

ITEM 1 DRAFT WOLLONGONG COASTAL MANAGEMENT PROGRAM SCOPING STUDY

The first stage of the process to prepare a Wollongong Coastal Management Program (CMP) is the scoping phase. The primary purposes of a Scoping Study are to review past and current coastal management actions, identify knowledge and data gaps, develop a shared understanding of the value and issues along the coastal zone, and identify the focus of the CMP.

This report provides a brief overview of the draft Scoping Study and its recommendations, including sea level rise projections. This report seeks Council's endorsement of the draft Scoping Study and progressing development of the Wollongong CMP to Stage 2 of the Coastal Management Framework.

RECOMMENDATION

- 1 The draft Wollongong Coastal Management Program Scoping Study be endorsed by Council.
- 2 Council endorse progressing to Stage 2 of the CMP framework, including the recommended technical studies outlined in this report.
- 3 Council endorse AR6 SSP5-8.5 Sea Level Rise Projection Values, for use in modelling of coastal hazards in Stage 2 of the CMP process (modelling a sea level rise range for each time horizon).

REPORT AUTHORISATIONS

Report of: Chris Stewart, Manager City Strategy

Authorised by: Linda Davis, Director Planning + Environment - Future City + Neighbourhoods

ATTACHMENTS

- 1 Draft Wollongong Coastal Management Program Scoping Study
- 2 Wollongong Coastal Management Program Scoping Study Community Summary

BACKGROUND

The *Coastal Management Act 2016* provides the framework for councils to prepare and implement CMPs. CMPs set the long-term strategy for the coordinated management of the coast. The CMP facilitates a strategic and collaborative approach for relevant land managers to implement a range of credible, evidence-based actions to address current and future risks, not only from coastal hazards, but for a broad range of community, stakeholder, economic, climate change, catchment processes and environmental issues and values. The preparation of a CMP is prescribed by the Coastal Management Framework, including the NSW Coastal Management Manual.

There are five stages to develop a CMP, as prescribed in the Manual -

- Stage 1: Identify the scope of the CMP
- Stage 2: Determine risks, vulnerabilities, and opportunities
- Stage 3: Identify and evaluate opportunities
- Stage 4: prepare, exhibit, certify and adopt the CMP
- Stage 5: Implement, monitor, evaluate and report

Council prepared a CMP for Lake Illawarra, in partnership with Shellharbour Council, which was gazetted in 2020. The remainder of Wollongong's coastal zone, including its open coastline, the smaller estuaries and associated areas is now subject the CMP process. The resulting CMP will supersede the Wollongong Coastal Zone Management Plan (CZMP) and is likely to include actions relating to dune and estuary management which will replace the current Dune Management Strategy and Estuary Management Plans.

PROPOSAL

A draft Wollongong CMP Scoping Study (Attachment 1) has been developed as per Stage 1 of the NSW Coastal Management Manual.

Coastal consultants, Salients, prepared the draft Scoping Study, with assistance from sub-contractors Spectrum Comms for the community engagement component. A grant from the NSW Coastal and Estuary Program funded 2/3 of the consultant costs. Council's engagement team assisted with the First Nations engagement component.

The draft Scoping Study involved collating information on existing coastal context information and data, current and past management approaches, review of the latest coastal and climate change science, and engaging with community and internal and external stakeholders to develop a shared understanding of the current situation including our values, and the threats and issues along the coastal zone. The draft Scoping Study document includes –

- an outline of the physical components and coastal hazards of Wollongong's open coast
- the strategic context relevant to the coastal zone
- the stakeholder and community engagement undertaken during Stage 1
- a preliminary overarching vision and discusses suitable objectives for the CMP
- the proposed scope for management actions relating to the coastal zone, including geographic issues and an assessment of the issues (or 'risks') that need to be managed
- the findings of an audit of existing coastal management strategies
- roles and responsibilities of public authorities with regard to the CMP
- a first pass risk assessment, identifying key and future issues and studies recommended for Stage 2 of the CMP process
- a business case and consideration of the forward program for integrating open coast management actions into the CMP
- a Community and Stakeholder Engagement Plan for all stages of the CMP process

More detail on some of these inclusions is outlined below.

Geographical Scope

The draft Scoping Study outlines the geographic extent of the proposed CMP, which includes all of the coastal management areas defined by the *Coastal Management Act 2016* and mapped in the *State Environmental Planning Policy (Resilience and Hazards) 2021*. This however excludes coastal zone around Lake Illawarra which is managed under the Lake Illawarra CMP and Port of Port Kembla which is managed under a separate legislative framework (*SEPP Transport and Infrastructure 2021 – Chapter 5 Three Ports: Port Botany, Port Kembla and Port of Newcastle*).

Stakeholder and Community Engagement

A large range of community and stakeholder engagement activities were undertaken for the draft Scoping Study, which involved identifying what our community values about our coastline, how they use and enjoy it and what they identify as issues or challenges, now or in the future. A summary of community engagement activities and a detailed full engagement report is listed as Appendix D within the draft Scoping Study.

Key community values identified during community consultation, as part of the draft Scoping Study include -

- Recreation: dog walking (on and off leash), surfing, swimming, snorkelling, kite surfing, cycling, scenic views
- Recreational facilities: ocean pool, shared pathways, playgrounds, seating, bins
- Environmental values: Recreational water quality, birds and wildlife
- Social values: Contribution to well-being, family friendly environment, connection to country

Key threats to those values, also identified during community consultation include -

- Growth in the local population and visitors resulting in user conflicts in shared public spaces, inadequate public recreation facilities and increased development pressure
- Community and visitor awareness of the safety risks associated with recreational activities such as swimming and rock fishing
- Water quality, loss of habitat and degradation of cultural items, places and assets
- Quality of access paths and infrastructure to facilities and beaches
- Lack of clarity around governance in coastal management particularly heritage issues
- Climate change and sea level rise

First Nations engagement for Stage 1 followed the key principles of Council's Aboriginal Engagement Framework and aimed to inform, engage, build trust, and connect with the local Aboriginal community. The engagement was designed to create the building block for deeper and focused engagement in future stages of the project. A summary of First Nations engagement activities and a detailed full engagement report is listed as Appendix E within the draft Scoping Study.

Key coastal issues raised included erosion, threat of development, invasive species, fire and accessibility, however, is acknowledged that further engagement is required on values and issues. Illawarra Local Aboriginal Land Council (ILALC) provided detailed feedback covering a variety of aspects of the project and have expressed a strong interest in playing an active role in future phases of engagement.

First Pass Risk Assessment

A first pass risk assessment was undertaken, utilising information gathered during the review of relevant reports and plans, site inspections, stakeholder interviews, community engagement and Councillor workshop. This process resulted in a list of priority risks or issues and identified where further studies are required. The issues that were considered to require further studies included -

- inaccuracies in Littoral Rainforest and Coastal Wetlands mapping
- outdated coastal hazard mapping
- knowledge gaps in understanding of Aboriginal cultural values and assets
- outdated ecological studies
- wind-blown sand impacting facilities, infrastructure and public safety.

Stage 2 Studies

Stage 2 of the CMP process involves undertaking studies to assist Council in identifying, analysing and evaluating risks, vulnerability and opportunities. The studies are to support decision making in the subsequent stages.

Based on the recommendations in the draft Scoping Study, and with consideration of the budget available for this project, the following Stage 2 studies are proposed -

- 1 Littoral Rainforest and Coastal wetlands mapping
- 2 Coastal Hazard Mapping -
 - a Coastal Cliff or Slope Instability Study
 - b Coastal Entrances Study Foreshore Erosion Study
 - c Coastal Inundation Hazard Study including wave overtopping
 - d Tidal Inundation Hazard Study
 - e Combined Open Coast Infrastructure Inundation Hazard Assessment
 - f Coastal Erosion and Recession Study
 - g Combined Coastal Hazard Risk Assessment

- 3 Identification of Aboriginal Cultural Heritage values and assets, and vulnerability assessment
- 4 Port Kembla Beach – options assessment for management of windblown sand
- 5 Detailed Risk Assessment and Stage 2 Report

This list excludes two smaller ecological studies, recommended in the draft Scoping Study. These relate to inventories of shorebirds and ecology of rocky platforms. It is considered that these studies can be deferred until the implementation stage of the CMP (Stage 5).

These studies will inform a more detailed risk assessment that will determine the final list of priority risks that need to be addressed in the CMP.

Sea level rise

In 2009, the NSW Government released the NSW Sea Level Rise Policy Statement. This statement adopted the planning benchmarks of an increase above 1990 mean sea levels of 0.4 metres by 2050 and 0.9 metres by 2100, with the two benchmarks allowing for consideration of sea level rise over different timeframes. The benchmarks were established by considering the most credible national and international projections of sea level rise and take into consideration the uncertainty associated with sea level rise projections.

In 2012, the NSW Government rescinded the statement, advising that they were providing councils with the flexibility to consider local conditions when determining future hazards within their Local Government Area. In August 2013, Wollongong City Council resolved the following (in part) -

... Council endorse the continued use of the previous state-wide sea level rise benchmarks for planning and development decisions until a pathway for identifying locally appropriate sea level rise values is identified by the State Government ...

The Wollongong CZMP was prepared and certified in 2017. In accordance with the Council resolution the CZMP used the benchmarks previously recommended in the NSW Sea Level Rise Policy Statement.

The draft Scoping Study includes commentary on consideration of sea level rise. It states that the current NSW State policy is that Councils adopt their own projections that are “widely accepted by competent scientific opinion”. It also indicates that coastal risks are now required to be assessed for present day, 20, 50 and 100-year timeframes, which do not align with the benchmarks in the NSW Statement above.

The latest assessment by the Intergovernmental Panel on Climate Change (IPCC) (Assessment Report 6) was released in 2021. It provided updated sea level rise projections at a finer scale and further into the future.

The local sea level rise projection for a high emissions scenario (SSP5-8.5) for Port Kembla is shown in Figure 1 below. The draft Scoping Study advises that this high emissions scenario is comparable to the projections that have been adopted for planning in NSW over the past 15 years and, following suitable consideration, would most likely be a suitable basis for a projection for Council to adopt to inform development of the CMP.

Utilising this data, the draft Scoping Study has extracted the relevant SSP5-8.5 values for sea level rise (relative to a 1995-2014 baseline), from NASA's Sea Level Projection Tool, which are shown in Table 1 below.

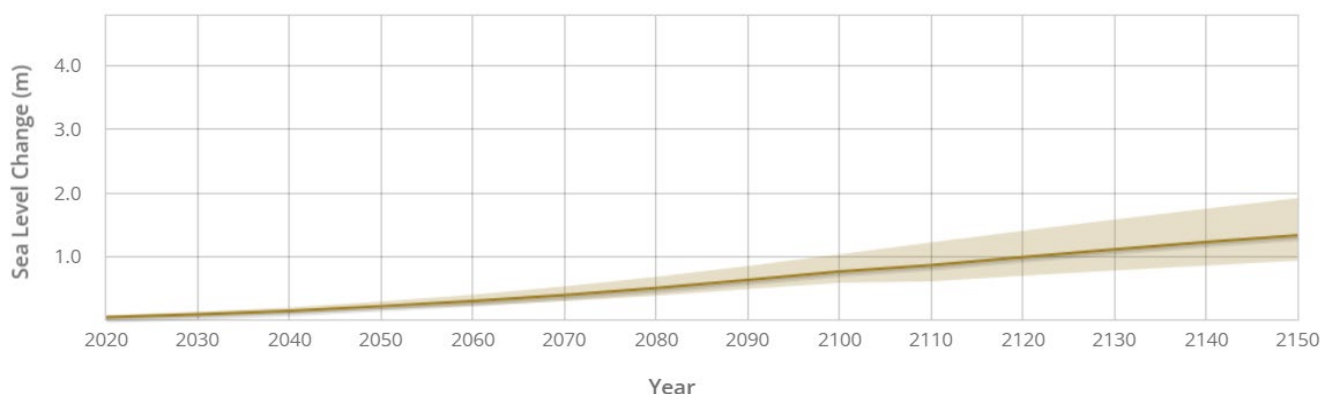


Figure 1: IPCC AR6 Projection for Port Kembla, SSP5-8.5

Table 1: AR6 SSP5-8.5 Sea Level Rise Projection Values (rise in metres, relative to 1995-2014 baseline)

Probability of Exceedance	2025 (Now)	2045 (20 years)	2075 (50 years)	2125 (100 years)
95%	0.01	0.11	0.29	0.61
83%	0.04	0.14	0.35	0.74
50%	0.07	0.19	0.46	1.06
17%	0.11	0.25	0.61	1.50
5%	0.14	0.31	0.75	1.85
Modelling Range	0.01 - 0.14m	0.11 - 0.31m	0.29 - 0.75m	0.61 - 1.85m

These are provided in the draft Scoping Study as indicative, reasonable values for adoption, based on the most widely accepted international scientific opinion (the IPCC). It is recommended that AR6 SSP5-8.5 Sea Level Rise Projection Values be used in modelling of coastal hazards in Stage 2 of the CMP process.

CONSULTATION AND COMMUNICATION

The Scoping Study was prepared in close consultation with Department of Planning and Environment – Environment and Heritage Group, who provided council with technical and financial support to develop a Scoping Study to guide preparation of a certifiable CMP.

In addition, a CMP must be prepared in collaboration with other relevant agencies, who must be engaged throughout the process and must commit to implementing any certified CMP actions within their remit. An Advisory Working Group was developed for Stage 1 and included representatives from relevant external agencies such as South East Local Land Services, Department of Primary Industries - Fisheries, divisions from Department of Planning and Environment – Planning and Policy: Crowns Lands, and National Parks and Wildlife Service, Property NSW, Transport for NSW, Sydney Water, Illawarra Local Aboriginal Land Council and an independent scientific advisor from the University of Wollongong. Key Council staff in City Strategy, Infrastructure Strategy and Planning, Open Space and Environmental Services, Development Assessment and Certification, Property and Recreation and Legal Services were also part of the Advisory Working Group for the project. They have provided relevant data, participated in project presentations and meetings and the first pass risk assessment. Councillors and key staff working to manage our coast were also engaged through workshops, meetings and interviews.

A large range of community and stakeholder engagement activities were undertaken for the draft Scoping Study, which are outlined previously in this report.

A summary of the outcomes of the community engagement for the draft Scoping Study has been drafted, to report back to the community. This is shown as Attachment 2 to this report.

PLANNING AND POLICY IMPACT

This report contributes to the delivery of Our Wollongong 2032 Goal 1 '*We value and protect our environment*'. It specifically delivers on the following –

Community Strategic Plan 2032		Delivery Program 2022-2026
Strategy		Service
1.2	Manage and effectively improve the cleanliness, health, biodiversity of land and water including creeks, lakes, waterways and oceans	Environmental Services
1.3	Increase our resilience to natural disasters and a changing climate to protect life, property and the environment	Environmental Services

It also specifically delivers on the action “Develop a Coastal Management Program for the Open Coast”. The future CMP will also support multiple other services of Council that provide services within the coastal zone.

SUSTAINABILITY IMPLICATIONS

The long-term management of the coastal zone is integral to maintaining the economic, cultural, environmental and social values of the area. Preparing for future implications of climate change was an important part of the Coastal Zone Management Plan and will continue to be throughout the development of the new CMP, as a long-term strategy for the coordinated management of land within the coastal zone.

RISK MANAGEMENT

There are risks associated with not having a CMP in place for the open coast, especially as the magnitude and frequency of coastal hazards is expected to increase over time. Risks can be reputational, financial and legal, and arising in a variety of contexts including land use planning, development assessment, asset management, project delivery and public liability. A CMP informed by contemporary and detailed hazard assessments will improve our knowledge and ability to respond to coastal hazards and help to mitigate associated risks.

FINANCIAL IMPLICATIONS

The development of a CMP for the Open Coast is an action within the Delivery Program 2022-2026. Every stage of the CMP development process is eligible for 2:1 funding from the NSW Government Coast and Estuary Grants Program. Council has allocated funding in its forward programs to meet the contribution commitments for Stages 2 to 4. The cost will be confirmed through future procurement processes.

Stage 5 is CMP implementation which currently has no allocated budget and will be subject to the business proposal process once the CMP is prepared.

CONCLUSIONS

The draft Scoping Study for the Wollongong Coastal Management Program has been developed as per Stage 1 of the NSW Coastal Management framework. It is recommended that the draft Scoping Study, including the recommended technical studies and sea level rise projection values, be endorsed by Council and that works progress to Stage 2 under the CMP framework.



WOLLONGONG SCOPING STUDY

Prepared by Salients
for Wollongong City Council

Final Draft
1 February 2023

This project is supported by the NSW Government's Coastal and Estuary Management Program



Wollongong Coastal Scoping Study

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Executive Summary

Wollongong City Council will prepare a Coastal Management Program (CMP) for the coastal zone (excluding Lake Illawarra and Port Kembla). This scoping study utilises existing strategies, plans, reports, studies and data to identify past, current and future issues in the coastal zone. It reviews the management actions previously undertaken, identifies any knowledge gaps and provides a focus for development and subsequent stages of the final Wollongong CMP.

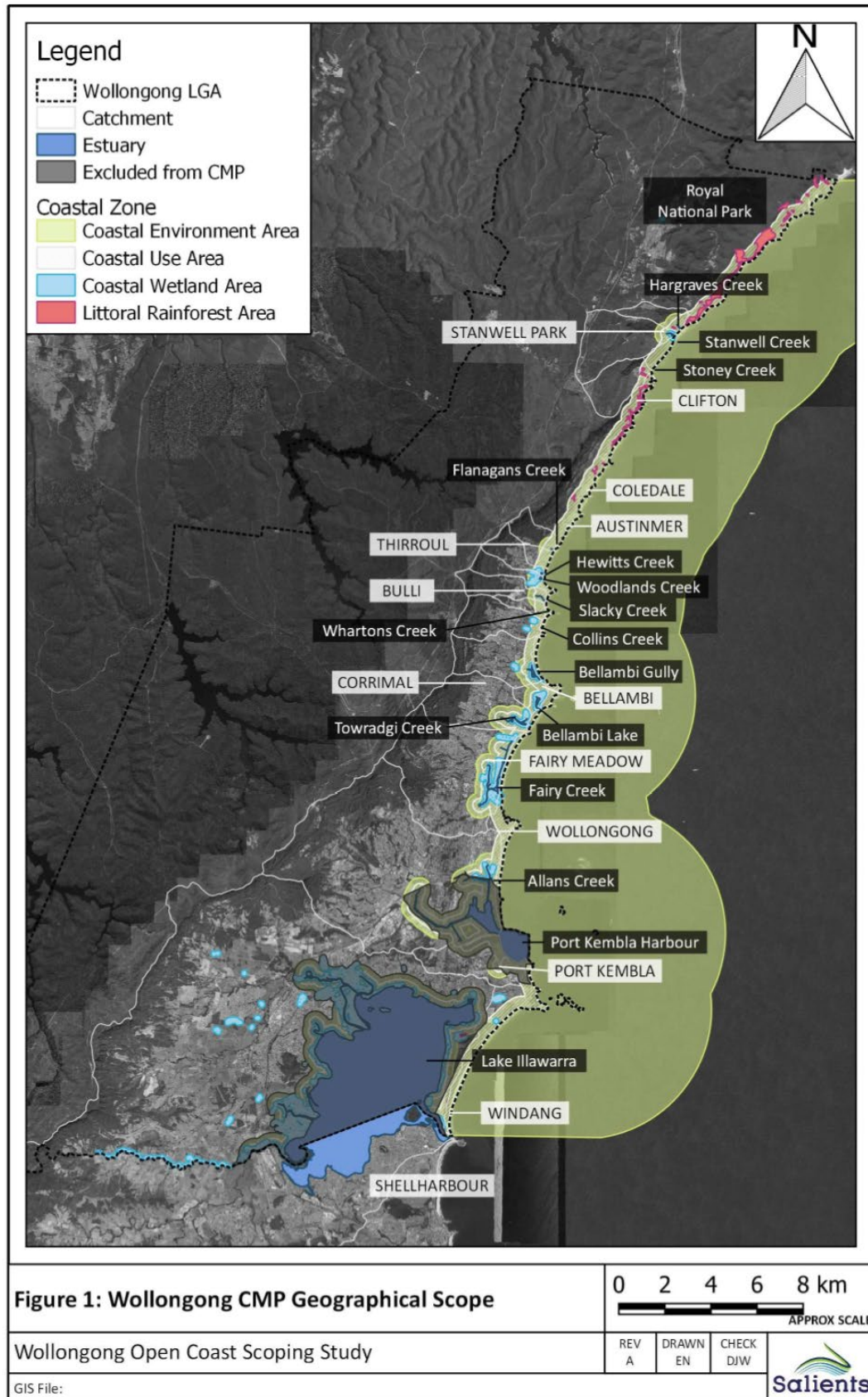
The study area for this Scoping Study includes the open coastline, the smaller estuaries and associated areas extending from the entrance of Lake Illawarra in the south, to Lilyvale in the north (see Figure 1). The CMP will be developed for the coastal management areas defined in the *Coastal Management Act 2016* (Coastal Wetlands and Littoral Rainforest Area, Coastal Vulnerability Area, Coastal Environment Area, and Coastal Use Area). Currently, the Coastal Vulnerability Area remains unmapped. Existing coastal hazard assessments are outdated and would require additional studies to inform development of a Coastal Vulnerability Area map in accordance with the requirements of the *State Environmental Planning Policy (Resilience and Hazards) 2021* (RH SEPP).

The Wollongong coast spans around 50km and begins 10km to the north of Stanwell Park, at Garie Beach, with that northernmost 10km within the Royal National Park. The coastline comprises a total of 27 beaches, mostly separated by headlands, rock platforms and cliffs. There are a number of creeks within the coastal zone. The proximity to the escarpment increases from north to south, resulting in smaller estuary catchments in the north and larger catchments to the south. Likewise the urban footprint expands as the coastal plain widens, with development intensification greatest in Wollongong City itself and surrounds.

The geographic extent of this Scoping Study is within the lands of the Dharawal speaking people of the Dharawal Nation.

"This coastal land holds deep family kinship connections embodied through memories and lives of people and community, extending through time to the ancestors that created this part of the Country. Continuing cultural practices, interwoven with the land and sea environment, have been maintained for a millennium. Cultural practices across the coastal region, such as food and medicine gathering, teaching and learning, ceremonies and crafts, instil a great sense of wellbeing and responsibility for the conservation of resources in the extended Aboriginal community and demonstrate a continual and deeply rooted held respect for Country".

Illawarra Local Aboriginal Land Council (2022)





The coastal zone is highly valued by the local community and attracts large numbers of tourists, ranging from day trippers to overseas visitors. Key community values identified during community consultation, as part of the scoping study include:

- Recreation: dog walking (on and off leash), surfing, swimming, snorkelling, kite surfing, cycling, scenic views.
- Recreational facilities: ocean pool, shared pathways, playgrounds, seating, bins.
- Environmental values: Recreational water quality, birds and wildlife.
- Social values: Contribution to well-being, family friendly, connection to country.

Key threats to those values, also identified during community consultation include:

- Growth in the local population and visitors resulting in user conflicts in shared public spaces, inadequate public recreation facilities and increased development pressure.
- Community and visitor awareness of the safety risks associated with recreational activities such as swimming and rock fishing.
- Water quality, loss of habitat and degradation of cultural items, places and assets.
- Quality of access paths and infrastructure to facilities and beaches.
- Lack of clarity around governance in coastal management particularly heritage issues.
- Climate change and sea level rise.

The Wollongong coast is currently managed under the Wollongong Coastal Zone Management Plan 2017 (CZMP), Estuary Management Plans (EMPs) developed in 2005 and 2007, and the Dune Management Strategy 2014. Under the EMPs, Council undertook a range of projects with a particular focus on improving water quality, bank erosion and entrance management. In more recent years, implementation of the Dune Management Strategy has been a strong focus for Council. That program is now substantially complete, including tower and dune re-profiling works at several beaches, supporting policy and plan development including Dune Vegetation Site Plans for eight vegetated beaches, Whartons Creek Entrance Management Plan, and a plan for the management of construction and demolition waste at Wollongong City Beach.

The EMPs and CZMP are now dated, both in terms of the supporting studies and legislative and planning framework under which they were developed. Whilst many of the key issues remain unchanged, the identified coastal hazards and their treatment has changed between the prior coastal management framework and its replacement.



The scoping study reconsiders these risks (or 'issues') in light of the current framework.

A first pass (or preliminary) risk assessment and knowledge gap analysis was completed to inform subsequent steps in the CMP development. Based on the existing information, Table 1 presents those risks that received an extreme or high rating. Moving forward, detailed and current information is required to accurately assess consequence, likelihood and ultimately risk so that issues and management actions can be prioritised to determine inclusion in the final CMP. Table 1 also identifies those issues where the 'risk' is a lack of information and therefore a Stage 2 Study is recommended.

Issue		Current Risk	Future Risk	Stage 2 Study recommended
Overarching	Governance	High	High	
Overarching	Inaccuracies in SEPP Littoral Rainforest and Coastal Wetlands mapping	High	Extreme	✓
Overarching	Outdated coastal hazard mapping	High	Extreme	✓
Overarching	Outdated water quality data for coastal estuaries	High	High	
Overarching	Surf club renewal and maintenance	High	Extreme	Will be informed by coastal hazard studies
Overarching	Ocean pools renewal and maintenance	High	Extreme	
Overarching	Knowledge gaps in the understanding of Aboriginal cultural values and assets	High	Extreme	✓
Overarching	Buried asbestos and building waste	High	High	
Overarching	Outdated or lack of ecological studies – shorebirds, rocky platforms, estuaries and coastal dunes	High	High	✓
Overarching	Urban water quality	High	High	
Central Section	Migration pathways for coastal wetlands in response to climate change	High	High	
Central Section	Dune vegetation management	High	High	
Central section	Sight lines for lifeguards	High	Extreme	Will be informed by coastal hazard studies
Southern section	Wind-blown sand impacting facilities, infrastructure and public safety	High	Extreme	✓

Table 1 Extreme and high risk issues identified in the first pass risk assessment

Detailed studies recommended for Stage 2 of the CMP development are as follows:

- 1 Littoral Rainforest and Coastal wetlands mapping
- 2 Coastal hazard studies
 - a. Coastal Cliff or Slope Instability Study



-
- b. Coastal Entrances Study
 - c. Foreshore Erosion Study
 - d. Coastal Inundation Hazard Study including wave overtopping
 - e. Tidal Inundation Hazard Study
 - f. Combined Open Coast Infrastructure Inundation Hazard Assessment
 - g. Combined Coastal Hazard Risk Assessment
- 3 Ecological studies
- a. Shorebirds – baseline inventory and threats
 - b. Ecology of rocky platforms – baseline inventory and threats
- 4 Identification of Aboriginal Cultural Heritage values and assets, and vulnerability assessment
- 5 Port Kembla Beach – options assessment for management of windblown sand
- 6 Detailed Risk Assessment and Stage 2 Report

Completion of all recommended studies will be dependent on funding and resource availability. Council may be required to prioritise these studies. Where a Stage 2 study cannot be completed, it may be considered for inclusion as an action in the CMP.

Development of the CMP is listed as an action in Council's Delivery Program. Council funding may be leveraged to obtain grants under the 'planning stream' of the NSW Government Coastal and Estuary Grants Program. Under that stream, funding is available for projects that aim to either develop a CMP or transition a coastal zone management plan (CZMP) to a CMP. It would be appropriate for Council to apply for grants under this program to complete the recommended Stage 2 studies.

A CMP provides a long-term strategy, developed with inputs from a cross section of government stakeholders and thus enables coordinated management of the coast and estuaries within a local government area. Council has already engaged with a range of external stakeholders through the Stage 1 community and stakeholder engagement process. In addition, the Open Coast Advisory Working Group had been established and comprises representatives from South East Local Land Service, Department of Primary Industries - Fisheries, divisions from Department of Planning and Environment - Environment, Energy and Science; Planning and Policy; Crowns Lands; and National Parks and Wildlife Service, Property NSW, Transport for NSW, Sydney Water, Illawarra Local Aboriginal Land Council. Moving forward into subsequent stages of CMP development, governance arrangements may change, with different agencies involved depending on management actions. In Stages 3 and 4, agencies will



be required to commit funding and resources for management actions for which they have financial, management or legislative responsibility.

CMP development will continue over the next 2 years following Council's adoption of the Scoping Study. It is recommended that Council allocate projects in its Forward Program and future operational budget to ensure the required studies are undertaken.

FINAL DRAFT



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1 Introduction

1.1 Background

Wollongong City Council (Council) is preparing a Coastal Management Program (CMP) to manage its coastal zone (excepting Lake Illawarra) as defined under the *Coastal Management Act 2016* (CM Act) and *State Environmental Planning Policy (Resilience and Hazards) 2021* (RH SEPP). A separate CMP for Lake Illawarra has been prepared (BMT, 2019) and was gazetted in 2020. This scoping study relates to the CMP which will cover the remainder of Wollongong's coastal zone, including its open coastline, the smaller estuaries and associated areas (excluding Port Kembla Port area). The coastal zone within the Wollongong LGA is shown in Figure 1.

The CMP is being prepared under guidance provided by the *Coastal Management Manual* (CMM), following the five-step process in Figure 2.

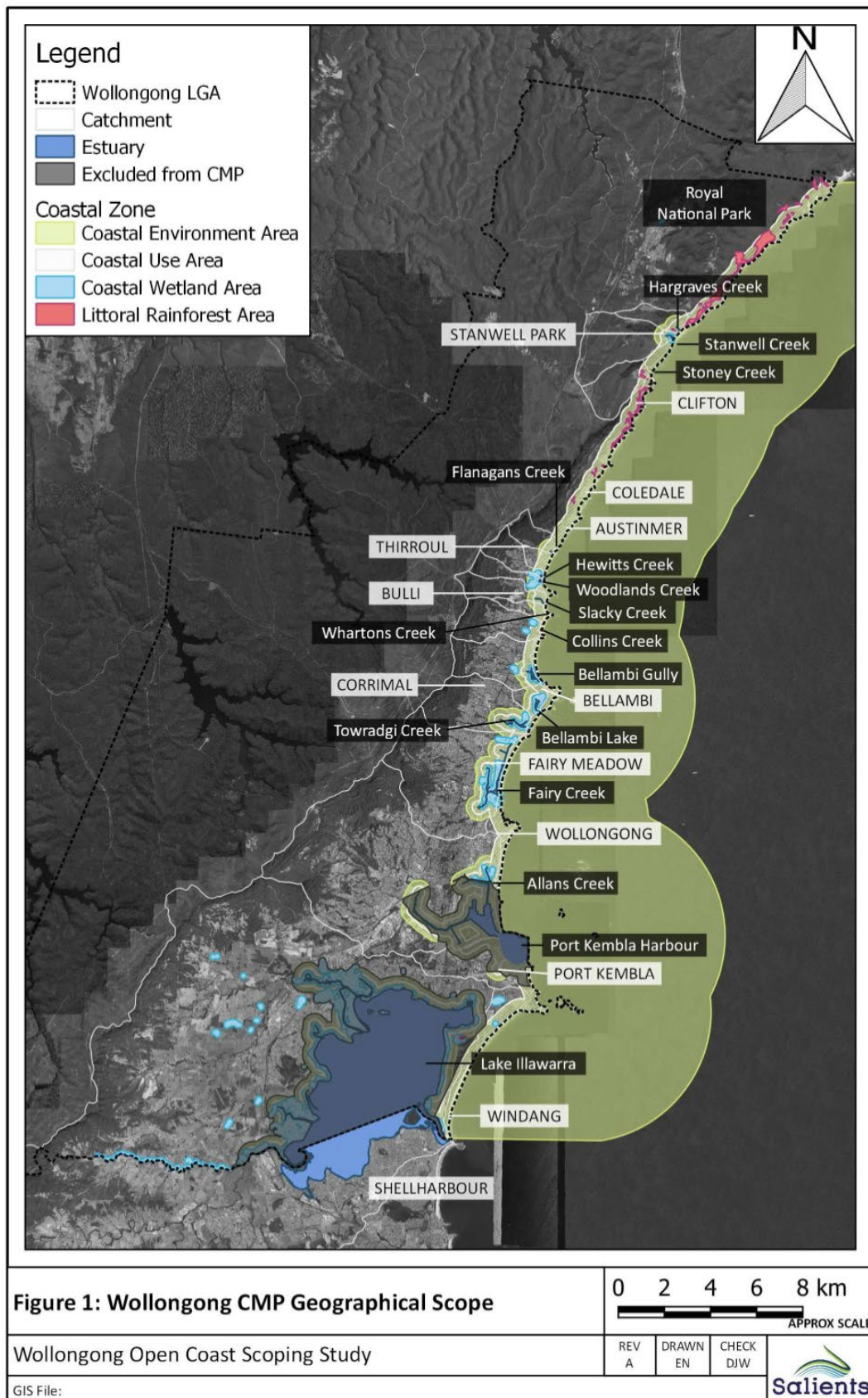
The scoping study is the first stage in preparing a CMP under Section 13 of the CM Act. The primary purposes of a scoping study are to:

- Review progress made in managing issues in coastal areas.
- Develop a shared understanding of the current situation.
- Identify the focus of the new CMP.

The scoping study utilises existing strategies, plans, reports, studies and data to identify past, current and future issues in the coastal zone. It provides an opportunity to review past management actions and gain a contemporary understanding of management, through engagement with the community and stakeholders. Through completion of the scoping study, knowledge gaps are identified to inform studies to be prepared in Stage 2. In Stage 3, the findings of the scoping study and Stage 2 studies will be integrated, allowing for informed development of management options.

Preparation of a CMP is an extensive process, but it is advantageous to local councils in NSW for several reasons, including:

- A CMP provides a long-term strategy, developed with inputs from a cross section of government stakeholders and thus enables coordinated management of the coast and estuaries within a local government area.
- A CMP presents an opportunity to manage the coastal zone proactively and to ensure that there is alignment with other local and regional planning instruments and initiatives.



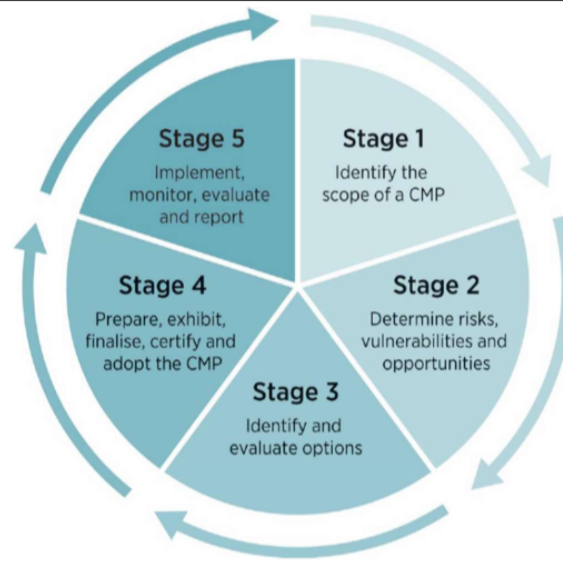


Figure 2 Stages in Preparing and Implementing a CMP (Source: (NSW Government, 2018a)).

- A CMP allows for community involvement in management and decision making, supporting community connection and the acknowledgement and protection of cultural values.
- A CMP will support Council to make decisions about the coastal zone which are evidence based, consistent with a long-term management strategy, transparent and sustainable.
- A CMP will provide technical information about the coastal zone which can be accessed by a range of stakeholders and which can serve to increase understanding of the coastal zone and challenges associated with its long term management.
- A gazetted CMP unlocks funding opportunities via the NSW Government's *Coast and Estuary Grants* funding stream (presently on a 1:2, local:state government contribution basis).
- A gazetted CMP allows for a more streamlined approval process for certain identified projects and activities.

1.2 Relationship of this Scoping Study to Other Coastal Plans

The Wollongong Coastal Zone Management Plan (CZMP), which dealt with coastal hazards along the Wollongong open coast and Lake Illawarra, was certified in 2017. That CZMP was prepared under the previous NSW coastal management framework, which was replaced in 2018.



The Wollongong CZMP was prepared in accordance with the then relevant legislative and policy framework being the NSW Coastal Protection Act 1979, NSW Coastal Policy and Guidelines for Preparing Coastal Zone Management Plans (OEH, 2013). Whilst many of the key issues remain unchanged, the identified coastal hazards and their treatment has changed between the prior coastal management framework and its replacement. The scoping study reconsiders these risks (or 'issues') in light of the current framework. As per section Schedule 3, Clause 4 of the CM Act, the 2017 CZMP will remain in effect until the end of 2023 or when replaced by a certified CMP, whichever comes first.

In response to public consultation carried out for the development of the current CZMP, Council developed a Dune Management Strategy for the patrolled areas of 17 beaches (GHD, 2014). The strategy has guided much of the active management of the Wollongong dune systems over the past 9 years. As with the CZMP, treatment of dune issues has changed under the current coastal management framework. Hence the Wollongong CMP will also replace the Dune Management Strategy once developed.

In 2020, the Lake Illawarra CMP was certified and is jointly managed by Wollongong City Council and Shellharbour City Council. The geographic scope of the Lake Illawarra CMP is distinct to the geographic boundary of this scoping study. However, ultimately it will be important that the CMPs managed by Wollongong City Council have a level of consistency where actions extend into Council policies, planning instruments and on-ground works.

The coastal zone in NSW includes estuaries upstream to their tidal limit. Estuary management plans (EMPs) (Cardno Lawson Treloar, 2005; GHD, 2007a) were prepared for the smaller creeks and lagoons within the Wollongong LGA under the previous coastal management framework.

- Fairy, Towradgi and Hewitts / Tramway Creeks Estuary Management Study and Plan (Cardno Lawson Treloar, 2005).
- Estuary Management Plan for Several Wollongong Creeks and Lagoons (GHD, 2007a), covering Tom Thumb Lagoon (including Springhill and J.J. Kelly catchments), Bellambi Lagoon, Bellambi Gully (including Farrahars Creek catchment), Collins Creek, Whartons Creek, Slacky Creek, Flanagans Creek (including Thomas Gibson Creek), Stoney Creek, Stanwell Creek and Hargraves Creek.

These EMPs are dated both in terms of the supporting studies and legislative and planning framework under which they were developed.

Due to changes in the overall approach to coastal management in NSW, it is difficult for a new CMP to carry forward the approach and findings of these previous documents. However, the historical context remains valuable in considering the



success or otherwise of previous management actions and whether those initiatives should be continued, replaced or abandoned altogether.

1.3 Structure of this Report

The Scoping Study Report is presented as:

- Section 2 outlines the physical components and coastal hazards of Wollongong's coastal zone.
- Section 3 outlines, in more detail, the strategic context relevant to the coastal zone.
- Section 4 summarises the stakeholder and community engagement undertaken during Stage 1.
- Section 5 presents a preliminary, overarching vision and discusses suitable objectives for the CMP.
- Section 6 presents the proposed scope for management actions relating to the coastal zone, including geographic issues and an assessment of the issues (or 'risks') that need to be managed.
- Section 7 outlines the findings of an audit of existing management strategies.
- Section 8 summarises the distribution of public and private land and infrastructure in the coastal zone. It also describes the roles and responsibilities of public authorities with regard to the CMP.
- Section 9 summarises the first pass risk assessment, identifies key and future issues, as well as describing studies recommended in Stage 2 of the CMP process.
- Section 10 closes the report with a business case and consideration of the forward program for integrating coastal zone management actions into the CMP.

The relationships between these sections and the key components required of a Scoping Study (as detailed in the manual) are outlined in Table 2.



Table 2 Relationship between the scoping study requirements and this report.

Scoping study requirement	Relevant section of document
Strategic context for coastal management	Sections 2, 3 and 4
Purpose, vision and objectives of the CMP	Section 5
CMP scope – issues and areas, including maps	Section 6
Review of current coastal management practices and arrangements	Section 7
Identification of roles and responsibilities	Section 8
First-pass risk assessment	Section 9
Stakeholder and community engagement strategy	Section 10.4
Preliminary business case	Section 10.1
Forward plan	Section 10.5



2 The Wollongong Coast

2.1 Coastal Form

2.1.1 Overview

The Wollongong coast spans around 50km, from the southern end of Garie Beach at the northern LGA boundary to the entrance of Lake Illawarra at the southern boundary. The coastline comprises a total of 27 beaches, mostly separated by headlands, rock platforms and cliffs.

The topography of the Wollongong LGA is shown in Figure 3. The Illawarra Escarpment runs parallel to the coast for the entire length of the LGA. The Wollongong coastal plain is triangular shaped, confined by the escarpment to the west and the coast to the east. The plain spans from around Thirroul to the southern end of the LGA. The plain is narrow at its northern end, averaging less than 1km between the coast and the escarpment, and widens with distance to the south to around 15km wide at Lake Illawarra. The coastline north of Thirroul is dominated by cliffs and development is confined to the lower slopes of the escarpment (GHD, 2010a).

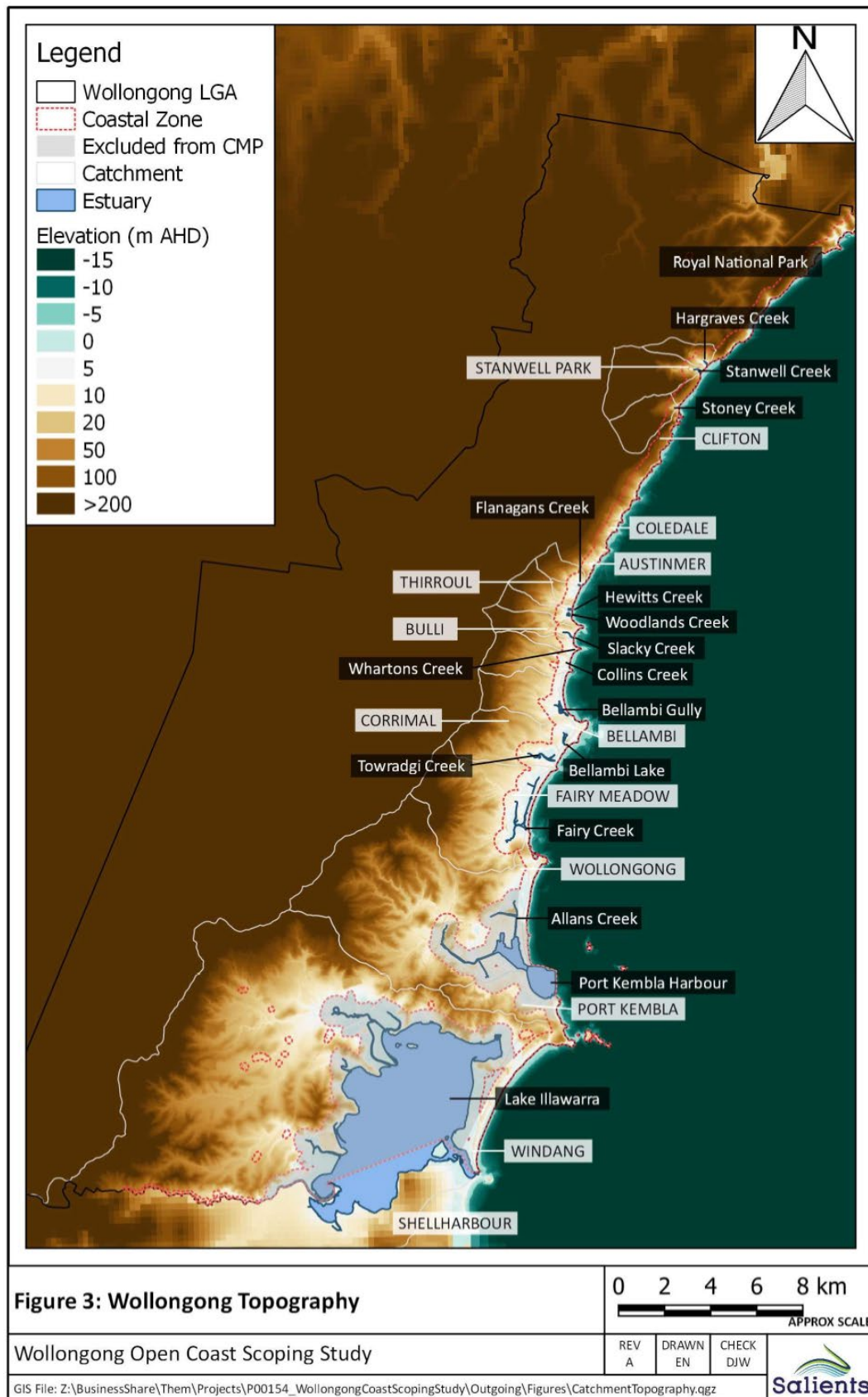
The beaches are predominantly small, embayed beaches in the northern section of the LGA, where the escarpment is located closest to the coast, and become longer towards the south as the plain widens.

The northern 10km of the Wollongong LGA lies within the Royal National Park. Four of Wollongong's beaches are part of the Royal National Park: Era Beach, Burning Palms Beach, Werrong Beach, and Bulgo Beach.

The coastal zone around Lake Illawarra is presently managed under the Lake Illawarra CMP and is excluded from the study area. Similarly, Port Kembla is excluded as it is managed under a separate legislative framework (SEPP Transport and Infrastructure 2021 – Chapter 5 Three Ports: Port Botany, Port Kembla and Port of Newcastle). However, Allans Creek and several areas upstream and outside the SEPP boundary for Port Kembla (for example Greenhouse Park, Tom Thumb lagoon, JJ Kelly Park) do fall within the coastal zone and therefore subject to this Scoping Study and CMP.

There are a number of creeks within the coastal zone, with generally smaller catchments in the north and larger catchments to the south. The main waterways included in the open coast CMP, from north to south, comprise:

- Hargraves Creek and Stanwell Creek (Stanwell Park)
- Stoney Creek (Coalcliff)
- Flanagans Creek (Thirroul Beach)





-
- Hewitts Creek / Woodlands Creek and Tramways Creek (McCauleys Beach)
 - Slacky Creek (Sandon Point Beach)
 - Whartons Creek and Collins Creek (Bulli Beach)
 - Bellambi Gully (Bellambi Beach)
 - Bellambi Lagoon and Towradgi Creek (Corrimal Beach)
 - Fairy Creek (Fairy Meadow – North Wollongong Beach)

2.1.2 Underpinning Geology and Coastal Geomorphology

The Wollongong LGA is situated within the Sydney Basin and comprises three geologic regions: the Woronora Plateau to the west, the steep Illawarra Escarpment and the Wollongong Plain upon which most of the City's development is located. Wollongong's geology is complicated, and the geological units found within the LGA include the Hawkesbury Sandstone, the Narrabeen Group, the Illawarra Coal Measures, and the Shoalhaven Group (GHD, 2007).

The Illawarra Escarpment is oriented north east to south west and was formed by westward recession of the plateau through natural processes including slope instability, coastal erosion, and marine abrasion (Flentje, 2012). Most of the escarpment is capped by Hawkesbury Sandstone, underlain by sandstones and claystones of the Narrabeen Group followed by sandstone, mudstone and coal of the Illawarra Coal Measures (Bowman, 1974). The slopes of the escarpment are covered by alluvial and colluvial debris (Flentje, 1998). In some locations, particularly towards the north of the LGA, these debris deposits are present near the coast.

The Wollongong Plain is bound by the escarpment to the west and ocean to the east. The Plain is typically less than 1km wide in the northern section of the LGA (north of Thirroul) and around 10-15km wide towards the south of the LGA.

The northern section of the Wollongong coast is characterised by sandstone and claystone units of the Narrabeen Group. Stanwell Park Claystone and Wombarra Claystone are prominent in this area and are associated with frequent landslides. Some small sandy beaches are present in this region but the coastline is predominantly rocky, with almost vertical 100m sandstone cliffs along the shoreline between Stanwell Park and Scarborough, and rock platforms at sea level (Abuodha, 2009; GHD, 2010a).

The escarpment is over steepened in the northern section of the LGA, where it has been undercut by coastal erosion. This section of the escarpment is particularly prone to landslides (Flentje, 2012; GHD, 2010a).

The plain to the south of Thirroul has comparatively flatter topography and is characterised by the Illawarra Coal Measures. The Illawarra Coal Measures occur from



Scarborough to Thirroul, Bulli Point, Wanjiora Point, Flat Rock, Bellambi, Bellambi Point, and Towradgi Point (Abuodha, 2009). This area contains alluvial floodplain soils of the Shoalhaven Group and generally consists of flat to moderate slopes with localised headlands and cliffs (GHD, 2010). Much of the coastal plain comprises Pleistocene age fluvial sediment.

The immediate coastline is characterised by sandy beaches of Holocene age, embayed by headlands, rock platforms and rocky reefs. The beach embayments are shorter towards the north of the LGA where the escarpment is located closer to the coast and become more pronounced and longer towards the south as the coastal plain widens (BMT WBM, 2017).

A geotechnical investigation was completed by Council in November 2009. The investigation included sampling at twelve beaches from Stanwell Park Beach to Windang Beach. It was found that all beaches contained poorly graded beach sands to a depth of 1-2.8m. Medium-coarse grained sands were typically present for the northern beaches (Stanwell Park Beach, Wombarra, Beach Coledale Beach), and fine-grained sands at the southern beaches (Wollongong City Beach, Coniston Beach, Port Kembla Beach, Windang Beach). Quartz and shell fragments were present at all beaches (Cardno Lawson Treloar, 2010a).

2.1.3 Overarching Coastal Processes

The beach is more than the “sub-aerial” beach which can be readily seen above the water line. When examining changes to the beach it is necessary to consider a dynamic system extending some distance offshore and being constantly reworked by waves, although the intensity and frequency of reworking by waves reduces with depth.

The present-day sand barriers (or beaches) and the adjacent shoreface represent the extent of the beach which can be reworked by waves. This area can be considered as the morphologically active extent of the beach and is encapsulated within the CM Act as the “beach fluctuation zone” which extends seaward to 40m below the highest astronomical tide level (around 39m below mean sea level in NSW) and incorporates “the range of natural locations a beach profile occupies”. This definition includes parts of the beach dune system. However, the area of the beach which is readily reworked is constrained along the Wollongong coast. Offshore reefs dominate the nearshore area, particularly to the north of Wollongong itself, and in the northernmost suburbs any sand present along the coast is limited¹. There is a rough spatial correlation between the size of the adjacent catchments and the extent of any sub aqueous sand bodies present along the coast.

¹ Linklater, M., Morris, B., Kinsela, M., Ingleton, T. and Hanslow, D. (2022), Exploring patterns of reef distribution along the southeast Australian coast using marine lidar data. Manuscript in preparation.
<https://datasets.secd.nsw.gov.au/dataset/3f00d173-aa85-4e58-8dda-97948d772700>



Wave and Water Level Environment

The NSW coastline, and the Wollongong coastline in particular, are subject to waves and water levels which have been well described (Cardno Lawson Treloar, 2010b). In summary:

- Waves are generated from a range of different weather patterns with a mean significant offshore wave height ($H_{s,o}$ of around 1.5m).
- Larger storm waves (say $H_{s,o} > 3.0\text{m}$) tend to occur in autumn and winter although storms can occur throughout the year and can approach from directions ranging from south, anti-clockwise to north east.
- Regardless, the dominant wave direction is from the south east to south. This is true for both storm waves and smaller waves.
- A 1% AEP storm wave height of $H_{s,o} = 10.6\text{m}$ was reported, based on the Botany Bay wave record.
- The nature and occurrence of storms is known to be correlated to climate indices such as the El Nino Southern Oscillation (ENSO), with La Nina periods tending to result in a greater storm frequency with storms arriving more from a (slightly) more northerly direction.
- The maximum *astronomical* tide range offshore of NSW is around 2.0m but tides propagate quickly along the NSW coast resulting in minimal shore-parallel tidal currents. Tide currents are most pronounced in the vicinity of estuarine entrances.
- Along the NSW coast, astronomical tides are semi-diurnal, meaning that the ocean water level goes up and down approximately twice a day. There is a further fortnightly cycle from smaller tide ranges (i.e., neap tides) through to larger tides (spring tides).
- During storms, a lowering of barometric pressure, onshore winds and further elevation of water levels against beaches due to wave setup and runup act to elevate water levels above normal astronomical tide levels. There are a range of other continental and ocean scale processes which also modify water levels by several centimetres.
- When the processes associated with storms coincide with high spring tides, severe coastal hazards can result, including those associated with erosion and /or coastal inundation. It is these rare events which pose a significant threat to coastal development and need to be managed appropriately.
- Historically, a commonly adopted still water level (excluding wave setup and runup) for the 1% AEP event has been around 1.45m AHD for the NSW coast.



This must now be adjusted due to an ongoing, climate change related rise in mean sea level.

Waves also generate currents in and around the beach. These are complex and continually changing, affected by the water level, configuration of bars and the angle at which the waves approach the beach.

Sediment Transport

During large storm events, steep, erosive waves tend to strip sand from the immediate beach face and carry that sand offshore to form sandbars. Subsequently, more ambient wave conditions tend to transport sand landward, causing an eroded beach to recover relatively quickly. However, due to the complexity of sand and water movement along the coast, this cannot be guaranteed.

Circulations associated with rip cells can cause sand to wash both ways along the beach and, during large wave events, to carry sand offshore via rip cells, depositing sand seaward beyond the breaking waves.

The dominant direction for sand movement along the NSW coast is from south to north due to the dominant south east to east wave approach direction. Waves generate an alongshore current which, when combined with the stirring action of waves as they are breaking, drive a south to north alongshore sand drift. Within a particular beach compartment, the dominant wave direction can change over longer periods (seasonally to interannually), causing sand to accumulate at opposite ends of the beach. This periodic oscillation, known as “Beach Rotation”, has also been linked to ENSO (Short and Trembanis, 2004), with La Nina periods associated with more sand at the southern end of a beach.

In assessing the potential response of the coast to waves, the “closure depth” concept is employed with an inner and outer closure depth commonly determined to define the offshore limits of the “upper” and “lower” shoreface, respectively (Hallermeier, 1983, 1981).

Closure depth is of particular importance when considering sea level rise. Future projections of shoreline location tend to be sensitive to the value adopted for the closure depth and the values adopted are subject to uncertainty. Use of 46 years of regular shore-normal transects on the Gold Coast led Patterson and Nielsen (2016) to settle on an inner closure depth of 11-12m, and an outer depth of about 26m, within which changes over hundreds to thousands of years could expect to be contained. In a probabilistic coastal erosion modelling assessment for sites along the NSW coast, (Flocard et al., 2013) allowed for closure depths to vary between 12 and 35m (modal value of 20m).



The validity of sets of previously determined values is likely limited in many locations along the Wollongong coast. The extensive presence of nearshore rocky reefs makes “closure depth” along with related concepts such as the “equilibrium profile” and the “Bruun Rule” difficult to apply with rigour.

Acting in addition to the above, even broader scale currents such as the East Australia Current (EAC) can, at times, flow close to headlands in NSW and are likely to have affected the distribution and shape of sand bodies associated with headlands where those are present. An elongated shelf sand body exists offshore of the Royal National Park, reported by Ferland (1990) as extending from Garie Beach at the northernmost extent of the Wollongong LGA, through to Maroubra. Recent analysis of underwater bed forms from lidar¹ indicates that this sand body continues as a sand plain in shallower water even further south reaching Coalcliff Beach. The next notable shelf sand body reported by Ferland is present offshore of Bass Point to the south of the entrance to Lake Illawarra.

Summary

In summary, while coastal form is controlled by bedrock features (headlands, reefs, outcrops) and modified by waves and water levels, the ways in which these interact, their varying magnitude and infinite combinations, and the way in which they move sand mean it is impossible to make exact, reliable predictions about where the shoreline may exist in future. The substantial uncertainty surrounding mean sea level in future decades makes these predictions even more difficult. A risk based and adaptive approach to development which may be threatened by sea level rise is desirable.

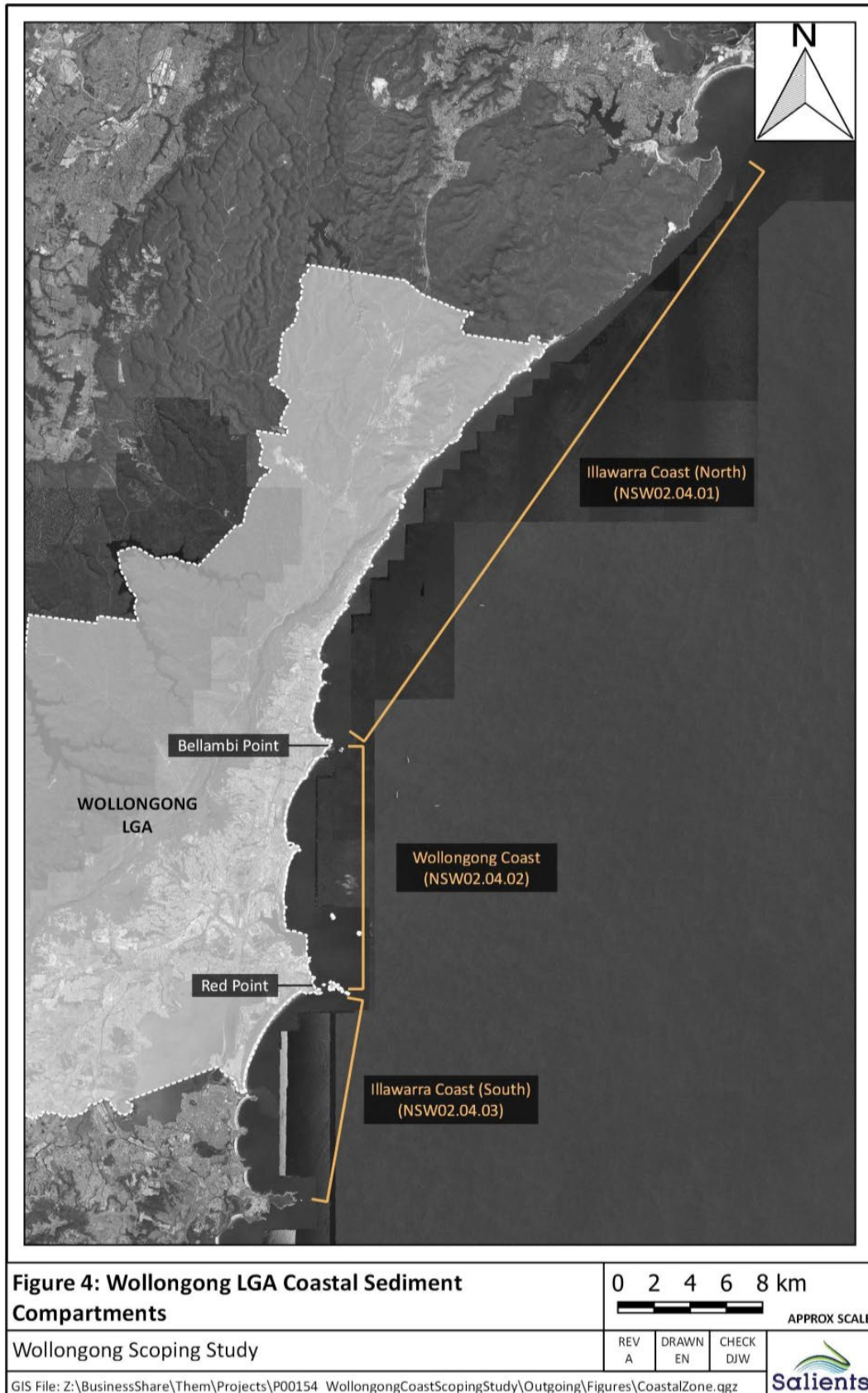
2.1.4 Sediment Compartments

Coastal sediment compartments are defined in the CM Act as:

“[areas] of the coast defined by its sediment flows and landforms”.

The act contains a schedule of sediment compartments. These are based on the “secondary” compartments described in Short and Thom (2018) and the three of interest to the Wollongong Open Coast (Figure 4) are:

- Illawarra Coast (North) (Sedimentary Compartment No NSW02.04.01), containing the boundary with Sutherland Shire Council and extending south to Bellambi Point.
- Wollongong Coast (Sedimentary Compartment No NSW02.04.02), from Bellambi Point to Red Point, northern end of Port Kembla Beach.





- Illawarra Coast (South) (Sedimentary Compartment No NSW02.04.03), extending south from Red Point and containing the boundary with Shellharbour City Council.

The sediment compartment approach is useful for coastal management as it enables the compartments to be treated as a semi-closed system and provides a framework for managing issues such as sediment transport across administrative boundaries².

The definition of these compartments means that Wollongong Council does have some obligations under the CM Act regarding consulting with the adjacent councils. Before adopting a CMP, a Council must consult on the draft CMP with any Councils that they share a coastal sediment compartment with. However, this only applies if the Councils LGA contains land within the coastal vulnerability area. At the time of writing there is no mapped coastal vulnerability area in New South Wales.

2.2 Coastal Zone Sections

The Wollongong Coast may be broken down into three logical sections for ease of description and reference. A finer scale precinct or suburb based approach however, may be of benefit at future stages of the CMP process, particularly in Stage 3 where management actions are developed. The northern coastal zone is typically less than 1km in width due to the presence of the escarpment. The central section commences at Thirroul where the coastal plain widens from around 1.5km at Thirroul to around 5km at Wollongong. Finally the southern section from Wollongong City Beach to the entrance of Lake Illawarra at Windang, has the widest coastal plain, ranging from approximately 5km wide at Wollongong, to around 15km at Lake Illawarra. The topography has a strong influence on development patterns and use of the coastal zone, and therefore subsequent influence on ecological and environmental features. These elements are described in sections 2.2.1 to 2.2.3.

2.2.1 Northern Section (Stanwell Park to Thirroul)

Coastal Form

The northern part of the coastline, from the northern boundary of the LGA to Thirroul, is shown in Figure 5. There is typically less than 1km from the coast to the escarpment in this section. The Wollongong coast begins 10km to the north of Stanwell Park, at Garie Beach, with that northernmost 10km within the Royal National Park.

South of the Royal National Park lies the village of Stanwell Park, shown in Figure 6. Stanwell Park is located in a small valley drained by Hargraves Creek, which flows through Stanwell Park Reserve before exiting across Stanwell Park Beach, and

² <https://coastadapt.com.au/how-to-pages/use-sediment-compartments-regional-coastal-management>, Accessed 1/12/2022

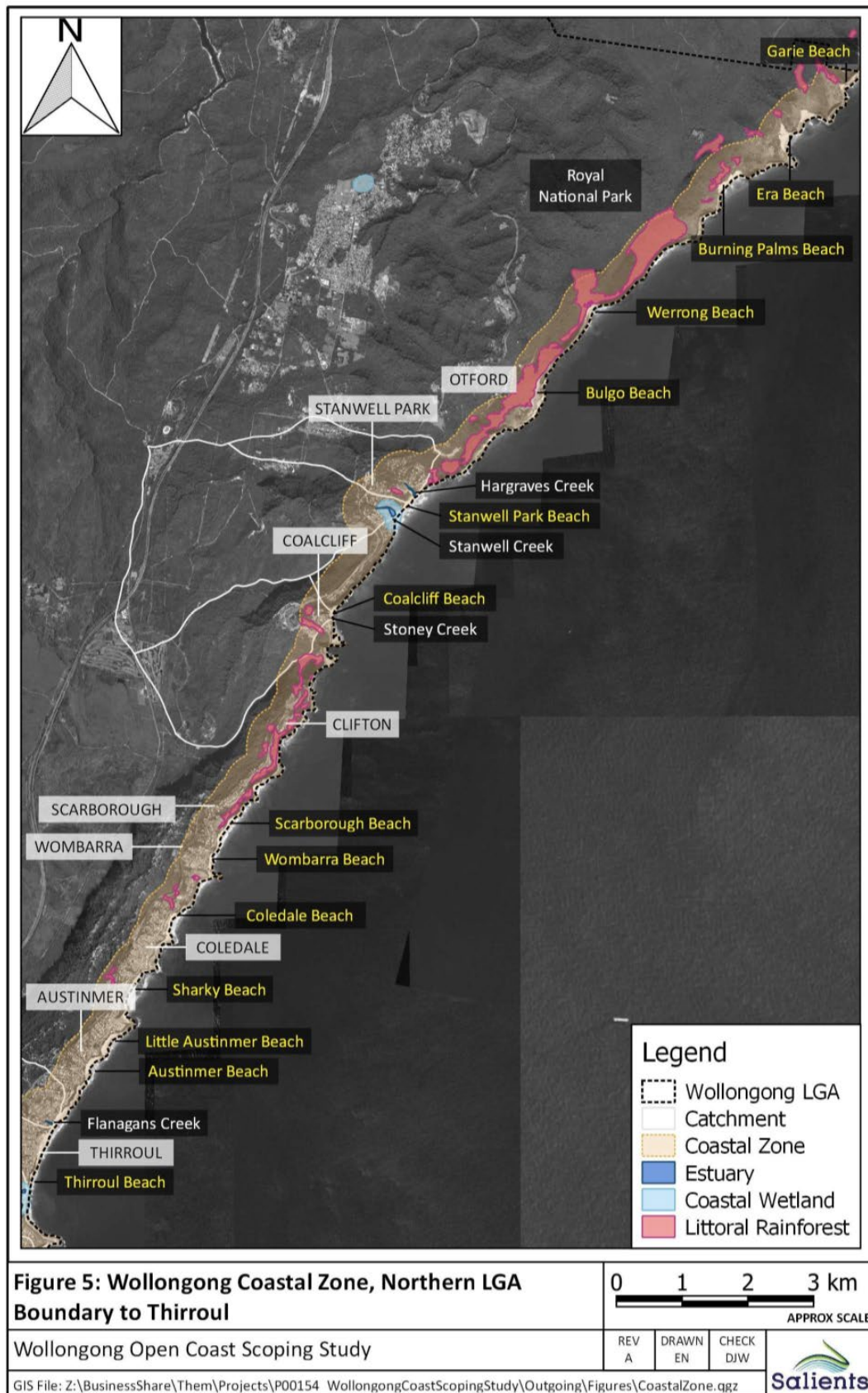




Figure 6 Stanwell Park. Image Courtesy Wollongong City Council.

Stanwell Creek, which drains the southern side of the village. Hargraves Creek and Stanwell Creek both intermittently open and close (i.e., classified as ICOLLs). Hargraves Creek is around 3km long and drains a catchment of approximately 210ha. Stanwell Creek drains a larger catchment of around 760ha, with three main tributaries, and is around 5km long (GHD, 2007b). Both creeks enter the ocean at Stanwell Park Beach.

Stanwell Park Beach is around 850m long and is backed by rock to the north of Hargraves Creek and to the south of Stanwell Creek. The Helensburgh-Stanwell Park Surf Life Saving Club (SLSC) is located towards the southern end of the beach, behind the dunes on the northern side of Stanwell Creek. Those dunes have an elevation of around 6m AHD in front of the SLSC but are as low as 3-5m AHD in front of the adjoining beach car park and amenities building.

Between Stanwell Park and Scarborough, the coastline comprises, typically, 50m high cliffs with rock platforms at sea level, except for the village of Coalcliff, located around 1km south of Stanwell Park.

Coalcliff Beach is a small, embayed beach around 350m long. Coalcliff SLSC and Coalcliff Beach Reserve are located towards southern end of the beach, where there is a relatively recently constructed sand filled geotextile bag wall in front of the reserve to protect the reserve and infrastructure from further coastal erosion. Based on aerial photos, the wall was constructed in 2016 in front of the SLSC, then was extended both towards the north and towards the south to the entrance to Stoney Creek in 2017. The geotextile bag wall is shown in Figure 7. The entrance to Stoney Creek is located at the southern end of the beach, also shown in Figure 7 on the left-hand side. Stoney Creek is a small ICOLL that is 3km long, with three tributaries and a catchment of

approximately 425ha (GHD, 2007b). Coalcliff Rock Pool is located on the rock platform to the south of the beach, which can be seen in Figure 8.



Figure 7 Geotextile Bag Wall at Southern end of Coalcliff Beach



Figure 8 View south towards Sea Cliff Bridge. Image Courtesy Wollongong City Council.

Between Coalcliff and Clifton, the escarpment is immediately adjacent to the ocean, and Lawrence Hargrave Drive either hugs the cliff or is suspended over the surf zone via the Sea Cliff Bridge face, as shown in Figure 9. South of Clifton, the coastline comprises more regular beach embayments and slightly flatter topography between the escarpment and the coast.

The 1km long Scarborough-Wombarra Beach is located around 2.0km south of Clifton. The northern end of Scarborough Beach is backed by rock and is bounded by rock platforms at both the north and south ends. Scarborough Wombarra SLSC is located behind the middle Scarborough Beach with elevation around 11m AHD. The Horse Creek entrance is located towards the southern end of Scarborough Beach. Horse Creek is approximately 1.3km long, draining a catchment of around 90ha.

Wombarra Beach is to the south of Scarborough Beach, separated by a rock platform. There is a sea wall with elevation ~4m AHD at the southern end of Wombarra Beach in front of the beach amenities block. Wombarra Rockpool is located at southern end of the beach, in front of the sea wall.



Figure 9 Sea Cliff Bridge. Image Courtesy Wollongong City Council.

Coledale Beach is another small, embayed beach around 300m long, located around 1km to the south of Scarborough - Wombarra. The Coledale Camping Reserve is located at the back of the dune along the full length of beach, with elevation around 4-5m AHD. Coledale SLSC is located at the southern end of the beach and is also on low-lying land (~5m AHD). The reserve behind the beach at the southern end, as well as the SLSC, are shown in Figure 10.



Figure 10 Southern end of Coledale Beach with Coledale SLSC, View towards the South.

850m long Sharkys beach is located south of Coledale, separated from Coledale Beach by a 700m long rock platform which also contains Coledale Rock Pool. A photograph of Sharkys Beach, taken from the north end looking towards the south, is shown in Figure 11. The southern end of Sharkys Beach includes a boat ramp and is bound by Brickyard Point. Carparks are located at both ends of the beach, at elevations of around 5m AHD. The north carpark can be seen on the right-hand side of Figure 11.



Figure 11 Sharkys Beach, View from North end towards the South.

Little Austinmer Beach is 400m long, spanning between Brickyard Point and Bells Point. Tuckerman Park is located at the northern end of the beach with an adjoining carpark. Elevations are between 4-5.5m AHD along the park and carpark. Jacky Jones Gully, a 1km long creek, exits to the ocean near the middle of the beach.

From Bells Point, Austinmer Beach spans 350m further south. The stretch of Lawrence Hargrave Drive that passes behind Austinmer Beach is low-lying (around 5m AHD) and is located 20-30m from the back of the beach. The reserve behind Austinmer Beach, including the carpark and Knox Park Playground, Austinmer SLSC, Austinmer War Memorial and the Pavilion are also low-lying, predominantly below 4m AHD. The Austinmer Ocean Pools are located at the southern end of the beach. The southern end of the beach, including the ocean pools, pavilion and SLSC, is shown in Figure 12.

The coastline stretches a further 600m south before reaching Thirroul Beach, with the shoreline comprising either rocky reef or a narrow and thin veneer of sand behind a submerged rock platform. The coastline south of Austinmer Beach can be seen in Figure 12.



Figure 12 Austinmer Beach (South End) and Austinmer Ocean Pools. Image Courtesy Wollongong City Council.

At the northern end of Thirroul Beach there is a drainage line which discharges to the beach. Approximately 180 metres to the south, Flanagans Creek is an ICOLL which



discharges across the northern end of Thirroul Beach although it originally extended further south to Harbord Street, south of the Thirroul Pool, prior to construction of the pool complex in the 1930s (GHD, 2007b). It drains a catchment of 266ha which comprises part of Austinmer and Thirroul.

The Thirroul SLSC and adjacent carpark, the Beach Pavilion and the Thirroul Pool are all located along the back of the beach to the south of Flanagans Creek and are low-lying with elevation typically 3.5-4m AHD. There is a low, concrete sea wall extending from in front of the carpark north of the SLSC around 300m southwards along the back of the beach, with elevation around 3.5-4m AHD. The settled area of Thirroul behind the northern section of Thirroul Beach, on both sides of Flanagans Creek, is also low-lying (elevation around 3-4m AHD).

Development Patterns and Land Use

The most northern 10km of the Wollongong coastline is part of the Royal National Park. Established in 1879, the land was the first in Australia reserved for the purposes of a national park. Today, the park continues to be managed with the goal of preserving the ecological and cultural values of the land, whilst providing recreational, educational and visitor opportunities.

North of Thirroul, the Wollongong coastline is dominated by cliffs, and the escarpment is generally located within 1km of the coast. Development is hence limited to this region, on the lower slopes of the escarpment. The topography of this section steep and is particularly prone to landslides.

The proximity of Stanwell Park to metropolitan Sydney makes it a desirable location for residents who commute for employment purposes. The Stanwell Park coastal zone is approximately 50% zoned residential (R2 - Low Density). Expansion of the residential footprint is unlikely with the suburb bound by the escarpment to the west and the Illawarra Railway Line. However, there may be opportunities and demand in the future for density intensification. Stanwell Park provides a unique recreational opportunity, with the topography allowing for hang gliding and para gliding from Bald Hill to Stanwell Park Reserve. The current and forward management of this public recreation land (zoned RE1) is detailed in the Stanwell Park Reserve and Bald Hill Plan of Management (Wollongong City Council, 2021a).

From Stanwell Park Reserve to the suburb of Coalcliff, the coastline includes a mix of land zoned for the purposes of recreation (RE1) or conservation (C2, C3, C4 zonings). Like Stanwell Park, Coalcliff is a small coastal village. Much of the Coalcliff Coastal Zone is zoned primary production (RU1), being the location of the former Coal Cliff Cokeworks that closed in 2013. Whilst dwelling houses are permitted with consent in an RU2 zone, the minimum lot size is 39.99ha. Hence with the current zoning, the



intensification or an increase in footprint of the current urban environment is not anticipated.

From Coalcliff to Thirroul, the entire coastline is zoned Public Recreation (RE1). The strip of RE1 land ranges from 7.5 – 250m in width. From the suburb of Scarborough to Thirroul, residential development in the coastal zone is continuous. With the escarpment running close to the coastline, the residential development is relatively narrow, mostly bound between the public recreation strip to the east and the Illawarra Railway Line to the west. Land west of the railway line that lies within the coastal zone is, for the most part, zoned for conservation purposes and unsuitable for urban development due to the steep terrain. The presence of the escarpment once again limits any urban expansion, however intensification is possible within the existing urban footprint.

Environmental / Ecological Features

Of interest to the coastal management program are areas of coastal wetland and littoral rainforest, presently mapped in the RH SEPP. It should be noted that there are some significant anomalies in the RH SEPP Mapping, as well as the Illawarra Plant Community Type Vegetation Map 2020. Numerous locations are mapped where there is clearly no vegetation present, including roadways, cemeteries, residential properties and sports fields. Hence, there is a low level of confidence in the current vegetation mapping. The extent of coastal wetland and littoral rainforest vegetation needs to be re-examined and updated.

The Royal National Park land within the Wollongong Coastal zone comprises a narrow, steep escarpment supporting small patches of littoral rainforest, dominated by cabbage tree palms (*Livistona australis*) (NSW National Parks and Wildlife Service, 2000). A small patch of littoral rainforest is also mapped south of the entrance road to Stanwell Park Reserve. From Coalcliff to Scarborough, much of the vegetation on the immediate coastal plain is identified as littoral rainforest. South of the Scarborough Wombarra Cemetery to Thirroul there are 6 small, isolated patches of littoral rainforest that, due to their proximity to urban development, are subject to edge effects such as disturbance and weeds.

A single area of coastal wetlands is mapped in the northern coastal section associated with Stanwell Creek. An additional vegetation community of significance is Themeda grasslands, which occur on exposed coastal cliffs and have been identified within Royal National Park, Bald Hill, south of Stanwell Park Beach and on the clifftops immediately north of Coledale Beach and south of Sharkys Beach.

Stanwell, Hargraves and Stoney Creeks provide a range of estuarine and riparian habitat for a variety of native fauna including reptiles, micro bats, birds, flying foxes and amphibians. Stanwell and Hargraves Creeks are considered suitable habitat for



the endangered Green and Golden Bell Frog (*Litoria aurea*) that typically inhabit unshaded waterbodies containing Typha species, often in highly disturbed environments (GHD, 2007a).

Stanwell Park Beach exhibits a well-developed dune vegetation system, particularly north of the SLSC, where both a fore dune and hind dune are evident. The fore dune vegetation is mapped as Coastal Sand Scrub which provides a food source for migratory and nomadic nectar and insect feeding birds (GHD, 2014). There are small patches of dune vegetation at Coledale Beach, mostly confined to the northern and southern ends providing limited habitat for Grey-headed Flying-fox, Eastern Bentwing Bat and Regent Honeyeater (GHD, 2014).

At Coalcliff and Scarborough no dune vegetation is present. Vegetation at these beaches is growing on Illawarra Coal Measures soil, rather than on sand. Predominantly mapped as Coastal Headland Banksia Scrub, this vegetation community provides a range of habitat values associated with nectar, seed and fruit bearing native plants, trees of varying age and size classes and patches of dense understorey (GHD, 2014).

There is a large, healthy patch of Themeda Grassland on Seacliffs on the headland to the north of Austinmer Beach. Large rock outcrops along this section of the coast provide habitat for migratory shorebirds and waders such as the Sooty Oystercatcher, which has several records within the area. Offshore seabirds, such as the Sooty Shearwater, have been recorded in significant numbers on occasion along the beach (GHD, 2014).

As with many urban coastal environments, threats to the natural environment include weed invasion, vegetation disturbance due to informal pedestrian access and disturbance of native fauna by domestic dogs. Additional threats in the northern section include clearing of native riparian and dune vegetation and impacts of deer (weed spread, soil erosion and trampling / grazing native vegetation).

Water Quality

The most recent water quality data for Hargraves, Stanwell and Stoney Creeks was collected in 1999. At the time, faecal contaminants were of particular concern with levels regularly exceeding the secondary recreational contact limit. However, in 2006 Sydney Water implemented a sewerage scheme resulting in the majority of residential properties in this geographic region connecting to the scheme (GHD, 2007a). There has been no regular program of monitoring since this time.

Recreational water quality has been monitored at the beaches in the Wollongong LGA since 1996 by Sydney Water Corporation, as a requirement of Environment Protection Licences, and by Wollongong City Council since 2011 under the Department of Planning and Environment's Beachwatch Partnership program. The 2021-2022 report



card grades Stanwell Park Beach and Austinmer Beach as very good and Coledale and Thirroul Beaches as good (NSW Government Department of Planning and Environment, 2022a).

