submissions or participated in other key Inquiry processes is presented in Appendix 2. Copies of the earlier Issues Paper and Draft Paper for the Coastal Lakes Inquiry are available from the Commission upon request or on the Commission's website (www.hrc.nsw.gov.au). Additionally, a report prepared for the Commission by Professor Ian White relating to lake conditions required for producing healthy oysters is available upon request.

Strategy Implementation

A frequently mentioned matter in submissions to the Draft Paper related to the arrangements for implementing the *Coastal Lakes Strategy*. In aggregate, the submissions reinforced the Commission's findings that the processes for implementing the strategy must fulfil the requirements specified in the *Coastal Lakes Strategy*, if they are to result in effective implementation and achievement of the desired goals. The implementation arrangements that the Commission agrees are essential are included as part of the recommended strategy, as discussed in Section 9. Some specific elements of those arrangements are further explained below, in light of the matters raised in submissions.

Formalising the Management Framework, Classifications and Requirements for Decision Making

As indicated above, submissions to the Inquiry demonstrate that there is strong support for an effective means to formalise the management framework for coastal lakes. It is evident that many local councils, state agencies and citizens prefer the use of a State Environmental Planning Policy (SEPP) for this purpose, particularly given the capacity of such an instrument to influence the decisions made by public authorities and their familiarity with its use.

The Commission has expressed its preference for the use of a SEPP as a means of formalising relevant components of the *Coastal Lakes Strategy.* The potential merits of the SEPP mechanism are discussed in Section 9.1 and the strategy provides that any alternative implementation arrangements must have comparable merits. An indicative draft of a SEPP that would satisfy the requirements sought for coastal lakes is presented in Appendix 3.

Responsibilities and Relationships

The Commission noted in the Draft Paper for the Coastal Lakes Inquiry that it would undertake further discussions to determine the best mechanisms for implementing the *Coastal Lakes Strategy*. In formulating its final recommendations, the Commission has considered the comments provided in submissions and the views expressed by state agencies, such as the Department of Land and Water Conservation and PlanningNSW with existing primary responsibilities. The arrangements that in the Commission's judgement provide for the most effective and efficient division of responsibilities are described in Section 9.5.

As stated in the Draft Paper, the Government has announced that the technical component of the Sustainability Assessment and Management Plans for each coastal lake will be undertaken as part of the *Comprehensive Coastal Assessment,* which is being managed by PlanningNSW.

Submissions from some local councils called for material to be produced that explains how the many existing and proposed state natural resource management policies interrelate. The Commission suggests that the Department of Land and Water Conservation prepare such material, in collaboration with local councils.

Funding and Resources

The Commission received a number of submissions from state agencies and local councils calling for additional funding to implement the *Coastal Lakes Strategy*. There is a general view that the current level of funding is insufficient to achieve the standard of integrated assessment, planning, actions and outcomes sought. This widely held view is captured in the Department of Land and Water Conservation's commentary:

"*Councils and coastal management agencies, especially DLWC and DUAP, have few staff who have experience or training in coastal ecology or environmental science. This capacity to understand ecological consequences of management actions needs to be strengthened and skills gaps need to be addressed…On close analysis, one of the major reasons for the shortcomings of the current process is merely limited funding*".

The Commission notes that *existing* statutory obligations require state agencies and local councils to allocate resources to the preparation of robust assessments and management responses for specific elements of the natural resources under their management.[47] In its past Inquiries, the Commission has not generally recommended the allocation of significant *additional* funds, as it has been convinced that existing funding could be better utilised within more strongly integrated management approaches.

In this case, however, the Commission is convinced that better direction of existing funding programs would *alone* be insufficient to secure the outcomes sought by citizens and governments for coastal lakes. Additional resources will be required for preparing assessments and management plans, and to implement actions, as

[47] For example, such obligations require preparation of local environmental studies for urban development proposals or environmental impact studies for commercial fisheries.

encompassed in the Sustainability Assessment and Management Plan for each coastal lake. The recommended *Coastal Lakes Strategy* therefore includes, as an implementation matter, a provision for additional funding in the short term, and for new funds allocation processes in the longer term. These are discussed in Section 9.3 of the strategy.

Accountabilities and Completion Times

Many submissions raised concerns relating to the assignment of accountabilities for actions, as well as timing.[48] The coastal lakes framework and arrangements for its implementation are designed to ensure that local councils and state agencies with the powers to make decisions affecting coastal lakes are better equipped to make the 'best' decisions, and that they are accountable for the results of those decisions.

The Government's Statement of Intent in response to the Coastal Lakes Inquiry, and the State Environmental Planning Policy (SEPP) for coastal lakes (if adopted), will explicitly define high level accountabilities for implementation of the *Coastal Lakes Strategy*. The Commission has recommended indicative arrangements for responsibilities and schedules, as shown in Table 7 of the strategy.

In keeping with previous Government decisions and the need to separate audit and operational functions, implementation actions will be audited by the Commission two years after the Government's decisions.

Selection of Coastal Lakes and their Classification

In finalising its selection of the coastal lakes that should be covered by the *Coastal Lakes Strategy*[49], the Commission has considered comments made in a number of submissions. In particular, several submissions called for Goolawah Lagoon (located near Crescent Head) to be covered by the strategy. The Commission is satisfied that Goolawah Lagoon exhibits the characteristics of a coastal lake and that it should be covered by the strategy.[50]

Several submissions, such as that received from NSW Fisheries, call for the strategy to be extended to a number of other estuarine creeks, with entrances that open and close intermittently. The Commission reiterates that the approach it advocates for managing coastal lakes is highly applicable to all estuaries. The Commission recommends extension of the approach to the management of estuarine creeks with intermittent entrances, but has not developed this in detail as part of this Coastal Lakes Inquiry. This task could be undertaken in conjunction with the *Comprehensive Coastal Assessment*, using this coastal lakes framework as the template. A list of possible estuaries is presented in Table A1.

The Commission sought further technical advice from several specialists on ways to strengthen the methodology used to determine the draft classifications for coastal lakes. The methodology has been enhanced somewhat in light of that advice. The Commission has reviewed the classifications for all coastal lakes having regard to the revised methodology, new information and the material provided in submissions. Through this process it has developed its recommendations for the final lake classifications. The Draft report's classifications for the majority of coastal lakes have been confirmed, whilst the classifications for Back, Nargal, Killalea and Pambula lakes have been changed.

The indicative status given to the classification of some coastal lakes in the Draft Paper, such as Queens and Meringo has been removed, and these classifications finalised. A 'provisional' classification has been retained for a few coastal lakes, for example, St Georges Basin and Wallaga lakes, given that the available information suggests that these systems lie on the borderline between two different classifications. The findings of sustainability assessments would be used to confirm these classifications, or to inform reclassification, if

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[48] Submissions to the Coastal Lakes Inquiry also expressed concern about the adequacy of developer accountability, that is, holding developers accountable for the projected impacts and the effect of mitigative measures. This will be investigated by the Healthy Rivers Commission as part of the North Coast Rivers Inquiry.

[49] Whilst the Commission has not included small lakes, which are components of larger river systems, such as Wommin Lake and Wommin Lagoon (parts of the Tweed River) in this Inquiry, the concepts within the coastal lakes strategy are equally applicable to these areas. The Commission will further investigate the applicability of capability and limitation assessments as part of the North Coast Rivers Inquiry.

[50] Refer to the Issues Paper or the Draft Paper for the Coastal Lakes Inquiry for further information on the criteria used by the Commission to select coastal lakes.

appropriate. The Commission has also recommended a process for reclassifying coastal lakes, as described in the strategy.

A summary of the classification approach, classifications and information used to classify each coastal lake is presented in Appendix 4. A final working paper that presents more detail about the classification system and the information used to classify each coastal lake, is available from the Commission upon request.

Table A1: Estuarine Creeks

Arrawarra Creek	Darkum Creek	Merrica Creek	Station Creek
Baragool Lake	Fiddamans Creek	Mollymook Creek	Tallows Creek
Belongil Creek	Fisheries Creek	Moonee Creek	Towradgie Creek
Berrara Creek	Greenpatch Creek	Nerrindillah Creek	Wattamolla Creek
Boambee Creek	Jerusalem Creek	Newtons Creek	Willis Creek
Broken Head Creek	Jordans Creek	Pine Brush Creek	Woodburn Creek
Bunyip Hole	Khappinghat Creek	Plutus Creek	Wrights Creek
Callala Creek	Killick Creek	Saltwater Creek	
Currarong Creek	Little Creek	Sandy Creek	
Currumbene Creek	Little Lake (Bensons Creek)	Short Point Beach	

Aboriginal Values and Significance

The Department of Aboriginal Affairs and the National Parks and Wildlife Service have provided further advice, in their submissions on the Draft Paper, concerning the significance of coastal lakes and their catchments to Aboriginal peoples. The Service also convened a meeting of Aboriginal and other officers from state agencies, on behalf of the Commission, to provide further advice. In brief, the key outcomes of this advice is that:

- *all* coastal lakes and catchments have high Aboriginal significance and that this should be reflected in the system for classifying lakes;
- an initial assessment of Aboriginal values and significance could be undertaken on a 'desktop basis' based on available information; and
- the determination of management strategies, in the process of preparation of Sustainability Assessment and Management Plans for each coastal lake, requires consultation on a lake specific basis.

Adoption of this approach would assist to fulfil the *1997 NSW Government Statement of Commitment to Aboriginal Peoples* and elements of the *Coastal Protection Package* with regard to coastal lakes. The Commission has revised the relevant components of the *Coastal Lakes Strategy* accordingly. This approach should also be extended to the wider *Comprehensive Coastal Assessment*.

Entrance Management: Artificial Openings

As discussed in the Draft Paper, the way in which entrances of coastal lakes are managed is one of the most frequently mentioned concerns expressed in submissions to the Inquiry. The Commission has found that immediate action is required to improve the processes for making decisions and the regulatory processes for implementing them.

The preparation of Sustainability Assessment and Management Plans would establish the context for managers to make informed decisions about whether or not to open the entrance of a coastal lake, and under what circumstances.

