Lake Illawarra

The Lake Illawarra Authority was created under the Lake Illawarra Authority Act 1987. It has undertaken works to restore the environment of Lake Illawarra since enactment. It has been funded in the majority by the NSW Government and also by local councils Wollongong City and Shellharbour City, as the Lake is part of their Shires.

The Lake Illawarra Authority has achieved its primary objectives, with an overall increase in aquatic health and improvements to the foreshores of the Lake. The permanent opening of the estuary to the sea has been a significant development that has allowed for tidal flushing of the shallow lake.

In the 25 years of operation of the Lake Illawarra Authority, the legislative framework for estuary management in NSW has changed considerably. Stronger development controls in the planning system, generally implemented by local councils, has decreased the cumulative degrading impacts of most development, particularly urban housing. The Estuary Management Program, operated by the Office of Environment and Heritage, provides clear and effective guidelines as well as funding directly to local councils for estuary management activities across NSW. Across the numerous estuaries on the coast of NSW these committees guide sound management of, and community engagement in, the management of their local estuary.

This review recommends that the Lake Illawarra Authority, having achieved the key objectives, be disbanded and that management arrangements that exist across NSW be put into place at Lake Illawarra through the implementation of an Estuary Management Committee, to maintain and continue the significant improvements by the Lake Illawarra Authority.

It is recognised that the Lake Illawarra Authority has achieved sound environmental results, increased the recreational function and appeal of the Lake, and worked closely with Wollongong and Shellharbour City Councils to form effective partnerships.

Community consultation undertaken as part of this review has highlighted that the local community has also noted the success of the Lake Illawarra Authority, and that there are some critical issues for the ongoing management of the Lake. These issues are common to many other estuaries along the NSW coast.

This review outlines the detailed process that the NSW Government has undertaken to determine the best future management options for Lake Illawarra, as a key recreational asset to the Illawarra region.

I would like to take this opportunity to thank the Lake Illawarra Authority Board and its staff for the long standing commitment and success they have had in greatly improving the environment of and around Lake Illawarra.

Troy Grant
Parliamentary Secretary for Natural Resources
Member for Dubbo

NSW 2021

Goal 22 - Protect Our Natural Environment: Protect rivers, wetlands and coastal environments

‘Improve the environmental health of wetlands and catchments through actively managing water for the environment by 2021’
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**Acronyms**

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>CZMP</td>
<td>Coastal Zone Management Plan</td>
</tr>
<tr>
<td>CMA</td>
<td>Catchment Management Authority</td>
</tr>
<tr>
<td>EMC</td>
<td>Estuary Management Committee</td>
</tr>
<tr>
<td>EMP</td>
<td>Estuary Management Plan</td>
</tr>
<tr>
<td>LIA</td>
<td>Lake Illawarra Authority</td>
</tr>
<tr>
<td>NSW</td>
<td>New South Wales</td>
</tr>
<tr>
<td>OEH</td>
<td>Office of Environment and Heritage</td>
</tr>
</tbody>
</table>
Lake Illawarra
Lake Illawarra is situated on the south coast of NSW, within the Wollongong and Shellharbour Local Government areas. The immediate foreshore of the Lake is primarily urban, although large areas of grazing land and some remnant vegetation are located on the western side of the Lake. The Lake opens to the sea at Windang, with a trained permanent entrance. The Lake has a surface area of 36km², with a catchment area of 238km². This is one of the larger coastal lake estuaries in NSW.
Background to the Review

Terms of Reference
In 2012 the Deputy Premier announced that the NSW Government would undertake a review of the Lake Illawarra Authority.

The Terms of Reference for the review outlined two key areas for focus, the first being if the LIA had achieved its objectives, and the second being future management options for Lake Illawarra.

The Terms of Reference included a set of milestones that outlined a clear review of data against environmental, social and economic indicators to evaluate the achievement of objectives. Future management options were to be developed by comparing governance of similar estuaries in NSW and determining through analysis which would be the most effective for Lake Illawarra.

Communication Strategy
As part of the Terms of Reference, a detailed Communication Strategy was developed to ensure that the community and key stakeholders were provided with information about the review, and were given the opportunity to provide comments and input to the review process. This included a call for public submissions through NSW Government websites and the local newspapers, meetings with key stakeholders including Wollongong City and Shellharbour City Councils, and written correspondence with local members of Parliament.