2.2.2 Central Section (Thirroul to Flagstaff Hill)

Coastal Form

The central part of the coastline, from Thirroul to Flagstaff Hill, is shown in Figure 13. In this region, the coastal plain widens from around 1.5km at Thirroul to around 5km at Wollongong. This section of the coastal plain generally has flatter topography compared to the northern section.

McCauleys Beach is located south of Thirroul beach, with the two separated by around 500m of a narrow but variable strip of sandy beach backed by a coastal bluff. McCauleys Beach is around 750m long, stretching south to Sandon Point. A photograph of the southern end of the beach, captured from above Sandon Point is shown in Figure 14. The Sandon Point Boat Sheds are located at the southern end of the beach, on the northern side of Sandon Point.

Hewitts Creek is around 3km long and flows through Thirroul, draining a catchment of approximately 230ha. Hewitts Creek is categorised as an ICOLL, with its entrance located at the northern end of McCauleys Beach. The entrance is unmanaged and is often closed (Cardno Lawson Treloar, 2010b). Woodlands Creek forms the boundary of the suburbs of Thirroul and Bulli. The creek is around 2.7km long and historically joined with Tramway Creek near the entrance, discharging midway along McCauleys Beach. Accretion of sediment in Woodlands Creek has resulted in the formation of a breakout channel linking Woodlands Creek to Hewitts Creek.³

Sandon Point Beach runs south from Sandon Point, for approximately 1km to its southern end at Waniora Point. Sandon Point and Sandon Point SLSC is located at the northern end of the beach, situated around 4.5m AHD. The SLSC can be seen in Figure 14. Trinity Row and Blackall St are located to the rear of the beach at around 5m AHD, and as low as 3.5m AHD in some locations. There are a number of low-lying residential properties along this road and a sports ground (also low-lying), particularly around the middle and southern section of the beach.

Slacky Creek, an often closed ICOLL, discharges across the middle of Sandon Point Beach (GHD, 2007b). Slacky Creek passes through Bulli for around 5km, draining a catchment of 300ha.

³ Email from Robert Dinero dated 2/12/2022

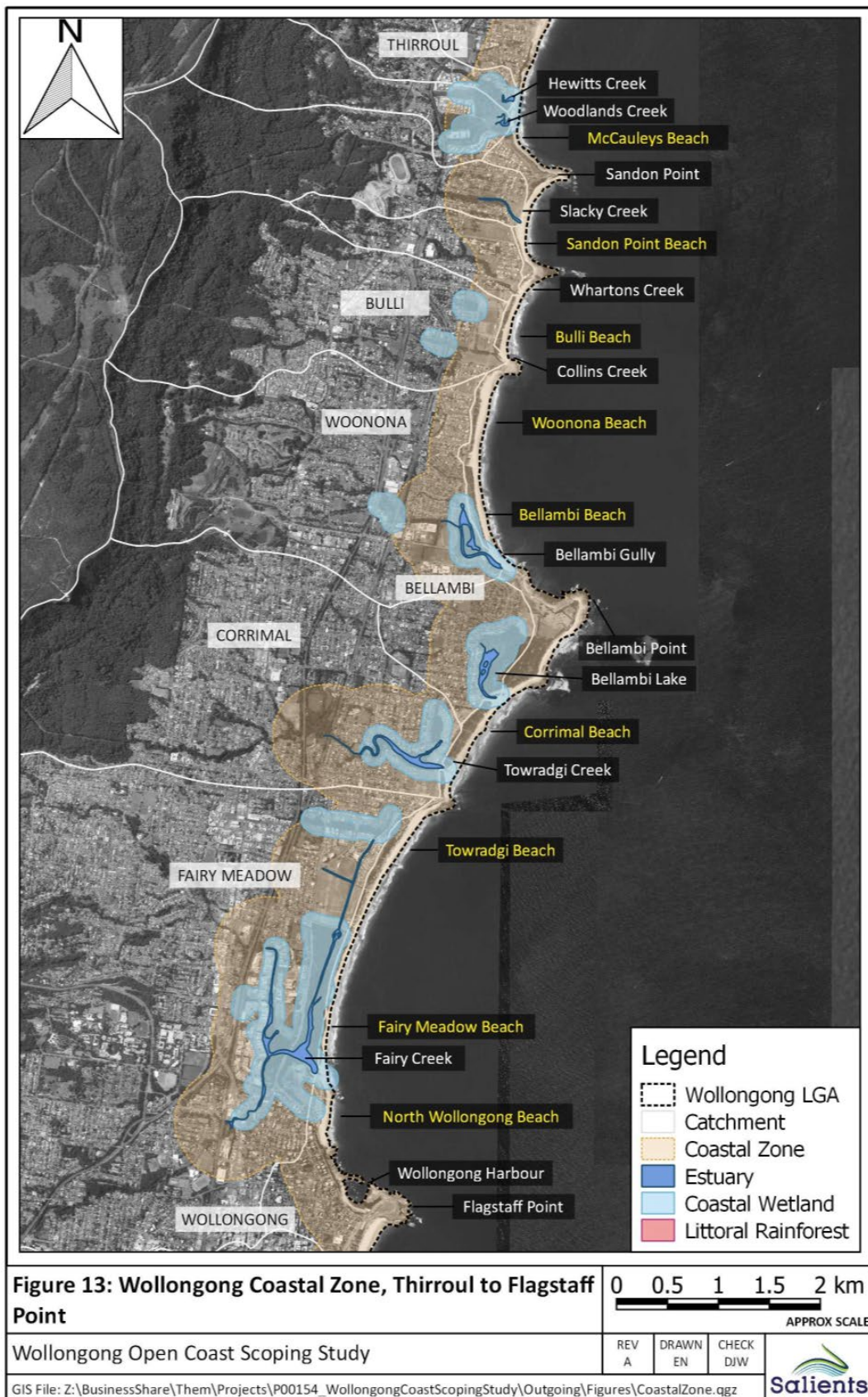




Figure 14 Sandon Point Beach, Sandon Point and south end of McCauleys Beach.
Image Courtesy of Wollongong City Council.

Bulli Beach is around 900m long, located between rock outcrops at Waniora Point and Collins Point. There are also rock pools at both ends (Bulli Rockpool in the north and Woonona Rock Pool in the south). Along the northern end of the beach, between Waniora Point and the Whartons Creek entrance, is Bulli SLSC, a café, and Bulli Beach Reserve (shown in Figure 15). The elevation of the dune along this northern section is around 4-5.5m AHD. The reserve itself is also low-lying, predominantly below 5.5m AHD. Vegetated dunes are present along the entire beach. The Wollongong to Thirroul Coastline Cycleway is located behind the dunes for the full length of the beach and is shown in Figure 16.

Whartons Creek is an ICOLL which drains a catchment of around 200ha, managed periodically by re-aligning the location of the creek breakout to minimise adjacent erosion of dune and accessways. The re-alignment is managed through implementation of the Whartons Creek Entrance Management Plan (Royal Haskoning DHV, 2015a). The entrance is just south of Bulli Beach Reserve, towards the northern end of Bulli Beach, and is often closed (GHD, 2007b). Bulli Beach Tourist Park occupies the area behind the beach on the southern side of Whartons Creek, just behind the beach as shown in Figure 16. The northern end of the holiday park is low-lying, situated mostly below 5.5m AHD.

The entrance to Collins Creek is located at the southern end of Bulli Beach. Collins Creek is approximately 4km long with a catchment of around 400ha. It is a small ICOLL and often closed (GHD, 2007b).

The Woonona-Bellambi Beach compartment is located between two rock platforms: Collins Point and Bellambi Point. The beach compartment is approximately 2.5km long with vegetated dunes along almost the entire beach. The Coastline Cycleway also runs behind this beach. The Woonona SLSC is located at the northern end of Woonona Beach, with elevation approx. 5m AHD. The vegetated dunes are wider and lower towards the southern end of the beach. A drainage channel discharges across the

middle of the beach. Some of the residential area behind the beach is low-lying, particularly around that drainage channel.



Figure 15 Bulli Beach, North End. Image Courtesy of Wollongong City Council.



Figure 16 Coastline Cycleway, Bulli Beach. Image Courtesy of Wollongong City Council.

Bellambi Gully is an ICOLL with entrance located at the southern end of Bellambi Beach. It has two tributaries: Bellambi Gully Creek and Farrahars Creek, with a total catchment area of 430ha. The entrance is unmanaged and is often closed (Cardno Lawson Treloar, 2010b). It is connected to a freshwater wetland known as Bellambi Gully Wetlands, to the north of Bellambi Gully (GHD, 2007b). The Bellambi SLSC is located on the western side of Bellambi Gully Creek. Immediately south of the Bellambi Gully entrance is Bellambi Rock Pool, which has been constructed on a low rocky headland which partly compartmentalises this beach. The rock pool and Bellambi Gully entrance are shown in Figure 17. To the south of this low headland, the beach comprises a narrow 500m long strip of sand interspersed with nearshore rocky

reef, backed by the low-lying Robert Cram Drive, which provides access to the Regional Boat Launching facility at Bellambi Point.



Figure 17 Bellambi Rock Pool. Image Courtesy of Wollongong City Council.

There is a breakwall on the northern side of Bellambi Point which shelters the boat ramp and its accompanying jetty, shown in Figure 18. There is an adjacent carpark (~150m long by ~60m wide) protected by rock revetment to the west of the breakwall and boat ramp. The entire carpark is below 3.5m AHD. Bellambi Wastewater Treatment Plant is located at Bellambi Point, just south of the carpark, with elevation between 6-7m AHD. This area is managed in part by the NSW Government and in part Council.



Figure 18 Bellambi Point Breakwall, Boat Ramp and Carpark. Image Courtesy of Wollongong City Council.



To the south of Bellambi Point, the narrow, 800m long Bellambi Point Beach stretches southwards for around 800m to Sandspit Point. There has been a history of sand mining in the Bellambi dunes.

Corrimal Beach is located between two rocky outcrops, Sandspit Point to the north and Towradgi Point to the south. It is approximately 1.5km long and is backed by wide, vegetated dunes. There are two ICOLLs at the north and south ends of the beach: Bellambi Lagoon and Towradgi Creek. Bellambi Lagoon is a large ICOLL, relative to others on the Wollongong coast, with entrance near the north end of Corrimal Beach. Bellambi Lagoon is shown in Figure 19. The entrance is often closed (Cardno Lawson Treloar, 2010a) and does not have a formal Entrance Management Policy, however it has been periodically managed through beach scraping and re-contouring, to artificially manage the entrance position and to prevent further erosion of the adjacent dunes. The Towradgi Creek entrance is near the southern end and is managed for flood mitigation. Its catchment area is 750ha.



Figure 19 Bellambi Lagoon. Image Courtesy of Wollongong City Council.

Corrimal Beach Tourist Park occupies most of the area behind the dunes along central Corrimal Beach (between Bellambi Lagoon and Towradgi Creek). The central-southern section of Corrimal Beach and the adjacent tourist park are shown in Figure 20. Corrimal SLSC is located towards the southern end of the beach, on the north side of the Towradgi Creek entrance. Active management of the entrance is conducted as prescribed within the Towradgi Lagoon Entrance Management Policy (Cardno Lawson Treloar, 2007a). The SLSC building is situated behind the dunes at 3.3m AHD, and the dune in front of this location is around 4m AHD.



The Towradgi-Fairy Meadow Beach compartment extends 3km from Towradgi Point at its northern end to the Fairy Creek entrance, near Stuart Park, North Wollongong. Towradgi Rock Pool is located at the northern end of the beach. Vegetated dunes are present along the entire beach, with the southern end consisting of Puckeys Estate Nature Reserve. The entrance to Fairy Creek is located at the southern end of Fairy Meadow Beach and is managed for flood mitigation in accordance with the Fairy Lagoon Entrance Management Policy (Cardno Lawson Treloar, 2007b). The Fairy Creek entrance and Stuart Park are shown in Figure 21. Fairy Creek's main tributaries are Fairy Creek and Cabbage Tree Creek, collectively draining a catchment area of around 2100ha, (Cardno Lawson Treloar, 2010b). Both Towradgi and Fairy Meadow have SLSCs.



Figure 20 Corrimal Beach and Tourist Park. Image Courtesy of Wollongong City Council.



Figure 21 Fairy Creek Entrance and Stuart Park. Image Courtesy of Wollongong City Council.



North Wollongong Beach is on the southern side of Fairy Creek. It is around 600m long with a rock platform at its southern end. A photograph of the beach captured from the southern end is shown in Figure 22. Stuart Park is located behind the dune at the northern end of the beach, on the southern side of Fairy Creek. The park is mostly below 5m AHD, with the dune in front of the park ranging from 5-7m AHD. Within the park are carparks and Cliff Road, which runs behind the whole beach. South of the park is the North Wollongong SLSC and a café, with elevations around 5.5m AHD. From the SLSC to the southern end of the beach, the beach is backed by a sea wall. The sea wall has elevation around 4.5m AHD and can be seen in Figure 22. Upgrade and construction of an extension to the sea wall at the northern end, along the beach in front of the SLSC building, commenced around mid-2021. There are gabions under the dune at the northern end of the beach. North Wollongong Beach Pavilion is located towards the southern end of the beach and can also be seen in Figure 22. The elevation of the pavilion is around 4.5-5m AHD.



Figure 22 North Wollongong Beach. Image Courtesy of Wollongong City Council.

The Continental Pool is located at the southern end of the rock platform to the south of North Wollongong Beach. South of the Continental Pool, enclosed by breakwalls, is Wollongong Harbour, also called Belmore Basin, with the Wollongong Breakwater Lighthouse located on the eastern breakwall. The harbour and Continental Pool are shown in Figure 23. A 380m long beach (Cove Beach) is located inside the harbour.

The Blue Mile Pathway is located along the shoreline, atop the seawall extending from the southern end of North Wollongong Beach, along the back of Cove. This section of the pathway has elevation around 4-6m AHD.



Flagstaff Hill is a large Headland to the south of Wollongong Harbour. Flagstaff Point Lighthouse is located at the top of the headland and can be seen in Figure 24.



Figure 23 Wollongong Harbour. Image Courtesy of Wollongong City Council



Figure 24 Flagstaff Hill and Lighthouse. Image Courtesy of Wollongong City Council.

Development Patterns and Land Use

The central section from Thirroul to Flagstaff Hill is characterised an increasing width of coastal plain between the escarpment and the coastline, creating a wider area suitable for urbanisation, and a more expansive urban footprint between the coast and the escarpment. The central section coastline has a strip of land zoned for Public Recreation (RE1) along almost its entire length. The exception is a section of land zoned Environmental Living (C4) at the southern end of Thirroul Beach where there are 11 direct waterfront residences, and the 1.5km of coastline zoned Environmental Conservation (C2) at Puckeyes Beach and Estate (Behind Fairy Meadow Beach). Other Environmental Conservation land within the broader coastal zone includes Bellambi



Lagoon Reserve, Carrington Woodland and the low-lying area between Hewitts and Woodlands Creeks at Thirroul.

Much of the public recreation coastal strip is backed by a Low Density Residential (R2) zoning to its immediate west. From Fairy Meadow, south to the Wollongong city centre, Multi Dwelling Housing (R3) land becomes prominent. At North Wollongong, there is a substantial block of General Residential (R1) land to the west of the public reserve adjoining George Hanley Drive and Cliff Road. The General Residential zoning provides for a range of housing types and densities and facilities and services to meet the needs of residents. There is also an area of Light Industrial zone (IN2) adjacent to Fairy Creek.

The central section of the coast supports a number of large-scale public facilities within the coastal zone. Facilities located within Special Activities land (SP1) include Bulli Cemetery and the University of Wollongong Innovation Campus. The Bellambi Gully sports fields and the Bellambi Wastewater Treatment Plant occupy land zoned Infrastructure (SP2). Land zoned SP3 (Tourist) includes the Bulli Beach Tourist Park, Corrimal Beach Tourist Park, and Wollongong Surf Leisure Resort which contains a mixture of short stay accommodation and permanent residents.

Sandon Point Aboriginal Place and Bellambi Point are of considerable significance to Aboriginal people. Sandon Point is a highly significant and sacred site and was declared an Aboriginal Place by the NSW government in 2007. Bellambi Point was declared an official Aboriginal Place in 2012 recognising its cultural significance.

Wollongong Harbour is zoned Working Waterfront (IN4). Wollongong Harbour is owned in part by the NSW Government and in part Council, and managed by Transport for NSW who released a Master Plan Report for the harbour in October 2020. The vision for the harbour is the continuance of marine, tourism and recreation uses. Whilst there is ongoing support for a working harbour, the decline in need for boat building services means that the working elements will primarily comprise fishing, charter and tourism operators. Adaptive re-use options for the hardstand currently utilised for boat building include provision of a café or kiosk.

Environmental / Ecological Features

The central section is characterised by the presence of coastal wetlands and the absence of littoral rainforest, reflecting the flatter terrain in the immediate vicinity of the coast. Coastal wetlands are associated with the low-lying land in and adjacent to Hewitts, Woodlands and Tramway Creeks, at Thirroul; Bellambi Gully, Bellambi Lagoon, Towradgi Creek, Fairy Creek and Puckeys Estate Nature Reserve which is behind Fairy Meadow Beach.

Bellambi Gully, Bellambi Lagoon and Puckeys Estate Nature Reserve are significant in terms of biodiversity in a coastal zone otherwise dominated by urban development.



Bellambi Gully is an estuarine creek with an intermittently closed entrance. It provides habitat for a range of reptiles, birds, micro-bats, flying foxes and amphibians. Two threatened vegetation communities (Biodiversity Conservation Act 2016) are present, including Swamp Oak Floodplain Forest and Bangalay Sand Forest. Bellambi Gully is considered to provide potential habitat for the threatened Green and Golden Bell Frog, Australasian Bittern and Black Bittern.

Bellambi Lagoon lies south of Bellambi Gully, separated by residential development. The dominant vegetation community is Swamp Oak Floodplain Forest. Bellambi Lagoon is the only surveyed site in the central and southern coastline of Wollongong with potential habitat for arboreal mammals due to the presence of hollow bearing trees and stags (GHD, 2007b). Additional survey effort could potentially identify hollow bearing trees and arboreal habitat at other locations, such as within Puckeys Estate and in the hind dunes of Perkins Beach.

Puckeys Estate is home to around 130 different species of birds, and threatened vegetation communities including Swamp Oak Floodplain Forest, Swamp Sclerophyll Forest, Coastal Saltmarsh and Bangalay Sand Forest. Puckeys Estate was established as a biobank site in 2011 and is subject to a Biobanking Agreement (ID 163) under the Threatened Species Conservation Act 1995. It is to be managed for the purposes of biodiversity conservation but can be used by the public for interpretive walks, walking groups, running groups and on-leash dog walking.

The creeklines in the central section (Flanagans, Hewitts, Woodlands, Tramway, Slacky, Whartons, Bellambi Gully and Bellambi Lagoon, Towradgi and Fairy) provide a range of estuarine and riparian habitat for a variety of native fauna including reptiles, micro bats, birds, flying foxes and amphibians. There are also patches of EECs along most of these riparian areas. Despite the highly urbanised environment, some form of dune vegetation is present along most of the open beaches. Vegetation communities present include Coastal Sand Scrub, Coast Banksia – Coast Wattle Dune Scrub and Beach Sand Spinifex. Coastal Wattle *Acacia longifolia* subsp. *sophorae* tends to self-recruit in places and can form dense mats. The dense scrub provides habitat for small mammals and passerine birds.

The riparian and dune environments are subject to human disturbance through informal pedestrian access. This creates higher edge to patch ratios for natural vegetation, leading to weed infestation, increased prevalence of predatory pest species such as foxes and loss of natural vegetation. Vandalism to vegetation is evident in some areas, with shrubs, especially Coastal Banksia being poisoned (drill holes evident), uprooted seedlings and torn branches.



Water Quality

DPE-Coasts and Estuaries conduct a state-wide estuary monitoring program producing a report card that summarises water quality and aquatic ecosystem health. There are four sites within the central section that have been subject to monitoring (Bellambi Gully, Bellambi Lagoon / Lake, Fairy Creek and Towradgi Creek). Results range from very poor in Bellambi Gully to Good in Bellambi Lagoon. Fairy and Towradgi Creeks received a grading of fair.

WCC undertook water quality monitoring from August 2002 to March 2006 (Wollongong City Council, 2008a). Twenty-three of the thirty-six sites monitored lie within the central section of the coast. Water quality is closely linked with urbanisation. The estuaries within the highly urbanised catchments in this area had low dissolved oxygen, high nutrient concentrations and high faecal coliform counts.

Recreational water quality under the Beachwatch monitoring program is rated as very good or good (NSW Government Department of Planning and Environment, 2022a) for all beaches in this section of the coast.

2.2.3 Southern Section (Wollongong City Beach to Windang)

Coastal Form

The southern section of the coastline, from Wollongong City Beach to the entrance of Lake Illawarra at Windang, is shown in Figure 25. The coastal plain is widest in this area, ranging from approximately 5km wide at Wollongong, to around 15km at Lake Illawarra.

The northern most compartment, Wollongong City Beach is around 2.8km long, stretching between Flagstaff Hill to the north and the revetment fronting NSW Ports land to the south. The beach is backed by vegetated dunes that are widest at the northern end of the beach, where the SLSC is located. A photograph of the beach, captured from the northern end is shown in Figure 26. Lang Park and a carpark are located behind the dune at the north end of the beach. To the south of the park is WIN Stadium, with elevation around 6.3m AHD. The dune in front of the stadium has elevations between 7-8.5m AHD and is notably narrower in this location compared to the northern section of the beach. The stadium is shown in Figure 27.

Most of the land behind City Beach, from the middle to the southern end, is occupied by the Wollongong Golf Club. The golf club and nearby commercial and residential streets are almost entirely below 3m AHD. The dune in front of this area ranges from around 4-7m AHD and appears to be particularly degraded along the golf course. There is also a water recycling plant at the southern end of the golf course, with elevation between 3.2-5.2m AHD.

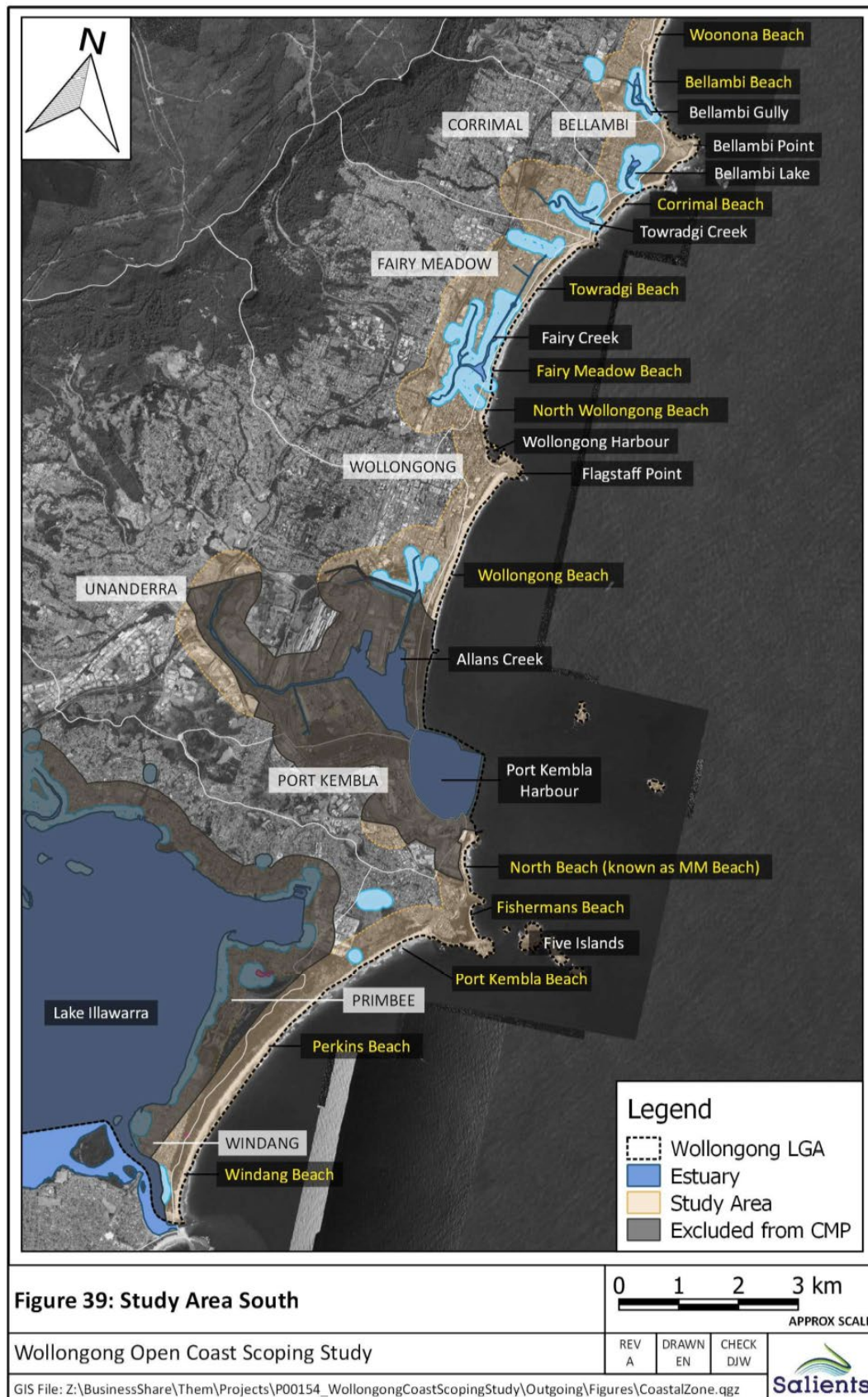




Figure 26 Wollongong City Beach. Image Courtesy of Wollongong City Council



Figure 27 WIN Stadium, Wollongong City Beach. Image Courtesy of Wollongong City Council.

Port Kembla is located to the south of City Beach. This area, indicated by the shaded region in Figure 25, is not included within the scope of the CMP.

North Beach (commonly known as MM Beach) and Fishermans Beach are to the south of Port Kembla. Both are small pocket beaches around 600m long, separated by the small headland Boilers Point. The area known as Hill 60, a heritage-listed Aboriginal site, is located between Boilers Point and Red Point. The eastern side of Hill 60, at the back of Fishermans Beach, is very steep. North Beach (commonly known as MM Beach), Fishermans Beach, and Hill 60 are shown in Figure 28.

The Red Point headland is located at the southern end of Fishermans Beach. Fishermans Beach is protected by Red Point and the Five Islands, shown in Figure 29. Port Kembla Wastewater Treatment Plant is located on the northern side of Red Point and can be seen in Figure 29. The elevation of the treatment plant ranges from around 3-7m AHD.



Figure 28 Fishermans Beach, Hill 60 (Left) and North Beach (commonly known as MM Beach) (Right). Image Courtesy of Wollongong City Council



Figure 29 Five Islands and Red Point with Port Kembla Wastewater Treatment Plant. Image Courtesy of Wollongong City Council.

South of Red Point is a ~6.5km long beach compartment, with Port Kembla Beach at the northern end, Perkins Beach in the middle and Windang Beach in the south, bounded by the entrance to Lake Illawarra at the southern end. The beach compartment is shown in Figure 30.

Port Kembla Pool and a café are located at the northern end of the beach, with elevation around 3-4m AHD, and are shown in Figure 31. The beach is backed by wide, vegetated dunes, and the SLSC is located high above the beach to the north-west. The area has always been subject to substantial sand drift, primarily as a result of wind-blown transport, particularly when winds are in a southerly direction due to the orientation of the beach. This can result in significant maintenance issues with sand migrating onto paths, roads, pool infrastructure at the northern end of the beach and preventing access to ground-level buildings. Towards the southern end of the beach, Windang SLSC is located behind the dune on land with elevation around 5m AHD.



The southern end of the beach is bound by the northern breakwall at the entrance to Lake Illawarra.



Figure 30 Hill 60 and Port Kembla-Perkins-Windang Beach. Image Courtesy of Wollongong City Council.



Figure 31 Port Kembla Beach. Image Courtesy of Wollongong City Council.

Development Patterns and Land Use

Approximately two thirds of the 2.8km stretch of Wollongong City Beach is zoned Public Recreation (RE1). The southern third is zoned Infrastructure (SP2) and includes Wollongong Golf Club and the Wollongong Recycling Plant. Inland of Wollongong



City Beach, the coastal zone is largely business and residential zones, reflecting the nature of the core business area of Wollongong. Key infrastructure of relevance in the coastal zone includes the WIN Stadium and Entertainment Centre.

From the Port Kembla breakwater to Hill 60 lies, North Beach (commonly known as MM Beach) and Fishermans Beach. These beaches are zoned Public Recreation (RE1) and backed by the Port Kembla industrial area and further south Low Density Residential (R2). The Port Kembla Waste Water Treatment Plant (Zoned SP2) occupies Red Point, adjacent to Hill 60, which is also a site commonly associated with rock fishing.

The Port Kembla Beach to Windang compartment is approximately 6.5km in length. The northern 1.4km is zoned for Public Recreation (RE1) with the remainder zoned for Environmental Conservation (C2). The western side of the peninsula falls outside the scope of this CMP and will instead be managed via the Lake Illawarra CMP. The boundary between these two CMPs will need to be clear.

Environmental / Ecological Features

There is a small area of coastal wetland just north of the Wollongong water recycling plant adjoining Wollongong City Beach associated with Garangaty Waterway. The perimeter of Coomaditchie Lagoon is also mapped as coastal wetland under the RH SEPP, with the entire lagoon identified as wetland proximity area. North of Port Kembla, tributaries of Tom Thumb Lagoon are mapped as coastal wetland, with an adjoining wetland proximity area that lies over sporting fields, the heliport and golf course. A small, 1270 square metre patch of littoral rainforest is mapped within the dune vegetation backing Windang Beach.

Coomaditchie Lagoon is one of the largest lagoons in the Wollongong LGA providing important wildlife habitat in an otherwise heavily urbanised and industrial area. The Illawarra Aboriginal Land Council (ILALC) under a Care Agreement in partnership with Heritage NSW, undertake bush regeneration and restoration activities at Coomaditchie Lagoon. The Agreement expired in 2020, however Council is working with ILAC and Heritage NSW to renew the agreement and continue bush care works (Wollongong City Council, 2022a).

The dune vegetation from Port Kembla Beach to Windang Beach is the most continuous stretch of vegetation along the Wollongong coast however is isolated from other vegetation remnants. The majority of vegetation is mapped as Sydney Coastal Heath, however, there are intermittent patches of the threatened Bangalay Sand Forest vegetation community in the hind dune. The most easterly vegetation community is Beach Sand Spinifex which is subject to periods of erosion in severe weather events. The vegetation exhibits a high level of disturbance (weeds, vegetation gaps) consistent



with a history of sand mining and clearing (Midges Bushland Restoration Pty Ltd, 2021).

The various vegetation communities provide habitat for a variety of native fauna from intertidal species to canopy dwelling birds, mammals and insects. Threatened fauna species recorded include Green and Golden Bell Frog, Grey-headed Flying Fox, Pied Oystercatcher, Sooty Oystercatcher, White-bellied Sea Eagle, Osprey and Little Tern (Midges Bushland Restoration Pty Ltd, 2021).

Water Quality

WCC's water quality monitoring from August 2002 to March 2006 included one watercourse in the southern study area, the Garangaty Waterway. The Garangaty Waterway drains the highly urbanised central business district of Wollongong. Water quality monitoring results indicate a highly contaminated watercourse, due to elevated nutrients and metal (copper and zinc) levels (Wollongong City Council, 2008a).

Recreational swimming quality, assessed as part of the 2021-2022 Beachwatch program was rated as very good at Wollongong City, Coniston and Fisherman's Beaches. Port Kembla Beach received a good rating (NSW Government Department of Planning and Environment, 2022a).

2.3 Previous Water Quality Studies

There have been several historical water quality studies undertaken on the Wollongong Coast ICOLLs. The methodology and results of these are detailed below.

2.3.1 Wollongong Wide Water Quality Monitoring Program – Review Report (Wollongong City Council, 2007a)

A water quality program occurred from 2002 to 2006 covering twenty creeks and lagoons, with 36 freshwater and estuarine sites being monitored monthly. These were:

- Flanagans Creek (2 sites)
- Hewitts Creek (2 sites)
- Woodlands Creek (1 site)
- Tramway Creek (1 site)
- Slacky Creek (1 site)
- Whartons Creek (1 site)
- Collins Creek (2 sites)



-
- Bellambi Gully (2 sites)
 - Bellambi Lagoon (2 sites)
 - Towradgi Creek (3 sites)
 - Cabbage Tree Creek (3 sites)
 - Fairy Creek and Lagoon (3 sites)
 - Byarong Creek (2 sites)
 - Tom Thumb lagoon (1 site)
 - Garangaty Waterway (1 site)
 - American Creek (2 sites)
 - Charcoal and Jenkins Creeks (1 site each)
 - Robins Creek (1 site)
 - Reeds Creek (1 site)
 - Mullet Creek (1 site)
 - Brooks Creek (1 site), and
 - Minnegang Creek (1 site).

This report presented an evaluation of the data and the design of the sampling program and made ten recommendations that address the limitations of the sampling program for any future monitoring program. A range of physio-chemical parameters were measured. The physical measurements comprised temperature, conductivity, salinity, pH, dissolved oxygen, oxidation reduction potential, suspended solids. The chemical parameters included various forms of nitrogen, total phosphorus, faecal coliforms and several metals consisting of aluminium, arsenic, cadmium, copper, iron, lead, manganese, mercury, nickel, and zinc. Data was assessed against ANZECC (2000) guidelines for fresh and marine water quality and showed Wollongong creeks and lagoons were affected by a number of water quality issues. In particular, low dissolved oxygen saturation values, high nutrient concentrations and high faecal coliform counts made the water unsuitable for primary recreation. Spatial differences between sites were also evident with some waterways not meeting the guideline values on more than 50% of the occasions. For example, nutrient concentration in the Bellambi Gully, Garangaty Waterway, and Brooks Creek exceeded the guidelines almost 100% of the time.



2.3.2 Localisation of Water Quality Guidelines for Wollongong's Creeks and Lagoons (Wollongong City Council, 2008a)

This study reports the findings of an investigation into the application of the ANZECC (2000) water quality guidelines for Wollongong's ICOLLs, and the development of localised guideline values. The water quality indicators that were the focus for localisation included nitrogen and phosphorus, and chlorophyll *a*. These were the indicators that most often failed to meet the existing ANZECC (2000) guidelines in a 4-year water quality monitoring program that was completed in early 2006 for a large number of sites in the Wollongong LGA (WCC, 2007). This report presents the results of 12-months of monitoring a number of reference sites (not affected by nuisance algal blooms) and sites affected by nuisance algal blooms to determine whether there is clear separation in nutrient concentrations between the two sets of sites. Creeks sampled were Stanwell Creek, Stoney Creek, Flanagans Creek, Slacky Creek, Bellambi Lagoon and Towradgi Creek. The sites were monitored on 17 occasions between October 2007 and October 2008, with approximately monthly visits over the cooler months and fortnightly visits over the spring to summer.

In general sites not affected by nuisance algal blooms (i.e., those meeting the reference condition) generally had higher nutrient concentrations than sites which were affected. Furthermore, unaffected sites did not comply with the ANZECC guideline values.

For nitrogen, localised guidelines were developed for nitrate and nitrite (NO_x), total dissolved nitrogen (TDN), and total nitrogen (TN). For phosphorus, guidelines could be localised for total phosphorus only. Chlorophyll *a* (algae) was found not suitable for guideline development. Generally, the localised values were higher than the ANZECC (2000) guideline values that were previously used to assess the condition of local waterways.

2.3.3 Foreshore Pollutant Audit and Remediation Options for Fairy and Towradgi Lagoons (Wollongong City Council, 2010)

This study was undertaken to identify pollution sources and propose remedial measures to improve water quality in the Fairy and Towradgi Lagoons. These lagoons are two of the major estuarine water bodies for which Council has management responsibility. Wet weather runoff was collected on six occasions from 2007 to 2010 from several locations in the lower catchments of the two lagoons and analysed for a number of pollutants that had earlier been identified to be of concern. These included suspended solids, total nitrogen and phosphorus, the metals copper, lead, nickel and zinc, and faecal coliforms. A desktop assessment was also carried out to identify potential point sources of industrial pollution.

It was found that overall, the major impact on water quality in these two creeks was from the larger upper sub catchments. These sub catchments had significantly larger



areas (and therefore larger runoff volumes) and thus often had higher total load of pollutants than the smaller, more urbanised lower sub catchments. This pattern was observed particularly for pollutants, such as nutrients and suspended solids which are often associated with water quality issues such as increased turbidity and algal blooms.

The smaller sub catchments in the lower reaches, however, were still a concern for other pollutants of a more commercial or industrial nature. The desktop assessment study of industrial premises identified the areas where this could be the case. The general dominance of the upper catchment areas for pollutants such as nutrients and suspended solids suggested though that remediation efforts should be focussed in these areas and a number of remediation options were recommended in this report.

2.3.4 Department of Planning and Environment Estuary monitoring program

The most recent water quality data for the Wollongong coast is detailed on the NSW Department of Planning and Environment (DPE) 'Health of our estuaries' website⁴. DPE conduct a state-wide estuary monitoring program where they sample a subset of the estuaries between Wollongong and the Victorian border every 3 years. They measure for chlorophyll *a* (algae) and water clarity and sample two sites within a creek system over summer only on a monthly basis. A report card is produced that summarises water quality and aquatic ecosystem health. There are four sites within Wollongong that have been subject to monitoring and Table 3 presents the latest information available. The infrequency and limited number of locations in the DPE estuary monitoring program does not support development of specific management actions.

Table 3 DPE Estuary Monitoring Results

Location	Year	Algae	Water Clarity	Grade
Bellambi Gully	2014-15	Poor	Very Poor	E – Very Poor
Bellambi Lagoon / Lake	2008-09	Fair	Good	B – Good
Towradgi Creek	2020-21	Fair	Poor	C - Fair
Fairy Creek	2020-21	Fair	Fair	C - Fair

Fairy Creek is the only site that has been monitored continuously since 2007. Table 4 presents the historical grades for Fairy Creek and show there has been no improvement in its estuary health over the sampling period.

⁴ <https://www.environment.nsw.gov.au/topics/water/estuaries/estuaries-of-nsw>



Table 4 Historical estuary health grades from DPE monitoring program for Fairy Creek⁵

Year	Algae	Water Clarity	Overall Grade
2007-08	D	D	D
2008-09	C	D	C
2009-10	D	C	D
2010-11	D	E	D
2011-12	C	D	D
2012-13	C	D	D
2013-14	B	C	C
2014-15	D	D	D
2015-16	C	D	D
2016-17	C	D	C
2017-18	E	D	D
2018-19	D	C	C
2019-20	C	C	C

2.3.5 Beachwatch monitoring

Recreational water quality has been monitored at the beaches in the Wollongong LGA since 1996 by Sydney Water Corporation as a requirement of Environment Protection Licences, and by Wollongong City Council since 2011 under the Department of Planning and Environment's Beachwatch Partnership programs.

Thirteen beaches are monitored under the Beachwatch program. At the time of writing the most recent report card was for the 2021-22 summer. All 13 swimming sites were graded as Very Good or Good in 2021-2022. Excellent results have also been recorded in previous years (Department of Planning and Environment, 2022).

Table 5 Beachwatch Results 2021-2022

Swimming Site	Beach Suitability Grade
Stanwell Park Beach	Very Good
Coledale Beach	Good
Austinmer Beach	Very Good
Thirrourl Beach	Good

⁵ <https://www.environment.nsw.gov.au/topics/water/estuaries/estuaries-of-nsw/fairy-creek>



Swimming Site	Beach Suitability Grade
Bulli Beach	Good
Woonona Beach	Very Good
Bellambi Beach	Good
Corrimal Beach	Good
North Wollongong Beach	Good
Wollongong City Beach	Very Good
Coniston Beach	Very Good
Fishermans Beach	Very Good
Port Kembla Beach	Good

2.4 Previous Assessment of Coastal Hazards

2.4.1 Overview

The coastal hazards identified in the CM Act differ somewhat from those commonly analysed under the previous coastal management framework. There are seven coastal hazards defined in the CM Act:

- “(a) beach erosion,*
- (b) shoreline recession,*
- (c) coastal lake or watercourse entrance instability,*
- (d) coastal inundation,*
- (e) coastal cliff or slope instability,*
- (f) tidal inundation,*
- (g) erosion and inundation of foreshores caused by tidal waters and the action of waves, including the interaction of those waters with catchment floodwaters.”*

A summary of the nature of these hazards is provided in Appendix C. Furthermore, past analyses relating to each of the hazards are discussed in the following sections, including an appraisal of whether those past analyses are suitable to meet the needs of a CMP.

Overall, the available coastal hazard assessments are typically out of date and will need to be revisited during Stage 2 of the CMP process. Even so, Council’s existing hazard line and inundation information was used, alongside the prior risk assessment completed in preparing the CZMP (BMT WBM, 2017a), to identify assets potentially at risk from coastal hazards. These issues of concern were discussed with attendees at



the coastal hazards workshop as part of the preliminary 'first-pass' risk assessment workshop described in Appendix A.

2.4.2 Hazard 1 (Beach Erosion) and Hazard 2 (Shoreline Recession)

Cardno Lawson Treloar (2010b hereafter, CLT) examined photogrammetric beach profile data and determined that the most landward recorded position for almost all beaches was during 1974, measured some five months after severe storms in May and June of that year. Since 1974, the beaches along Wollongong's coast were found to have accreted (i.e., moved seaward). From that analysis, the beaches were assumed, conservatively, to have been in a stable equilibrium. CLT used a maximum possible storm bite value of $250\text{m}^3/\text{m}$, which has been commonly adopted in NSW (NSW Government, 1990), representative of a 1% AEP storm. That maximum value was applied to Bulli Beach, with other locations scaled based on their relative exposure, determined from numerical wave and beach erosion modelling.

The numerical modelling completed by CLT adopted the "design storm" approach of Carley and Cox (2003) to estimate relative exposure at several locations along each beach of the Wollongong LGA. The model results were generally in accordance with typical, reported historical extreme erosion values at the time (Gordon, 1987; NSW Government, 1990). The modelled values were then scaled to derive the design storm demand values used in the hazard lines. For example, the modelled storm demand at Bulli Beach ($212\text{m}^3/\text{m}$) was scaled up to $250\text{m}^3/\text{m}$. At a less exposed location at Windang, a modelled value of 141 was scaled up to $166\text{m}^3/\text{m}$.

The presence of nearshore rock and rock below the beach is important along the Wollongong coast and was investigated by CLT as follows:

- 23 test pits were dug at beaches along the Wollongong coast. Typically, these collapsed due to groundwater inflow and instability before rock was encountered. Follow up Perth Sand Penetrometer testing was completed, commonly in the most seaward test pit location at each beach. The results provided a limited representation of depth to bedrock, typically midway along the beach. These data were used by CLT to limit the extent to which a beach could erode during their model simulations.
- Data regarding offshore reefs was limited, and interpretation of existing hydrographic charts and aerial photography was used to estimate the locations of offshore reefs and rock platforms. This informed the wave modelling, by enabling representation of the sheltering effect of these features.

Using the combined assessment of coastline recession and storm erosion, CLT prepared hazard lines for 2010, 2050 and 2100.



For the time that the CLT assessment was undertaken it was reasonable. However, to support risk-based management, the present industry standard is to use probabilistic assessment (described below). Furthermore, Councils are required to consider present day conditions alongside future timeframes of 20, 50, and 100 years. These do not align well with existing 2050 and 2100 analyses.

Since the studies which underpinned the existing Coastal Zone Management Plan were completed, there has been a move towards a more rigorous risk assessment approach including the consideration of numerical probabilities (Wainwright et al., 2015). A risk assessment and management process is now required in the Coastal Management Manual, (see also Section 21(3)(b) of the CM Act). Updated probabilistic hazard line (beach erosion and recession) modelling, should be completed for the entire Wollongong coast.

An example of a probabilistic assessment was recently applied by Royal Haskoning, along a limited beach length to support cost benefit analysis of the North Wollongong seawall (Royal Haskoning DHV, 2020a). The method applied by Royal Haskoning is still reliant on the limited, underpinning assumptions of the Bruun Rule (refer to Appendix C), but introduced variability into the key parameters used in the allowance for sea level rise, ongoing recession, and depth of closure. For depth of closure, Royal Haskoning used values varying between -9 and -20m AHD, which is more typical than the value of -8.5 used by CLT at this location.

A coastwide beach erosion analysis has also been completed by the NSW State Government based on another set of simplifying assumptions by Kinsela et al. (2017). The output data were recently made available by the NSW State Government, but unfortunately were received after the risk assessment workshops described in Appendix A.

The 2050 lines derived by CLT were compared with comparable lines derived by Kinsela et al. (also for 2050). Qualitatively, the output from Kinsela et al. (2017) tends to sit 20 to 50m landward of the hazard lines derived by CLT.

The discrepancies may relate to differences in the included closure depths, with Kinsela et al. allowing for the closure depth to vary between 5 and 25m compared to the relatively shallow values adopted by CLT. Kinsela et al. also noted that:

"Exposed reef outcrops that protrude above an otherwise sedimentary shoreface surface suggest that sediment cannot accumulate there under the prevailing energy conditions. To account for the negative accommodation profile of reef outcrops, we assume that they do not represent potential sediment accommodation. This assumption is not suitable for application in sediment-deficit compartments, where extensive low-profile reef may be exposed, simply due to a lack of sediment in the shoreface environment."



Based on the above quote, it is clear the northern Wollongong coast in particular has "extensive low-profile reef" (i.e., rocky areas in the nearshore which extend out beyond depths of 30m). Therefore the modelling by Kinsela et al. is presumably less reliable in those areas. The statewide outputs of Kinsela et al. also miss several beaches between Coledale and Stanwell Park.

A fair amount of analysis would be required to resolve the differences between the methods that have been applied along the Wollongong coast and it may not even be possible to fully understand reasons for discrepancies, as the computer code and finer details of analysis by both CLT and/or Kinsela et al. are not documented.

Overall, it is recommended that any replacement coastal hazard lines would need to be informed by investigation and selection of an optimal method before progressing with sandy beach hazard line development. There are a range of methods being currently applied to develop hazard lines in NSW and the underpinning assumptions are not always transparent.

Finally, one recently available data set which may be considered to calibrate or refine modelling for coastal hazard lines is the DEA Coastlines product from Geosciences Australia (Bishop-Taylor et al., 2021). They analysed over 30 years of Landsat imagery, to determine annually averaged mean water lines, including a modelled allowance for tides.

A screen shot from the online interface which presents the data (Figure 32) shows notable erosion (around -0.8m/yr) at the southern end of McCauleys Beach, and accretion along Sharky Beach and the northern end of Corrimal Beach (0.7 to 0.8 m/yr). As the waterline is annually averaged, it represents a good medium-term representation of beach position, around which fluctuations may occur.

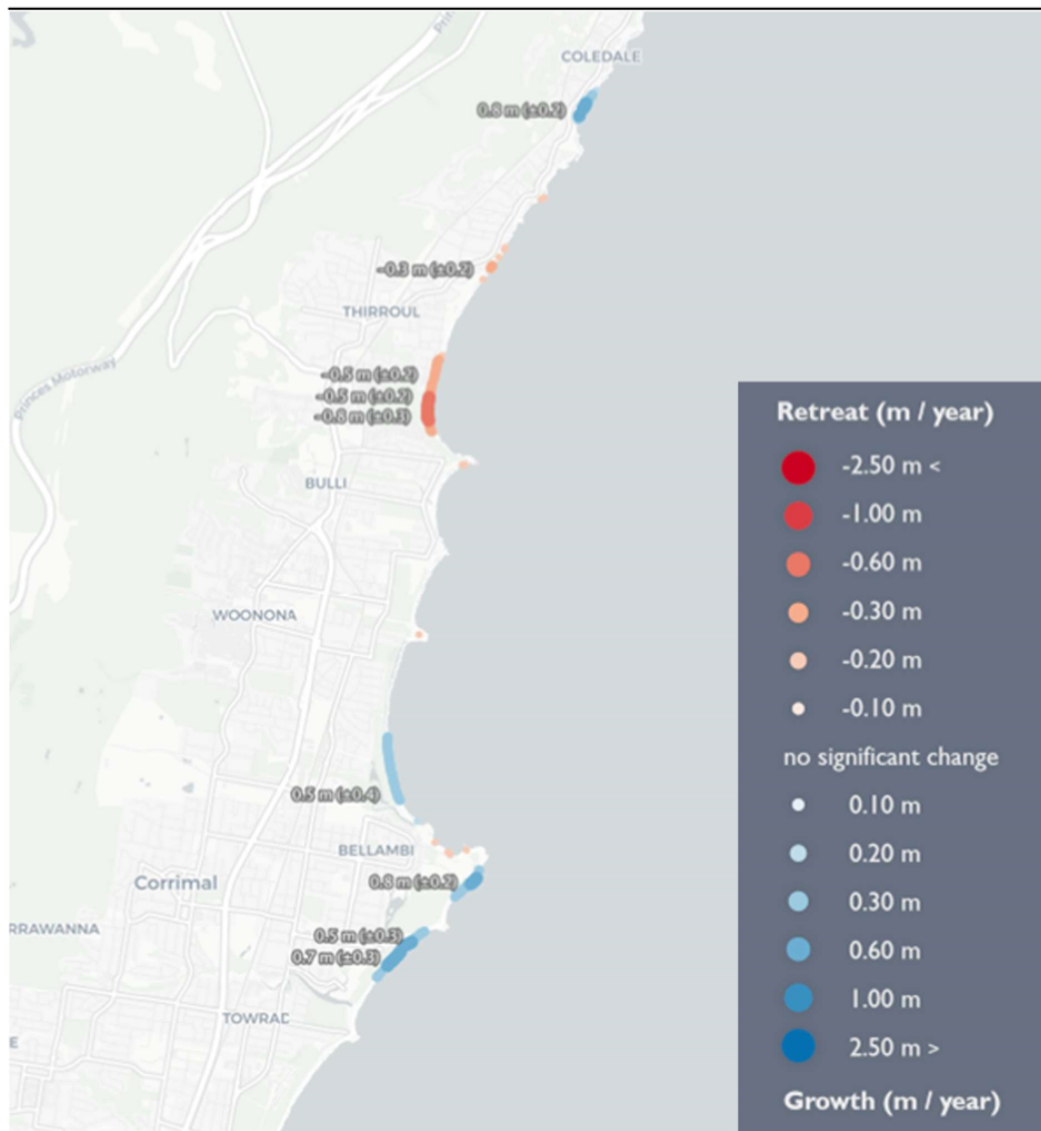


Figure 32 DEA Coastlines Sample Results

2.4.3 Hazard 3: Coastal Lake or Watercourse Entrance Instability

The entrance dynamics of several small creeks and lagoons within the area covered by this CMP are of interest. The vast majority of significant watercourses within the geographical boundaries of this CMP are ICOLLs, or "Intermittently Closed or Open Lakes or Lagoons", with the exception of the few that drain directly into Port Kembla harbour. For ICOLLs a sand barrier, or bar tends to build across the entrance, preventing tidal exchange. Once closed, freshwater from the catchment acts to fill the waterway, with the sand barrier overtopped and a channel scoured following a rainfall event.



The coastal entrances of interest are:

- Hargraves Creek (Stanwell Park Beach).
- Stanwell Creek (Stanwell Park Beach).
- Flanagans Creek (Thirroul).
- Hewitts Creek (McCauleys Beach).
- Tramway Creek (McCauleys Beach).
- Slacky Creek (Sandon Point Beach).
- Whartons Creek (Bulli Beach, noting that this creek does not seem to be captured adequately by current Coastal Environment Area Mapping in the RH SEPP).
- Collins Creek (Bulli Beach).
- Bellambi Gully / Farrahars Creek (Bellambi Beach).
- Bellambi Lagoon (Corrimal Beach).
- Towradgi Creek (Corrimal Beach).
- Fairy Creek/Lagoon (Fairy Meadow/North Wollongong Beach).

Of the above waterways, Bellambi Lagoon is the only waterway specified as a "*Coastal Lake*" under the RH SEPP, although it is not categorised as a "*Sensitive Coastal Lake*". The "*Coastal Lake*" classification does, however, place restrictions on development in and around the entrance under other State Environmental Planning Policies.

Entrance Management Policies exist for Fairy Lagoon and Towradgi Creek (Cardno Lawson Treloar, 2007a, 2007c). Both policies recommend that review take place every five years. In recent years, those reviews have been delayed as Council proceeds through its development of a CMP. Furthermore, entrances to Fairy Lagoon and Towradgi Creek are now contained within the coastal wetland area (or its accompanying proximity area) of the RH SEPP. This is an issue which will need to be resolved as it places significant constraints on how Council can manage these entrances.

An entrance management plan for Whartons Creek has also been adopted by Council (Royal Haskoning DHV, 2015b). The management plan involves periodic relocation of sand from the southern side of the entrance to the northern side, in order to reduce the potential threat to beach accessways and dune vegetation from migration of the entrance. Furthermore, the plan allows for sand to be relocated, or entrance breaching prior to intense rainfall. It was recommended that the plan be reviewed after three



years, with potential structural modifications (extension of a sandbag training structure) if the plan was seen as being ineffective.

It is noted that there was a draft management plan developed for the entrance to Bellambi Lagoon, but that this was, apparently, not progressed or adopted by Council.

Consideration should be given to developing an overarching policy/plan including all entrances. For most of the entrances along the coast, the default “*no intervention*” policy is likely to remain.

Redevelopment of an overarching policy including a review of existing policies should occur in line with more up to date sea level rise projections and understanding, and more recent guidance and policy released by the State government (Department of Primary Industries, 2013; Ferguson et al., 2020). However, there is an issue of balance here, and the requirements of existing floodplain risk management plans and risks from floods also need to be considered.

One precursor to the reviews would be a study of the coastal vulnerability area affected by the coastal entrance instability hazard. This would typically involve an assessment of historical remote sensed information (satellite imagery and/or aerial photography) to understand the extent to which entrances meander across the beach when the entrance is open. This should be completed as part of the Stage 2 studies on coastal hazards and should include all of the entrances listed above.

Furthermore, issues surrounding mapping within the RH SEPP need to be resolved for some entrances. For this reason, it is unlikely that an overarching policy can be developed until after a planning proposal to adjust the SEPP mapping is completed. The entrance management review/policy will necessarily need to be an action in the CMP.

2.4.4 Hazard 4: Coastal Inundation

There are two key mechanisms that need to be considered for Coastal Inundation (refer to Appendix C for more information):

- 1 Coastal Storm Surge Inundation.
- 2 Wave Overtopping of beaches, dunes, bluffs, cliffs or seawalls

With reference to Point 1, it is noted that NSW state government guidance for flood modelling in coastal areas recommends that suitably elevated tailwater levels be adopted in flood modelling, and that this has been the case for over 15 years.



Relevant available council flood studies are:

- Fairy and Cabbage Tree Creeks Flood Study (Advisian Worley Group, 2020): This covered both the Fairy/Cabbage Tree Creek catchments and the catchments draining to Wollongong Harbour.
- Collins Creek Flood Study (Catchment Simulation Solutions, 2019): This covered Bellambi Lake, Bellambi Gully/Farrahars Creek, Collins Creek and Whartons Creek.
- Hewitts Creek Flood Study (WMA Water, 2019a): This covered Hewitts, Slacky, Woodlands (Tributary of Hewitts Ck.), Tramway and Thomas Gibson (South End of Thirroul Beach) Creeks.
- Towradgi Creek Flood Study (WMA Water, 2019b): Covering Towradgi Creek.
- Wollongong City Flood Study (Jacobs, 2019): Covers the area between Wollongong and Coniston, which drains to Tom Thumb Lagoon, in Port Kembla.
- Allans Creek Flood Study (Advisian (Worley Group), 2019): Covers the catchment of Allans Creek which flows into the western edge of Port Kembla. This flood study covers small portions of the NSW coastal zone (as mapped in the RH SEPP) which lie outside the boundary of Port Kembla and are therefore included in the scope of Wollongong's CMP.

It is clear from a review of these studies that all have applied the relevant NSW government guidance. While not readily apparent from reading the Wollongong City Flood Study (Jacobs, 2019), subsequent checking of model outputs by staff at Wollongong Council has confirmed that a downstream boundary consistent with the NSW guidance has been applied in that flood study.

For the most part, sea level rise values of 0.4m and 0.9m have been adopted as part of flood studies. These reflect Council's adopted sea level rise projection values which, if traced back to their origin, relate to the years 2050 and 2100. It is not essential to re-execute model simulations to precisely account for 20-, 50- and 100-year timeframes as part of CMP development, although this could be considered. Instead, the 0.4m sea level rise results could, as an interim measure, be considered representative of medium term time frame (~20-year) and the 0.9m sea level rise results could be considered representative of a long-term time frame (~indicative of between 50 to 100 year).

In terms of adequately accommodating the sea level rise risks, it is noted that the 0.4/0.9m projections adopted by Council relate to a future emissions intensive scenario (A1FI from IPCC 2007, see the original state policy: (New South Wales Government, 2009)) and also that a further freeboard can be added to these values for floodplain development control. The sea level rise values adopted in future flood studies should



incorporate consideration of 20-, 50- and 100-year timeframes and this should follow through to flood planning controls in areas affected by coastal storm surge, where appropriate.

To avoid duplication of processes and confusion, it is recommended that coastal inundation from storm surge not be managed directly through Wollongong's CMP. However, administration of the CMP delivery should include an action which provides oversight to the flood modelling process when undertaken as part of future flood studies where the watercourse contains an entrance to the ocean.

As of yet, Council's "Northern Suburbs Catchment", including Flanagans, Stanwell and Hargraves Creeks, has not been subject to a flood study. When this occurs, simulations which are consistent with 20-, 50- and 100- year sea level rise timeframes should be completed.

With reference to the second mechanism (coastal inundation by wave overtopping), the most recent analysis was by Cardno Lawson Treloar (2010b), including:

- A wave runup assessment on cliffs.
- A wave overtopping and coastal inundation assessment of back beach areas (where the beach barrier is overtopped).

The approaches applied by Cardno Lawson Treloar to assess wave overtopping are now outdated and the assessment should be revisited.

Tsunamis are also discussed as part of the coastal inundation hazard within the Coastal Management Manual. There has been no detailed, recent study of Tsunami along the Wollongong coastline. Emergency management, with the NSW SES the controlling agency, is the means of managing the tsunami risk in NSW.

The State Emergency Service (SES) have developed a State Tsunami Plan (NSW Government, 2018b). In the event that a land threat tsunami warning is received by the NSW SES, the overriding strategy is for evacuation of low-lying areas to areas at least 10m above sea level or one kilometre away from the coast and rivers. Accordingly, it is not necessary to complete a Stage 2 study to quantify the tsunami risk.

The SES publishes an evacuation area map. For the Wollongong Coast, the governing topography means that the evacuation area is relatively narrow to the north of Thirroul, but gradually widens (largely contained to the east of Memorial Drive until North Wollongong). A wider area would require evacuation from around Port Kembla (and behind City Beach and low-lying areas of Wollongong). Similarly, the majority of the Windang Peninsula, south from Port Kembla Beach and between Lake Illawarra and the ocean, would require evacuation.



As tsunami is part of the "coastal inundation" hazard, it will need to be addressed as part of the Coastal Zone Emergency Action Subplan to accompany the CMP. This Plan should be updated/prepared in consultation with the SES during Stage 3 of the CMP preparation.

2.4.5 Hazard 5: Coastal Cliff or Slope Instability

The Wollongong LGA has significant coastal cliff and slope instability issues on account of the closeness of the Illawarra Escarpment to the ocean along its northern suburbs and the variability of geology within this location. Some analysis was completed by GHD Geotechnics (2010b) as part of the previous coastal zone study.

Along the northern suburbs, they defined three domains:

- Domain 1: Narrabeen Group, extending from Garie Beach in the National Park to south of Coalcliff Beach, containing Wombarra Claystone which is associated with numerous landslides.
- Domain 2: Faulted Transition from Illawarra to Narrabeen, from south of Coalcliff Beach to the northern end of Scarborough Beach comprising sandstone and claystone units, with the Illawarra coal measures at sea level.
- Domain 3: Illawarra Coal Measures: From North Scarborough Beach through to the northern end of Thirroul Beach, containing sandstones and claystones.

To the south of Thirroul Beach, GHD Geotechnics defined the remainder of the open coastline as "Coastal Plains", with beaches tending to lengthen with distance south along the coast and localised headlands and cliffs characterised by the Illawarra Coal Measures.

The legacy of decades addressing geotechnical hazards associated with the Illawarra Escarpment means that there is substantial local corporate knowledge held within Wollongong Council, other agencies which work locally such as Transport for NSW (responsible for management of the Railway, Lawrence Hargrave Drive, and the Sea Cliff Bridge) and the University of Wollongong.

Building on the previous experience, GHD geotechnics established a *Coastal Influenced Geotechnical Hazard Zone* which:

"includes areas where coastal processes (including climate change) could directly influence geotechnical hazards for the defined study time period to 2100. Geotechnical assessments of proposed or future development in accordance with Wollongong City Council's Development Control Plan requirements should include specific assessment of coastal processes if located within this Zone."

The assessment set a zone within which developers, or project proponents, could be required to undertake their own assessment of coastline geotechnical risks. The



requirement is controlled by Chapter E12 of Wollongong's Development Control Plan, which makes mention of the impacts of wave action and inundation along the coast but seems to make no direct reference to the coastal influenced geotechnical hazard zone determined by GHD Geotechnics. Instead, section 4.1 of Chapter E12 indicates that the need for a geotechnical impact assessment report will be based on determinations by Council, using maps, data, reports, and other information available to Council.

It is understood that the extent of the *Coastal Influenced Geotechnical Hazard Zone* was mostly based on the judgement and past experience of GHD's study team members and staff from Council.

Ideally, the information used, and basis for setting the Coastal Influenced Geotechnical Hazard Zone, and its relationship with the DCP, should be made publicly available, although it is recognised that geotechnical behaviour along the Wollongong Coast is complex. As a minimum, a description on how the zone has been derived should be made clear. Presently, the description provided in GHD Geotechnics (2010b) is sparse, noting that the zone was developed using a "*judgemental approach*" based on:

- Coastal geology.
- Topography.
- Drainage features.
- Existing historical geotechnical hazard data.
- Knowledge of the authors and Council.
- A nominal minimum 10m buffer zone.

Alternatively, a detailed re-examination of the entire coast could be completed, applying accepted methods (e.g., AGS, 2007). The impact of coastal processes on all rocky lengths of the shoreline should be considered under Hazard 5. Any ephemeral presence of sand along rock platforms should be neglected and these areas treated as rocky shores.

In some instances, it is difficult to draw a clear line between what comprises a beach, and what comprises a "bluff". Figure 33 shows the northern end of Coalcliff Beach where sand is normally present, but the narrowness of the beach means that waves can readily runup and attack the base of the cliffs. In these areas where there is a transition between a sandy beach with dunes and a headland which projects into the ocean, care is needed in deriving hazard zones at the interface to ensure that development controls are clear and consistent.

Figure 34, taken to the south of Coledale Rock Pool, illustrates contemporary coastal erosion, into a rock scarp at the back of the beach. At this location, a public reserve has



been established on the relatively level surface of loosely consolidated material containing cobble sized rock fragments. This is now being eroded by coastal processes to form a relatively steep cobble beach at the base of the immediate scarp which sits to the rear the rock platform stretching between Coledale Beach and Sharky Beach. Methods which involve consideration of unconsolidated beach erosion and an understanding of geotechnical elements are required here in deriving hazard lines.



Figure 33 Cliffs to rear of Coalcliff Beach, Northern End

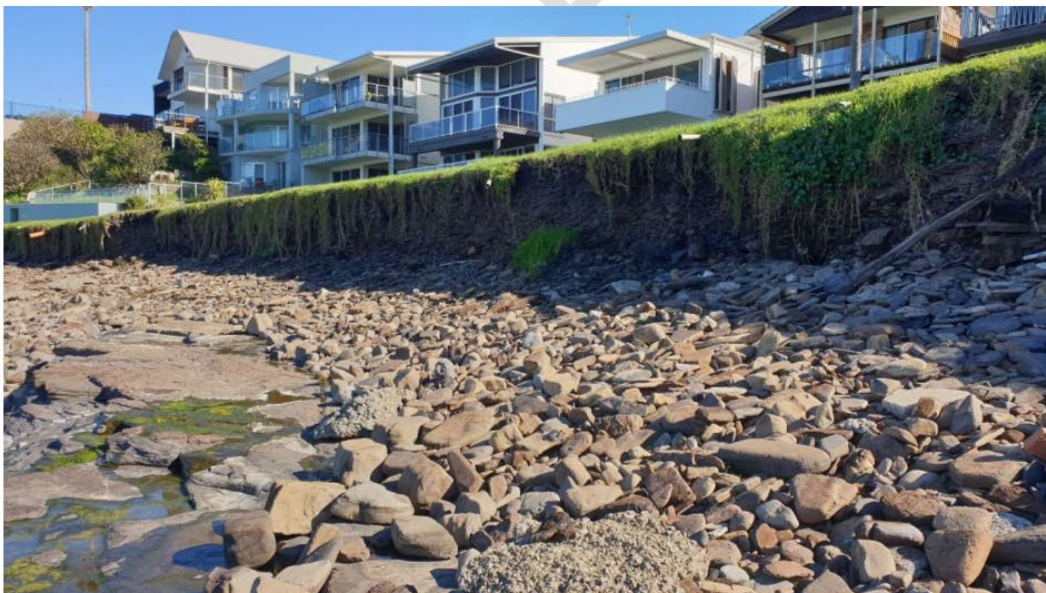


Figure 34 Erosion, South of Coledale Rock Pool



2.4.6 Hazard 6: Tidal Inundation

In contrast to “*coastal inundation*” is the “*tidal inundation*” hazard defined by the CM Act. That hazard refers to inundation by “normal” tides, considering how these will be affected by sea level rise in future. Colloquially, such inundation is referred to as “sunny day” flooding and the CMM equates “*tidal inundation*” with “*nuisance flooding*”. “Nuisance flooding” is commonly used to refer to inundation which causes inconvenience but doesn’t represent a significant risk to life or property.

A statewide assessment of tidal inundation was completed for the entire NSW coast (Hanslow et al., 2018; OEH, 2018). Data for this assessment has recently been made available and includes extents for Hargraves, Stanwell, Flanagans, Woodlands, Slacky, Towradgi and Fairy Creeks, Bellambi Gully, Bellambi Lagoon and Port Kembla. Consistent with the broad scale nature of the study, the methods adopted required several assumptions and simplifications. Furthermore, assessment was completed for three specified sea level rise scenarios of 0.0, +0.5, +1.0 and +1.5m, which do not necessarily align with the 20, 50 and 100-year timeframes required by the CM Act.

No detailed tidal inundation analyses have been completed for the Wollongong Coast, and these studies will be required given the intensity of urban development within the coastal floodplain. Such studies will need to cover all the ICOLLs listed in Section 2.4.3. In those studies, it will be important to consider the height to which the sand barrier fronting each of the ICOLLs could build, because of coastal processes, when the entrance is closed.

In relation to the smaller ICOLLs, where nuisance flooding most commonly results from high water levels when the entrance is closed, existing water level records are available for Towradgi Creek, Bellambi Lagoon, Fairy Creek, Cabbage Tree Creek and Hewitts Creek.

Based on those records, and the considerations outlined above, probabilistic berm height and water level analyses can be completed to examine how these conditions will vary with different dominant offshore wave directions, management strategies, and amounts of sea level rise. When the entrance is closed, the water surface behind the barrier can be considered to be flat and mapping of the water level which represents the Tidal Inundation Hazard is relatively easy.

Tidal inundation may also be an issue arising from tides propagating in through the entrance of Port Kembla and then upstream, through Port Land in future. However, the data set which was produced as part of the statewide tidal exposure assessment (Hanslow et al., 2018; OEH, 2018) indicates that this may not be an issue until more than 0.5m of sea level rise has occurred.

Aside from tidal inundation inside estuaries, this hazard is also of importance along the open coast. However, during “normal” conditions, it is not useful to consider tides



acting in isolation as waves will also contribute to normal “sunny day” inundation along the open coast. Although not clearly captured as a hazard by the CM Act, the inundating action of normal (i.e., not during a storm) tides and waves on the open coast, when combined with future sea level rise, presents a risk to the continued operation and use of community infrastructure present along the open coast (e.g. ocean pools, beach stairs, stormwater systems). A combined open coast infrastructure inundation assessment is recommended (refer Section 9.3.2).

2.4.7 Hazard 7: Erosion and Inundation of Foreshores caused by Tidal Waters and the Action of Waves, including the Interaction of those waters with Catchment Floodwaters

Appendix C outlines the different hazards and processes considered by “Hazard” 7 and concludes that erosion of foreshores, creeks and riverbanks within estuaries is the main item of concern, whether arising from tidal action or catchment floods.

Erosion along creek lines has been identified in several past studies, but the treatment is often piecemeal. An opportunity exists to consolidate and set priorities across the LGA, even though foreshore erosion has, seemingly, not been a major issue for Wollongong Council along the waterways which will be subject to the CMP (i.e., the CMP doesn’t include Lake Illawarra). Identified locations where there has been erosion are:

- Three sites of moderate to highly active beach foreshore erosion in Hargraves Creek (GHD, 2007c).
- Left bank of Stanwell Creek Lagoon, which was apparently threatening a road and car park (GHD, 2007c).
- Moderately active erosion along two short sections of the right bank of Flanagans Creek (GHD, 2007c).
- Lower estuary of Slacky Creek which has several sections of moderate to highly active bank erosion (GHD, 2007c).
- Minor instability near the footbridge on Collins Creek (GHD, 2007c).
- Along the northern bank of Wharton’s Creek “between the footbridge and the Tourist Park” (Royal Haskoning DHV, 2015a).

A foreshore erosion risk study is recommended for the estuaries of the Wollongong LGA. It should contain a review of the previous work completed by GHD and an assessment of any improvements or exacerbation of the erosion previously identified.



2.4.8 Suitability of Available Information in First Pass Risk Assessment

Ultimately, the actions adopted in the final CMP should be based on likelihoods developed for 20-, 50- and 100-year future time frames. Existing analyses have typically provided projections to 2050 and 2100, representing ~25-30 and ~80-year timeframes respectively, when referenced to the current day. Accordingly, the existing hazard assessments do not meet the requirements of the CM Act.

For the Wollongong coast, where urban development is commonly located in close proximity to the ocean, it is important that robust analyses are completed which comply with the requirements of the CM Act.

Similarly, much better data are now available to inform hazard assessments, and analytical methods have improved. One notable area where assessments need to be updated over time is in relation to sea level rise. Sea level rise projections, where adopted in past assessments including recent flood studies, have included a rise of 0.4m by 2050 and 0.9m by 2100. Again, these projections do not match up with the time frames required for risk assessment in a CMP. Furthermore, those benchmarks, which are commonly applied by Councils across NSW, are based on a withdrawn policy of the NSW State Government (2009), which was itself based on findings from the IPCC's fourth Assessment Report ("AR4" IPCC, 2007). The IPCC have subsequently updated that assessment twice as part of AR5 (IPCC, 2013) and AR6 (IPCC, 2021).

When the state government withdrew their sea level rise policy, NSW Councils were given freedom to adopt their own projections based on local information. Eurobodalla Shire and Shoalhaven City Councils engaged a study to recommend appropriate sea level rise projections for the NSW South Coast based on AR5. The recommendations are summarised in Wainwright et al. (2014) and can be considered applicable to the Wollongong LGA. Ultimately, it was recommended that RCP8.5, a high-emissions projection be adopted based on a need to encourage a cautious approach and considering the tendency of most jurisdictions both in Australia and overseas to adopt high emissions scenarios as their basis for planning.

In AR6, RCP8.5 has been replaced by the approximately equivalent scenarios SSP5-8.5 and it is recommended that projection be used in for future coastal hazard assessments. The sea level rise projection, local to Port Kembla, is presented in Section 3.7. Clearly, the coastal hazard assessments are out of date and should be replaced when practicable. Accordingly, the existing hazard assessments are limited in their reliability for present-day risk management.

Confounding the use of existing analyses is the significant differences in results obtained by different researchers (e.g., coastal hazard lines derived by Kinsela et al. (2017) and Cardno Lawson Treloar (2010b)). Even so, a preliminary 'first-pass' risk assessment is a requirement for a scoping study to inform Stages 2 and 3 of the CMP.



For the preliminary risk assessment workshop described in Appendix A, both the present day, and 2050 beach erosion/recession hazard lines of Cardno Lawson Treloar were used. The 2050 timeframe was chosen as this is the period that would most influence actions to be included in the CMP, itself a 10-year program. Risks which may arise over the next 25 years will either require action during the 10-year program, or a concerted monitoring effort to inform actions required in the medium term. In addition to the sandy beach hazard lines, the "Coastal Influenced Geotechnical Hazard Zone" and inundation layers prepared by Cardno Lawson Treloar for 2050 were also considered.

Noting that the hazard extents need to be updated, consideration of the additional 2100 timeframe for which hazard information was available was not included. Longer term hazard extents (e.g., 50 year and 100-year timeframes) are still important but are mostly a concern for long-term planning. They will need to be considered in the updated risk assessment, based on more reliable hazard information derived during Stage 2. Those hazard lines will need to be developed and utilised to identify Wollongong's coastal vulnerability area. The hazard lines can be utilised to inform a Planning Proposal for modifying maps in the RH SEPP should Council decide that this process would be beneficial. Councils DCP will also need to be modified to reflect the updated modelling.

During Stages 2 and 3 of the CMP process, as refined hazard information becomes available, the medium term (~20-year) risks will need to be revisited alongside long-term risks (50- and 100-year timeframes). This will demonstrate compliance with the mandatory requirements of the Coastal Management Manual.

In completing the preliminary risk assessment, the findings of the risk assessment completed to support council's existing CZMP (BMT WBM, 2017a), were considered. There are a few matters from that work which warrant discussion.

BMT WBM (2017a) classified all beaches along the Wollongong Coastline as being subject to "extreme" risks over all time frames, including the immediate timeframe. This classification can be unhelpful when considered through a risk management lens relating to the management objectives that apply to a beach.

It is true that beaches are continually subject to change, including occasional significant storm events which strip large volumes of sand from the beach. However, this is all part of normal beach behaviour. The beach risk assessment should consider whether a particular beach will continue to function in future. There are a few issues to consider:

- It is expected that beaches will tend to move landward with sea level rise. If development or other infrastructure (e.g., a seawall) exists landward of the beach, there may not be space for the beach to migrate across the landscape and



the beach could be partly or completely 'squeezed' out of existence. Appropriate management normally involves the setting of suitable development controls where possible.

- A rising sea level may completely strip sand from the beach if it presently comprises a shallow layer of sand overlying bedrock.
- As a beach recedes, the recession occurs as a series of storms from which the beach does not fully recover. If the recession is fast enough, this could result in a notably narrower beach for a greater proportion of the time which may affect public perception and usability of the beach.

Related to loss of beach width is the potential squeeze of valuable ecological communities which exist landward of the beach. Ideally, space would need to be available for the entire beach system (ocean facing beach, dunes, hind dunes and associated ecological communities) to migrate landwards. Where present, littoral rainforests can be particularly at risk if they are located landward of sandy dunes.

The overall sense is that the beach systems of the Wollongong coast are not all subject to "extreme" risks, but these may arise in future if room is not provided for the beaches to migrate landwards over time. Risks will likely be enhanced if sea levels begin to rise rapidly, but this is not projected for several decades yet. Ongoing monitoring of both mean sea level and changes to the coastline seems to be an appropriate approach and should be carried forwards as a management action.

A further issue is the classification, within the CZMP, of some constructed assets as being at risk of inundation. Assets such as stormwater pipes and ocean pools are clearly designed to withstand inundation. A more nuanced approach is required of this risk regarding whether the asset will cease to function.

For example, an ocean pool may become so low relative to mean sea level that waves break too regularly across the pool, reducing the safety and amenity of the pool. Similarly, stormwater systems may fail to drain properly with increasing frequency. It is suggested that this functionality is best considered alongside the "tidal inundation" hazard, rather than under the extreme inundation considered by BMT WBM. Structural integrity of these assets (more related to erosion) may also need to be assessed under the extreme "coastal erosion/recession" hazard.

After filtering out these anomalous risks, the remaining risks of concern ("extreme" or "high" classifications either for present day or by 2050) were carried forwards, alongside other assets that could be affected, determined using GIS and considering the findings of Cardno Lawson Treloar (2010b) and GHD Geotechnics (2010b). Those assets and the threats that Coastal Hazards posed were discussed at the coastal vulnerability workshop described in Appendix A.



2.4.9 Consideration of Sea Level Rise

Past hazard studies for Council have typically adopted a sea level rise “projection” of 0.4m by 2050 and 0.9m by 2100, consistent with the most commonly applied values in NSW during the past decade. However, the CM Act and accompanying Coastal Management Manual now places different requirements on Councils and these will need to be considered in future hazard studies. Projections for future sea level rise are discussed in Section 3.7

Coastal risks now need to be assessed for present day, 20, 50 and 100-year future time frames. In order to complete the required risk assessment of stage 2, Council needs to instruct consultants regarding the sea level rise projection which it plans on adopting. This effectively means that Council needs to be planning for sea level rise out to at least ~2125.

Ultimately, Council will need to update and advise consultants regarding its adopted sea level rise projection. If this cannot happen before the coastal hazard studies of Stage 2 need to begin, the coastal hazard studies could be completed considering a selected range of future sea level rise amounts, without attaching a particular time frame. Once Council has upgraded its projection, the results from the coastal hazard studies can be interpolated to derive results that match that projection.

A suitable set of sea level rise amounts that could be considered by the hazard studies are 0.0m, +0.2m, +0.4m, +0.6m, +0.9m, +1.2m and +1.5m. While it isn't essential that a projection be adopted for the hazard studies to be completed, it will be essential that a projection is adopted by the time the updated, detailed risk assessment is completed. That risk assessment typically would occur at the end of Stage 2, or the beginning of Stage 3.



3 Strategic Context

3.1 Background

A detailed summary of key legislation and planning instruments under which Coastal Management occurs in NSW is provided in Appendix B. Notable elements of the coastal management framework, and those policies and plans that are particular to the Wollongong Coast are described in the following sections.