Additionally, the Commission sought further advice from the responsible state agencies, and the views of local councils and citizens on the most effective regulatory processes for managing lake entrances. Such processes must require all relevant public authorities to assess, monitor and review the impacts of opening lake entrances artificially on lake ecosystems and dependent human uses, as well as ensure they comply with decisions.

The Commission has therefore recommended that the Department of Land and Water Conservation apply the 'controlled activity' provisions of the *Water Management Act 2000* as the primary mechanism for implementation of entrance management programs. The arrangements for managing the entrance of an individual coastal lake should be approved by the Minister for Land and Water Conservation and the Minister for Planning as part of their approval of Sustainability Assessment and Management Plans.

In light of these improved assessment and regulatory processes, it is also recommended that *State Environmental Planning Policy 35* should be amended to exclude its application to the management of coastal lake entrances. Additionally, the responsible public authorities should develop and implement an education strategy to increase community understanding and acceptance of entrance management strategies.

Transitional Arrangements

The Commission received a number of submissions, particularly from local councils and citizens relating to decisions about new development proposals, entrance management and other aspects of lake management pending the preparation of Sustainability Assessment and Management Plans. Transitional arrangements are necessary to manage such matters. The Commission agrees that effective transitional arrangements are essential and its recommendations in that regard are contained in Section 10.1 of the strategy.

Enhancing Processes for Estuary Management

As reported in the Draft Paper for this Inquiry, the Commission found that the management practices followed by some estuary management committees are inappropriate. The Department of Land and Water Conservation confirmed that conclusion in its submission.

In light of submissions to the Inquiry, the Commission has refined its recommendations for reforming the functions of these committees, especially with regard to the selection of independent chairpersons. The Commission continues to believe in most situations that independence in chairing estuary management committees is of paramount importance. It recognises, however, that there may be circumstances in which a serving councillor or council officer could discharge the responsibilities effectively, within the context of the safeguards described in Section 10.6 of the strategy.

The Commission therefore recommends that the chairperson (and other committee members) should be selected and appointed by the relevant council(s), with the concurrence of the Minister for Land and Water Conservation. The appointment of suitable chairpersons should be considered within the context of the outcomes sought for a particular estuary, past management practices and the range of interests engaged (including the degree of conflict), and the obligations of chairpersons specified in *Support Package for River, Groundwater and Water Management Committees*. Where a council proposes to appoint a councillor or council officer, such a proposal must be justified in writing to the satisfaction of the Minister.

For its part, the Commission will review the effectiveness of the above arrangements as part of its future audit of efforts to implement the *Coastal Lakes Strategy*.

Appendix 2: Submissions and Consultations

Preparatory Roundtable Discussions		
Sydney Central Coast 27 June 2000		
Ric	Slatter	Coast and Estuaries Engineer, Department of Land and Water Conservation
Katryna	Dawson	Water Networker, Nature Conservation Council
Klaus	Koop	Director, Water Science, Environment Protection Authority
Lara	Gallagher	Regional Project Officer, Environment Protection Authority
John	Hickey	Principal Policy Officer, Waterways Authority
John	Fisher	Regional Manager, Hunter and Inland, Waterways Authority
Bruce	Coates	Senior Specialist, Estuaries, Department of Land and Water Conservation
Annette	Wheeler	Acting Principal Ministerial Co-ordinator, Department of Land and Water Conservation
Helen	Hillier	Project Manager, Septic Safe Program, Department of Local Government
Scot	Hedge	Environmental Officer, Warringah Council
Mike	Alsop	Manager, Environmental Services, Gosford City Council
Julie	Smith	Conservation Assessment Officer, National Parks and Wildlife Service
Steve	Blackley	Senior Project Officer, Promotion and Education, NSW Coastal Council
Howard	Reed	Manager, Policy and Legislative Review, Department of Mineral Resources
Susan	Calvert	Water and Catchments Policy, Environment Protection Authority
North Coast 18 July 2000		
Gerard	Tuckerman	Environmental Co-ordinator, Great Lakes Council
Peter	Chappelow	Regional Manager, North Coast, Waterways Authority
Richard	Hagley	Coast and Estuaries Manager, Department of Land and Water Conservation
ohn	Williams	Regional Director, North Coast, NSW Agriculture
Steve	Perdriau	Client Manager, State and Regional Development
John	Smith	Dairy farmer, NSW Dairy Farmers Association
David	Heggie	Principal Research Scientist, Australian Geological Survey Organisation
Alex	Purvis	Regional Manager, North Coast, Environment Protection Authority
Sonya	Ardill	Environmental Planning Officer, Water Reforms, National Parks and Wildlife Service
Keith	Lynch	Manager, Wallis Lake Fishermen's Co-op
Elizabeth	Yeoman	Environmental Planning Officer, Department of Urban Affairs and Planning
John	Corkill	Secretary, North Coast Environment Committee
Greg	McAvoy	Environmental Health Officer, Mid North Coast Area Health Service
Heather	Bell	Environmental Health Officer, Mid North Coast Area Health Service
Cliff	Toms	Technical Services Manager, Hastings Council
Robert	Kasmarik	Coast and Estuary Manager, Department of Land and Water Conservation
South Coast 28 July 2000		
Daniel	Ouma-Machio	Regional Director, Department of Urban Affairs and Planning
Ross	Anthony	Environmental Planning Officer, Department of Urban Affairs and Planning
John	Bates	Manager, Policy and Planning, NSW Tourism
Steve	Blackley	Senior Project Officer, Promotion and Education, NSW Coastal Council
Klaus	Koop	Director, Water Science, Environment Protection Authority
Peter	Roy	Consultant Marine Geologist and Coastal Geomorphologist
Bruce	Coates	Senior Specialist, Department of Land and Water Conservation
Gavin	Heycox	Environmental Health Officer, Shoalhaven City Council
John	O'Connor	Resource Management Officer, NSW Agriculture
Peter	Fogarty	Consultant, Soil and Land Conservation Pty Ltd
Tim	Samways	Director, Linkwood
David	Heggie	Project Leader, Urban and Coastal Impacts, Australian Geological Survey Organisation
Rodney	James	Conservation Manager, NSW Fisheries
Phil	Craven	Conservation Planning Officer, National Parks and Wildlife Service
Mark	Bice	Dairy farmer, Dairy Farmers Association
Fergus	Thomson	Chair, South Coast Water Management Committee
Peter	Simpson	Regional Director, NSW Agriculture
Jenny	Edwards	Secretary, Coastwatchers Association Inc.
Emmett	O'Loughlin	Consultant
Peter	Spurway	Team Leader, Strategic Planning, Eurobodalla Shire Council
Marcus	Lincoln-Smith	Aquatic Ecologist, The Ecology Lab Pty Ltd
Tony	Roper	Coasts/Estuaries/Riverine Manager, Department of Land and Water Conservation
Brian	Binning	Planning Consultant, Brian Binning Consulting
Helen	Hillier	Septic Safe Program, Department of Local Government
Craig	Lamberton	Regional Manager, South Coast, Environment Protection Authority
David	Van Senden	Principal Engineer, Manly Hydraulics Laboratory

Expert Panel (27 July 2000 at Tuross & Coila lakes)	
Independent Experts	
Dr David Van Senden	Principal Engineer, Manly Hydraulics Laboratory
Mr Brian Binning	Planning Consultant, Brian Binning Consulting
Dr Marcus Lincoln-Smith	Aquatic Ecologist, The Ecology Lab Pty Ltd
Dr David Heggie	Project Leader, Urban and Coastal Impacts, Australian Geological Survey Organisation
Dr Peter Roy	Consultant Marine Geologist and Coastal Geomorphologist
Mr Peter Fogarty	Consultant, Soil and Land Conservation Pty Ltd
Agency and Council Specialists	
Mr Phil Craven	Conservation Planning Officer, National Parks and Wildlife Service
Dr Rodney James	Conservation Manager, NSW Fisheries
Dr Klaus Koop	Director, Water Science, Environment Protection Authority
Mr Peter Spurway	Team Leader, Strategic Planning, Eurobodalla Shire Council
Other Participants	
Mr Steve Blackley	Senior Project Officer, Promotion and Education, NSW Coastal Council
Mr Fergus Thomson	Chair, South Coast Water Management Committee

Other Independent Consultants		
Prof Ian White	Australian National University	Oysters

Registered Oral Submissions at Public Hearings				
Ms	Janet	Purcell	Pristine Waters Council	Ballina
Mr	Graham	Plumb	Ballina Shire Council	Ballina
Ms	Sally	Townley	National Parks & Wildlife Service	Forster
Mr	Neville	Smith		Forster
Mr	Brian	Fletcher	Wharf Road Landcare	Forster
Mr	Michael	Johnson		Forster
Mr	Bob	Laughton		Forster
Mr	Lachie	Whetham		Forster
Ms	Daintry	Gerrand		Forster
Mr	R Paul	Hennelly	Myall Waterways Blue-Green Algal Action Committee	Forster
Ms	Mary	Grealy		Merimbula
Mr	Chris	Boyton	Aquaculture Enterprises Pty Ltd	Merimbula
Mr	Don	McPhee	South Coast WMC	Merimbula
Mr	Geoff	Morris		Merimbula
Mr	David	Bright		Merimbula
Ms	Anabel	Macdonald		Merimbula
Mr	Jack	Cole		Merimbula
Mr	Ray	Tynan		Merimbula
Ms	Marlene	Wall	Wallaga Lake EMC	Narooma
Ms	Maureen	Baker	Tuross Lake Preservation Group Inc.	Narooma
Ms	Karin	Kruger		Narooma
Mr	Daniel	Ouma-Machio	Department of Urban Affairs & Planning	Shellharbour
Mr	Mark	Conlon	National Parks & Wildlife Service	Shellharbour
Dr	Klaus	Koop	Environment Protection Authority	Shellharbour
Mr	Peter J	O'Neill	Wamberal Action Group	Wamberal
Mr	Rolf	Hoppe		Wamberal
Mr	Greg	Walkerden	Wyong Shire Council	Wamberal
Mr	John	Lipman	Burrill Lake Task Force	Ulladulla
Mr	Ernie	Royston	Shoalhaven City Council	Ulladulla
Mr	Robert	Goodwin		Ulladulla
Mr	Warwick	Papworth	Shoalhaven City Council	Ulladulla
Ms	Frances	Bray	Lake Wollumboola Support Group	Ulladulla
Mr	Robert	Sutherland	Shoalhaven City Council	Ulladulla
Mr	Gary	Lightfoot	Lake Conjola Care Committee Inc	Ulladulla
Mr	Bill	Haig	Manyana District Citizens' Association	Ulladulla
Clr	John	Finkernagel		Ulladulla
Ms	Veronica	Husted	Bay & Basin Community Resources Management Committee Inc.	Ulladulla
Mr & Mrs	Norman & Maureen	Webb		Ulladulla