History of the LIA
The LIA was enacted in 1987 under the Lake Illawarra Authority Act 1987 in response to the significant environmental degradation that had occurred in Lake Illawarra. This degradation, seen across many similar estuaries in NSW, had been predominantly caused by long term and relatively uncontrolled development activity. Symptoms of the degradation included:

- Foul odours
- Sedimentation and infilling
- Decreased water quality
- Increased nutrient loading
- Loss of aquatic habitat
- Reduced visual and recreation amenity
- Increased pollution and littering

Media reports, in the form of letters to the editor, at the time of establishment of the LIA show the community was concerned about black sludge, odours, sewage and effluent, dead and dying fish and rotting seagrass wrack. To local communities, one of the most concerning indicators of poor lake condition were
the odours that rose from the lake shallows and travelled into adjoining suburbs. Historic media articles help
to indicate the level of degradation Lake Illawarra was experiencing.

The management of the Lake was the responsibility of the two relevant local councils as well as several NSW
Government agencies, which had duplicative and sometimes conflicting approval roles. The legislation of the
time did not provide clear environmental or development controls for estuaries across NSW, resulting in
conflict, inaction and ultimately a decline in resource condition. Specific government authorities and
committees were set up in areas such as Lake Macquarie and Tuggerah Lakes to address similar estuary
degradation.

The LIA consists of 10 members appointed by the Minister. The Lake Illawarra Authority Act 1987 outlines
representation as follows:

- 1 member Wollongong City Council
- 1 member Shellharbour City Council
- 1 member NSW Fisheries
- 1 member Crown Lands
- 1 member Southern Rivers CMA
- 5 members of the community (Chair is appointed from community representatives)

Initially supported by the Department of Public Works, the LIA is currently administered by Crown Lands
under the Department of Trade and Investment. Crown Lands provides an Executive Officer who is
nominated by the Director General of the Department. Crown Lands also provides administrative systems
and support, employs several staff working for the LIA and provides access to other resources (such as
finance, legal services and communications). Initially management programs were outlined in a Draft Strategy
Plan (1990), Value Management Study (1992) and Works Program (1995). These documents were updated in
a more comprehensive Strategic Plan in 2006.

The LIA has been funded by the NSW Government since 1987, with a similar amount provided by
Wollongong and Shellharbour City Councils. For example, in the 2010/2011 financial year, the total income
by source was noted as follows.

![Income ($2.46m)](image)

Figure 1: 2010/2011 Income by source (LIA, 2011)
The LIA has provided statutory Annual Reports to the Minister for each financial year of operation. As required, the report includes details about the structure of the LIA, budgets and financial statements, works undertaken and management planning. Commonwealth funding has been through employment programs such as GreenCorps and Work for the Dole. Other income, while a minor part of the budget, includes rent from leases and licences and interest earned. This data indicates that the NSW Government has funded the majority of works over the operation of the LIA.

![Figure 2: Funding source over history of the LIA, 1987 - 2010.](image)

**Part 1: Has the LIA met its objectives?**

**Objectives**
The *Lake Illawarra Authority Act 1987* does not state specific objectives for the LIA. The Act states ‘An Act to constitute the Lake Illawarra Authority for the purpose of improving the environment of Lake Illawarra, its foreshores and environs; and for related purposes’.

General objectives have been described in later management plans developed by the LIA. The Act outlines the “development works” that the LIA could undertake to improve the Lake and its foreshores.

Development works are defined in the Act as follows:

The improvement of Lake Illawarra and its foreshores and immediate environs, including:

(a) the removal of ooze, silt, sand, sediment, algae and weed growth,
(b) the deepening of channels and bays and disposal of spoil,
(c) the construction of silt traps and nutrient filters at entry points of streams and drains,
(d) the landscaping of foreshores, including the planting and removal of trees and other vegetation,
(e) the provision of recreational facilities and amenities, including beaches, boat ramps, boathouses, jetties, wharves, moorings and appropriately screened car parks, and
(f) the carrying out of land reclamation and works for the protection of the environment.

The LIA confirmed its Mission Statement as “The LIA aims to achieve a healthy, attractive, well-managed amenity for the benefit of the community.”

The management plans developed by the LIA (most recently 2006) note the following objectives.