3.2 Social and Economic Context

3.2.1 Aboriginal Cultural Assets and Values

The local Aboriginal community is made up of Traditional Custodians (Dharawal people), knowledge holders, language holders, Aboriginal groups and organisations and individuals. It is recognised the coast holds enormous cultural importance to First Nations people. There are many sites across the coastal areas of the Wollongong City Council Local Government Area that are significant to the Traditional Custodians. The Aboriginal cultural assets and values are best represented and managed by the local Aboriginal community.

The following text has been provided to Wollongong City Council by the Illawarra Local Aboriginal Land Council for direct inclusion in this Scoping Study.

"The coastal region of the Wollongong LGA is extremely important to Aboriginal Traditional Owners and Custodians, Aboriginal people who have historical ties and connection with this region, as well as the broader Aboriginal community. The landscape that is the focus of the Coastal Management Programs (CMP) lies within the lands of the Dharawal speaking people of the Dharawal Nation. This coastal land holds deep family kinship connections embodied through memories and lives of people and community, extending through time to the ancestors that created this part of the Country.

Continuing cultural practices, interwoven with the land and sea environment, have been maintained for a millennium. Cultural practices across the coastal region, such as food and medicine gathering, teaching and learning, ceremonies and crafts, instil a great sense of wellbeing and responsibility for the conservation of resources in the extended Aboriginal community and demonstrate a continual and deeply rooted held respect for Country.

This coastal region within the Wollongong LGA is integral to a number of dreaming narratives and is an important place for resource gathering and use, occupation, connection to Country and teaching and learning.

As outlined in the Illawarra – Shoalhaven Regional Plan, the region "has a rich and diverse heritage reflected in the strong links between the Aboriginal people



and the region's coastline and escarpment – which are important cultural landscapes – and in the historic sites and townships associated with early European settlement" (DPE, 2015). Directive 3.4 of the Regional Plan notes that protecting this cultural heritage is important to the region's communities, its identity and character, and contributes to the visitor economy.

Threats to Cultural Values

Past studies have identified a number of cultural values and assets associated with the Wollongong coastal region. There are approximately 50 previously recorded Aboriginal sites registered on the Aboriginal Heritage Information Management System (AHIMS) database, including artefact scatters, middens and a burial site located along the Wollongong LGA coast. An additional 60 Aboriginal sites are located around the fringe of Lake Illawarra (within the Wollongong LGA boundary). Additionally, there are three Aboriginal Places located within the coastal region of the Wollongong LGA: Sandon Point, Bellambi Point and Era Beach Resting Place Aboriginal Place.

The full extent of Aboriginal cultural values and assets has not previously been established. Aboriginal people are the primary source of information about Aboriginal cultural heritage values (cultural significance), and determining the cultural values within a region can only be done by Aboriginal knowledge holders. Additionally, the full extent of tangible Aboriginal sites remains unknown and previously unrecorded sites may occur.

Previously identified cultural values and assets along the Wollongong coastline are being actively destroyed. Aboriginal coastal cultural values and assets will increasingly be at risk due to a number of threats/hazards, including:

- Coastal Hazards:
- Wave overtopping
- Coastal inundation
- Beach erosion
- Shoreline recession
- Tidal Inundation
- Dune instability
- Coastal cliff or slope instability
- Surface runoff/direct erosion from increased storm frequency.
- Overdevelopment in the coastal zone



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- *Poorly suited or inappropriate development*
 - *Risk of damage from people who are not aware of their presence/significance (i.e. by trampling)*
 - *Deliberate damage (i.e. vandalism)*
 - *Population growth (tourism and recreational pursuits)*
 - *Management measures to protect other coastal values (i.e. dune stabilisation, revegetation etc.)*
 - *Insufficient or inappropriate governance and management of this coastal environment”*

3.2.2 Post European Colonisation

The post colonisation history of the Wollongong coast is comprehensively detailed by Kass (2010). A summary of events impacting the Wollongong Coast and estuaries is listed below:

- 1815: Charles Throsby entered the Wollongong area and erected a stockyard and hut.
- 1816: Commencement of surveying for land grants.
- 1821: Settlement commenced in Parish of Woonona.
- 1826: Wollongong Harbour established as one of the main cedar shipping ports of the Illawarra.
- 1833: Instructions were issued to survey an acre at Wollongong for shipbuilder John Cunningham for a shipyard on the harbour.
- 1837: Construction of a basin with a pier using convict labour housed in a stockade on Wollongong Head, later known as Flagstaff Hill.
- 1834: Governor Gipps approved the plan for the town of Wollongong.
- 1849: First mine opened on the escarpment.
- 1860: Deepening of the Wollongong Harbour entrance with construction of a new stone barrier.
- 1861: A second loading slip was erected at Wollongong Harbour.
- 1868: Lady Belmore opened the newly completed harbour works and renamed it Belmore Basin.



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- 1868: Three muzzle loading 68-pounder guns were sited to defend Wollongong Harbour.
 - 1880: A T-jetty constructed in the outer Wollongong Harbour. in 1880.
 - 1871: Joseph Mather of Sydney erected a prefabricated wrought iron harbour lighthouse at the end of the Wollongong Harbour breakwater.
 - 1879 to 1885: Construction of a road from Bulli to Coal Cliff and Stanwell Park.
 - 1883: Commencement of railway construction.
 - 1885: Part of Brighton Beach (in Wollongong Harbour) reclaimed, lawns laid down and trees planted. Sea bathing occurring amongst the rock holes.
 - 1888: Opening of the railway.
 - 1870-1890 Strong demand for coal leads to an increase in collieries opening north of the Wollongong township along the escarpment. Villages such as Bulli, Woonona, Thirroul, and Austinmer develop to provide housing for coal miners and their families.
 - 1893: A small salt works erected at the south end of Austinmer beach for the Illawarra Salt Company.
 - 1894: The Sydney Salt Company constructed a salt works Hicks Point south of Austinmer jetty.
 - 1898: Port Kembla Harbour Act, (No 34) gave the colonial government the power to build the eastern breakwater at Port Kembla as well the necessary jetties and rail lines.
 - 1899: Beach cleared of stone at Austinmer and used to ballast the road opening up the beach to surf bathing.
 - 1902: Baths cut into rock platform at Clifton.
 - 1908: Helensburgh-Stanwell Park, Bulli and Thirroul SLSCs formed.
 - 1908: Eastern breakwater completed at Port Kembla enabling better loading facilities.
 - 1909: Woonona and Austinmer SLSCs formed.
 - 1914: Scarborough SLSC formed.
 - 1917: Austinmer Baths erected.
 - 1920s: Tourist hotels begin to appear in the Bulli area.
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- 1925: Northern breakwater at Port Kembla completed.
 - 1926: Scarborough baths completed.
 - 1928: The Woonona Baths Pavilion opened.
 - 1921-1947: Shift from coal mining to manufacturing at Port Kembla.
 - 1927-1933: The first phase of sewerage works was in progress until halted by the Great Depression.
 - 1936: North Wollongong Beach Surf Club opened.
 - 1936: Ben Howard built Windang Boat Shed hiring boats to tourists and selling fish.
 - 1938: The North Wollongong Beach Pavilion and Kiosk at Wollongong opened.
 - 1945- 1976: Expansion of the steel industry drove the expansion of Wollongong connecting many of the coastal villages.
 - 1953-1958: Large quantities of sand quarried for construction, filling, and export from the peninsula south of Port Kembla running south to Windang.
 - 1953-1958: Beach sands were mined at Bulli, and Wollongong-Port Kembla beaches to extract rutile and zircon concentrate.
 - 1960s: Sandon Point became a popular location for surfboard riding.
 - 1988: A 15-kilometre cycle path built and heritage trail established along the Wollongong coastline.
 - 2003: Lawrence Hargrave Drive closed to traffic after a large embankment slip between Stanwell Park and Clifton.
 - 2005: North Wollongong Beach Section added to the State Heritage Register.
 - 2005: Sea Cliff Bridge opened, and elevated boardwalk and pathways constructed to connect Clifton Village to the new bridge.
 - 2010: Wollongong Harbour Section added to the State Heritage Register.

The post European colonisation history demonstrates that the Wollongong coast has been intensively managed over the past 200 years, with substantial modification to the natural environment. There is little of the coast that has not been subject to artificial change to landform, vegetation extent or biological composition. As with many urban coastlines, modification and intensive management continue today with recent examples including dune re-shaping and profiling, removal of dune vegetation and estuary entrance modification.



The CZMP (BMT WBM, 2017b) identifies a number of non-indigenous heritage sites in the coastal zone. These are listed in Table 6 below.

Table 6 Non-indigenous heritage in the coastal zone

Item	Suburb	Level of Significance
Norfolk Island pines on former Headlands Hotel site	Austinmer	Local
Gladstonbury Gardens	Austinmer	Local
War memorial	Austinmer	Local
Norfolk Island pines	Austinmer	Local
Norfolk Island pines	Austinmer	Local
Site of Austinmer jetty	Austinmer	Local
Norfolk Island pines	Austinmer	Local
Bellambi Lake and Sandpit Point	Bellambi	Local
Lake islands	Berkeley	Local
Lake islands	Berkeley	Local
Bulli general cemetery	Bulli	Local
Norfolk Island pine beachfront planting and row of phoenix palms	Bulli	Local
Boat sheds	Bulli	Local
Norfolk Island pines beach front planting	Bulli	Local
Cliff vegetation and Moranga Park	Clifton	Local
Imperial Hotel	Clifton	Local
Coalcliff Colliery jetty mine - including entrance portal	Coalcliff	Local
Coalcliff Colliery shaft mine and coke works	Coalcliff	Local
Norfolk Island pines	Coledale	Local
Norfolk Island pines	Coledale	Local
Former Dapto smelter	Kanahooka	Local
Newton Park and gardens	Kembla grange	Local
North Beach surf club	North Wollongong	Local
Group of Norfolk Island pines and Canary Island palms	North Wollongong	Local
Seafeld House and graduation works	North Wollongong	Local
North Beach kiosk and residence	North Wollongong	State
North Beach pavilion	North Wollongong	State
Gun emplacement connected & isolated concrete bunkers, Red Point / Hill 60 landscape	Port Kembla	Local
Remains of original ocean baths	Port Kembla	Local
Hill 60, Fisherman's Beach, Boilers Point, Red Point and MM beach	Port Kembla	State
Port Kembla Olympic pool	Port Kembla	Local
Vegetated hill and swamp	Primbee	Local
"Esperanza"	Primbee	Local
Scarborough Hotel	Scarborough	Local
Police station	Scarborough	Local
Scarborough public school	Scarborough	Local
Wet sclerophyll forest	Stanwell Park	Local
House (former quest house)	Thirroul	Local



Item	Suburb	Level of Significance
"Wyewurk"	Thirroul	Local
Thirroul Beach reserve	Thirroul	Local
Thirroul baths precinct	Thirroul	Local
Norfolk Island pines	Windang	Local
Wollongong Head lighthouse	Wollongong	State
Site of cokeworks, including remains of coke oven	Wollongong	State
Ladies' baths	Wollongong	State
Seawall	Wollongong	State
Railway cuttings and embankments	Wollongong	State
Former roman catholic cemetery including gravestones and monument	Wollongong	Local
Harbour steps	Wollongong	State
Breakwater light house	Wollongong	State
Harbour steps	Wollongong	State
Three guns	Wollongong	State
Flagstaff Hill fort	Wollongong	State
Nuns' baths	Wollongong	State
Battery Park	Wollongong	State
Stone steps	Wollongong	State
Avenue of Norfolk Island pines	Wollongong	Local
Wombarra general cemetery	Wombarra	Local

3.2.3 Demographics⁶

In 2021, the estimated resident population for the Wollongong City LGA was 241,657 with a population density of 313.9 persons per square kilometre. Approximately 46% of residents in the LGA live in a coastal suburb. The population has been gradually increasing since the early 1990s. The vast majority of recent growth has been from new dwellings in Horsley and Woonona, and more recently, medium and high-density dwellings in central Wollongong. Population growth is expected to continue, particularly from the West Dapto land release. The proximity of Wollongong to the outer southern and western suburbs of Sydney also results in higher visitor numbers particularly over weekends and holidays.

Across the coastal suburbs, the population density generally increases with closeness to the Wollongong city centre (see Table 7). The largest anticipated growth areas over the next 20 years are Bulli, North Wollongong, and Wollongong. Given that the residential development footprint is unlikely to change significantly, these increases in population will most likely be accommodated through an increase in medium and high-density housing options.

⁶ <https://profile.id.com.au/wollongong/about?WebID=10>


Table 7 Population distribution and growth

Area	Land Area (sq km)	Density (persons per sq km)	Population 2022	Expected % Growth to 2041	Projected Pop. in 2041
Helensburgh, Lilyvale	43.49	160.4	6677	7.2	7159
Stanwell Park, Stanwell Tops & Coalcliff	35.56	65.99	2226	5.1	2339
Wombarra, Coledale, Scarborough, Clifton	5.87	455	2487	-.5	2475
Austinmer	3.37	804.7	2658	2.9	2736
Thirroul	4.85	1303	6421	1.2	6499
Bulli	7.94	857.7	6398	15.3	7378
Woonona, Russell Vale	9.77	1429	14283	2.0	14568
Bellambi	2.28	1768	4156	-1.1	4112
East Corrimal	1.41	2410	3540	0.9	3571
Towradgi	1.42	2276	3428	1.2	3470
Fairy Meadow	3.47	2170	7753	3.9	8056
North Wollongong	2.45	936.7	2844	10.2	3133
Wollongong	5.85	3499	23755	47.3	34982
Coniston-Mount Saint Thomas	1.61	2375	3906	-0.66	3880
Port Kembla – Spring Hill	16.8	302.4	5370	1.04	5426
Windang Primbee	5.47	771.2	4417	5.04	4640
Total	151.61	1349.01 (average)	100319	6.31 (average)	114424

The coastal suburbs north of Wollongong have an even distribution of residents across all age classes. However, within Wollongong city centre itself there is a higher proportion of persons aged 20-29 years and, perhaps unsurprisingly, greater than ninety percent of development approvals in Wollongong East in the past 5 years have been for unit developments. The increase in population density is likely to result in increased pressure on the coastal environment, particularly around recreational use. This may be compounded by an increasing visitor and tourist presence, associated with high levels of urban growth in south-west Sydney.

The demand for recreational facilities, associated infrastructure (picnic tables, toilets, showers, carparks) and the resources to service these facilities (lifeguards, waste services etc.) will grow. Greater levels of human disturbance can be expected on what is already a heavily impacted dune and estuarine ecology. Preservation of these natural values will become increasingly important as this pressure increases with population growth.



3.2.4 Socio Economic Context

Employment and industrial data are presented by .idcommunity⁷, based on the 2016 census and broken down by local government wards.

- Ward 1 covers the northern section of the Wollongong LGA inclusive of the coastal suburbs from Stanwell Park to Fairy Meadow, and North Wollongong. Health care and social assistance is the largest employment industry accounting for 14.5% of employed persons, which is 2% above the state average. The education and training sector makes up 13.2% of employment, which is nearly 5% higher than the NSW average of 8.4%. The University of Wollongong Innovation Campus and a number of high schools and primary schools are located within Ward 1.
- Ward 2 includes the coastal city suburb of Wollongong. The remainder of the ward sits outside the coastal zone to the west of the city centre. As with Ward 1, Health care and social assistance, and education and training are the highest employment sectors at 15.1 % and 13.8% respectively.
- Only a small section of Ward 3 falls within the Wollongong Coast coastal zone, namely the suburbs of Coniston, Port Kembla and Windang. Much of Ward 3 forms the catchment for Lake Illawarra and therefore is of greater importance to the Lake Illawarra CMP. Ward 3 includes the industrial area of Port Kembla which also falls outside the scope of this CMP. However, the proximity to the coast and city centre means that Ward 3 residents may still be frequent users of the Wollongong coast. As with the other wards, the health care and social assistance sector accounts for around 15% of employment. Ward 3 is unique in that the other predominant employers are the retail trade (11.8%) and construction (10.1%).

Overall, Wollongong is similar to the NSW state averages for most employment sectors. The one exception is Professional, Scientific and Technical services with Wollongong nearly 5% less than the state average which is 8.1%.

Tourism is an important part of the economy. In 2020/21, the total tourism sales in Wollongong City was \$831.0m, with 2,023,489 domestic visitor nights in 2020/21 (Tourism Research Australia, 2021). Tourism may include overseas visitors in the country for a holiday, business or education, Australian visitors staying overnight, or local day trippers visiting the area. Wollongong is a major destination for coastal offerings, both for natural areas and managed spaces. These spaces are likely to become under increased pressure as NSW's population grows over the coming decades. Over the next 20 years it is expected the Western Sydney and areas to the south of Wollongong will grow by 57%, or up to 1.3m more people (Place Intelligence, 2022). Day trippers made up approximately 48% of tourism in Wollongong in

⁷ <https://economy.id.com.au/wollongong/employment-locations>



2019/2021. It is highly likely this will put increased pressure on the coastal environment and built assets along the foreshore.

The Socio-Economic Indexes for Areas are published by the Australian Bureau of Statistics. The most recent version of the product dates from the 2016 census and was released in 2018.

Key indices are:

- **Index of Relative Socio-economic Disadvantage** which summarises a range of information about the economic and social conditions of people and households in the area, considering the prevalence of disadvantage only. A value of 1 is indicative of an area having a high proportion of people and households displaying characteristics of disadvantage (low-income households, no qualifications, low skill occupations). A value of 5 indicates relatively few people and households expressing these signs of disadvantage.
- **Index of Relative Socio-economic Advantage and Disadvantage (IRSAD)** which summarises a range of information about the economic and social conditions of people and households in the area, considering markers of both advantage and disadvantage. A value of 1 is indicative of an area having a high proportion of people and households displaying characteristics of disadvantage as well as a low proportion of people and households displaying characteristics of advantage. Conversely, a value of 5 indicates relatively few people and households expressing these signs of disadvantage and many households showing signs of advantage.
- **Index of Education and Occupation (IEO)** which reflects the education and occupational level of communities. A low score indicates a high prevalence of people without qualifications, in low skilled jobs, or unemployed. A high score indicates higher education and occupational status.

The values for key areas along the Wollongong Coast are summarised in Table 8. These show that within the coastal zone, the northern suburbs have relatively few households with signs of disadvantage, many households showing signs of advantage and a higher education and occupational status. South of Bellambi the scores decrease with Bellambi itself and Fairy Meadow having a high proportion of people with signs of disadvantage, a low proportion with advantage and a high prevalence of people without qualifications, in low skilled jobs or unemployed. This data highlights that there is diversity in the coastal population which may influence the perceived value of coastal assets and priorities of residents. Future community engagement strategies should demonstrate consideration of demographic data particularly for projects on a precinct level.



**Table 8 Socio Economic Indices for Areas, derived from 2016 census
(Australian Bureau of Statistics, 2018)⁸**

Area	IRSD	IRSAD	IEO
Lilyvale – Stanwell Park	4	4-5	5
Coalcliff	5	5	5
Clifton to Scarborough	4	5	5
Wombarra	5	5	5
Coledale	4	5	5
Austinmer	5	5	5
Thirroul	4-5	5	5
Bulli	3-5	4	3-4
Woonona Russell Vale	1-5	3-4	3-4
Bellambi	1	1	1
East Corrimal	2	1-2	1-3
Towradgi	1-3	2-3	2-4
Fairy Meadow	1	1	1
Wollongong	2-4	1-4	3-4
Port Kembla	1-4	1-4	1-3
Windang	1-2	1-2	1-3

3.3 Overarching Coastal Planning Framework

A detailed summary of key legislation and planning instruments that influence Coastal Management in NSW is provided in Appendix B. Notable elements of the coastal management framework, and those policies and plans that are particular to the Wollongong Coast are described in the following sections.

3.3.1 NSW Coastal Management Framework

In late 2021, the CM Act was amended which is of relevance to the 2017 CZMP. The amendment (NSW Government, 2021a) relates to ‘Schedule 3 - Savings, transitional and other provisions’. Schedule 3, Clause 4 now states:

- A coastal zone management plan (including any emergency action subplan in that plan) in force under the former Act before the repeal date continues to have effect in respect of the local council to which it applied immediately before the

⁸[https://www.abs.gov.au/ausstats/abs@.nsf/Lookup/by%20Subject/2033.0.55.001~2016~Main%20Features~SOCIO-ECONOMIC%20INDEXES%20FOR%20AREAS%20\(SEIFA\)%202016~1](https://www.abs.gov.au/ausstats/abs@.nsf/Lookup/by%20Subject/2033.0.55.001~2016~Main%20Features~SOCIO-ECONOMIC%20INDEXES%20FOR%20AREAS%20(SEIFA)%202016~1)



repeal date until replaced by a coastal management program prepared and adopted under this Act.

- This clause ceases to have effect at the end of 31 December 2023.

The amendment changed the repeal date for existing coastal zone management plans, prepared under the prior NSW Coastal Management Framework, from 31 December 2021 to 31 December 2023. Therefore the Wollongong CZMP (BMT WBM, 2017b), which focusses on the open coast will remain in effect until the end of 2023, or when replaced by the certified CMP which is currently under development, whichever comes first.

3.3.2 Resilience and Hazards SEPP – Chapter 2 Coastal Management

On 21 December 2021, the NSW Government consolidated 45 State Environmental Planning Policies (SEPPs) into 11 SEPPs. The provisions of the previous Coastal Management SEPP now sit within the RH SEPP. All provisions from the previous CM SEPP have been maintained and therefore the change is administrative in nature with no impact on the current CMP development process. The RH SEPP, as with all other consolidated SEPPs, came into effect on 1 March 2022.

3.4 Regional Plans and Policies

3.4.1 Illawarra Shoalhaven Regional Plan 2041 (NSW Government, 2021b)

The Illawarra Shoalhaven Regional Plan 2014 is a 20-year regional land-use plan that applies to the Wollongong, Shellharbour, Kiama and Shoalhaven LGA's.

Specific strategies within the plan relating to the coastal zone include:

- Strategy 11.5 - Protect coastal lakes and estuaries by implementing the NSW Government's Risk Based Framework for Considering Waterway Health Outcomes in Strategic Land-use Planning Decisions.
- Strategy 11.6 - Align local plans with any certified CZMP or CMP.
- Strategy 12.3 - Reduce the regions exposure to natural coastal hazards through implementing the NSW Governments Coastal Management Framework.
- Strategy 15.4 - Explore opportunities where carbon sequestration using estuarine ecosystems could be used for estuary riverbank restoration and/or be included in CMPs.
- Strategy 28.1 - Strategic planning and local plans should consider opportunities to connect existing coastal walkways to enhance the user experience and link coastal towns and villages.



3.4.2 Illawarra Biodiversity Strategy 2011 (Lemmon, 2011)

Presented in two volumes, the Strategy details key issues, values, and threats to the biodiversity of the Illawarra region. With respect to the Wollongong coastal zone the strategy highlights the fragility of the coastal plain vegetation, describing it as scarce, in isolated fragments and much of the remaining vegetation listed as Endangered Ecological Communities.

The document proposes action objectives under the themes of community participation, knowledge, data and monitoring, land use planning, and managing natural areas. Since the completion of this strategy there has been significant changes to the NSW Biodiversity Conservation framework, following the 2016/17 reforms. However, the general principles of biodiversity conservation remain consistent and of ongoing relevance to management of vegetation in the coastal zone.

3.4.3 The Six Cities Region Discussion Paper (State of NSW, 2022)

The Six Cities Region comprises the Lower Hunter and Greater Newcastle City, Central Coast City, Illawarra-Shoalhaven City, Western Parkland City, Central River City and Eastern Harbour City. The aim of creating the city region is to facilitate strategic planning across a wider geographic area to address economic, liveability, climate, sustainability, fairness and equity challenges and opportunities. Following on from the discussion paper, a Region Plan is expected to be developed by the end of 2023 and a regional plan for the Illawarra-Shoalhaven delivered in 2024.

3.5 Council Plans and Policies

3.5.1 Wollongong LEP, Land Use and Development Control

The Wollongong Local Environment Plan (2009) provides the framework within which planning, and land use decisions are made within the Wollongong Local Government Area. The land use zonings are defined in the Section 2 Land Use Table of the LEP. Section 2.2 of this report describes the spatial distribution of land use zonings within the Wollongong coastal zone.

Wollongong City Council's current Development Control Plan (DCP) (Wollongong City Council, 2009) contains numerous sections that relate to development controls within the coastal zone. Listed below, many of these sections will require updating potentially upon completion of Stage 2 studies, and/or following certification of the CMP.

- Chapter A1: Introduction. *"In determining a development application, a consent authority is to take into consideration ... any CZMP within the meaning of the Coastal Protection Act 1979."*



- Chapter B1 (Section 4.15.1): Residential Development near the Coastline.
The objectives for coastal development within this section are:
 - a) To minimise built intrusions into the coastal landscape.*
 - (b) To protect property from the threat of coastal hazards and land instability.*
 - (c) To retain views to the ocean from roads and public spaces.*
 - (d) To facilitate buildings that are consistent with a coastal character.*
- Chapter B1 (Section 4.15.2): Contains specific development controls relating to coastal hazards (cliff instability and erosion) including setbacks, design criteria and geotechnical assessment requirements.
- Chapter D14 Wollongong Innovation Campus: An Objective for this area plan is “to reinforce the site as part of the regional coastal landscape particularly in its relationship to Puckeys Estate, surrounding creeks and its visual connection to the Illawarra escarpment.”
- Chapter E10 (Section 2.2) Aboriginal Heritage: This section states that a precautionary approach will be taken requiring an Aboriginal archaeological and cultural heritage assessment to be undertaken for any new land use activity or development upon:
 - (a) Any beach or coastal foredune area (i.e. both primary and secondary dunal areas) (excluding any portion of land subject to past development disturbance).*
 - (b) Land within 40 metres from top of bank of any watercourse / riparian land (excluding any portion of land subject to past development disturbance).*
 - (c) Land within 40 metres from the mean high-water mark (MHW) of any estuary or tidal inlet (excluding any portion of land subject to past development disturbance).*

Whilst the assessment process within the DCP is clear, the management of cultural heritage in the coastal zone continues to be a considerable concern for Council and the Aboriginal community. This is an area of the DCP that is likely to require revision upon completion of the CMP.

- Chapter E12 Geotech Assessment of Slope Instability: This chapter of the DCP applies to lands that are known or suspected to be subject to land instability. It encompasses land subject to cliff instability or impacted by wave action or inundation.



- Chapter E13 Floodplain Management: This chapter of the DCP refers to the 2100 Coastal Zone Inundation Extent in defining the Low Flood Risk Precinct for the Wollongong LGA.
- Chapter E15 Water Sensitive Urban Design, Chapter E22 Soil erosion and sediment control and Chapter E23 Riparian Corridor Management: These chapters aim to provide best practice guidance to deliver improved water quality and ecological outcomes for waterways.

A notable omission within Chapter C4 Caravan Parks, Camping Grounds and Manufactured Home Estates is the absence of controls relating to coastal hazards. With three caravan parks in the coastal zone, including one with a large number of permanent residents, a greater understanding of coastal hazards would be of benefit.

Throughout the DCP there are numerous references to superseded state level policies and broad references to ensuring consistency with existing plans such as the CZMP. These will require updating as part of the CMP process.

3.5.2 Our Wollongong Our Future 2032: Community Strategic Plan (Wollongong City Council, 2022b)

The Community Strategic Plan outlines the community's main priorities and aspirations for the future and include strategies for how they will be achieved. There are several references relevant to the coastal zone throughout the document.

- Goal 1: We value and protect our environment.
- Strategy 1.2: Manage and effectively improve the cleanliness, health and biodiversity of creeks, lakes, waterways and ocean.
- Strategy 1.3: Increase our resilience to natural disasters and a changing climate to protect life, property and the environment.
- Community indicators included: Proportion of beaches sampled for recreational water quality through the NSW Beachwatch Program rated as good to very good.

3.5.3 Delivery Program 2022-2026 and Operational Plan 2022-2023

The Operational Plan forms a component of Council's Integrated Planning and Reporting (IP&R) framework. It is an annual plan of actions that support a longer-term Delivery Program and includes budget allocations to support those actions. The Delivery Program and Operational Plan identifies development of the open coast CMP/s as an action. Other plan actions that may address or impact some of the issues identified thus far are outlined below. It is important to note that these actions will not necessarily become an action within the CMP going forward, as many will be best dealt



with through more appropriate planning mechanisms and funding programs. However, knowledge of complementary actions, may create opportunities to enhance and support program delivery. Actions of relevance are:

- Develop and install the Sandon Point Aboriginal Place Interpretive Strategy.
- Continue implementation of priority actions from the Dune Management Strategy.
- Implement funded actions from the Beach and Foreshore Access Strategy 2019-2032 Port Kembla Beach Access Ramp construction.
- Plan, design and complete the renewal of the downstairs North Wollongong SLSC.
- Design and construct a boat shed for North Wollongong SLSC.
- Plan, design and undertake renewal works at Ocean Rock Pools (Bulli Rock Pool).
- Reconstruct Bellambi Boat Ramp Jetty, Bellambi Lagoon Carpark, Lawrence Hargrave Drive boardwalk, Fishermans Beach Access Ramp.
- Design and implement North Wollongong Beach seawall renewal.
- Construct Grand Pacific Walk at Austinmer and Clifton, Seacliff Bridge Lookout.
- Preparation of the Bellambi Foreshore Precinct Plan.
- Implement the Landscape Masterplan for Hill 60 Reserve.
- Develop and implement the landscape masterplan for Stuart Park North Wollongong.

3.5.4 Our Resourcing Strategy 2032 (Wollongong City Council, 2022c)

The Resourcing Strategy outlines how Council will allocate resources to achieve the visions and goal set out in 'Our Wollongong Our Future 2032'. The long-term financial plan identifies 5 actions of relevance to the coastal zone. Projects to be funded 2022-2026 include the North Wollongong Beach seawall renewal, Cliff Road Stuart Park to Marine Drive, disabled viewing platform on Hill 60, Stuart Park Masterplan, Biodiversity Strategy.

The Strategy incorporates the Asset Management Strategy 2022-2032 which outlines Council's approach and commitments to resourcing long-term, high value assets. Asset classes relevant to the coastal zone include transport, stormwater, buildings and recreation and open spaces. Council has Asset Management Plans for these asset



classes. During the Scoping Study, consultation (see Appendix D) identified that some coastal assets, such as seawalls, are currently not represented in any asset class.

3.5.5 Wollongong Local Strategic Planning Statement 2020 (Wollongong City Council, 2020a)

The Strategic Planning Statement is a 20-year plan that sets out the land use vision for the Wollongong LGA. The Statement largely summarises and collates existing strategies and plans into a single document. Those strategies and plans relevant to the coastal zone detailed in adjacent sections.

3.5.6 Sustainable Wollongong 2030 (Wollongong City Council, 2020b)

This Strategy provides the overarching framework and goals to create a sustainable city. The Strategy identifies that the Wollongong CMP is one of many strategic documents that will be used to achieve sustainable outcomes.

3.5.7 Climate Change Adaptation Plan (Wollongong City Council, 2022d)

The Climate Change Adaptation Plan outlines a long-term and staged approach to managing hazards from projected climate change. The Plan identifies storms, sea-level rise future hazards. Risks associated with these hazards includes coastal erosion, damage to assets and infrastructure along the coastal fringe, exposure and loss of cultural heritage, loss of access and biodiversity impacts of salt water intrusion. A priority action to manage these risks is preparation and implementation of a CMP dealing with the Wollongong open coast.

3.5.8 Climate Change Mitigation Plan 2020 (Wollongong City Council, 2020c)

The Climate Change Mitigation Plan sets the context for how Council intends to move forward to meet emissions reduction targets. The plan identifies the Wollongong CMP as a complementary and supporting strategy. It also recognises the role of coastal wetlands in carbon sequestration.

3.5.9 Beach and Foreshore Access Strategy 2019-2028 (Wollongong City Council, 2019a)

The Beach and Foreshore Access Strategy aims to improve access for people with a disability to the beaches and foreshores of the Wollongong Coast. The Strategy contains an audit of community recreational facilities at Wollongong beaches such as toilets, showers, footpaths, and picnic tables. The Strategy identifies Austinmer, Thirroul, North Wollongong, and Port Kembla as priority locations for access improvements. Any works that are conducted as part of the CMP, should consider this strategy, so that opportunities for access improvements can be embraced where possible.



3.5.10 Heritage Strategy and Action Plan (Wollongong City Council, 2019b)

The aim of this Strategy is to provide direction to Council and the Wollongong Heritage Reference Group in relation to heritage outcomes. In addition to general actions related to heritage preservation, actions specifically relating to the coast include:

- Strategy 7.3: Implement the remaining recommended Heritage Interpretation Works contained within the Blue Mile Heritage Interpretation Strategy
- Strategy 7.4: Seek funding to support the development of a Heritage Interpretation Strategy for the Grand Pacific Walk.
- Strategy 8.5: Implement the outcomes of the Sandon Point Aboriginal Place Plan of Management and AHIP in consultation with the local Aboriginal Community and other Stakeholders.
- Strategy 8.6: Develop an updated Conservation Management Plan and Aboriginal Cultural Heritage Assessment Report for the Hill 60 site to support the adopted Masterplan in consultation with the local Aboriginal Community and other Stakeholders.
- Strategy 8.8: Seek specialist advice for the conservation and ongoing maintenance of the Fortifications in the Wollongong Harbour State Heritage Precinct and explore options for their activation in collaboration with Destination Wollongong.

Many of the actions and challenges detailed within this Plan remain current. These issues would benefit from progression through the CMP process, particularly where heritage loss is occurring due to uncertainty around governance processes.

3.5.11 Community Land Plan of Management for Council owned land. (Wollongong City Council, 2022a)

This document provides direction and continuity for the planning, resource management, maintenance, operation and permitted uses of community land.

The POM identifies the following areas and priority actions on community land that are relevant to the coastal zone:

- Section 2.2.4.1 Natural Area Foreshore: Implement the CZMP, implement dune vegetation site plans, enforcement of public safety and environmental laws on beaches, close or re-locate off-leash areas during severe coastal erosion events.
- Section 2.2.4.2 Natural Area Watercourse: implement EMPs, use soft engineering works where feasible, develop riparian VMPs, apply for funding



for stormwater infrastructure and implement floodplain risk management plans.

- Section 4.4.2 Natural Area Wetland: implement the 2011 Illawarra Biodiversity Strategy and implement EMPs.

Upon completion of the CMP, it will be important to ensure that there is consistency between the principles and actions of the generic POM and the CMP, for community land in the coastal zone.

In addition to the over-riding community land POM, there are a number of site specific POMs outlined below.

Stanwell Park Reserve and Bald Hill Lookout Plan of Management (Wollongong City Council, 2021a)

Covering the public recreation land at Stanwell Park Beach and Bald Hill Lookout this POM has the following performance targets.

- Maintain or improve the condition of littoral rainforest, coastal wetlands and Themeda grasslands on seacliffs.
- Maintain or improve existing natural values of the area from 2020 conditions.
- Signage to encourage protection of the natural environment.
- Support recreation and events operating in line with Council policy.
- Well maintained or improved creative infrastructure (art works, heritage).

Coledale Beach Reserve Plan of Management (Wollongong City Council, 2012)

The Coledale Beach POM provides a framework for the current and future use of the area regarding its management, maintenance and operation. Coledale Beach has been used for many years for camping and other recreational activities by both the local Coledale community and tourists. Over time, there has been tension amongst different user groups including campers, surf club, and the general community in relation to the use and management of the reserve. The POM contains actions to improve native vegetation in the reserve, upgrade facilities, increase ordinance signage and remove or stabilise the retaining wall.

Sandon Point and McCauley's Beach Plan of Management (Wollongong City Council, 2015)

The POM outlines, to the community, how Wollongong City Council plans to manage public land at Sandon Point and McCauley's Beach into the future. It includes a review of the current condition of the land, lists the current uses and existing community infrastructure, and then sets future permissible uses or developments. The POM also sets goals and objectives for the area's future management.



- To increase the community's awareness and appreciation of the site's Aboriginal cultural heritage significance and of the continuing importance of the area to Aboriginal people today.
- To work with Aboriginal people and groups in managing the area's Aboriginal cultural heritage values and sites and in presenting these, where appropriate, to the community.
- To maintain the site as a low-key and less-developed area of coastal open space providing an attractive venue for a range of appropriate leisure and information recreation activities.
- To provide for safe, convenient, low-impact and sustainable access to the area's beach and foreshore.
- To balance the needs of managing and protecting vegetation communities and species legislated as having high conservation value or of conservation significance with maintaining and enhancing the area's scenic values, vantage points and views.
- To accommodate appropriate cultural, recreational, social, educational, or special use activities.
- To maintain the site's accessibility and promote pedestrian and bicycle links to adjacent areas.
- To promote and enhance residents, visitors and the community's appreciation and understanding of the area's values.

It is important to note that Sandon Point is a declared Aboriginal Place under the National Parks and Wildlife Service Act (1974). The action plan within the POM includes increased community awareness of the significance of the site as an Aboriginal Place, formalisation of access to reduce impacts on middens and dune erosion and ongoing management of the shared path to reduce user conflicts and improve user safety.

Wollongong City Foreshore Plan of Management (Wollongong City Council, 2008b)

The Wollongong City Foreshore POM outlines Council's proposed management for City Beach, Flagstaff Hill, Brighton Lawn, Osborne Park, North Wollongong Beach, JP Galvin Park and Stuart Park.

It describes the existing licences/leases, and existing and future permissible uses for zones within the POM area. The POM includes management options for traffic, health and safety of users and actions to address the general amenity of the foreshore area,



ecological sustainability for the city foreshore beaches, coastal hazards, commercial developments, and cultural heritage.

3.5.12 Urban Greening Strategy 2017-2037 (Wollongong City Council, 2017)

The Urban Greening Strategy provides a snapshot analysis of the urban forest and details priority actions for greening streets and public spaces. The Strategy proposes and prioritises a range of management options to increase the extent of the urban forest and protect and maintain the condition of existing vegetation, diversify planting, improve urban ecology, and engage the community in implementation. Whilst there are no specific actions relating to coastal vegetation, the Strategy clearly states that the urban forest incorporates riparian vegetation, and that Council will continue to support the Dunecare and Landcare programs.

3.5.13 Wollongong Dune Management Strategy for the patrolled swimming areas of 17 beaches (GHD, 2014)

The Wollongong Dune Management Strategy describes management options for the high use recreational areas of 17 beaches along the Wollongong coast. This document has significantly informed the operational management of the coastal zone over the past 10 years.

The Strategy was developed in response to community concerns about coastal dune management during the public exhibition of the Draft Wollongong CZMP in 2012. The community expressed concerns regarding excessive dune heights and the occurrence of scarping after storms, and the type, height and extent of vegetation occurring on the dunes. In particular, concerns related to how these factors influenced the amount of sandy beach available for recreation, public safety, accessing and using the beach, the condition of surf breaks and the visual amenity of the coastline. Similarly, Council's lifeguard service raised concerns about dune heights and vegetation impacting sightlines and the ability to adequately patrol the beach. The purpose of the Strategy was to address beach amenity, degradation of sight lines for lifeguards and lifesavers, and access issues at patrolled beaches raised by the community, while considering biodiversity values and the role of dunes in coastal processes.

Management options for each beach were identified and prioritised, and include building lifeguard observation towers, raising observation areas in SLSCs, removing vegetation from the seaward edge of dunes, and dune re-profiling. There were also broader management options for all beaches including community engagement, beach and dune monitoring and ongoing vegetation management works including weed control and management of monocultures of subspecies of *Acacia longifolia*. On the basis of this report, an Implementation Plan was developed for the period 2014 to 2016 (Wollongong City Council, 2013a). The vast majority of 'one-off' actions have been completed such as relocating or renewing lifeguard towers and dune re-profiling.



Ongoing actions from the Strategy and Implementation Plan include dune vegetation maintenance and the beach and dune profile monitoring program.

Wollongong City Council has produced a series of site plans to guide dune vegetation management in line with the Wollongong Dune Management Strategy. Actions include treatment of weed species, management of dead and senescent Acacia and Banksia species, new dune plantings, removal of vegetation blocking sight lines from the lifeguard towers. Site Plans are available for the following locations.

- Woonona Beach (Wollongong City Council, 2018a)
- Corrimal Beach (Wollongong City Council, 2018b)
- Towradgi Beach (Wollongong City Council, 2018c)
- Fairy Meadow Beach (Wollongong City Council, 2018d)
- Bellambi Beach (Wollongong City Council, 2018e)
- Wollongong City Beach (Wollongong City Council, 2018f)
- Stanwell Park Beach (Wollongong City Council, 2018g)
- Bulli Beach (Wollongong City Council, 2018h)

3.5.14 The Future of our Pools Strategy 2014-2024 (Wollongong City Council, 2014)

The Future of Our Pools Strategy endeavours to assist Council in delivering aquatic recreational opportunities in alignment with Council's commitment to achieving financial sustainability.

The Wollongong coast has nine tidal rock pools that are highly valued by both the local community and visitors. The strategy highlights that there is limited information on the condition of the tidal rock pools however Council is experiencing rising costs for renewal and maintenance of these assets. Through the Strategy, Council has committed to continue to invest in the programmed renewal of existing tidal rock pools. However, a defined approach is required to suitably respond to the age and condition of the pools.

In addition to the Strategy, Council will need to consider the impact of coastal hazards and climate change on ongoing maintenance and asset renewal, for the tidal pools to remain fit-for-purpose. Further, consider management options for future viability of coastal rock pools at high risk.



3.5.15 Grand Pacific Walk Vision Report and Masterplan (Wollongong City Council, 2013b)

The Grand Pacific Walk is a 60-kilometre shared pathway for cyclists and pedestrians linking Royal National Park to Lake Illawarra. Council has completed Stage 1 of the Masterplan with construction of the section between Coalcliff and Stanwell Park. There remains a significant section between Coalcliff and Thirroul requiring construction. South of Thirroul there is an existing network of shared pathways that will be connected via construction of minor linkage pathways.

3.5.16 Blue Mile Vision and Masterplan (Wollongong City Council, 2007b)

The Blue Mile is a shared pathway and promenade from Stuart Park to Wollongong Golf Club. The Masterplan recognises the increased demand for infrastructure in the city foreshore precinct due to increased population density within and around the precinct. The master plan addresses public facilities, beaches and open space, parks and playgrounds, recreation facilities, footpaths and cycleways, cafes and restaurants, tourism and other commercial opportunities, pedestrian and traffic movement and car parking issues. Council has significantly progressed the masterplan, with a number of major projects completed, including the Tramway seawall and shared path upgrade, new pathways (North Wollongong Surf Club, Squires Way to Stuart Park, Stages 1 and 2 of the Heritage Walk, Flagstaff Hill Walk, East Cliff Road footpath), Brighton Lawn and Harbourside Promenade seawall and facilities, and City Beach SLSC redevelopment.

3.5.17 Towradgi Lagoon Entrance Management Policy (Cardno Lawson Treloar, 2007d) and Fairy Lagoon Entrance Management Policy (Cardno Lawson Treloar, 2007b)

The Towradgi Lagoon Entrance Management Policy and Fairy Lagoon Entrance Management Policy describe the procedures and responsibilities for mechanical breakouts of the respective entrances for flood management and the required response of authorities to unassisted breakouts.

The breakout frequency for Towradgi Lagoon between 1985 and 2003 varied between 7 and 23 times per year, with an average of 16 breakouts per year. The breakout frequency for Fairy Lagoon between 1985 and 2003 varied between 2 and 14 times per year, with an average of 7 breakouts per year. Approximately 50% of breakouts for both ICOLLs were followed by tidal exchange. These policies relate to the threat to flooding of private property and public assets if a lagoon entrance is closed, the water level reaches the threshold level of 1.6 mAHD, and heavy rain occurs. Wollongong City Council is responsible for lagoon opening, should intervention be necessary. The



document outlines the procedures for mechanical opening based on established triggers.

Should an unassisted breakout occur, then Council is responsible for monitoring and internal communication to relevant stakeholders within Council. The Entrance Management Policies should be updated following completion of any new entrance studies, or updated coastal wetland littoral rainforest SEPP mapping, that may occur as part of the CMP.

3.6 Other Legislation, Plans and Policies of Relevance

3.6.1 NSW Marine Estate Management Strategy

The NSW Marine Estate Management Strategy is in the fifth year of a ten-year program. There are three specific actions that include the Wollongong coast (see Table 9) and several state-wide actions that may help manage risks relevant to the Wollongong coast CMP (see Table 10). As the CMP development progresses particularly in Stage 3, awareness of these actions is beneficial, to avoid duplication of effort and capitalise on complementary actions.

Table 9 Wollongong Specific Initiatives and Actions within the Marine Estate Management Strategy Implementation Plan 2022-2024

Wollongong Specific Initiatives	Actions
Initiative 9 – Delivering effective governance	Newcastle to Wollongong Increased fisheries compliance outcomes focusing on addressing priority threats to environmental assets. Increased community and stakeholder education and awareness of fisheries and marine protected areas rules and regulations.



Table 10 Relevant State-wide Initiatives and Projects within the Marine Estate Management Strategy Implementation Plan 2022-2024

Relevant Initiatives	Projects
Initiative 1 – Improving water quality and reducing litter	Building capacity of the Risk-based Framework Review of the NSW water quality objectives Fish friendly workshops for councils Marine litter campaign Estuarine water quality monitoring Land use pressures on the marine estate
Initiative 2 – Delivering healthy coastal habitats with sustainable use and development	Breakwall governance and management ICOLL management Coastal design guidelines review Threats to estuarine fish assemblages Sub-tidal reef monitoring
Initiative 3 – Planning for climate change: risk assessment	Estuarine habitat monitoring and threat assessment Informing the Climate Change Adaptation Strategy in particular Action 3.4: Investigate the impacts of climate change on Aboriginal cultural heritage values in the marine estate and implement strategies to reduce or adapt to this risk. This action is linked to Initiative 4. Climate change research Climate change monitoring Climate change citizen science
Initiative 4 – Protecting the Aboriginal cultural values of the marine estate	Aboriginal engagement Cultural Immersion ‘Elders as mentors’ Cultural fishing funds Cultural research and monitoring
Initiative 5 – Reducing impacts on threatened and protected species.	Planning to protect marine wildlife Partnerships to protect marine wildlife Education to protect and conserve marine wildlife Improve reporting of interactions with marine wildlife Species habitat research Species monitoring
Initiative 6 – Ensuring sustainable fishing and aquaculture	Harvest strategy research Recreational fishing environment assessment Commercial fisheries socio-economic research Fishing industry marine stewardship Eat more NSW seafood Marine biosecurity awareness
Initiative 7 – Enabling safe and sustainable boating.	Maritime infrastructure
Initiative 8 – Enhancing social, cultural and economic benefits.	Marine estate education strategy Maritime heritage review Social and cultural benefits monitoring and research Economic benefits monitoring and research Blue economy

3.6.2 Native Title Act 1993

The south coast of New South Wales, stretching from south of Wollongong to south of Eden is Yuin Country. The entire coastal strip from Bundeena to the Victorian Border, and inland to the tablelands, is presently subject to a native title claim which was filed



in late 2017. Media reports⁹ highlight that a key concern of the native title claim relates to cultural fishing rights. If successful, the claim is likely to affect Aboriginal fishing rights and use of some land, particularly national parks, state forests and Crown land, including Crown reserves managed by Council.

3.6.3 Aboriginal Land Rights Act 1984

This Act provides a framework for recognising the rights and interests of Aboriginal people with respect to certain Crown land. This may include Crown land within the CMP study area, noting that there are large areas of Crown land subject to a claim lodged under the *Aboriginal Land Rights Act 1984*. Aboriginal Land Councils may make claims under the NSW *Aboriginal Land Rights Act 1983* over Crown land that is not lawfully used or occupied or required for an essential public purpose or for residential land.

3.6.4 NSW Blue Carbon Strategy 2022-2027 (NSW Government Department of Planning and Environment, 2022b)

Blue carbon is the carbon captured and stored in coastal and marine ecosystems, including seagrass meadows, saltmarshes, mangroves and supratidal forests. The Blue Carbon Strategy outlines five priorities and the actions to protect and conserve blue carbon ecosystems for their carbon storage, environmental and economic benefits.

The five overarching priorities are:

- Conserving blue carbon ecosystems and supporting their adaptation and migration.
- Delivering blue carbon projects on public, private and First Nations peoples owned and managed land.
- Embedding blue carbon in coastal and marine policy planning and management.
- Progressing blue carbon research.
- Promoting pathways for blue carbon investment.

The strategy defines 20 priority tributaries with the highest area for blue carbon ecosystem restoration. There are no sites within the study area for the CMP. It is considered unlikely at this stage, that the Blue Carbon Strategy would form a component of the final CMP.

⁹ For example <https://www.abc.net.au/radio/programs/am/yuin-community-fight-for-cultural-fishing-rights/12077520>, sourced 19/10/2020.



3.7 Climate Change

Finally, when discussing strategic considerations, climate change is an important medium to long term consideration. Climate change will impact coastal processes by altering temperatures (tending towards warming) and rainfall (decreased rainfall in winter and increased rainfall in autumn and summer)¹⁰. Storm intensity is predicted to increase with higher wind speeds, more intense rainfall and potentially increased ocean swells and storm surge levels.

Sea level rise is of primary importance for coastal planning purposes. In 2021, the IPCC released Assessment Report 6 (AR6), which provided updated sea level rise projections at a finer scale and projecting further into the future (i.e., beyond 2100, noting that analysis to 2100 was the case for AR4). NASA has digested this data and presents it via its Sea Level Rise Projection Tool¹¹. The local sea level rise projection for a high emissions scenario (SSP5-8.5, previously known as RCP8.5) is shown in Figure 35. This high emissions scenario is comparable to the projections that have been adopted for planning in NSW over the past 15 years and, following suitable consideration, would most likely be a suitable basis for the projection Council adopts to inform development of the CMP.

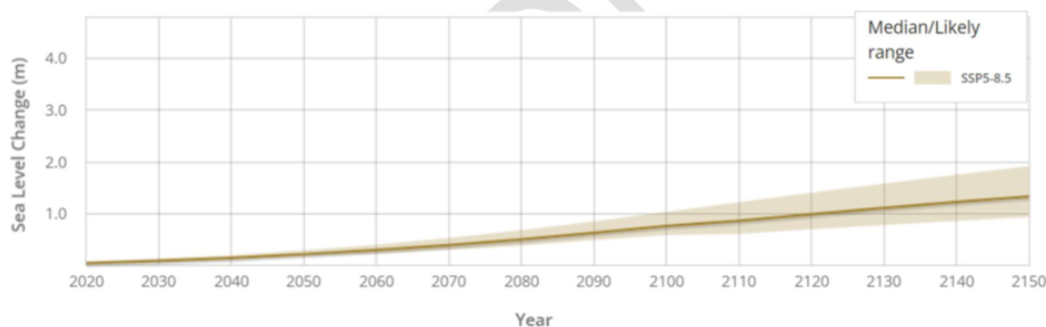


Figure 35 IPCC AR6 Projection for Port Kembla, SSP5-8.5

Sea level rise will continue to be relatively constrained for the next 20-30 years. The projection is slightly higher than corresponding scenarios from previous assessment reports at 2100. However, when taken to 2150, there is an even chance of sea level rise exceeding 1.3m, and it is plausible (1 in 6 chance) that sea level rise of 2.0m would be exceeded, noting that there is a 2/3 chance that sea level rise would be within the “likely range” on Figure 35.

Relevant SSP5-8.5 values for sea level rise (relative to a 1995-2014 baseline), as extracted from NASA’s Sea Level Projection Tool, are presented in Table 11. These are provided as indicative, reasonable value for adoption, based on the most widely

¹⁰ AdaptNSW Illawarra Climate Change Snapshot -
<https://www.climatechange.environment.nsw.gov.au/illawarra>

¹¹ <https://sealevel.nasa.gov/ipcc-ar6-sea-level-projection-tool>



accepted international scientific opinion (the IPCC). Most commonly, the upper end of the “likely” range (~17% level from Table 11) has been selected as a benchmark value for planning purposes by local councils in NSW.

Table 11 AR6 SSP5-8.5 Sea Level Rise Projection Values (rise in m, relative to 1995-2014 baseline)¹²

Probability of Exceedance	2025 (Now)	2045 (20 years)	2075 (50 years)	2125 (100 years)
95%	0.01	0.11	0.29	0.61
83%	0.04	0.14	0.35	0.74
50%	0.07	0.19	0.46	1.06
17%	0.11	0.25	0.61	1.50
5%	0.14	0.31	0.75	1.85

¹² NASA’s data provides values at the end of every decade, the values in this table are simple averages, e.g. 2045 is an average of the 2040 and 2050 values provided by NASA. A more precise analysis could change these values slightly.

4 Community and Stakeholder Engagement

4.1 Community Engagement

Community engagement to inform the Scoping Study was undertaken between 31 May and 7 July 2022. The purpose of the engagement was to understand what the community value about the coastline, how they use and enjoy it, as well as how they have seen the coast and estuaries change over time. Further, to understand what issues stakeholders believe may threaten or challenge the coastline or estuaries in the future. A variety of engagement methods were used including online survey and map, pop-up stalls and meetings with key stakeholder groups. A full description of the community engagement process is detailed in the Stage 1 CMP Engagement Outcomes Report (see Appendix D).

The following values were identified from community input, discussions with Councillors and Council staff and key user groups during Stage One with more frequently mentioned values illustrated in Figure 36. The values described in Table 12 are listed in order of frequency of mention during the engagement period and are not necessarily representative of the values of the Wollongong LGA.



Figure 36 Word cloud of coastal values



Table 12 Summary of key community values

Value	Detail
Recreation	From surfing to walking, swimming, snorkelling, kite surfing, and cycling, people value the recreational opportunities along the coast. Most people surveyed said they used the coast for some kind of recreational activity.
Coastal views	People value their coastal views, both from private property and from community land. They like being able to enjoy these views while socialising, exercising, dining or simply appreciating nature.
Dog off leash areas	The beaches are popular with dog walkers and off-leash areas are particularly valued. In particular, people appreciate being able to walk their dogs 24/7 in some locations to accommodate shift workers.
Shared pathways and walks	The pathways and creek walks are popular assets enjoyed by residents and visitors of all ages. They value being able to ride and/or walk along the coastline with coastal views and easy access to playgrounds, dining options, toilets and parking. Creek walks are appreciated for their flora and fauna, native vegetation and shade.
Rockpools	The ability to access the LGA's rock pools year-round was broadly appreciated and recognised. People also commented on the regular maintenance activity.
Water Quality	People value clean, clear water to undertake recreational activities in, as well as observe as part of the natural amenity and beauty of the coastline. Good water quality was linked to thriving fish and bird life.
Wellbeing	People value how the coast and nature can help with their physical, emotional and mental wellbeing. They say being connected to nature is important to their health. Many indicated they liked to walk among the native trees and bushes, littoral rainforests and see the local fauna.
Blue Mile	The Blue Mile is valued by residents and visitors as a safe location for dog walking, exercising, socialising and dining. This is particularly of value during winter as it has lighting.
Family-friendly	People value family-friendly locations, locations with seating, bins, playgrounds or recreational activities. They value safe swimming areas such as the rock pools or shallows. Recently developed and new playgrounds are highly valued by families with children, the timing of this consultation coinciding with the opening of three new playgrounds at Bulli, Clifton and Balgownie.
Birds and wildlife	Many people engage in bird watching along the coast and within the estuaries. People associate sightings of bird and other wildlife with a healthy natural environment and expressed strong desires to protect native flora and fauna. Whale and dolphin sightings were also enjoyed by many.
Surf breaks	Locals and visitors love their regular surf breaks with many surfing the same breaks for decades.
Connection to country	People recognise the significant value of the coastline and estuaries to First Nations groups, despite there being only moderate awareness about local sites.
Seclusion	Beaches within the Royal National Park were valued for their seclusion and privacy, with many enjoying the clothing optional beach. Others said they valued unpatrolled beaches as they were less busy and crowded.



Table 13 details the issues and threats identified based on input from community and other stakeholders from the June to July 2022 engagement period. The issues and threats are listed in order of frequency of mention during the engagement period and are not necessarily representative of the broader Wollongong LGA. The order does also not necessarily reflect the risk of the issue or threat to the Wollongong coastal area. All issues and threats identified throughout the engagement were considered during the first pass risk assessment workshops detailed in Section 9.

Table 13 Summary of issues and threats

Issue or Threat	Detail
Vegetation Management	The issues of vegetation management, dune vegetation and vegetation vandalism were raised across all engagement activities, with a wide and varied range of opinions. People believe there is either too little dune vegetation (e.g. Port Kembla), too much dune vegetation impacting beach width and access (e.g. Bulli), too much vegetation affecting coastal views and amenity (e.g. Woonona) or a poor selection of vegetation plantings (coastal wattle and banksias). People were critical of historical and current vegetation management by Council and there was a perceived link between vegetation planting and/or removal to scarping, impacts to natural sand movements and surf break changes. Trees and other vegetation have also been the target of vandalism to protect coastal views and visual amenity.
Dogs on beaches and pathways	Dogs on beaches and shared pathways was both highly valued by the community and identified as a significant issue. Complaints and concerns related to: <ul style="list-style-type: none"> • Misuse of designated off-leash areas • Dog waste left on beaches and pathways • Lack of suitable disposal facilities for dog waste • Dogs on rock platforms • Dogs disturbing/killing birds and other wildlife
Population growth, visitors and tourism	Across the coastal zone, there were examples shared of user conflicts resulting from an increasing number of residents, visitors and tourists to the area. This in turn is increasing demand on local infrastructure, such as parking, playgrounds, barbecues, roads, waste, recreation facilities and public amenities. User conflicts included: <ul style="list-style-type: none"> • On and off-leash dogs and their owners and other beach users • Shared pathways (cyclists, walkers, joggers, parkrun) • Antisocial behaviour – alcohol, fires and barbecues and litter • Campers and day visitors • Lack of parking • Traffic congestion Council staff and Councillors also recognised the increase in visitors was pushing more people (especially visitors) onto unpatrolled beaches creating a public safety issue.



Issue or Threat	Detail
Recreation	Coastal recreation areas have been a victim of their own success, with increased demand from visitors and tourists. There is a call for more amenities, wider or separated pathways for cyclists and pedestrians, more seating and improved shaded grassy areas. People would also like to see investment in recreational improvements across the coastal area and not just around the Harbour/Blue Mile/North Wollongong Beach.
Development	There are concerns, particularly across the northern suburbs, about encroaching development and the increased density of new dwellings along the coastline and Lawrence Hargrave Drive. Issues related to development included impacts on visual amenity and coastal views, parking and traffic along Lawrence Hargrave Drive. It was also thought that more could be done to guide the development of dwellings and other buildings on cliffs and other areas that may be impacted by instability and inundation from sea-level rise. There were also concerns about the lack of enforcement of stormwater And run-off conditions during construction of new development.
Water quality and stormwater	There are concerns at various locations about stormwater run-off from development sites and general urban run-off, impacting water quality for both creeks and beaches. The debris and litter that is often washed down with stormwater was also a concern. People believe that an increasing number of storm events and frequent flooding was eroding creek banks and increasing sedimentation.
Erosion	Erosion of beaches, creek banks and under access points and pathways were identified across the coastal area. Many people associate an increase in erosion to an increasing number of storm events and flooding.
Pests and weeds	Pest species preying on native flora and fauna, as well as damaging environment e.g. deer, rabbits preventing revegetation, mosquito fish. Problem weeds are threatening native vegetation and some EECs and choking creeks. The lantana was the most commonly mentioned problem weed.
Accessibility	Broadly this issue related to physical access to infrastructure and sites, rather than disability access specifically. This included access from headlands down to rock pools, access onto beaches by way of informal infrastructure, impeded access from sand drift (such as at Port Kembla) and access to undertake activities previously undertaken (such as surf carnivals at Bulli).
Climate change/sea level rise	More frequent storm events are causing scouring, pollution and cliff destabilisation. Councillors and staff acknowledged that Council needs to plan for sea-level rise, make tough decisions about retreating assets and the upgrade and maintenance of coastal infrastructure. There was a perceived lack of strategy and policy for planning for climate change.
Beach safety	Lifesavers believe patrol views are being impeded by vegetation at Bulli, Woonona, City, Bellambi, Corrimal, Fairy Meadow, Towradgi, Port Kembla, Windang beaches as well as an increased number of people visiting unpatrolled beaches.



Issue or Threat	Detail
Community awareness and education	Councillors and Councils staff believe community expectations are often at odds with natural coastal processes, creating a greater demand for human intervention which can create new problems. They also believe there is a lack of community awareness and education relating to: <ul style="list-style-type: none"> • Cultural heritage and First Nations heritage • Value and importance of natural habitats • Endangered ecological communities (EECs)
Heritage	There is a lack of: <ul style="list-style-type: none"> • An agreed approach on historic (local) heritage obligations • Knowledge and awareness of sites and places and objects of historical significance, protection for historic heritage sites in planning instruments, policy direction • Community awareness of First Nations heritage
Rock fishing	Ongoing fatalities and rescues of people washed into the ocean while fishing from rock platforms. Since January 2021, six rock fishers have lost their lives at the rock platform known as Honeycomb Rocks at Port Kembla.
Rock pools	The loss of rock pools due to sea-level rise or rationalisation of rock pools due to maintenance requirements is a threat to the much-loved community assets.
Governance	There is a lack of strategy and policy direction relating to: <ul style="list-style-type: none"> • Cultural heritage • Historic heritage obligations • Future planning for climate change • Coastal hazards • Protection for historic heritage sites in planning instruments There is also a gap between strategy and works undertaken.

4.2 First Nations Engagement

As the coast holds significant cultural and historical value to the Wollongong Aboriginal community, targeted community engagement was undertaken by Council's Engagement team in accordance with Council's Aboriginal Engagement Framework. A detailed account of the engagement is described in Appendix E.

The stakeholders identified prior to the engagement period included Traditional Custodians and Owners, knowledge holders, Aboriginal groups, organisations, and individual community members. Engagement activities included:

- 10 face to face meetings with six stakeholders.
- Participation in two workshops by a stakeholder.
- Two informal discussions with two stakeholders.



Coastal issues identified through engagement included coastal erosion, development threats, invasive species, fire and accessibility.

Feedback from the ILALC was also documented in this report in Appendix E, including suggestions for a Stage 2 study to identify Aboriginal Cultural Heritage values and assets, and undertake a vulnerability assessment.

Further engagement is required to gain deeper feedback from the Aboriginal community, specifically around coastal values and issues. The engagement and relationship building undertaken to date has laid the groundwork for this to occur.

FINAL DRAFT



5 Overarching Vision and Objectives

5.1 Vision Statement

Whilst not a mandatory requirement of the CMP, the NSW CMM (State of NSW and Office of Environment and Heritage, 2018) recommends that a local vision statement be developed that fosters a meaningful connection between the coast and the local community. These elements should demonstrate consistency with the NSW Government's objectives and vision for the coastal zone as presented by the CM Act.

The overriding object of the CM Act is to:

"manage the coastal environment of New South Wales in a manner consistent with the principles of ecologically sustainable development for the social, cultural and economic well-being of the people of the State".

Ecologically Sustainable Development (ESD) is defined within Clause 6 of the Protection of the Environment Administration Act 1991 as requiring¹³:

"the effective integration of social, economic and environmental considerations in decision-making processes."

Which then proceeds to define the relevant ESD principles as:

- (a) the precautionary principle – namely, that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.*
- (b) inter-generational equity – namely, that the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations.*
- (c) conservation of biological diversity and ecological integrity – namely, that conservation of biological diversity and ecological integrity should be a fundamental consideration.*
- (d) improved valuation, pricing and incentive mechanisms – namely, that environmental factors should be included in the valuation of assets and services.*

To promote the ESD principles, the vision for the coastal zone should express how the community wishes to experience the coast in their daily life both now and in the future. The vision should express the desired state of the natural environment, with reference to the economic framework within which that vision needs to operate. Community expectations need to be considered alongside the stated government objectives for management of the coastal zone, as outlined in the CM Act.

¹³ <https://legislation.nsw.gov.au/view/whole/html/inforce/current/act-1991-060> accessed 4 May 2022

5.1.1 Our Wollongong 2032 CSP

Under the Local Government Act 1993, NSW Councils are required to have a CSP. The CSP must describe the community's vision and aspirations for a period of 10 or more years. Councils undertake a substantial community engagement process to develop these elements of the CSP. It is therefore appropriate that the vision statement for the CMP demonstrates strong alignment with the CSP vision statement which is as follows:

"From the mountains to the sea, we value and protect our natural environment and will be leaders in building an educated, creative, sustainable and connected community."

5.1.2 Sustainable Development Goals

Many of WCC's strategic planning documents reference and are underpinned by the United Nations (UN) Sustainable Development Goals. The Sustainable Development Goals comprise a global development framework agreed by the United Nations General Assembly. There are 17 goals for 2015-2030 as illustrated in Figure 37. There is a clear link particularly between goals 11, 13, 14 and 15 and the CM Act objectives.



Figure 37 UN Sustainable Development Goals



5.2 Preliminary vision statement

A preliminary vision statement has been developed for Council's consideration. It aims to align with requirements of the Coastal Management Act 2016, the 2028 Our Wollongong Community Strategic Plan and the UN Sustainable Development Goals.

We value and protect our natural coastal environment and will be leaders in building an educated, creative, sustainable and connected coastal community.

CMP development is a lengthy process. The vision statement should be reviewed at each stage to ensure it remains consistent and relevant to the local and regional context.

5.3 Objectives

The CM Act requires that Council gives effect to the objectives outlined for each of the Coastal Management Areas defined by the Act. Given that all four coastal management areas are to be included in Council's CMP, it follows that the objectives associated with all four coastal management areas will be the underpinning objectives for the CMP and will be considered in assessing risks and developing management actions. The objectives associated with each coastal management area are listed in the Act and reproduced in Appendix B.



6 Required Scope for the Wollongong Coast CMP

6.1 Geographical Scope

Wollongong City Council is preparing a CMP for the open coast and estuaries in the Wollongong LGA, extending from the entrance of Lake Illawarra in the south, to Lilyvale in the north. The scoping study will exclude Lake Illawarra and catchment which is managed under the certified Lake Illawarra CMP. It will also exclude the Port Kembla port area, as this is managed under a separate policy and legislative framework (SEPP Transport and Infrastructure 2021 Chapter 5 Three Ports – Port Botany, Port Kembla and Port of Newcastle) . Councils may elect to have separate CMPs for estuaries and the coastline, as is the case with the Lake Illawarra CMP. However, for the Wollongong coastline north of Lake Illawarra, the estuaries are relatively small and due to the presence of the escarpment and associated topography, are limited in extent. From a coastal management perspective, it is logical to combine the small coastal estuaries and coastline into one CMP, as the issues and risks are of a similar nature and the geographic proximity lends itself to an integrated management approach.

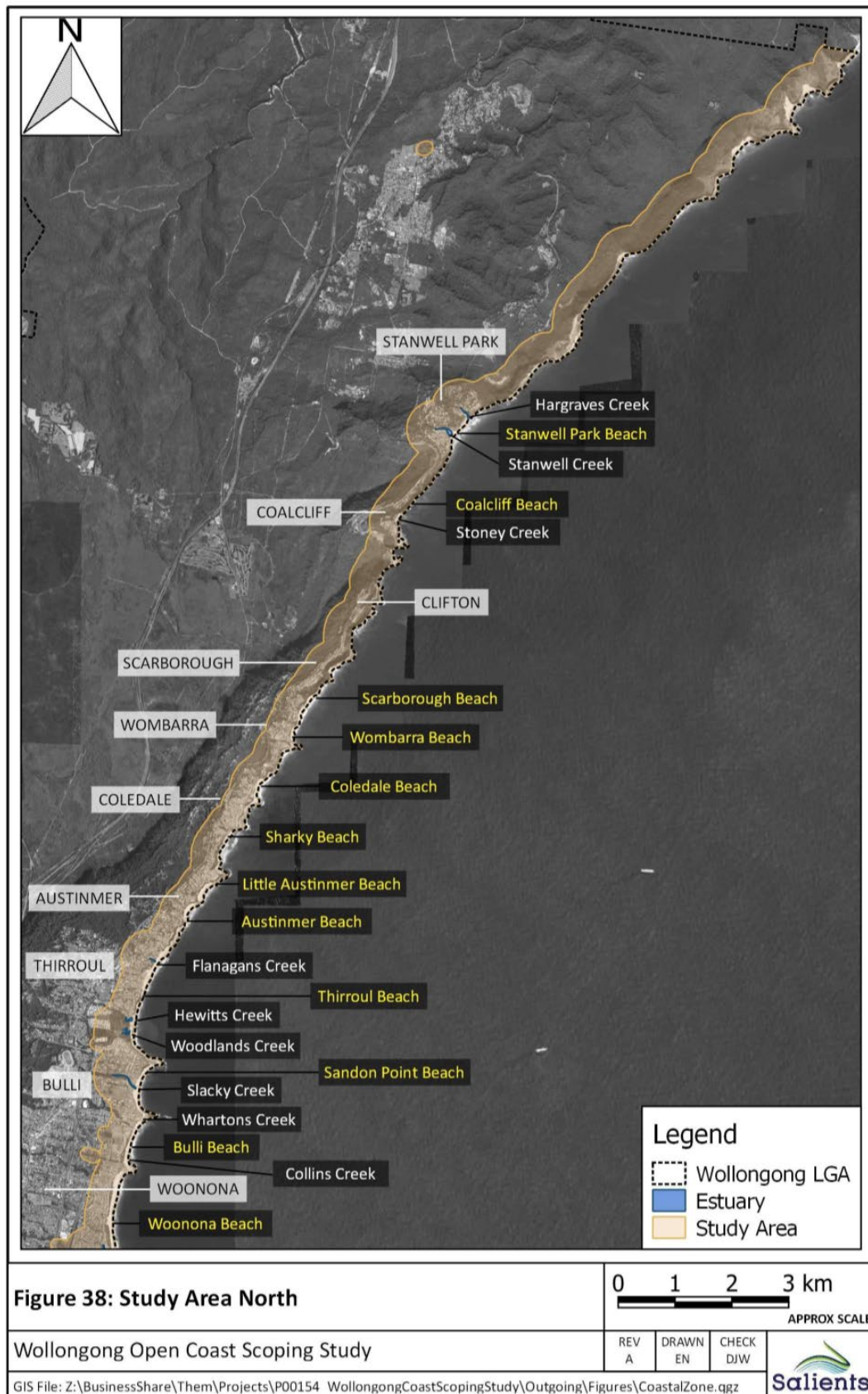
The coastal zone is mapped under the RH SEPP. The extent of the coastal zone is reproduced in Figure 38 (north) and Figure 39 (south). The extent shown in those figures is the combined coastal wetlands and littoral rainforest areas, coastal environment area and coastal use area as current during November 2022. There is no mapped Coastal Vulnerability Area as of November 2022.

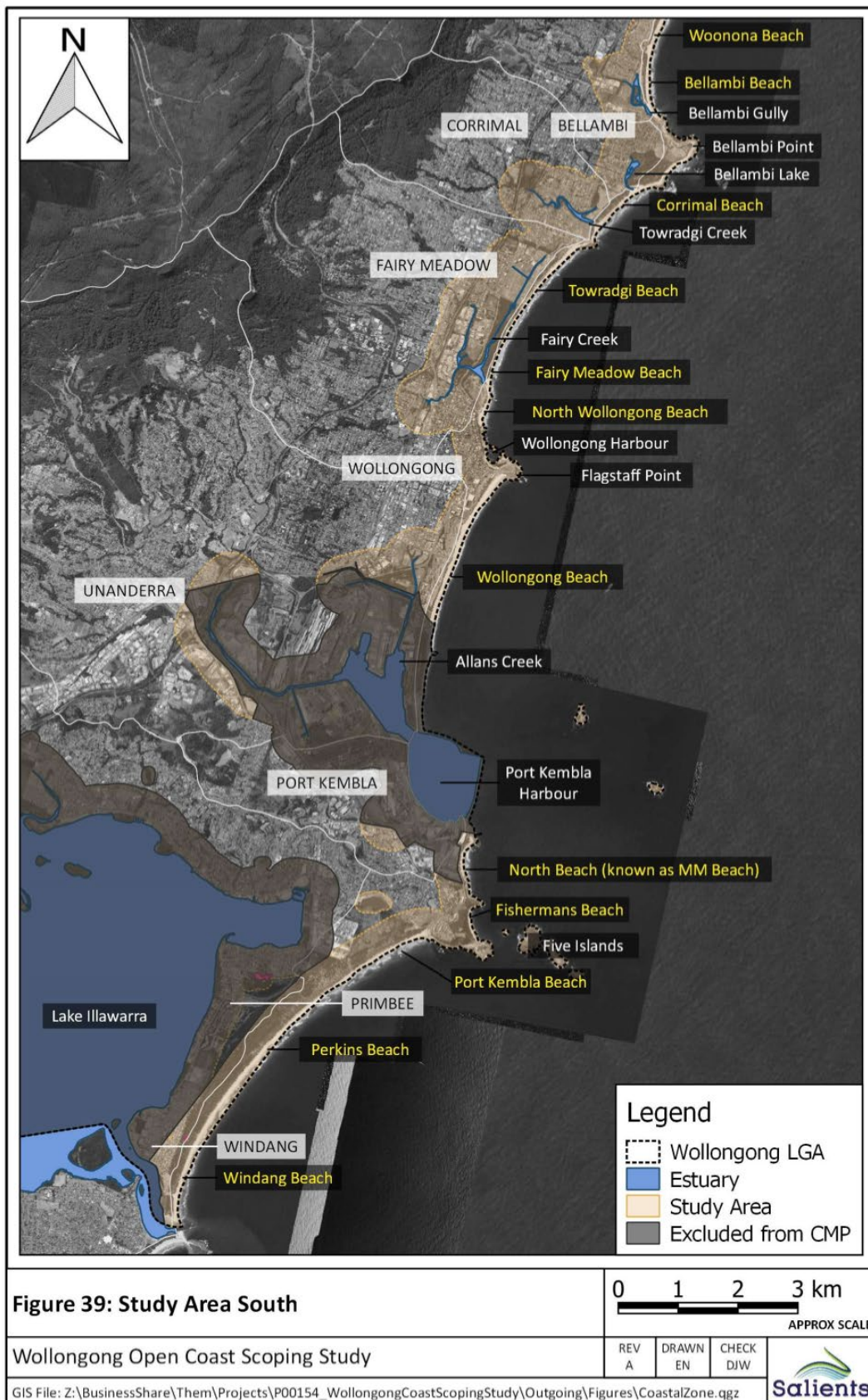
6.1.1 Proposed Modifications to the Coastal Zone

It is a mandatory requirement of a CMP to identify any proposed amendments to mapping of the relevant coastal management areas (NSW Government, 2018a). WCC will await the outcomes of Stage 2 and 3 of the CMP to determine if it will proceed with preparing a planning proposal to modify the coastal vulnerability, and coastal wetlands and littoral rainforest mapping within the RH SEPP. The following preliminary comments are made in relation to these issues.

Coastal Vulnerability Area

Currently the Coastal Vulnerability Area for the Wollongong Coast has not been mapped. The available coastal hazard assessments are out of date and need to be revisited during Stage 2 of the CMP process.







Some guidance has been prepared by DPE on how to map the coastal vulnerability area¹⁴. However, more recent advice from DPE indicates that fine grained consideration of different types of hazards, time frames or probabilities is undesirable for the maps that are to be included in the SEPP. It seems most likely that combined polygons incorporating all hazards Council chooses to include, time frames and probabilities being considered is all that would be presented in the online mapping that accompanies the SEPP. Including areas within the SEPP mapping automatically introduces the controls established for Coastal Vulnerability Areas within that SEPP, namely:

“Development consent must not be granted to development on land that is within the area identified as “coastal vulnerability area” on the Coastal Vulnerability Area Map unless the consent authority is satisfied that –

(a) if the proposed development comprises the erection of a building or works – the building or works are engineered to withstand current and projected coastal hazards for the design life of the building or works, and

(b) the proposed development –

(i) is not likely to alter coastal processes to the detriment of the natural environment or other land, and

(ii) is not likely to reduce the public amenity, access to and use of any beach, foreshore, rock platform or headland adjacent to the proposed development, and

(iii) incorporates appropriate measures to manage risk to life and public safety from coastal hazards, and

(c) measures are in place to ensure that there are appropriate responses to, and management of, anticipated coastal processes and current and future coastal hazards.

WCC has not yet determined if a Coastal Vulnerability Area will include all coastal hazards. However, following completion of any additional coastal hazard assessments, Council’s DCP would need to be drafted carefully to address these matters.

Coastal Wetlands and Littoral Rainforests

There are some significant anomalies in the RH SEPP Mapping for the spatial extent of littoral rainforest and coastal wetlands. Unfortunately, the more recent Illawarra Plant Community Type (PCT) Vegetation Map 2020, whilst of a finer scale appears to have the same level of inaccuracy. Numerous locations are mapped in both data sets

¹⁴ <https://www.planning.nsw.gov.au/-/media/Files/DPE/Factsheets-and-faqs/Policy-and-legislation/Coastal-management/fact-sheet-process-for-mapping-the-coastal-vulnerability-area-2020-08.pdf>



where there is clearly no vegetation present, including roadways, cemeteries, residential properties, rock shelves and sportsfields. Hence, there is a low level of confidence in the current vegetation mapping. The extent of coastal wetland and littoral rainforest vegetation needs to be re-examined and updated. Once updated, a planning proposal should be prepared and submitted to amend the RH SEPP Mapping. The Department of Planning and Environment has provided guidance on how coastal wetlands and littoral rainforests were mapped (NSW Government Department of Planning and Environment, 2018)¹⁵. That guidance indicates that coastal wetlands are areas containing communities dominated by the following vegetation types:

- Mangroves.
- Saltmarshes.
- Melaleuca forests.
- Casuarina forests.
- Sedgeland.
- Brackish and freshwater swamps.

Similarly, Littoral rainforests comprise vegetation types mainly dominated by the following tree species:

- Riberry, broad-leaved lilly pilly.
- Tuckeroo.
- Brush box.
- Yellow tulip, bauerella, red olive plum, plum pine.
- Lilly pilly, various figs, cabbage tree palm and plum pine.

6.2 Key Issues

Key issues were identified through a rigorous and comprehensive process involving the following actions.

- Background review of relevant information: Ninety-two reports spanning a twenty-year period were reviewed. All reports were reviewed in conjunction with accompanying or relevant datasets provided by Council or sourced via the NSW state government data portals.