Written Submissions on Issues Paper			
Ms	Natalie	Abbott	
Mr	Michael	Abramowitz	
Assoc. Prof.	P	Adam	Coast & Wetlands Society Incorporated
Mrs	Anne	Adams	
Ms	Pat	Allen	
Mr	P F	Alway	
Mrs	Joyce	Andersen	
Mr	D J	Anderson	
Mr	J	Anderson	
Mr	Peter	Andren	
Ms	Isobel	Angus	
Mr	John	Archer	
Mr	George	Archer	
Ms	Margaret	Armstrong	
Mr	Geoff J	Armstrong	
Clr	Pam	Arnold	
Mr	Ian	Ashby	
Mr	John	Asquith	Central Coast Community Environment Network Inc
Ms	Elaine	Atkinson	
Ms	Maureen	Baker	Tuross Lake Preservation Group
Clr	Jane	Bange	
Mr	Len	Banks	NSW Agriculture
Mrs	P	Barbe	
Mr	N	Barbe	
Clr	Jane	Barham	Byron Shire Council
Mrs	Joyce	Barker	
Mr & Mrs	CJ & D	Barlis	
Mr & Mrs	George & Joan	Barnwell	
Mr	David	Barr	Member for Manly
Mr	P	Barthelmess	
Mr	Geoffrey	Bartram	Friends of Durras
Mr & Mrs	Edna & Arthur	Baxter	
Ms	Lesley	Beards	
Mr & Mrs	Fay & James	Bennett	
Mr	David	Berghofer	
Mrs	M	Berghofer	
Mr	Attila	Bicskos	amb productions
Rev.	Grant	Bilbey	Uniting Church, Ebenezer - Pitt Town
Ms	Melinda	Bilbey	
Mr	T	Binder	
Mr	Ian	Blacklock	
Dr	Antony B	Blake	
Mr	W T	Bluff	
Mr & Mrs	Gwen & Arthur	Boast	
Mr & Mrs	Maureen & John	Boland	
Ms	Thea	Bourne	
Mr	Brian	Bourne	Brian Bourne Bridge Engineer Pty Limited
Mr	Chris	Boyton	Merimbula Lakes & Foreshore Committee
Mr	Chris	Boyton	Aquaculture Enterprises
Mr	Chris	Boyton	Merimbula Quality Assurance Program
Mr	Tom	Bray	
Mr	Ben	Bray	
	K M	Bray	
Mr	Michael Francis	Bray	
Mr	Simon	Bray	
Mr	Allan	Bray	
Ms	Erin	Bray	
Ms	Frances	Bray	Lake Wollumboola Support Group
Mr & Mrs	Dorothy & Ian	Bremner	
Mr	John	Bromage	Native Animal Network Association Inc.
Ms	Annette	Brown	Booderee National Park Board of Management(Environment Australia)
Ms	Joy	Brown	
Mr	J	Brown	
Mr	James	Brown-Sarre	
Ms	Marion	Bruce	
Mr	Ian J	Bruce	
Mr	Warren	Buchan	Tuross Head Progress Association
Mr	Bob	Buggy	
Ms	Stephanie	Bull	
Mr	Adam	Bull	
Mr	R A	Butler	
Mr	W	Byatt	
Mrs	C	Byatt	
Mr	Lloyd	Cairns	
Ms	Marie	Caleo	Wamberal Lagoon Conservation Society
Mr	Anthony	Cameron	
Ms	Cath	Campbell	
Mr	Keith	Campbell	
Mr	Trevor	Cartwright	
Mr	W H	Carwardine	
Mrs	Olia	Carwardine	

Written Submissions on Issues Paper			
Mr	J F	Casey	
Mr	Tom	Cashel	Grafton District Anglers Club
Mr	Bruce	Casselden	Kempsey Shire Council
Mr	T	Chadwick	
Mr	Adam	Chamberlain	
Mr	Colin	Cheadle	Culburra Boardriders
Mr	Ken W	Cheadle	
Mr	Gary	Chestnut	Gosford City Council
Ms	Coral	Christina	
Mr	Steve	Clemesha	Ulitarra Conservation Society
	W J	Coburn	
	G	Coburn	
Mr	Ronald A	Colbran	
Mr	John	Colée	
Ms	Penelope	Coleing	National Parks Association, Three Valleys Branch
Mr & Mrs	WJ & HM	Collins	
Mr	G	Collis	
Mrs	Sharon	Collis	
Ms	Zoe	Commandeur	
Ms	Beverley	Conran	
Mr	T	Conran	
Mr	David	Cooper	
Mr	Bob	Cooper	Amateur Fishermen's Association of NSW
Mr	Stephen	Corbett	NSW Health Department
Ms	Lisa	Corbyn	Environment Protection Authority
Mrs	P	Cormick	
Ms	Vickie	Coulhey	
Mr	Rod	Coulhey	
Mr	Andrew	Cox	National Parks Association of NSW
Mr	Richard	Crago	
Mr	Andy	Crammond	
Mr	Colin	Creighton	National Land & Water Resources Audit
Mr	Colin	Critcher	
Ms	Gail	Cronin	
Ms	Diane	Crosdale	Lake Macquarie City Council
Mr	Jack	Cummings	
Mr	S	Cunningham	
	J	Curtis	
	E	Curtis	
Mr	R	Dallas	
Ms	Diane	Davies	
Ms	Kaye	Davis	
Ms	Karen	Davis	
Mr & Mrs	Ron & Shirley	Davis	
Mr	J	Davison	
Mr	John S	Dawson	Gosford-Wyong Councils' Water Authority
Mr & Mrs	L & K	Day	
Mr & Mrs	K J	Day	
Ms	Shelly	de Vos	
Mr	Michael	de Vos	
Ms	C	de Vos	
Mr	M	Dean	
Mrs	J	Dean	
Mr	B	Dean	
Mr	B J	Dean	
Mrs	H	Debono	
Mr & Mrs	Michael & Lina	Debrincat	
Ms	S	Deling	
Mr	Geoff	Dewey	
Mr	Ian	Dinham	Clarence River County Council
Ms	Roberta	Dixon	Ocean Watch Australia Ltd
Mr	A R	Doyle	
Ms	Mary	Doyle	
Mr	Edgar P	Duker	
Mr	Phillip	Duker	
Ms	Robyn A	Duker	
Mr	James M	Duker	
Ms	Gail	Duker	
Mr	Stephen	Dunn	NSW Fisheries
Mr	B E	Dwyer	
	P J	Dwyer	
Ms	Phyllis	Dyball	
Ms	Jenny	Edwards	The Coastwatchers Association Inc.
Ms	Yvonne	Emery	
Mr	Tim	Evans	
Ms	Lisa	Evans	
Mr	David	Evans	Hunter Water Corporation Ltd
Mr	Ken	Exley	Pristine Waters Council
Mr	J L	Fallick	
Ms	Ruth	Farmer	
Ms	Diane	Farmilo	
Mr	N	Farrell	

Written Submissions on Issues Paper			
Miss	Lisa	Fato	
Mr & Mrs	Barrie & Beverly	Faulkner	
	I & D	Findlay	
Mr	Chris	Fink	
Mr	Alan	Finkernagel	Verons Estate Landholders' Group
Mr	Barry	Finkernagel	
Mr	John	Finkernagel	
Mr	Peter	Finnegan	Burrill Lake Progress Association Inc.
Mr & Mrs	Isabel & Peter	Finnegan	
Mr	J	Flannery	
Mr	N M	Fleming	
Mr	Robert	Fletcher	
Mr	Ted	Foster	
Ms	Thelma	Forster	
Mr	Ron	Freedman	
Mr & Mrs	June & Lex	Frew	
Ms	Eleanor	Gash	
Mrs	Lynne	Gassingena	
Mr	Victor	Gassingena	
Mrs	M R	Gatt	
Mr & Mrs	Joseph & Rosy	Gatt	
Mr	Mike	Geary	Department of Land and Water Conservation
Mr	David	Gibson	
Clr	Linda	Gill	
Mr	Blair	Gilmore	Anglers Action Group
Clr	Sally	Gjedsted	
Mr	Stephen	Glennan	
Mr	John	Glennan	Bungalow Park
Mr	J H	Goffin	
Mr	David	Goldberg	
Mr	Jose	Gonzalez	
	G	Goodluck	
	C	Goodluck	
	R	Goodwin	
Mr	Angus D	Gordon	Pittwater Council
Mr	Murray	Gould	
Mr	K	Gould	
Mr	P	Grady	
Mr	A L	Grady	
Mr	Allan	Graham	
Mrs	L	Graham	
Mr & Mrs	E & D	Gratzer	
Ms	Carolyn	Green	
Ms	Genelle	Gregory	
Mr	Simon	Greig	
Mr	P	Griggs	
Ms	Rosalind	Griggs	
Mrs	E	Grimaldi	
Mr	C	Grimaldi	
Mr	Sydney	Grover	
Mr	J D	Guinan	
Mr	Bill	Haigh	
Mr	Greg	Hall	
Mr & Mrs	P & F N	Hall	
Mr & Mrs	I G & L A	Halliday	
Mr	Charles	Hamlyn-Harris	Curl Curl Lagoon Friends Inc.
Mr	John	Hampson	
Mr	Glenn	Handford	Great Lakes Council
Mr	Clayton	Hardie	
Mr	R	Hargraves	
	J & L	Harper	
Mr	Sean	Harris	
Mr & Mrs	M & S	Harris	
Mr	Chris	Harty	
Ms	Donna	Hawke	
Mr	L	Hawken	
Mr & Mrs	Max & Wendy	Hawkins	
Ms	Wendy	Hawkins	
Mr	C	Haythorpe	
Ms	Mary J	Helliwell	
Mr	G	Helm	
Mr	Paul	Hennelly	Myall Waterways Blue Green Algal Action Committee
Mr	Richard D	Hewitt	
Mr & Mrs	M & R	Higgs	
Mr	Ken	Higgs	Save Manly Dam Catchment Committee Inc.
Ms	Doris M	Hill	
Ms	Kaia	Hodge	Sydney Water Corporation
Mr	Bruce	Hodgson	Pacific Power
Ms	Rose-Marie	Hoekstra	
Mrs	B	Hollis	
Mr	E	Holmes	
Mr	D	Hood	