<table>
<thead>
<tr>
<th>Area</th>
<th>Objective</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water quality</td>
<td>To improve the lake’s water quality to a standard that protects ecological, recreational and aesthetic values</td>
</tr>
<tr>
<td>Sedimentation</td>
<td>To reduce the rate of sediment build up in the lake and restore areas of the lake afflicted by its excessive accumulation</td>
</tr>
<tr>
<td>Aquatic ecology</td>
<td>To restore and protect the diversity and abundance of lake habitats and aquatic flora and fauna</td>
</tr>
<tr>
<td>Waterway usage</td>
<td>Maximise opportunities for the lake’s sustainable recreational and tourist use</td>
</tr>
<tr>
<td>Riparian zone</td>
<td>Restore the lake’s foreshore vegetation and amenity value while encouraging public access</td>
</tr>
<tr>
<td>Fishery</td>
<td>Minimise conflict between users of the resource and ensure harvesting of stock is maintained at a long term sustainable level</td>
</tr>
<tr>
<td>Lake management</td>
<td>Promote integrated and sustainable lake management by encouraging participation by community interest groups and government agencies in the planning, management and funding of the lakes restoration program</td>
</tr>
</tbody>
</table>

Table 1: Management objectives for the Lake Illawarra Authority

**Evaluation methods**

A range of data were reviewed across social, environmental and economic sectors to assess the achievement of the LIA’s objective to improve the environment of Lake Illawarra, its foreshores and environs.

For example, media reports over the history of the LIA were randomly selected, the topics discussed in each noted, and a tally kept of the historical and current issues that were being reported.

A significant number of environmental reports and data were reviewed, using information from the LIA, Office of Environment and Heritage and consultants.

The LIA’s annual reports provided the financial information on where the expenditure was applied ie in development works, monitoring, foreshore facilities, administration and governance or environmental improvements.

A large number of independently assessed industry awards won by the LIA have provided further substantiation as to the effectiveness of the restoration works undertaken.

**Conclusions**

The LIA has achieved its objectives through the development works noted in the Act and a range of other activities. It has undertaken each of the development activities noted in the Act, with the outcomes of improved aquatic ecosystem health, increased tidal flow, improved foreshore facilities including the shareway
and parking areas, provision of recreational boating facilities and installation of gross pollution traps and wetlands to trap nutrients. These outcomes are further outlined below.

**Water Quality and Ecology**
The installation of a permanent, trained entrance in July 2007 has made a significant positive impact on the water quality parameters of the Lake. The entrance works have been the most significant cost to the LIA, with the installation of break walls, dredging, engineering reports and ongoing maintenance.

Research papers have noted that the water quality parameters, while still variable, have generally stabilised since opening to the sea in 2007. The impacts of storm water runoff are now generally balanced by tidal inflow, resulting in fewer peaks of phosphorus and nitrogen, allowing further development of habitat including saltmarsh and seagrass. It is also noted that as there has been a shift from a strongly influenced freshwater system to a predominantly tidal system. The ecosystem of the Lake will continue to change and develop in the future. The LIA has undertaken mapping of saltmarsh habitat and implemented vehicle and pedestrian controls at selected sites to protect this and other restored habitat.

The LIA has also undertaken a program of algae removal on an as needed basis. Algal blooms occur in particular environmental conditions and can reduce the recreational water quality. For example, in 2010/2011, the LIA harvested around 85 tonnes of macroalgae. It is noted that the opening of the Lake to the sea has reduced the frequency and extent of algal blooms. Several weed control and re-vegetation projects have occurred along the foreshores of the Lake, utilising Green Corps and contractors. Since 1988, the LIA has:

- Dredged 1,000,000m³ of sediment
- Constructed 3 large wetlands for nutrient filtering and installed 40 storm water devices
- Removed 55,000 tonnes of odour producing decaying seagrass wrack
Lake management
This objective is focused on developing effective partnerships. The LIA has developed working partnerships with groups including government agencies, the community education group Futureworld, Illawarra Bird Observers Club, and recreational groups such as Illawarra Yacht Club. For example, the works on an area close to the entrance have focused on recreating habitat for Little Terns was undertaken with Wollongong Council, OEH, and the Bird Observers. This project included fox baiting, den fumigation, fencing and signage.

Recreation and access
Access to the Lake has been increased through several foreshore improvement projects, and the installation of 28km of shareway for pedestrian and bicycle use. This perimeter shareway project has been strongly supported by the community, and efforts are underway to join the remaining pathways to form a complete circuit around the lake, a further 10km. The location of the existing shareway is shown in Figure 4.