¹⁵ <https://www.planning.nsw.gov.au/-/media/Files/DPE/Factsheets-and-faqs/Policy-and-legislation/Coastal-management/fact-sheet-4-technical-mapping-coastal-management-sepp-2018-04.pdf?la=en>, accessed 15/10/2022



- **Site Inspections:** Field inspections were completed by study team members in December 2021, March 2022, May 2022 and July 2022, with staff from WCC and DPE-Coasts and Estuaries attending some of these. Land based fieldwork involved on foot inspection of the entrances of estuaries and lagoons along the coastline and the state of various beaches and dunes. Assets likely to be subject to coastal hazards were recorded, as well as contributing threats to coastal condition and coastal use such as weeds and dune scarping.
- **Stakeholder Interviews:** Salients met with a range of staff from WCC across the operational works and strategic planning arms of Council. In total, 8 hours of interviews were conducted, and 16 Council staff interviewed to understand their views on the coastal zone, its infrastructure, maintenance, management and governance. The staff interviewed represented the areas of lifeguards, open space and environmental services, legal services, project delivery, land use planning, property and recreation and infrastructure strategy and planning.
- **Community consultation:** Undertaken over a 6-week period, the program involved a mix of online and in person events. Based on input from the community a list of key values, issues and threats was developed. Those issues that fell within the scope of the CMP were carried forward in the risk assessment. The consultation process and outcomes are documented within the Wollongong CMP Stage 1 Community Engagement Outcomes Report (refer to Appendix D).
- **Councillor Workshop:** A workshop was held with Councillors and senior staff to obtain input on community values, coastline issues and challenges involving 15 participants. A subsequent online interview was also conducted with a Councillor who was unable to attend the workshop.

6.2.1 Overarching Issues

Governance

Governance of the coastal zone is a theme which runs through several risks that underpin management of the entire coastal zone. Multiple land tenures and governance arrangements under various legislative Acts can lead to gaps between strategy and works or contradictory strategies and/or priorities across Council and other agencies. Management of entrances and dunes is one area where governance issue have become apparent. This CMP will provide a means of addressing some of these issues, however there may also be opportunities to streamline processes between Council and Crown Lands. Coastal governance arrangements should be carried forward as a risk into subsequent stages.



Coastal Wetland and Littoral Rainforest

There are significant anomalies in the RH SEPP Mapping, as well as the Illawarra Plant Community Type Vegetation Map 2020, for mapping of littoral rainforest and coastal wetlands. Numerous locations are mapped where there is clearly no vegetation present, including roadways, cemeteries, residential properties and sports fields. Hence, there is a low level of confidence in the current vegetation mapping. The extent of coastal wetland and littoral rainforest vegetation needs to be re-examined and updated. Once updated, a planning proposal should be prepared and submitted to amend the RH SEPP Mapping.

Coastal Vulnerability

The available coastal hazard assessments (and dependent policies and planning instruments) are out of date and will need to be revisited during Stage 2 of the CMP process as listed below:

- It is important that a clear approach to coastal hazards is established. For example, standard flood modelling practice in NSW already considers elevated ocean levels ("Coastal Inundation"). However, the model simulations that are executed do not normally align to the 20, 50 and 100 year time frames required by the CMP. Similarly, by collaborating during flood studies, it could be possible to calibrate flood models to represent tides and examine tidal inundation, although care is required when using this method for ICOLLs.
- The CM Act requires that Council consider risks at time frames of immediate, 20 years, 50 years and 100 years and possibly beyond for development of hazard lines. This would require, for the Wollongong Coast, hazard lines relating to ~2025, 2045, 2075 and 2125. These do not align well with the 2050 and 2100 timeframes derived by Cardno Lawson Treloar. Further, since the previous hazard assessment, new data has become available that would improve the accuracy of hazard mapping (see Section 2.3.4).
- Consideration should be given to developing an overarching management policy/plan which includes all entrances. For most of the entrances, the default "no intervention" policy is likely to remain. In terms of coastal hazard extents, it is recommended that, in conjunction with these reviews, the coastal vulnerability area associated with coastal entrances could be examined along the entire coastline.
- The assessment of coastal inundation by wave overtopping is outdated. The analyses provided by Cardno Lawson Treloar (2010b) can be used as a starting point for identifying areas that are prone to overtopping but the analysis should be updated to meet the requirements of the CMM (regarding sea level rise and



subsequent risk based assessment) and using more modern analytical techniques.

- The present Geotechnical Hazard Zone should be reviewed to provide a transparent approach. As part of that review, the way in which the zone has been derived should be clearly described and reported.

Whilst the coastal hazards mapping requires review, there is value in identifying those assets previously assessed as being at immediate or future risk. The risks identified and carried forwards to the coastal vulnerability (coastal hazards) risk workshops for the northern Wollongong Coastline were derived from the initial assessment and consideration of risks identified as “high” or “extreme” in the documents underpinning the CZMP. These risks should all be reconsidered during the Stage 2 risk assessment, as improved coastal hazard information is received.

The detailed Stage 2 risk assessment should involve an inventory and, where possible, valuing (or quantifying) all assets threatened within the Coastal zone. The probabilistic hazard assessments can then be used to establish the “likelihood” side of risk, and the valuation data can be used to examine “consequences”. This can be achieved robustly and effectively by intersecting data sets in GIS.

Coastal Environment – Natural ecosystems

The primary issue of concern in the coastal environment area is the lack of current data. Previous studies were completed in 2007 and identified the following high-risk issues:

- Vegetation clearing due to informal pedestrian and vehicle access.
- Weeds.
- Terrestrial pests (foxes, rabbits, domestic dogs, deer).
- Lack of community awareness of environmental values of natural ecosystems.

The nature of these issues, mean that they are likely to persist in both the dune and riparian environments, however the quantitative nature, extent and consequence on sensitive environments remains unknown.

Council has historically completed Vegetation Management Plans for priority natural coastal areas. Vegetation Management Plans are currently being updated at several locations including Bellambi Dunes, Wollongong City Beach and Perkins Beach. Council has also undertaken a range of vegetation management activities in the past ten years in the dune environment including weed control, planting of native species and pest control. However, there are no ecological studies to understand the impact of vegetation works on flora, fauna and habitat values. Prior to committing to further works, there is value in understanding the extent of EECs in the coastal environment area, presence of threatened species and a contemporary understanding of the threats



to these values. This information could be used in an educational context at locations where vegetation vandalism of rehabilitation projects (such as headlands and dunes) has occurred.

Coastal Environment - water quality

Wollongong's coastline is characterised by a number of intermittently closed and open lakes and lagoons (ICOLLs) that drain to the coast and of which a number are close to popular swimming beaches. There is an absence of a recent LGA wide dataset but older studies (or limited regular sampling) suggest water quality may be fair to poor in some locations. A comprehensive water quality and estuary health program exists for Lake Illawarra, which is an action in the Lake Illawarra Coastal Management Program 2020-2030 (BMT, 2019) .

The most recent water quality data for the Wollongong coast is detailed on the NSW Department of Planning and Environment (DPE) 'Health of our estuaries' website. DPE-Coasts and Estuaries conduct a state-wide estuary monitoring program where they sample a subset of the estuaries between Wollongong and the Victorian border every 3 years. They measure for chlorophyll a (algae) and water clarity and sample zones within a creek system over summer only on a monthly basis. A report card is produced that summarises water quality and aquatic ecosystem health.

In addition to the DPE-Coasts and Estuaries monitoring program, Wollongong City Council (WCC) monitored water quality at 36 sites in 23 creeks and lagoons in 17 catchments on an approximately monthly basis between August 2002 and March 2006. The study found that most creeks and lagoons had low levels of dissolved oxygen, high nutrient concentrations, and high faecal coliform counts.

Recreational water quality has been monitored at the beaches in the Wollongong LGA since 1996 by Sydney Water Corporation as a requirement of Environment Protection Licences, and by Wollongong City Council since 2011 under the Department of Planning and Environment's Beachwatch Partnership programs. Thirteen beaches are monitored under the Beachwatch program. At the time of writing the most recent report card was for the 2021-22 summer. All 13 swimming sites were graded as Very Good or Good in 2021-2022. Excellent results have also been recorded in previous years (DPE 2022).

It is clear from community consultation that water quality in the creeks is of concern, however in the absence of regular and recent monitoring data, it is not possible to develop an informed management plan.

There is value in repeating water quality studies in all coastal creeks and estuaries along the Wollongong Coast, particularly where primary recreational contact occurs such as in coastal lagoons and entrances. An understanding of pollutant sources will



allow development of a targeted water quality strategy and / or management approach to limit exposure to poor quality waterways.

Coastal Use – Access, use and amenity

Due to their very nature, SLSCs and ocean pools are facilities in the coastal zone that are exposed to coastal hazards and coastal inundation. Interviews with Council staff indicate that the maintenance expenses of these facilities continue to rise due to coastal hazards and the dynamic nature of the coastal environment. Council has formalised several leases with SLSCs in recent years. Council's commitment is ensuring SLSC building facilities are compliant with relevant building codes and fit for purpose. Revision of the coastal hazard mapping should be completed with a view to incorporating this information into asset maintenance and renewal plans. It may be prudent for Council to consider a future management action to develop a Coastal Infrastructure and Assets Strategy to guide decision making as part of its climate change adaptation response.

Legacy buried asbestos and building waste has been a recurrent issue for Council when attempting to undertake dune re-profiling and asset protection works. Sites where this has been identified include City Beach and Sandon Point Beach although the issue may be widespread. Legacy contamination issues have also been identified at Windang Peninsula and Greenhouse Park. The issue will be exacerbated by coastal erosion and due to both the public safety and economic risks, it should be carried forward for consideration into future stages of the CMP development.

Public safety issues with rock fishing were identified as a high priority risk in the coastal use zone at the stakeholder workshops. There have been numerous deaths and incidents in relation to rock fishing at Hill 60. Wollongong City Council has obligations under the Local Government Act with regard to beach and coastal safety. On 12 September 2022, Council resolved to opt-in to the Rock Fishing Safety Act 2016, which allows enforcement of mandatory use of life jackets if rock fishing at high-risk locations. As this issue is best managed through the described process, it is not recommended that it progress into further stages of the CMP.

Coastal use – Social, cultural and heritage assets

Aboriginal cultural heritage is a key issue in the coastal zone with numerous risks to heritage evident. The following is recommended (text provided by ILALC).

The Aboriginal cultural values and assets within the Wollongong LGA coastal region remain partly unknown. This scoping study has identified that previously recorded Aboriginal coastal cultural values and assets, and those still to be identified, are at risk due to coastal hazards. These risks are significant enough to warrant a detailed technical study to inform the CMP. This technical study should be undertaken in Stage 2 of the CMP process.



Council's First Nations engagement (see section 4.2) identified coastal erosion, development threats, invasive species, fire and accessibility as current risks to cultural values and assets.

6.2.2 Northern Section

In the northern section, accurate mapping of littoral rainforests is required to ensure adequate protection into the future. Given that much of the broader vegetation in the coastal zone is EEC, there would be value in undertaking more comprehensive vegetation mapping combined with an adequate level of ground truthing. Improved vegetation mapping will inform development of Stage 3 management actions, so that sensitive areas can be prioritised to manage disturbance impacts.

There is little data available on the ecological status of the coastal environment zone. In particular, the value of the coastal cliffs, rocky platforms and coastal dunes as habitat are not well understood. Without a base understanding, evidence-based management decisions are not possible. Studies that consider shorebirds and productivity of the intertidal zone on rock platforms would assist in filling this gap. The northern section may serve as a suitable control site being subject to significantly less modification and disturbance.

6.2.3 Central Section

In the central section, accurate mapping of coastal wetlands is required to ensure adequate protection and consideration of migration pathways into the future in response to sea level rise. As with the northern section, much of the broader vegetation in the coastal zone is EEC, and therefore undertaking more comprehensive vegetation mapping and ground truthing is recommended. Improved vegetation mapping will inform development of Stage 3 management actions, so that sensitive wetlands can be prioritised for rehabilitation and adequately buffered from disturbance impacts associated with urban development and intensification.

Entrance Management Policies exist for Fairy Lagoon and Towradgi Creek (Cardno Lawson Treloar, 2007a, 2007c). Both policies recommend that review take place every five years. Review of both policies should occur in line with more up to date sea level rise projections and understanding, updated SEPP mapping and more recent guidance and policy released by the State government (Department of Primary Industries, 2013; Ferguson et al., 2020). These policies should consider both extreme flooding and the tidal inundation hazard, including future projected extents. They should also include consideration of any information from new flood studies and flood risk management plans.

Management of dune vegetation has been a contentious issue for many years along this section of coast. Vegetation vandalism was rated as a high priority issue in the stakeholder workshops. A greater understanding of dune modification on coastal



ecology is required to assist in future decisions regarding active dune management. Such a study should also include consideration of habitat linkages between riparian and dune environments, identify habitat enhancement opportunities and build on existing Vegetation Management Plans and the Biodiversity Strategy.

Although Council has completed a range of works to improve sight lines for lifeguards, ongoing maintenance of sightlines remains a concern. Reliance on vegetation management can be difficult, as resource allocation is often dynamic in response to the community's requests (i.e., after natural events). It is therefore recommended that this issue is progressed through the CMP so that a more sustainable solution can be sought. An example may be a relatively simple GIS analysis of sight lines to optimise mobile tower placement and establish required platform heights.

6.2.4 Southern Section

The southern section contains the most continuous stretch of coastal vegetation. Coastal wetland, littoral rainforest and EEC mapping requires updating. A recent Vegetation Management Plan for Perkins Beach has been developed (Midges Bushland Restoration Pty Ltd, 2021).

Due to the orientation of the beach and prevailing winds, there has always been a significant maintenance burden related to infrastructure built in the area. Wind-blown sand can impact on pool maintenance, accessways, carparks and buildings located on the beach and adjacent roads, as well as hamper dune revegetation efforts due to smothering of plantings. The Port Kembla SLSC equipment shed is regularly inaccessible and is structurally failing due to sand build up. This also became an additional safety risk with children climbing the sand to access the roof of the shed, requiring clearing of sand and installation of a new wall between the dune and shed. The windblown sand is not an issue that can be readily modified and therefore an adaptive approach is required. It is recommended that Council progress the issue in the CMP and develop an options management report that includes funding implications over the period of the asset life of impacted structures. Options may include ongoing maintenance, relocation or acceptance of amenity loss.



7 Review of Current Coastal Management Practices and Arrangements

7.1 Wollongong CZMP (BMT WBM, 2017a)

The existing CZMP has a total of 94 actions. Following review of background information and consultation, each of these actions was considered and an assessment of progress provided by Council. Overall, Council and other agencies have made significant progress on most actions that remained relevant.

Table 14 provides a summary of progress and description of follow on or continuation actions that should be considered during Stage 3 of the CMP development process. Assessment of continuation for a large proportion of the actions will be dependent on the results of the revised hazard assessment recommended for Stage 2. It should be noted that many actions were scheduled to be undertaken when monitoring shows the coastal hazard was encroaching on asset and have not yet been triggered. Experience with implementation to date, has highlighted the importance of applying a precinct based approach. That is, undertaking works in a particular geographic area, to ensure that works activities support future associated infrastructure upgrades, in addition to resolving the immediate issue.

Table 14 Summary of CZMP Audit

Category	Action from CZMP	Level of Completion	Potential Continuation Action for CMP
Beach Management	1: Undertake revegetation works for sand dunes supplemented through beach scraping and re-contouring episodes.	Complete	Council to continue to undertake dune vegetation management as per the location specific Dune Vegetation Site Plans.
	2: Undertake beach scraping and re-contouring to increase sand volumes in front of facilities and infrastructure.	Not started	Action to be implemented only when required. Ongoing suitability of this action to be reviewed upon updating coastal hazard mapping.
	3: Develop, adopt and implement a Council policy that requires any sand removed from estuary/lagoon entrances to be returned to the adjacent beaches.	Not pursued	Currently Council is not wishing to progress this action.
Cycleways	If supported by the Asset Management Plan, secure ownership of land (if not currently public land) and undertake detailed design, site investigations, and approvals as necessary to relocate cycleways outside of hazard zone.	Not started	Action is likely to be carried forward as will be triggered when hazard impacts manifest or when replacement is due under Council's Asset Management Plan. Preliminary work could occur, as part of CMP delivery, to identify the land needing purchase & /or rerouting of the pathway
	Undertake audit of cycleway to identify options available for at-risk sections.	Not started	Potentially remove as a forward action for the CMP as triggered by asset management process (due for renewal or upgrade) or as part of project planning for new cycleways. Review upon updating coastal hazard mapping.



Category	Action from CZMP	Level of Completion	Potential Continuation Action for CMP
	Add cycleways to Council's Asset Management Plan, and based on the outcomes of the audit, incorporate remediation, maintenance, relocation or retrofit works into forward works programs.	Not started	As above.
Development Controls	Revise/update, adopt and implement Chapter E12 – Geotechnical Assessment of Council's Development Control Plan (DCP).	Complete	Update geotechnical assessment for cliffs and headlands to address current inadequacies and make relevant amendments to planning instruments. Amend DCP accordingly.
	Revise/update, adopt and implement Chapter E13 – Floodplain Management of Council's Development Control Plan (DCP) to include areas affected by Coastal Inundation as Low Risk Flood Sections.	Complete	No further action.
	Prepare, adopt and implement a new Coastal Management Chapter of Council's Development Control Plan (DCP).	Not started	Carry forward and to be informed by updated coastal hazard mapping.
Further studies and plans	Undertake further investigations to determine an appropriate response to managing risks to both Council assets and 19 properties at risk by 2100 on Woonona Beach.	Not started	Carry forward and to be informed by updated coastal hazard mapping.
	Develop interim flood emergency response and evacuation plans for roads and properties affected by coastal inundation outside of existing flood planning areas.	In progress	Carry forward and to be informed by updated coastal hazard mapping. Develop CZEASP in conjunction with NSW SES during Stage 3 of CMP delivery.
	Update or commence flood studies at all catchments that are impacted by elevated ocean water levels in flood mapping and management.	In progress	Carry forward into Floodplain Management Program as Northern catchment yet to be completed.
Heritage	In close consultation with NPWS, Local Aboriginal Groups and Historical Societies, develop a decision framework for managing Aboriginal and Non-Indigenous Heritage Items and places affected by coastal hazards. The decision framework would include what actions are necessary when currently buried sites are uncovered by erosion.	Not started	Carry forward. Aboriginal Heritage component identified as a high priority risk through Stage 1 CMP stakeholder consultation.
Infrastructure, assets and boat harbours	If supported by the Asset Management Plan, undertake detailed design, assessment, planning and works to redesign or retrofit Austinmer Boat Harbour, the sewage treatment plant, Bellambi Boat Harbour.	Not started	Review following update of coastal hazard mapping.
	Ensure all Council infrastructure, including boat harbours and other relevant services, are included in Council's Asset Management Plan with a notation indicating proximity to coastal hazards.	In progress	Carry forward into CMP until all asset categories are complete. For example seawalls are currently not captured.
	For non-Council assets, such as water supply, wastewater, gas, telecommunications and electricity services infrastructure, undertake an audit and investigate design elements for infrastructure to withstand inundation with seawater and / or wave action.	Not started	Inform asset owners following update of coastal hazard mapping.



Category	Action from CZMP	Level of Completion	Potential Continuation Action for CMP
Monitoring	Monitor beach profile and distance of immediate impact zone and ZFRC from structural assets located behind the beach.	In progress	Carry forward into CMP to inform adaptive management.
	Monitor lagoon / coastal creek entrance breakout level, frequency and berm height, as sea level rise (including recession) impacts upon the entrance configuration.	In progress	Carry forward into CMP to inform adaptive management.
	Monitor frequency, depth and spatial extents of coastal inundation events.	In progress	Carry forward into CMP to inform adaptive management.
	Review risk assessment based on monitoring results and revise risk response.	Not started	Carry forward into CMP to inform adaptive management.
Ocean Pools	If supported by the Asset Management Plan, undertake detailed design, assessment, planning and works to retrofit Ocean Pools in current locations to withstand current and future coastal hazards.	Not started	Review following update of coastal hazard mapping. Consider preparation of an adaptation study in Stage 3 or as a CMP action.
	Update / include ocean pools in Council's Asset Management Plan and, based on the outcomes of the audit, incorporate maintenance plans and priorities into forward works programs.	Not started	Review following update of coastal hazard mapping.
Private Land Acquisition	Voluntary buy back – lease back or Voluntary Acquisition of properties in imminent hazard impact zone.	Not started	Review following update of coastal hazard mapping and risk assessment.
	Demolish 1 property at Thirroul and 1 at McCauleys Beach following termination of lease.	Not started	Review following update of coastal hazard mapping and risk assessment.
Recreational Facilities	Undertake detailed design, assessment, planning and works to relocate WIN Stadium complex and Bulli Tourist cabins.	Not started	Review facilities identified following update of coastal hazard mapping and risk assessment.
	Allow natural retreat of beaches into park lands, repair storm damage to minor recreational facilities.	Not started	Review existing or develop new Plans of Management for public recreation land informed by updated coastal hazard information and risk assessment.
Roadways and Parking	Undertake detailed design, assessment, planning and works for at risk access roads and carparks.	Not started	Review proposed locations following update of coastal hazard mapping and risk assessment.
	Undertake traffic assessments to determine the feasibility and costs associated with redirection of traffic compared with redesign/protection of roadways at risk of recession. And update Councils Asset Management Plan.	In progress	Review Council's Asset Management Plan informed by updated coastal hazard information and risk assessment.
Seawalls and Training Walls	Undertake detailed design, site investigations, approvals and works to repair, retrofit or replace seawalls to withstand coastal hazards.	Not started with the exception of North Wollongong Beach	Review proposed sites following update of coastal hazard mapping.
	Audit asset condition and add seawalls and training walls to Council's Asset Management Plan.	Not started	Carry forward. Identified as an ongoing risk during Stage 1 stakeholder consultation.
Stormwater	Undertake detailed design, site investigations, approvals and works to repair, retrofit or replace stormwater infrastructure to withstand coastal hazards.	In progress	Where stormwater assets are due for renewal, coastal hazards are being considered currently. Going forward, new coastal hazard information should be incorporated into design considerations.



Category	Action from CZMP	Level of Completion	Potential Continuation Action for CMP
	Undertake stormwater asset audit and investigate appropriate design elements for stormwater infrastructure for periodic inundation with seawater and / or wave action and utilise as assets are replaced. Update Councils Asset Management Plan.	Not started	Action is to be triggered when hazard impacts manifest. Review following update of coastal hazard mapping.
Surf Clubs and Public Buildings	Undertake detailed design, site investigations, approvals and works to repair, retrofit or relocate surf clubs and public buildings to withstand coastal hazards.	Not started for all surf clubs other than Sandon Point (2013)	Action is to be triggered when hazard impacts manifest. Review following update of coastal hazard mapping and risk assessment.
	Conduct audit (dilapidation survey) of substantial public buildings (including Surf Clubs) to determine current condition, as well as site constraints for future redevelopment. Update Asset Management Plan.	In progress	Where facilities are due for renewal, coastal hazards are being considered currently. Going forward, new coastal hazard information should be incorporated into design considerations.
Vegetation and habitats	Undertake an audit of all EECs and important habitat areas within the hazard zones and implement buffers and rehabilitation.	In progress	Update vegetation mapping of EECs.
	Utilise Norfolk Island Pines in new coastal plantings.	Ongoing	Not an action for the CMP.
	Revitalise and implement an LGA-wide Dune Management Strategy.	Complete	Review following Stage 2 studies. Likely to be carried forward.
Whole of Council Actions	Preparation of Community & Crown Land Plans of Management and Masterplans.	In progress	Review POMs following update of coastal hazard studies and risk assessment.
	Community Education for Resilience Building.	In progress	Carry forward into CMP.
	Prepare a foreshore building line for entire LGA based upon the existing hazard lines.	Not started	Review following update of coastal hazard studies and risk assessment.
	Consideration of hazards and development controls for Council works not requiring development consent.	In progress	Review quality management system following update of coastal hazard studies.
	Conduct internal Council training to educate the different departments about coastal hazards and the coastal hazard lines.	In progress	Provide training following update of coastal hazard studies. May occur in Stage 3 CMP development as part of stakeholder engagement.
	Consideration of coastal risk zones when reviewing land zones in the Wollongong LEP.	Not started	Carry forward into CMP.

The CZMP contains a Coastal Erosion Emergency Action Sub-plan (CEEAS). The CEEAS describes actions Council will undertake prior, during and following a coastal erosion emergency. The response largely involves monitoring, public warnings (signage and closures), repair to damaged infrastructure, and re-profiling dangerous scarps with machinery. WCC has developed an implementation plan for the CEEASP which outlines the roles and responsibilities of Council. A Review of Environmental Factors is in place to allow Council to re-profile severe dune scarping that is a safety risk. Due to the cultural sensitivity of the coastline, it is important that moving forward, caution is exercised whenever utilising machinery in the dune environment.



7.2 Estuary Management Plan (EMP) for Several Creeks and Lagoons (GHD, 2007a) & Estuary Management Plan for Fairy, Towradgi and Hewitt's Creeks (Cardno Lawson Treloar, 2005)

The EMPs combined contains 303 actions (237 and 66 respectively). The EMPs were developed 15 years ago and reflect the trend at the time to include a broad and extensive range of management actions, in order to secure any opportunistic funding that arose during the period of the plan. The following key activities were undertaken in accordance with the EMPs:

- Ongoing riparian habitat restoration works across all estuaries and development of Vegetation Management Plans.
- Fish passage improvements.
- Bank erosion works.
- Interpretive signage about certain threatened species and water quality.
- Development control plan chapters for riparian land management and water sensitive urban design.
- Entrance Management Policies prepared for Fairy Lagoon (2007), Towradgi Creek (2007) and Whartons Creek (2015).
- Localisation of Water Quality Guidelines for Wollongong's Creek and Lagoons study (2008).
- Climate Change Impact Assessment of Wollongong's Estuaries – Implications for Ongoing Estuary Management Planning study (2009).
- Foreshore Pollutant Audit and Remediation Options for Fairy and Towradgi Lagoons study (2010).
- Water Quality Improvement Options for Parker Road Arm, Towradgi Lagoon study (2010).

The CMP should contain targeted actions, prioritised in response to identified threats. The lack of recent estuary studies also makes it difficult to directly carry forward the actions of the EMP's, as baseline environmental monitoring has not occurred.

7.3 Wollongong Dune Management Strategy for the Patrolled Swimming Areas of 17 Beaches (GHD, 2014)

Dune management and implementation of the Strategy has been a strong focus for Council in recent years. In 2021, Council completed an internal evaluation of the



program (Wollongong City Council, 2021b). Table 15 illustrates that the program is substantially complete, including tower and dune re-profiling works at several beaches and supporting policy and plan development including Dune Vegetation Site Plans for eight vegetated beaches, Whartons Creek Entrance Management Plan, and a plan for the management of construction and demolition waste at Wollongong City Beach. Council has continued to undertake ongoing dune vegetation maintenance with the support of Dunecare volunteers, beach and dune monitoring and erosion responses.

Table 15 Summary of Dune Management Projects

Location	Projects	Objectives achieved?		
		Improve sight lines	Improve access	Improve recreational amenity
LGA-wide	Monitoring Community Engagement Erosion response			✓
Stanwell Park, Bulli, Woonona, Bellambi, Corrimal, Towradgi, Fairy Meadow, Wollongong City Beaches	Policies/ plans Vegetation management Dunecare	✓	✓	✓
Bulli Beach	Policies / plans		✓	✓
Woonona Beach	Tower installation / access Dune re-profiling	✓	✓	✓
Bellambi Beach	Tower installation / access Dune re-profiling	✓	✓	✓
Corrimal Beach	Tower installation / access Dune re-profiling	✓	✓	✓
Towradgi Beach	Dune re-profiling	✓	✓	✓
Fairy Meadow Beach	Accessway widening Dune re-profiling	✓	✓	✓
Wollongong City Beach	Tower installation / access Accessway widening Policies / plans	✓	✓	
Port Kembla Beach	Tower installation / access Dune re-profiling	✓	✓	
Windang Beach	Tower installation / access	✓		

With specific reference to dune re-profiling projects, preparation for each project included evaluating options including a coastal hazards assessment (will the work increase risk of coastal hazards?), a detailed design and Review of Environmental Factors, prepared by a qualified Coastal Engineer. Works were not undertaken if it



was shown by this assessment that they would have adverse impact on the risk of coastal hazards. Works were followed up by ongoing monitoring of dune heights and vegetation growth.

It was observed that while the objectives of each re-profiling project were achieved, after the works the dunes tended to regain the volume of sand removed, with the rate of growth quicker at the northern ends of beach compartments. The sand accumulates at the new vegetation line and then can migrate forward with vegetation growth. In some places, for example Towradgi, the dune is actually higher than prior to works, but in a different location and with lower growing vegetation.

Council identified several dune management matters that are relevant to future CMP action development, design and implementation:

- Planning for future dune re-profiling projects should include consideration of longevity of results at various locations (how long before dune volumes and heights began to increase again).
- Track vegetation re-growth to inform decisions about future re-profiling works and subsequent maintenance requirements.
- Seaward growth of spinifex is challenging to control. Expectations about the reality of maintaining a front vegetation line should be clear if future vegetation removal works are undertaken.
- Where planting is required, exposed dune areas will require additional maintenance to ensure plant survival, potentially including the use of sacrificial sediment fences.
- Future dune management should involve pre and post monitoring of the ecological impacts of the works, in particular fauna species abundance in response to habitat changes.
- Towers are an appropriate way to improve sight lines and these should be readily used by SLSCs. Placement of any new towers should consider surrounding vegetation and consultation with Open Space and Environmental Services is important.
- Future coastal planning processes should build in effective and innovative community engagement methods to ensure a broad range of voices are heard.
- Convey to the community the extent of works and realistic maintenance regimes to manage expectations.
- Future coastal management works should continue to engage with Aboriginal communities, with improved engagement techniques.



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- Future coastal strategies should detail funding sources and divisional responsibilities. Development of the CMP and integration into Council's IP & R framework provides a mechanism for this.

7.4 Additional New Information

The existing CZMP (BMT WBM, 2017b), although published in 2017, was built on information and underpinning studies completed prior to 2011 (BMT WBM, 2017a; Cardno Lawson Treloar, 2010c). Following completion of the CZMP, at an operational level there has been significant focus on the implementation and monitoring of the Dune Management Strategy (GHD, 2014). This is reflected in the subject matter of the additional information of technical relevance developed in recent years. These new sources of information have been referenced, where relevant, in this document. The key additional information sources are:

- Flocard et al., 2013: East Coast Study Project-National Geomorphic Framework for the Management and Prediction of Coastal Erosion.
- Cardno, 2014: Preliminary Options Report Towradgi Beach - Re-shaping Works.
- WMA Water, 2015: Wollongong City Floodplain Risk Management Study & Plan.
- Cardno, 2016: Coastal Engineering Study Coalcliff Beach, NSW.
- Baird, 2016: Fairy Meadow Beach Dune Reshaping Study.
- Baird, 2016: Corrimal Beach Dune Reshaping Study Preliminary Options Report.
- Carvalho et al., 2017: Identifying Sediment Compartment Dynamics on the Illawarra Coast.
- Gangaiya, Philomena et al., 2017: Morphological changes following vegetation removal and foredune re-profiling at Woonona Beach, New South Wales, Australia.
- Baird, 2018: Bellambi Beach Dune Reshaping Preliminary Option Report.
- Royal Haskoning DHV, 2018: Port Kembla Beach Dune Reshaping Preliminary Option Report.
- Baird, 2019: Coastal Engineering Services for Towradgi Creek Bank Support Initial Options Review.
- Baird, 2020: North Wollongong Beach Seawall Coastal Engineering Report.



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- Royal Haskoning DHV, 2020a: North Wollongong Beach Cost Benefit and Distributional Analysis Coastal Hazard Assessment.
 - Royal Haskoning DHV, 2020b: Port Kembla Beach Pool Intake High-Level Coastal Processes Investigation.
 - Baird, 2021: Bellambi Point Ramp Inundation Assessment.
 - NSW Government Department of Planning and Environment, 2022: State of the Beaches 2021-22.
 - Vegetation Management Plans prepared by Council for coastal natural areas.

Key data sets that have been captured/created since the CZMP was developed are:

- NSW Marine LiDAR Project (2018): Coastwide capture of topography and bathymetry out to approximately 30m depth using Laser Airborne Depth Sounding. Details available in Fugro (2019).
- NSW seabed landform classification data¹⁶ (2022), derived from the 2018 Marine LiDAR, with the methodology outlined in Linklater et al. (2019). The seabed landform classifications offshore of the Wollongong coast, as derived by Linklater et al. (2019), are shown in Figure 40. Reef platforms are the dominant marine bedform offshore of the Wollongong LGA, particularly between Stanwell Park and Thirroul. In this northern region, small sand plains are mapped close to the shore. From Thirroul, the sandy plains become larger with distance southwards. South of Wollongong, plains become more prominent with the exception of the reef outcrop offshore of Port Kembla around Red Point and Five Islands.
- Statewide Vegetation Type Maps (SVTM, 2020) showing current extents of Plant Community Types (PCT)¹⁷. This dataset reveals many inconsistencies with present coastal wetland and littoral rainforests along the coast, as provided in the current RH SEPP mapping. These inconsistencies create a range of difficulties for state and local government agencies, not only in terms of strategic management, but approval and operational processes for development, rehabilitation works and vegetation maintenance.
- Recent, coastwide LiDAR survey, captured for DPE-Coasts and Estuaries during October 2022.

¹⁶ Available from: <https://datasets.secd.nsw.gov.au/dataset/nsw-seabed-landforms-derived-from-marine-lidar-data-2022>

¹⁷ Available from: <https://datasets.secd.nsw.gov.au/dataset/nsw-state-vegetation-type-map>



Dune Monitoring Program

Since 2013, Wollongong City Council (2021c) have been monitoring beach and dune volume and width changes along six beach compartments: Bulli, Bellambi-Woonona, Corrimal, Fairy Meadow-Towradgi, City-Coniston, and Port Kembla. The monitoring aims to observe how the beaches and dunes respond to coastal processes and management interventions. The monitoring comprises regular topographic surveys of the north, middle and southern sections of each beach compartment as well as the capture of ground level photographs.

The indicators assessed are beach volume (volume between 0-3m AHD), beach width (horizontal distance to 2.5m AHD elevation), and dune volume (volume above 3m AHD). Differences from the earliest survey date, or immediately before any reprofiling works (where relevant), were recorded.

Reprofiling has been undertaken at the middle and northern sections of Fairy Meadow-Towradgi Beach, the southern and northern sections of Bellambi-Woonona Beach, the middle section of Corrimal Beach and the northern end of Port Kembla Beach.

The monitoring results show that dunes are slow to recover following storms, and recovery generally occurs faster along the northern end of the beach compartment. The rate of dune growth varies between locations. The rate of dune growth can slow with time, (witnessed at Woonona, Towradgi and City beaches), indicating that there is an equilibrium profile for some locations.

Beach volumes in the southern section of all compartments, as well as the middle sections of Bulli and Bellambi-Woonona beaches, have continually eroded since monitoring began.

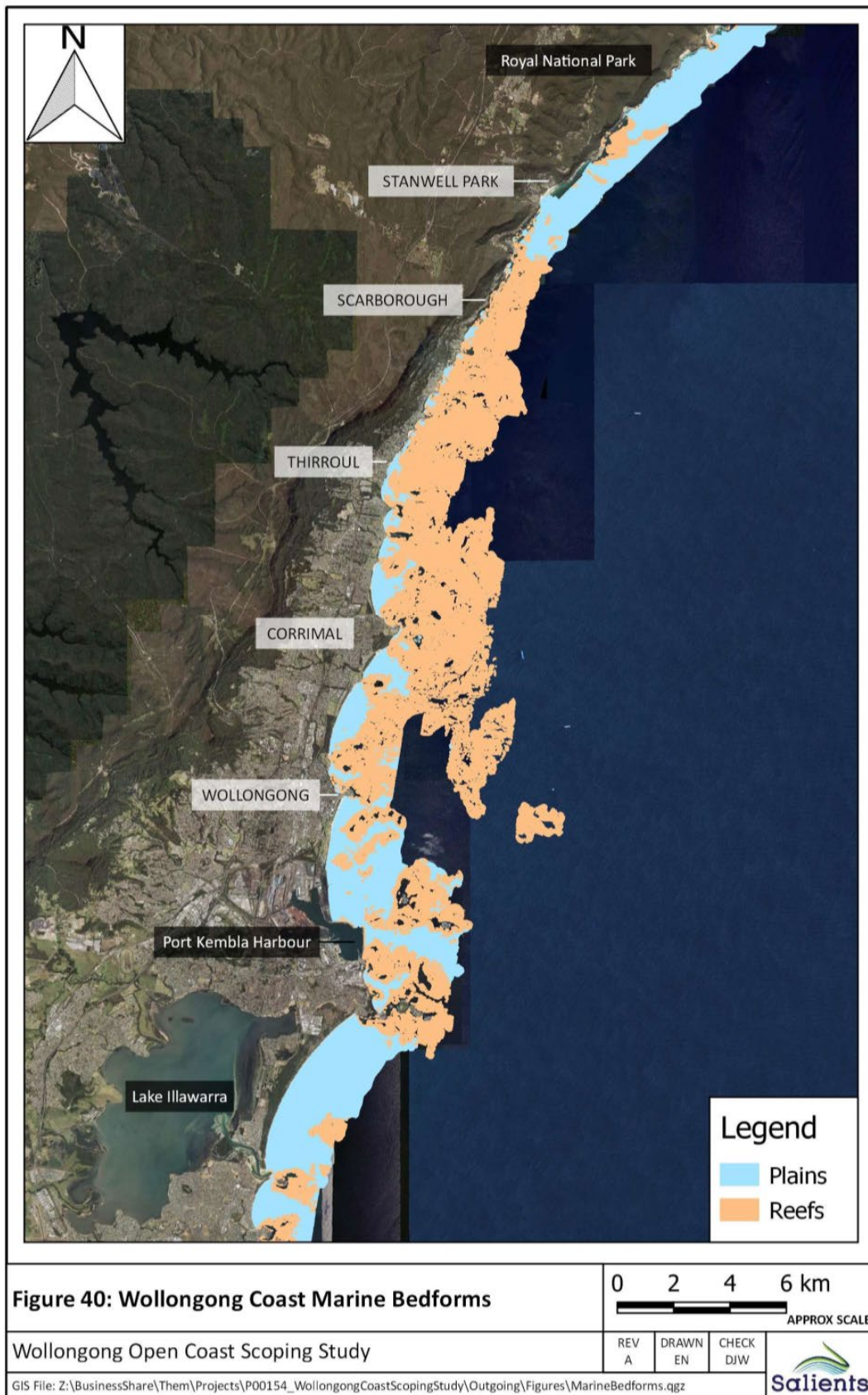
The pattern of south to north transport of sand is most likely related to overall beach rotation, manifesting as relative accretion at the northern end when compared to the southern end which recedes at the same time. This is an important point worth noting as it is a cyclical pattern that tends to reverse over time in response to medium term variability of the overall climate, and wave climate in particular (Short and Trembanis, 2004). The south to north rotation of beaches has been witnessed at other locations along the central NSW coastline over the past decade.

The analysis has been completed well and a discussion of the behaviour witnessed is robust, although could benefit from more nuanced interpretation from an experienced practitioner (coastal scientist or engineer), to pick up peculiarities and consider long term context. Understanding whether patterns of recession/accretion are likely to be persistent or part of normal beach variability is helpful to avoid poorly targeted management actions.



The monitoring data are incredibly valuable to managing the coastline of the Wollongong LGA and should continue. Consideration should be given to expanding the monitoring, where the budget allowance can be sustained, and capturing more detailed data using drones, a practice which is becoming commonplace and should prove more cost effective. If drones are to be used to capture data in future, there should be a period of overlap with more traditional survey techniques to provide confidence in the data capture.

FINAL DRAFT





8 Roles and Responsibilities

8.1 Public and Private Lands

Royal National Park, at the northern end of the Wollongong LGA and including the northern extents of the coastline, is part of the National Parks and Wildlife Estate with management governed by the National Parks and Wildlife Act 1974. From Stanwell Park to Scarborough, tenure of the coastline itself is complex. The coastal cliffs are a mix of Council and Crown land, interspersed with privately owned lots. The sandy beaches are Crown and Council owned, though largely under Council's care and control.

South of Scarborough this arrangement continues along the entire coastline, except for a section of land at the southern end of Thirroul where there are 11 direct waterfront residences. Land to the west of the immediate coast, and within the coastal zone, reflects a typical suburban and urban environment, containing large areas of privately owned land supported by public infrastructure on public lands.

Crown land is managed under the provisions of the Crown Lands Management Act 2016 (CLM Act) and Council land under the Local Government Act 1993 (LG Act). The CLM Act authorises local councils that have been appointed to manage dedicated or reserved Crown land to manage that land as if it were public land under the LG Act. A Plan of Management (PoM) is required for all community land. A PoM provides authorisation for use of the land, including tenures and development on the land. An adopted PoM may reduce the number of approvals required from the . In a practical sense, the relationship between Crown and Council land management can be challenging. Council is often responsible for the day to day management of the land, whereas Crown must ensure that all land management delegations and approvals are in place to meet the obligations of the Crown Lands Management Act. This can result in decision making and operational delays, which can be particularly difficult in a dynamic and sometimes quickly changing coastal environment. Delays due to legislative processes are often not well understood by the community, and can lead to high levels of frustration amongst local residents.

Major public assets in the coastal zone include the railway and associated stations, arterial roads such as Lawrence Hargrave Drive, Sea Cliff Bridge and waste water treatment facilities. Various private and public agencies are responsible for service delivery of these essential services. Council itself is the service provider and responsible for a large proportion of coastal assets including Bulli and Corrimal Holiday Parks and the Bulli Cemetery.

Ownership and governance of Wollongong Harbour is complex and will likely require resolution as master planning for this precinct proceeds. The harbour is controlled in part by the state and in part by Wollongong City Council. Transport for NSW released



a Master Plan Report for the harbour in October 2020 that identified the delineation of these boundaries is unclear and will become increasingly problematic as land use changes and maintenance costs rise.

WIN stadium and the entertainment centre are owned by Venues NSW, a NSW Government agency. Careful coordination with Council will be required for future management of this substantial asset due to proximity to the coast and low elevation.

Overall, the coastline itself and riparian corridors are largely within public ownership. This is advantageous as it allows public authorities, through the CMP, to implement a consistent and integrated approach to management of coastal land and assets. Much of the private land, be it for residential or business purposes is located within the estuarine catchments and therefore will have implications when addressing issues such as water quality.

8.2 CMP Governance

The CMP provides an opportunity for a range of land managers, government agencies and the community to create an integrated vision and plan for management of the coastal zone. However, Council is the lead agency for CMP development, coordination, implementation and reporting.

Council has already engaged with a range of external stakeholders through the Stage 1 community and stakeholder engagement process. In addition, the Open Coast Advisory Working Group had been established. In Stage 1 of CMP development the responsibilities and functions of the Working Group are:

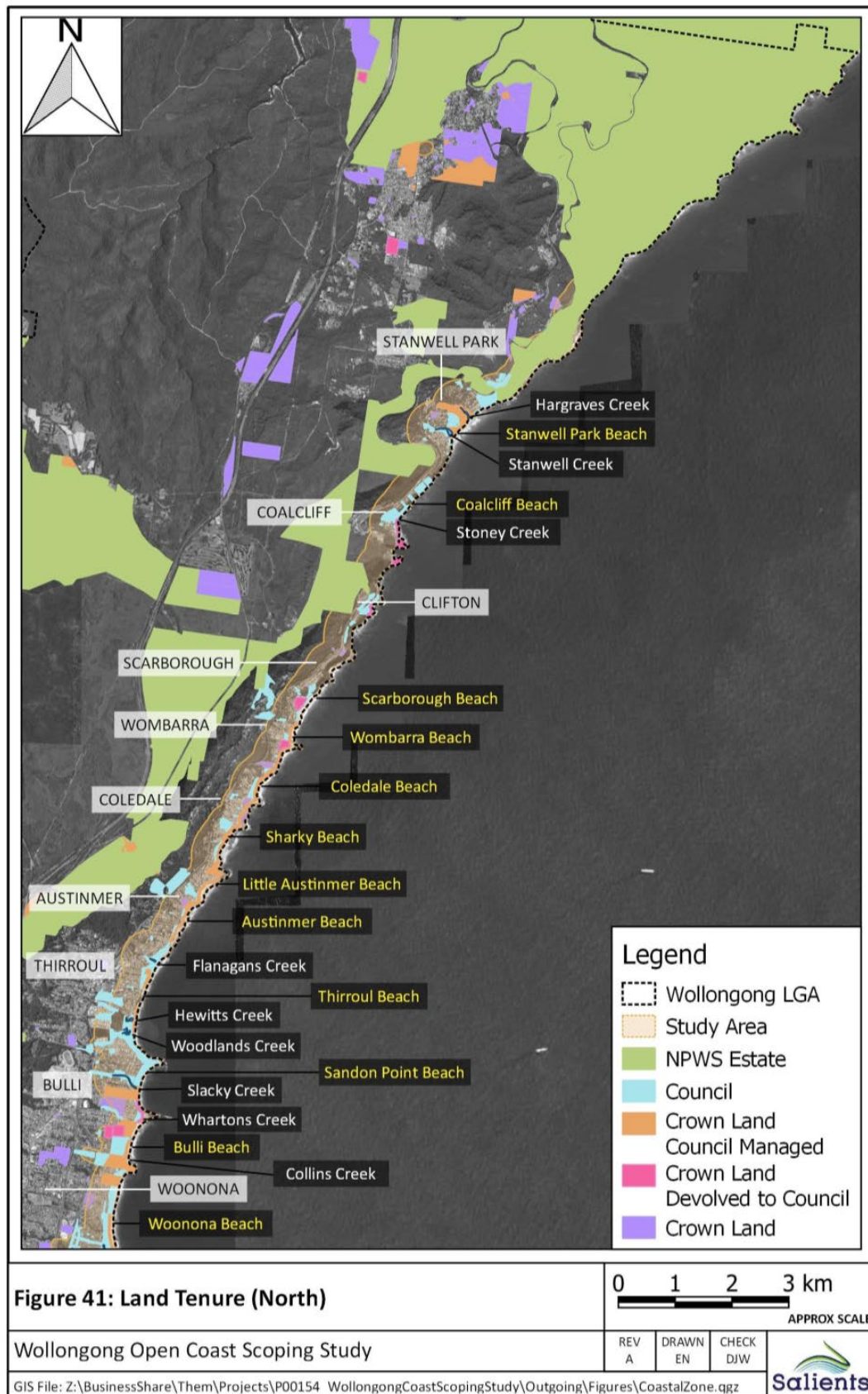
- To guide development of the Wollongong CMP Scoping Study as per Stage 1 of the NSW government CMP framework and manual.
- To assist Wollongong City Council determine scope, vision, purpose and objectives of the Wollongong CMP.
- To promote a collaborative cross-organisational and multi-agency approach to the development of the Scoping Study for the Wollongong CMP.
- To develop a better understanding of the risks, issues and challenges for management of the coast, including current coastal management arrangements.
- To provide data and information as required in a timely manner, review scientific advice and integrate this knowledge into the preparation of the CMP.
- To review and provide input into draft documents.
- To help ensure the development of an effective, feasible and high-quality CMP that appropriately addresses stakeholder needs and interests.

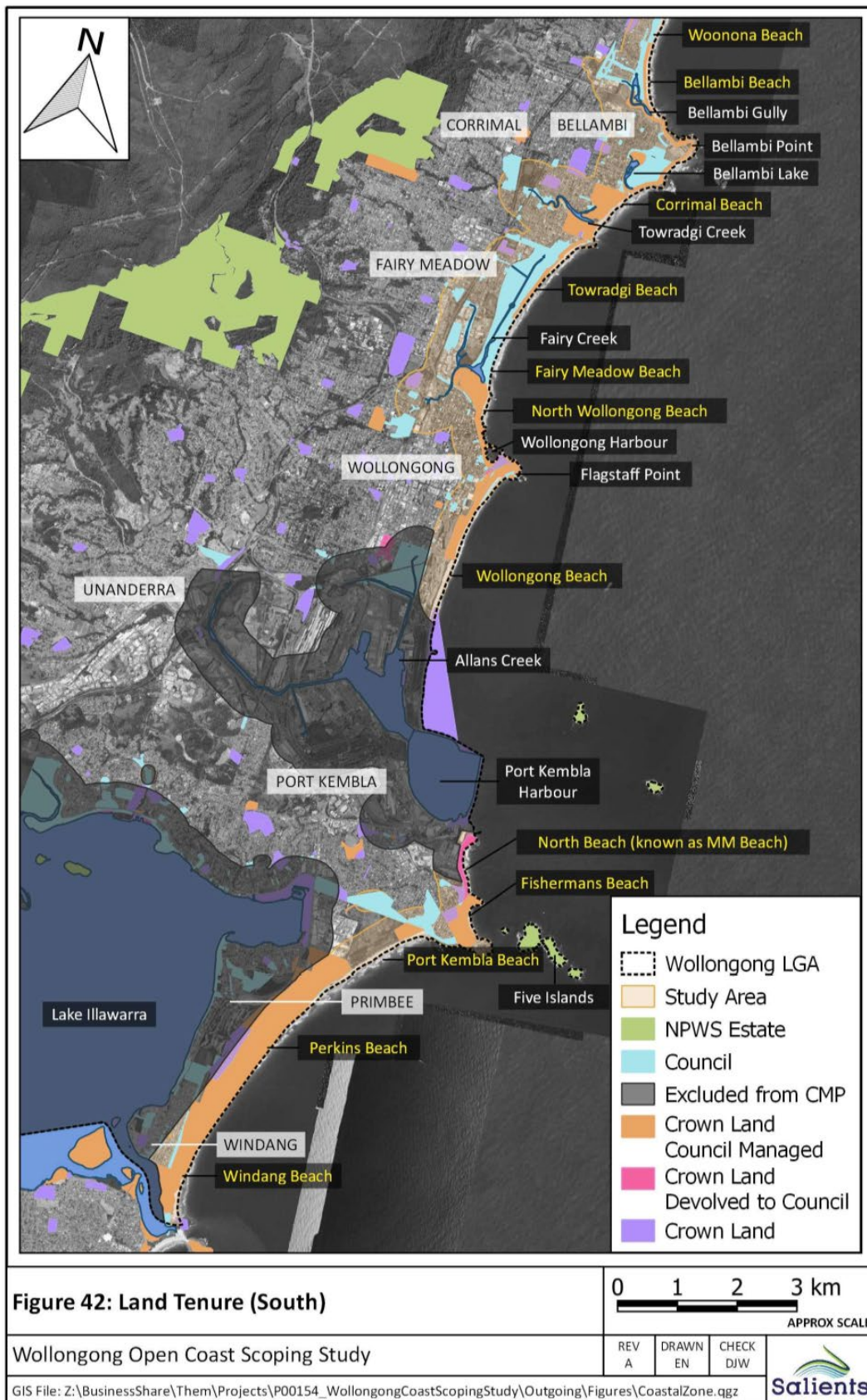


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- Ensure information on the development of the CMP is reported back to the member's relevant Council division or State agency.

The Working Group consists of representatives from South East LLS, DPI Fisheries, divisions from DPE - Environment, Energy and Science; Planning and Policy; DPE-Crown Lands; and National Parks and Wildlife Service, Property NSW, Transport for NSW, Sydney Water, ILALC and an independent scientific advisor. It also includes Council staff from a range of divisions across Council responsible for coastal management and assets.

Moving forward into subsequent stages of CMP development, governance arrangements may change, with different agencies involved depending on management actions. In Stages 3 and 4, agencies will be required to commit funding and resources for management actions for which they have financial, management or legislative responsibility. At this time, agency representatives will need to have access to authorised personnel, or be in a position to make binding decisions on behalf of their agency.







9 First Pass Risk Assessment

Mandatory Requirement 8 from Part A of the CMM (NSW Government, 2018a) requires that a CMP identifies “*key coastal management issues affecting the areas to which the CMP is to apply*”. Section 21 (3)(b) of the CM Act requires councils to follow a “risk management process” when preparing a CMP. Mandatory Requirement 6 from Part A requires that a Council must “*determine and assess coastal risks*”. The CMP must also demonstrate how a Council has considered risks at present day, 20-, 50- and 100-year timeframes (Mandatory Requirement 13). It logically follows that those “*coastal risks*” identified as requiring some type of management under a CMP are the “*key coastal management issues*” that are to be addressed by the CMP.

Part B of the CMM (NSW Government, 2018c) calls for preparation of a “first-pass” or qualitative risk assessment, using available information, as part of the Stage 1 Scoping Study. Risk Assessment typically comprises three steps: Identification, Analysis and Evaluation. The methodology adopted for the risk assessment included the elements and activities outlined in Figure 43. Following identification of risks, the analysis process involved consideration of the likelihood of the risk event occurring and the consequences should the event occur. This qualitative risk rating was based on the available information, feedback from the risk assessment workshops and professional experience. For each of the identified risks, the following factors were considered:

- How is the risk currently being managed?
- Have previous management plans or actions addressed this risk?
- How effective are the current management measures and what is the residual risk?
- In the future, how is the risk level likely to change (over 20, 50 and 100 years)?

A detailed risk assessment will be undertaken after Stage 2 studies are completed.

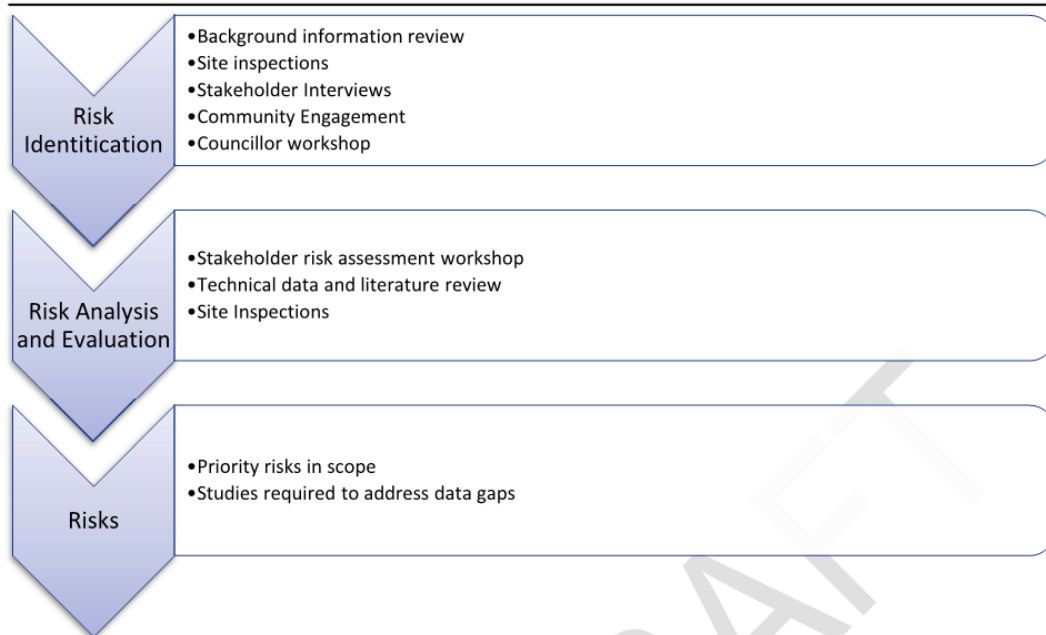


Figure 43 Risk Assessment Process and relevant activities for this scoping study

9.1 Risk Identification

The review of data and literature, and site inspections informed not only those issues that were carried through to the stakeholder workshops, but also informed the decision making process for the identification and prioritisation of key issues (see sections 6.2.1 to 6.2.4). Issues were prioritised through a qualitative process utilising the knowledge and experience of the stakeholders and technical experts engaged to undertake the review, as per the requirements for a Stage 1 Scoping study described in the CMM. The data gaps identified by the review are discussed in Sections 9.3 and 9.4.

9.2 Risk Analysis and Evaluation

Stakeholder Risk Assessment Workshops

The stakeholder first pass risk assessment was completed via three separate stakeholder workshops. The workshops were attended by representatives from Council, DPE-Coasts and Estuaries, Department of Primary Industries - Fisheries, Transport For NSW, Illawarra Local Area Land Council (ILALC), NSW National Parks and Wildlife Service, DPE - Crown Lands, Local Land Services and Sydney Water.

Workshop 1 reviewed risks most relevant to the natural environment, Workshop 2 reviewed risks most relevant to coastal hazards and Workshop 3 focussed on coastal use. Within each workshop, assessment of risks was either grouped by geographic location or management theme. Following completion of the survey for each location



or theme, participants were provided with the opportunity to flag any risks that they felt had been missed or warranted further consideration during CMP development.

Overall, although there have been numerous studies completed historically across Wollongong's Coastal zone, substantial additional work is required during Stage 2 to fill data gaps and enable the robust risk assessment and management process required of a CMP. For example, the overwhelming majority of available coastal hazard information does not provide information with different likelihoods scale and the timeframes commonly available (2050 and 2100) do not align with the 20, 50 and 100 year timeframes required by the CM Act. Furthermore, there has not yet been any robust analysis of some hazards (Tidal Inundation, Entrance Instability). This has hindered the methods that could be reasonably applied to the first-pass risk assessment. The methodology applied is limited, being largely based on opinion, the review of background information, site inspections and workshop outcomes.

Table 16 lists all issues that received a high-risk rating based on a consequence and likelihood score. No risks were rated as extreme. The detailed methodology and outcomes for this process are documented within the First Pass Risk Assessment Workshop Summary (refer to Appendix A).


Table 16 Issues with High-Risk Rating from Risk Assessment workshop

Location	Risk	Management Theme	Risk Score	Risk Rating
Coastal Zone	Rock fishing	Public safety	15.56	High
Port Kembla Beach	Wind blown sand preventing revegetation	Natural Assets	15.39	High
Coastal Zone	Lack of policy direction - cultural heritage	Cultural Heritage	15.17	High
Woonona Beach	Vegetation vandalism	Natural Assets	14.06	High
Coastal Zone	Multiple land tenures and governance arrangements	Governance	12.25	High
Woonona / Bellambi Beach	80 Residences along Creek and Stormwater infrastructure (Inundation)	Private development	12.25	High
Coastal Zone	Loss of existing seawalls – coastal erosion and dilapidation	Public infrastructure	12.24	High
Coastal Zone	Lack of agreed approach on historic heritage obligations (local)	Historic heritage	12.22	High
Woonona Beach	Lack of community awareness - importance of natural habitats	Natural Assets	11.98	High
Fairy Creek, Fairy Meadow Beach, North Wollongong Beach & City Beach	Urban stormwater pollutants	Stormwater	11.90	High
Bellambi Lagoon & Corimal Beach	Urban stormwater pollutants	Stormwater	11.84	High
Coastal Zone	Children climbing Port Kembla shed where sands build up	Public safety	11.61	High
Coastal Zone	Gap between strategy and works	Governance	11.55	High
Coastal Zone	Loss or rationalisation of ocean pools	Facility management	11.52	High
Sharkys Beach	Vegetation vandalism	Natural Assets	11.25	High
McCauleys Beach	McCauleys Beach Reserve (Erosion)	Public recreation	11.06	High
Bellambi Boat Harbour / Bellambi Point Beach	Boat Harbour Access Road (Erosion)	Public infrastructure	11.02	High
Coastal Zone	Contradictory strategies across Council	Governance	10.72	High
Bulli Beach	Beach Safety - Patrol View impeded by Vegetation	Public safety	10.64	High
Coalcliff Beach & Stoney Creek	Buried asbestos & building waste	Public safety	10.56	High
Hewitts, Woodlands & Tramway Creeks & McCauleys Beach	Vegetation clearing - dune	Natural Assets	10.56	High
Sandon Pt Beach	Sandon Point SLSC (Erosion)	Facility management	10.54	High
Whartons Creek & Collins Creek	Leachate discharge from landfill	Public safety	10.50	High



Location	Risk	Management Theme	Risk Score	Risk Rating
Coastal Zone	Lack of strategy for future planning for climate change	Governance	10.33	High
Hewitts, Woodlands & Tramway Creeks & McCauleys Beach	Pest species (foxes) preying on native fauna	Natural Assets	10.02	High
Coastal Zone	Lack of clarity around surf club management	Facility management	10.02	High
Headlands	Vandalism of revegetation projects on headlands	Natural Assets	Newly identified	High
Seacliff Bridge	Coastal hazard impact on piers	Public infrastructure	Newly identified	High
Sharkys Beach	Footpath failing opposite Park St	Public infrastructure	Newly identified	High
City Beach	Exposure of building waste	Public safety	Newly identified	High
Seawalls	No asset category for management in Council	Governance	Newly identified	High
Headlands	Cliff instability and inadequate geotechnical studies	Public safety	Newly identified	High
Estuary entrances	Safety of children playing and swimming (water quality and stability)	Public safety	Newly identified	High
Tidal Pools	Increased frequency of closures due to pollution	Facility management	Newly identified	High

Technical Literature/Data Review and Site Inspections

The literature and data review process evaluated the available information in terms of its currency, consistency and adherence to best practice principles for the subject matter. It identified methods and gaps in the existing research resulting in a comprehensive review and assessment of the quality of available background information and reports. The review was supported by field inspections providing on site validation or otherwise of issues and findings of previous studies.

9.2.1 Summary of current and future key issues

Based on the process outlined above in Section 9.2, Table 17 presents a summary of the current key issues with an assessment of current and future risk. Key issues requiring additional studies to progress are flagged for Stage 2. These are issues for which significant data gaps exist, and that will require resolution in order to develop appropriate and evidence based management actions in future stages of the CMP development. In Stage 3, a detailed risk assessment will be completed that incorporates the new information and findings that arise from the Stage 2 studies. The detailed risk assessment may also include a review of those risks that ranked low or moderate in



the first pass risk assessment, to ensure that the previous ranking is accurate in the current context and in view of the Stage 2 studies.

Table 17 First Pass Risk Assessment – High and Extreme Risk Issues

Issue		Current Risk	Future Risk	Stage 2 Study recommended
Overarching	Governance	High	High	
Overarching	Inaccuracies in SEPP Littoral Rainforest and Coastal Wetlands mapping	High	Extreme	✓
Overarching	Outdated coastal hazard mapping	High	Extreme	✓
Overarching	Outdated water quality data for coastal estuaries	High	High	
Overarching	Surf club renewal and maintenance	High	Extreme	Will be informed by coastal hazard studies
Overarching	Ocean pools renewal and maintenance	High	Extreme	
Overarching	Knowledge gaps in the understanding of Aboriginal cultural values and assets	High	Extreme	✓
Overarching	Buried asbestos and building waste	High	High	
Overarching	Outdated or lack of ecological studies – shorebirds, rocky platforms, estuaries and coastal dunes	High	High	✓
Overarching	Urban water quality	High	High	
Central Section	Migration pathways for coastal wetlands in response to climate change	High	High	
Central Section	Dune vegetation management	High	High	
Central section	Sight lines for lifeguards	High	Extreme	Will be informed by coastal hazard studies
Southern section	Wind-blown sand impacting facilities, infrastructure and public safety	High	Extreme	✓

9.3 Recommended Stage 2 Studies

9.3.1 Coastal Wetland and Littoral Rainforest Studies

Coastal wetlands and littoral rainforest mapping

This study should confirm the extent and distribution of coastal wetlands and littoral rainforest and in doing so assess the validity of the RH SEPP mapping. The outputs of this study should be:

- A succinct technical report that provides a summary of the fieldwork and the assessment methodology.
- Mapping and spatial data that spatially describes the extent and distribution of riparian vegetation across the study area.



- Confirmation of the validity of the CM SEPP Mapping of Coastal Wetlands and Littoral Rainforests, and if necessary, amendment of the mapping.

9.3.2 Coastal Vulnerability Studies

The following table outlines the studies relating to coastal hazards that need to be completed as part of Stages 2 and 3 of the CMP development process. These studies are presented, approximately, in the order in which it is expected they would be completed.

Table 18 Recommended Coastal Hazard Studies

Coastal Hazard	Commentary and Recommended Stage 2 Studies
Study 1a 5. Coastal Cliff or Slope Instability	<u>Option 1:</u> Council may opt to continue with its present approach of adopting a <i>Coastal Influenced Geotechnical Hazard Zone</i> and requiring detailed assessment of developments in that area. However, a report which clearly outlines and justifies the derivation of that area and its relationship with Council's DCP should be prepared. Note that this Option will still require the depth to bedrock below the beach to be derived as outlined in Option 2 and will require that the extent of the <i>Geotechnical Hazard Zone</i> be revisited once sandy beach hazard lines are derived, to ensure consistency at the interface between the two.
Study 1b 5. Coastal Cliff or Slope Instability	<u>Option 2:</u> The present Geotechnical Hazard Zone would be thoroughly reviewed, and lines derived for 20-year, 50 year and 100-year time frames to address the requirements of the CM Act. As part of that review, the way in which the zone has been derived using the available information should be clearly described and reported. A probabilistic assessment of landslip using Australian Geomechanics Society guidelines should be completed. In addition to the geotechnical hazard zones, the height of underlying rock below and landward of sandy beaches, should be determined so that an informed assessment of any constraints to sandy beach erosion/recession can subsequently be made by a coastal engineer, to ensure consistency between the definition of beach erosion/recession hazards and adjacent geotechnical hazards. It is envisaged that a seamless GIS layer showing a continuous surface elevation of cliff lines, rocky bluffs, and exposed offshore reefs (available from existing LiDAR) alongside the bedrock surface underlying these beaches would be produced. Methods such as seismic profiling, ground penetrating radar and/or Multichannel analysis of surface waves could be considered.



Coastal Hazard	Commentary and Recommended Stage 2 Studies
Study 2 Coastal Entrances 3. Coastal Lake or Watercourse Instability and 6. "Tidal Inundation" around ICOLLs (where influenced by a closed barrier)	<p>The coastal vulnerability area associated with coastal entrances could be examined along the entire coastline. All entrances listed in 2.4.3 need to be considered. The following guidance is provided as to how the assessment might be informed:</p> <ol style="list-style-type: none"> 1 Utilising available survey information including local survey and data from similar estuaries on the NSW coast, plus a probabilistic modelling assessment of dune heights, derive a range of barrier heights of different probabilities for the present, 20-, 50- and 100- year timeframes. Using those timeframes, develop probabilistic tidal inundation maps for those ICOLLs assuming a flat water surface behind the barrier. 2 Consider the extent of entrances present on suitably georeferenced, remote sensed historical data (aerial photography and satellite imagery). It is noted that the small scale of most inlets along the Wollongong Coast may make most freely available satellite imagery unsuitable for the analysis. 3 Consider any structural barriers that currently exist to constrain entrance movement, such as the training structure north of the entrance at Towradgi Creek, or the beach rock which constrains the outlet to Hargraves Creek. 4 Collate any historical data relating to erosion inside the entrance as a result of wave penetration when the entrance is open (this is an overlap with Hazard 7, relating to the erosion of foreshores by swell waves). 5 Establish an envelope of likely behaviour (based on all historical data and field inspection). 6 Consider how this envelope may change with sea level rise given likely beach recession and raising of the beach barrier with sea level rise. Project changes for a 20-, 50- and 100-year time frame. 7 Justify and apply a suitable buffer around the assessed historical extent to define the extent of the coastal vulnerability area (CVA) surrounding these entrances. <p>While attempts could be made to probabilistically establish the areas exposed to entrance instability it is likely that a reasonable result can't be practically obtained. It is recommended that the default approach to entrances should be one of minimal intervention and managing any development so that it is well away from the envelope of areas that the entrance channel could inhabit as it changes over time. It is recognised that this is not necessarily possible and a clearly developed entrance management policy would help control what is and isn't allowed inside the CVA associated with coastal entrance instability. Such a policy could be established as an action in the CMP.</p>



Coastal Hazard	Commentary and Recommended Stage 2 Studies
Study 3 7. Foreshore Erosion	<p>A Foreshore erosion study within coastal zone of tidal creeks and ICOLLs:</p> <ol style="list-style-type: none"> 1 A review of prior analyses of erosion concern within the ICOLLs of the coastal zone. 2 Inspection and documentation of foreshores. 3 Identification of key areas of active erosion and an assessment of contributing processes. 4 Identification of assets threatened. 5 Assessment of likely timeframes for erosion considering historical rates, future uncertainty and the impacts of sea level rise. 6 Prioritisation of sites for treatment and management during the CMP, including the development of preliminary concepts for the most critical 3-5 sites, including cost estimates. 7 As part of Stage 3, design and construction of any required works could be assessed as an action for the CMP. <p>In completing the study, which is expected to include the above steps, consideration may be given to adopting an foreshore management assessment framework such as that recently prepared for the Marine Estate Management Strategy (Hydrosphere Consulting, 2020).</p>
Study 4 4. Coastal Inundation	<ol style="list-style-type: none"> 1 Revisit existing flood model results to compile "coastal inundation hazard" (storm surge) results into a single layer for use by Council in planning. This may require re-execution of flood models, but this should be a relatively straight forward task as all seem to use the same modelling package (TUFLOW). New simulations could be based on suitably updated sea level rise projections as adopted by Council. This compilation will include all entrances for which recent flood studies have been completed (all except Council's "northern catchments"). Those flood studies have generally applied sea level rise values of 0.4m to 0.9m by 2050 and 2100 respectively, and these values should suffice until such time as a new sea level rise projection is adopted and the flood studies are updated. 2 Coastal wave overtopping study (coastal inundation hazard). Assess coastal overtopping using up to date methods of analysis. Provide outputs for present day, 20-, 50-, and 100-year timeframes. Study to include identification of areas threatened by overtopping during future sea level rise, wave modelling to assess exposure of those locations, probabilistic generation of storm conditions and ranking of storms based on peak overtopping rates or total storm overtopping volume either modelled numerically, or derived using the methods of Eurotop (Van der Meer et al., 2018). Subsequent backshore modelling to estimate the extent of inundation.
Study 5 6. Tidal Inundation	<p>For Port Kembla:</p> <ol style="list-style-type: none"> 1 Recalibrate existing flood models to tidal conditions 2 Run appropriate "King Tide" (no catchment inflow) conditions through the models for different amounts of sea level rise (dependent on Council's adopted projection) 3 Map tidal inundation extents around those estuaries for the present day, 20, 50 and 100 year timeframes.



Coastal Hazard	Commentary and Recommended Stage 2 Studies
Study 6 4. Coastal Inundation and 6. Tidal Inundation	<p>A "Combined Open Coast Infrastructure Inundation Hazard Assessment" is required to assess low lying infrastructure in the immediate vicinity of the open coast. The study should:</p> <ol style="list-style-type: none"> Undertake a preliminary identification and description of all public infrastructure which may be affected by "normal" tide and wave conditions under present and future sea level rise. This is expected to include (but not be limited to): <ul style="list-style-type: none"> -Ocean Pools -Open coast access ways -Low lying promenades -Stormwater outlets draining directly to the ocean and associated constructed drainage infrastructure further inland -Boat launching facilities (ramps, wharfs, pontoons) Identify any low-lying land immediately adjacent to the open coast, but not attached to the floodplains of any estuaries, which may be connected to the ocean during normal tide/wave conditions, including future sea level rise. This land will be a subset of any coastal inundation areas adjacent to the open coast (which is why Study 4 should be completed first). Low lying land could comprise back dune areas which have been cleared and partly filled in the past. Acquire, where not available from Council, elevation data relating to these assets and, suitable to describe reduction in their functionality under a sea level rise scenario. Provide a qualitative description of the way in which these assets may be affected by future ocean water levels (alongside normal wave conditions). This will vary between different asset types. For example, water level and waves will be very important in assessing future safe use of ocean pools, whereas the water levels alone will likely be enough for stormwater infrastructure. For each asset, estimate the amount of sea level that can be accommodated with the asset remaining functional (some wave modelling may be required to replicate waves exceeded 50, 80, 95% of the time etc.). Rank Assets in terms of cost, criticality and mean sea level at which they would cease to be functional. Utilising council's adopted sea level rise projection (or other agreed projection), estimate the likely time frame over which different assets will need to be upgraded/modified to adapt to sea level rise. Provide recommendations regarding which assets need to be investigated further as part of Stage 3 of the CMP process. <p>Note, that points 6-8 above may form part of Study 8.</p>



Coastal Hazard	Commentary and Recommended Stage 2 Studies
Study 7 1. Beach Erosion and 2. Shoreline Recession	<p>1 Probabilistic coastal erosion and recession assessment for all sandy beaches along the coast, including constraints and the nature of beach deposits alongside available offshore reef and bedrock prevalence and elevations (from geotechnical study) plus more recently available published analyses. The method adopted in the assessment should be clearly justified as part of the proposal submitted by consultants to do the study.</p> <p>9 Consultants should (i) explain how recent reef extent and nearshore bathymetric data would be used (Fugro, 2019), (ii) explain how bedrock elevations captured by the geotechnical studies would be used, (iii) outline and justify the approach to be taken in the probabilistic modelling.</p> <p>10 The modelling should be executed to derive a set of probabilistic hazard lines for present (~2025), 2045, 2075 and 2125.</p> <p>11 Probabilistic sandy beach hazard lines are to be integrated with the Cliff and Slope instability hazard lines at the interface of sandy beaches and to provide a seamless dataset of hazard lines along the coastline</p>
Study 8 Combined Hazard and Risk Study	<p>1 All hazard outputs derived previously are to be combined into a single consistent data set.</p> <p>2 Preparation of a DCP to support development in the CVA.</p> <p>3 The envelope of those hazards is to be determined and provided to support a planning proposal, including mapping of the "Coastal Vulnerability Area", should Council decide to modify the RH SEPP mapping to include a Coastal Vulnerability Area.</p> <p>4 Combined coastal hazard risk assessment (sub study of overall detailed risk assessment in Stage 2). This study should be based on Council's corporate risk analysis tables, where available and should aim to provide a numerical assessment (i.e., likelihoods as % chance and consequences in \$ values, areas of land lost etc.).</p>



The studies in Table 18 could be let as a single large package, which would likely result in a cheaper price, although that would limit the pool of suitably qualified consultants that might be interested, and the quality of outcomes might not be as good as if they were let in separate packages. The studies could be packaged as follows.

- Study 1a or 1b, to a specialised geotechnical consultant.
- Studies 2 and 3, to a coastal engineering/science consultant.
- Studies 4 and 5, to a coastal engineering/science, environmental hydraulics or flood modelling consultant.
- Study 6, to a coastal/civil engineering consultant.
- Study 7, to a coastal engineering/science consultant.
- Study 8, to a coastal science / engineering / planning and/or risk management consultant.

Council could consider engaging a coastal hazards specialist to coordinate the required studies on their behalf.

9.3.3 Coastal Environment Studies

Shorebird baseline inventory and threats assessment

The assessment should include systematic field studies of both sandy and rocky habitats. The assessment report would provide information on shorebird species occurrence, abundance, use of habitat, key threats and conservation management requirements. Recommendations for future monitoring should also be included.

Ecology of rocky platforms baseline inventory and threats

This study should provide a baseline inventory of intertidal species assemblages on rocky platforms, detailing species occurrence, distribution and abundance. The assessment report should detail the sampling methodology, sampling effort and survey results. The assessment should include high, mid and low intertidal zones. Habitat features and evidence of disturbance factors should be recorded. Recommendations for future monitoring and conservation management are to be included.

9.3.4 Coastal Use Studies

Identification of Aboriginal Cultural Heritage values and assets, and vulnerability assessment (text provided by ILALC).

"This technical study will apply a community-led place-based approach to identify the known and predicted Aboriginal cultural values within the Wollongong LGA coastal regions. These



values will be determined by Traditional Owners, custodians and knowledge holders. Aboriginal people will play an active role in the cultural values assessments and be central to controlling how these values are best protected, conserved, and/or managed. The technical study will undertake a cultural values vulnerability assessment, utilising the outcomes of the key hazards assessments to determine the risks, vulnerabilities and opportunities relevant to Aboriginal Cultural Values. Coastal management issues relating to Aboriginal cultural values and assets and high-level actions and/or interventions to manage the impacts of coastal hazards as identified by the Aboriginal community will inform Stages 3 – 5 of the CMP process."

Port Kembla Beach wind blown sand

This study would involve an initial analysis of historic lidar and morpho dynamics to better understand influences on sand movement in the Port Kembla area on a temporal and geographic scale. The study should include a preliminary options assessment for management of the impacts of windblown sand on infrastructure such as roads, footpaths and buildings.

9.3.5 Stage 2 Risk Assessment

Upon completion of the above Stage 2 studies, detailed revision of the first pass risk assessment will be required incorporating new findings. The detailed Stage 2 risk assessment will form the basis of the management action identification and evaluation undertaken in Stage 3.

9.4 Longitudinal studies

In addition to the Stage 2 studies, there would be significant benefit in undertaking the longer-term studies listed below, over the period of the CMP implementation. These studies may form CMP actions in themselves and will guide subsequent CMP reviews.

1. Water quality monitoring in coastal estuaries.
2. EEC mapping of the coastal zone.
3. Migration pathways of coastal wetlands.



10 Preliminary Business Case and Forward Plan

This chapter provides a summary of the subsequent stages of the CMP process and a summary of recommended studies, investigations and assessments proposed, which forms the forward plan. The forward plan is the key outcome of this Stage 1 Scoping Study.

10.1 Benefits of CMP Development

The future management of the Wollongong Coast will be undertaken within a context of (likely) limited financial resources, ongoing threats to the natural coastal environment, cultural heritage and built infrastructure, and ongoing climate change uncertainty. A CMP will help mitigate these factors. Specifically:

- A CMP provides a long-term strategy, developed with inputs from a cross section of government stakeholders and thus enables coordinated management of the coast and estuaries within a local government area.
- A CMP presents an opportunity to manage the coastal zone proactively and to ensure that there is alignment with other local and regional planning instruments and initiatives.
- A CMP allows for community involvement in management and decision making, supporting community connection and the acknowledgement and protection of cultural values.
- A CMP will support Council to make decisions about the coastal zone which are evidence based, consistent with a long-term management strategy, transparent and sustainable.
- A CMP will provide technical information about the coastal zone which can be accessed by a range of stakeholders and which can serve to increase understanding of the coastal zone and challenges associated with its long term management.
- A gazetted CMP unlocks funding opportunities via the NSW Government's *Coast and Estuary Grants* funding stream (presently on a 1:2, local:state government contribution basis).
- A gazetted CMP allows for a more streamlined approval process for certain identified projects and activities.