Written Submissions on Issues Paper			
Mr	R	Hood	
Mr & Mrs	Brett & Claurissa	Hood	
Ms	Helen	Hooper	
Mr	Graham	Hopkins	
Mr	M G	Horton	
Mr	Paul	Howe	
Ms	Louise	Howells	
Mr	Peter	Hudson	Bendalong & Districts Environmental Assn.
Ms	Veronica	Husted	Bay & Basin Community resources Management Committee Inc
The Hon.	Morris	Iemma	Minister for Public Works & Services
Ms	Bridget	Ikin	
Mr	Merv	Innes	Innes Boatshed
Mr	Benjamin	Innes	
Mr & Mrs	P	Irwin	
Mr	Tom	Jackson	
Ms	Emily	Jackson	
Ms	Sandra	Janes	
Mr	Jeff	Jansson	Lake Macquarie Catchment Co-ordinator
Mr	John	Jeayes	
Mr	Shaun	Jenkins	
Mr	David	Jenkinson	
Mr & Mrs	Brian & Iris	Jenns	
Mr	B	Jodd	
	M J	Johnson	Myall Waterways Blue Green Algal Action Committee
Mrs	Kerry	Joyce	
Ms	Karen	Joynes	
Mr	G	Jurotte	
Mr & Mrs	Susan & Michael	Keating	
Mr & Mrs	Peter	Heller	
Ms	Frances	Kelly	Total Environment Centre
Ms	Leonie	Kemp	
Ms	Nancy	Kemp	
Mr & Mrs	Malcolm & Maz	Kennedy	
Ms	Nicole	Kennedy	
Mr	T	Kent	
Clr	Jack	Kerr	
Ms	Pat	Kerr	
Mr	G	Kilgannon	
Mr	John	Killeen	
Mr	John	King	Coastcare
Mr	F W	Kluss	Narrawallee Foreshores & Reserve Management Committee
Mr & Mrs	Luise & Richard	Korber	
Ms	Karen	Kruger	
Ms	Kathy	La Fontaine	
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Mr	Merv	Lane	Lake Tabourie Tourist Park Social Club
Mr	Barrie	Law	
Mrs	Gina	Law	
Dr	Ewan M	Lawson	
Ms	Fay	Lawson	
Ms	May	Leatch	Australian Conservation Foundation – Shoalhaven Branch
Ms	Isabelle	Lee	National Parks Association – Mid North Coast Branch
Ms	Teresita C	Legge	
Mr	Gary	Lightfoot	Lake Conjola Lake Care Committee Inc
Mrs	Robyn A	Lightfoot	Lake Conjola Lake Care Committee Inc
Mr	E	Limbrick	
Mr	G	Lipman	
Mr	B	Little	
Mr	K	Loveday	
Mr	H A	Lowdel	
Mr	Ralph W	Lucas	Lucas & Tait (Sales) Pty Ltd
Ms	Paula	Luck	
Ms	Penny	Lumb	Healthy Cities Shoalhaven
Ms	Jan	Lynch	
Ms	Michelle	Mackey	
Mr	I J	MacLaren	
Mr	John	Macris	The Confederation of Bushwalking Clubs NSW Inc.
Mr	B J	Maher	
Professor	Bill	Maher	CRC for Freshwater Ecology
Mrs	M	Maher	
Ms	Johanna	Majzner	
Mr	Grahame	Malligan	
Mr & Mrs	Bill & Linda	Maniseng	
Ms	Lynda	Manley	
Mr	Barry S	Manning	
Ms	Faye	Manning	
Ms	Vanessa	Mansbridge	Solitary Islands Marine Park Authority
Mr	Greg	Marks	
Ms	Glenda	Marshall	
Ms	Carol	Martin	
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Mr & Mrs	A S & J A	Martin	

Written Submissions on Issues Paper			
Mr	Neal	Martin	
Mr & Mrs	Dudley & Dorothy	Mason	
Mr	Erik	Mather	
Ms	Linda	Mather	
Mr	D J	Matthews	
Mr	Paul	May	
Ms	Jane	McAloon	Ministry of Energy & Utilities
Ms	P	McCann	Gosford City Council
	E	McCarthy	
Ms	Suzanne	McCarthy	
	W T	McCarthy	
	D J	McConnell	
Mr & Mrs	A & RA	McDonald	
Mr	T	McDonald	
Mr	Allan	McDonald	
Mr & Mrs	GTW & B E	McElroy	
Mr	Patrick	McEntee	Port Macquarie Conservation Society Inc
Mr	D	McEwan	
Ms	Candice	McGregor	
Mr	Nathan	McGregor	
Mr	M	McKechnie	
Ms	Jillian	McKenna	
Mr	John	McKenna	
Ms	Sharlene	McKenzie	
Mr	John	McMahon	
Mr & Mrs	Garry & Bev	McVey	
Mr	Doug	Mein	Bega Valley Shire Council
Dr	Justin	Meleo	Meleo Coastal & Catchments
Mr	Steve	Melocco	
Mr	W	Menzies	
Mr	David	Miller	
Ms	Lisa	Miller	Wollongong City Council
Dr & Mrs	J & GM	Moncrieff	
Mr	John	Morgan	
Mr	John	Morgan	Culburra Beach Progress Association
Mrs	M W	Morley	
Mr	Leigh	Morley	
Ms	Myee	Morley	
Mrs	A	Morley	
Mr	G L	Morley	
Professor	John	Morrison	University of Wollongong
Mr	David	Morrison	Maclean Shire Council
Mr	Will	Mrongovius	
Mr & Mrs	Michael & Roslyn	Mueller	
Mr & Mrs	Peter & Ingrid	Mueller	
Mr & Mrs	Clive & Joyce	Mueller	
Mr	Phil	Muller	
Mr	Allan	Muir	
Ms	Bridget	Murphy	
Mr	Richard	Murray	Lakesdrive Bridge Action Group & Terranora WPC
Dr	Robert	Mylchreest	
Ms	Susan	Nadas	
Mr	Graham	Napper	Shoalhaven City Council
Mr	Barrie	Naylor	
Ms	Helen	Neeson	
Ms	Annette	Neilsen	
Mr	Arthur	Nicholls, JP	
Mr	David	Nile	
	L J & T	Norman	
Mr	Richard	Nott	Environment Australia
Mr	Bob	O'Brien	Holiday Haven Tourist Parks
Mrs	Lynn	O'Brien	
Mr	Peter	O'Neill	Wamberal Action Group
The Hon.	Edward M	Obeid	Minister for Fisheries
Ms	Jennifer	Parkes	
Mr & Mrs	Len & Annette	Parsons	
Mr	Raymond S	Parsons	
Mr	M	Parsons	
Mr	Geoff	Pawson	
Ms	Joy	Pegler	
Ms	Coral	Peterson	
Mr & Mrs	G & J	Philpott	
Mr & Mrs	Dorothy & William	Piggott	
Mr	Graham	Pill	
Ms	Cassi	Plate	
Mrs	H	Plowman	
Mr	Robert	Podesta	
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Written Submissions on Issues Paper			
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Mr	Robert	Randell	
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Mr & Mrs	J & AJ	Read	
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Mr	J B	Reardon	
Ms	Genevieve	Reid	National Parks & Wildlife Service – Advisory C'tee Far South Coast
Mr	James R	Renyolds	Merimbula Lakes & Foreshore Committee
Mr	David	Reynolds	South Coast Holiday Cottages
Mr & Mrs	Anne & Bruce	Riddell	
Ms	Christine	Rigg	
Mrs	D J	Roberts	Orient Point Progress Association
Mr & Mrs	N & S	Robinson	
Mr	Steven	Robinson	
Mr	Howard L	Robinson	
Ms	Catherine J	Robinson	
Mr	Dale	Rockall	
Mr	Steve	Rockall	
Mr	Steven A A	Rockall	
Ms	Bernice	Rockall	
Ms	Karan	Rogers	
Mr	Brett	Rogers	
Mr & Mrs	H & B	Rogerson	
Mr	Tony	Rolfe	Edgewater Motel
Ms	Margaret	Rourke	
Ms	Susan M	Rowe	
Mr	P	Rowe	
Ms	Rebecca	Rudd	
Mr	John	Ruggiero	
Mr	Chris	Rumpf	
Ms	Zoe	Russell	Gosford Wildlife Conservation Society
Mr	Colin	Sagar	
Mr & Mrs	FG & JA	Salmon	
Mr	Con	Sarris	
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Mr	Murray	Schofield	Gunninah Consultants
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Mr	H S	Scott	
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Mr	Ray	Seymour	
Ms	Kim	Seymour	
Mr	John	Seymour	
Mr & Mrs	L & M	Seymour	
Mr & Mrs	N R & A	Shannon	
Ms	Ann	Sharp	
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Ms	Nola H	Sharwood	Tabourie Lake Ratepayers' Association
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Dr	Kevin	Sheridan	NSW Agriculture
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	T J	Shields	
Mrs	Robyn	Shimmen	
Mr	Robert	Shimmen	
Mr	Ian	Sinclair	Edge Land Planning
Mr	Malcolm	Sloan	Lake Conjola & Districts Progress Association
Mr	Denis	Smith	Warringah Council
Mr	Robert	Smith	The Fishing Party
Dr	Bob	Smith	Department of Land & Water Conservation
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Mrs	Lindy	Smith	Tweed Heads Pony Club
Mr	Ian	Smith	
Dr	Bob	Smith	State Forests of NSW
Mr	Larry	Smith	
Mr	Reg	Smith	NSW Dairy Farmers Association Ltd
Mr	Jack	Soerters	Jervis Bay Regional Alliance
Mr	R	Sokolowski	
Ms	Tammy	Spaven	
Mrs	Irene	Spooner	
Mr	Edward	Spooner	
Ms	Cathy	Stapleton	
Mr & Mrs	M & S	Steed	
Mr	Alan W	Stephenson	
Ms	Libby	Sterling	Solitary Islands Marine Park Authority
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Mr	S	Stevenson	
Mr	R L	Stevenson	
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Written Submissions on Issues Paper			
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Mrs	Heather	Swift	
Mr	John	Symonds	
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Mr & Mrs	C & D	Talty	
Mr	Clarence	Tasker	
Ms	Colleen	Tasker	
Mr	Robert	Tasker	
Ms	Julianne	Tasker	
Ms	Anne E	Taylor	
Mr	Matthew	Taylor	Waterways Authority
Mr	M C	Taylor, JP	
Mr	B J	Teague	
Mr	Horrie	Tebbutt	
Mr	Peter	Tegart	Eurobodalla Shire Council
Mr & Mrs	Rob & Tricia	Thomas	
Mr	Chris	Thomas	
	A	Thompson	
Mr	Bruce	Thompson	
	A C	Thompson	
	M	Thompson	
	A C	Thompson	
Mr & Mrs	Kathleen & Kevin	Thompson	
Mr	Shane	Thompson	
Ms	Kathryn	Thompson	
Mr	Kerry	Thompson	
Mr	D	Thomson	
Mr	Warren	Tindall	Cattle out of Water
Ms	Debbie	Tozer	
Mr & Mrs	S D	Tozer	
Ms	Joan	Turner	
Mr & Mrs	Robyn & Basil	Turner	
Mr & Mrs	F & A	Vahovec	
Dr	David	van Senden	Manly Hydraulics Laboratory (DPWS)
Ms	Olga	Vidler	
Mrs	Z	Vincer	
Mr	Warren G	Vincer	
Mr	N R	Virgin	
Ms	P D	Waldon	
Mr	Alex	Walker	Sydney Water Corporation
Mr	Jim	Walker	Recreational Fishing Advisory Committee Zone 7
Ms	Marlene	Wall	Wallaga Lake Landcare Group
Mr	Clifford	Wallis	
Mr	Greg	Walkerden	Wyong Shire Council
Mr	Allan	Walsh	
Mrs	Jean	Walsh	
Clr	Greg	Watson	Shoalhaven City Council
Mr & Mrs	M & N	Webb	
Ms	Diana	Weekes	
Mr & Mrs	Kay & Neville	Weidemier	
Ms	Ingrid	Wells	
	S D	Wells	
Mr	Jayme	Wells	
Ms	Cassandra	Wells	
Mr	D	Welsh	
Dr	Ron	West	University of Wollongong
Mr	R A	Whitelaw	
Mr	Alleyn	Wilkinson	
Mrs	Elaine	Wilkinson	
Mr	Douglas L	Wilks	
Mr	Gordon L	Williams	
Ms	Elizabeth	Williams	Environment Australia
Ms	Alma	Williams	
Mr	Peter	Williams	
Mr	Michael	Williams	
Mr	Vaughan	Williamson	
Mr	Geoff	Withycombe	Sydney Coastal Councils Group
Mrs	D L	Woolmer	
Mr	L G	Woolmer	
Ms	Narelle	Wright	
Mr	Alan	Wright	
Mr	John C	Wright	Culburra Beach Chamber of Commerce
Ms	Dianne	Wright	
Mr	Michael	Wright	National Parks & Wildlife Service
Mr	John C	Wright	
Mr	Garry	Wright	
Mr	Dimitri	Young	
Mr	Alan	Zoeller	