With the installation of the permanent opening, a safe, netted swimming lagoon was also created allowing for family use. This site is also monitored for water quality and generally meets the ANZECC guidelines for recreational use. Other recreation improvements include installation of jetties, construction and maintenance of boat ramps, and installation of fish cleaning tables. Approximately 20 jetties and wharves are located in the lake, many funded by the NSW Government’s Better Boating Program. A condition assessment and asset register has been developed to assist with maintenance of these facilities. In addition, since 1998, the LIA has:

- Installed 1km of boardwalk
- Built 9 carparks
- Installed 2 equal access playgrounds
- Built 5 viewing platforms and one large bird observation tower

Figure 3: The permanent opening to the Lake in 2009 (Colin Douch)
Figure 4: The shareway cycle and pedestrian track around the Lake
Community consultation

Community comment on the LIA’s achievement of its objectives indicated that significant progress towards the key goals has been made. The environment of the Lake is believed to have improved significantly, primarily due to the permanent opening of the channel to the sea. The results are noted in Figure 5, below. A recurring comment was that there was far less sludge and ooze and the odour was reduced. It is noted that a highly significant majority of community respondents had lived near the Lake for more than 15 years, which provides a long term view of the changes to the Lake. Several ongoing issues were also noted and are discussed in the next section.

![Figure 5: Responses to question 'Has the LIA achieved its objectives?'](image_url)

The change in community concerns as raised in the local media reflect this improvement across the Lake, with fewer reports about ecosystem health, and more focus on amenity and recreation.

An analysis of 2010/2011 expenditure was undertaken, categorising line item expenses into environmental, economic and social categories. There has been a decrease in terrestrial and aquatic habitat expenditure. Over time, expenditure in foreshore recreation has notably increased, while expenditure in studies and investigations has remained even. This reflects a shift in the focus of the works undertaken by the LIA, and is further discussed in Section 2 Future Management Options.
A review of the total expenditure since 1987 shows the increase in foreshore recreation expenditure over time. The large peak in water quality expenditure is related to the entrance channel works. Since this large expense, investment in water quality has been able to be reduced, as with other environmental expenditure on aquatic and terrestrial habitat. This is shown in Figure 7.
Part 2: Future management options

Governance of estuaries
Across NSW, there are approximately 184 estuaries with various levels of ocean influence, from brackish lakes to drowned river valleys. The governance of these is directed by the coastal zone management planning process managed by OEH. The policy guides local councils and communities to manage the complex estuarine environment, with a principle of cooperation between all stakeholders in preparing a local estuary management plan. This is the responsibility of the local council. Guidelines for councils preparing CZMPs note that the ‘primary purpose of a CZMP is to describe proposed actions to be implemented by a council, other public authorities and potentially the private sector to address priority management issues’. The priority issues are identified as:

- Managing risks to public safety and built assets,
- Pressures on coastal ecosystems, and
- Community uses of the coastal zone.

Councils fund the implementation of CZMPs through a range of sources, including recurrent council budgets, OEH coastal zone funding programs and Commonwealth Government environment initiatives (eg Caring for our Country).

In order to review future management options for Lake Illawarra, four estuaries that are broadly similar to Lake Illawarra were selected and compared. The comparison examined both governance models for these lakes and a small number of environmental indicators. The analysis of this data is presented in Appendix 2.

The estuaries selected for comparison are listed in the table below.

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<td>Great Lakes Council</td>
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<td>Wallis Lake Estuary Management Plan 2005 ( currently open for review and public submissions)</td>
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Table 2: Governance of comparative estuaries

“Estuaries in NSW vary in their shape and size, ranging from large coastal embayments and drowned river valleys, such as Port Stephens and the Hawkesbury River, to coastal lakes, such as Lake Macquarie and Wallis Lake, and smaller intermittently open coastal lakes and lagoons, such as Manly Lagoon and Tabourie Lake. Estuaries also support many different habitat types and species.”