The risks of not developing a CMP are substantial and potentially place Council in a position where it is unable to meet its obligations and commitments in terms of financial sustainability, climate change adaptation and emergency management. Without an understanding of key issues, it is impossible to adequately budget for their



management. The CMP process integrates with Councils Integrated Planning and Reporting (IP&R) framework, allowing the recommended actions to be prioritised and resourced in a transparent way. This approach removes the risk of CMP actions competing in an inequitable way with other Council priorities.

The CMP must be formally endorsed by all other government agencies for which actions are allocated either in terms of funding or resource allocation. Thus, it provides a strong degree of certainty for Council, that the interagency actions within the Plan can and will be delivered.

The already urbanised Wollongong coastal zone, and ongoing pressures for higher densities of development, means that substantial investment in this area will continue. It is paramount that Council adequately considers the potential impact of coastal hazards on development as part of strategic planning, to avoid placing development in areas with significant coastal risks and/or creating intractable problems for future generations.

The benefits of developing a CMP are substantial, as are the risks of not developing a CMP. Hence, it is considered prudent that Council continues with CMP development beyond completion of this Scoping Study.

10.2 Funding

Council has budgeted \$333,000 for a three-year project to prepare the CMP (including this Scoping Study). Development of the CMP is listed as an action in Council's Delivery Program. This funding may be leveraged to obtain grants under the 'planning stream' of the NSW Government Coastal and Estuary Grants Program. Under that stream, funding is available for projects that aim to either develop a CMP or transition a coastal zone management plan (CZMP) to a CMP. It would be appropriate for Council to apply for grants under this program to complete the recommended Stage 2 studies.

Once the CMP is certified and formally adopted, it can be classed as a 'supporting document' within Council's Delivery Program. For any plan, or action in a plan to be implemented, the plan needs to be identified as a 'supporting document'. However, until the actions are enabled through resourcing and included in the Delivery Program and Operational Plan, they remain aspirational.

Implementation of an action requires identification of funding within an existing operational or capital budget or will require an application for new funding through Council's annual budgeting processes. At this early stage in the process, Council has not allocated any existing funding for CMP implementation. New funding applications must be in the form of:



- A competitive 'business proposal' process for operational one-off projects, or recurrent operational funding where relevant (e.g., additional regular monitoring or enhanced veg work may be eligible for recurrent); or
- A competitive 'project nomination' process for capital works.

Once internal funding is secured for actions that are included in the CMP, it can then be used to seek NSW Coastal and Estuary Grants Program funding through that program's "*implementation stream*". The implementation stream is presently on a 1:2, local:state government contribution basis and may be used to implement actions identified in a certified coastal zone management plans or coastal management programs. Projects must fit into 1 of 4 program areas (coastal vulnerability area, coastal wetland and littoral rainforest areas, coastal environment area or coastal use area).

Local councils, Joint organisations, Incorporated Regional Organisations of Councils, Local Land Services, and public land managers (in partnership with Council leading the project) are eligible to apply for grants under NSW Coastal and Estuary Grants Program. Technically, Council is currently eligible to apply for funds via the implementation stream, for actions documented within the existing CZMP. However, access to this funding is forecast to cease at the end of 2023 when existing CZMPs are deemed to no longer be in effect under the transitional arrangements of the CM Act.

Other funding opportunities may also become available via other grant schemes such as the Recreational Fishing Trust, Crown Reserve Improvement Fund, Environmental Restoration Fund, Envirotrust, Landcare and Coastcare. However, as with the NSW Coastal and Estuary grants, these are awarded via a competitive application process and there is no guarantee funding will be secured.

10.3 Forward Plan

10.3.1 Stage 2 – determine risks, vulnerabilities and opportunities

Stage 2 of the CMP process involves undertaking detailed studies that will assist Council in identifying, analysing and evaluating risks, vulnerabilities and opportunities in the study area. The studies conducted during Stage 2 are to support decision-making in the subsequent stages of the CMP planning process. Recommended activities in Stage 2 include:

- Completion of Stage 2 technical studies (see Sections 9.3 and 9.4) including preparation of an overall Coastal Hazard map combining coastal hazard datasets.
- Refine understanding of key management issues through detailed revision of the first pass risk assessment. This will identify the "issues" that need to be addressed by management actions in the CMP.



- Community and stakeholder engagement as per the engagement plan (see Section 10.4).

10.3.2 Stage 3 – identify and evaluate management options

In Stage 3, the revised risk assessment developed in Stage 2 would be used to identify potential management options and to evaluate these to identify those which can be justifiably included in the CMP.

The management options are assessed based on feasibility (Are there any engineering or planning road blocks?), economic viability (Is it worth paying for and is funding available?) and acceptability to stakeholders (Do stakeholders think it is a good idea?). The management options which pass these tests would become the short list of desirable management actions to be considered as the CMP is drafted in Stage 4.

In Stage 3 it is critical that Council commence consultation with public authorities regarding those risks for which that authority is a key stakeholder. A preliminary business plan will be developed following assessment of the management options outlining the cost and scheduling of implementation. In principle support from public authorities will be sought for the preliminary business plan.

10.3.3 Stage 4 – finalise, exhibit and certify the CMP

Development of the CMP requires formal agreement from all parties regarding the actions that would be completed as part of the CMP. This stage, would be driven by a 'business planning' exercise, where the timing, likely cost and responsibilities for actions are negotiated.

In Stage 4 it is critical that Council engage and obtain the formal concurrence of public authorities for any actions for which that authority will have responsibility either as the legal entity or through funding.

Once agreement is reached on the actions to include, a complete draft CMP can be prepared. The CM Act has specific requirements regarding what is needed in a CMP and these need to be strictly followed. Key elements of the CMP are:

- The key issues to be addressed.
- The management actions to address the key issues.
- The Business Plan (how it would be done including full costs, cost-sharing arrangements, funding and financing mechanisms, timing and monitoring, evaluation & reporting framework (MER)).

Where a CMP covers areas affected by some of the coastal hazards, a CZEASP must also be prepared in consultation with the State Emergency Service.



A CMP must be placed on public exhibition and any comments of relevance considered and addressed. Following exhibition, the CMP is finalised and submitted to Council for adoption. Once adopted by Council, the CMP is forwarded to the Minister for Local Government for certification.

10.3.4 Stage 5 – implement, monitor and report

During this stage, the actions in the gazetted CMP will be implemented through the IP&R framework and land use planning system. It is appropriate, following certification of the CMP, to progress draft planning proposals and planning instrument amendments. Crucial to this stage is enactment of an effective MER program to inform review and updating of the CMP. The MER Program is an active document which is prepared as part of the CMP. It needs to identify indicators, trigger points and thresholds relevant to the CMP, and will guide the way in which the CMP is administered over its 10 year delivery program. The MER program is used to keep track of, and measure delivery and effectiveness of management actions within the business plan.

10.4 Community and Stakeholder Engagement Plan (CSEP)

The CSEP is a living document and engagement action plan for each stage of the CMP development and is provided in Appendix F. Ongoing development of the CSEP will be informed by community and stakeholder feedback as CMP development progresses through stages 2 through 5.

However, the overall objectives of the CSEP are to:

- Deliver an honest, innovative, flexible and transparent community engagement process.
- Inform the community and other stakeholders about the preparation of the CMP and the associated engagement activities.
- Ensure the commitments made to the community during project discussions, are tracked and met.
- Close the loop with community and other stakeholders to ensure they understand how their input is has been considered in developing the final CMP.

During the five stages of this project, the level of consultation and the types of conversations will vary, as will the desired outcomes:



Table 19 Engagement outcomes stages 1-5

Project Stage	Outcomes
Stage One	Establish key relationships Build community awareness about CMP Establish a collective vision for the Wollongong coast Collate community themes and values related to the coast
Stage Two	The community and stakeholders identify and understand risks and opportunities
Stage Three	Establish local targets for change Ratify community prioritisation of actions Explore management options
Stage Four	Encourage community ownership of priority actions Grow awareness of funding opportunities for key actions Clarify the roles of key contributors to action
Stage Five	Inform the community of the plan actions and outcomes Articulate opportunities for community involvement in the plan implementation Close the loop with participating stakeholders

10.5 CMP Forward plan

The forward plan is the key outcome of this Stage 1 Scoping Study. It should be noted that completion of all Stage 2 studies will depend on available funding and resources. There may be a need to prioritise the recommended Stage 2 studies and consider those that are unable to be resourced within the Stage 2 budget, for future CMP actions.

Table 20 Stage 2-4 Forward Plan for the Wollongong Coast CMP

CMP Stage and Task	Budget Cost Estimate Low	Budget Cost Estimate High	Primary Responsibility	Support Agencies	Timing
<i>Stage 2 – determine risks, vulnerabilities and opportunities</i>					
Littoral Rainforest and Coastal wetlands mapping	\$60,000	\$80,000	WCC	DPE–Coasts and Estuaries	2023
Coastal Hazard Mapping					
Coastal Cliff or Slope Instability Study (option 2 in Table 18)	\$100,000	\$140,000	WCC	DPE–Coasts and Estuaries	Mid 2023
Coastal Entrances Study	\$35,000	\$45,000	WCC	DPE–Coasts and Estuaries	Mid 2023
Foreshore Erosion Study	\$20,000	\$30,000	WCC	DPE–Coasts and Estuaries	August 2023
Coastal Inundation Hazard Study including wave overtopping	\$25,000	\$30,000	WCC	DPE–Coasts and Estuaries	August 2023
Tidal Inundation Hazard Study	\$35,000	\$45,000	WCC	DPE–Coasts and Estuaries	August 2023
Combined Open Coast Infrastructure Inundation Hazard Assessment	\$70,000	\$100,000	WCC	DPE–Coasts and Estuaries	August 2023 to Feb 2024
Coastal Erosion and Recession Study	\$100,000	\$120,000	WCC	DPE–Coasts and Estuaries	Mid 2023 to Dec 2023



CMP Stage and Task	Budget Cost Estimate Low	Budget Cost Estimate High	Primary Responsibility	Support Agencies	Timing
Combined Coastal Hazard Risk Assessment	\$120,000	\$150,000	WCC	DPE-Coasts and Estuaries, NPWS, DPE-Crown Lands, ILALC, DPE-Planning, Sydney Water, TfNSW, DPI-Fisheries, LLS	Oct 2023 to April 2024
Shorebird – baseline inventory and threats	\$15,000	\$25,000	WCC	DPE-Coasts and Estuaries, NPWS	2023
Ecology of rocky platforms – baseline inventory and threats	\$10,000	\$15,000	WCC	DPE-Coasts and Estuaries, NPWS	2023
Identification of Aboriginal Cultural Heritage values and assets, and vulnerability assessment	\$30,000	\$80,000	WCC, ILALC	DPE-Coasts and Estuaries	2023/24
Port Kembla Beach – options assessment for management of windblown sand	\$35,000	\$55,000	WCC	DPE-Coasts and Estuaries	2023
Detailed Risk Assessment and Stage 2 Report	\$20,000	\$40,000	WCC	DPE-Coasts and Estuaries, NPWS, DPE-Crown Lands, ILALC, DPE-Planning, Sydney Water, DPI-Fisheries, TfNSW, LLS	2023/24
Stakeholder engagement	\$5,000	\$10,000	WCC		2023/24
Stage 2 Total	\$680,000	\$965,000	WCC	DPE-Coasts and Estuaries, NPWS, DPE-Crown Lands, ILALC, DPE-Planning, Sydney Water, DPI-Fisheries, TfNSW, LLS	April 2023- June 2024

Stage 3 – identify and evaluate management options

Options assessment	\$20,000	\$30,000	WCC	DPE-Coasts and Estuaries, NPWS, DPE-Crown Lands, ILALC, DPE-Planning, Sydney Water, DPI-Fisheries, TfNSW, LLS	2024
Cost-benefit analysis if required	-	\$100,000	WCC	DPE-Coasts and Estuaries	2024
Preliminary Business Plan	\$5,000	\$10,000	WCC	DPE-Coasts and Estuaries	2024
Prepare coastal zone emergency action sub plan (CZEASP)	\$5,000	\$10,000	WCC	DPE-Coasts and Estuaries	2024
Stakeholder engagement	\$10,000	\$15,000	WCC		2024
Stage 3 Total	\$40,000	\$165,000	WCC	DPE-Coasts and Estuaries, NPWS, DPE-Crown Lands, ILALC, DPE-Planning, Sydney Water, DPI-Fisheries, TfNSW, LLS	July 2024 - June 2025

Stage 4 – finalise, exhibit and certify the CMP

CMP preparation and finalisation of CZEASP, business plan and MER program.	\$30,000	\$40,000	WCC	DPE-Coasts and Estuaries, NPWS, DPE-Crown Lands, ILALC, DPE-Planning, Sydney Water, DPI-Fisheries, TfNSW, LLS, Transport NSW	2025
CMP exhibition	-	-	WCC		2025
CMP finalisation	\$5,000	\$10,000	WCC	DPE-Coasts and Estuaries	2025
Stakeholder engagement	\$5,000	\$10,000	WCC		2025
Stage 4 total	\$40,000	\$60,000	June 2025 - December 2025		
Stages 2-4 total	\$760,000	\$1,190,000	April 2023 – December 2025		



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Glossary and Abbreviations

AEP	Annual exceedance probability. The probability of an event occurring in a given year.
AHD	Australian Height Datum. Approximately equal to mean sea level.
Bruun Rule	A formula for estimating shoreline retreat in response to sea level rise.
Closure Depth	The seaward boundary of the active shoreface.
CM Act	Coastal Management Act 2016.
CMM	Coastal Management Manual
CMP	Coastal Management Program.
H_s	Significant wave height. The average of the highest one third of wave heights.
ICOLL	Intermittently closed and open lake or lagoon.
Oversteepened	A slope that has been steepened by natural processes or human activity.
RH SEPP	State Environmental Planning Policy (Resilience and Hazards) 2021
Sediment Compartment	A defined section of the coast based on landforms and sediment transport.
SLSC	Surf lifesaving club.



Appendix A First Pass Risk Assessment Workshop Summary

FINAL DRAFT



WOLLONGONG COASTAL MANAGEMENT PROGRAM STAGE 1. FIRST PASS RISK ASSESSMENT WORKSHOP SUMMARY

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Prepared For	Wollongong City Council
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1 Introduction

1.1 Background

Salients was engaged, in consultation with Spectrum Comms, by Wollongong City Council (WCC) to prepare a Stage 1 Scoping Study for the Coastal Management Program (CMP). The Scoping Study covers the coastal zone of the WCC Local Government Area (LGA) with the exception of Lake Illawarra and land managed by the Port Authority of NSW at Port Kembla.

The CMP is being prepared in accordance with the 5 stage process outlined in the Coastal Management Manual (CMM) as illustrated in Figure 1.

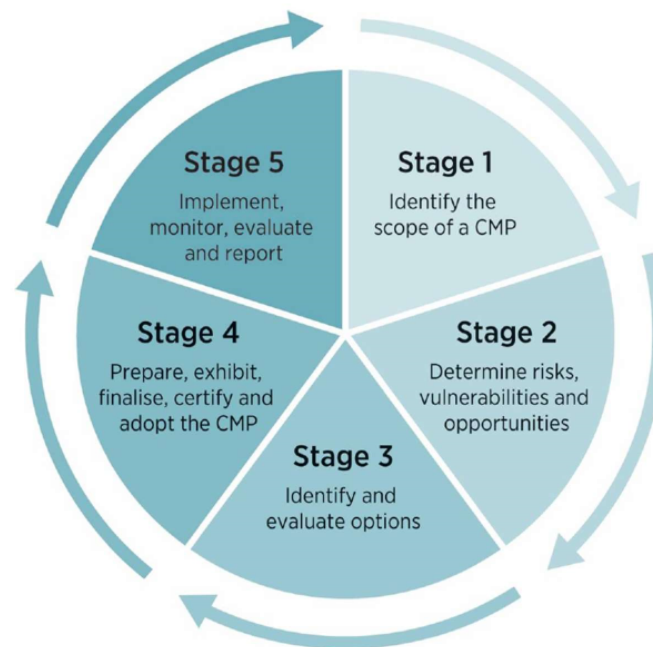


Figure 1 - Stages in Preparing and Implementing a CMP (Source: (NSW Government, 2018)).

In Stage 1, a first-pass risk assessment must be prepared to inform the scope of the CMP and direction of future stages. This report describes the process and outcomes of the First Pass Risk Assessment Workshop with stakeholders, which along with a literature/data review and field inspections contributes to development of a first-pass risk assessment documented within the Stage 1 Scoping Study Report.

1.2 CMPs and the role of Risk Management

The risk management context within which CMP's are prepared is underpinned by the requirements of the *Coastal Management Act 2016* (CM Act). Within that Act, and



through its interactions with the Coastal Management Manual and *State Environmental Planning Policy (Resilience and Hazards) 2021* (Resilience SEPP), obligations are imposed upon various stakeholders regarding their responsibilities under NSW legislation. When a council prepares a Coastal Management Program, The CM Act (S14) states:

“a local council must –

(a) Consider and promote the objects of this Act, and

(b) Give effect to the management objectives for the coastal management areas covered by the program.”

In undertaking risk identification and assessment, it is critically important that there is a shared understanding of the language used to describe the risk environment. We have adopted nomenclature from the international standard ISO 31000 (Standards Australia, 2009) and associated supporting documents as the baseline. While we understand that there are countless examples of that risk standard being extended for various purposes, our experience is that direct application of the standard results in a simpler, more transparent, and ultimately more defensible approach.

In our approach to the development of a CMP, we have equated the term “coastal management issues” used in the CM Act (e.g., S15(1)(a)), with those coastal management risks which are ultimately intolerable and require action. The primary purpose of this report is to define that set of risks.

ISO 31000 defines risk as:

“effect of uncertainty on objectives”

Most importantly, a complete risk assessment needs to avoid only considering risks through a negative lens. Under ISO 31000, if a risk arises, the effect may actually be positive. A complete risk management strategy should look to maximise the likelihood of such positive effects.

The objectives of importance to CMP development are those outlined in the CM Act for the different coastal management areas. The Act notes that Council must “give effect” to those management objectives via the CMP. For this reason, those risks that have received a high risk rating, have subsequently been defined in terms of the relevant coastal management areas and management objectives (see Appendix B).

When considering risks, it is important to understand that these need to be specific to enable the development of appropriately defined and targeted management actions that can be executed. Clear risk identification helps to develop management actions that are Specific, Measurable, Achievable, Relevant and Time-bound (or “SMART”). Non-specific or poorly defined management actions that cannot be budgeted or

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integrated cleanly into Council's (and other stakeholders) forward programming under the Integrated Planning and Reporting framework are inconsistent with the requirements of the CM Act and Manual.

In our consideration of risks, vulnerability is one facet which contributes to the nature of a risk. It can be defined in several different ways but assets that are more vulnerable are more prone to be affected by risks. This may be because the asset has a high degree of exposure to a hazard (i.e., high likelihood) that threatens the asset, or that they have minimal capacity to avoid the effects of being exposed to a hazard (i.e., high consequence). Overall, we find "vulnerability" a difficult term to use in risk identification and assessment because of these differing interpretations. The concepts encapsulated by the term, however, are considered within our approaches to risk identification and assessment, respectively.



2 Risk Identification

2.1 Methodology

Potential risks to examine within the workshop were identified through a rigorous and comprehensive process involving the following actions.

- Background review of relevant information: Ninety-two reports spanning a twenty-year period were reviewed. All reports were reviewed in conjunction with accompanying or relevant datasets provided by Council or sourced via the NSW state government data portals.
- Site Inspections: Field inspections were completed in December 2021 and March 2022 with staff from WCC and Department of Planning and Environment (DPE). Land based fieldwork involved on foot inspection of the entrances of estuaries and lagoons along the coastline and the state of various beaches and dunes. Assets likely to be subject to coastal hazards were recorded, as well as contributing threats to coastal condition and coastal use such as weeds and dune scarping.
- Stakeholder Interviews: Salients met with a range of staff from WCC across the operational works and strategic planning arms of Council. In total, 8 hours of interviews were conducted, and 16 Council staff interviewed to understand their views on the coastal zone, its infrastructure, maintenance, management and governance. The staff interviewed represented the areas of lifeguards, open space and environmental services, legal services, project delivery, land use planning, property and recreation and infrastructure strategy and planning.
- Community consultation: Undertaken over a 6 week period, the consultation program involved activities outlined in Table 1. Based on input from the community a list of key values, issues and threats was developed. Those issues that fell within the scope of the CMP were carried forward for the risk assessment. The consultation process and outcomes are documented within the Wollongong CMP Stage 1 Community Engagement Outcomes Report.
- Councillor Workshop: A workshop was held with Councillors and senior staff to obtain input on community values, coastline issues and challenges involving 15 participants. A subsequent online interview was also conducted with a Councillor who was unable to attend the workshop.



Table 1- Community Consultation Activities

Medium	Description	Deliverables
Corflutes	Corflutes were installed at various locations along the coastline, at beaches, in parks and near playgrounds to inform people about the project with a QR code to visit the project webpage.	60 corflutes installed
Emails	Project information was sent via email to various stakeholder mailing list with links to engagement opportunities. These included registers of interest through Council's online engagement platform, Bushcare volunteers, and coastal stakeholders including Surf Life Saving Clubs, Landcare, Bushcare, and Dunecare groups, Neighbourhood Forums, chambers of commerce, board riding groups, Tourism bodies, and holiday parks. Project information was also sent to stakeholder who use the beaches, parks, reserves or kiosks under a license agreement such as fitness services, surf schools, and food and drink vendors.	6 campaigns sent to 26 Advisory Working Group members 400 Bushcare volunteers 1892 recipients on environment register 129 recipients on Lake Illawarra CMP register 50 key stakeholder groups 51 licensees
Facebook	Posts about the project were shared on Council's Facebook page to disseminate information with links to the project webpage.	3 posts averaging: 15,002 post impressions (the number of times the post was seen) 9965 unique people reached 799 engagements (likes, comments, shares, views, and link clicks).
Flyer	An information flyer was produced to share information and a QR code to the project webpage. The flyer was distributed while at pop-ups.	300 flyers distributed
Information note	An information note was provided to Councillors outlining the CMP background, process and engagement opportunities.	13 Councillors
Interactive map	An interactive map was hosted on Engagement HQ that allowed users to drop a pin on a place along the coast they valued or loved. They were then asked to complete some questions about that place.	128 pins dropped 53 participants
Letters	Letters were sent to local state and federal MPs as well as property owners with coastal hazard notations on their properties to make them aware of the project and engagement opportunities	5 MP letters sent 984 property owner letters sent
Media Releases	A media release was issued to launch engagement for the Project and let people know how they could participate in engagement opportunities.	1 media release Issued
Newsletters	Digital newsletters were sent to subscribers with project information and links to engagement opportunities. These included Council's Climate Emergency Update and Sustainable Wollongong.	2769 Sustainable Wollongong recipients



Presentations	A short online presentation was provided to member clubs of Surf Life Saving Illawarra to let them know the purpose of the CMP and how they could get involved.	1 presentation
Pop-up stalls	A series of pop-up engagements were held at various locations to intercept residents and visitors and tell them how they could get involved.	7 x pop-up events ~300 people engaged
Stories Tool	An online tool called Seaside Stories that allowed users to share a story, including photos and videos, about something they love about the coast.	8 stories received
Submissions	Written submissions received by email.	12 submissions received
Survey	A short structured online questionnaire was hosted on Engagement HQ to obtain input about how residents and visitors value and use the coast and estuaries and any challenges of threats.	223 responses received
Webpage	A project page was created on Council's Engagement HQ site which held project information, FAQs, reference documents, a timeline and links to the online engagement tools.	1200 page views 256 engaged visitors 420 informed visitors 929 aware visitors

2.2 Outcomes

The initial compilation of risks from the above activities resulted in an extensive list. This list was subsequently screened to remove duplicated risks. Where possible and practical, risks were grouped for the purposes of assessment. A list of 275 risks remained for prioritisation within the Risk Assessment workshop.

3 First Pass Risk Assessment Workshops

The NSW Coastal Management Manual Part B defines a Stage 1 risk assessment as ‘a qualitative risk assessment using available information, to help inform the scope of the CMP’ (State of NSW and Office of Environment and Heritage, 2018).

3.1 Methodology

Following identification of the issues, a risk assessment table was developed. In describing each risk, the following word formula was used to populate the risk table attributes.

There is a risk that a cause will lead to an event (or chain of events) resulting in an outcome with a set of consequences/impacts.

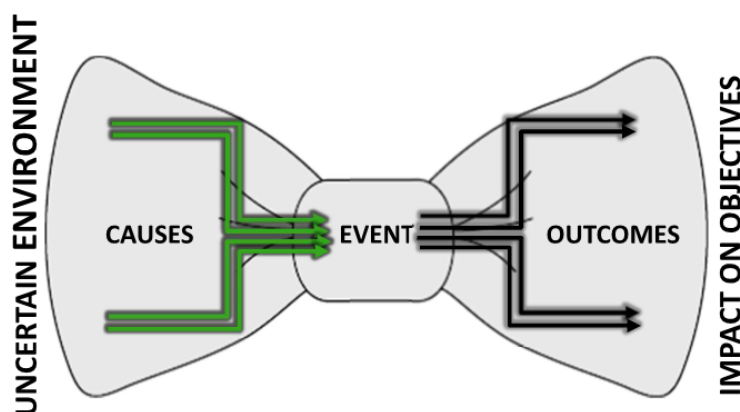


Figure 2 - Bow Tie Model used to Guide Risk Description

The first pass risk assessment workshops were completed via three separate stakeholder sessions. The workshops were attended by representatives from Council, DPE, Illawarra Local Area Land Council (ILALC), NSW National Parks and Wildlife Service, Crown Lands, DPI-Fisheries, Transport for NSW, Local Land Services and Sydney Water.

Workshop 1 reviewed risks most relevant to the natural environment, Workshop 2 reviewed risks most relevant to coastal hazards and the Workshop 3 focussed on coastal use. Within each workshop, assessment of risks was either grouped by geographic location or management theme.

Using Mentimeter (an online survey tool) participants were asked to rate the “Likelihood” and “Consequence” of each risk on a mobile device or laptop. Participants were provided with WCC’s Enterprise-wide Risk Management – Risk



Ranking Tool (See Appendix C) to aid in assigning likelihood and consequence values using the descriptors provided in the matrix. It is important to note that not all risks fit neatly within the matrix descriptors or have sufficient known information to quantify accordingly, in those cases participants were required to use their experience and judgment to assess the risks.

Figure 3 illustrates the online survey as viewed on a mobile device. Figure 4 shows an example of the compiled results as displayed to participants upon completion of each survey. Stakeholders were not required to give a rating for every risk and could limit their response to the risks that were of relevance to them or for which they had expertise. Results are shown in Sections 3.3 and 3.4.

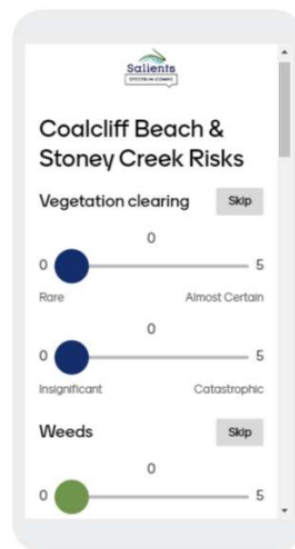


Figure 3 – Workshop participant mobile interface

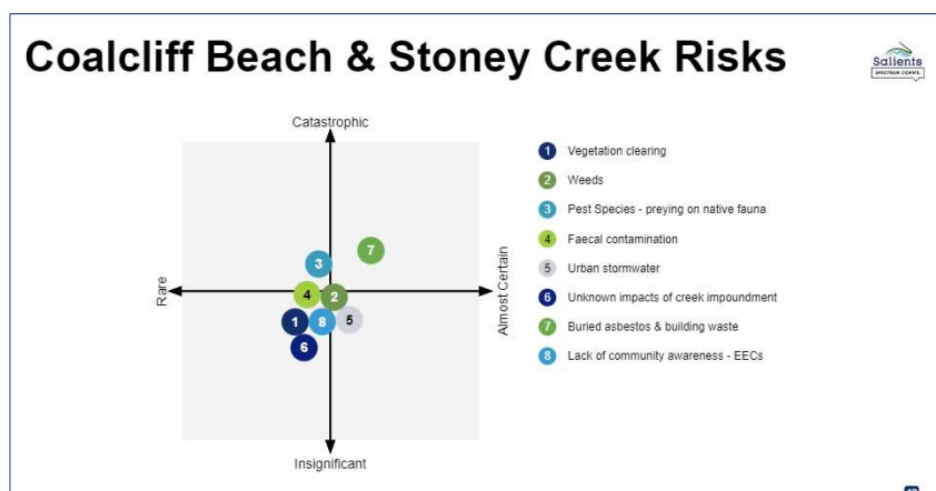


Figure 4 – Example of Live Workshop Results

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Following completion of the survey for each location or theme, participants were provided with the opportunity to flag any risks that they felt had been missed or warranted further consideration during CMP development. These new risks were recorded and are shown in Section 3.5.

3.2 First Nations Cultural Heritage

Workshop 3 relating to the Coastal Use Area was attended by the Chief Executive Officer of the ILALC. ILALC advised that they are currently working with Department of Planning and Environment on a project to integrate Aboriginal cultural heritage into the CMPs on a regional rather than local Council basis. ILALC advised that this project was the preferred methodology for prioritising and managing risks to cultural heritage in the coastal zone. It was agreed within the workshop that the risk assessment methodology described in section 3.1 would not be applied to Aboriginal cultural heritage in this forum, as requested by ILALC. The incorporation of First Nations cultural heritage into the CMP will therefore require further consideration. It is likely that Stage 2 of the CMP will need resources allocated to determine a way forward, either through alignment with the current DPE project or a separately funded project.

Council is also continuing to consult with other cultural knowledge holders, in addition to the ILALC, throughout Stage 1 of the CMP project.

3.3 Workshop Outcomes

The consequence and likelihood ratings for each risk were represented numerically and then averaged across all responses. A multiplication of the averaged scores provided the final score and rating. The score was then transformed back to provide a final risk rating. Risks with a score of less than 4 were classed as low, between 4 and 10 as medium, between 10.1 and 15.9 as high and 16 or more as extreme.

Appendix A provides the combined risk table for all risks assessed across the three workshops. No risks were ranked as extreme, 26 received a high rating (see Table 2), 177 rated as medium and 71 received a low rating. Note that table 2 does not include new risks identified in the course of the workshop, however these are listed in Section 3.5.

AS5334 regards that the following treatments are applicable:

- *Low* risks would typically be addressed through routine maintenance and day to day operations.
- *Moderate* risks would require a change to the design or maintenance regime of assets.
- *High* risks require detailed research and appropriate planning (or design).

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- *Extreme* risks would require immediate action to mitigate.

All high risks should be considered moving forward into Stage 2 of the CMP. Where inadequate understanding of a high risk exists, then a Stage 2 study may be warranted to inform future management. In Stage 3, a detailed risk assessment will be completed that incorporates the new information and findings that arise from the Stage 2 studies. The detailed risk assessment may also include a review of those risks that ranked low or moderate in the first pass risk assessment, to ensure that the previous ranking is accurate in the current context and in view of the Stage 2 studies. Figure 5 and Figure 6 display the high risks by geographic location.

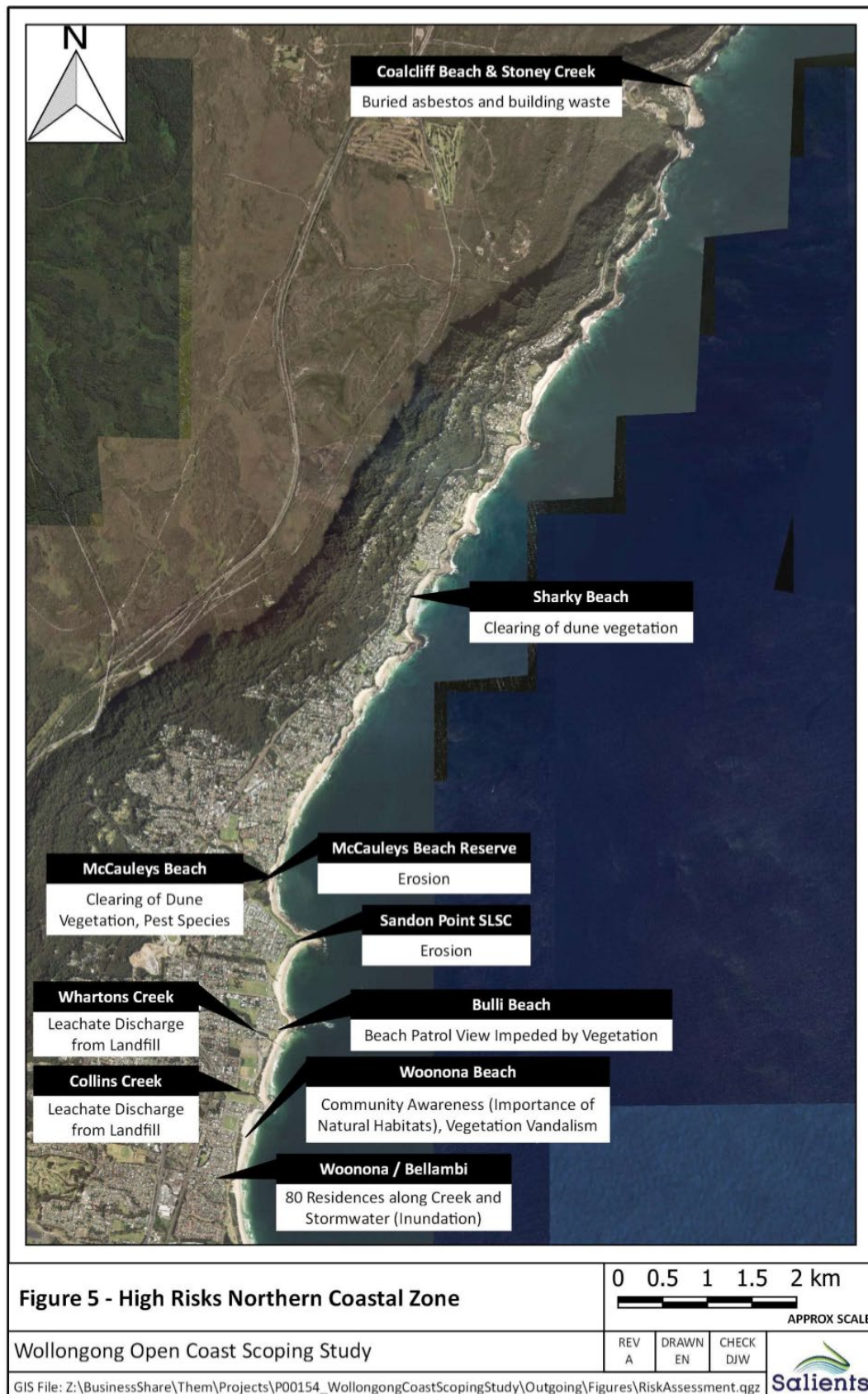
Table 2 –High Rating Risks

Work shop*	Location	Risk	Management Theme	Risk Score	Risk Rating
3	Coastal Zone	Rock fishing	Public safety	15.56	High
1	Port Kembla Beach	Wind blown sand preventing revegetation	Natural Assets	15.39	High
3	Coastal Zone	Lack of policy direction - cultural heritage	Cultural Heritage	15.17	High
1	Woonona Beach	Vegetation vandalism	Natural Assets	14.06	High
3	Coastal Zone	Multiple land tenures and governance arrangements	Governance	12.25	High
2	Woonona / Bellambi Beach	80 Residences along Creek and Stormwater infrastructure (Inundation)	Private development	12.25	High
2	Coastal Zone	Loss of existing seawalls – coastal erosion and dilapidation	Public infrastructure	12.24	High
3	Coastal Zone	Lack of agreed approach on historic heritage obligations (local)	Historic heritage	12.22	High
1	Woonona Beach	Lack of community awareness - importance of natural habitats	Natural Assets	11.98	High
1	Fairy Creek, Fairy Meadow Beach, North Wollongong Beach & City Beach	Urban stormwater pollutants	Stormwater	11.90	High
1	Bellambi Lagoon & Corrimal Beach	Urban stormwater pollutants	Stormwater	11.84	High
3	Coastal Zone	Children climbing Port Kembla shed where sands build up	Public safety	11.61	High
3	Coastal Zone	Gap between strategy and works	Governance	11.55	High
	Coastal Zone	Loss or rationalisation of ocean pools	Facility management	11.52	High
1	Sharkys Beach	Vegetation vandalism	Natural Assets	11.25	High
2	McCauleys Beach	McCauleys Beach Reserve (Erosion)	Public recreation	11.06	High
2	Bellambi Boat Harbour / Bellambi Point Beach	Boat Harbour Access Road (Erosion)	Public infrastructure	11.02	High
3	Coastal Zone	Contradictory strategies across Council	Governance	10.72	High
3	Bulli Beach	Beach Safety - Patrol View impeded by Vegetation	Public safety	10.64	High



Work shop*	Location	Risk	Management Theme	Risk Score	Risk Rating
3	Coalcliff Beach & Stoney Creek Risks	Buried asbestos & building waste	Public safety	10.56	High
1	Hewitts, Woodlands & Tramway Creeks & McCauleys Beach	Vegetation clearing - dune	Natural Assets	10.56	High
2	Sandon Pt Beach	Sandon Point SLSC (Erosion)	Facility management	10.54	High
3	Whartons Creek & Collins Creek	Leachate discharge from landfill	Public safety	10.50	High
2	Coastal Zone	Lack of strategy for future planning for climate change	Governance	10.33	High
1	Hewitts, Woodlands & Tramway Creeks & McCauleys Beach	Pest species (foxes) preying on native fauna	Natural Assets	10.02	High
3	Coastal Zone	Lack of clarity around surf club management	Facility management	10.02	High

*Workshop 1 reviewed risks most relevant to the natural environment, Workshop 2 reviewed risks most relevant to coastal hazards and the Workshop 3 focussed on coastal use.







The highest number of total risks impacting individual locations (does not include LGA wide risks) were recorded at Corrimal Beach (26), Bellambi Beach (24) and Thirroul Beach (20) – see Figure 7. Despite having a lower number of risks, McCauleys Beach and Woonona Beach have the highest number of high priority risks (see Figure 8).

The greatest number of risks relate to management of the natural environment, with the majority of these rated as medium risk. High priority risks include vegetation clearing, beach and rock platform safety, coastal inundation of stormwater assets and private property, coastal erosion of particular assets such as seawalls, contaminated lands and governance (see Figure 9).

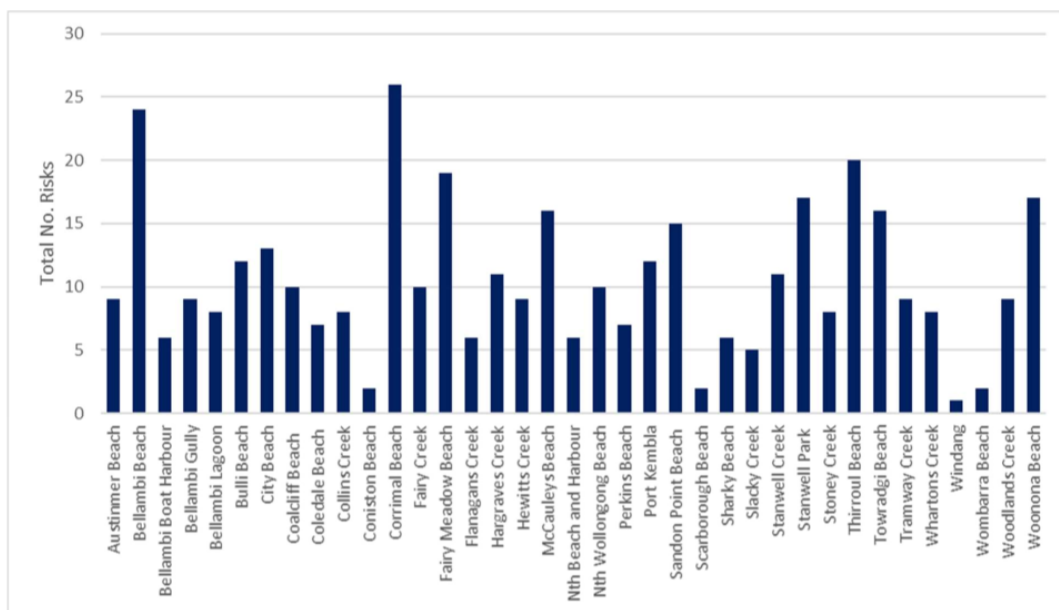


Figure 7 – Number of risks per location

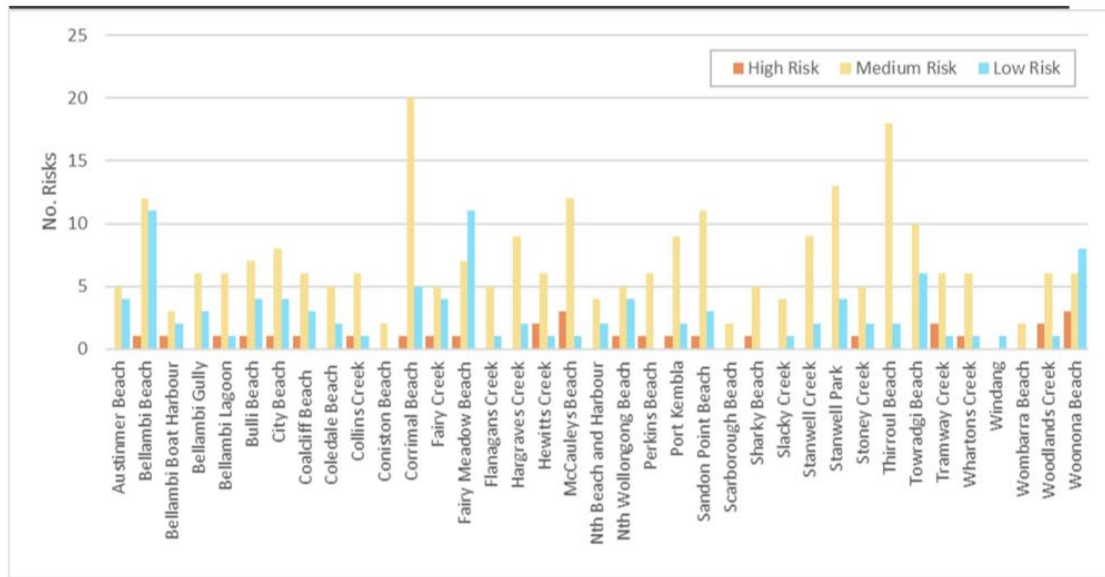


Figure 8 – High, medium and low risks per location

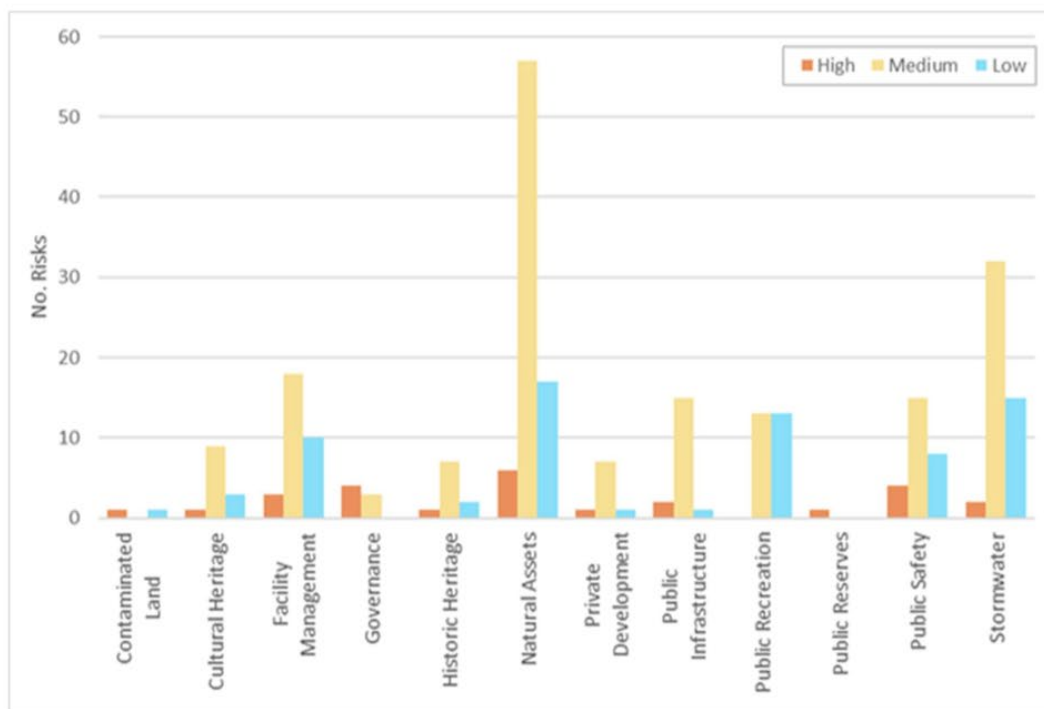


Figure 9 – High, medium and low risks by management theme



3.4 Detailed prioritisation by management theme

3.4.1 Natural assets

Much of the natural vegetation of the coastal environment has been cleared due to urban development. As with many coastal cities and towns, the natural assets remaining are wetlands, creeks and beaches with varying extents of vegetation bordering these assets. The condition of the natural assets reflects this urban environment with impacts of urban stormwater, weeds, pest species and human disturbance evident in all natural areas. Site inspection clearly indicates that the dune environment has been intensively managed over a long period of time. The dunes have been subject to clearing, reshaping, replanting, seawalls, stabilisation controls and fencing as coastal management practices have changed over the years. Table 3 provides a summary of the risks and the priority ranking assigned to them through the first pass risk assessment workshop.

Table 3 – Risk Rating Natural Assets

High	Wind blown sand preventing revegetation – Port Kembla Beach
	Vegetation vandalism – Woonona Beach
	Lack of community awareness regarding importance of natural habitats – Woonona Beach
	Clearing of dune vegetation - Sharky Beach and McCauleys Beach.
	Pest species (foxes) preying on native fauna – McCauleys Beach
Medium	Vegetation clearing at all beaches (excludes beaches rated as high) – all dune and riparian areas
	terrestrial pests, informal access pedestrian and vehicle, lack of community awareness, erosion
	Weeds – all dune and riparian vegetation
	Terrestrial pests (foxes, rabbits, domestic dogs) – all dune and riparian areas
	Erosion – dunes and estuary foreshores and entrances
	Informal pedestrian and vehicle access – all beach and riparian areas
Low	Lack of community awareness of natural habitats and their values – coastal zone
	Lack of knowledge regarding pest species - estuaries, aquatic pests
	Aquatic pests

3.4.2 Public Safety

The Wollongong Coastal Zone has seventeen patrolled beaches, nine tidal rock pools and several rock platforms utilised by rock fishers. The beaches are used not only by residents, but a large number of visitors from southern and western parts of the Sydney metropolitan area and inland towns. Table 4 provides a summary of the risks and the priority ranking assigned to them through the first pass risk assessment workshop.



Table 4 – Risk Rating Public Safety

High	Rock fishing
	Children climbing on Port Kembla shed via sand build-up
	Vegetation blocking Life Guard sight lines at Bulli Beach
	Buried asbestos at Coalcliff Beach
Medium	Visitor intensification including going to unpatrolled beaches
	Beach access width and grade unsuitable at City Beach, Port Kembla Beach, Towradgi, Bulli and Corrimal.
	Vegetation blocking Life Guard sight lines at Woonona, City, Bellambi, Corrimal
Low	Snags in all creeks – increased potential for flooding
	Vegetation blocking Life Guard sight lines at Fairy Meadow Beach, Towradgi Beach, Port Kembla Beach and Windang.
	Beach access width and grade unsuitable at Fairy Meadow Beach, Bellambi Beach Woonona Beach

3.4.3 Water Quality

The 2007 Estuary Processes Study for ten coastal creek and lagoon systems found that most had low dissolved oxygen, high nutrient concentrations and high faecal coliform counts, making the waters unsuitable for primary, and in some cases, secondary recreational activities. Table 5 provides a summary of the risks and the priority ranking assigned to them through the first pass risk assessment workshop.

Table 5 – Water Quality and Stormwater Risk Rating

High	Coastal inundation of stormwater infrastructure - Woonona & Bellambi
	Urban stormwater pollutants - Fairy Creek & Bellambi Lagoon
	Leachate discharge from landfill at Whartons Creek and Collins Creek
Medium	Urban stormwater pollutants at all creeks
	Coastal inundation of stormwater infrastructure -Coledale, McCauleys, Thirroul, Scarborough and Wombarra, Sharky, Bulli and Sandon Pt
	Increased catchment runoff
	Faecal contamination
	Coastal erosion of stormwater infrastructure at Woonona /Bellambi, Thirroul Beach, Scarborough and Wombarra, Sharky, Sandon Pt Beach
Low	Erosion at particular stormwater outlets (Bellambi Pt, Sandon Pt, Port Kembla, North Beach, Towradgi/ Fairy Meadow Beach, Woonona
	Coastal inundation of stormwater infrastructure - (Bellambi Point Beach, Stanwell Park, Corrimal Beach, Towradgi / Fairy Meadow, Woonona/ Bellambi Beach, Sandon Pt, Coledale Beach) and Bellambi WWTP.

3.4.4 Public Facility Management

Due to their very nature, Surf Life Saving Clubs and ocean pools are facilities in the coastal zone that are exposed to coastal hazard and coastal inundation. Interviews with Council staff indicate that the maintenance expenses of these facilities continue to rise due to coastal hazard and the dynamic nature of the coastal environment. Council has formalised several leases with the Surf Life Saving Clubs in recent years.



Council's commitment is to ensuring Surf Life Saving Club building facilities are compliant with relevant building codes and fit for purpose. Table 6 provides a summary of the risks and the priority ranking assigned to them through the first pass risk assessment workshop.

Table 6 – Facility Management Risk Rating

High	Loss or rationalisation of ocean pools due to management and maintenance costs
	Lack of clarity around surf club management moving forward
	Sandon Pt SLSC erosion
Medium	Erosion: Thirroul SLSC, WIN Stadium (State government owned and managed), Stanwell Park SLSC, Bulli Surf Club, Thirroul Pool, Austinmer SLSC, Port Kembla Olympic Pool, North Wollongong Surf Club
	Inundation: Thirroul SLSC, Thirroul Beach Pavilion, Sandon Point SLSC, Coledale SLSC, Austinmer SLSC, Kiosk & Dwelling in Stanwell Park Reserve, Woonona SLSC
	Loss or rationalisation of surf Clubs due to cost of ongoing maintenance and management.
Low	Erosion: Rock Pools
	Inundation: Bellambi SLSC, Bulli Surf Club, Thirroul Pool, North Wollongong Surf Club

3.4.5 Public Infrastructure

The escarpment to the west of the Wollongong coastline prevents urban sprawl and therefore focuses much of Wollongong's public open space onto the coast itself. Specific infrastructure includes The Blue Mile shared pathway and promenade from Stuart Park in the north to Wollongong Golf Club in the south. Over a larger geographic area, The Grand Pacific Walk, is a shared pathway for cyclists and pedestrians linking Royal National Park to Lake Illawarra. Numerous car parks and roads supporting public access to the coast. Potentially threatened beach infrastructure includes seawalls. Of note, Council staff advise that internal governance (maintenance and budgeting responsibilities) for seawalls is unclear. Table 7 provides a summary of the risks and the priority ranking assigned to them through the first pass risk assessment workshop.

Table 7 – Public Infrastructure Risk Rating

High	Loss of existing seawalls
	Erosion - Boat Harbour access road
Medium	Bulli Beach: Cycleway coastal erosion & local road coastal inundation
	Coniston Beach: Cycleway coastal erosion
	Corrimal Beach: Lake Parade & Dobbie Avenue (Inundation)
	Little Austinmer & Austinmer Beach: Lawrence Hargrave Drive (Erosion & Inundation)
	McCauleys Beach: McCauleys Beach Reserve & Local Roads (Inundation)
	North Beach and Harbour: Cycleway (Erosion)
	Sandon Pt Beach: Blackall St near Slacky Creek (Inundation)
	Stanwell Park: Car Parks & Roads (Inundation)



	Thirroul Beach: Lawrence Hargrave Drive (Inundation)
	Towradgi / Fairy Meadow Beach: Shared Cycleway (Erosion)
Low	Corrimal Beach: Car Park at End of Murray Road (Inundation)

3.4.6 Public Recreation

The community utilise the coastal zone for a broad range of recreational activities including walking, swimming, surfing, dog-walking, sky diving, cycling, social events and formalised exercise such as Park Run, Nippers and fitness groups. The provision of facilities (footpaths, BBQ's, picnic tables, playgrounds etc.) to reasonably meet community demand can reduce user conflicts and decrease impacts on natural assets. Accessible facilities allow a greater enjoyment of the coastal zone by people of all abilities and ages. Table 8 provides a summary of the risks and the priority ranking assigned to them through the first pass risk assessment workshop.

Table 8 – Public Recreation Risk Rating

High	McCauleys Beach Reserve erosion
Medium	User conflicts between dogs and other beach users
	Dog faeces being left on beaches
	User conflicts - Shared path (joggers, cyclists, walkers), Antisocial behaviour (alcohol use & fires)
	Campers and day visitors (Coledale Beach)
	Privatisation of public land
	Insufficient public parking at beaches
	Lack of dune vegetation reducing visual amenity
Low	Minimal beach width and/or moderate scarps impacting recreation at City Beach
	Perception of unsightly dune vegetation
	Minimal beach width and/or moderate Scarps impacting recreation (Towradgi Beach, Corrimal Beach, Bulli Beach, Bellambi Beach, Woonona Beach, Fairy Meadow Beach)
	Insufficient bike racks near beach access points
	No facilities for passive watercraft storage (kayaks)
	Insufficient picnic facilities (tables etc.)
	Insufficient walking trails
	Insufficient public land for access and recreation
	Insufficient viewing platforms

3.4.7 Private Development

Much of Wollongong City itself lies within the coastal zone. Therefore the coastal zone contains a mix of high and medium density private development, providing residential housing and business and commercial premises. Table 9 provides a list of high, medium and low risks impacting private development in the coastal zone.

Table 9 - Private Development Risk Rating

High	Woonona / Bellambi Beach - 80 Residences along Creek (inundation)
Medium	Corrimal Beach - 37 Residences adjacent to Towradgi Creek (inundation)
	Thirroul Beach - 8 Residences at Southern End, Residence at Northern End (Erosion)



	Sandon Pt Beach - Residences adjacent to Slacky Creek (inundation)
	McCauleys Beach - Existing Residences (inundation)
	Bulli Beach - Existing Residences adjacent to Whartons Creek (inundation)
	Coalcliff Beach - Properties at North End (inundation)
Low	Stanwell Park - Residences (inundation)

3.4.8 Historic Heritage

Historic heritage refers to Local heritage items and State heritage items listed on local environment plans (LEP) or on the state heritage register respectively. Table 10 provides a list of historic heritage items, risks and the priority ranking assigned to them through the first pass risk assessment workshop.

Table 10 - Historic Heritage Risk Rating

High	Lack of agreed approach on historic heritage obligations (local)
Medium	Thirroul Beach Reserve (Heritage Values)
	Sandon Point Boat Sheds (Erosion & Inundation)
	Austinmer Jetty Site & Heritage Items (Erosion & Inundation)
Low	Austinmer War Memorial (Erosion & Inundation)

3.4.9 Governance

Staff interviews identified a range of governance risks impacting management of the coastal zone. The staff interviewed represented the following areas - lifeguards, open space and environmental services, legal services, project delivery, land use planning, property and recreation and infrastructure strategy and planning. Table 11 provides a list of governance risks and the priority ranking assigned to them through the first pass risk assessment workshop. Notably, all governance risks were rated as high or medium risk.

Table 11 – Governance Risk Rating

High	Multiple land tenures and governance arrangements
	Lack of policy direction – cultural heritage
	Gap between strategy and works
	Contradictory strategies across Council
	Lack of strategy for future planning for climate change
Medium	Lack of policy direction - coastal hazards
	DCP lacks clarity and is not prescriptive enough
	Lack of understanding of legislative requirements across all levels of Council



3.5 Newly identified risks

Throughout the first pass risk assessment workshop participants were given the opportunity to add newly identified risks (see Table 12). A risk rating was applied post-workshop, based on the ratings provided by workshop participants to similar known risks.

Table 12 – Newly Identified Risks

Area	Workshop	Risk	Rating
Environment	1	Threats to Sooty Oystercatchers (disturbance from dog walking and predation of eggs and chicks by foxes, dogs and cats)	Medium
		Themeda Grassland (loss of opportunity for increase in extent)	Medium
		Threats to Pygmy Possum habitat at Sharky Beach	Medium
		Vandalism of revegetation projects on headlands	High
		Illegal vegetation clearing at Bald Hill Reserve	High
		Monoculture of dune vegetation	Medium
		Impacts of deer on natural environment	Medium
Coastal Hazards	2	Coalcliff Beach coastal erosion impacting reserve, properties at northern and southern end (backyards), surf club building	Medium
		Seacliff Bridge damage to piers	High
		Coledale Beach coastal erosion impacting park in front of Coledale Avenue	Medium
		Sharky Beach coastal erosion impacting footpath opposite park street dropping due to wave attack at the base of the slope, Lawrence Hargrave Drive and carpark	High
		Scarborough Beach coastal erosion and inundation impacting public school	Medium
		Austinmer Beach coastal erosion and inundation impacting change shed behind pool	Medium
		Flanagans Creek – James Street inundation	Medium
		Corrimal Beach coastal erosion and inundation impacting cultural heritage	*
		Fairy Lagoon coastal erosion and inundation impacting cultural heritage	*
		City Beach coastal erosion exposing building waste and impacting golf course (Crown Land). Swan Street tidal inundation.	High
		Port Kembla coastal erosion and inundation impacting cultural heritage	*
		Perkins Beach coastal erosion impacts on natural dune system	Medium
		Internal governance (maintenance and budgeting responsibilities) for seawalls is unclear	High
		Limited seawall design history such as technical drawings	Medium
		Cliff instability on headlands	High
		Inadequate geotechnical studies and information available	High
		All entrance management plans require review and sustainable and timely approval pathways if works are required.	Medium



Coastal Use	3	Commercial leases on Council land such as skydiving, exercise classes privatising the use of public land.	Medium
		Lack of shade on public reserves	Medium
		Safety of children playing and swimming in estuary entrances in relation to water quality and stability	High
		No water quality guidelines for tidal pools	Medium
		More frequent closures of tidal pools due to pollution	High
		Wind blown sand at Port Kembla beach impacting roads, pathways and buildings and requiring frequent removal.	High
		Legacy contaminant issues at Windang Peninsula	High

*Not assessed – see Section 3.2



4 CMP Progression

Information from the first-pass risk assessment workshop will be used to provide a broader understanding of the risks in the coastal zone. In terms of progressing the CMP, the outcomes of the risk assessment workshops assist in the identification of:

- Risks that require further investigation to fill existing data and information gaps (Stage 2 studies).
- Extreme, high and medium risks that are likely to require current and future management actions (Stage 3 management options assessment).
- Risks that are of low consequence and that will not require further consideration through the CMP process.
- New and emerging risks (Stage 2 and Stage 3)



5 References

NSW Government, 2018. Our future on the coast. NSW Coastal Management Manual Part A: Introduction and mandatory requirements for a coastal management program.

Standards Australia, 2009. AS/NZS ISO 31000:2009, Risk management- Principles and guidelines.

State of NSW and Office of Environment and Heritage, 2018. Our future on the Coast. NSW Coastal Management Manual Part B: Stage 1 Identify the scope of a coastal management program.



Appendix A Risk Rating Tables

Coastal Management Area	Location	Risk	Likelihood	Severity	Risk Score	Risk Level
Coastal Wetlands and Littoral Rainforest	Bellambi Lagoon & Corrimal Beach	Urban stormwater pollutants	3.70	3.20	11.84	High
Coastal Wetlands and Littoral Rainforest	Bellambi Lagoon & Corrimal Beach	Lack of community awareness - habitat values	3.18	2.73	8.68	Medium
Coastal Wetlands and Littoral Rainforest	Bellambi Gully & Bellambi Beach	Urban stormwater pollutants	3.00	2.60	7.80	Medium
Coastal Wetlands and Littoral Rainforest	Bellambi Gully & Bellambi Beach	Lack of community awareness - habitat values	3.00	2.42	7.25	Medium
Coastal Wetlands and Littoral Rainforest	Whartons Creek & Collins Creek	Lack of community awareness - EECs & natural habitats	3.00	2.38	7.15	Medium
Coastal Wetlands and Littoral Rainforest	Hargraves Creek, Stanwell Creek & Stanwell Park Beach	Weeds	2.75	2.42	6.65	Medium
Coastal Wetlands and Littoral Rainforest	Hargraves Creek, Stanwell Creek & Stanwell Park Beach	Informal vehicle & pedestrian access - erosion & trampling vegetation	2.86	2.29	6.53	Medium
Coastal Wetlands and Littoral Rainforest	Whartons Creek & Collins Creek	Weeds	2.92	2.08	6.08	Medium
Coastal Wetlands and Littoral Rainforest	Whartons Creek & Collins Creek	Informal access - creekbank erosion, trampling vegetation	2.45	2.27	5.58	Medium
Coastal Wetlands and Littoral Rainforest	Hargraves Creek, Stanwell Creek & Stanwell Park Beach	Inadequate buffers to EECs	2.27	2.36	5.37	Medium
Coastal Wetlands and Littoral Rainforest	Hargraves Creek, Stanwell Creek & Stanwell Park Beach	Lack of community awareness - habitat values	2.17	2.08	4.51	Medium
Coastal Wetlands and Littoral Rainforest	Bellambi Gully & Bellambi Beach	Vegetation clearing - riparian	2.17	2.08	4.51	Medium
Coastal Wetlands and Littoral Rainforest	Bellambi Lagoon & Corrimal Beach	Vegetation clearing - riparian	2.00	2.22	4.44	Medium
Coastal Wetlands and Littoral Rainforest	Bellambi Gully & Bellambi Beach	Informal pedestrian access - trampling vegetation	2.10	2.10	4.41	Medium
Coastal Wetlands and Littoral Rainforest	Whartons Creek & Collins Creek	Vegetation clearing - riparian	2.18	1.82	3.97	Low
Coastal Wetlands and Littoral Rainforest	Hargraves Creek, Stanwell Creek & Stanwell Park Beach	Lack of threatened species data & knowledge	1.90	2.00	3.80	Low
Coastal Wetlands and Littoral Rainforest	Hargraves Creek, Stanwell Creek & Stanwell Park Beach	Vegetation clearing - riparian	1.75	1.75	3.06	Low
Coastal Vulnerability	Woonona / Bellambi Beach	80 Residences along Creek and Stormwater (Inundation)	3.56	3.44	12.25	High
Coastal Vulnerability	McCauleys Beach	McCauleys Beach Reserve (Erosion)	3.56	3.11	11.06	High

Coastal Vulnerability	Bellambi Boat Harbour / Bellambi Point Beach	Boat Harbour Access Road (Erosion)	3.86	2.86	11.02	High
Coastal Vulnerability	Sandon Pt Beach	Sandon Point SLSC (Erosion)	3.40	3.10	10.54	High
Coastal Vulnerability	Thirroul Beach	Thirroul Beach Reserve (Heritage Values)	3.17	3.00	9.50	Medium
Coastal Vulnerability	Corrimal Beach	37 Residences adjacent to Towradgi Creek (Inundation)	3.33	2.78	9.26	Medium
Coastal Vulnerability	Corrimal Beach	Lake Parade (Inundation)	3.50	2.63	9.19	Medium
Coastal Vulnerability	Thirroul Beach	Thirroul SLSC (Inundation)	3.44	2.67	9.19	Medium
Coastal Vulnerability	McCauleys Beach	McCauleys Beach Reserve (Inundation)	3.63	2.50	9.06	Medium
Coastal Vulnerability	Thirroul Beach	8 Residences at Southern End	2.89	3.11	8.99	Medium
Coastal Vulnerability	McCauleys Beach	Sandon Point Tent Embassy (Erosion)	3.33	2.67	8.89	Medium
Coastal Vulnerability	Sandon Pt Beach	Residences adjacent to Slacky Creek (Inundation)	3.44	2.56	8.80	Medium
Coastal Vulnerability	Thirroul Beach	Thirroul SLSC (Erosion)	3.00	2.89	8.67	Medium
Coastal Vulnerability	Coniston Beach	WIN Stadium (Erosion)	3.00	2.86	8.57	Medium
Coastal Vulnerability	Thirroul Beach	Stormwater Outlet to Thomas Gibson Creek (Inundation)	3.67	2.33	8.56	Medium
Coastal Vulnerability	Little Austinmer & Austinmer Beach	Lawrence Hargrave Drive (Erosion)	2.89	2.89	8.35	Medium
Coastal Vulnerability	Thirroul Beach	Thirroul Beach Pavilion (Erosion)	3.00	2.78	8.33	Medium
Coastal Vulnerability	Thirroul Beach	Residence at Northern End (Erosion)	3.11	2.56	7.95	Medium
Coastal Vulnerability	Sandon Pt Beach	Sandon Point Boat Sheds (Inundation)	3.56	2.22	7.90	Medium
Coastal Vulnerability	McCauleys Beach	Existing Residences (Inundation)	3.00	2.63	7.88	Medium
Coastal Vulnerability	Bellambi Boat Harbour / Bellambi Point Beach	Bellambi (Sandspit) Point Heritage Site (Erosion)	3.00	2.63	7.88	Medium
Coastal Vulnerability	Sandon Pt Beach	Stormwater Outlets and Pipes at Centre of Beach (Inundation)	3.50	2.25	7.88	Medium
Coastal Vulnerability	Stanwell Park	SLSC (Erosion)	2.70	2.80	7.56	Medium
Coastal Vulnerability	Sandon Pt Beach	Sandon Point Boat Sheds (Erosion)	3.22	2.33	7.52	Medium
Coastal Vulnerability	Thirroul Beach	Lawrence Hargrave Drive (Inundation)	2.78	2.67	7.41	Medium
Coastal Vulnerability	Thirroul Beach	Thirroul Beach Pavilion (Inundation)	3.33	2.22	7.41	Medium
Coastal Vulnerability	Bulli Beach	Existing Residences adjacent to Whartons Creek and Stormwater System (Inundation)	2.88	2.50	7.19	Medium
Coastal Vulnerability	Thirroul Beach	Stormwater Outlet to Thomas Gibson Creek (Erosion)	3.14	2.29	7.18	Medium
Coastal Vulnerability	McCauleys Beach	Sandon Point Tent Embassy (Inundation)	3.38	2.13	7.17	Medium
Coastal Vulnerability	Bulli Beach	Waniora Point Heritage Site (Erosion)	3.22	2.22	7.16	Medium
Coastal Vulnerability	Sandon Pt Beach	Sandon Point SLSC (Inundation)	3.20	2.20	7.04	Medium
Coastal Vulnerability	Sandon Pt Beach	Blackall St near Slacky Creek (Inundation)	2.86	2.43	6.94	Medium
Coastal Vulnerability	Coledale Beach	Coledale SLSC (Inundation)	2.82	2.45	6.92	Medium
Coastal Vulnerability	Scarborough and Wombarra Beach	Stormwater Outlets (Erosion)	3.00	2.29	6.86	Medium
Coastal Vulnerability	Stanwell Park	Stanwell Creek (Erosion)	3.00	2.20	6.60	Medium
Coastal Vulnerability	Woonona / Bellambi Beach	Bellambi Pool & adjacent Stormwater (Erosion)	2.75	2.38	6.53	Medium
Coastal Vulnerability	Coniston Beach	Cycleway / Shared Pathway (Erosion)	3.00	2.14	6.43	Medium
Coastal Vulnerability	Bulli Beach	Cycleway between Beach and Tourist Park (Erosion)	2.90	2.20	6.38	Medium

Coastal Vulnerability	McCauleys Beach	Local Roads (Inundation)	3.00	2.13	6.38	Medium
Coastal Vulnerability	Bellambi Boat Harbour / Bellambi Point Beach	Bellambi Boat Harbour (Erosion)	2.63	2.38	6.23	Medium
Coastal Vulnerability	Bulli Beach	Bulli Surf Club (Erosion)	3.11	2.00	6.22	Medium
Coastal Vulnerability	Coalcliff Beach	Properties at North End (Inundation)	2.33	2.67	6.22	Medium
Coastal Vulnerability	Bulli Beach	Local Roads (Inundation)	2.75	2.25	6.19	Medium
Coastal Vulnerability	Woonona / Bellambi Beach	Stormwater under Bellambi SLSC Carpark and Adjacent to Bellambi Pool Car Park (Inundation)	2.83	2.17	6.14	Medium
Coastal Vulnerability	Corrimal Beach	Towradgi Lagoon and adjacent EEC Habitat (Inundation)	3.67	1.67	6.11	Medium
Coastal Vulnerability	Thirroul Beach	Stormwater Outlet to Flanagans Creek (Erosion)	2.88	2.13	6.11	Medium
Coastal Vulnerability	Scarborough and Wombarra Beach	Stormwater Outlets (Inundation)	3.00	2.00	6.00	Medium
Coastal Vulnerability	McCauleys Beach	Stormwater Lines at Northern End (Inundation)	3.00	2.00	6.00	Medium
Coastal Vulnerability	Little Austinmer & Austinmer Beach	Austinmer SLSC (Inundation)	2.60	2.30	5.98	Medium
Coastal Vulnerability	Thirroul Beach	Thirroul Pool (Erosion)	2.50	2.38	5.94	Medium
Coastal Vulnerability	Woonona / Bellambi Beach	Bellambi Gully and adjacent Habitat (Erosion)	2.89	2.00	5.78	Medium
Coastal Vulnerability	Little Austinmer & Austinmer Beach	Pr	2.40	2.40	5.76	Medium
Coastal Vulnerability	Corrimal Beach	Bellambi Lagoon and adjacent Habitat (Inundation)	3.22	1.78	5.73	Medium
Coastal Vulnerability	Thirroul Beach	Stormwater Outlet to Flanagans Creek (Inundation)	3.00	1.88	5.63	Medium
Coastal Vulnerability	North Beach and Harbour	North Beach Pavilion (Inundation)	3.33	1.67	5.56	Medium
Coastal Vulnerability	North Beach and Harbour	Stuart Park (Erosion)	3.13	1.75	5.47	Medium
Coastal Vulnerability	Stanwell Park	Car Parks & Roads (Inundation)	2.89	1.89	5.46	Medium
Coastal Vulnerability	Stanwell Park	Kiosk & Dwelling in Reserve (Inundation)	2.33	2.33	5.44	Medium
Coastal Vulnerability	Sharky Beach	Austinmer Jetty Site & Heritage Items (Erosion)	2.56	2.11	5.40	Medium
Coastal Vulnerability	Sharky Beach	Stormwater Outlets and Pipes (Inundation)	2.88	1.88	5.39	Medium
Coastal Vulnerability	Woonona / Bellambi Beach	Bellambi Gully and adjacent Habitat (Inundation))	3.11	1.67	5.19	Medium
Coastal Vulnerability	Port Kembla	Port Kembla Olympic Pool (Erosion)	2.33	2.17	5.06	Medium
Coastal Vulnerability	Little Austinmer & Austinmer Beach	Lawrence Hargrave Drive (Inundation)	2.11	2.33	4.93	Medium
Coastal Vulnerability	Coledale Beach	Daly Creek Stormwater Pipes (Inundation)	2.86	1.71	4.90	Medium
Coastal Vulnerability	Sharky Beach	Stormwater Outlets and Pipes (Erosion)	2.44	2.00	4.89	Medium
Coastal Vulnerability	Sandon Pt Beach	Stormwater Outlets and Pipes at Southern End (Erosion)	2.67	1.83	4.89	Medium
Coastal Vulnerability	Towradgi / Fairy Meadow Beach	Shared Cycleway (Erosion)	2.56	1.89	4.83	Medium
Coastal Vulnerability	North Beach and Harbour	Cycleway (Erosion)	2.63	1.75	4.59	Medium
Coastal Vulnerability	North Beach and Harbour	North Wollongong Surf Club (Erosion)	2.29	2.00	4.57	Medium
Coastal Vulnerability	Little Austinmer & Austinmer Beach	Stormwater Outlets (Inundation)	2.86	1.57	4.49	Medium
Coastal Vulnerability	Woonona / Bellambi Beach	Woonona SLSC (Inundation)	2.75	1.63	4.47	Medium
Coastal Vulnerability	Bellambi Boat Harbour / Bellambi Point Beach	Bellambi (Sandspit) Point Heritage Site (Inundation)	2.75	1.63	4.47	Medium
Coastal Vulnerability	Corrimal Beach	Dobbie Avenue (Inundation)	2.50	1.75	4.38	Medium
Coastal Vulnerability	Bulli Beach	Stormwater Outlets and Pipes (Inundation)	2.43	1.71	4.16	Medium

Coastal Vulnerability	Towradgi / Fairy Meadow Beach	Fairy Lagoon & Associated Habitat (Inundation)	3.11	1.33	4.15	Medium
Coastal Vulnerability	Sharky Beach	Austinmer Jetty Site & Heritage Items (Inundation)	2.33	1.78	4.15	Medium
Coastal Vulnerability	Woonona / Bellambi Beach	Stormwater Outlets - North End Kurraba Rd and line to Beach Dr (Erosion)	2.67	1.50	4.00	Low
Coastal Vulnerability	Little Austinmer & Austinmer Beach	Austinmer War Memorial (Erosion)	1.86	2.14	3.98	Low
Coastal Vulnerability	Little Austinmer & Austinmer Beach	Stormwater Outlets (Erosion)	2.14	1.86	3.98	Low
Coastal Vulnerability	Sandon Pt Beach	Sandon Point Heritage Area (Erosion)	2.22	1.78	3.95	Low
Coastal Vulnerability	Woonona / Bellambi Beach	Bellambi SLSC (Inundation)	2.63	1.50	3.94	Low
Coastal Vulnerability	North Beach and Harbour	Stormwater Infrastructure near Pavilion (Erosion)	2.50	1.50	3.75	Low
Coastal Vulnerability	Sandon Pt Beach	Stormwater Outlets and Pipes at Southern End (Inundation)	2.50	1.50	3.75	Low
Coastal Vulnerability	Little Austinmer & Austinmer Beach	Austinmer War Memorial (Inundation)	1.75	2.13	3.72	Low
Coastal Vulnerability	Towradgi / Fairy Meadow Beach	Towradgi Pool (Erosion)	2.13	1.75	3.72	Low
Coastal Vulnerability	Bulli Beach	Bulli Surf Club (Inundation)	2.56	1.44	3.69	Low
Coastal Vulnerability	Thirroul Beach	Thirroul Pool (Inundation)	2.25	1.63	3.66	Low
Coastal Vulnerability	Woonona / Bellambi Beach	Stormwater Outlets - Seaward Edge of Beach Dr (Erosion)	2.60	1.40	3.64	Low
Coastal Vulnerability	Woonona / Bellambi Beach	Stormwater Outlets - Seaward Edge of Beach Dr (Inundation)	2.60	1.40	3.64	Low
Coastal Vulnerability	Coledale Beach	Carricks Creek & Stockyard Creek (Erosion)	2.10	1.70	3.57	Low
Coastal Vulnerability	Stanwell Park	Stormwater Infrastructure (Inundation)	2.67	1.33	3.56	Low
Coastal Vulnerability	Towradgi / Fairy Meadow Beach	Fairy Lagoon & Associated Habitat (Erosion)	2.44	1.44	3.53	Low
Coastal Vulnerability	Woonona / Bellambi Beach	Stormwater Outlets - North End Kurraba Rd and line to Beach Dr (Inundation)	2.33	1.50	3.50	Low
Coastal Vulnerability	North Beach and Harbour	North Wollongong Surf Club (Inundation)	2.33	1.50	3.50	Low
Coastal Vulnerability	Corrimal Beach	Car Park at End of Murray Road (Inundation)	2.71	1.29	3.49	Low
Coastal Vulnerability	Stanwell Park	Residences (Inundation)	1.56	2.22	3.46	Low
Coastal Vulnerability	Port Kembla	Stormwater Infrastructure (Erosion)	2.50	1.33	3.33	Low
Coastal Vulnerability	Woonona / Bellambi Beach	Woonona Ocean Pool (Erosion)	2.00	1.63	3.25	Low
Coastal Vulnerability	Corrimal Beach	Stormwater Infrastructure adjacent to Lagoon (Inundation)	3.14	1.00	3.14	Low
Coastal Vulnerability	Bulli Beach	Bulli Rock Pool (Erosion)	2.00	1.44	2.89	Low
Coastal Vulnerability	Corrimal Beach	Stormwater Outlets and Pipes (Inundation)	2.83	1.00	2.83	Low
Coastal Vulnerability	Bulli Beach	Waniora Point Heritage Site (Inundation)	2.00	1.33	2.67	Low
Coastal Vulnerability	Coalcliff Beach	Coalcliff Tidal Rock Pool (Erosion)	1.90	1.40	2.66	Low
Coastal Vulnerability	Bellambi Boat Harbour / Bellambi Point Beach	Bellambi WWTP and Associated Stormwater (Inundation)	1.75	1.50	2.63	Low
Coastal Vulnerability	Coledale Beach	Coledale Rock Pool (Erosion)	1.90	1.30	2.47	Low
Coastal Vulnerability	Bellambi Boat Harbour / Bellambi Point Beach	Bellambi WWTP and Associated Stormwater (Erosion)	1.50	1.63	2.44	Low
Coastal Vulnerability	Towradgi / Fairy Meadow Beach	Stormwater Outlet (Inundation)	2.17	1.00	2.17	Low
Coastal Vulnerability	Little Austinmer & Austinmer Beach	Rock Pool (Erosion)	1.67	1.22	2.04	Low
Coastal Vulnerability	Towradgi / Fairy Meadow Beach	Stormwater Outlet (Erosion)	1.83	1.00	1.83	Low