Shoalhaven Interviews on 12 and 13 March 2001		
Environment 12 March 2001		
Frances	Bray	Lake Wollumboola Support Group, Jervis Bay Regional Alliance
Ted	Foster	Community member
Maureen	Webb	Community member
Peter	Hudson	Bendalong and Districts Environmental Association
Graham	Hopkins	Lake Conjola Lakewatch
John	King	Coastcare Facilitator
Business, Development & Community Services 12 March 2001		
Lloyd	Cairns	Lake Conjola Lakecare Committee
John	Morgan	Culburra Beach Progress Association
Ralph	Lucas	Lucas and Tait Real Estate Group of Companies
Murray	Schofield	Gunninah Environmental Consultants on behalf of Realty Realizations
Penny	Lumb	Healthy Cities Shoalhaven
David	Reynolds	South Coast Holiday Cottages
Bob	Goodwin	Burrill Lake Progress Association
Genelle	Gregory	Dairy farmer
William	Powell	Willinga Bush Café, Bawley Bush Retreat
Kevin	Smith	Commercial fisher
Shoalhaven City Council 13 March 2001		
Warwick	Papworth	Environmental Services Manager
Ernie	Royston	Planning Services Manager
John	Gould	Shoalhaven Water Manager
Robert	Sutherland	Asset Client Services Manager
Tim	Fletcher	Development and Environmental Services Manager
John	Anderson	Councillor
Patricia	Mason	Councillor
Sally	Gjedsted	Councillor
Jack	Kerr	Councillor
Josie	Young	Councillor
Mark	Hurley	Councillor

Note: Some other invited people were not available to attend.

Written Submissions on Draft Paper			
Mr	Jeff	Angel	Total Environment Centre
Mr	John	Asquith	Central Coast Centre for Sustainability
Ms	Maureen	Baker	Tuross Lake Preservation Group Inc.
Ms	Sue	Baker	National Parks Association - Mid North Coast
Clr	Jane	Bange	
Mr	Geoffrey	Bartram	Friends of Durras
Ms	Lesley	Beards	
	Fay & James	Bennett	
Mr	W T	Bluff	
Mr & Mrs	Maureen & John	Boland	
Mr	Clarrie	Bramble	
Mrs	Frances	Bray	Jervis Bay Regional Alliance Inc.
Mr	John	Bromage	Native Animal Network Associaton Inc.
Mr	Ray	Brooks	Foreshore Preservation Group
Mr	John	Broomhead	Baragalia Aboriginal Council
Ms	Linda	Burney	Department of Aboriginal Affairs
Mr	J M	Butterfield	
Mr	Keven	Byles	
Mr	Chris	Carloss	Gosford City Council
Mr	Trevor	Cartwright	
Mr	W H	Carwardine	
Mr	Tom	Cashel	Grafton District Anglers Club
Mr	T	Chadwick	
Mr	John R	Clarke	
Mr	Stephen	Corbett	NSW Health Department
Ms	Lisa	Corbyn	Environment Protection Authority
Mr	Chris	Core	Friends of Cudget Nature Reserve
Mr	Alan	Coutts	Department of Mineral Resources
Mr	Colin	Critcher	
Mr	Graham	Cullen	
Mr	Peter	Cuming	Upper North Coast Water Management Committee
Mr & Mrs	L & K	Day	
Mr	Steve	Dunn	NSW Fisheries
Ms	Jenny	Edwards	The Coastwatchers Association Inc.
Ms	Natasha	English	
Mrs	Joan	Ennis	Tathra Landcare – Waterwise
Ms	J	Esposito	Shoalhaven Landowners' Association
Mr	Mick	Fields	Shellharbour City Council
Mr & Mrs	LD & JE	Fleming	
Mr	Brad	Foot	Hunter Water Corporation Ltd
Mr & Mrs	June & Lex	Frew	
Mr	Len A	Gazzard	Bega Valley Shire Council - Bemboka Area Committee
Clr	Linda	Gill	