OEH, 2011

NSW Estuary Management Framework
- Coastal Protection Act 1979
- NSW Coastal Policy 1997
- NSW Sea Level Rise Policy Statement 2009
- Guidelines for Preparing Coastal Zone Management Plans

Part 2: Future management options

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OEH, 2011

NSW Estuary Management Framework
- Coastal Protection Act 1979
- NSW Coastal Policy 1997
- NSW Sea Level Rise Policy Statement 2009
- Guidelines for Preparing Coastal Zone Management Plans
Lake Macquarie
One of the largest estuaries in NSW, Lake Macquarie is located close to Newcastle and adjacent to the Tuggerah Lakes catchment to the south. Lake Macquarie is managed by Lake Macquarie City Council, through the Lake Macquarie Estuary and Coastal Management Committee. In 1998, a Government funded task force was established to undertake a range of environmental improvement works, similar to those of the LIA. This agency and council taskforce had a ‘sunset’ clause which determined the end date for its funding and works in 2009. In 10 years, the task force lists these outcomes:

- 66 stormwater devices, with a focus on wetland
- Rehabilitated 38.6km of lake foreshore and estuarine creek bank
- Rehabilitated 15 State significant wetlands
- Planted over 600,000 endemic plants through 260 Landcare groups

In 2008/2009, 76% of the $3.2m budget was provided by Lake Macquarie City Council and 23% by government agencies.

Lake Macquarie opens to the sea through the Swansea channel, a trained permanent opening. The land use in the catchment is a mix of urban and vegetated (reserves) areas, with minor cleared and industrial areas.

Tuggerah Lakes
This area is on the Central Coast of NSW and is comprised of Tuggerah Lake, Budgewoi Lake and Lake Munmorah, with the sea opening at The Entrance. Tuggerah Lakes is managed by Wyong Shire Council. Due to the condition of the Lakes in the 1980s, an interagency committee was appointed to investigate and report to the NSW Government. As a result, a $15m program to remove black odorous sludge, build and operate a dredge to keep the entrance open, and stormwater devices was commenced. At the completion of this funding program Wyong Council established an estuary management committee, working with the NSW Government to develop an estuary management plan.

Tuggerah Lakes does not have a permanent opening to the sea and has an intermittent channel which is periodically dredged if not open by storm activity.
Wallis Lake
Wallis Lake is on the mid north coast and opens to the sea at the twin towns of Tuncurry and Forster. Wallis Lake is managed by Great Lakes Council, through the Wallis Lake Estuary Management Committee. It opens through a trained channel between the two towns of Forster and Tuncurry.

St Georges Basin
St Georges Basin is located on the south coast of NSW, adjacent to the large waterway of Jervis Bay. The basin connects with the ocean through a narrow outlet past the village of Sussex Inlet. St Georges Basin is managed by Shoalhaven City Council. The current EMP was developed by the St Georges Basin Task Force in 1996 and is currently under review.
Comparison

Data indicates that whilst surface area of the estuary is not significantly different across these five estuaries, the catchment area feeding the lakes is considerably varied. As the catchment area and the land use within that catchment will have a marked impact on the ecosystem health of the estuary, the size of the catchment is relevant. Lake Illawarra has a very small catchment area which can concentrate the impacts of development, which is critical due to the shallow depth of the lake.

The shallow nature of Lake Illawarra and its small tidal prisms compared with large stormwater inputs led to the rapid decline in ecosystem habitat until the permanent opening of the Lake allowed improved flushing and reduced sedimentation infill. However, Tuggerah and Wallis Lakes have experienced similar negative impacts on ecosystem health as they are also shallow with low water volumes, and have limited tidal flushing. The management plans for both of these lakes have identified this as a key management issue. While sedimentation at Tuggerah is slow, nutrient levels were above water quality guidelines at the time of the plan, sea grasses were in decline and contributing factors were erosion, pollution, development pressure and foreshore degradation. The Wallis Lake Management Plan similarly noted these issues.

Recent environmental monitoring indicates that these estuaries have similar condition. Measuring chlorophyll, microalgae, turbidity, seagrass, mangrove, saltmarsh and fish species, a composite index of estuary health is listed in Table 3, below. However, the pressure on the estuaries does vary notably. An index comprised of cleared land, population, sedimentation, nutrient load, freshwater flow, tidal flow, fishing and disturbance of habitat indicates that St Georges Basin is under a high level of pressure, while Lake Illawarra has the lowest level of pressure of these estuaries. Lake Illawarra also records the best condition of the five estuaries.

<table>
<thead>
<tr>
<th>Estuary</th>
<th>Condition</th>
<th>Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lake Macquarie</td>
<td>4.25</td>
<td>2.63</td>
</tr>
<tr>
<td>Wallis Lake</td>
<td>4.00</td>
<td>3.00</td>
</tr>
<tr>
<td>Tuggerah Lakes</td>
<td>4.20</td>
<td>3.13</td>
</tr>
<tr>
<td>St Georges Basin</td>
<td>4.00</td>
<td>4.25</td>
</tr>
<tr>
<td>Lake Illawarra</td>
<td>4.40</td>
<td>2.50</td>
</tr>
</tbody>
</table>

*Table 3: Estuary environmental condition (OEH, 2012)*

The similarity of the objectives for the estuaries indicates that the pressures and management issues are similar across most NSW estuaries. The comparison shows that, while each estuary has its unique characteristics, management issues are alike across these estuaries, and management models should reflect these similarities.