Coastal Environment	Port Kembla Beach & Perkins Beach	Wind blown sand preventing revegetation	4.45	3.45	15.39	High
Coastal Environment	Woonona Beach	Vegetation vandalism	4.15	3.38	14.06	High
Coastal Environment	Woonona Beach	Lack of community awareness - importance of natural habitats	3.46	3.46	11.98	High
Coastal Environment	Fairy Creek, Fairy Meadow Beach, North Wollongong Beach & City	Urban stormwater pollutants	3.64	3.27	11.90	High
Coastal Environment	Sharkys Beach	Clearing of dune vegetation	3.75	3.00	11.25	High
Coastal Environment	Coalcliff Beach & Stoney Creek Risks	Buried asbestos & building waste	3.25	3.25	10.56	High
Coastal Environment	Hewitts, Woodlands & Tramway Creeks & McCauleys Beach	Vegetation clearing - dune	3.17	3.33	10.56	High
Coastal Environment	Whartons Creek & Collins Creek	Leachate discharge from landfill	3.50	3.00	10.50	High
Coastal Environment	Hewitts, Woodlands & Tramway Creeks & McCauleys Beach	Pest species preying on native fauna	3.22	3.11	10.02	High
Coastal Environment	Hargraves Creek, Stanwell Creek & Stanwell Park Beach	Urban stormwater pollutants	3.67	2.67	9.78	Medium
Coastal Environment	Fairy Creek, Fairy Meadow Beach, North Wollongong Beach & City	Buried building waste - asbestos contamination (City Beach)	3.70	2.60	9.62	Medium
Coastal Environment	Towradgi Creek & Corrimal Beach	Urban stormwater pollutants	3.10	3.00	9.30	Medium
Coastal Environment	Hewitts, Woodlands & Tramway Creeks & McCauleys Beach	Pedestrian / vehicle access - vegetation trampling	3.27	2.64	8.63	Medium
Coastal Environment	Whartons Creek & Collins Creek	Urban stormwater pollutants	3.11	2.67	8.30	Medium
Coastal Environment	Hewitts, Woodlands & Tramway Creeks & McCauleys Beach	Weeds	3.17	2.58	8.18	Medium
Coastal Environment	Hargraves Creek, Stanwell Creek & Stanwell Park Beach	Pedestrians, dogs, horse riders, 4WDs - migratory birds	2.88	2.75	7.91	Medium
Coastal Environment	Hewitts, Woodlands & Tramway Creeks & McCauleys Beach	Lack of community awareness - EECs	3.08	2.46	7.57	Medium
Coastal Environment	Slacky Creek & Sandon Point	Urban stormwater pollutants	3.10	2.40	7.44	Medium
Coastal Environment	Fairy Creek, Fairy Meadow Beach, North Wollongong Beach & City	Weeds	3.17	2.33	7.39	Medium
Coastal Environment	Port Kembla Beach & Perkins Beach	Pest species preying on native fauna	2.71	2.71	7.37	Medium
Coastal Environment	Port Kembla Beach & Perkins Beach	Weeds	3.00	2.45	7.36	Medium
Coastal Environment	Bellambi Gully & Bellambi Beach	Increased catchment runoff	3.00	2.44	7.33	Medium
Coastal Environment	Slacky Creek & Sandon Point	Increased catchment runoff	2.90	2.50	7.25	Medium
Coastal Environment	Bellambi Lagoon & Corrimal Beach	Pest species preying on native fauna	2.67	2.67	7.11	Medium
Coastal Environment	Towradgi Creek & Corrimal Beach	Weeds	2.92	2.42	7.05	Medium
Coastal Environment	Fairy Creek, Fairy Meadow Beach, North Wollongong Beach & City	Lack of community awareness - EECs	3.08	2.23	6.86	Medium
Coastal Environment	Coalcliff Beach & Stoney Creek Risks	Pest Species - preying on native fauna	2.29	3.00	6.86	Medium
Coastal Environment	Flanagans Creek & Thirroul Beach	Increased catchment runoff	2.89	2.33	6.74	Medium

Coastal Environment	Bellambi Lagoon & Corrimal Beach	Lack of data - pest species	2.80	2.40	6.72	Medium
Coastal Environment	Port Kembla Beach & Perkins Beach	Urban stormwater pollutants	3.00	2.22	6.67	Medium
Coastal Environment	Hewitts, Woodlands & Tramway Creeks & McCauleys Beach	Urban stormwater pollution	2.82	2.36	6.66	Medium
Coastal Environment	Fairy Creek, Fairy Meadow Beach, North Wollongong Beach & City	Pest species preying on native fauna	2.63	2.50	6.56	Medium
Coastal Environment	Fairy Creek, Fairy Meadow Beach, North Wollongong Beach & City	Entrance management - Fairy Creek	2.75	2.38	6.53	Medium
Coastal Environment	Port Kembla Beach & Perkins Beach	Lack of community awareness - EECs	2.92	2.15	6.30	Medium
Coastal Environment	Port Kembla Beach & Perkins Beach	Informal access - damage to dune vegetation and dune	2.56	2.44	6.25	Medium
Coastal Environment	Whartons Creek & Collins Creek	Increased catchment runoff	2.70	2.30	6.21	Medium
Coastal Environment	Towradgi Creek & Corrimal Beach	Vegetation clearing - dune	2.75	2.25	6.19	Medium
Coastal Environment	Towradgi Creek & Corrimal Beach	Lack of community awareness -EECs	3.00	2.00	6.00	Medium
Coastal Environment	Coledale Beach	Harvesting and walking on rock platforms	3.00	2.00	6.00	Medium
Coastal Environment	Slacks Creek & Sandon Point	Informal access - erosion	2.67	2.25	6.00	Medium
Coastal Environment	Whartons Creek & Collins Creek	Mosquito fish	3.00	2.00	6.00	Medium
Coastal Environment	Flanagans Creek & Thirroul Beach	Urban stormwater pollutants	2.56	2.33	5.96	Medium
Coastal Environment	Bellambi Lagoon & Corrimal Beach	Informal pedestrian / vehicle access - vegetation and dune impacts	2.67	2.22	5.93	Medium
Coastal Environment	Coalcliff Beach & Stoney Creek Risks	Weeds	2.50	2.30	5.75	Medium
Coastal Environment	Towradgi Creek & Corrimal Beach	Entrance management	2.60	2.20	5.72	Medium
Coastal Environment	Towradgi Creek & Corrimal Beach	Informal pedestrian /vehicle access - creebank erosion, dune impacts, vegetation trampling	2.67	2.08	5.56	Medium
Coastal Environment	Coledale Beach	Weeds	2.64	2.09	5.51	Medium
Coastal Environment	Hargraves Creek, Stanwell Creek & Stanwell Park Beach	Vegetation clearing - dune	2.44	2.22	5.43	Medium
Coastal Environment	Hargraves Creek, Stanwell Creek & Stanwell Park Beach	Faecal contamination in waterways	2.67	2.00	5.33	Medium
Coastal Environment	Coalcliff Beach & Stoney Creek Risks	Urban stormwater	2.67	2.00	5.33	Medium
Coastal Environment	Sharkys Beach	Urban stormwater pollutants	2.86	1.86	5.31	Medium
Coastal Environment	Coledale Beach	Higher visitation causing dune erosion	2.64	2.00	5.27	Medium
Coastal Environment	Hewitts, Woodlands & Tramway Creeks & McCauleys Beach	Urban development - migratory bird habitat loss	2.42	2.17	5.24	Medium
Coastal Environment	Coalcliff Beach & Stoney Creek Risks	Faecal contamination	2.14	2.43	5.20	Medium
Coastal Environment	Bellambi Gully & Bellambi Beach	Vegetation clearing - dune	2.27	2.27	5.17	Medium
Coastal Environment	Flanagans Creek & Thirroul Beach	Pest species preying on native fauna	2.17	2.33	5.06	Medium
Coastal Environment	Flanagans Creek & Thirroul Beach	Vegetation clearing - dune	2.13	2.38	5.05	Medium
Coastal Environment	Bellambi Lagoon & Corrimal Beach	Vegetation clearing - dune	2.44	2.00	4.89	Medium
Coastal Environment	Coalcliff Beach & Stoney Creek Risks	Lack of community awareness - EECs	2.40	2.00	4.80	Medium

Coastal Environment	Hewitts, Woodlands & Tramway Creeks & McCauleys Beach	Vegetation Clearing - riparian	2.15	2.15	4.64	Medium
Coastal Environment	Port Kembla Beach & Perkins Beach	Vegetation clearing - dunes	2.18	2.00	4.36	Medium
Coastal Environment	Towradgi Creek & Corrimal Beach	Vegetation clearing - riparian	2.25	1.92	4.31	Medium
Coastal Environment	Flanagans Creek & Thirroul Beach	Vegetation Clearing - riparian	1.88	2.25	4.22	Medium
Coastal Environment	Slacky Creek & Sandon Point	Rabbits preventing revegetation	2.40	1.70	4.08	Medium
Coastal Environment	Hargraves Creek, Stanwell Creek & Stanwell Park Beach	Litter	2.38	1.69	4.04	Medium
Coastal Environment	Coalcliff Beach & Stoney Creek Risks	Vegetation clearing	2.00	1.89	3.78	Low
Coastal Environment	Bellambi Gully & Bellambi Beach	Lack of data - pests	2.13	1.63	3.45	Low
Coastal Environment	Bellambi Gully & Bellambi Beach	Pest species preying on native fauna	1.75	1.75	3.06	Low
Coastal Environment	Fairy Creek, Fairy Meadow Beach, North Wollongong Beach & City	Vegetation clearing - riparian	2.00	1.50	3.00	Low
Coastal Environment	Coalcliff Beach & Stoney Creek Risks	Unknown impacts of creek impoundment	2.00	1.50	3.00	Low
Coastal Environment	Hewitts, Woodlands & Tramway Creeks & McCauleys Beach	Entrance management - aquatic fauna	1.57	1.86	2.92	Low
Coastal Environment	Fairy Creek, Fairy Meadow Beach, North Wollongong Beach & City	Vegetation clearing - dune	1.64	1.45	2.38	Low
Coastal Environment	Slacky Creek & Sandon Point	Instream structure preventing fish passage	1.25	1.50	1.88	Low
Coastal Environment	Fairy Creek, Fairy Meadow Beach, North Wollongong Beach & City	Instream structure preventing fish passage	1.50	1.25	1.88	Low
Coastal Environment	Fairy Creek, Fairy Meadow Beach, North Wollongong Beach & City	Exposure of acid sulfate soils - Fairy Creek	1.60	1.00	1.60	Low
Coastal Environment	Flanagans Creek & Thirroul Beach	Mosquito Fish	0.75	1.00	0.75	Low
Coastal Environment	Bellambi Lagoon & Corrimal Beach	Mosquito fish	0.33	0.33	0.11	Low
Coastal Environment	Bellambi Gully & Bellambi Beach	Mosquito fish	0.00	0.00	0.00	Low
Coastal Use	LGA wide	Rock fishing	4.00	3.89	15.56	High
Coastal Use	LGA wide	Lack of policy direction - cultural heritage	4.10	3.70	15.17	High
Coastal Use	LGA wide	Multiple land tenures and governance arrangements	3.50	3.50	12.25	High
Coastal Use	LGA wide	Loss of existing seawalls	3.60	3.40	12.24	High
Coastal Use	LGA wide	Lack of agreed approach on historic heritage obligations (local)	3.33	3.67	12.22	High
Coastal Use	LGA wide	Children climbing Port Kembla shed where sands build up	3.67	3.17	11.61	High
Coastal Use	LGA wide	Gap between strategy and works	3.50	3.30	11.55	High
Coastal Use	LGA wide	Loss or rationalisation of rockpools	3.20	3.60	11.52	High
Coastal Use	LGA wide	Contradictory strategies across Council	3.44	3.11	10.72	High
Coastal Use	Bulli Beach	Beach Safety - Patrol View impeded by Vegetation	3.80	2.80	10.64	High
Coastal Use	LGA wide	Lack of strategy for future planning for climate change	3.00	3.44	10.33	High
Coastal Use	LGA wide	Lack of clarity around surf club management	3.11	3.22	10.02	High
Coastal Use	LGA wide	Lack of policy direction - coastal hazards	3.20	3.10	9.92	Medium

Coastal Use	LGA wide	Vegetation vandalism	3.45	2.82	9.74	Medium
Coastal Use	LGA wide	Lack of agreed approach on historic heritage obligations (state)	3.22	3.00	9.67	Medium
Coastal Use	LGA wide	Visitors gravitating to unpatrolled beaches	3.50	2.75	9.63	Medium
Coastal Use	Woonona Beach	Beach Safety - Patrol View impeded by Vegetation	3.20	3.00	9.60	Medium
Coastal Use	LGA wide	User conflicts Dogs and other beach users	3.73	2.55	9.49	Medium
Coastal Use	LGA wide	Lack of community awareness of First Nations Heritage	3.14	3.00	9.43	Medium
Coastal Use	LGA wide	Council lifeguards services stretched - visitor intensification	3.25	2.75	8.94	Medium
Coastal Use	LGA wide	DCP lacks clarity and is not prescriptive enough	3.00	2.83	8.50	Medium
Coastal Use	LGA wide	Lack of knowledge of sites / places and object of historic significance	2.88	2.88	8.27	Medium
Coastal Use	LGA wide	Loss or rationalisation of surf Clubs	3.00	2.75	8.25	Medium
Coastal Use	LGA wide	Litter and not enough public bins	3.10	2.60	8.06	Medium
Coastal Use	LGA wide	Recreational Swimming Water Quality	3.36	2.36	7.95	Medium
Coastal Use	LGA wide	Lack of protection for historic heritage sites in planning instruments	2.78	2.78	7.72	Medium
Coastal Use	City Beach	Beach access ways - width and grade not suitable	3.00	2.36	7.09	Medium
Coastal Use	City Beach	Beach Safety - Patrol View impeded by Vegetation	3.20	2.20	7.04	Medium
Coastal Use	LGA wide	Unauthorised Public Foreshore Structures	2.91	2.36	6.88	Medium
Coastal Use	City Beach	Minimal Beach Width and/or Moderate Scarps Impacting Recreation	3.00	2.27	6.82	Medium
Coastal Use	LGA wide	Dog poo	3.20	2.10	6.72	Medium
Coastal Use	Port Kembla Beach	Beach access ways - width and grade not suitable	2.91	2.27	6.61	Medium
Coastal Use	LGA wide	User conflicts - Shared path (joggers, cyclists, walkers)	3.30	2.00	6.60	Medium
Coastal Use	Bellambi Beach	Beach Safety - Patrol View impeded by Vegetation	2.40	2.60	6.24	Medium
Coastal Use	LGA wide	User conflicts - Antisocial behaviour - alcohol, fires	2.64	2.36	6.23	Medium
Coastal Use	Corrimal Beach	Beach Safety - Patrol View impeded by Vegetation	2.80	2.20	6.16	Medium
Coastal Use	LGA wide	Senior management don't understand legislative requirements	2.25	2.63	5.91	Medium
Coastal Use	Towradgi Beach	Beach access ways - width and grade not suitable	2.73	2.00	5.45	Medium
Coastal Use	LGA wide	Privatisation of public land	2.45	2.18	5.36	Medium
Coastal Use	LGA wide	User conflicts - Campers and day visitors (Coledale Beach)	2.67	2.00	5.33	Medium
Coastal Use	LGA wide	Access tracks impacting midden sites	2.25	2.25	5.06	Medium
Coastal Use	LGA wide	Erosion of historic heritage sites	2.25	2.25	5.06	Medium
Coastal Use	Bulli Beach	Beach access ways - width and grade not suitable	2.40	2.10	5.04	Medium
Coastal Use	LGA wide	Insufficient public parking	2.73	1.82	4.96	Medium
Coastal Use	LGA wide	Lack of dune vegetation reducing visual amenity	2.36	2.09	4.94	Medium
Coastal Use	LGA wide	Lifeguard ATV unable to be used due to beach width	2.29	2.14	4.90	Medium
Coastal Use	Port Kembla	Minimal Beach Width and/or Moderate Scarps Impacting Recreation	2.82	1.64	4.61	Medium
Coastal Use	Corrimal Beach	Beach access ways - width and grade not suitable	2.45	1.73	4.24	Medium

Coastal Use	LGA wide	Dogs at McCauleys Beach	2.17	1.83	3.97	Low
Coastal Use	LGA wide	Snags in Creeks	2.30	1.70	3.91	Low
Coastal Use	Fairy Meadow Beach	Beach Safety - Patrol View impeded by Vegetation	2.40	1.60	3.84	Low
Coastal Use	LGA wide	Perception of unsightly dune vegetation	2.40	1.60	3.84	Low
Coastal Use	Towradgi Beach	Minimal Beach Width and/or Moderate Scarps Impacting Recreation	2.45	1.55	3.79	Low
Coastal Use	Corrimal Beach	Minimal Beach Width and/or Moderate Scarps Impacting Recreation	2.36	1.55	3.65	Low
Coastal Use	Bulli Beach	Minimal Beach Width and/or Moderate Scarps Impacting Recreation	2.36	1.55	3.65	Low
Coastal Use	Bellambi Beach	Minimal Beach Width and/or Moderate Scarps Impacting Recreation	2.18	1.45	3.17	Low
Coastal Use	Woonona Beach	Minimal Beach Width and/or Moderate Scarps Impacting Recreation	2.27	1.27	2.89	Low
Coastal Use	Fairy Meadow Beach	Beach access ways - width and grade not suitable	2.00	1.40	2.80	Low
Coastal Use	Towradgi Beach	Beach Safety - Patrol View impeded by Vegetation	2.00	1.33	2.67	Low
Coastal Use	Fairy Meadow Beach	Minimal Beach Width and/or Moderate Scarps Impacting Recreation	2.09	1.27	2.66	Low
Coastal Use	Bellambi Beach	Beach access ways - width and grade not suitable	1.82	1.45	2.64	Low
Coastal Use	Woonona Beach	Beach access ways - width and grade not suitable	2.00	1.30	2.60	Low
Coastal Use	LGA wide	Insufficient bike racks near beach access points	2.00	1.18	2.36	Low
Coastal Use	LGA wide	No facilities for passive watercraft storage (kayaks)	1.73	1.27	2.20	Low
Coastal Use	LGA wide	Insufficient picnic facilities (tables etc.)	1.82	1.18	2.15	Low
Coastal Use	LGA wide	Insufficient walking trails	1.73	1.18	2.04	Low
Coastal Use	Port Kembla Beach	Beach Safety - Patrol View impeded by Vegetation	1.50	1.33	2.00	Low
Coastal Use	LGA wide	Insufficient public land for access and recreation	1.64	1.00	1.64	Low
Coastal Use	Windang	Beach Safety - Patrol View impeded by Vegetation	1.33	1.17	1.56	Low
Coastal Use	LGA wide	Insufficient viewing platforms	1.36	1.09	1.49	Low



Appendix B Coastal Management Objectives and High Rating Risks

Objects & Objectives

CM Objects	Short Name	Description from Act
CM1	Coastal Processes/Values	to protect and enhance natural coastal processes and coastal environmental values including natural character, scenic value, biological diversity and ecosystem integrity and resilience
CM2	Social and Cultural Values	to support the social and cultural values of the coastal zone and maintain public access, amenity, use and safety
CM3	Aboriginal Values/Uses	to acknowledge Aboriginal peoples' spiritual, social, customary and economic use of the coastal zone
CM4	Coastal Economies	to recognise the coastal zone as a vital economic zone and to support sustainable coastal economies
CM5	Ecologically Sustainable Development	to facilitate ecologically sustainable development in the coastal zone and promote sustainable land use planning decision-making
CM6	Coastal Hazards / Climate Change	to mitigate current and future risks from coastal hazards, taking into account the effects of climate change
CM7	Ambulatory Recognition	to recognise that the local and regional scale effects of coastal processes, and the inherently ambulatory and dynamic nature of the shoreline, may result in the loss of coastal land to the sea
CM8	Integrated Planning/Management	to promote integrated and co-ordinated coastal planning, management and reporting
CM9	Resilience of Coastal Assets	to encourage and promote plans and strategies to improve the resilience of coastal assets to the impacts of an uncertain climate future including impacts of extreme storm events
CM10	Co-ordinated Management Activities	to ensure co-ordination of the policies and activities of government and public authorities relating to the coastal zone and to facilitate the proper integration of their management activities
CM11	Public Participation/Understanding	to support public participation in coastal management and planning and greater public awareness, education and understanding of coastal processes and management actions
CM12	Identify Land for Protection	to facilitate the identification of land in the coastal zone for acquisition by public or local authorities in order <<for the environment>>
Coastal Wetland Objectives	Short Name	Description from Act
CW1	Natural Biodiversity/Integrity	to protect coastal wetlands and littoral rainforests in their natural state, including their biological diversity and ecosystem integrity
CW2	Rehabilitation/Restoration	to promote the rehabilitation and restoration of degraded coastal wetlands and littoral rainforests
CW3	Resilience/Migration	to improve the resilience of coastal wetlands and littoral rainforests to the impacts of climate change, including opportunities for migration.
CW4	Social/Cultural Values	to support the social and cultural values of coastal wetlands and littoral rainforests
CW5	Promote State Policies/Programs	to promote the objectives of State policies and programs for wetlands or littoral rainforest management

Coastal Environment Objectives	Short Name	Description from Act
CE1	Environmental Values/Processes	to protect and enhance the coastal environmental values and natural processes of coastal waters, estuaries, coastal lakes and coastal lagoons, and enhance natural character
CE2	Resilience of Coastal Waters	to reduce threats to and improve the resilience of coastal waters, estuaries, coastal lakes and coastal lagoons, including in response to climate change
CE3	Water Quality	to maintain and improve water quality and estuary health
CE4	Social/Cultural Values	to support the social and cultural values of coastal waters, estuaries, coastal lakes and coastal lagoons
CE5	Beaches / Dunes / Natural Features	to maintain the presence of beaches, dunes and the natural features of foreshores, taking into account the beach system operating at the relevant place
CE6	Public Access/Amenity	to maintain and, where practicable, improve public access, amenity and use of beaches, foreshores, headlands and rock platforms
Coastal Use Objectives	Short Name	Description from Act
CU1	Natural Scenic Quality	the type, bulk, scale and size of development is appropriate for the location and natural scenic quality of the coast
CU2	Cultural / Built Environment Heritage	adverse impacts of development on cultural and built environment heritage are avoided or mitigated
CU3	Urban Design	urban design, including water sensitive urban design, is supported and incorporated into development activities
CU4	Public Open Space	adequate public open space is provided, including for recreational activities and associated infrastructure
CU5	Use of Surf Zone	the use of the surf zone is considered
CU6	Urbanised and Natural Coastline	to accommodate both urbanised and natural stretches of coastline
Coastal Vulnerability Objectives	Short Name	Description from Act
CV1	Public Safety	to ensure public safety and prevent risks to human life
CV2	Mitigate Coastal Hazards	to mitigate current and future risk from coastal hazards by taking into account the effects of coastal processes and climate change
CV3	Maintain Beaches	to maintain the presence of beaches, dunes and the natural features of foreshores, taking into account the beach system operating at the relevant place
CV4	Public Amenity	to maintain public access, amenity and use of beaches and foreshores
CV5	Sensible Land Use	to encourage land use that reduces exposure to risks from coastal hazards, including through siting, design, construction and operational decisions
CV6	Reduce Hazard Exposure	to adopt coastal management strategies that reduce exposure to coastal hazards by restoring or enhancing natural defences or if not sufficient take other action
CV7	Do no harm	If taking that other action to reduce exposure to coastal hazards - avoid degradation or disruption to ecology, coastal processes, amenity, social values, cultural values, adjoining lands and assets.

CV8	Essential Infrastructure	to prioritise actions that support continued functionality of essential infrastructure during and immediately following a coastal hazard emergency.
CV9	Resilient Development	to improve the resilience of coastal development and communities by improving adaptive capacity and reducing reliance on emergency responses.
MEMA Objects	Short Name	Description from Act
MEMA1	Biologically diverse and healthy	promotes a biologically diverse, healthy and productive marine estate
MEMA2	Economic Opportunities	economic opportunities for the people of New South Wales, including opportunities for regional communities
MEMA3	Cultural, Social, Recreational	the cultural, social and recreational use of the marine estate
MEMA4	Ecosystem Integrity	the maintenance of ecosystem integrity
MEMA5	Scientific Research and Education	the use of the marine estate for scientific research and education
MEMA6	Promote Coordination	to promote the co-ordination of the exercise, by public authorities, of functions in relation to the marine estate
MEMA7	Management of Marine Parks	to provide for the declaration and management of a comprehensive system of marine parks and aquatic reserves

Location	Risk	Management Theme	Coastal Management Area	Coastal Management Objectives	Likelihood	Severity	Risk Score	Risk Level
Coastal Use Zone	Rock fishing	Public safety	Use	CM2, CE4, MEMA3	4.00	3.89	15.56	High
Port Kembla Beach & Perkins Beach	Wind-blown sand preventing revegetation	Natural Assets	Environment	CM1, CE5, MEMA4	4.45	3.45	15.39	High
Coastal Use Zone	Lack of policy direction - cultural heritage	Cultural Heritage	Use	CM2, CM8, CE4, MEMA3	4.10	3.70	15.17	High
Woonona Beach	Vegetation vandalism	Natural Assets	Environment	CM1, CE5, MEMA4	4.15	3.38	14.06	High
Coastal Use Zone	Multiple land tenures and governance arrangements	Governance	Use	CM8, CM10, MEMA6	3.50	3.50	12.25	High
Woonona / Bellambi Beach	80 Residences along Creek and Stormwater (Inundation)	Private development	Vulnerability	CM6, CV1, CV6, MEMA3	3.56	3.44	12.25	High
Coastal Use Zone	Loss of existing seawalls	Public infrastructure	Use	CM6, CV1, CV4, MEMA3	3.60	3.40	12.24	High
Coastal Use Zone	Lack of agreed approach on historic heritage obligations (local)	Historic heritage	Use	CM2, CM8, CE4, MEMA3	3.33	3.67	12.22	High
Woonona Beach	Lack of community awareness - importance of natural habitats	Natural Assets	Environment	CM1, CM5, CE5, , MEMA1	3.46	3.46	11.98	High
Fairy Creek, Fairy Meadow Beach, North Wollongong Beach & City Beach	Urban stormwater pollutants	Stormwater	Environment	CM1, CE3, MEMA1, MEMA3	3.64	3.27	11.90	High

Location	Risk	Management Theme	Coastal Management Area	Coastal Management Objectives	Likelihood	Severity	Risk Score	Risk Level
Bellambi Lagoon & Corrimal Beach	Urban stormwater pollutants	Stormwater	Environment	CM1, CE3, MEMA1, MEMA3	3.70	3.20	11.84	High
Coastal Use Zone	Children climbing Port Kembla shed where sands build up	Public safety	Use	CM2,CE4, MEMA3	3.67	3.17	11.61	High
Coastal Use Zone	Gap between strategy and works	Governance	Use	CM8, CM10, MEMA6	3.50	3.30	11.55	High
Coastal Use Zone	Loss or rationalisation of rockpools	Facility management	Use	CM2, CE6, CV4, MEMA3	3.20	3.60	11.52	High
Sharkys Beach	Clearing of dune vegetation	Natural Assets	Environment	CM1, CE5, MEMA4	3.75	3.00	11.25	High
McCauleys Beach	McCauleys Beach Reserve (Erosion)	Public reserves	Vulnerability	CM2, CE6, CV4, MEMA3	3.56	3.11	11.06	High
Bellambi Boat Harbour / Bellambi Point Beach	Boat Harbour Access Road (Erosion)	Public infrastructure	Vulnerability	CM2, CE6, CV4, CV8, MEMA3	3.86	2.86	11.02	High
Coastal Use Zone	Contradictory strategies across Council	Governance	Use	CM8, CM10, MEMA6	3.44	3.11	10.72	High
Bulli Beach	Beach Safety - Patrol View impeded by Vegetation	Public safety	Use	CM2,CE4, MEMA3	3.80	2.80	10.64	High
Coalcliff Beach & Stoney Creek Risks	Buried asbestos & building waste	Public safety	Environment	CM1, CE3, MEMA1, MEMA3	3.25	3.25	10.56	High
Hewitts, Woodlands & Tramway Creeks & McCauleys Beach	Vegetation clearing - dune	Natural Assets	Environment	CM1, CE5, MEMA4	3.17	3.33	10.56	High
Sandon Pt Beach	Sandon Point SLSC (Erosion)	Facility management	Vulnerability	CM2, CU2, CV9, MEMA3	3.40	3.10	10.54	High
Whartons Creek & Collins Creek	Leachate discharge from landfill	Contaminated land	Environment	CM1, CE3, MEMA1, MEMA3	3.50	3.00	10.50	High
Coastal Use Zone	Lack of strategy for future planning for climate change	Governance	Use	CM8, CM10, CV9, MEMA6	3.00	3.44	10.33	High
Hewitts, Woodlands & Tramway Creeks & McCauleys Beach	Pest species preying on native fauna	Natural Assets	Environment	CM1, CE5, MEMA4	3.22	3.11	10.02	High
Coastal Use Zone	Lack of clarity around surf club management	Facility management	Use	CM2, CU2, CV9, MEMA3	3.11	3.22	10.02	High



Appendix C Wollongong City Council Enterprise-wide Risk Management – Risk Ranking Tool



ENTERPRISE-WIDE RISK MANAGEMENT – RISK RANKING TOOL

SEVERITY TABLE

DESCRIPTOR	PEOPLE (Social) <i>Due to Council Culpability or Negligence</i>	PROPERTY & FINANCIAL (Economic) <i>Property loss; Increased expenses; lost revenue</i> Assess loss as either One-off or Recurrent multiplied by 10	ENVIRONMENT (Environment) <i>e.g. Waterways; Bushland; Air; Fauna; Flora</i>	REPUTATION (Governance) <i>Social; Ethical; Heritage; Cultural; Leadership</i> “External Agency” may include: DLG; ICAC; Police; Audit Office, etc
Catastrophic 5	Death or total permanent disability	> \$15 million; Massive financial loss	Catastrophic event (e.g. habitat destruction) with national impact (e.g. endangered species) for more than one year	Appointment of Administrator Major State or National media coverage 1,000 + complaints Financial loss or fraud > \$500,000
Major 4	Critical injury resulting in long-term partial disability	> \$5 million - \$15 million; Major financial loss	Major event (e.g. creek contamination) with regional impact (e.g. lake, escarpment) for more than one year	External Agency Inquiry with adverse finding Significant regional media coverage 50 – 1,000 complaints Financial loss or fraud > \$50,000 - \$500,000
Moderate 3	Very serious injury, e.g. broken arm, leg, wrist, etc which could result in hospitalisation and/or greater than 7 days off work	> \$100,000 - \$5 million; High financial loss	Major event (e.g. creek contamination) with regional impact (e.g. lake, escarpment) for between one month and one year	External Agency request for clarification Regional & suburban media coverage 20 – 50 complaints Financial loss or fraud > \$5,000 - \$50,000
Minor 2	Minor injury, e.g. strain, sprain, gash, etc resulting in between 1-7 days off work	> \$10,000 - \$100,000; Minor financial loss	Minor event (e.g. 20lt oil spill) with localised impact (e.g. street, precinct) for less than month	Suburban media coverage 10 – 20 complaints Financial loss or fraud > \$1,000 - \$5,000
Insignificant 1	Minor injury, e.g. cuts, abrasions, etc requiring first-aid and/or resulting in less than 1 day off work	< \$10,000; Low financial loss	Negligible event (e.g. noise pollution) with localised impact (e.g. street, precinct) for less than month	Media enquiry / Letter to the Editor 0 – 10 complaints Financial loss or fraud < \$1,000

LIKELIHOOD TABLE

DESCRIPTOR	DESCRIPTION
Almost Certain A	<ul style="list-style-type: none"> Could happen at anytime Is expected to occur in most circumstances Occurs annually or more frequently
Likely B	<ul style="list-style-type: none"> Will probably occur in most circumstances Has occurred several times in the past (in my career) Might occur in a 2-3 year timeframe
Possible C	<ul style="list-style-type: none"> Has occurred once in the past at Council Might occur under prevailing circumstances Might occur in a 5 year timeframe
Unlikely D	<ul style="list-style-type: none"> Could occur at sometime at Council Could happen but unlikely Might occur in a 10 year timeframe
Rare E	<ul style="list-style-type: none"> May occur in exceptional circumstances Heard of something like this happening elsewhere Could happen but probably never will

RISK SCORE MATRIX *

		SEVERITY				
LIKELIHOOD		Catastrophic 5	Major 4	Moderate 3	Minor 2	Insignificant 1
Almost Certain	A	E25	E20	E15	H10	M5
Likely	B	E20	E16	H12	M8	L4
Possible	C	E15	H12	M9	M6	L3
Unlikely	D	H10	M8	M6	L4	L2
Rare	E	M5	L4	L3	L2	L1

RISK LEVEL	ACTION YOU SHOULD TAKE
EXTREME (E15-25)	Immediate action required; Eliminate or reduce risk; or accept risk provided residual risk level is understood
HIGH (H10-14)	
MODERATE (M5-9)	Reduce risk; or accept risk provided residual risk level understood
LOW (L1-4)	Accept the risk; Manage by routine procedure

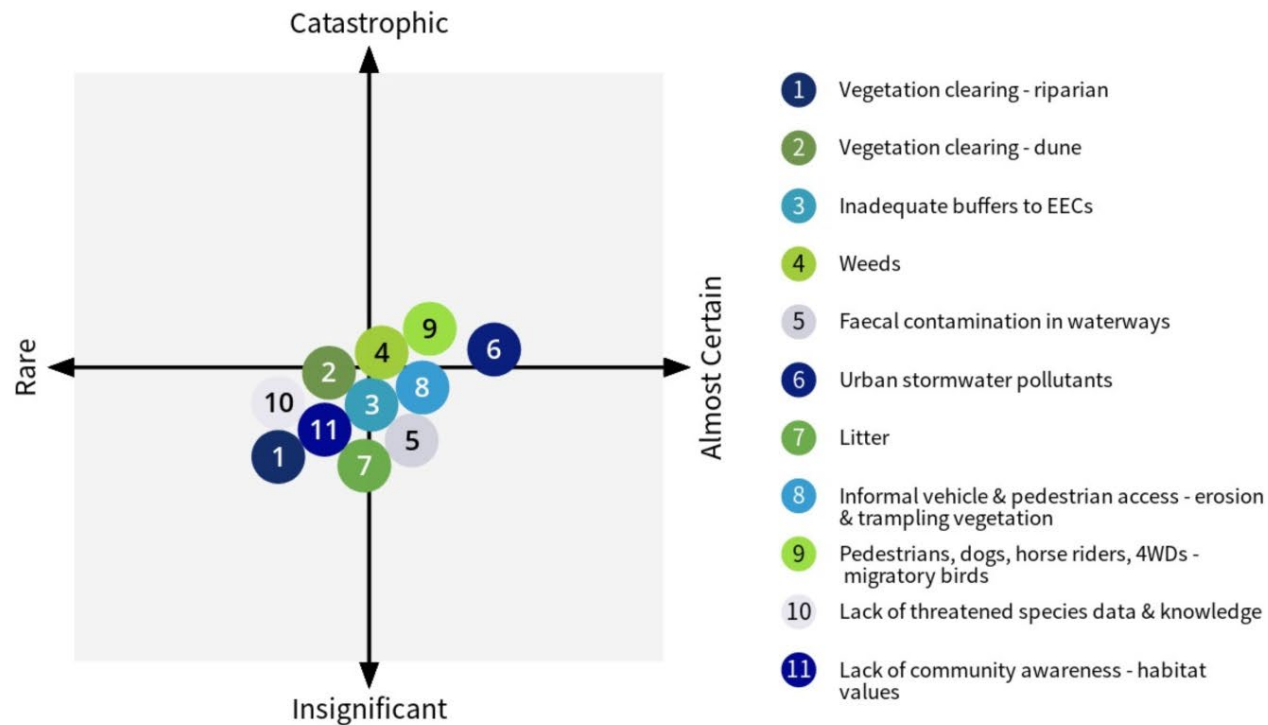
* Risk Score Matrix consistent with United Independent Pools Enterprise Risk Management Model Framework August 2008 and ISO 31000: Risk Management

Manage Your Risks

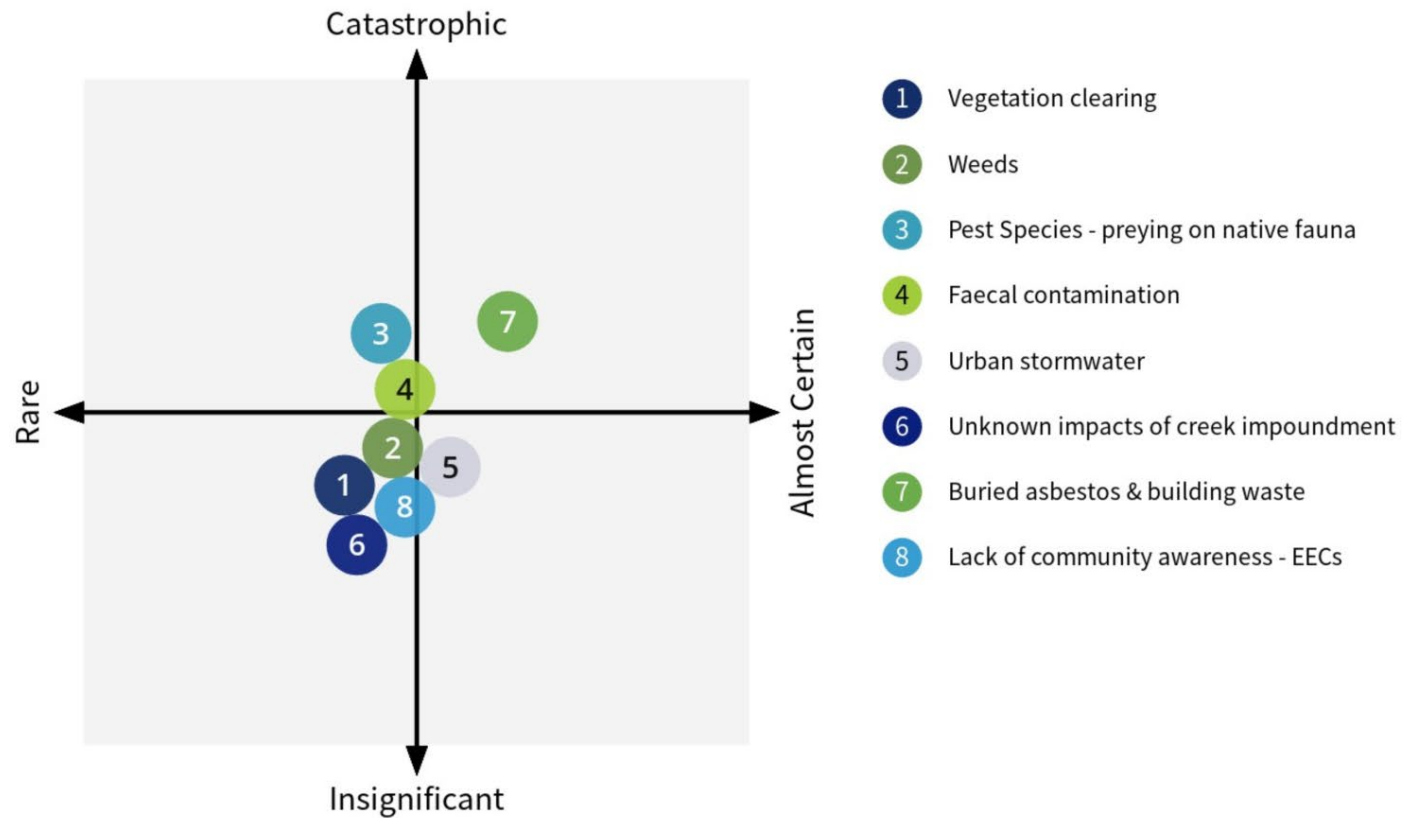


Appendix D Mentimeter Summary Report

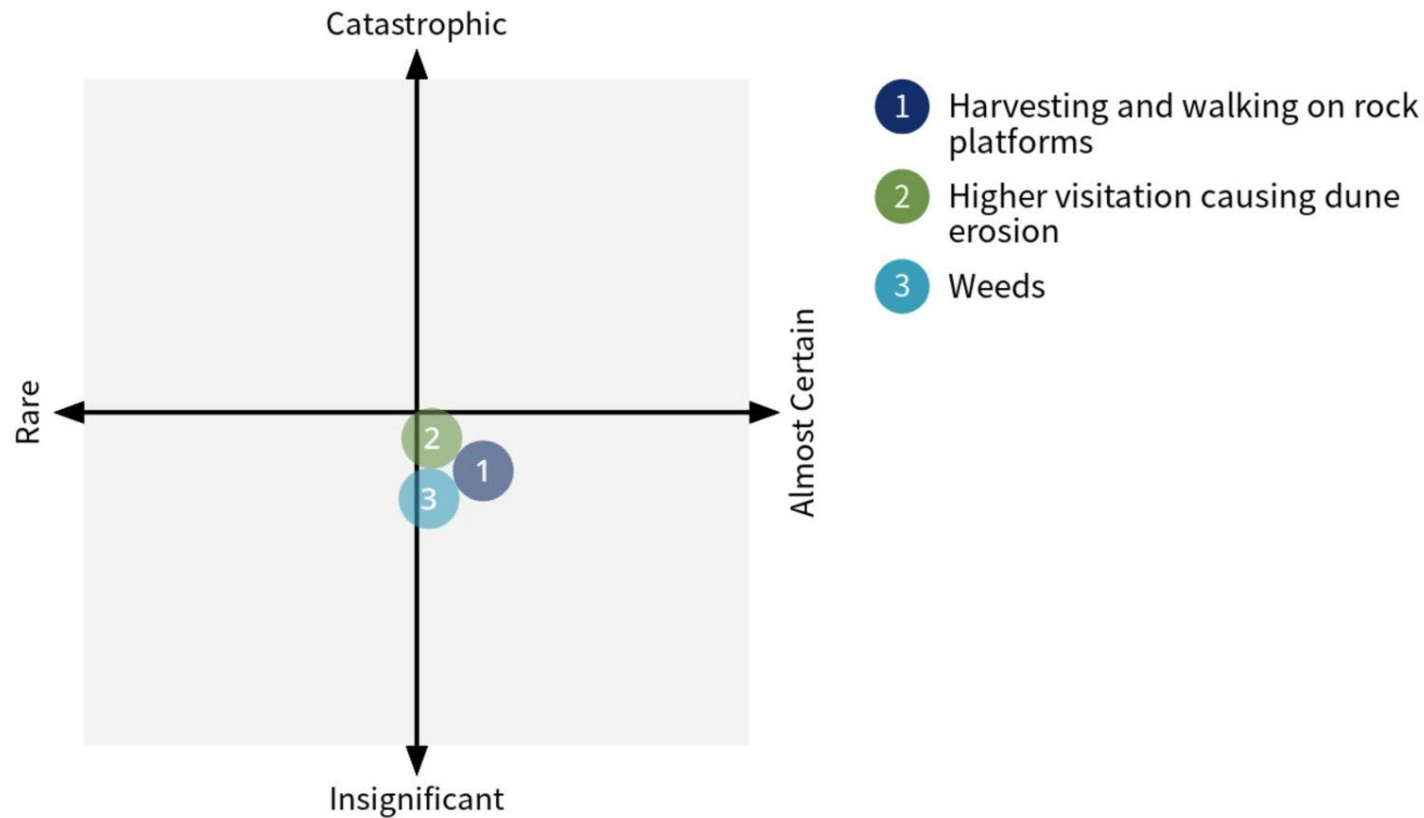
Hargraves Creek, Stanwell Creek & Stanwell Park Beach Risks



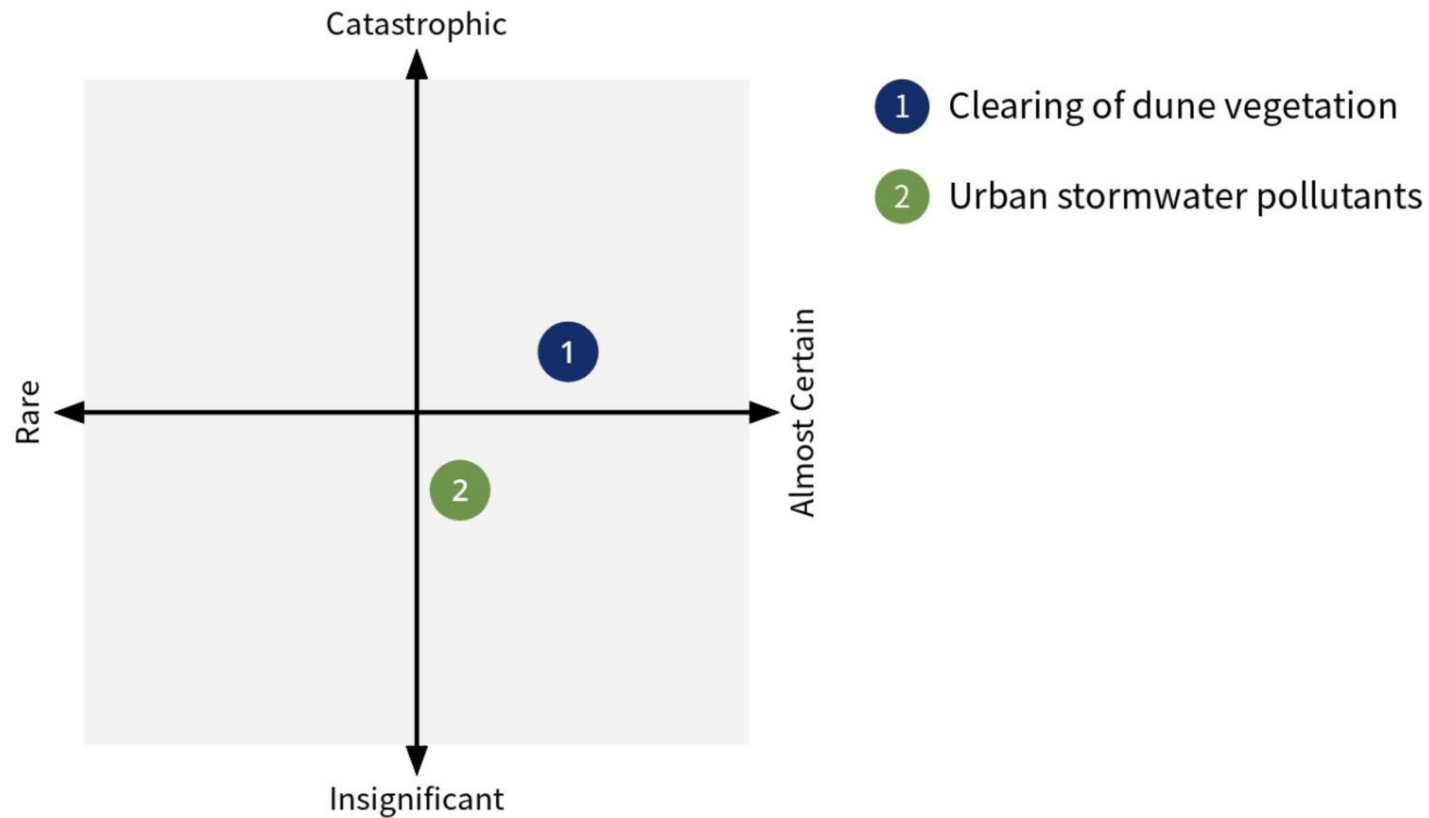
Coalcliff Beach & Stoney Creek Risks



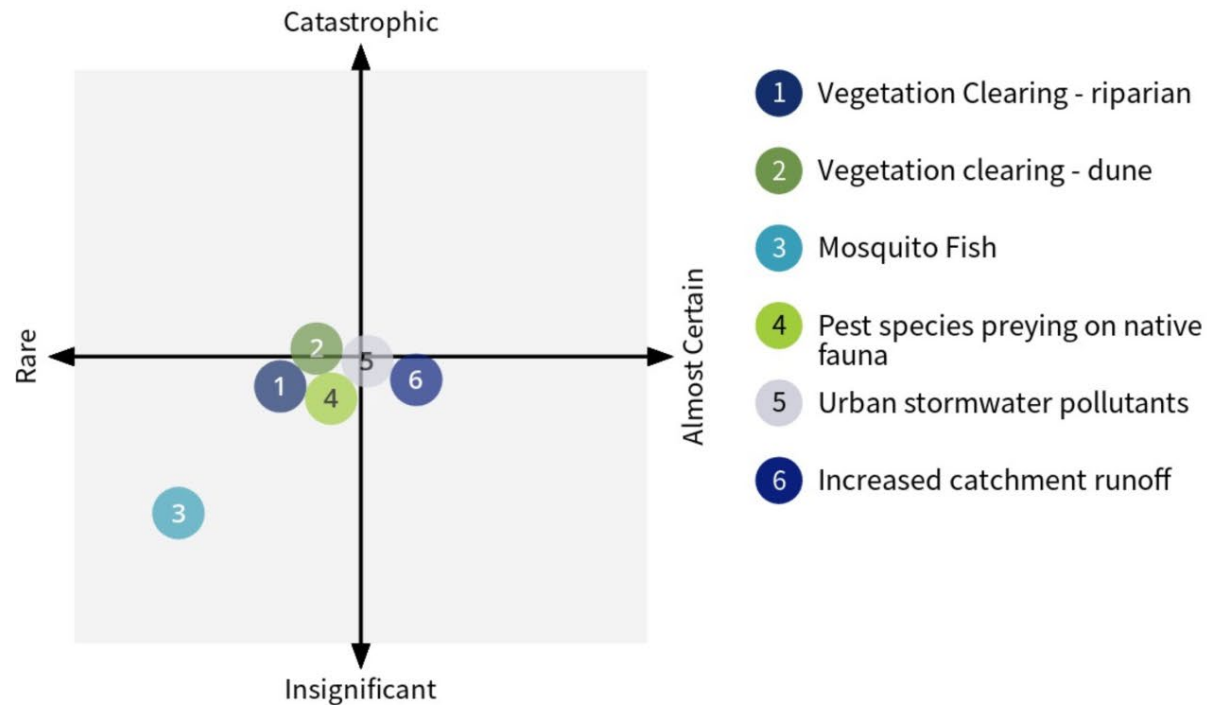
Coledale Beach Risks



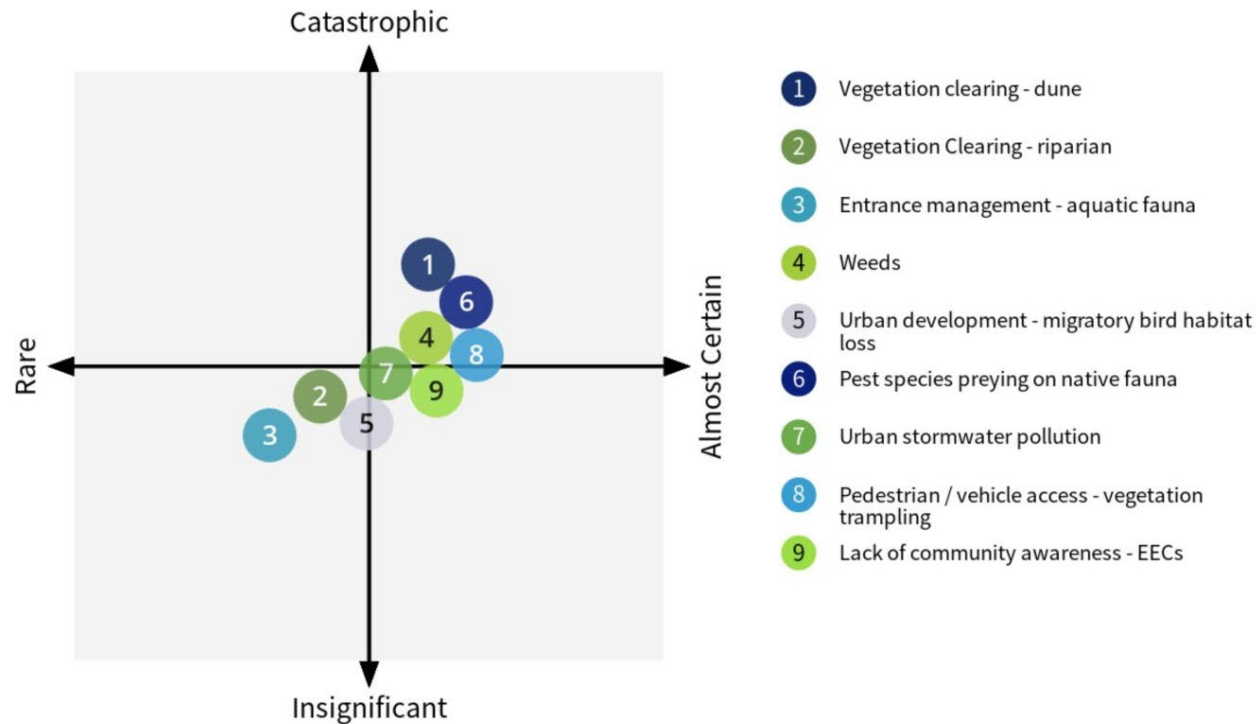
Sharkys Beach Risks



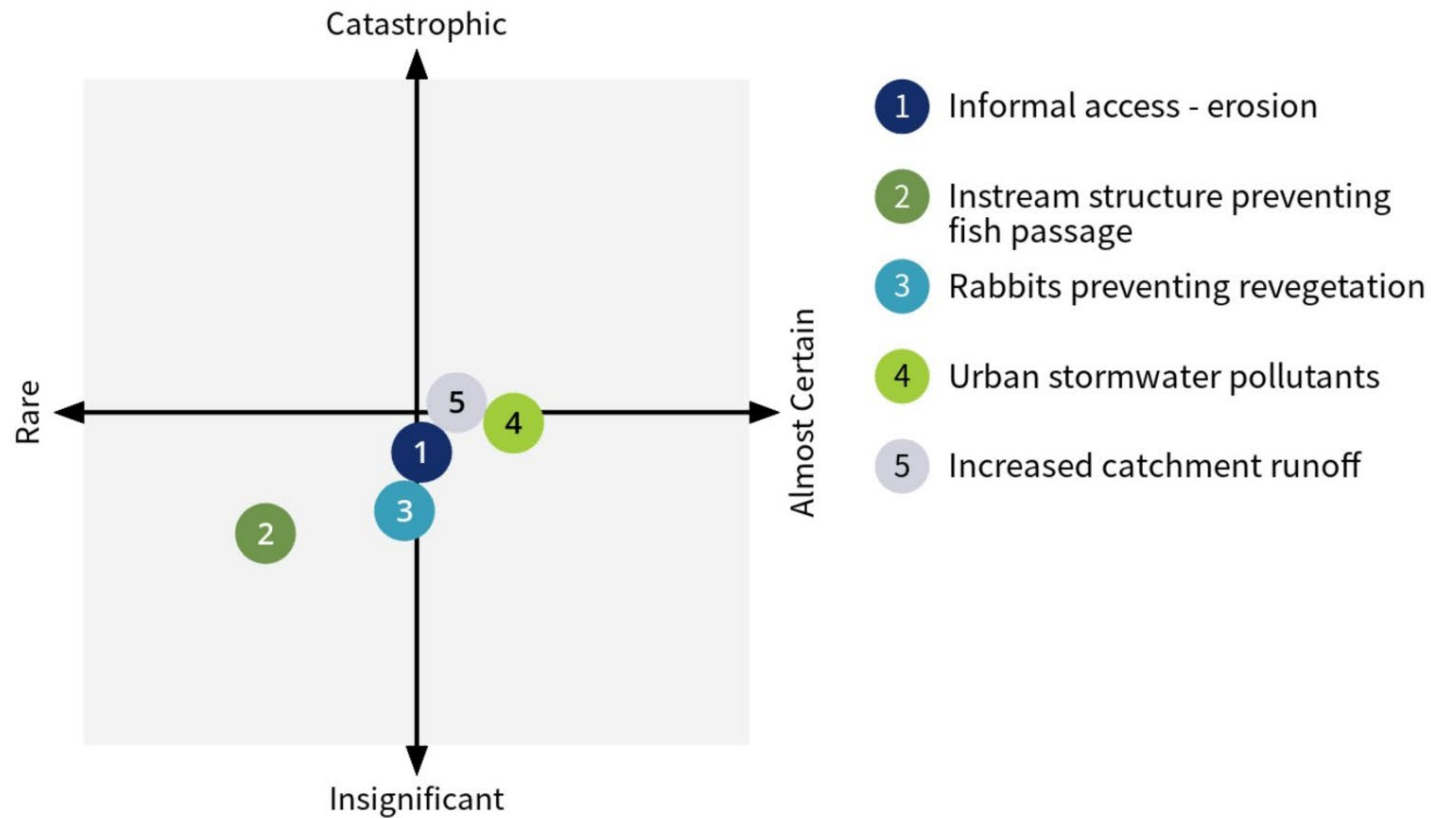
Flanagans Creek & Thirroul Beach Risks



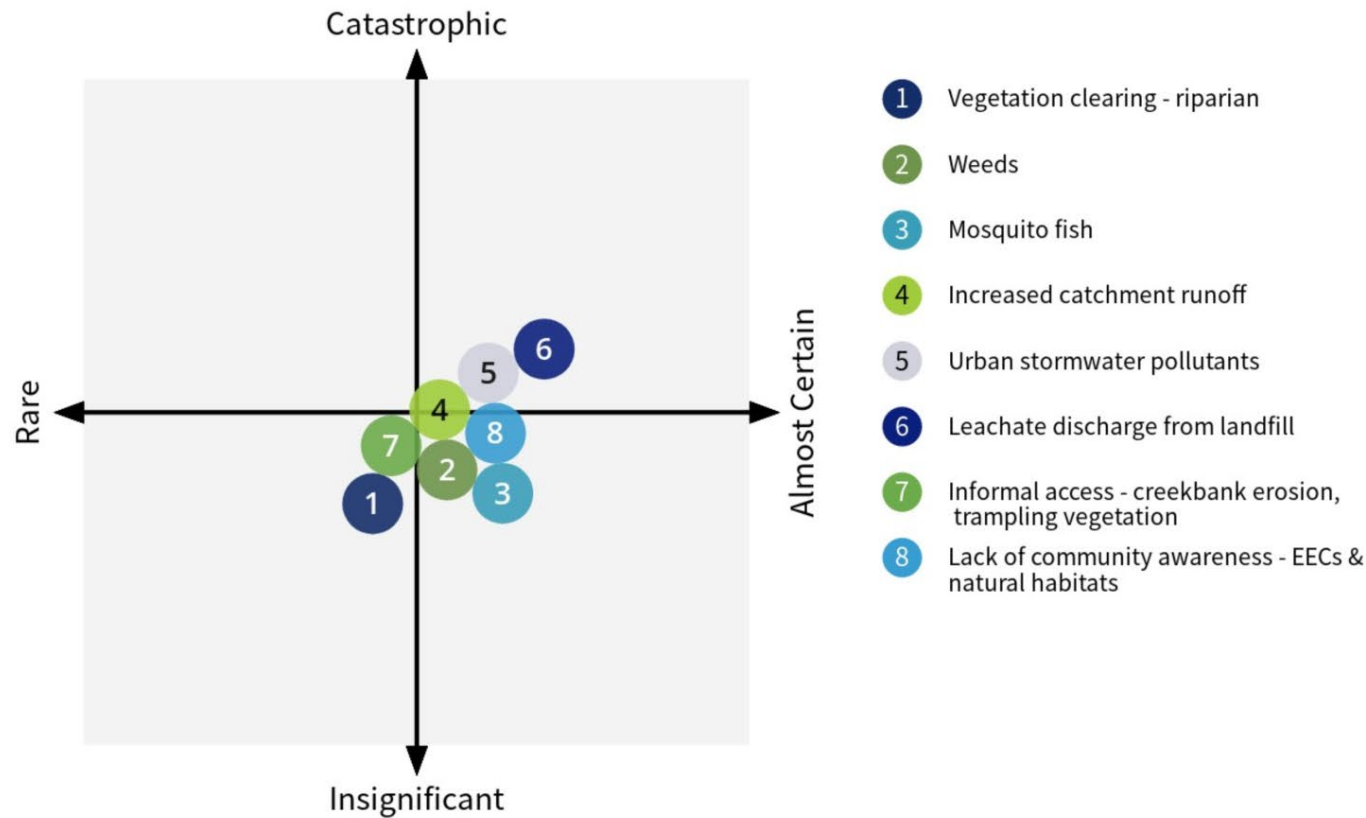
Hewitts, Woodlands & Tramway Creeks & McCauleys Beach Risks



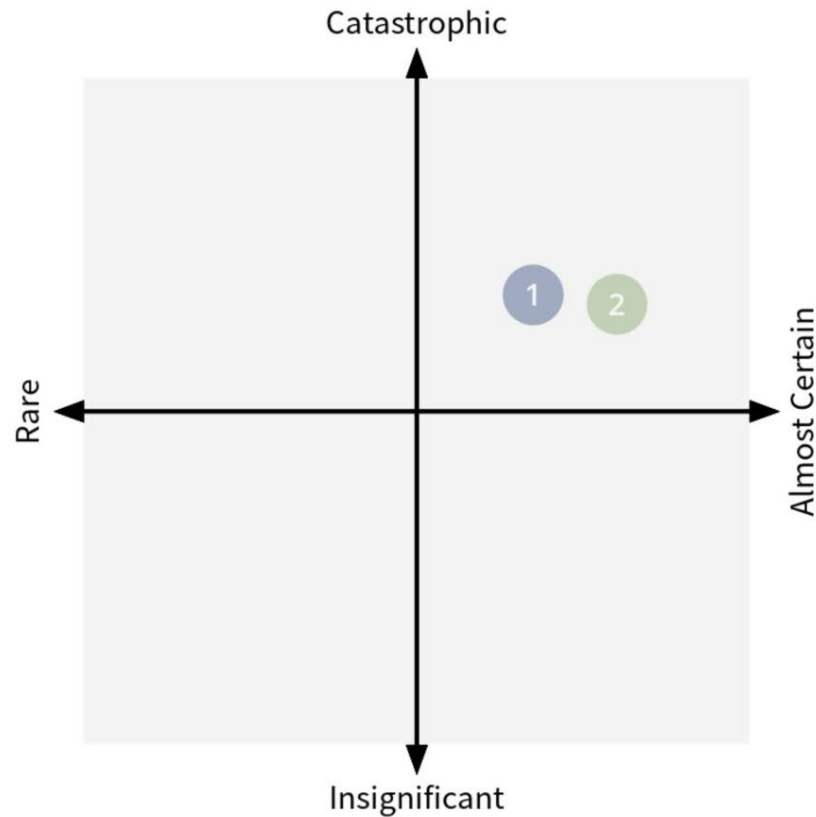
Slacky Creek & Sandon Point Risks



Whartons Creek & Collins Creek Risks

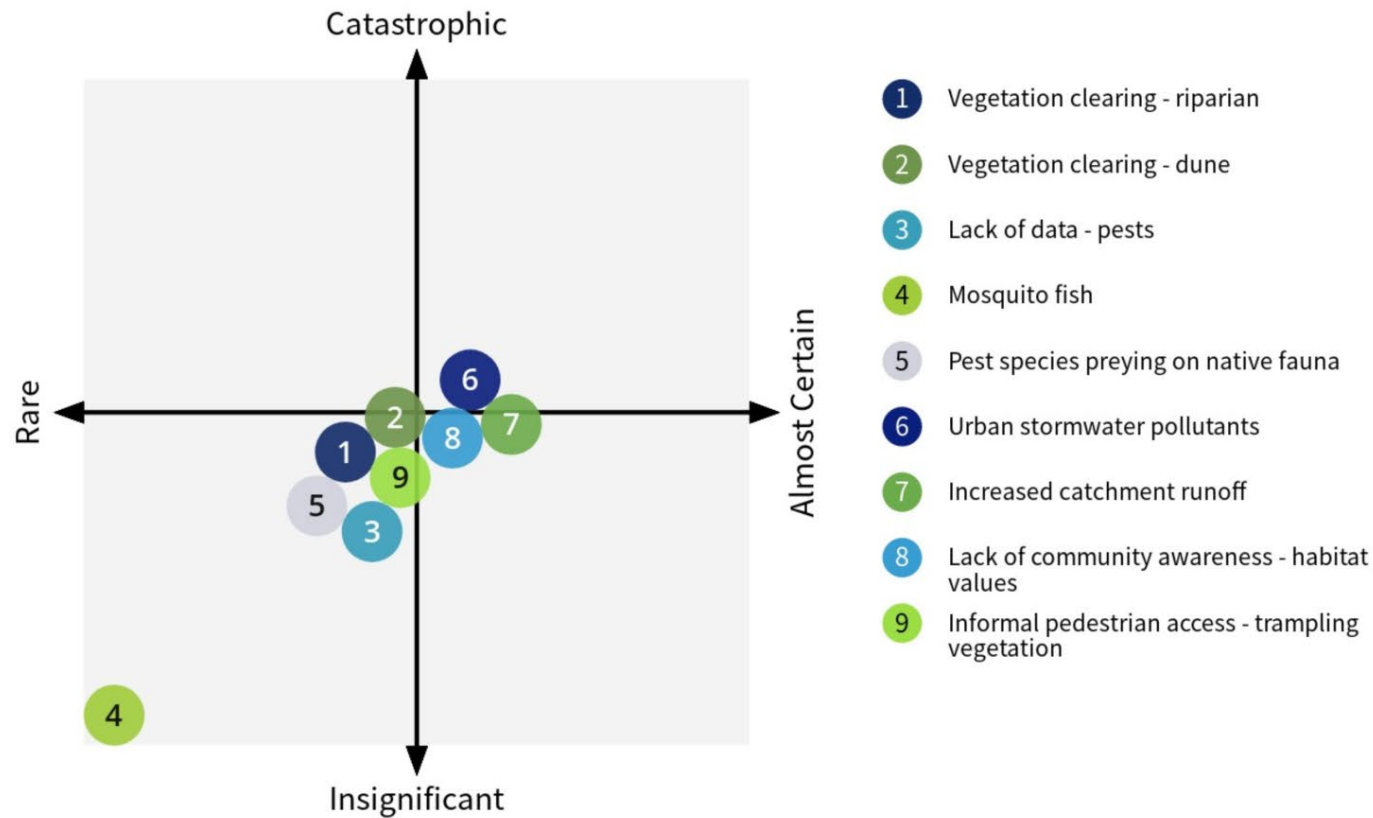


Woonona Beach Risks

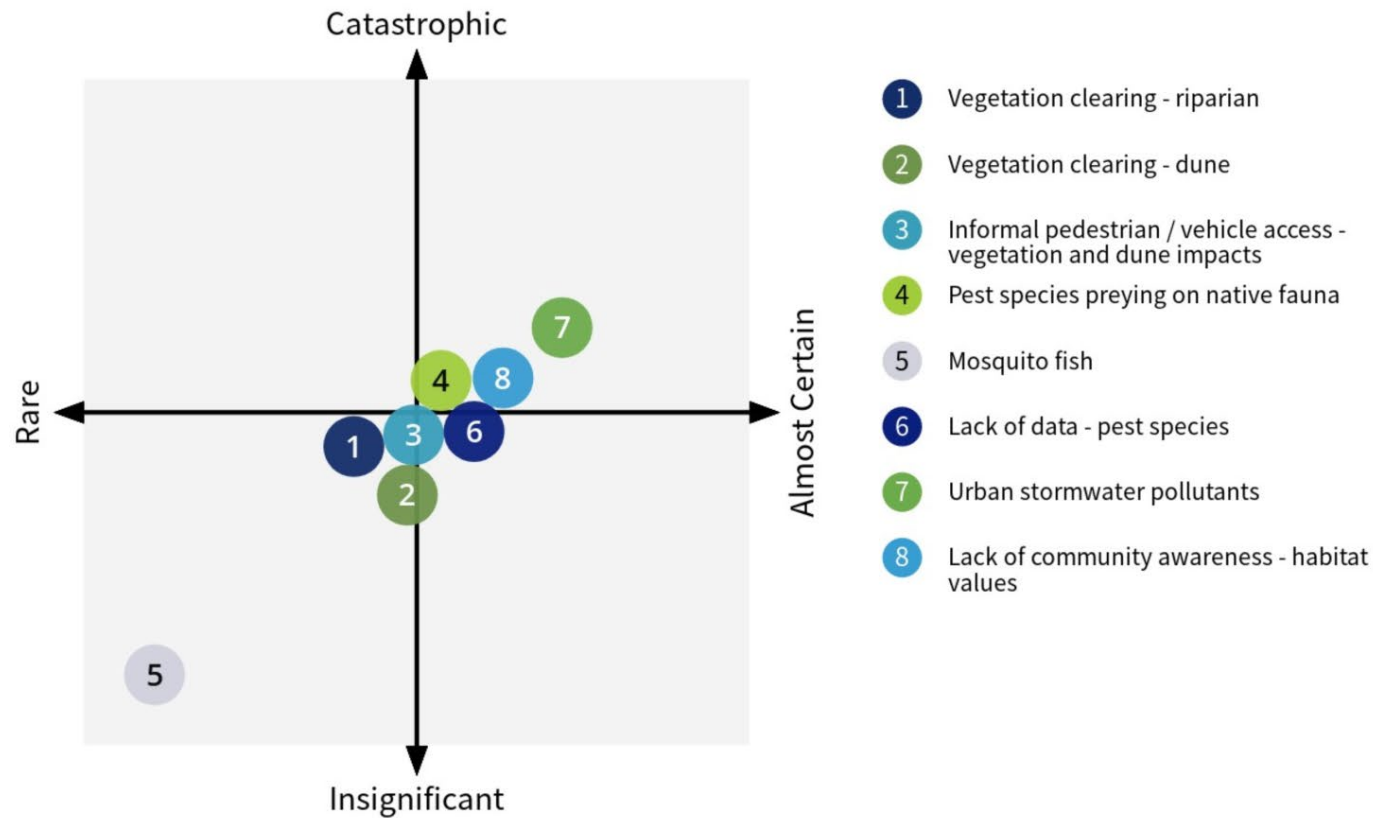


- 1 Lack of community awareness - importance of natural habitats
- 2 Vegetation vandalism

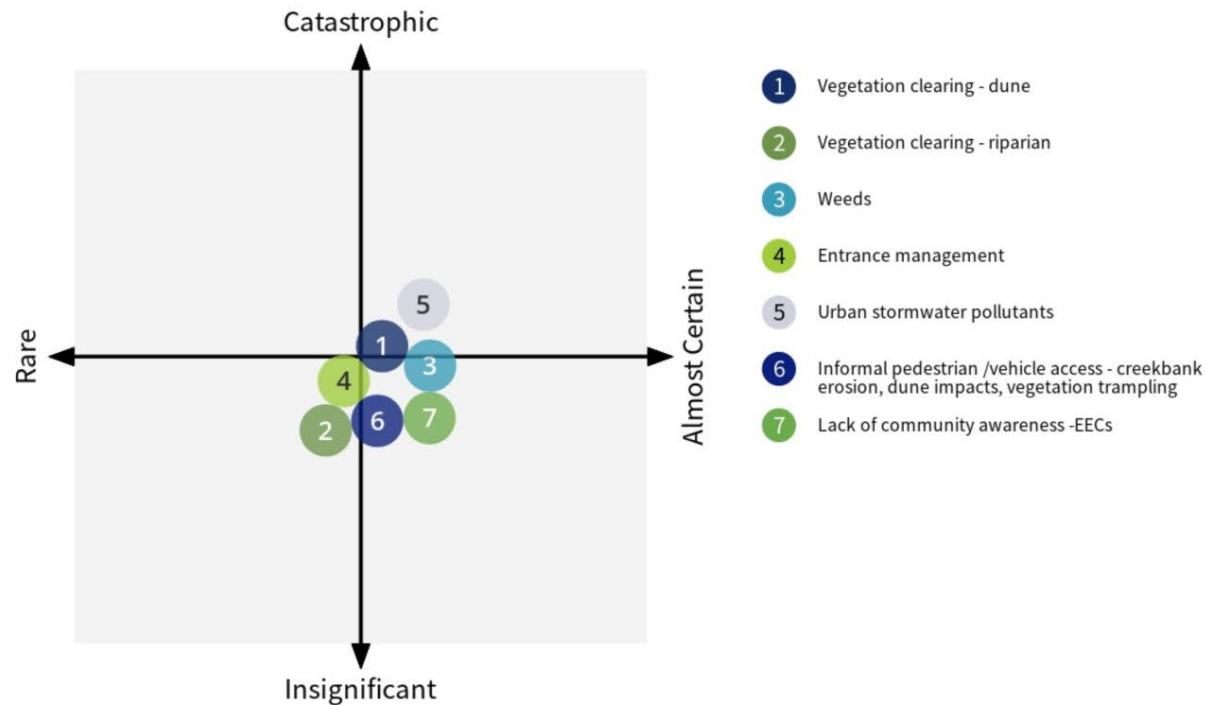
Bellambi Gully & Bellambi Beach



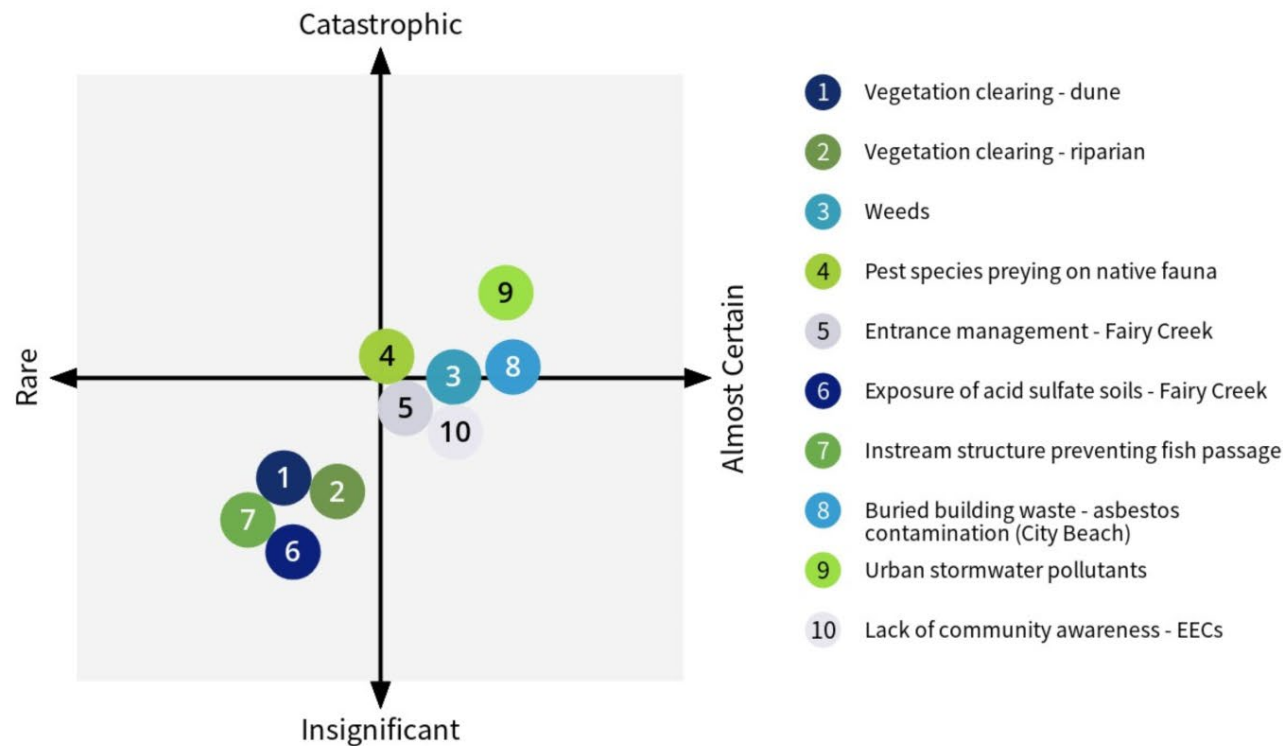
Bellambi Lagoon & Corrimal Beach



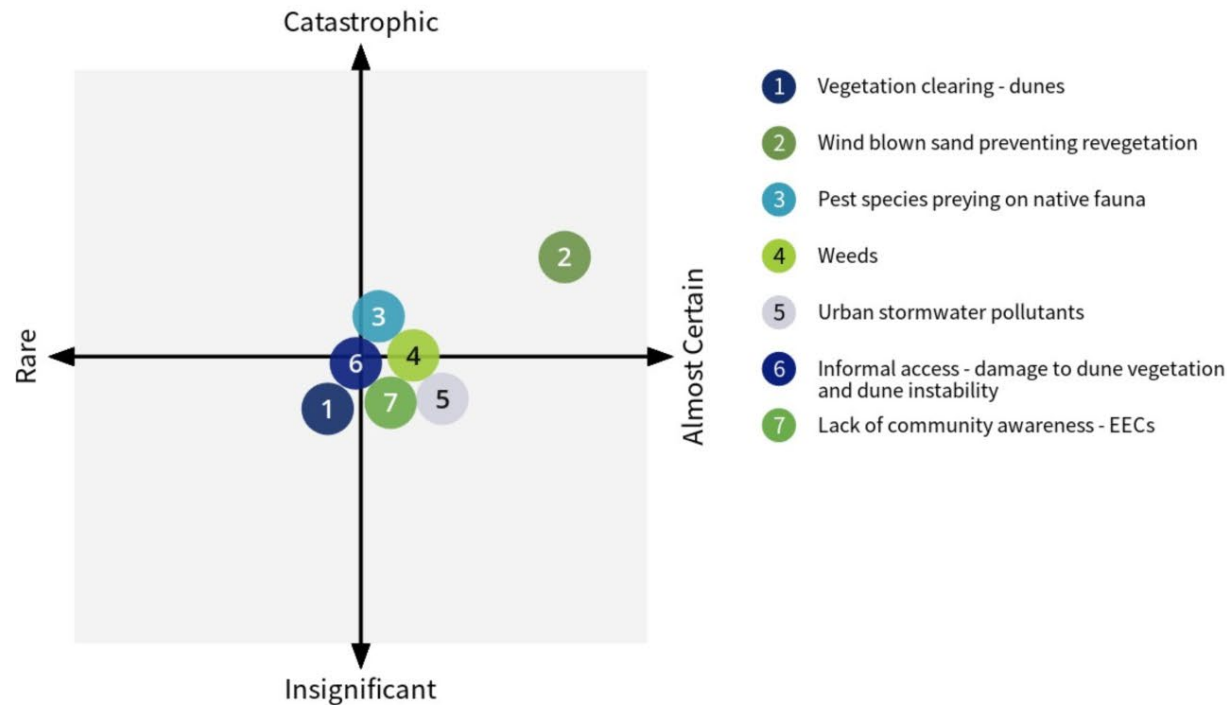
Towradgi Creek & Corrimal Beach Risks



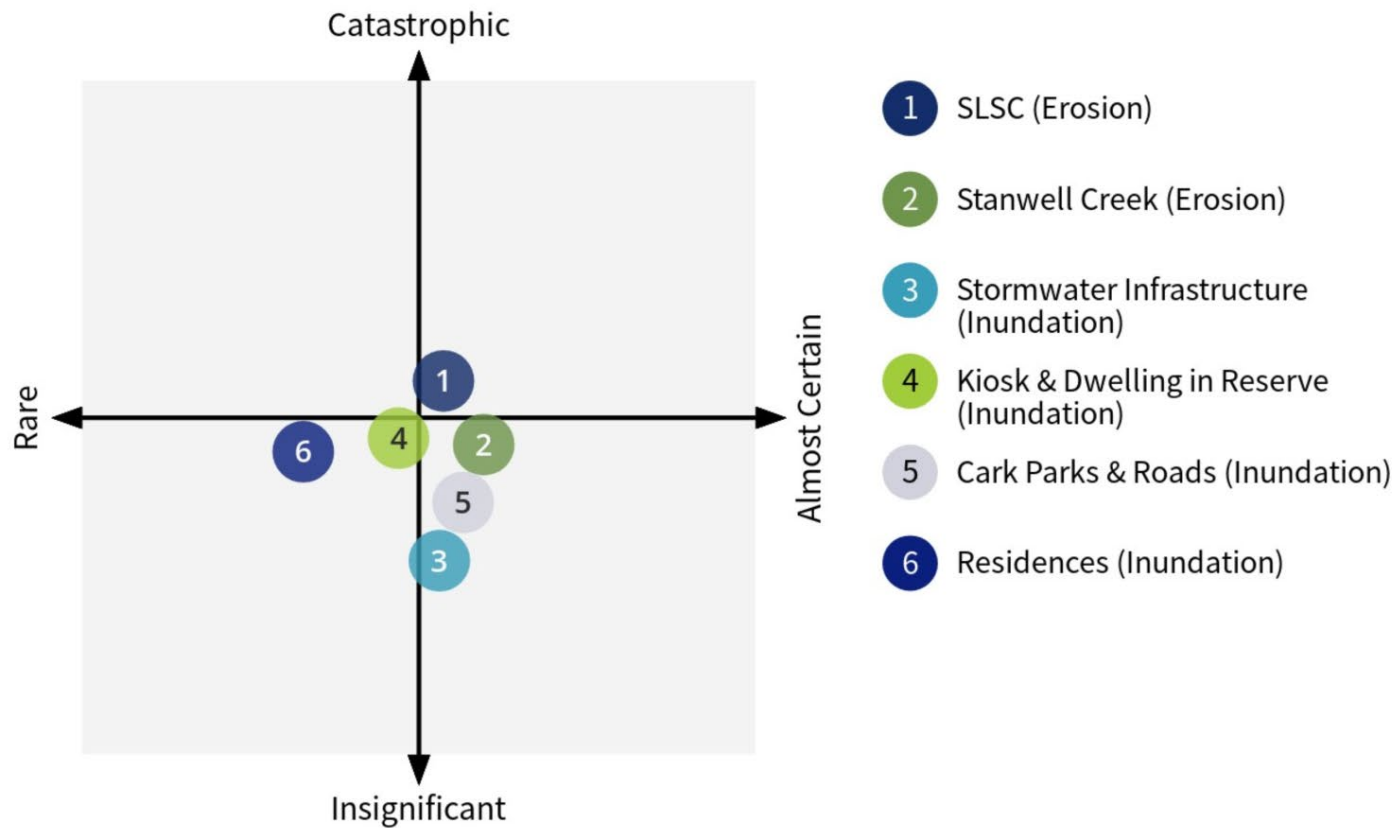
Fairy Creek, Fairy Meadow Beach, North Wollongong Beach & City Beach Risks