Written Submissions on Draft Paper			
Mr	Blair	Gilmore	Anglers Action Group
Mr	Frank	Gleason	
Mrs	D	Gratzer	
Assoc.Prof.	Peter	Greenaway	University of New South Wales
Ms	Genelle	Gregory	
Dr	Chris	Guest	Department of Land & Water Conservation
Mr	John	Hampson	
Mr	Chris	Harty	
Clr	Patricia	Harvey	Sydney Coastal Councils Group
Mr	John	Henley	Tweed Shire Council
Mr	Peter	Hudson	Bendalong & Districts Environmental Assn.
Mr	C J	Hyde	
Mr	John	Iliffe	
Mr	H T	Irwin	
Mr	Tom	Jackson	
Ms	Sandra	Janes	
Mr	John	Jeayes	
Ms	Karen	Joynes	Angourie Dunecare Group
Ms	Frances	Kelly	Total Environment Centre
Mr	W J	Kennewell	
Clr	Jack	Kerr	
Mr	G A	Lane	
Mr & Mrs	J & L	Lawrence	
Dr	Ewan M	Lawson	
Mr	Gary	Lightfoot	Lake Conjola Lake Care Committee Inc.
Mrs	Carol	Lucas	
Mr	Alan D	MacIntyre	Camden Haven Protection Society Inc.
Mr & Mrs	D	Mason	
Mr	Patrick	McEntee	
Mr & Mrs	James & Janice	Mitchell	
Mr	John	Morgan	Culburra Beach Progress Association
Mr	John G	Morgan	
Mr	David	Morrison	Maclean Shire Council
Mr	Philip	Mott	
Mr	Will	Mrongovius	
Mr & Mrs	Clive & Joyce	Mueller	
Mr	Michael	Mueller	
Mr	Richard	Murray	Lakesdrive Bridge AG & Terranora WPC
Mr	J K	Murray	
Mr	Arthur	Nicholls, JP	
Mr	Brendan	O'Reilly	Department of Sport & Recreation
Mrs	Lyn	O'brien	Lake Wollumboola Support Group Inc.
Ms	Leanne	Page	
Mr	Garry	Payne	Department of Local Government
Mr	Alexander	Pearce	
Ms	G	Penrose	
Mr	Dick	Persson	Department of Public Works & Services
Ms	Lorna	Plate	Curl Curl Lagoon Friends Inc.
Mr	Royal	Pullen	
Mr & Mrs	Chris & Fiona	Ray	Oreient Point Progress
Mr	Sean	Rea	Surfrider Foundation Kiama
Ms	Kathy	Ridge	Nature Conservation Council of NSW Inc.
Mr & Mrs	H & B	Rogerson	
Ms	Susan M	Rowe	
Mr	Ernie	Royston	Shoalhaven City Council
Ms	Rebecca	Rudd	
Ms	Susie	Russell	North Coast Environment Council Inc.
Mr	Anthony	Sciacca	Planning NSW
Dr	Jim	Scott	Citizens Against Minimbah Landfill
Mr	Stephen M	Scott	
Mrs	Ann	Sharp	
Mr	Kevin	Sheehan	
Dr	Kevin	Sheridan	NSW Agriculture
Mr	Robert	Shimmen	
Mrs	Kathleen	Smith	Great Lakes Environment Association
Mr	R	Sokolowski	
Mr	Peter	Spurway	Eurobodalla Shire Council
Mr	Alan W	Stephenson	
Mr	Brett	Stevenson	
Mr	R A	Stewart	
Mr	Andrew J	Stoner	Member for Oxley
Mrs	Heather	Swift	
Mr	Ross	Symons	Warringah Council
Mr & Mrs	N	Tallon	
Ms	Anne E	Taylor	
Mr	Matthew	Taylor	Waterways Authority
Mr	Jeff	Thompson	Manly Council
Mr	Ian	Tiley	Clarence Estuary Management Committee
Mr	Gerard	Tuckerman	Great Lakes Council
Ms	Joan	Turner	
Mr	A P	Vermeulen	Kempsey Shire Council
Ms	Olga	Vidler	

Written Submissions on Draft Paper			
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Mr	Symon	Walpole	Lake Macquarie City Council
Mr	John	Wearne	Bega Valley Shire Council
Mr & Mrs	Normal & Maureen	Webb	
Ms	Pamela	Wells	Community Forum Inc.
Mr	D	Welsh	
Mr	Brian	Whittaker	The Council of the Municipality of Kiama
Ms	Narelle	Wright	
Mr	Michael	Wright	National Parks & Wildlife Service
Mr	Theo	Wright	

Appendix 3: Coastal Lakes SEPP: Indicative Draft

PART 1 – PRELIMINARY

1. Name of policy - Coastal Lakes

2. Commencement of policy – This policy commences on…

3. Aims of policy – To improve and protect the health of coastal lakes and their catchments by creating a consistent framework for management by all responsible public authorities.

4. Definitions - …
   A 'coastal lake' includes the waters of the coastal lake, its tributaries and the whole of its catchment, as identified by the maps referred to in Schedule 1 *(note: requires preparation).*

   The 'Coastal Lakes Strategy' is the strategy referred to in clause 9.

   'Management framework' refers to any of the four frameworks, corresponding to the four classes of coastal lake, set out in Schedule 2.

   The 'Act' means the *Environmental Planning and Assessment Act 1979.*

   'Independent Coastal Lakes Expert Group' is the body referred to in clause 7.

   'Sustainability Assessment and Management Plan' is an assessment and plan prepared in accordance with Part 5 of this SEPP.

   'Coastal Council' is the Coastal Council of NSW as defined in Section 7 of the *Coastal Protection Act 1979.*

   'Comprehensive Coastal Assessment' includes the assessments of lake capability and limitations carried out under the comprehensive coastal assessment program.

5. Where this policy applies – This policy applies to all coastal lakes along the coast of NSW listed in Schedule 1.

6. Relationship to other environmental planning instruments -

PART 2 – ESTABLISHMENT OF INDEPENDENT COASTAL LAKES EXPERT GROUP

7. An Independent Coastal Lakes Expert Group (hereinafter referred to as 'the Group') is to be established with its members appointed by the Chairperson of the Coastal Council of NSW. The work of the group is to be overseen by the Chairperson of the Coastal Council.

8. Members appointed are collectively, to hold specialist expertise in ecosystem, social, cultural, economic or planning matters relevant to coastal lakes.

PART 3 – COASTAL LAKES STRATEGY

9. This SEPP provides for the development and implementation of a Coastal Lakes Strategy (hereinafter referred to as 'the Strategy').

10. The Strategy has three parts. It provides for:

    (a) The classification of each coastal lake into one of four classes in accordance with the classification table set out in Schedule 1.
    (b) A management framework for each of the four classes of coastal lake, as set out in the tables included in Schedule 2, requiring the preparation and implementation of a Sustainability Assessment and Management Plan for each lake.
    (c) Implementation responsibilities.

PART 4 – CLASSIFICATION OF COASTAL LAKES

11. Each coastal lake is classified under Table 1, into one of four classes. Each class description reflects the character of the management and level of protection required to achieve the primary and other outcomes for that class. The four classes are:

    (a) Comprehensive protection
    (b) Significant protection
    (c) Healthy modified conditions
    (d) Targeted repair

12. A coastal lake may be reclassified into another class, subject to:

    (a) Advice by the Independent Coastal Lakes Expert Group on the technical evidence supporting reclassification;
    (b) referral to the Chairperson of the Coastal Council for public exhibition and subsequent advice to the Minister for Land and Water Conservation and the Minister for Planning; and
    (c) endorsement by the Minister for Land and Water Conservation and the Minister for Planning.

PART 5 – SUSTAINABILITY ASSESSMENT AND MANAGEMENT PLANS

Management Frameworks

13. This SEPP provides for a management framework for each class of coastal lake, as set out in Schedule 2. Each framework incorporates:

    (a) primary outcomes for all coastal lakes in the said class of lake;
    (b) an indicative list of the types of management actions required to achieve those outcomes for each coastal lake within the class; and
    (c) requirements for the development of additional specific outcomes and refinement of the particular management actions that are to apply to the particular lake the subject of the assessment.

14. The relevant framework is to be applied in the development of each Sustainability Assessment and Management Plan for coastal lakes within the same class of lake.

Preparation of Sustainability Assessment and Management Plans

15. A Sustainability Assessment and Management Plan (hereinafter referred to as the 'Plan') is to be prepared for each coastal lake.

16. The Department of Planning and the Department of Land and Water Conservation are to arrange for the preparation of a draft and Final Plan for each lake in accordance with the priorities indicated in clause 28 below.

17. In arranging for preparation of a draft Plan, the Department of Planning and Department of Land and Water Conservation are to ensure the process has provided for:

    (a) adequate consideration of existing studies, plans and strategies that are relevant to the preparation of the subject plan; and
    (b) the provision of effective processes for community, agency and council input into the scope and outcomes of the plan.

18. The Independent Coastal Lakes Expert Group is to establish technical criteria and the methodology for preparing cost effective, practical lake specific assessments that are to be followed in preparation of a draft Plan, that comprise part of the Comprehensive Coastal Assesssment.

19. In the development of the criteria and methodology, the Group is to:

    (a) provide clear and expeditious guidance for the management of major threats to the health of coastal lakes;
    (b) identify cost effective ways to address any critical gaps in the knowledge of lake ecosystems;
    (c) consider public and private institutional mechanisms that could be used to implement strategies; and
    (d) provide performance indicators and monitoring protocols.

20. In satisfying the requirements of clause 19, the Group is to address:

    (a) ecosystem processes and thresholds relevant to the primary outcome for each class of coastal lake;
    (b) catchment processes;
    (c) environmental and ecosystem values;
    (d) indigenous values;
    (e) commercial resource use values;
    (f) resident values;
    (g) public health implications of lake conditions; and
    (h) the relationships between ecosystem needs and human activities relating to coastal lakes.

Plan Contents

21. Each draft Plan is to be prepared in accordance with the following:

    (a) the management framework that applies to the lake for which the plan is being prepared;
    (b) any relevant technical criteria or methodology prepared by the Independent Coastal Lakes Expert Group;
    (c) the requirements of clause 17(a) and (b);
    (d) any other requirements specified in clauses 22 to 28.

22. Table 1 of Schedule 2 must be applied in the preparation of a draft Plan for a coastal lake within the comprehensive protection class. The draft Plan must specify:

    (a) the primary outcome of restoring and preserving all natural ecosystem processes;
    (b) any other outcomes that are consistent with the primary outcome;
    (c) the actions required to manage existing and potential activities to achieve the outcomes; and
    (d) the most appropriate set of management tools for carrying out the required actions.

23. Table 2 of Schedule 2 must be applied in the preparation of a draft Plan for a coastal lake within the significant protection class. The draft Plan must specify:

    (a) the primary outcome of restoring and preserving critical natural ecosystem processes;
    (b) any other outcomes that are consistent with the primary outcome;
    (c) the actions required to manage existing and potential activities to achieve the outcomes; and
    (d) the most appropriate set of management tools for carrying out the required actions.

24. Table 3 of Schedule 2 must be applied in the preparation of a draft Plan for a coastal lake within the healthy modified conditions class. The draft Plan must specify:

(a) the primary outcome of rehabilitating and retaining key natural or modified ecosystem processes and sustainable types and levels of human uses;
(b) any other outcomes that are consistent with the primary outcome;
(c) the actions required to manage existing activities, drawing on but not limited to the types of actions identified in Table 3;
(d) the capability and limitations of the coastal lake and catchment ecosystem to sustain new development; and
(e) the most appropriate set of management tools for carrying out the required actions.