Future Management Options

The key considerations in assessing the management options for Lake Illawarra form a framework against which different options can be tested. These considerations are as follows:

1. Allocation of responsibility – ensuring that contemporary legislative responsibilities are reflected in the management of Lake Illawarra, and not duplicated
2. Future management direction – the shift from an environmental focus to a recreational asset focus must be possible in the model
3. Equity of resourcing – that NSW Government resources are allocated in an equitable way
Option 1 Retain Current Arrangements
This option would see the LIA retained broadly in its current format. It was noted by the Board and the two Councils that the King Street development area would require a specialist skill set or outsourcing, such as to NSW Government development agencies or similar (ie UrbanGrowth NSW). An issue for this management model is the expectation of continued NSW Government funding, both through direct LIA budget and also by the administrative and resourcing support provided to the LIA. In addition to the dedicated budget required to support the LIA, there is an issue of equity for the NSW Government as other estuaries are not provided with these additional resources. In this model, the responsibility for management remains with the LIA under the Lake Illawarra Authority Act 1987 and partnership with the two Councils would be retained on the Board. Additional resources in asset management and maintenance would be required. It is noted that there is duplication of responsibility in this model.

Option 2 Establish a State Park
Under the Crown Lands Act 1989, a State Park may be gazetted over the Lake and areas of land owned by the LIA. A Trust would be established to manage the Lake, with community representation. Funding of this model would be through the Crown Lands Public Reserves Management Fund, a competitive funding allocation to Crown Reserve Trusts on an annual basis. It is noted that funds generated within a State Park can be moved to other Crown Reserves under the legislation. The Trust would be required to prepare and implement a Plan of Management for the State Park. As with Option 1, specialist skills would be required to undertake development and environmental works. Responsibility for management would be held by the Trust. This option is not considered to offer any significant advantages over the current model.

Option 3 Allocated Responsibility
In this option, the current responsibilities of the LIA would be undertaken by a mixture of NSW Government agencies and local councils, consistent with the management of other estuaries in NSW. Local councils would retain broad responsibility for the management of the Lake though an estuary management committee. Funding is available to councils through the Estuary Management Program on an annual basis. The maintenance and management of the breakwalls and entrance could become the responsibility of Crown Lands as with similar breakwalls along the NSW coast. During consultation, both councils noted the cost of maintaining these assets as a considerable potential. Community engagement would be through membership on EMC. Guidelines and support from OEH through the Estuary Management Program is available to all local councils. Unlike the management options outlined in Options 1 and 2, councils have the skills required to undertake asset management and maintenance, and may undertake development planning. It is noted that the future key issues highlighted in this report are predominantly those handled by local councils. The bed of the Lake would remain Crown land. Environmental and estuary health projects would be eligible for funding through the Southern Rivers Catchment Action Plan, which would also guide the EMP targets to ensure consistency across the Southern Rivers Catchment. Unless special circumstances exist, land held by the LIA adjacent to the Lake would revert to being Crown land managed under the Crown reserve system.
**Key issues for the future**

Public consultation and targeted stakeholder discussions gave clear indications of key issues into the future, which will need to be addressed by any future management model. These are detailed in Figures A9 and A10 in Appendix I (Community Consultation).

1. Ongoing funding and resourcing of works at Lake Illawarra
2. Continuing to improve the environment of and around the Lake (weeds and sludge removal, increasing habitat and vegetation, impacts of urban development)
3. Providing foreshore facilities (completing the shareway)
4. Dredging (the entrance drop off and Griffins Bay)
5. Banning commercial fishing
6. Maintaining existing facilities (rubbish removal, asset maintenance)
7. Shift in focus from environmental improvements to asset maintenance, recreation and development planning
8. Land title - existing tenures and potential transfers
9. Stabilisation of the entrance
10. Management of land development activities (specifically the King Street site).