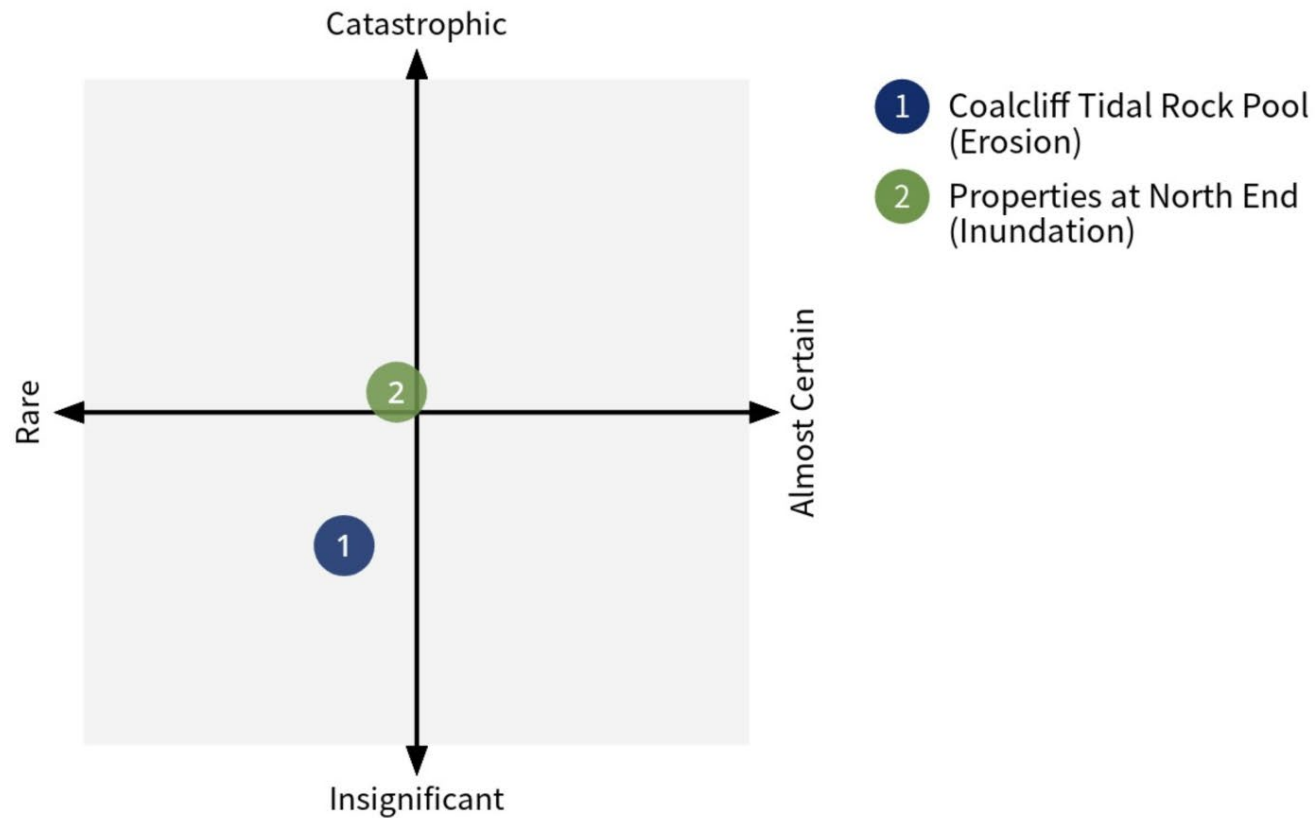
Port Kembla Beach & Perkins Beach Risks



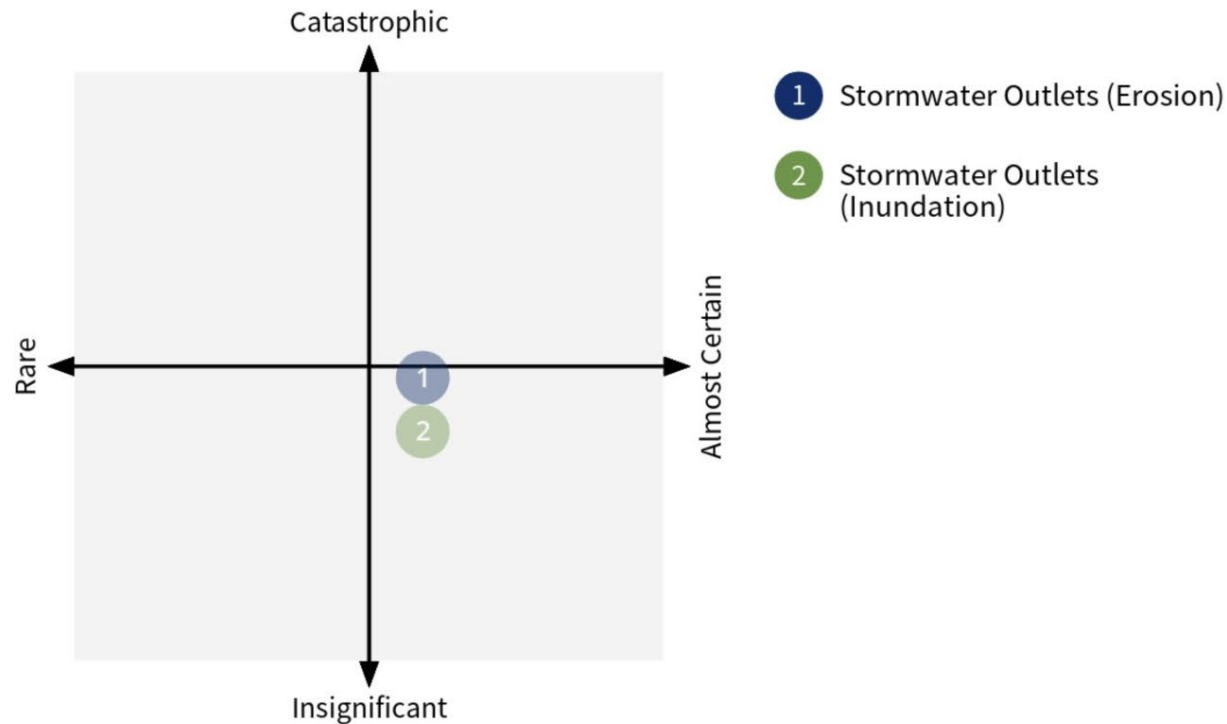
Stanwell Park Coastal Vulnerability Issues



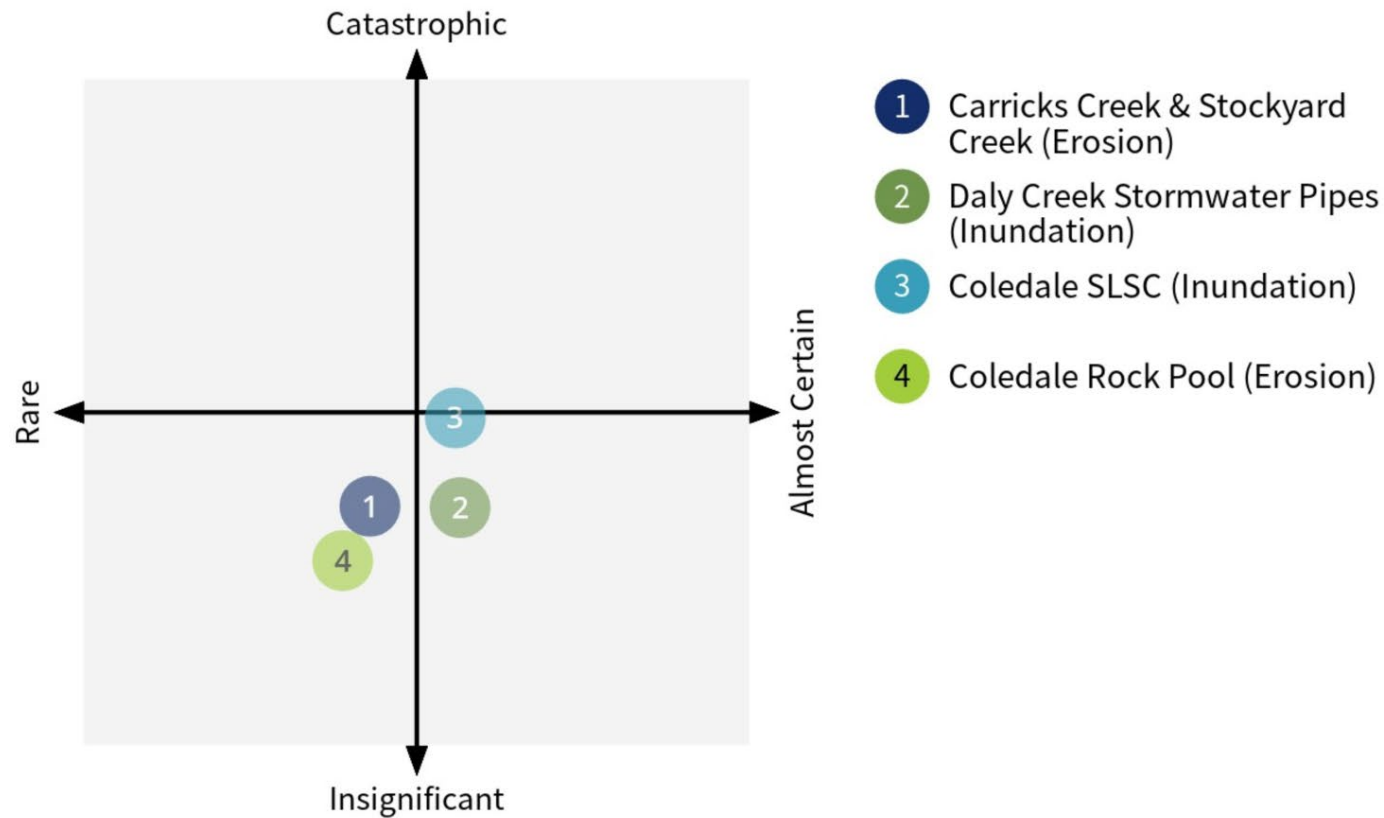
Coalcliff Coastal Vulnerability Issues



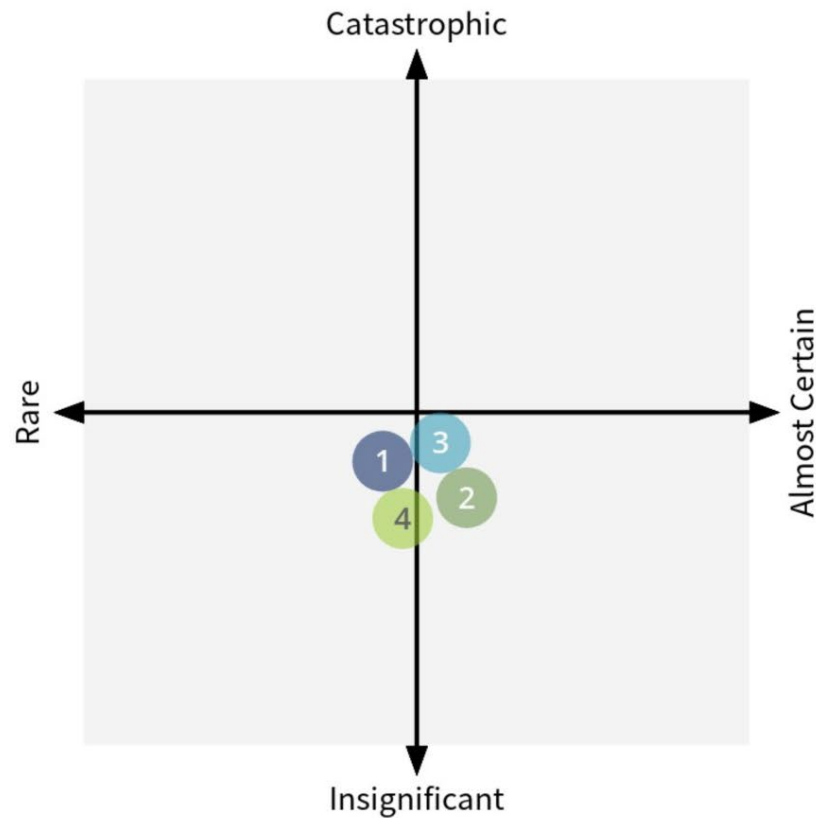
Scarborough and Wombarra Coastal Vulnerability Issues



Coledale Coastal Vulnerability Issues

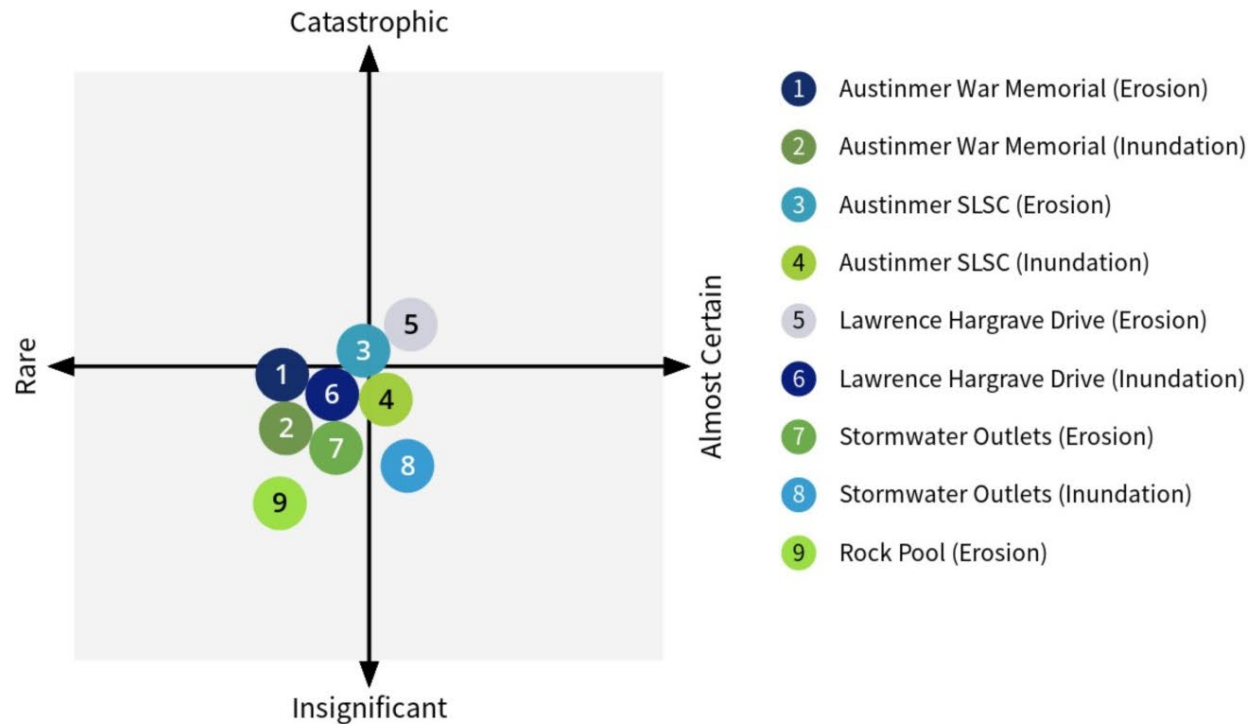


Sharky Coastal Vulnerability Issues

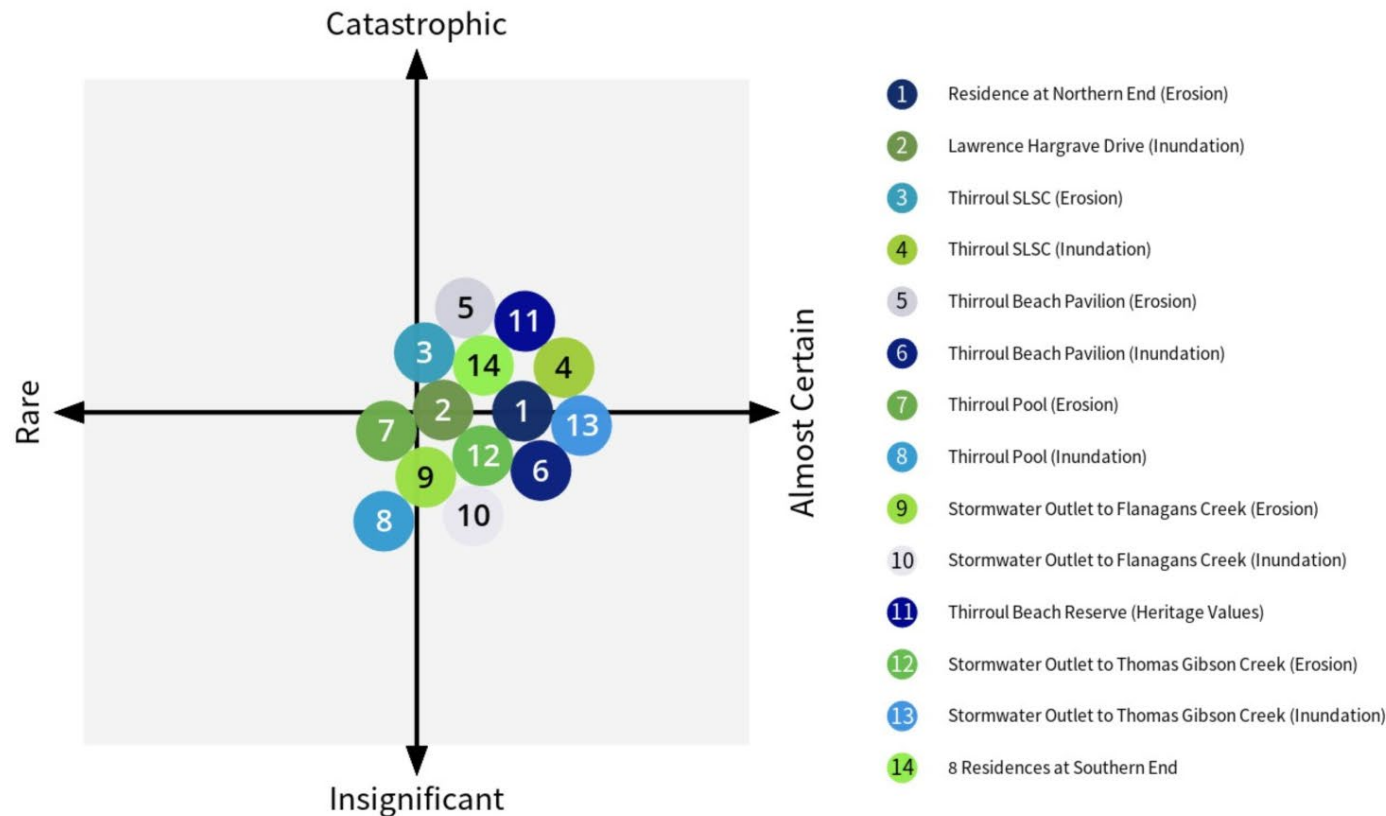


- 1 Stormwater Outlets and Pipes (Erosion)
- 2 Stormwater Outlets and Pipes (Inundation)
- 3 Austinmer Jetty Site & Heritage Items (Erosion)
- 4 Austinmer Jetty Site & Heritage Items (Inundation)

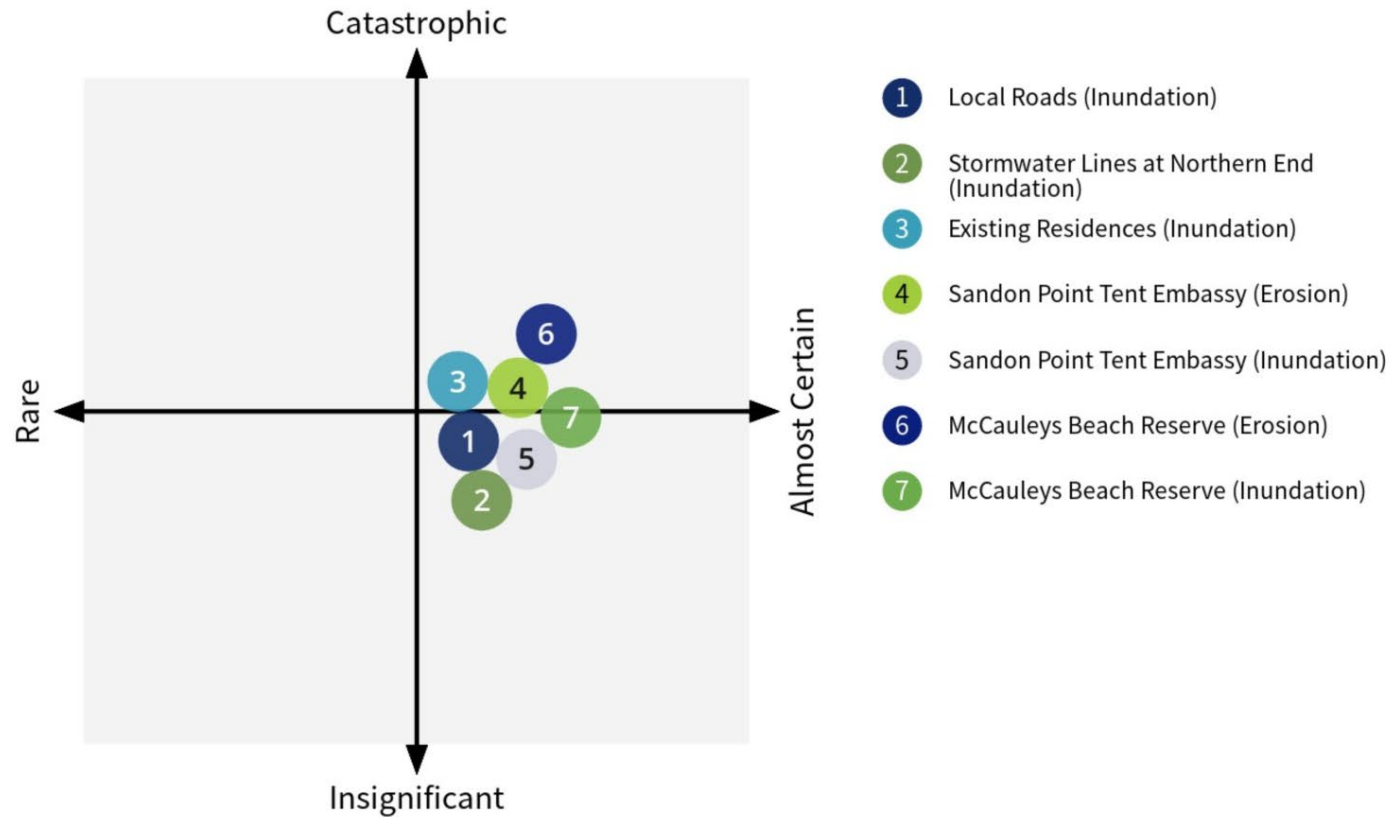
Little Austinmer & Austinmer Coastal Vulnerability Issues



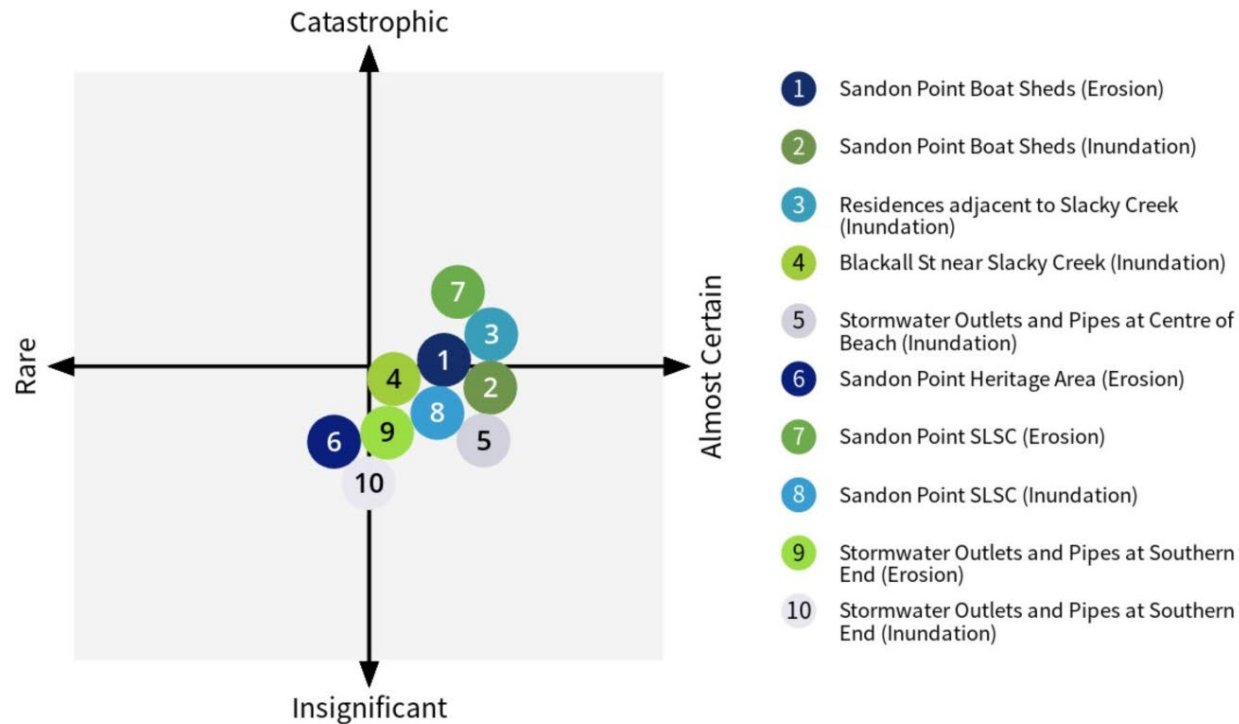
Thirrourl Coastal Vulnerability Issues



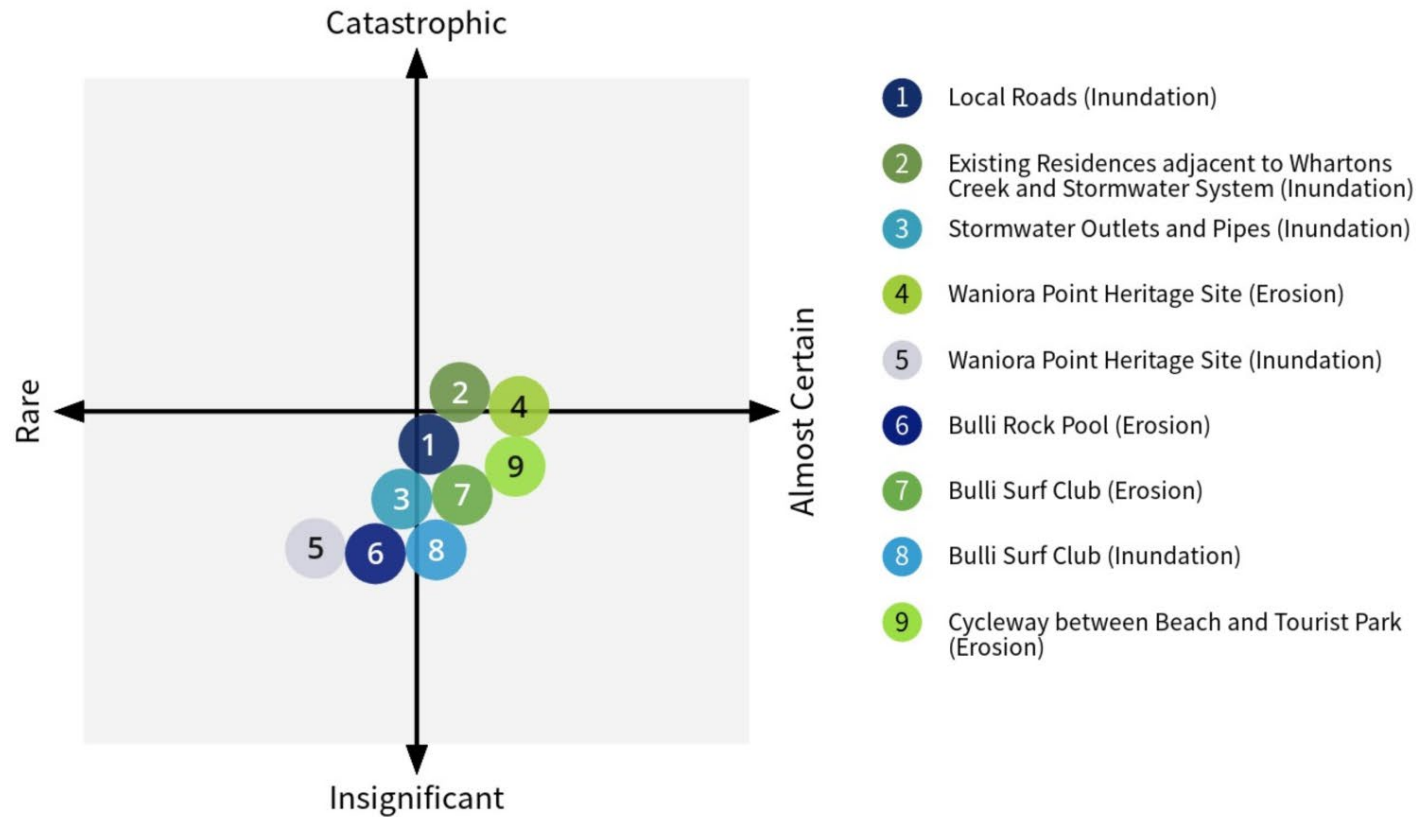
McCauleys Coastal Vulnerability Issues



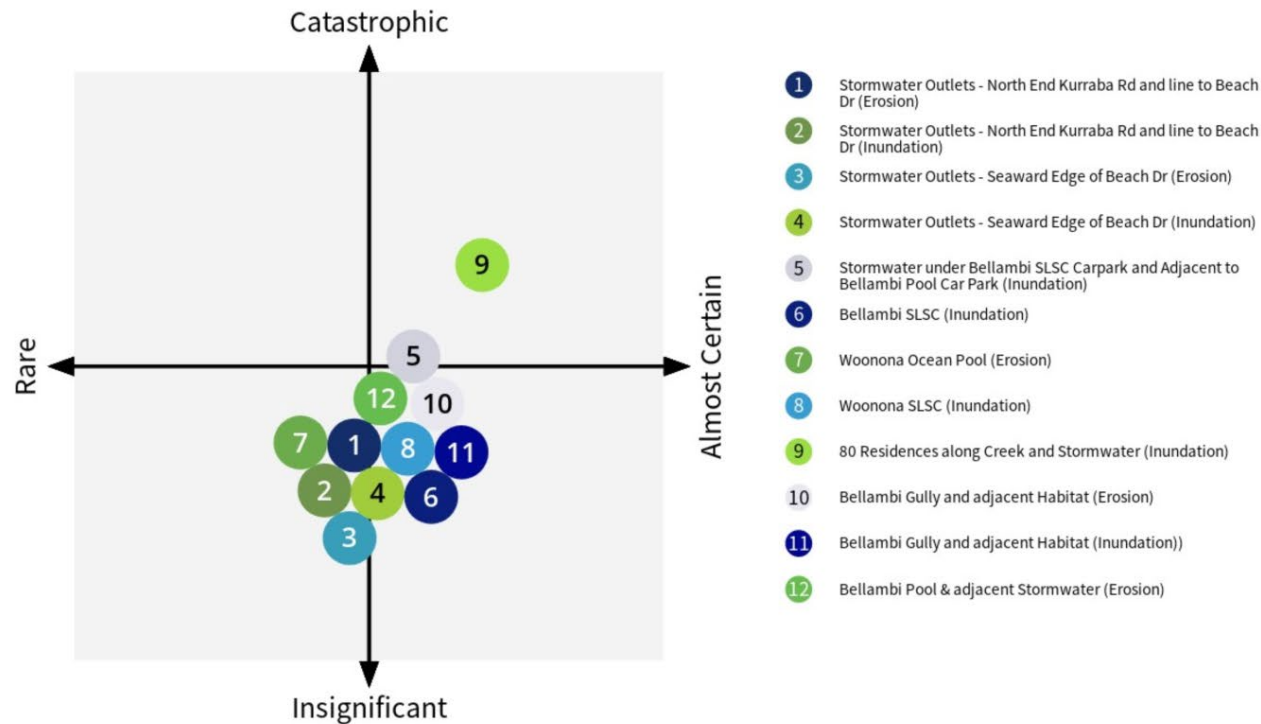
Sandon Pt Beach Coastal Vulnerability Issues



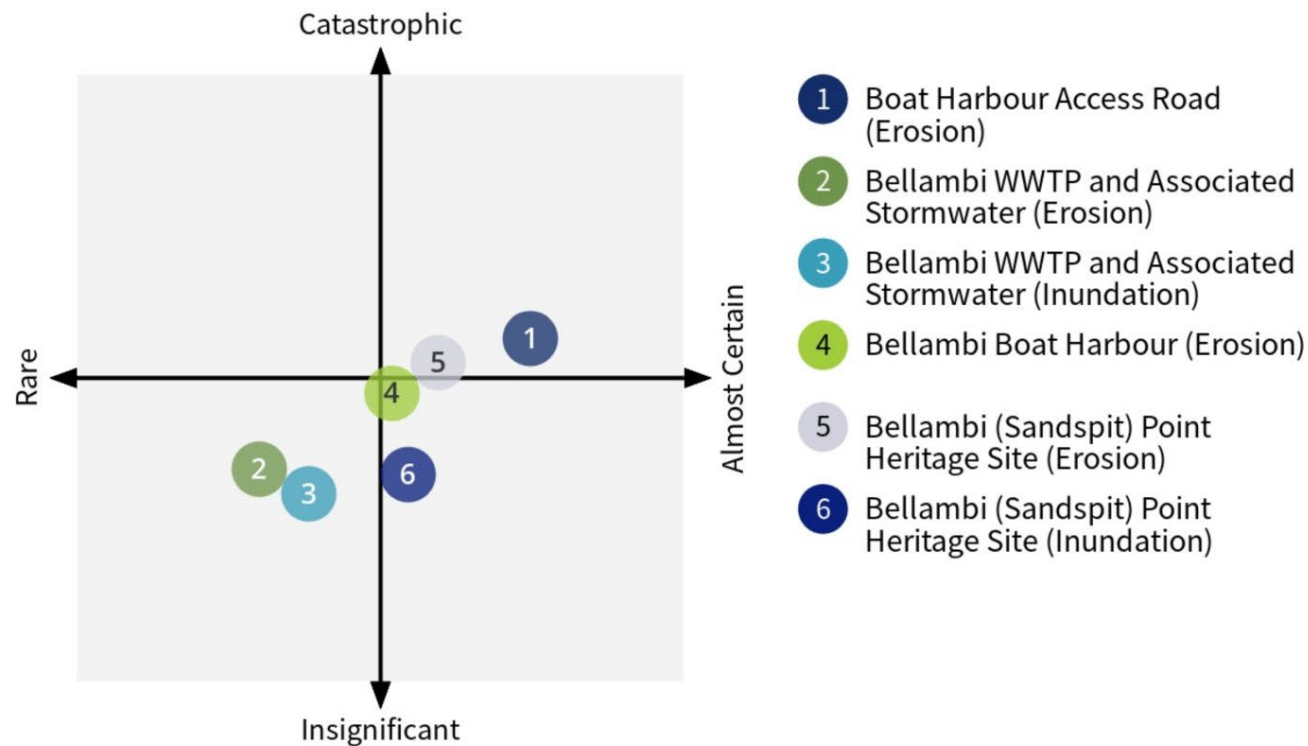
Bulli Coastal Vulnerability Issues



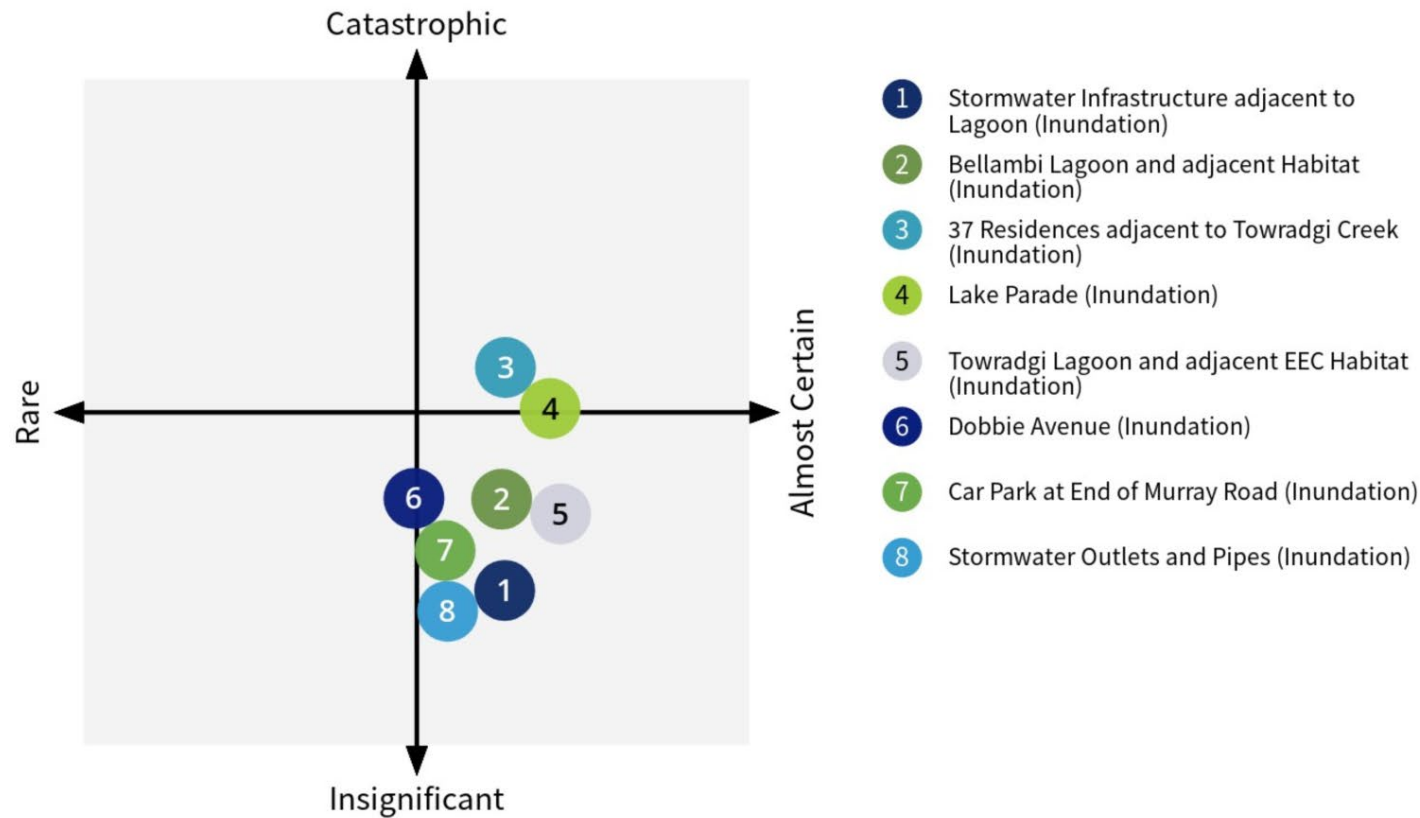
Woonona / Bellambi Coastal Vulnerability Issues



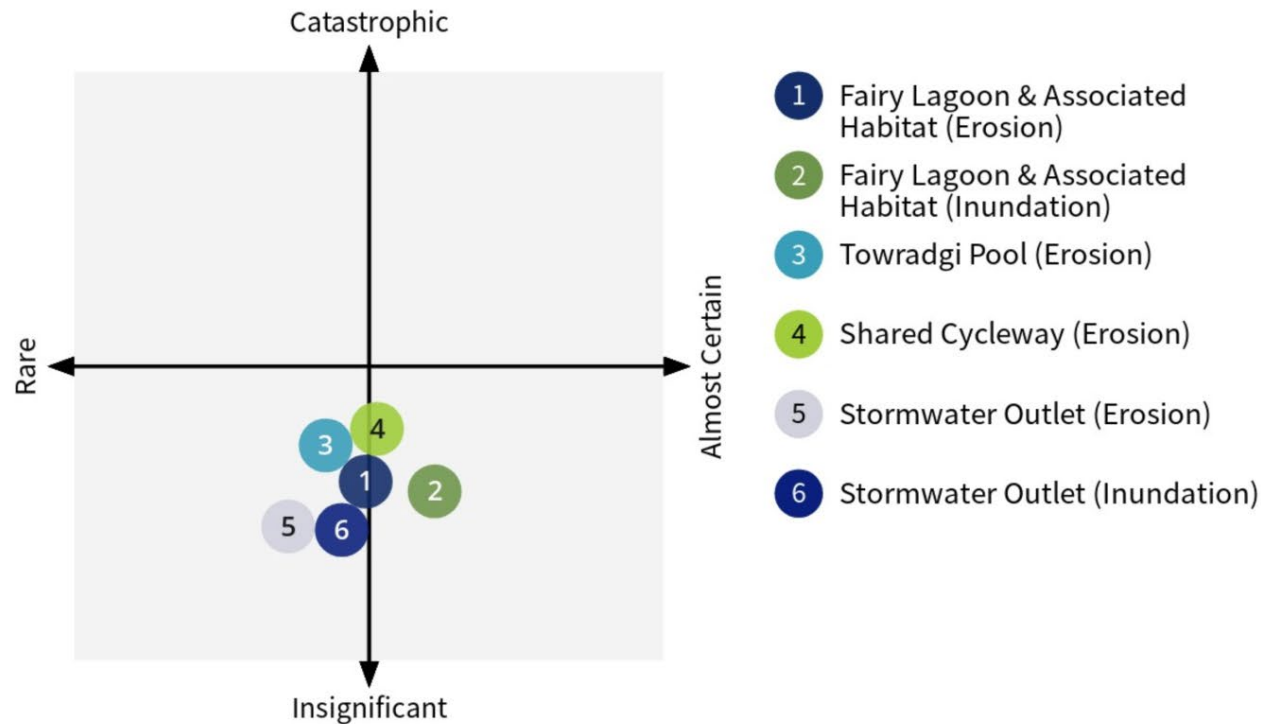
Bellambi Boat Harbour / Bellambi Point Beach Coastal Vulnerability Issues



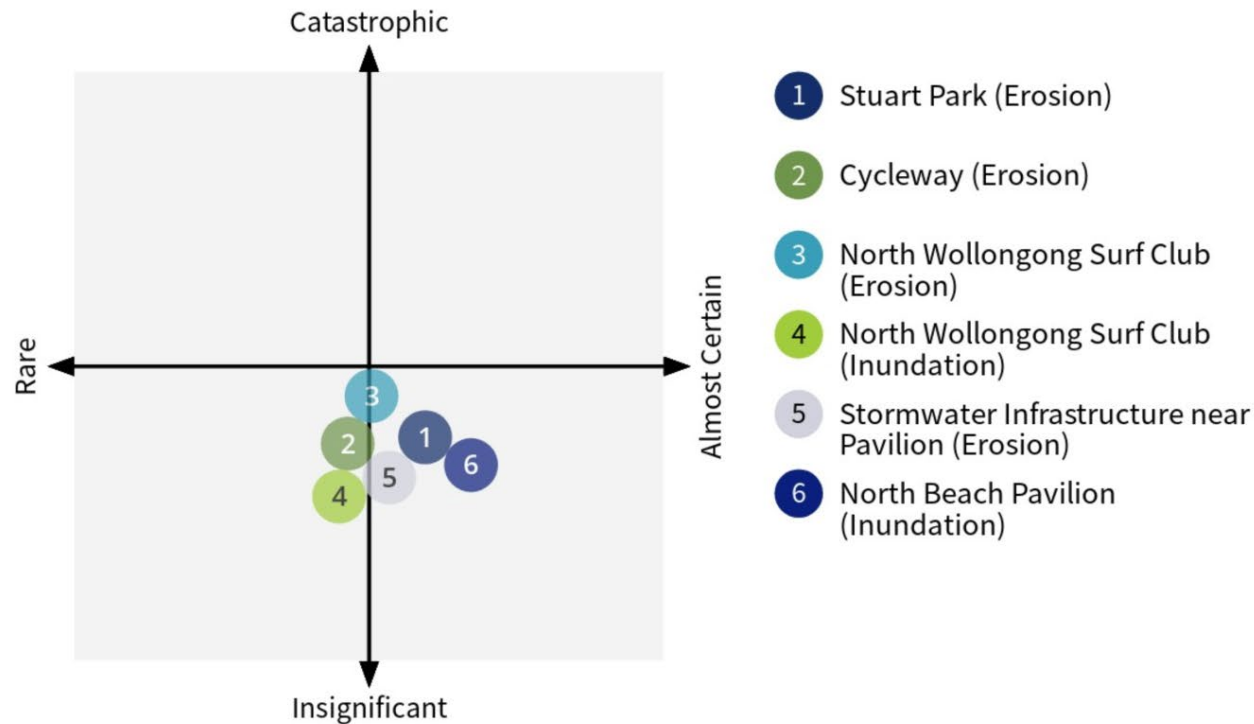
Corrimal Coastal Vulnerability Issues



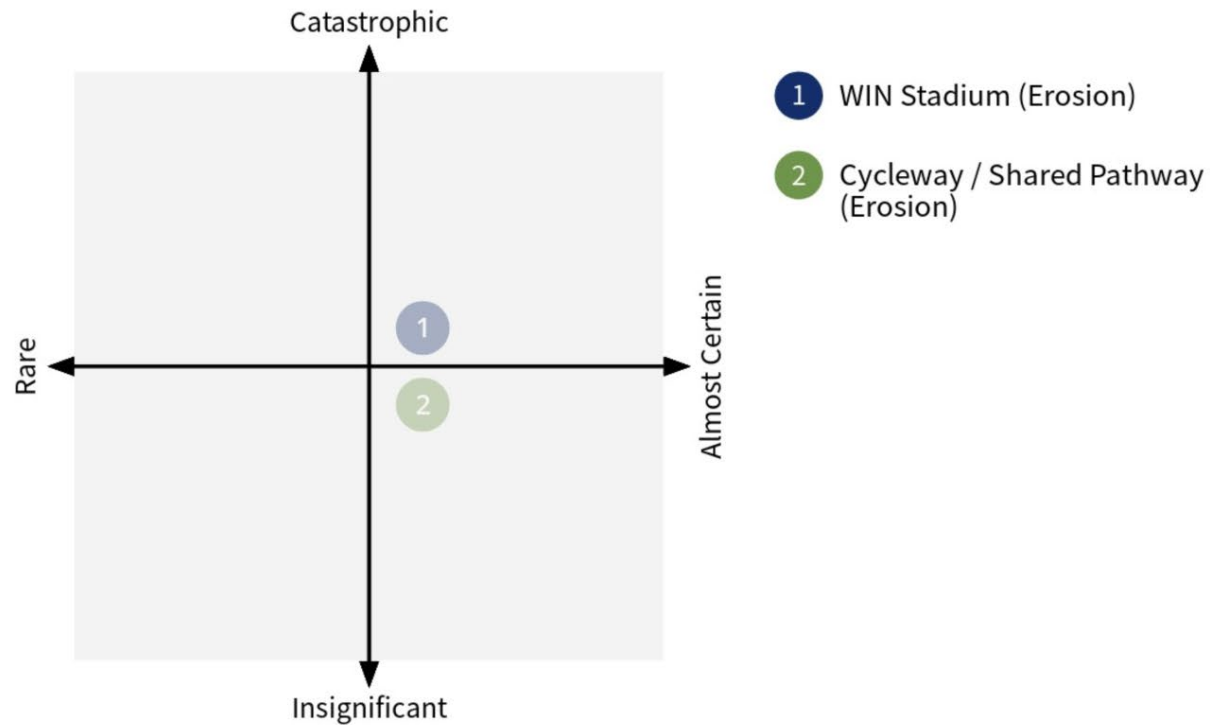
Towradgi / Fairy Meadow Coastal Vulnerability Issues



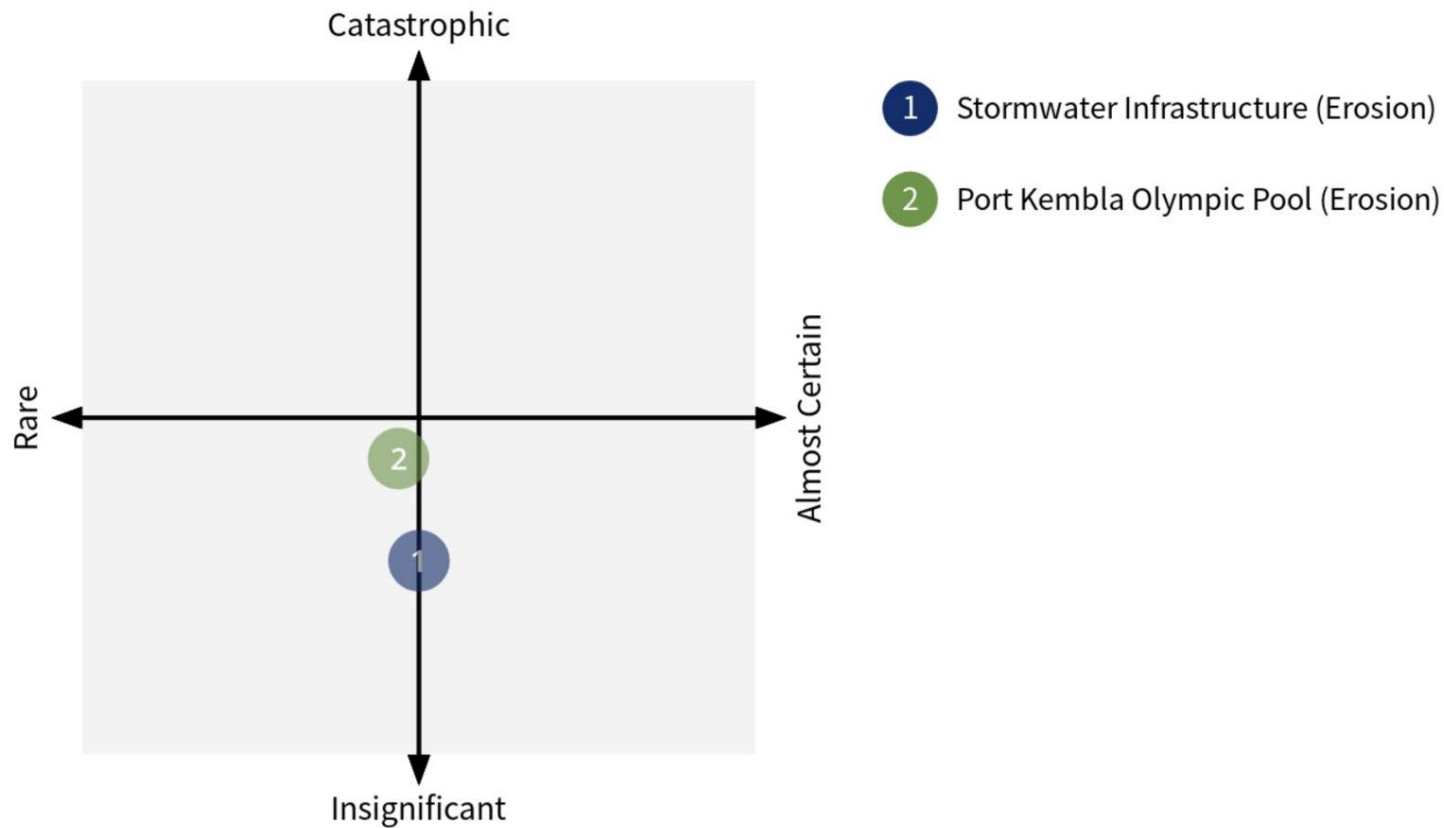
North Beach and Harbour Coastal Vulnerability Issues



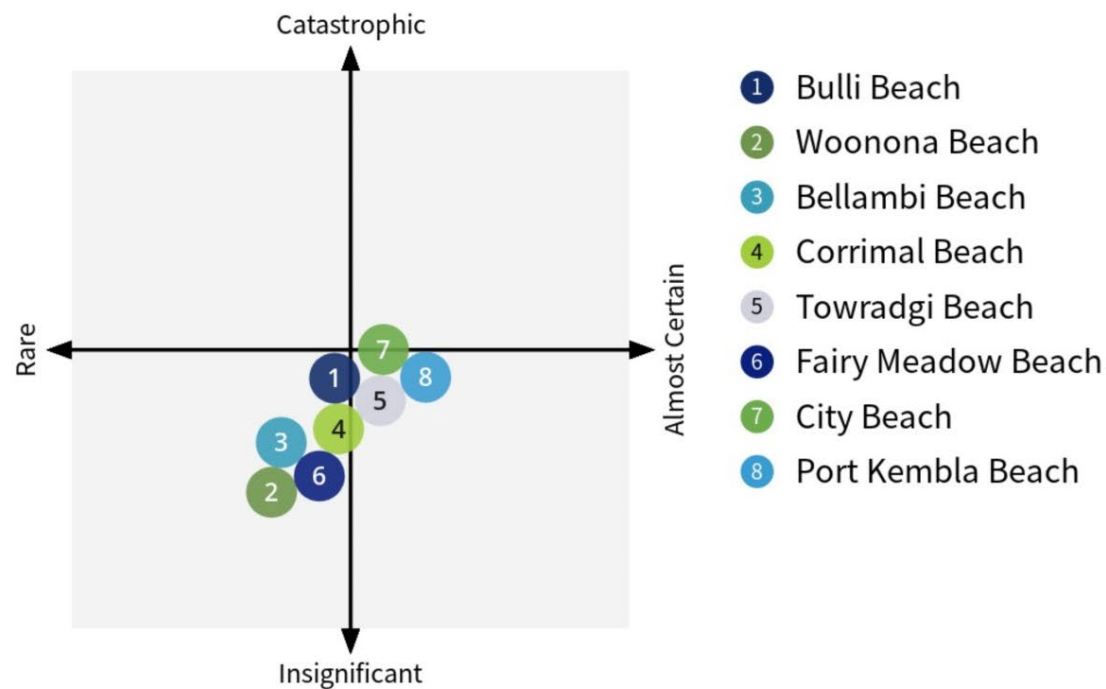
Coniston Beach Coastal Vulnerability Issues



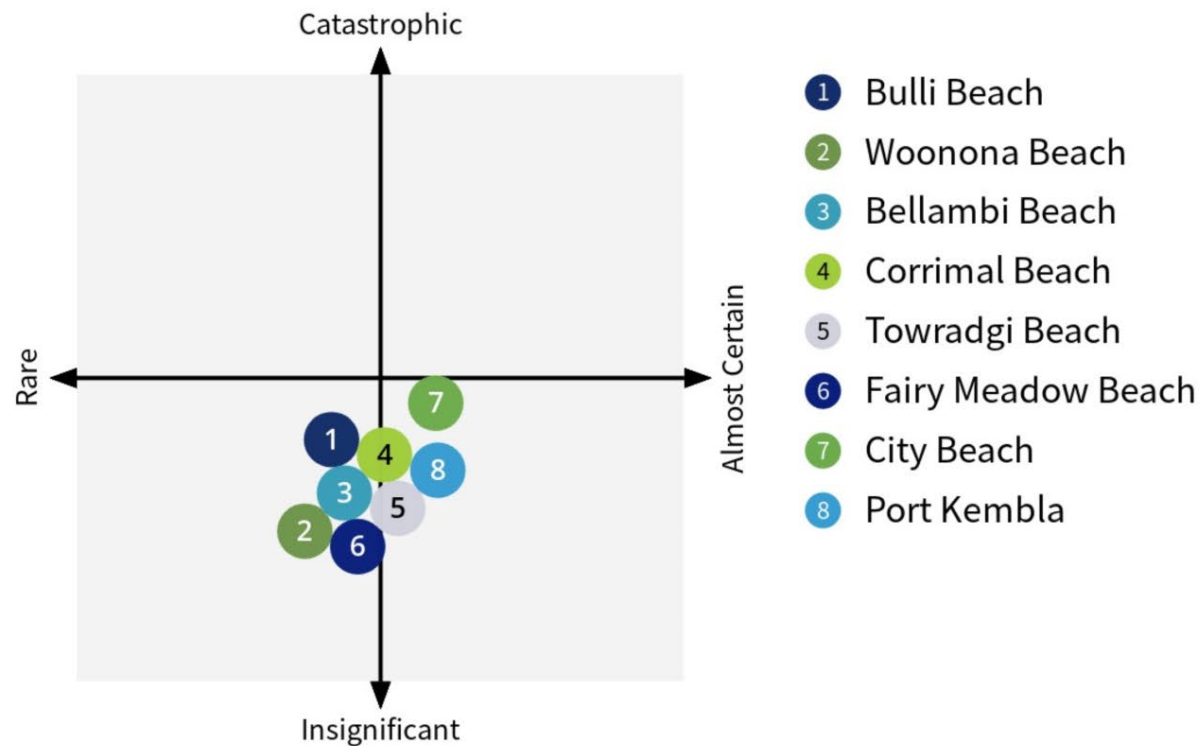
Port Kembla Coastal Vulnerability Issues



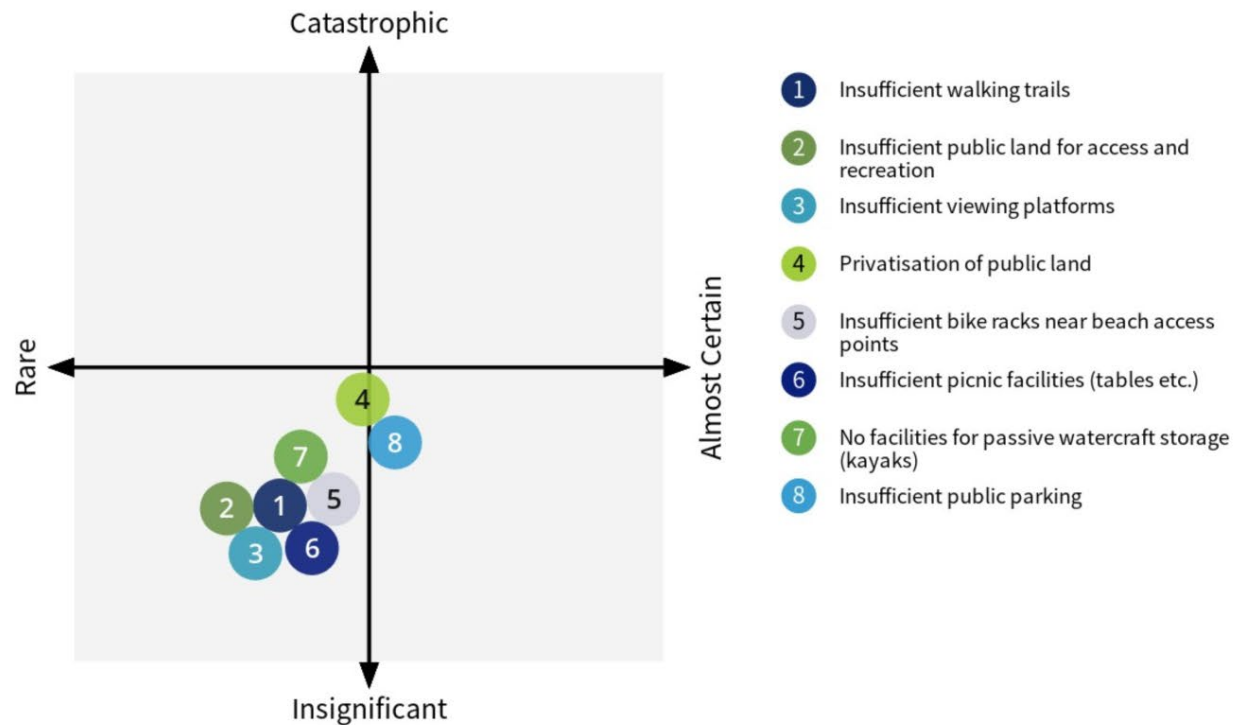
Beach access ways - width and grade not suitable due to uneven dune topography, scarping or encroaching dune vegetation



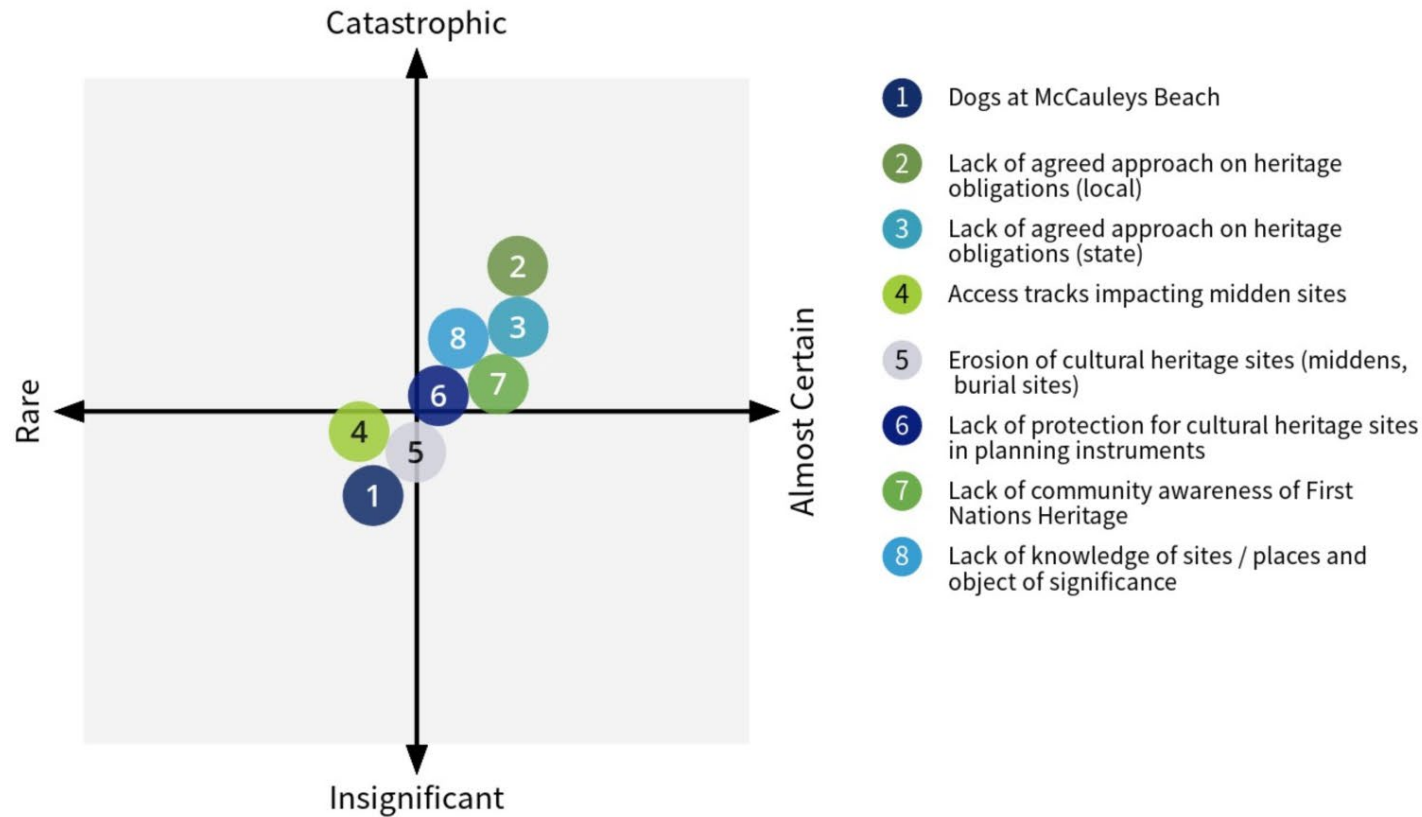
Minimal Beach Width and/or Moderate Scarps Impacting Recreation



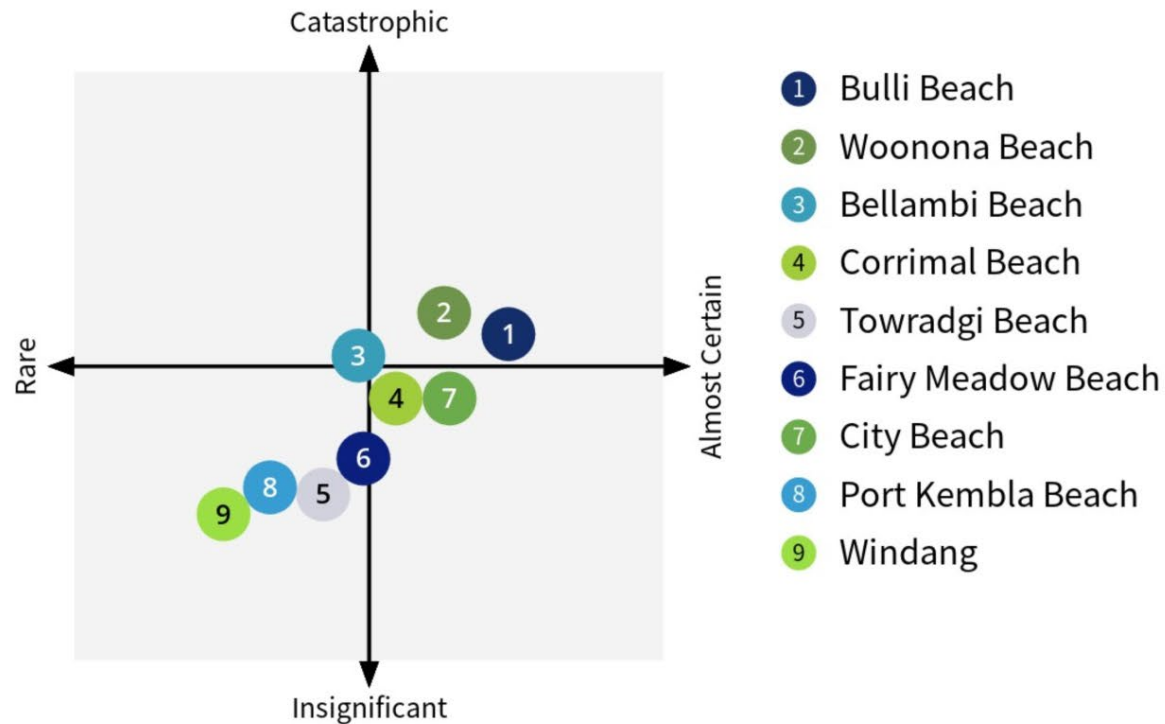
Other Recreation Issues - decreased amenity



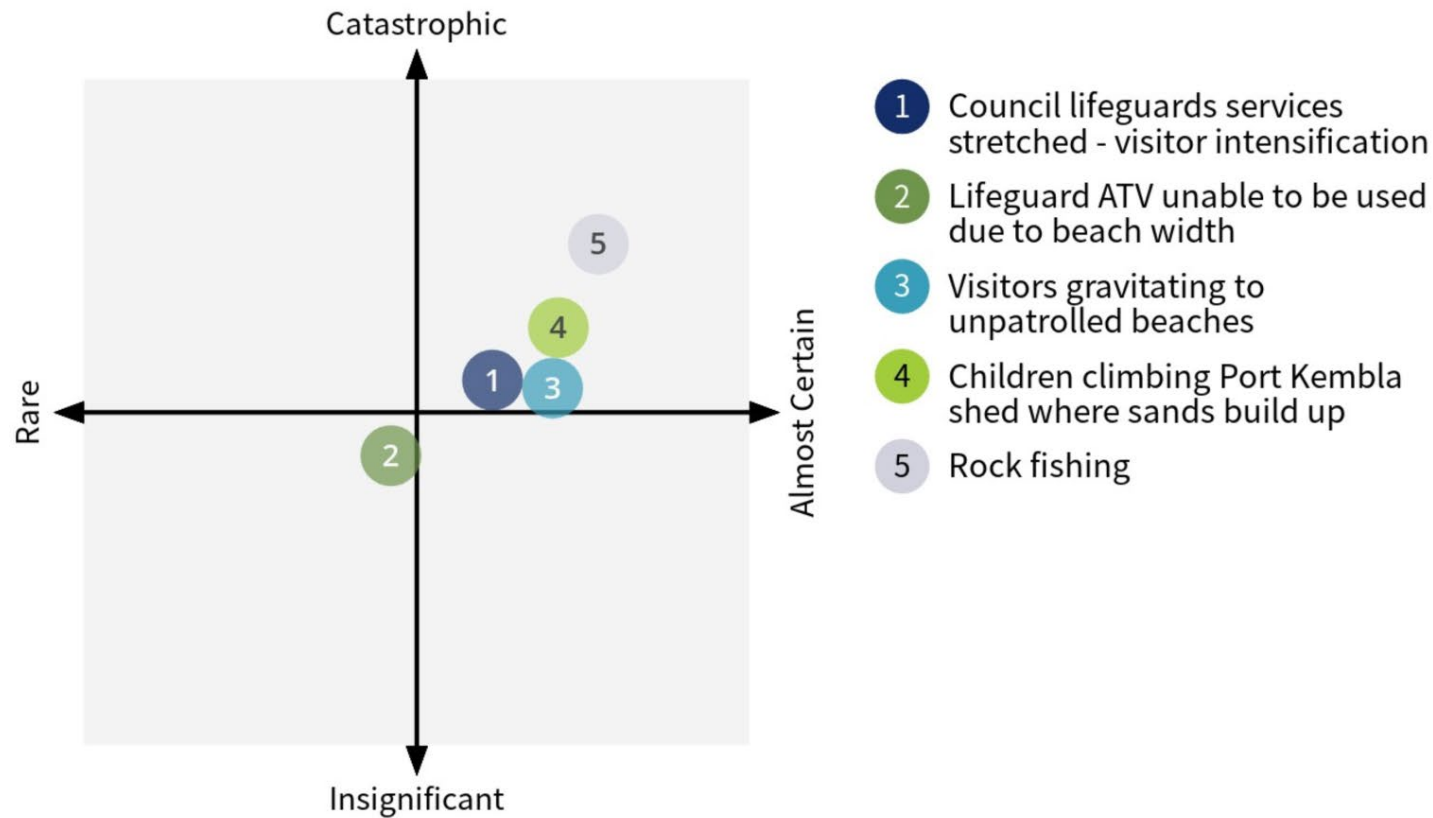
Cultural Heritage



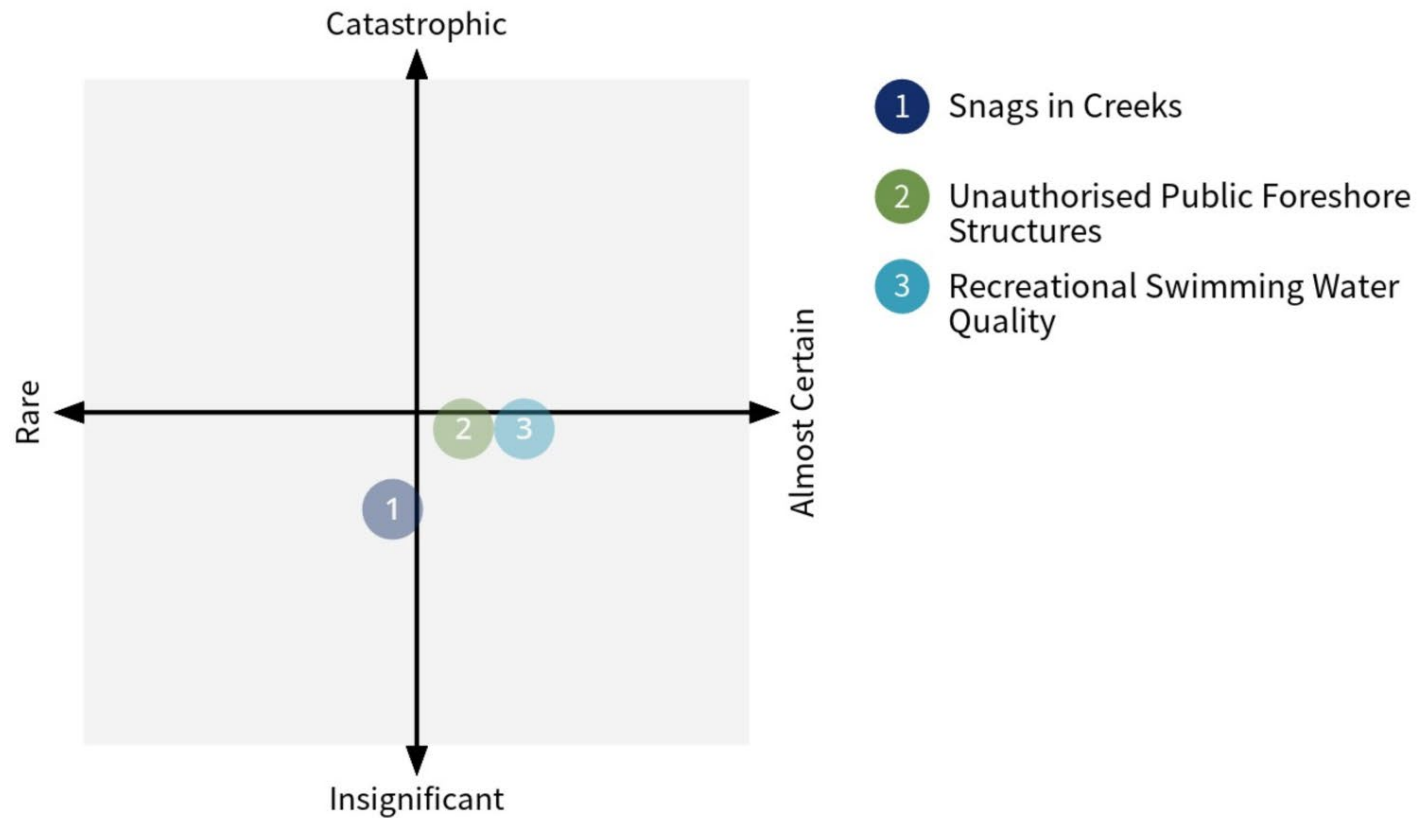
Beach Safety - Patrol View impeded by Vegetation