25. Table 4 of Schedule 2 must be applied in the preparation of the draft Plan for a coastal lake in the targeted repair class. The draft Plan must specify:

(a) the primary outcome related to the creation or retention of a preferred modified ecosystem condition;
(b) any other outcomes that are consistent with the primary outcome;
(c) the critical targeted rehabilitation measures necessary to achieve the outcomes;
(d) the capability and limitations of the coastal lake and catchment ecosystem to sustain new development; and
(e) the most appropriate set of management tools for carrying out the actions.

26. The draft Plan is to incorporate the assessments of lake capability and limitations from that part of the Comprehensive Coastal Assessment to which the draft Plan relates.

27. The draft Plan is to specify responsibilities, timing and resources for each action.

28. The Department of Planning and Department of Land and Water Conservation will prepare the Sustainability Assessment and Management Plans in partnership with the responsible council(s) according to the following priority staging:

(a) coastal lakes in the Shoalhaven and Great Lakes local government areas to be completed within 18 months of the commencement of this SEPP;
(b) Cudgen, Innes-Cathie, Narrabeen, Coila, Tuross, Wagonga, Merimbula and Back lakes to be completed within three years of the commencement of this SEPP; and
(c) other costal lakes in accordance with priorities determined by the Coastal Council.

29. In implementing clauses 22 to 27, the most appropriate set of management tools are to be designed and selected, with reference to but not limited to, those provided for in Table 5 of Schedule 2.

Dispute Resolution

30. If a dispute arises regarding the development of the contents of a draft Plan, including the specific management actions to be derived from application of the management framework tables, such dispute may be referred, by the Department of Land and Water Conservation, to the Chair of the Coastal Council of NSW.

31. The Chair of the Coastal Council is to mediate a dispute referred under clause 30.

32. In the event of a high level dispute on issues of state importance that remains unresolved after such mediation, it is to be referred to the Minister for Land and Water Conservation, with concurrence of the Minister for Planning, for decision.

Draft Plan

33. The Department of Land and Water Conservation is to refer a draft Plan, prepared in accordance with the above provisions, to the Independent Coastal Lakes Expert Group.

34. The Group is to review and provide advice on the technical merit of the assessment findings and the likely effectiveness of proposed management actions contained in a draft Plan, against the primary and other outcomes sought for each coastal lake.

35. The draft Plan, the advice and report on how the advice has been considered are to be exhibited for public comment.

Final Plan

36. After consideration of public comments on the draft Plan, the Department of Land and Water Conservation is to prepare and submit a Final Plan for the coastal lake for consideration by the Minister for Land and Water Conservation.

37. The Final Plan is to be approved by the Minister for Land and Water Conservation, with the concurrence of the Minister for Planning.

38. The Department of Land and Water Conservation is to release the Final Plan publicly.

39. The Coastal Council will include in its annual report a summary of the advice received from the Independent Coastal Lakes Expert Group.

PART 6 – IMPLEMENTATION

40. All relevant public authorities are to implement the actions identified in the Sustainability Assessment and Management Plan for each coastal lake.

41. A Sustainability Assessment and Management Plan prepared in accordance with the provisions of this SEPP is deemed to be a local environmental study for the purposes of Section 57 of the Act, for each of the local government areas to which it relates.

42. For the purposes of section 79C of Part 4, and environmental assessments under Part 5 of the Act, findings of the relevant Sustainability Assessment and Management Plan are to be considered.

43. In implementing the strategy and in the development of a Sustainability Assessment and Management Plan, the responsible authorities are to give effect to the following principles:

    (a) Each coastal lake and its catchment must be managed as a whole system;
    (b) Coastal lakes and their catchments are assets with productive values;
    (c) Management strategies are to address the unique characteristics and interrelationships of ecosystems and human activities for each coastal lake, taking account of the degree of existing modification and the conditions sought.
    (d) Management strategies for coastal lakes must provide for further adaptation to account for inherent scientific uncertainties and limited information bases.
    (e) Management plans are to be sufficiently clear to create explicit obligations on the responsible public authorities with powers and resources that can be applied to coastal lake management.
    (f) The responsibilities of public authorities and communities are to be clearly stated and outcomes achieved through partnership arrangements.
    (g) The responsible public authorities are to be accountable for the condition of coastal lakes at the conclusion of each cycle of planning, action and assessment. They are to be accountable for the proper implementation of agreed management processes where actual river outcomes are subject to a variety of uncontrollable external influences.

44. The Healthy Rivers Commission will audit the implementation of the components of the SEPP relating to the Coastal Lakes Strategy two years after its commencement.

PART 7 - TRANSITIONAL ARRANGEMENTS

Clauses to be drafted, that address the following issues:

1. Where a Sustainability Assessment and Management Plan has not been completed for a coastal lake in which development is proposed, any site specific environmental assessments undertaken are to be consistent with the primary outcome of, and in the context of, the management framework that applies to the said lake.

2. Where a Sustainability Assessment and Management Plan has not been completed for a coastal lake classified as comprehensive protection or significant protection, a development application for new urban, rural residential, industrial or intensive agricultural development is not permitted outside the boundaries of existing developed urban or rural residential areas.

3. Where a Sustainability Assessment and Management Plan has not been completed for a coastal lake a development application for development that:

   (a) may not have a neutral or beneficial effect on natural ecosystem processes, in the case of development proposed for a lake classified as comprehensive protection;
   (b) may not be able to contain potential minor adverse impacts on site, in the case of development proposed for a lake classified as significant protection; or
   (c) would not comply with the primary outcome for the particular coastal lake, in the case of development proposed for any lake class;

   the Minister for Planning may call-in the proposed development for determination.

Tables 1-6 of the Coastal Lakes Strategy would follow as schedules to the SEPP. (Note: the table numbers would be different in the SEPP.)

Appendix 4: Classification of Coastal Lakes

A state wide classification system for coastal lakes is an integral component of the *Coastal Lakes Strategy*. Within the classification system, the following broad factors influence the class to which an individual coastal lake is assigned:

- inherent natural sensitivity to human activities (eg potential pollutant inflows, flushing capacity, entrance behaviour);
- existing condition of the catchment and lake water body (eg extent of land clearing, potential impacts of different land uses and occurrence of water quality problems and fish kills); and
- 'recognised' natural and resource conservation values (eg presence of threatened species, ecosystem uniqueness and representativeness, commercial values, reserves).

The Healthy Rivers Commission has drawn, in particular, upon the data collected and analysed by the Department of Land and Water Conservation in its *Estuaries Inventory* (incorporating information obtained through estuary studies), and on the information collated under the Commonwealth Government's *National Land and Water Audit: Theme Seven - Estuaries Program*. Some additional data have been obtained from universities, independent experts, other state agencies, local councils and material provided in submissions. The Commission emphasises that the terms used to describe the status of each factor for a particular lake are *relative* to those for all other coastal lakes.

In light of comments made in submissions and meetings with technical specialists from key state agencies, the Commission has further enhanced the process for assessing some of these factors. For example, the relevant information from the fish kill database has been used to inform the lake condition factor. The method for assessing inherent natural sensitivity has been altered to assign a greater weighting to the lake entrance condition, and less to the maturity (degree of basin infilling) of the lake. Additionally, Aboriginal significance has been removed from the assessment of conservation value, given comments from the Department of Aboriginal Affairs and the National Parks and Wildlife Service that all lakes have significance for Aboriginal communities, and a more detailed, local assessment is needed to assign lake specific value.

The classification system also incorporates a range of other more qualitative, but *significant* factors that might influence the class to which an individual coastal lake is assigned. These factors include:

- data confidence, given the often limited technical information available;
- information on other natural resource factors that might affect the condition of a lake's ecosystem (eg soil type, shape and depth of a lake's basin);
- material provided in submissions;
- existing patterns of regional settlement, natural resources use, recreation and tourism and their sustainability;
- critical decisions made by government (federal, state and local), courts and planning Commissions of Inquiry;
- potential for restoration of natural ecosystem processes or rehabilitation of modified ecosystem processes; and
- the potential classification of a coastal lake with regard to classifications assigned to nearby lakes, as well as consideration of the likely capability, condition and pressures on other estuaries.

The Commission has classified each coastal lake using the classification system, which, in accordance with the management framework, indicates the management orientation for each lake, as shown in Table A2.

The Commission has used its *judgement* in determining the classifications for coastal lakes, with regard to the potential applicability of the types of actions presented in the framework for managing different classes of

coastal lake. In particular, the Commission has considered the results of its broad assessment of the above factors in aggregate, in considering where the public interest might be in cases where a more restrictive approach to managing a coastal lake might seem desirable, but may be premature prior to more detailed assessment. In these cases, the interests of lake health and affected parties are likely to be best served through early preparation of Sustainability Assessment and Management Plans (of the type recommended for coastal lakes classified as Healthy Modified Conditions) to determine the capabilities and limitations of each lake to sustain existing and potential development. This may confirm the classification assigned to a coastal lake or inform a decision to reclassify and demonstrate the reasons for such action. The Commission also emphasises that *some* areas within coastal lakes classified as Healthy Modified Conditions will require more careful management and planning, such as those surrounding embayments that are poorly flushed. Thus two lakes that have similar or the same broad descriptions, might be assigned to different classes.

The judgements underlying the classifications are also influenced by data availability, which is limited for many of the coastal lakes. For example, it has been necessary to adjust the natural sensitivity descriptions for several coastal lakes because of fundamental changes in the available data relating to the size of their 'catchment area'. The revised areas, which should be confirmed again when Sustainability Assessments are undertaken, have a significant bearing on the potential pollutant load entering a lake and hence a key aspect of a lake's natural sensitivity to human activities. In finalising the Coastal Lakes Inquiry, the Commission has obtained additional data to fill some gaps, and confirmed the accuracy of some existing data.

The fact that information on the ecological, social and economic characteristics and importance of many coastal lakes is inadequate necessitates the approach adopted by the Commission. Thus, the classification assigned to each coastal lake should be confirmed through the Sustainability Assessment process. A rigorous process is recommended to consider and approve any reclassification.

A working paper that presents more detail about the classification system and the information used to classify each coastal lake is available from the Healthy Rivers Commission upon request.