**Conclusion**

Noting the above analysis and the key considerations identified, the following comments are highlighted:

- Through its activities over the last two decades, the LIA has been able to transform the Lake and its environs into a healthy estuary with high recreational amenity, thus achieving the objective of the *Lake Illawarra Authority Act 1987*.
- There is a clear shift in emphasis away from estuary health issues, the objective of the Act, towards activities associated with recreation. This is highlighted in the community feedback.
- It is clear that the LIA has largely achieved what it was established to do. The achievements of the LIA have been reflected in feedback from the community consultation process and meetings with both local councils. As with all NSW estuaries, there is always more work to be done and the responsibilities for ongoing management are now clearly outlined in legislation.
- There is now substantial overlap between the activities of the LIA and the role of local government (and other NSW Government agencies) in other comparable estuaries. As a result, there is the potential for confusion over roles and responsibilities as well as a real and perceived duplication of resources and efforts.
- Since the LIA was formed there is a clearer legislative framework for estuary management and the need for a separate LIA is no longer evident.

**Option Three, allocated responsibility, is therefore the best fit to manage Lake Illawarra into the future.**
**Recommendation**

In order to maintain the outcomes of the LIA into the future, the recommendations of this review are as follows:

1. Support the establishment of a Lake Illawarra Estuary Management Committee consistent with other estuary management committees in NSW which:
   a. has as its primary aim to steer the management of Lake Illawarra and associated land,
   b. will ensure that management of the Lake is consistent with the relevant legislation, presently the *Coastal Protection Act 1979*, and associated guidelines and regulations,
   c. comprises representatives from relevant local government areas (currently Wollongong City and Shellharbour City Councils) and relevant agency and community representatives,
   d. will complete an update of the LIA’s 2006 Strategic Plan and thereby finalise an Estuary Management Plan that fully accords with current NSW Government policy guidelines,
   e. monitors and reports on estuary health in keeping with the Estuary Management Plan;

2. The Department of Trade and Investment – Crown Lands should prepare a Lake Illawarra Transition Plan that addresses any outstanding issues and specifies transitional funding arrangements that will support the Lake Illawarra Estuary Management Committee;

3. The Department of Trade and Investment – Crown Lands should become the managing authority for the entrance breakwalls;

4. The Department of Trade and Investment – Crown Lands should consult with Wollongong City Council on arrangements for the future management of the King Street development area.

As a result:

- The operation of the LIA will be discontinued by repealing the *Lake Illawarra Authority Act 1987* and allowing Wollongong City and Shellharbour City Council to resume management of the Lake in keeping with practices elsewhere in NSW; and
- The land owned by the LIA, being largely the bed of the Lake, will revert to being Crown land consistent with other estuaries in NSW.
Appendix 1: Community Consultation Summary Results

Overview
Community submissions sought from 3rd November to 7th December 2012.
A newspaper form was printed on 7th November in the Lake Times and Illawarra Mercury.
A media release was sent out on 10th November 2012.
The submission form was available on both Crown Lands and LIA websites.
Submissions were also available through NSW Government Have Your Say website.

Surveys received
140 surveys were received over four weeks. Submission of forms was slightly stronger on the website (Crown Lands) than other methods of delivery.

![Survey submission method](image)

Figure A1 Survey submission method

Results – Demographics
The majority of survey respondents visit the Lake daily, with a significant number visiting every two to three weeks. Many of the respondents noted they lived adjacent or near the Lake, showing that most respondents were residents rather than visitors or tourists. This was also shown in the response to question 11, how close respondents lived to the Lake. The significant majority lived within 5km of the Lake. The time respondents had been living adjacent to the Lake also closely followed the length of time they had been visiting the Lake, with the majority noting over 15 years.

The long term trends observed by this group of respondents are valuable to the review.
Approximately how close to the Lake do you live?

- Less than 1 km: 44%
- 1-2 km: 28%
- 2-5 km: 15%
- 5-10 km: 14%
- More than 10 km: 28%

Figure A2 Proximity to the Lake

How long have you lived there?

- Less than 1 year: 1%
- 1-5 years: 6%
- 5-10 years: 11%
- 11-15 years: 15%
- More than 15 years: 58%

Figure A3 Time lived at this proximity
A significant number of respondents indicated that they were members of a sailing/boating club, however a small majority said they were not a member of a group. Other user groups were represented by a very small number of responses.
The types of activities respondents undertake at the Lake are predominantly passive recreation such as sailing, walking and cycling. Together these activities form the significant majority of activities undertaken. Fishing, prawning and crabbing is the most commonly listed active recreation.
Results – Achieving objectives
The community was asked how well the LIA had achieved its objectives. In general, the response was about even, in that people felt the LIA had made a good start, but there were many issues that still required attention. Generally feedback indicated that respondents felt the LIA had achieved its objectives.