Table A2: Classification of Coastal Lakes: Summary of Data

Key for Classifications for Management Orientation

CP Comprehensive Protection
SP Significant Protection
HMC Healthy Modified Conditions
TR Targeted Repair

Key for Significant Other Factors

a Information on other natural resources factors that might affect the condition of a lake's ecosystem (eg soil type, shape and depth of a lake's basin).
b Material provided in submissions.
c Existing patterns of regional settlement, natural resources use, recreation and tourism and their sustainability.
d Critical decisions made by government (federal, state and local), courts and planning Commissions of Inquiry.
e Potential for restoration of natural ecosystem processes.
f Potential for rehabilitation of modified ecosystem processes.
g Potential implications of a classification of a coastal lake with regard to those assigned to nearby lakes, as well as consideration of the likely capability, condition and pressures on other estuaries.

Notes:

The catchment of a coastal lake is defined by the discharge point to the ocean, or to other creeks/rivers (where the lake forms part of a larger system).

* Provisional classification that, in particular, warrants more detailed assessment. Classes to be confirmed in light of the outcomes of Sustainability Assessment and Management Plans for each coastal lake and those for nearby lakes (or the implications for other estuaries).

IBRA = Interim Biogeographic Regionalisation of Australia
IMCRA = Interim Marine and Coastal Regionalisation for Australia
The boundaries of the IBRA and IMCRA regions have been identified to assist future lake specific assessment.

	Coastal Lake	Natural Sensitivity (Risk)	Existing Condition (Stress)		Recognised Conservation Value	Significant Other Factors	Lake Classification
			Catchment Condition	Lake Condition			
NSW North Coast IBRA	**Tweed Morton IMCRA**						
	Cobaki-Terranora	High	Modified	Unknown	High	b,c	HMC
	Cudgen	Extreme	Modified	Severely affected	Moderate	a,d,f	HMC
	Ainsworth	Extreme	Modified	Severely affected	Low	b	TR
	The Broadwater	Extreme	Modified	Moderately affected	Moderate	d,f	HMC
	Woolooweyah	High	Modified	Moderately affected	High	d,e	SP
	Arragan	Extreme	Near Pristine	Slightly affected	Moderate	c,e	CP
	Cakora	Extreme	Largely Unmodified	Slightly affected	Moderate	e	SP
	Minnie Water	Extreme	Largely Unmodified	Pristine	High	c,e	CP
	Hiawatha	Extreme	Near Pristine	Pristine	High	c,e	CP
	Corindi (Pipeclay)	High	Severely Modified	Moderately affected	Moderate	b	TR
	Woolgoolga	Very High	Modified	Slightly affected	Moderate	f	HMC
	Hearns	High	Severely Modified	Moderately affected	Moderate	f	HMC
	Dalhousie	High	Largely Unmodified	Slightly affected	Low	e	SP
	Oyster	High	Largely Unmodified	Slightly affected	Low	d,e	SP
	Deep	High	Largely Unmodified	Slightly affected	High	d,e	SP
	Manning Shelf IMCRA						
	Saltwater Lagoon	Extreme	Severely Modified	Moderately affected	Low	c,f	HMC
	Goolawah	Extreme	Largely Unmodified	Slightly affected	High	c	SP
	Saltwater Lake	Extreme	Near Pristine	Slightly affected	Moderate	c,e	CP
	Innes	Extreme	Largely Unmodified	Severely affected	High	b,c,d,e	SP
	Cathie	High	Unknown	Slightly affected	Moderate	b,f	HMC
	Queens	High	Largely Unmodified	Slightly affected	High	b,c,e	SP
	Watsons Taylor	High	Modified	Moderately affected	High	b,f	HMC
	Wallis	High	Modified	Slightly affected	High	c,d,f,g	HMC

	Coastal Lake	Natural Sensitivity (Risk)	Existing Condition (Stress)		Recognised Conservation Value	Significant Other Factors	Lake Classification
			Catchment Condition	Lake Condition			
Sydney Basin IBRA	Smiths	Very High	Largely Unmodified	Slightly affected	Moderate	e,g	SP
	Myall	Extreme	Largely Unmodified	Severely affected	High	b,c,d,f,g	SP
	Hawkesbury Shelf IMCRA						
	Macquarie	High	Modified	Severely affected	High	c,d,f	TR
	Tuggerah	Extreme	Modified	Moderately affected	High	f	TR
	Wamberal	High	Severely Modified	Severely affected	Low	c,f	HMC
	Terrigal	Extreme	Severely Modified	Severely affected	Low	c	TR
	Avoca	Extreme	Modified	Moderately affected	Low	f	HMC
	Cockrone	Extreme	Modified	Moderately affected	Low	f	HMC
	Narrabeen	Very High	Severely Modified	Moderately affected	Moderate	c,f,g	HMC
	Dee Why	Extreme	Severely Modified	Severely affected	Low	c	TR
	Curl Curl	Extreme	Severely Modified	Severely affected	Low	b,f	TR
	Manly	Extreme	Severely Modified	Severely affected	Low	c	TR
	Bellambi	Extreme	Modified	Unknown	Low	c,d,f,g	TR
	Illawarra	High	Modified	Severely affected	High	f	TR
	Batemans Shelf IMCRA						
	Killalea	Extreme	Modified	Unknown	Moderate	c	HMC
	Werri	Extreme	Modified	Moderately affected	Low	f	HMC
	Wollumboola	Extreme	Largely Unmodified	Slightly affected	High	b,c,d,e,g	CP
	St Georges Basin	High	Modified	Slightly affected	High	b,c,d,f,g	HMC*
	Swan	Extreme	Largely Unmodified	Slightly affected	High	c,e,g	SP
	Conjola (incl Berringer)	High	Modified	Slightly affected	Moderate	c,d,f,g	SP
	Narrawallee	High	Modified	Slightly affected	Moderate	d,f,g	HMC
	Burrill	High	Modified	Moderately affected	Moderate	a,c,d,f,g	HMC*
	Tabourie	Extreme	Modified	Slightly affected	Moderate	d,e,g	SP
	Termeil	Extreme	Near Pristine	Unknown	Moderate	d,e	CP
	Meroo	Extreme	Near Pristine	Slightly affected	Moderate	d,e	CP
	Willinga	High	Largely Unmodified	Slightly affected	Moderate	d,e	SP
	Brush (Swan)	Extreme	Modified	Unknown	Moderate	f	HMC
	Kioloa	Extreme	Largely Unmodified	Unknown	Moderate	f	HMC
	Durras	Very High	Near Pristine	Slightly affected	Moderate	c,d,e	CP
	Candlagan	High	Largely Unmodified	Unknown	Low	e	SP
	Congo	Very High	Modified	Unknown	Low	f	HMC
	Meringo	Extreme	Largely Unmodified	Unknown	Low	e	SP
	Mullimburra	Extreme	Modified	Unknown	Moderate	f	HMC
	Bingie (Kellys)	Extreme	Modified	Unknown	Unknown	e	SP
	Coila (Kyaily)	Extreme	Largely Unmodified	Slightly affected	Moderate	f	HMC
	Tuross	High	Largely Unmodified	Slightly affected	High	c,d,e	HMC*
	Brunderee	Extreme	Near Pristine	Unknown	Low	d,e	CP
	Tarourga	Extreme	Near Pristine	Unknown	Low	e	CP
	Brou	Extreme	Near Pristine	Slightly affected	Moderate	e	CP
	Mummuga (Dalmeny)	Very High	Largely Unmodified	Slightly affected	Moderate	c,d,e,g	SP
	Kianga	Extreme	Largely Unmodified	Severely affected	Moderate	c,f,g	HMC
	Wagonga	High	Largely Unmodified	Slightly affected	High	c,f,g	HMC*
	Little (near Narooma)	Extreme	Severely Modified	Moderately affected	Unknown	g	TR
	Bullengella	Extreme	Modified	Unknown	Low	g	HMC
	Nangudga	High	Modified	Unknown	Low	f,g	HMC
	Nargal	Extreme	Near Pristine	Pristine	High	e	CP
	Corunna	Very High	Largely Unmodified	Slightly affected	Moderate	a,c,e,g	SP
	Tilba Tilba	Extreme	Modified	Moderately affected	Moderate	e,f	HMC
	Little (near Wallaga)	Extreme	Modified	Unknown	Moderate	d	HMC
	Wallaga	High	Largely Unmodified	Slightly affected	High	c,e	HMC*

	Coastal Lake	Natural Sensitivity (Risk)	Existing Condition (Stress)		Recognised Conservation Value	Significant Other Factors	Lake Classification
			Catchment Condition	Lake Condition			
NSW North Coast IBRA	Long Swamp	Extreme	Modified	Moderately affected	Moderate	f	HMC
	Baragoot	High	Largely Unmodified	Unknown	Low	e	SP
	Cuttagee	Very High	Near Pristine	Slightly affected	Low	c,e	SP
	Murrah	High	Largely Unmodified	Slightly affected	Low	f	HMC
	Bunga	Extreme	Largely Unmodified	Unknown	Low	e	SP
	Wapengo	High	Largely Unmodified	Slightly affected	High	e	SP
	Middle	Extreme	Largely Unmodified	Slightly affected	Moderate	c,e	SP
	Nelson	High	Near Pristine	Slightly affected	High	b,d,e	CP
	Wallagoot	Very High	Largely Unmodified	Slightly affected	Moderate	c,e	SP
	Bondi	Extreme	Near Pristine	Pristine	High	c,e	CP
	Twofold Shelf IMCRA						
South East Corner IBRA	Bournda	Extreme	Near Pristine	Pristine	Moderate	c,e	CP
	Back	Very High	Largely Unmodified	Moderately affected	Low	c,d,f,g	SP*
	Merimbula	High	Modified	Moderately affected	High	c,f,g	HMC
	Pambula	High	Largely Unmodified	Slightly affected	High	d,e	HMC
	Curalo	Very High	Largely Unmodified	Slightly affected	Moderate	c,f	HMC
	Wonboyn	High	Near Pristine	Slightly affected	High	c,d,e	SP
	Nadgee	Extreme	Near Pristine	Pristine	High	c,e	CP