![Figure A8 Achievement of objectives by the LIA](image)

**Results - Future management**
Respondents showed a very clear preference for improving the environment of, and around, the Lake. Foreshore facilities were also seen as important. Respondents had the option of listing other issues for consideration.
Other considerations listed were as follows:

- Dredging and silt removal
- Completing the shareway
- Controlling development
- Revegetation and wetlands
- Banning commercial fishing
- Rubbish, weed and mud removal
- More facilities
- Increasing fish stocks
- Second opening at Windang

A similar question asked respondents what the key priorities for future management of Lake Illawarra. This provided an opportunity for more detailed responses, with the following results:
Figure A10 Key future priorities for the Lake

Figure A11 Historic community issues as reported in local media, 1984 – 2012.
### Appendix 2: Comparative data on selected NSW Estuaries

<table>
<thead>
<tr>
<th>Estuary</th>
<th>Management Objectives in Estuary Management Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lake Illawarra</td>
<td>Multiple Specific Objectives (See Part 1 of this report pages 9-10).</td>
</tr>
<tr>
<td>St Georges Basin</td>
<td>Unable to source.</td>
</tr>
<tr>
<td>Lake Macquarie (stated as aims)</td>
<td>1. To maintain or improve the navigable access to Lake Macquarie to a level consistent with warranted boating usage</td>
</tr>
<tr>
<td></td>
<td>2. To maintain or enhance the foreshore amenity and prevent foreshore erosion where necessary along the entrance to Lake Macquarie</td>
</tr>
<tr>
<td></td>
<td>3. To maintain or improve existing water quality to a level consistent with expected waterway uses</td>
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<tr>
<td></td>
<td>4. To prevent excessive sedimentation and identify/remediate areas currently experiencing excessive sedimentation which may adversely impact on water quality, recreational and visual amenity</td>
</tr>
<tr>
<td></td>
<td>5. To maintain or improve the ecological status of Lake Macquarie</td>
</tr>
<tr>
<td></td>
<td>6. To ensure the fisheries of Lake Macquarie are managed in a sustainable manner</td>
</tr>
<tr>
<td></td>
<td>7. To maintain and enhance the foreshores of Lake Macquarie to protect their ecological, recreational and visual amenities</td>
</tr>
<tr>
<td>Tuggerah Lakes (stated as vision)</td>
<td>1. Current water quality does not deteriorate in the face of new development. Recreational water quality is improved at lake and creek swimming areas</td>
</tr>
<tr>
<td></td>
<td>2. Healthy foreshores that promote saltmarsh growth which in turn aid the natural breakdown of seagrass wrack</td>
</tr>
<tr>
<td></td>
<td>3. Excellent recreational facilities at access points</td>
</tr>
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<td></td>
<td>4. Healthy rivers and creeks that connect well with the estuary and provide good habitat for estuarine animals</td>
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<td></td>
<td>5. Existing exchange with the ocean is maintained. A permanent entrance is not a cost effective solution and will have unknown ecological impacts</td>
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<tr>
<td></td>
<td>6. Seagrass wrack will be harvested from locations where it accumulates too frequently to be broken down naturally. Wherever possible, saltmarsh will be used to encourage natural odourless decomposition of wrack on the foreshores</td>
</tr>
<tr>
<td></td>
<td>7. Sustainable fish and prawn populations and habitat that provide for long term recreational and commercial fishing</td>
</tr>
<tr>
<td>Wallis Lake</td>
<td>1. Conserve, protect and enhance areas of significant cultural, ecological and aesthetic value</td>
</tr>
<tr>
<td></td>
<td>2. Restore or remediate degraded areas</td>
</tr>
<tr>
<td></td>
<td>3. Balance the recreational, commercial, social and cultural needs of the estuary</td>
</tr>
<tr>
<td></td>
<td>4. Increase the economic value of the estuary in an ecologically sustainable manner</td>
</tr>
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<td></td>
<td>5. Increase community awareness of estuarine processes and management issues</td>
</tr>
</tbody>
</table>

*Table B1: Management objectives for each estuary*
Figure B1: Land use in the catchment within a buffer zone (hectares), OEH, 2012.

Figure B2: Estuary area and catchment area comparison
Figure B3: Average depth over estuary volume
References

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Annual Report 2010-2011
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