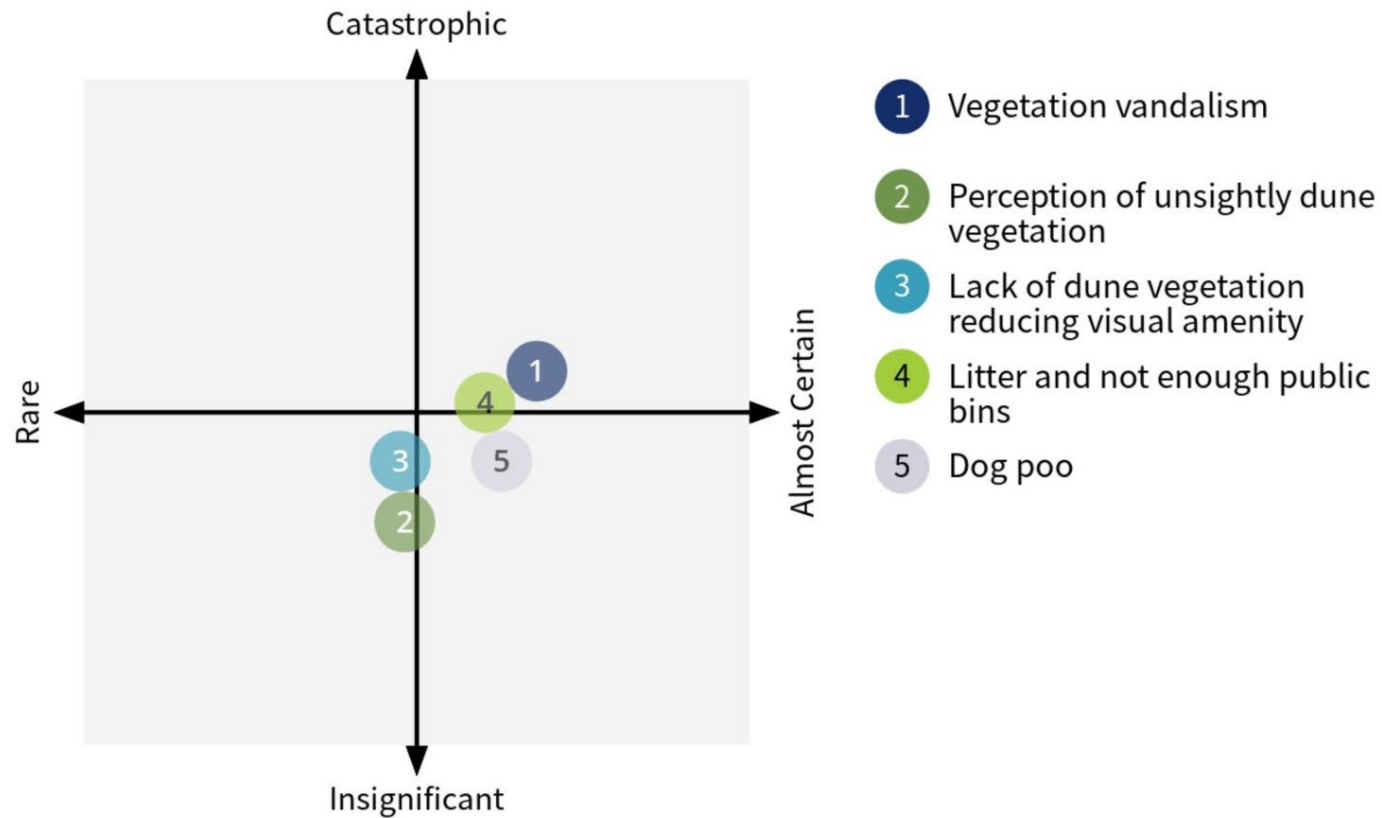
Other Safety Issues



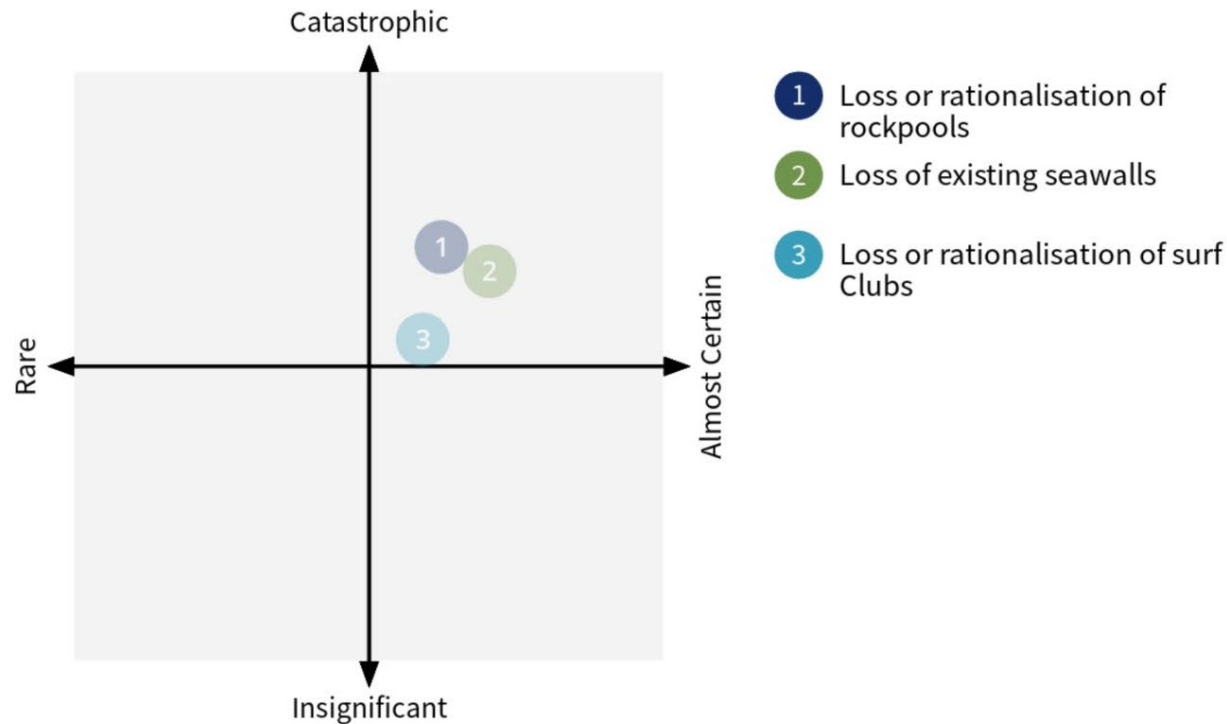
Health and Safety



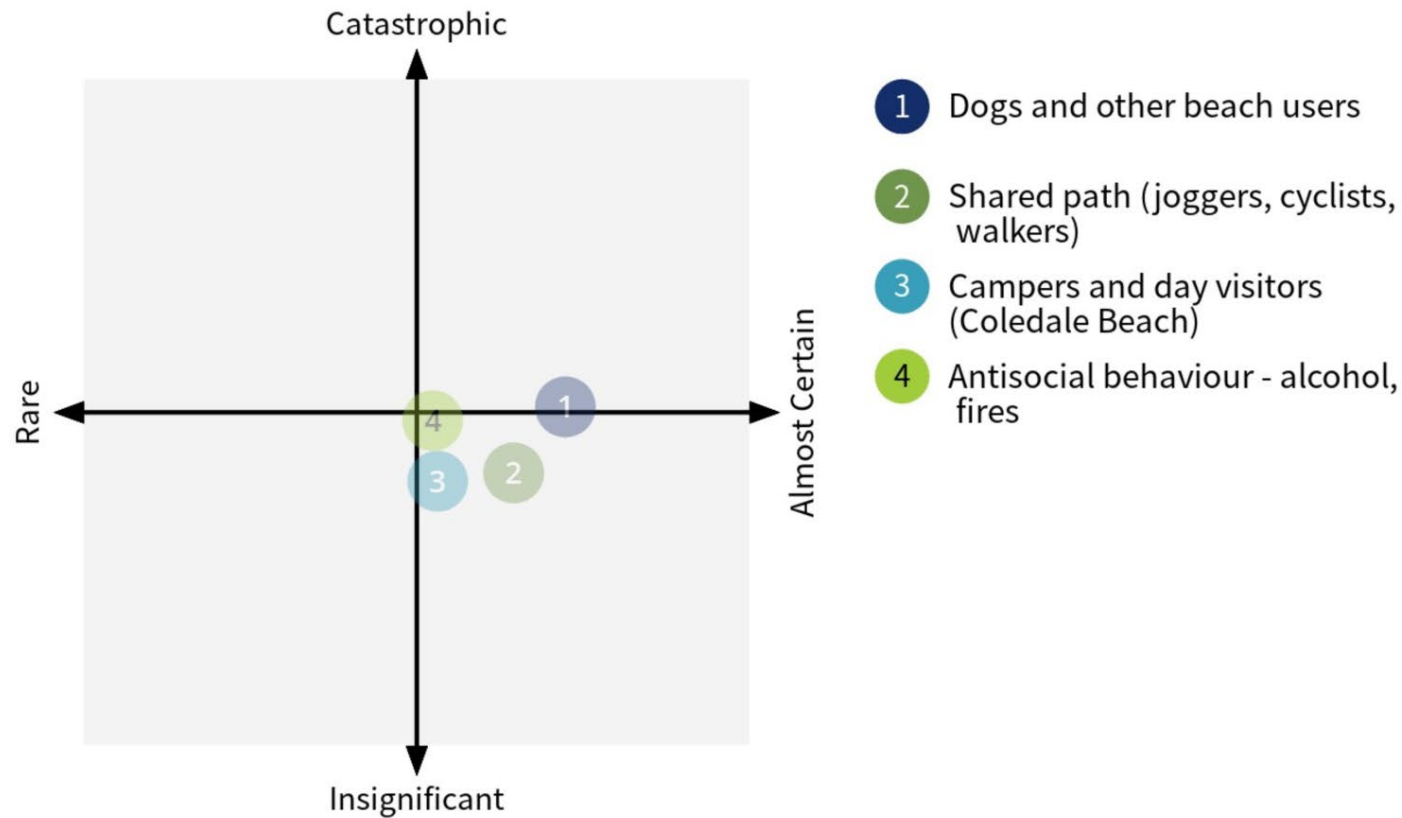
Visual Amenity



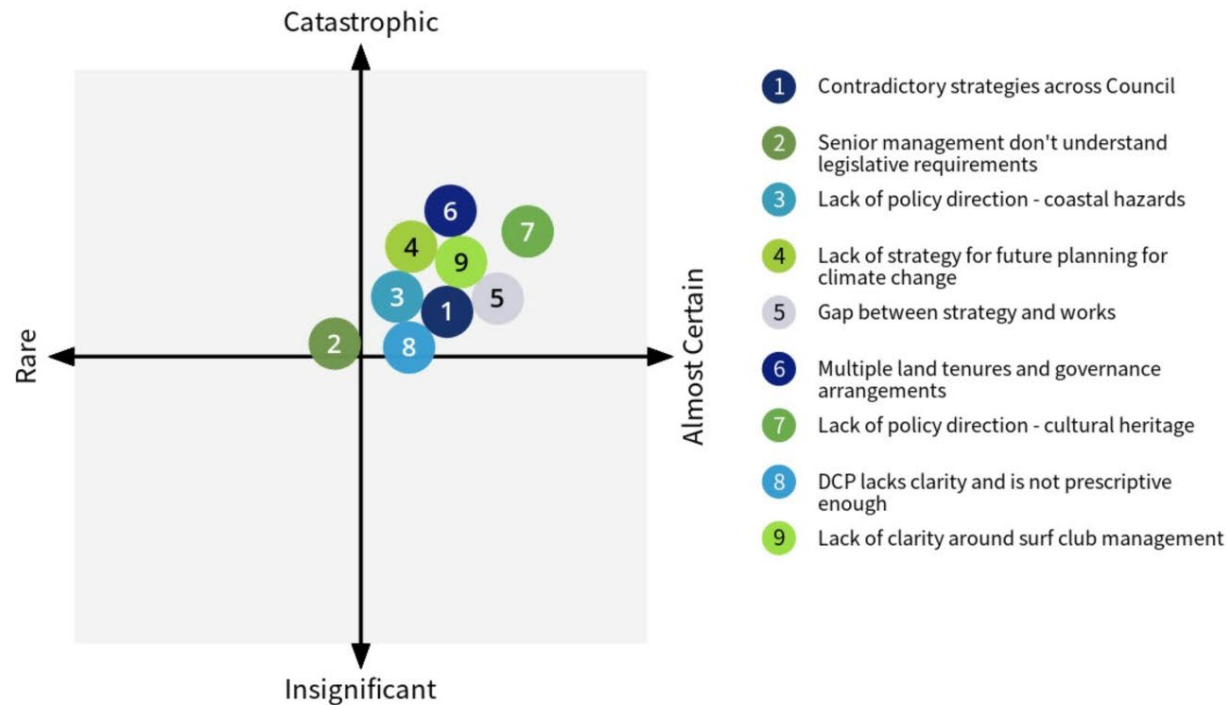
Infrastructure Management not sustainable



User Conflicts



Governance in Managing the Coastal Zone





Appendix B Legislation, Policy and Guideline Context for CMP Development in NSW

FINAL DRAFT

Legislative, Policy and Guideline Context for CMP Development in NSW

1 Introduction

This chapter outlines the legislative, policy and planning context insofar as it relates to the preparation and contents of a Coastal Management Program under the *Coastal Management Act 2016* in New South Wales. For brevity, the following abbreviations are used in this chapter:

Abbreviation	Full Title
ALR Act	<i>Aboriginal Land Rights Act 1983</i>
BC Act:	<i>Biodiversity Conservation Act 2016</i>
CM Act:	<i>Coastal Management Act 2016</i> , which commenced on 3 rd April, 2018
CMM:	Coastal Management Manual, which guides the development of Coastal Management Programs under the CM Act
CMP:	A Coastal Management Program, which aims to support the long-term strategic management of the coast in accordance with the CM Act
RH SEPP:	<i>State Environmental Planning Policy (Resilience and Hazards) 2021</i> which subsumed, as Chapter 2, the prior clauses of <i>State Environmental Planning Policy (Coastal Hazards) 2018</i>
CAMBA	<i>China – Australia Migratory Bird Agreement</i>
CL Act:	<i>Crown Lands Act 1989 (Now Repealed)</i>
CLM Act:	<i>Crown Lands Management Act, 2016</i>
CP Act:	<i>Coastal Protection Act 1979</i> which was repealed by the CM Act
EP&A Act:	<i>Environmental Planning and Assessment Act 1979</i>
FM Act	<i>Fisheries Management Act 1994</i>
EPBC Act	(Federal) Environmental Protection and Biodiversity Conservation Act 1989



Abbreviation	Full Title
JAMBA	<i>Japan – Australia Migratory Bird Agreement</i>
LG Act:	<i>Local Government Act 1993</i>
LLS Act	<i>Local Land Services Act 2013</i>
MEM Act:	<i>Marine Estate Management Act 2014</i>
MS Act	<i>Marine Safety Act 1998</i>
NT Act	<i>(Federal) Native Title Act 1993</i>
NPW Act	<i>National Parks and Wildlife Act 1974</i>
POEO Act	<i>Protection of the Environment Operations Act 1997</i>
ROKAMBA	<i>Republic of Korea – Australia Migratory Bird Agreement</i>
WM Act	<i>Water Management Act 2000</i>

2 Coastal Management Act, 2016 (CM Act)

2.1 Introduction

The CM Act commenced on 3 April 2018, replacing the 1979 CP Act. The CM Act is currently administered by the Minister for Local Government. It establishes the framework, and outlines the overarching objects, for coastal management in NSW. Part 3 of the CM Act contains the legislative basis for preparing Coastal Management Programs.

2.2 Objects of the Act and Coastal Management Areas

The overarching object or purpose of the CM Act is:

"to manage the coastal environment of New South Wales in a manner consistent with the principles of ecologically sustainable development for the social, cultural and economic well-being of the people of the State"

For reference, the four principles of ecologically sustainable development are defined in section 6(2) of the *Protection of the Environment Administration Act 1991* as follows:

(a) the precautionary principle – namely, that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.

In the application of the precautionary principle, public and private decisions should be guided by:

(i) careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment, and

(ii) an assessment of the risk-weighted consequences of various options,

(b) inter-generational equity – namely, that the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations,

(c) conservation of biological diversity and ecological integrity – namely, that conservation of biological diversity and ecological integrity should be a fundamental consideration,

(d) improved valuation, pricing and incentive mechanisms – namely, that environmental factors should be included in the valuation of assets and services, such as:

(i) polluter pays – that is, those who generate pollution and waste should bear the cost of containment, avoidance or abatement,



(ii) the users of goods and services should pay prices based on the full life cycle of costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any waste,

(iii) environmental goals, having been established, should be pursued in the most cost-effective way, by establishing incentive structures, including market mechanisms, that enable those best placed to maximise benefits or minimise costs to develop their own solutions and responses to environmental problems.

More specific objects outlined by the CM Act are as follows:

(a) to protect and enhance natural coastal processes and coastal environmental values including natural character, scenic value, biological diversity and ecosystem integrity and resilience, and

(b) to support the social and cultural values of the coastal zone and maintain public access, amenity, use and safety, and

(c) to acknowledge Aboriginal peoples' spiritual, social, customary and economic use of the coastal zone, and

(d) to recognise the coastal zone as a vital economic zone and to support sustainable coastal economies, and

(e) to facilitate ecologically sustainable development in the coastal zone and promote sustainable land use planning decision-making, and

(f) to mitigate current and future risks from coastal hazards, taking into account the effects of climate change, and

(g) to recognise that the local and regional scale effects of coastal processes, and the inherently ambulatory and dynamic nature of the shoreline, may result in the loss of coastal land to the sea (including estuaries and other arms of the sea), and to manage coastal use and development accordingly, and

(h) to promote integrated and co-ordinated coastal planning, management and reporting, and

(i) to encourage and promote plans and strategies to improve the resilience of coastal assets to the impacts of an uncertain climate future including impacts of extreme storm events, and

(j) to ensure co-ordination of the policies and activities of government and public authorities relating to the coastal zone and to facilitate the proper integration of their management activities, and

(k) to support public participation in coastal management and planning and greater public awareness, education and understanding of coastal processes and management actions, and

(l) to facilitate the identification of land in the coastal zone for acquisition by public or local authorities in order to promote the protection, enhancement, maintenance and restoration of the environment of the coastal zone, and

(m) to support the objects of the Marine Estate Management Act 2014 (MEM Act).



The objects of the MEM Act are outlined in Section 10.

The CM Act recognises that the coastal environment is dynamic, with beaches and estuaries changing in form and being affected from time to time by hazards driven by coastal processes. The Act specifies seven coastal hazards:

- (a) beach erosion,*
- (b) shoreline recession,*
- (c) coastal lake or watercourse entrance instability,*
- (d) coastal inundation,*
- (e) coastal cliff or slope instability,*
- (f) tidal inundation,*
- (g) erosion and inundation of foreshores caused by tidal waters and the action of waves, including the interaction of those waters with catchment floodwaters.*

For CMPs that address the management of Estuaries, hazards (c), (f) and (g) are particularly relevant.

Part 2 of the CM Act identifies four "coastal management areas" which, in order of hierarchical importance are the:

- (a) coastal wetlands and littoral rainforests area, comprising land which displays the hydrological and floristic characteristics of coastal wetlands or littoral rainforests and land adjoining those features.
- (b) coastal vulnerability area, comprising land which is defined as being subject to coastal hazards.
- (c) coastal environment area, comprising land containing features such as coastal waters, estuaries, coastal lakes, coastal lagoons and adjoining land, including headlands and rock platforms; and
- (d) coastal use area, comprising land adjacent to coastal waters, estuaries, coastal lakes, and coastal lagoons where development is or may be carried out (at present or in the future).

The hierarchical importance means, for example, that the management objectives outlined for coastal wetlands and littoral rainforests will prevail over those of the coastal vulnerability area, where the mapped areas of these overlap. The maps defining the four areas are contained in the RH SEPP. The combined, mapped extent of the four coastal management areas is defined as the "coastal zone". The CM Act states that the RH SEPP can be amended by a Local Environmental Plan (LEP)



prepared under the *Environmental Planning and Assessment Act 1979*, but that any such LEP would need to be recommended by the Minister administering the Act prior to adoption.

The management objectives for the four coastal management areas are presented in Appendix A.

2.3 Coastal Management Programs

Where a Local Government Area (LGA) is partly within the coastal zone, the relevant Council (or Councils) may prepare a coastal management program (CMP), which establishes a long-term strategy for coastal management that focuses on achieving the objects of the CM Act and gives effect to the management objectives of the coastal management areas that are to be covered by the CMP.

That program may be made in relation to the whole, or any part of the coastal management areas included in the coastal zone within the LGA. The Coastal Management Manual outlines how CMPs are to be prepared.

The CM Act states that a CMP must:

- (a) identify the coastal management issues affecting the areas to which the program is to apply, and*
- (b) identify the actions required to address those coastal management issues in an integrated and strategic manner, and*
- (c) identify how and when those actions are to be implemented, including those to be implemented by local councils under Chapter 13 of the Local Government Act 1993, those to be implemented under environmental planning instruments and development control plans under the Environmental Planning and Assessment Act 1979 and those to be implemented by public authorities (other than the local council), and*
- (d) identify the costs of those actions and proposed cost-sharing arrangements and other viable funding mechanisms for those actions to ensure the delivery of those actions is consistent with the timing for their implementation under the coastal management program, and*
- (e) if the local council's local government area contains land within the coastal vulnerability area and beach erosion, coastal inundation or cliff instability is occurring on that land, include a coastal zone emergency action subplan.*

The CMP may also include other matters if authorised or permitted by the Coastal Management Manual. Where a CMP proposes actions or activities to be undertaken



by any public authority or on land owned or managed by that public authority, the public authority must agree to the inclusion of those actions or activities. The CMP must not include matters relating to the response to emergencies where those already exist in a plan made under the State Emergency and Rescue Management Act 1989.

The CM Act specifies that consultation on a draft CMP must be undertaken with the community and potentially with other councils or public authorities. For example, where an estuary spans two or more local government areas, or where proposed actions will occur on land owned by a public authority. Consultation is to be undertaken in accordance with relevant provisions of the coastal management manual.

Other matters dealt with in the CM Act include the responsibilities of the Minister regarding the CM Act; the establishment and role of the NSW Coastal Council; the mechanics of adoption, certification, gazettal and review of CMPs and the publication, review and amendment of the Coastal Management Manual.

Once finalised, a local council is required to give effect to the CMP, including integration of the CMP into (i) the plans, strategies, programs and reports to which Part 2 of Chapter 13 of the *Local Government Act 1993* applies (namely, those prepared under the *Integrated Planning and Reporting Process: Community Strategic Plans, Delivery Programs and Operational Plans*); and (ii) the preparation of planning proposals and development control plans under the EP&A Act. The Minister may request that the NSW Coastal Council conduct a performance audit of the implementation of a CMP. If a local Council is thus found to be significantly non-compliant with a CMP, the NSW Coastal Council may make recommendations on appropriate remedial actions.

3 State Environmental Planning Policy (Resilience and Hazards) 2021 (RH SEPP)

The RH SEPP subsumed, in Chapter 2, the prior *State Environmental Planning Policy (Coastal Management) 2018* which commenced on April 3, 2018. Establishment of that prior SEPP resulted in three existing state environmental planning policies (SEPP14-Coastal Wetlands, SEPP26-Littoral Rainforests, and SEPP71-Coastal Protection) being repealed.

Chapter 2 of the RH SEPP aims to promote an integrated and coordinated approach to coastal zone land use planning consistent with the CM Act and the management objectives of each coastal management area by:

- (a) *managing development in the coastal zone and protecting the environmental assets of the coast, and*



(b) establishing a framework for land use planning to guide decision-making in the coastal zone, and

(c) mapping the 4 coastal management areas that comprise the NSW coastal zone...

At the time of policy commencement, and during writing of this document, the Coastal Vulnerability Area Map had not been developed and, therefore, no coastal vulnerability area had been identified. For the other CM Areas, the adopted maps are presently available through the NSW Planning Portal.¹

The RH SEPP also specified development controls that are to apply within the four coastal management areas. These are summarised in the following paragraphs.

For the **coastal wetlands and littoral rainforests area**: where the subject works would otherwise be allowable under other planning instruments, development consent is required for clearing native vegetation or marine vegetation, undertaking earthworks, draining the land, constructing a levee, undertaking environmental protection works or undertaking any other development. Unless the subject works are for environmental protection, the works are considered designated development, meaning that an environmental impact statement would need to be prepared. The works can be undertaken, without consent, on behalf of a public authority if they comprise environmental protection works that are identified in (i) a certified coastal management program, (ii) a plan of management prepared under the LG Act (Division 2, Part 2, Chapter 6); or (iii) a plan of management Division 3.6, Part 5 of the CLM Act. If development consent is required, consent must not be granted by an authority unless it is satisfied that the biophysical, hydrological, and ecological character of the area will be protected.

Specific exclusions to these development controls exist for the damage or removal of a priority weed (under the *Biosecurity Act 2015*) or development consistent with a plan of management under the *National Parks and Wildlife Act 1974*.

For lands within the **proximity area for coastal wetlands and littoral rainforests**: development consent for works must not be given unless the consent authority is satisfied that they will not significantly impact on (i) the biophysical, hydrological or ecological integrity of the adjacent wetland or rainforest; or (ii) the quantity and quality of surface and groundwater flows to and from the adjacent wetland or littoral rainforest.

For lands within the **coastal vulnerability area**: development consent must not be granted unless the consent authority is satisfied that (i) any proposed building or works are engineered to withstand coastal hazards, both current and as projected over

¹ <https://www.planningportal.nsw.gov.au/>



the design life; (ii) any proposed development is not likely to alter coastal processes in a way that is detrimental to adjacent land or the environment; (iii) any proposed development will not reduce access, public amenity or use of any beach, foreshore, rock platform or headland; (iv) the development incorporates appropriate provisions to manage risk to life and public safety from coastal hazards; (v) there are appropriate measures in place to manage the effects of anticipated coastal processes, including current and future hazards.

For lands within the **coastal environment area**: Development consent must not be granted unless the consent authority has considered whether there is likely to be an adverse impact on (i) the integrity and resilience of the biophysical, hydrological and ecological environment, (ii) coastal environmental values and natural coastal processes, (iii) water quality of the marine estate particularly any sensitive coastal lakes, (iv) marine vegetation, native vegetation and fauna and their habitats, undeveloped headlands and rock platforms, (v) public open space and access to the coastal environment including disabled access, (vi) Aboriginal heritage, and (vii) use of the surf zone. Furthermore, with respect to the aspects in the previous sentence, the consent authority must be satisfied that the development is appropriately designed and sited and will be managed appropriately to avoid adverse impacts. If the adverse impacts cannot be reasonably avoided, the impact should be minimised. If the impacts cannot be minimised, the development would need to be managed to mitigate the impact.

For lands within the **coastal use area**: Development consent must not be granted without consideration of potential adverse impacts on (i) public access, (ii) overshadowing, wind funnelling and the loss of views, (iii) visual amenity, including scenic qualities of coastal headlands, (iv) Aboriginal cultural heritage, (v) cultural and built environmental heritage. Furthermore, with respect to the aspects in the previous sentence, the consent authority must be satisfied that the development is appropriately designed and sited and will be managed appropriately to avoid adverse impacts. If the adverse impacts cannot be reasonably avoided, the impact should be minimised. If the adverse impacts cannot be minimised, the development would need to be managed to mitigate the impact. Consent must also consider the bulk, scale and size of the proposed development and its appropriateness in the context of surrounding development.

Generally, development consent must not be granted unless the consent authority is satisfied that the development will not cause an increased risk from coastal hazards on the subject or other land. Any development consent within the coastal zone must also take into consideration the provisions of any relevant certified coastal management program.



At the same time as the RH SEPP commenced, the Department of Planning issued a local planning direction (Direction 4.2) under Section 9.1(2) (previously 117(2)) of the EP&A Act, addressing the development of planning proposals applying to land within the coastal zone. Under that directive, planning proposals must be consistent with the CM Act, Coastal Management Manual and associated Toolkit, the Coastal Design Guidelines (2003) and any relevant certified CMP. The directive states that planning proposals must not rezone land in a way that enables intensification of land use within a coastal vulnerability area, an area that has been appropriately identified as being affected by current or future coastal hazards, or land within a coastal wetlands and littoral rainforests area. If the planning proposal aims to amend the maps within the RH SEPP, it must be supported by evidence from a relevant certified CMP (or pre-existing coastal zone management plan prepared under the CP Act). A planning proposal that is inconsistent with the directive may still be considered by the Director General of the Department of Planning under certain circumstances.

4 Coastal Management Manual (CMM)

4.1 Introduction

The NSW Coastal Management Manual (CMM) outlines the way in which coastal management programs (CMPs) are to be prepared, adopted, and subsequently managed by local councils and public authorities in New South Wales. Part A of the CMM imposes mandatory requirements for the preparation and management of CMPs. Part B provides more detailed guidance on the preparation and management of CMPs, including adherence to an adaptive risk management process, the completion of studies to address information gaps, the role of state government and the NSW Coastal Council and the integration of a CMP into Council's Integrated Planning and Reporting (IP&R) framework under the *Local Government Act 1993*.

The manual seeks to facilitate ecologically sustainable development and promote sustainable land use planning in the coastal zone. The manual encourages:

- Development that is not inappropriately exposed to hazards.
- Land use where risks can be mitigated, and residual risks are addressed.
- Development which does not increase risks or threats elsewhere.

CMPs are to be long-term, strategic, and coordinated, focusing on achieving the objects of the CM Act. A CMP should provide for the input of councils, public authorities, and local communities in achieving a balanced set of management actions. A CMP should build on previous work completed in preparing a coastal zone management plan under the now repealed *Coastal Protection Act 1979*. In preparing a CMP, previous

work is expected to be updated to consider changes to the social character of the local community.

4.2 The CMP Process

A 5-stage process is outlined by the CMM as shown in Figure F.1.

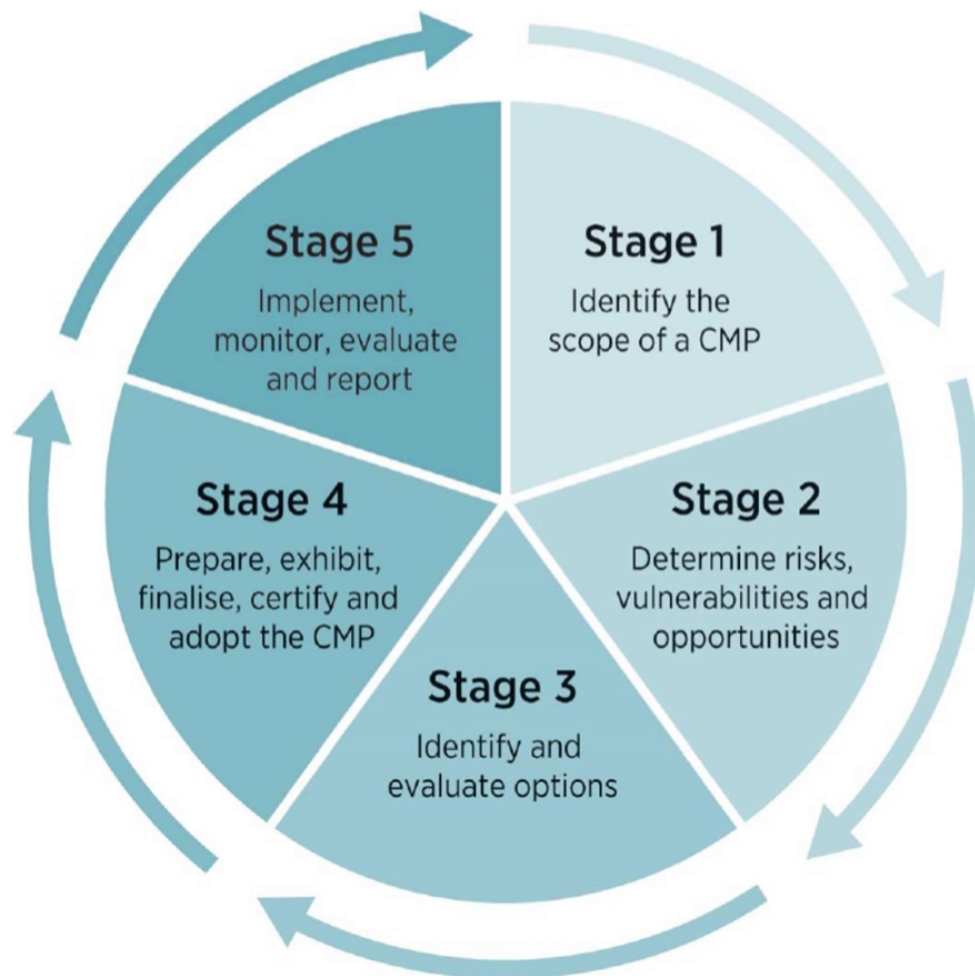


Figure F.1 Stages in Preparing and Implementing a CMP
(Source: NSW Government, 2018)

Given the significant amount of effort already expended in the preparation of CZMPs across NSW, it is possible that Stages 2 and 3, which involve detailed studies and analyses could be 'fast-tracked'. Accordingly, the scoping study (Stage 1) is important in setting the scope and process to be followed in preparing the CMP. Fast-tracking would only be appropriate where existing actions are performing well and remain appropriate despite changing circumstances. As part of Stage 5, Councils need to report on the outcomes and ongoing action associated with the CMP as part of their



Integrated Planning and Reporting framework. It is possible that a CMP may recommend modification of the boundaries of a coastal management area. In this case the Minister for Planning has the authority to make a Local Environmental Plan that modifies the boundaries in the Coastal Management SEPP, subject to the gateway process.

Other public authorities (e.g., Transport for NSW, NSW Department of Primary Industry) can be assigned responsibility for different coastal management actions identified in a CMP. If this is the case, it is required that the public authority agrees to take on that responsibility before the CMP is finalised.

4.3 Mandatory Requirements of a CMP

The CM Act imposes requirements on the preparation, adoption, implementation, amendment, and review of CMPs. These mandatory requirements are laid out in the CMM (Part A) with other content in Parts A & B of the Manual comprising *guidance* for the development and operation of CMPs. A CMP must meet the statutory provisions and mandatory requirements to allow certification.

The mandatory requirements of relevance to the preparation of a CMP are reproduced in Appendix B. These elaborate on the statutory requirements of the CM Act and deal with:

- The purpose, scope and focus of a CMP.
- The area that a CMP covers.
- How a CMP is to be prepared.
- Key issues to be identified in a CMP.
- Requirements for the business plan in the CMP.
- Requirements for preparing a CMP when it includes a proposed or mapped coastal vulnerability area.
- Requirements for taking coastal change into account when preparing a CMP.
- Format and content required of a CMP.
- Community engagement and consultation.

Other mandatory requirements in the CMM deal with the adoption, certification, gazettal, review, amendment, and replacement of CMPs, and the requirements for monitoring, reporting and record keeping during operation of the CMP.

4.4 Geographical Extent of a CMP

While the CM Act states (S13(1)):

“A coastal management program may be made in relation to the whole, or any part of the area identified within the coastal zone”

The CMM extends and clarifies this to note that:

“The CMP may also cover areas outside the mapped coastal zone, where the management of the external area has a significant impact on issues within the coastal zone, for instance, wider estuarine catchments. This helps to ensure that actions are integrated and undertaken at an appropriate scale to address the issues”.

At the time of preparing this document, however, it appears unlikely that the NSW state government will be inclined to accept management actions which are located outside the coastal zone, i.e., within the broader catchment unless very strong evidence of the significant impact on issues in the coastal zone can be provided.

5 (Federal) Environmental Protection and Biodiversity Conservation Act 1999 (EPBC Act)

The objects of the EPBC Act are:

- (a) to provide for the protection of the environment, especially those aspects of the environment that are matters of national environmental significance; and*
- (b) to promote ecologically sustainable development through the conservation and ecologically sustainable use of natural resources; and*
- (c) to promote the conservation of biodiversity; and*
- (ca) to provide for the protection and conservation of heritage; and*
- (d) to promote a co-operative approach to the protection and management of the environment involving governments, the community, land-holders and indigenous peoples; and*
- (e) to assist in the co-operative implementation of Australia’s international environmental responsibilities; and*
- (f) to recognise the role of indigenous people in the conservation and ecologically sustainable use of Australia’s biodiversity; and*
- (g) to promote the use of indigenous peoples’ knowledge of biodiversity with the involvement of, and in co-operation with, the owners of the knowledge.*



The EPBC is the overarching national environmental protection legislation and is concerned with actions undertaken on Commonwealth land or by Commonwealth agencies and actions taken anywhere that may affect *Matters of National Environmental Significance*. There are nine matters of national environmental significance:

- World heritage properties.
- National heritage places.
- Wetlands of international importance (often called 'Ramsar' wetlands after the international treaty under which such wetlands are listed).
- Nationally threatened species and ecological communities.
- Migratory species.
- Commonwealth marine areas.
- The Great Barrier Reef Marine Park.
- Nuclear actions (including uranium mining).
- A water resource, in relation to coal seam gas development and large coal mining development.

Regarding Migratory Species, Australia is a signatory to several international agreements resulting in the listing of migratory species of significance under the EPBC Act. These include agreements under the Bonn Convention on the Conservation of Migratory Species and three agreements with Japan, China and the Republic of Korea (JAMBA, 1974; CAMBA, 1986; and ROKAMBA, 2002; respectively) addressing migratory birds which use the East Asian – Australasian Flyway.

Lists of species covered by these agreements are available, and matters of concern under the EPBC act can be investigated using the *Protected Matters Search Tool*². Coastal areas tend to reveal many migratory species, threatened species, protected marine species, whales and other cetaceans. Furthermore, threatened ecological communities would commonly include littoral rainforests (critically endangered), coastal saltmarsh and coastal swamp forests.

6 Local Land Services Act, 2013 (LLS Act)

The LLS Act and associated regulations commenced in 2014, establishing local land services regions across NSW, each with a local board. The regions absorbed the functions of different Catchment Management Authorities and the *Catchment*

² <https://www.dcceew.gov.au/environment/epbc/protected-matters-search-tool>, accessed 28/09/2022



Management Authorities Act 2003 was repealed. The LLS Act defines Local Land Services as including:

- Agricultural production.
- Biosecurity.
- Management of animal and plant pest and disease emergencies and other emergencies impacting on primary production.
- Animal welfare.
- Chemical residue management.
- Natural resource management and planning.

Eleven LLS regions are established under the Act. Each region's local board is required to develop a local strategic plan to set the vision, priority, and strategy in respect of the delivery of local services, focussing on appropriate economic, social, and environmental outcomes.

6.1 Clearing of Native Vegetation

The clearing of native vegetation on rural land is subject to the provisions of the *Local Land Services Act 2013* and the *Biodiversity Conservation Act 2016*. Clearing of native vegetation in urban areas as well as land zoned for environmental protection is subject to the provisions of the *NSW Biodiversity and Conservation SEPP*³ and consent requirements are managed by local councils.

However, if land is zoned rural (RU1, RU2, RU3, RU4 or RU6) vegetation clearance is managed depending on how the land is categorised:

- Exempt Land (Category 1): native vegetation can be removed so long as animals or habitat that are threatened are not knowingly harmed.
- Regulated Land (Category 2): a range of other allowable "routine" management activities associated with agriculture and other common practices are allowed. Guidance on what is allowed is available from LLS.
- Excluded Land (Category 3): in this case the "allowable activities" specified by the *Land Management (Native Vegetation) Code* does not apply and the land is not covered by the LLS Act. This includes land which is not zoned rural, or is a national park, for example.

Land within the coastal zone to which this applies, is limited to the site of the former Coal Cliff Coke works that closed in 2013, zoned RU1 Primary Production.

³ <https://www.environment.nsw.gov.au/topics/animals-and-plants/native-vegetation>, accessed 28/9/2022

7 Water Management Act 2000

The objects of the Water Management Act are:

“to provide for the sustainable and integrated management of the water sources of the State for the benefit of both present and future generations and, in particular –

(a) to apply the principles of ecologically sustainable development, and

(b) to protect, enhance and restore water sources, their associated ecosystems, ecological processes and biological diversity and their water quality, and

(c) to recognise and foster the significant social and economic benefits to the State that result from the sustainable and efficient use of water, including –

(i) benefits to the environment, and

(ii) benefits to urban communities, agriculture, fisheries, industry and recreation, and

(iii) benefits to culture and heritage, and

(iv) benefits to the Aboriginal people in relation to their spiritual, social, customary and economic use of land and water,

(d) to recognise the role of the community, as a partner with government, in resolving issues relating to the management of water sources,

(e) to provide for the orderly, efficient and equitable sharing of water from water sources,

(f) to integrate the management of water sources with the management of other aspects of the environment, including the land, its soil, its native vegetation and its native fauna,

(g) to encourage the sharing of responsibility for the sustainable and efficient use of water between the Government and water users,

(h) to encourage best practice in the management and use of water.”

The WM Act prioritises the sustainable and integrated management of the state's water. The Act is based on concepts of ecologically sustainable development, including developing in such a way which does not threaten the ability of future generations to meet their needs. The Act addresses the need to allocate water to provide for the health of rivers and groundwater systems and provide license holders with secure access to water.

The main tool in the WM Act for the management of water is Water Sharing Plans.



Water sharing plans set rules for how water is allocated for the next 10 years, providing security for the environment and water users⁴. The plans ensure water is specifically provided for the environment, and allows licence holders (e.g., irrigators who need large volumes of water) to plan their business activities in advance. The plans set rules for water trading and annual water allocations for different water uses. The scoping study areas lies within the Water Sharing Plan for the Greater Metropolitan Groundwater and Unregulated River sources.

The WM Act also administers the operation of Private Drainage Boards. Private Drainage Boards comprise a board of directors of a drainage union which was established under the former *Drainage Act 1939*. The activities of Private Drainage Boards are now managed under the WM Act, but the WM Act does not allow for the establishment of any new drainage unions. The functions of a private drainage board are:

- (a) to prepare, review and implement a management program for its drainage district,*
- (b) to maintain in a state of efficiency the drainage works under its charge, and renew such drainage works if necessary,*
- (c) to construct, alter, or extend any drainage works in accordance with any authority and consent given under this Part,*
- (d) to make, levy and collect rates,*
- (e) to appoint such officers and employees as may be required,*
- (f) to institute legal proceedings for the recovery of outstanding rates or other amounts,*
- (g) to keep the prescribed books and accounts,*
- (h) to manage the affairs of the drainage union,*
- (i) to do such acts as may be necessary or desirable for carrying out the purposes of this Part.*

Drains are commonly by individual landholders and overseen by drainage unions and their associated drainage boards. Drains are primarily managed to minimise inundation of land and enable use for pasture. The Drainage Boards manage the collection of rates and distributes these to landowners to maintain their drains.

⁴ <https://www.industry.nsw.gov.au/water/plans-programs/water-sharing-plans/how-water-sharing-plans-work>

8 Local Government Act, 1993 (LG Act)

8.1 Introduction

The purpose of the LG Act is to provide a legal framework for local government in NSW, including setting out responsibilities and powers of councils, and facilitating the engagement with and accountability to the community. Under the LG Act, local councils in NSW have a variety of regulatory, administrative, and service functions. Councils also have a role in enforcement and the raising of revenue (through rates and charges, for example). Councils' regulatory responsibilities include planning and development control under the *Environmental Planning and Assessment Act 1979*. This involves the classification, use, and management of public land, the preparation of plans of management for community land.

The Act (§24) allows Council to provide service functions including “*provision of goods, services and facilities, and carry out activities*” appropriate to the needs of its community and the wider public. These service functions include environmental protection and providing for the recreation of the local community.

Local councils both own land and control, care for and manage other land such as Crown Land. Common service scenarios when considering estuaries for the benefit of its community would be council undertaking artificial lagoon breaching activities on an area classified as Crown Land or managing waterfront reserves for recreation purposes.

§7(e) of the LG Act requires that councils:

“have regard to the principles of ecologically sustainable development in carrying out their responsibilities.”

8.2 Exemption from Liability

With respect to land in the coastal zone, §733 of the Act provides an exemption from liability regarding:

(a) any advice furnished in good faith by the council relating to the likelihood of any land in the coastal zone being affected by a coastline hazard (as described in the coastal management manual under the Coastal Management Act 2016) or the nature or extent of any such hazard, or

(b) anything done or omitted to be done in good faith by the council in so far as it relates to the likelihood of land being so affected.



§733 specifically notes that these conditions apply to:

- The making of environmental planning instruments, planning proposals, or development control plans.
- The granting or refusal of development consent.
- The preparation and adoption of a CMP.
- The carrying out of coastal protection works.
- Anything done or omitted to be done regarding beach erosion or shoreline recession on crown land, a crown reserve or land owned or controlled by a council.
- Failure to undertake action to enforce removal of illegal or unauthorised structures that result in erosion of a beach or adjacent land.
- The provision of information relating to climate change or sea level rise.

Herein, “good faith” is presumed, unless proved otherwise, if Council has acted *substantially in accordance with the principles and mandatory requirements set out in the Coastal Management Manual*.

8.3 Accountability of Councils

Part 2 of Chapter 13 of the LG Act establishes the integrated planning and reporting requirements relating to the strategic planning of local councils. These are:

1. A **Community Strategic Plan** which identifies the main priorities and aspirations for the future of the local government area for a period of at least 10 years. The plan should establish strategic objectives and address civic leadership, social justice, environmental and economic issues. The community strategic plan must be reviewed following an ordinary councillor election.
2. A **Resourcing Strategy** which includes long-term financial, workforce management and asset management planning to implement the community strategic plan.
3. A **Delivery Program** which outlines the activities to be undertaken to deliver the community strategic plan using the resources of the resourcing strategy. It must include means of assessing effective delivery. A new delivery program is to be established after each ordinary council election and council staff are to provide progress reports to the council at least every 6 months.
4. An **Operational Plan** which is an annual plan that details the program of activities to be undertaken during a given year to fulfil the requirements of the delivery program.



The department of Local Government has established guidelines regarding integrated planning and reporting listed above and community engagement strategy, annual report, and state of the environment report of a council.

8.4 Levying Rates for Coastal Protection Works

§496B of the LG Act allows councils to make and levy an annual charge for the provision of coastal protection services. The annual charge must reasonably reflect the cost for providing coastal protection services, including maintenance and repair, and to manage the impacts of the coastal protection works.

However, for an annual charge to be levied in relation to *existing* coastal protection works, §553B indicates that the owner of that parcel of land, or any previous owner, must have consented in writing to the land being subject to such charges. Herein, *existing* means works which predated the commencement of §553B of the LG Act, which occurred in late 2010. This limitation does not apply, however, if the owner or occupier of the subject land contributed to the upgrade or expansion of the coastal protection works after commencement of §553B. In this case, a pro-rata amount based on the effect of the upgrade or expansion can be levied.

Council can make maintenance of the works and management of impacts a condition of consent. If that is the case, and the resulting maintenance or management is not being carried out by or on behalf of the council, an annual charge cannot be levied.

9 Environmental Planning and Assessment Act, 1979 (EP&A Act)

The EP&A Act is the overriding state environmental legislation in NSW. It governs the development of planning instruments, including state environmental planning policies (SEPPs) and local environment plans (LEPs) and outlines the way proposed developments are to be assessed by determining authorities and the environmental assessment that is required for development.

Significant changes were made to the *EP&A Act* in 2019. Councils within the Greater Sydney Region and the City of Wollongong were required to constitute a local planning panel, which has taken over the role of determining development applications. The affected Councils span the coast between the Hawkesbury River and Lake Illawarra. The EP&A Act also underwent decimal renumbering and rearrangement of the prior 8-part structure into 10 parts as follows:

1. Preliminary.
2. Planning Administration.



3. Planning Instruments: Including the making of environmental planning instruments such as SEPPs, LEPs and the associated planning proposal and gateway determination process.
4. Development Assessment and Consent: including the nature and role of the consent authority, state significant and integrated development.
5. Infrastructure and Environmental Impact Assessment.
6. Building and Subdivision Certification.
7. Infrastructure Contributions and Finance.
8. Reviews and Appeals.
9. Implementation and Enforcement.
10. Miscellaneous.

Broadly, clauses addressing development assessment under Parts 4 and 5 of the old Act are still contained within the corresponding parts of the new Act:

- *Development* where consent is required by an Environmental Planning Instrument (EPI), which needs to be carried out under Part 4 of the Act. This is the pathway most commonly applied to private development, and sometimes to activities by public authorities.
- *Activities* which do not require development consent under Part 4 of the Act. These activities include those undertaken by a local council or authority and not prohibited by an EPI. Environmental Assessment is required in accordance with Part 5 of the Act. This would commonly take the form of a Review of Environmental Factors (REF). An REF aims to demonstrate that the Council has considered the environmental impact of the proposed activity. For some activities, a full environmental impact statement is required, including the requirements for public exhibition.

§5.5 of the EP&A Act indicates that, if following the Part 5 pathway, a local Council would need to, as a minimum:

“examine and take into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of that activity”

The ruling in *Goldberg v Waverley* [2007] NSWLEC 259 suggests that a “concept of reasonableness” should be applied when interpreting the phrase “fullest extent possible” in §5.5.

Also of interest are:

- Ministerial directions (previously §117) are now covered by §9.1.



- Planning certificates (previously §149) are now covered by §10.7.

Over the next few years, it is expected that *Environmental Planning and Assessment Regulations, 2000* will make provisions relating to the standardisation of the form, structure and subject matter of DCPs, to avoid the proliferation of different clauses across the state. The mechanism for this is contained in §3.45(2A) of the EP&A Act.

10 Marine Estate Management Act, 2014 (MEM Act)

10.1 Introduction

The MEM Act was introduced in response to an audit which recommended a new approach to the sustainable management of the entire marine estate, including existing marine parks. It is jointly administered by the Minister for Agriculture and Western New South Wales and the Minister for Environment and Heritage.

The MEM Act lists its objectives as:

- a) *to provide for the management of the marine estate of New South Wales consistent with the principles of ecologically sustainable development in a manner that:*
 - (i) *promotes a biologically diverse, healthy and productive marine estate, and*
 - (ii) *facilitates:*
 - economic opportunities for the people of New South Wales, including opportunities for regional communities, and*
 - the cultural, social and recreational use of the marine estate, and*
 - the maintenance of ecosystem integrity, and*
 - the use of the marine estate for scientific research and education,*
- b) *to promote the co-ordination of the exercise, by public authorities, of functions in relation to the marine estate,*
- c) *to provide for the declaration and management of a comprehensive system of marine parks and aquatic reserves.*

The Marine Estate includes the ocean, estuaries, coastal wetlands (saltmarsh, mangroves, seagrass), coastline, beaches, dunes and headlands, coastal lakes and lagoons connected to the ocean, and islands including Lord Howe Island. It extends seaward out to 3 nautical miles from the coast and offshore islands, and from the Queensland border to the Victorian border.

The MEM Act establishes the Marine Estate Management Authority, which is tasked with, among other things, undertaking the assessment of threats and risks to the



marine estate and to prepare a marine estate management strategy. The Marine Estate Management Strategy was released in 2018 and is due to be updated on a decadal basis thereafter.

The MEM Act also covers the purpose, declaration and management of marine parks and aquatic reserves, and the preparation of associated management plans. The Marine Estate Management Strategy (MEMS) is underpinned by the state-wide threat and risk assessment report (or "TARA", BMT WBM, 2017). This assessment is a high-level document that does not provide site specific management guidance.

10.2 Outcomes of Threat and Risk Assessment (TARA)

The TARA process was described as "*essentially a tool for the prioritisation of threats*" with outputs to be used in the development of a state-wide scale management response. The assessment recognised that social and economic benefits are closely linked to the health of the environment.

The TARA divided the NSW coast into three regions, including the North region which extends from Tweed Heads to Stockton, the Central Region (Stockton to Shellharbour) and the South Region (Shellharbour to NSW/Vic border). On a state-wide scale, estuaries were found to have a much greater proportion of moderate and high threats, when compared to coastal and marine areas. This was particularly notable for the more densely populated regions (e.g., the Central "Hawkesbury Shelf Marine Bioregion").

Regarding estuaries, the TARA recognised the presence of significant knowledge gaps and the need for additional consideration of cumulative risk issues, given their role as a receiving water quality environment with multiple stressors such as:

- Agricultural, urban and point source pollution.
- Microplastics.
- Sediment contamination.
- The need to take a "systems-based" management approach.

Priority threats to "Environmental Assets" and "Social, Cultural and Economic Benefits" were ranked and the top 10 are reproduced in the following three tables. Note that only Table 3 is directly relevant to the Wollongong LGA.

Table 1 NSW North Region Priority Threats as Determined by the state-wide TARA

Environmental Assets	Social, Cultural and Economic Benefits
1 Estuary entrance modification	1 Water pollution on environmental values - urban stormwater discharge
2 Clearing riparian and adjacent habitat including wetland drainage (in estuaries)	2 Water pollution on environmental values - Agricultural diffuse sources



3 Agricultural diffuse source runoff (in estuaries)	3 Water pollution on environmental values - litter, solid waste marine debris and microplastics
4 Climate change (20 years)	4 Inadequate social and economic information
5 Urban stormwater discharge (in estuaries)	5 Lack of compliance and regulations (by users) or lack of compliance effort (by agencies)
6 Modified freshwater flows	6 Reductions in abundances of species and trophic levels
7 Recreation and tourism - Boating and boating infrastructure (in estuaries)	7 Limited or lack of access infrastructure to the marine estate
8 Recreation and tourism – Four-wheel driving	8 Anti-social behaviour and unsafe practices
9 Foreshore development	9 Climate change stressors 20 years
10 Navigation & entrance management and modification, harbour maintenance, etc. (in estuaries)	10 Loss of public access (either by private development or Government area closures)



Table 2 NSW Central Region Priority Threats as Determined by the state-wide TARA

Environmental Assets	Social, Cultural and Economic Benefits
1. Urban stormwater discharge	1. Water pollution on environmental values – urban stormwater discharge
2. Foreshore development	2. Water pollution on environmental values - Agricultural diffuse source runoff
3. Estuary entrance modifications (in estuaries)	3. Water pollution on environmental values - litter, solid waste, marine debris and microplastics
4. Shipping - Large commercial vessels and associated port activities and industries (trade ships, cruise ships, etc.)	4. Sediment contamination (toxicants in sediment; dioxins in Sydney Harbour, Cooks River)
5. Agricultural diffuse source runoff (in estuaries)	5. Inadequate social and economic information
6. Clearing riparian and adjacent habitat including wetland drainage	6. Anti-social behaviour and unsafe practices
7. Climate change 20 years	7. Limited or lack of access infrastructure to the marine estate
8. Recreational Boating – Boating and boating infrastructure (in estuaries)	8. Lack of compliance with regulations (by users) or lack of compliance effort (by agencies)
9. Sewage effluent and septic runoff	9. Reductions in abundances of species and trophic levels
10. Navigation & entrance management and modification, harbour maintenance, etc	10. Climate change stressors 20 years

Table 3 NSW South Region Priority Threats as Determined by the state-wide TARA

Environmental Assets	Social, Cultural and Economic Benefits
1. Agricultural diffuse source runoff (in estuaries)	1. Water pollution on environmental values – urban stormwater discharge
2. Estuary entrance modifications	2. Water pollution on environmental values - Agricultural diffuse source runoff
3. Urban stormwater discharge	3. Water pollution on environmental values - litter, solid waste, marine debris and microplastics
4. Modified Freshwater flows Modified freshwater flows (in estuaries)	4. Inadequate social and economic information
5. Clearing riparian and adjacent habitat including wetland drainage (in estuaries)	5. Lack of compliance with regulations (by users) or lack of compliance effort (by agencies)
6. Climate Change (20yrs)	6. Reductions in abundances of species and trophic levels
7. Recreation and tourism -Boating and boating infrastructure (in estuaries)	7. Limited or lack of access infrastructure to the marine estate
8. Foreshore development	8. Climate change stressors 20 years
9. Navigation & entrance management and modification, harbour maintenance, dredging etc. (in estuaries)	9. Loss of public access (either by private development or Government area closures)
10. Stock grazing of riparian and marine vegetation (in estuaries)	10. Anti-social behaviour and unsafe practices

While the TARA contains limited detailed site-specific information, the underpinning Background Environmental Information Report (MEMA, 2016) does.



10.3 Marine Estate Management Strategy (2018-2028)

The overall stated vision of the Marine Estate Management Strategy (MEMS) is:

*"A healthy coast and sea, managed for the greatest wellbeing of the community,
now and into the future"*

The MEMS details a set of management initiatives, but again does not provide any site-specific guidance. Similarly, the MEMS does not provide much detail on the carriage, responsibility and mechanisms for enacting the initiatives outlined.

The nine initiatives are:

1. Improving water quality and reducing litter
2. Delivering healthy coastal habitats with sustainable use and development
3. Planning for climate change
4. Protecting the Aboriginal cultural values of the marine estate
5. Reducing impacts on threatened and protected species
6. Ensuring sustainable fishing and aquaculture
7. Enabling safe and sustainable boating
8. Enhancing social, cultural and economic benefits
9. Delivering effective governance

Of these initiatives 1, 2, 3 and 9 were highlighted as potentially being delivered by coastal management programs. All initiatives were tabulated against management approaches that could be adopted to implement those initiatives.

The MEMS aims to deal with priority threats on a state-wide basis. It does note, however that the order of priorities differs slightly between regions.

The MEMS is presently implemented via an implementation plan, covering 2022-2024 which fills in some of the gaps relating to key performance indicators, timeframes and agency and stakeholder responsibilities. Also included is a monitoring program, which will evaluate the performance of the MEMS. Inspection of the different actions within the implementation plan shows that most have a state-wide or multiple LGA scope. Consistent with this, lead responsibility for the actions sits almost exclusively with state government agencies, with local councils earmarked as taking a secondary or "partner" role.

**Table 4 Mechanisms to Address the Priority Threats in each Management Initiative
(NSW Marine Estate Management Authority, 2018)**

MANAGEMENT INITIATIVE	Regulation/ compliance/ incentives	Policy/ program/ planning	Education/ awareness	Research/ monitoring/ mapping	On-ground works	Data / reporting	Collaboration
1. Improving water quality and reducing litter	✓	✓	✓	✓	✓	✓	✓
2. Delivering healthy coastal habitats with sustainable use and development	✓	✓	✓	✓	✓		✓
3. Planning for climate change		✓	✓	✓	✓		✓
4. Protecting the Aboriginal cultural values of the marine estate		✓	✓	✓	✓		✓
5. Reducing impacts on threatened and protected species	✓	✓	✓	✓	✓	✓	✓
6. Ensuring sustainable fishing and aquaculture	✓	✓	✓	✓		✓	✓
7. Enabling safe and sustainable boating	✓	✓	✓	✓	✓	✓	✓
8. Enhancing social, cultural and economic benefits	✓	✓	✓	✓		✓	✓
9. Delivering effective governance	✓	✓	✓	✓		✓	✓

11 Crown Lands Management Act, 2016 (CLM Act) and Crown Lands Act, 1989, (CL Act)

Following four years of engagement with the community regarding Crown Land, the *Crown Lands Act 1989* was fully repealed on 1 July 2018⁵, and replaced by the *Crown Land Management Act 2016*.

The objects of the CLM Act are:

- (a) to provide for the ownership, use and management of the Crown land of New South Wales, and*
- (b) to provide clarity concerning the law applicable to Crown land, and*
- (c) to require environmental, social, cultural heritage and economic considerations to be taken into account in decision-making about Crown land, and*
- (d) to provide for the consistent, efficient, fair and transparent management of Crown land for the benefit of the people of New South Wales, and*
- (e) to facilitate the use of Crown land by the Aboriginal people of New South Wales because of the spiritual, social, cultural and economic importance of land to Aboriginal people and, where appropriate, to enable the co-management of dedicated or reserved Crown land, and*

⁵ <https://www.industry.nsw.gov.au/lands/what-we-do/legislation-policies>



(f) to provide for the management of Crown land having regard to the principles of Crown land management.

The principles of Crown land management include environmental protection, conservation of natural resources wherever possible, encouraging appropriate public use and enjoyment, encouraging multiple use where appropriate, use and management that sustains the land and its resources in perpetuity and that Crown land be used, sold, leased, licensed, or dealt with in the best interests of the State (but consistent with the other principles).

Commensurate with the previous act, the CLM Act allows for:

- The dedication or reservation of land.
- The granting of leases, licences, permits, easements or right of way.
- The appointment of managers for Crown land reserves.
- The appropriate sale or disposal of Crown land.

The occupation of Crown land is managed through a system of leases, licenses, and permits. Leases and licenses which existed under the old Act continue under the CLM Act.

A lease enables exclusive use of a piece of land for a specified term and purpose. Leases can be for a term of up to 100 years. Licenses are contractual agreements that allow the licensee a right to occupy and use Crown land for a purpose, such as mineral extraction, mining, or dredging.

Local councils are often appointed responsibility for the care, control, and management of Crown land along the coast and adjacent to estuaries. The management of that land must be in accordance with the appointment instrument, the *Crown Land Management Regulation 2018*, any other applicable Crown land management rules, any applicable plan of management and any applicable community engagement strategy.

A local council managing Crown land is authorised to classify and manage Crown land as if it were public land as defined in the LG Act 1993. This means that a council can manage Crown land as if it were community land (the default classification) or operational land (with the consent of the minister). This is a significant difference from the previous system, whereby council managed Crown reserves under the Crown Lands Act but managed their own public land under the LG Act. The removal of this distinction has aimed to streamline land management, although Crown land is still “owned” by the state.

The intention is to give Councils more autonomy in the management of Crown land with less oversight by the state. This also places greater responsibility on local



councils, for example, in complying with the Commonwealth *Native Title Act 1993*. There is also an increased requirement for transparency and community engagement in the management of Crown lands.

Councils can prepare plans of management for Crown land over which they have control or, alternatively, the minister responsible for the CLM Act may direct a council to prepare a Plan.

Importantly, any land reserved by either the CLM Act (or the NPW Act) will also be subject to the provisions of any relevant environmental planning instruments (EPIs). However, the provisions of these two Acts hold precedence over the EPIs. In other words, the EPIs cannot authorise any activities or projects that would not be authorised under these two acts.

12 Aboriginal Land Rights Act 1983 (ALR Act)

The ALR act provides a means whereby Aboriginal Land Councils (also established under the Act) can lodge a claim to land. Where the land is found to meet certain criteria, freehold title to that land must be transferred to the relevant Land Council. "Claimable" lands under S36(1) of the Act, are lands which:

- "a are able to be lawfully sold or leased, or are reserved or dedicated for any purpose under the Crown Lands Consolidation Act 1913 or the Western Lands Act 1901*
- b are not lawfully used or occupied*
- b1 do not comprise lands which, in the opinion of a Crown Lands Minister, are needed or are likely to be needed as residential lands*
- c are not needed, nor likely to be needed, for an essential public purpose*
- d do not comprise lands that are subject to an application for determination of native title (other than a non-claimant application that is an unopposed application) that has been registered in accordance with the Commonwealth Native Title Act, and*
- e do not comprise lands that are the subject of an approved determination of native title (within the meaning of the Commonwealth Native Title Act) (other than an approved determination that no native title exists in the lands)."*

The assessment is completed by the Crown Lands branch of DPE. There are some 120 Aboriginal Land Councils established in NSW, to carry out functions relating to land acquisition, use and management, culture and heritage, financial stewardship and schemes for community benefit.

13 (Federal) Native Title Act 1993 (NT Act)

Native title refers to a collection of rights relating to performing particular activities on land, including the right to camp, hunt, use water, hold meetings, perform ceremony and protect cultural sites.

The NT Act was developed in response to the Mabo claim, lodged in 1982 and upheld in the High Court in 1992. Acknowledgement of this claim to native title overturned a prior claim of *terra nullius*, upon which the British colonisers of Australia originally justified seizure and possession of Australia. Effectively, the colonisers claimed that the continent was “nobody’s land” or “not owned” by anyone else. The Mabo decision effectively found that the claim of *terra nullius* was unjustified and that there were pre-existing rights to native title across Australia prior to colonisation and that those pre-existing rights survived colonisation. The NT Act recognises and protects those rights.

The NT Act establishes a process for claiming and recognising native title over land and waters in Australia. It aims to balance Indigenous and non-Indigenous rights and, in most cases, native title results in non-exclusive possession existing alongside other non-indigenous property rights. In this case, native title does not allow for controlling access to, and use of, an area. In some cases, however, native title rights may result in exclusive possession, which is similar in nature to freehold title over the land.

Native title can be claimed over land such as:

- vacant (or unallocated) Crown land.
- parks and public reserves.
- beaches.
- some leases (such as non-exclusive pastoral leases).
- land held by government agencies.
- some land held for Aboriginal and Torres Strait Islander communities.
- oceans, seas, reefs, lakes, rivers, creeks and other waters that are not privately owned.

Native title rights cannot be claimed in relation to minerals, gas or petroleum. The NT Act, also recognises rights and interests in water according to traditional customs and law. This means that native title holders can access and take water, without a license for (S211(3)):

- Hunting.
- Fishing.



- Gathering.
- Cultural or Spiritual Activities.
- Other prescribed activities

Native title rights in tidal and sea areas can only be of a non-exclusive nature.

Unlike claims under the ALR Act, native title claims are ultimately made by a court. This can either follow agreement between the claimants and the NSW government or, if agreement can't be reached, following a trial.

The Crown Lands branch of DPE assists the NSW Government with negotiations.

14 National Parks and Wildlife Act, 1974 (NPW Act)

The *National Parks and Wildlife Act, 1974* (NPW Act) gives the Chief Executive of the National Parks and Wildlife Service care, control, and management over a range of reserves including national parks, historic sites, nature reserves and Aboriginal areas. In addition, the Chief Executive is also responsible for the protection and care of Aboriginal places and objects in NSW. Parts 7, 7A, 8, 8A and 9 of the Act, which dealt with flora, fauna, and threatened species, were repealed by the Biodiversity Conservation Act in 2016.

As noted above, parcels of Crown Land can be reserved for purposes under the NPW Act.

The purpose of a national park is to

“identify, protect and conserve areas containing outstanding or representative ecosystems, natural or cultural features or landscapes or phenomena that provide opportunities for public appreciation and inspiration and sustainable visitor or tourist use and enjoyment”

And this purpose is to be supported by the following management principles:

- (a) the conservation of biodiversity, the maintenance of ecosystem function, the protection of geological and geomorphological features and natural phenomena and the maintenance of natural landscapes,*
- (b) the conservation of places, objects, features and landscapes of cultural value,*
- (c) the protection of the ecological integrity of one or more ecosystems for present and future generations,*
- (d) the promotion of public appreciation and understanding of the national park's natural and cultural values,*



(e) provision for sustainable visitor or tourist use and enjoyment that is compatible with the conservation of the national park's natural and cultural values,

(f) provision for the sustainable use (including adaptive reuse) of any buildings or structures or modified natural areas having regard to the conservation of the national park's natural and cultural values,

(g) provision for appropriate research and monitoring.

The Minister for the Environment can grant a lease or licenses over land within a National Park with limits on the purpose for which the lease or license can be granted outlined in §151A of the NPW Act. However, any license granted under this section should be consistent with the management principles for national parks as outlined above. The NPW Act requires a management plan for the nature reserve to be prepared, consistent with those management principles.

15 Fisheries Management Act, 1994 (FM Act)

The *Fisheries Management Act, 1994* (FM Act) is the primary act covering the management of fish and their habitats in NSW. Therein, 'fish' includes oysters, crustaceans, echinoderms, beachworms, and other polychaetes. The act is administered by the NSW Department of Primary Industries which issues permits and has both a compliance role and an approval role for development in some circumstances.

The *FM Act* also provides a parallel role to the *Biodiversity Conservation Act* with the conservation of threatened species, population and ecological communities of fish and marine vegetation.

Depending on the nature of actions that are involved in coastal management, and the tenure of land upon which it is undertaken, it is possible that one or more permits could be required under Part 7 of the Fisheries Management Act. These may comprise some or all the following:

- A permit for dredging, due to the potential impact on estuarine habitats.
- A permit for reclamation, for example, relating to the reinstatement of access ways in areas when entrance channels have migrated; and
- A permit to harm marine vegetation, if seagrass beds are to be removed or smothered with sand.

The NSW Department of Primary Industries website⁶ advises that permission for dredging and reclamation could be granted for essential navigation or environmental

⁶ <https://www.dpi.nsw.gov.au/fishing/habitat/protecting-habitats/activities-requiring-a-permit>



rehabilitation. Regardless, permission is likely to be withheld if the activity would reduce water quality; damage or destroy marine vegetation or riparian vegetation, gravel beds, reefs, or snags; or interfere with commercial or recreational fishing. Furthermore, the website advises that, under most circumstances a permit to damage live seagrasses would only be permitted for replanting and scientific research purposes.

However, there is an exception to the requirement for a permit outlined in §200(2)(a). If work is authorised under the *Crown Lands Management Act 2016*, the need to acquire a permit is removed. Under §199 Crown Lands still has an obligation to consult with NSW DPI (Fisheries) prior to authorizing and dredging or reclamation works.

16 Biodiversity Conservation Act, 2016 (BC Act)

The BC Act repealed the *Threatened Species Conservation Act, 1995* in 2017 and was introduced alongside parallel amendments to the *Local Land Services Act 2013* which were enacted at the same time.

Commensurate with the previous *Threatened Species Conservation Act* the BC Act provides for the conservation of threatened species and ecological communities. It generally covers:

- Procedures and criteria for the identification and listing of threatened species and ecological communities and their related critical habitats.
- The making of management plans for protected animals and plants.
- Provisions relating to biodiversity assessment and approvals.
- The establishment of the Biodiversity Conservation Trust (BCT, which has replaced the Nature Conservation Trust, with the *Nature Conservation Trust Act* also being repealed by the BC Act).
- Regulatory compliance, investigation powers, criminal and other proceedings relating to offences under the BC Act.

The BCT has the following purposes:

- To encourage landholders to enter into co-operative arrangements for the management and protection of the natural environment that is significant for the conservation of biodiversity.
- To seek strategic biodiversity offset outcomes to compensate for the loss of biodiversity due to development and other activities.
- To provide mechanisms for achieving the conservation of biodiversity.



- To promote public knowledge, appreciation and understanding of biodiversity, and the importance of conserving biodiversity.

The reforms which introduced the BC Act aimed to maintain the protection of plants and animals (including marine mammals) to support ecologically sustainable development and to deliver a sustainable and productive agricultural sector. The BC Act also establishes a regulatory framework for a biodiversity offset scheme, including the calculation of biodiversity credits using the *Biodiversity Assessment Method (BAM)*⁷. The BAM also applies to the clearing of land under the *Local Land Services Act 2013*.

Under the new Act, non-State significant development under part 4 of the EP&A Act cannot be approved if the consenting authority believes the development is likely to have serious and irreversible impacts on biodiversity values. The assessment of biodiversity impacts via the BAM is to be presented in a Biodiversity Assessment Report (BDAR) which is to accompany the development application. If impacts are not “serious and irreversible”, developers may offset impacts by:

- Generating biodiversity credits through a Biodiversity Stewardship Agreement.
- Purchasing biodiversity credits.
- Paying money into the Biodiversity Conservation Fund.

Serious and irreversible impacts on biodiversity values are defined in the *Biodiversity Conservation Regulation 2017* as contributing significantly to the risk of a threatened species or ecological community becoming extinct by:

- Causing further decline with the species or community which is suspected to be in a rapid rate of decline.
- Reducing the size of the species population or ecological community that is suspected or known to have a very small size.
- Impact on the species habitat or ecological community that is reasonably suspected to have a limited geographic distribution.
- The species or ecological community being unlikely to respond to measures to improve the situation.

⁷ outlined in the supporting document: <https://www.environment.nsw.gov.au/research-and-publications/publications-search/biodiversity-assessment-method-2020> with an online calculator available at <https://www.lmbc.nsw.gov.au/bamcalc>



17 Protection of the Environment Operations Act 1997 (POEO Act)

The POEO Act 1997 is the primary legislation administered by the NSW Environment Protection Authority. The act allows for:

- The EPA to set out “Protection of the Environment Policies” which establish standards, goals, protocols, and guidelines for protection of the environments.
- The EPA to issue licenses including relevant conditions.
- The EPA to regulate “scheduled” activities (e.g. coal and coke works, concrete works, chemical manufacture and storage, extractive industries, marinas..., sewage treatment, agricultural processing, aquaculture and mariculture
- Either the EPA (for scheduled activities) or a local Council (other activities) to issue Environment Protection Notices, Clean-up, or prevention notices

The POEO and its attendant regulations also identify offences and the penalties that apply. Coastal management programs are largely strategic documents, and it is important to understand that compliance and regulation under the POEO Act is an operational matter.

18 Marine Safety Act 1998 (MS Act)

The objects of the MS Act are:

- (a) to ensure the safe operation of vessels in ports and other waterways,*
- (b) to promote the responsible operation of vessels in those waters so as to protect the safety and amenity of other users of those waters and the amenity of occupiers of adjoining land,*
- (b1) to provide an effective framework for the enforcement of marine legislation,*
- (c) to provide for the investigation of marine accidents and for appropriate action following any such investigation,*
- (d) to consolidate marine safety legislation.*

Alongside its attendant regulations, the MS Act sets controls on boat operation including (among other things) licensing, towing, wake boarding, safe distances and speeds and safety equipment.

Section 11 (2A) of the MS Act notes that, through publication of a notice in the Gazette, the Minister may impose restrictions on:



-
- (a) the speed of vessels, or*
 - (b) the creation of wash by vessels, or*
 - (c) the creation of noise by vessels, or*
 - (d) the mooring or anchoring of vessels, or*
 - (e) the use of vessels for particular purposes, or*
 - (f) the use of vessels in particular areas (including the exclusion of vessels from particular areas).*

FINAL DRAFT



Attachment A: Coastal Management Act, 2016: Management Objectives for Coastal Management Areas

FINAL DRAFT



Management Objectives for Coastal Wetlands and Littoral Rainforests Area

(a) to protect coastal wetlands and littoral rainforests in their natural state, including their biological diversity and ecosystem integrity.

(b) to promote the rehabilitation and restoration of degraded coastal wetlands and littoral rainforests.

(c) to improve the resilience of coastal wetlands and littoral rainforests to the impacts of climate change, including opportunities for migration.

(d) to support the social and cultural values of coastal wetlands and littoral rainforests.

(e) to promote the objectives of State policies and programs for wetlands or littoral rainforest management.



Management Objectives for Coastal Vulnerability Area

- (a) to ensure public safety and prevent risks to human life.
- (b) to mitigate current and future risk from coastal hazards by taking into account the effects of coastal processes and climate change.
- (c) to maintain the presence of beaches, dunes and the natural features of foreshores, taking into account the beach system operating at the relevant place.
- (d) to maintain public access, amenity and use of beaches and foreshores.
- (e) to encourage land use that reduces exposure to risks from coastal hazards, including through siting, design, construction and operational decisions.
- (f) to adopt coastal management strategies that reduce exposure to coastal hazards:
 - (i) in the first instance and wherever possible, by restoring or enhancing natural defences including coastal dunes, vegetation and wetlands, and
 - (ii) if that is not sufficient, by taking other action to reduce exposure to those coastal hazards,
- (g) if taking that other action to reduce exposure to coastal hazards:
 - (i) to avoid significant degradation of biological diversity and ecosystem integrity, and
 - (ii) to avoid significant degradation of or disruption to ecological, biophysical, geological and geomorphological coastal processes, and
 - (iii) to avoid significant degradation of or disruption to beach and foreshore amenity, and social and cultural values, and
 - (iv) to avoid adverse impacts on adjoining land, resources or assets, and
 - (v) to provide for the restoration of a beach, or land adjacent to the beach, if any increased erosion of the beach or adjacent land is caused by actions to reduce exposure to coastal hazards,
- (h) to prioritise actions that support the continued functionality of essential infrastructure during and immediately after a coastal hazard emergency
- (i) to improve the resilience of coastal development and communities by improving adaptive capacity and reducing reliance on emergency responses.



Management Objectives for Coastal Environment Area

(a) to protect and enhance the coastal environmental values and natural processes of coastal waters, estuaries, coastal lakes and coastal lagoons, and enhance natural character, scenic value, biological diversity and ecosystem integrity.

(b) to reduce threats to and improve the resilience of coastal waters, estuaries, coastal lakes and coastal lagoons, including in response to climate change.

(c) to maintain and improve water quality and estuary health.

(d) to support the social and cultural values of coastal waters, estuaries, coastal lakes and coastal lagoons.

(e) to maintain the presence of beaches, dunes and the natural features of foreshores, taking into account the beach system operating at the relevant place.

(f) to maintain and, where practicable, improve public access, amenity and use of beaches, foreshores, headlands and rock platforms.



Management Objectives for Coastal Use Area

(a) to protect and enhance the scenic, social and cultural values of the coast by ensuring that:

- (i) the type, bulk, scale and size of development is appropriate for the location and natural scenic quality of the coast, and
- (ii) adverse impacts of development on cultural and built environment heritage are avoided or mitigated, and
- (iii) urban design, including water sensitive urban design, is supported and incorporated into development activities, and
- (iv) adequate public open space is provided, including for recreational activities and associated infrastructure, and
- (v) the use of the surf zone is considered.

(b) to accommodate both urbanised and natural stretches of coastline.



Attachment B: Mandatory Requirements of a Coastal Management Program

The purpose, scope and focus of a CMP (Mandatory Requirements 2 & 3)

A CMP is to consider a range of timeframes and planning horizons including immediate, 20 years, 50 years, 100 years and (if council considers it relevant based on expert advice) beyond.

A CMP is to consider a broad range of coastal management issues and management actions with a focus on achieving the objects and objectives of the CM Act.

The area that a CMP Covers (Mandatory Requirements 4 & 5)

A CMP must include the rationale for selecting the area to be covered by a CMP and identify whether it applies to:

- (i) all or part of the coastal zone of one local government area; or
- (ii) all or part of the coastal zone of adjoining local government areas that share a coastal sediment compartment or estuary (where adjoining local government areas share a coastal sediment compartment or estuary - refer to Schedule 1 of the CM Act - a CMP that addresses an area comprising that coastal sediment compartment or estuary must reflect this regional context).

A CMP must identify:

- (i) any proposed amendments to mapping of the relevant coastal management areas;
- (ii) evidence to support any proposed amendments or additions to the area of the four coastal management areas in the relevant area; and
- (iii) information about these proposed amendments that can support the preparation of a planning proposal and, in particular, that could be forwarded along with a planning proposal to the Greater Sydney Commission (if the planning proposal relates to the Greater Sydney Region) or the Minister (for elsewhere) to inform a Gateway determination under section 3.34 of the EP&A Act.



Preparing a CMP (Mandatory Requirements 6 & 7)

During preparation of a CMP, a council is to:

- (i) identify the scope of the CMP;
- (ii) determine and assess coastal risks, vulnerabilities and opportunities (including without limitation risks to environmental, social and economic values and benefits); and
- (iii) evaluate and select coastal management options.

Note: These requirements correspond to the first three stages of the five-stage risk management process for the preparation and implementation of a CMP. These requirements are in addition to the specific requirements during preparation in the CM Act. Guidance for preparation is provided in Part B of the manual.

A council may choose not to repeat steps (or parts of steps) in subparagraphs (ii) or (iii) of mandatory requirement 6 for the area the subject of the proposed CMP (or parts of that area) if those tasks have already been undertaken for the coastal management of that area, provided that council first considers:

- (i) whether the existing assessment of coastal risks, vulnerabilities and opportunities, or the existing evaluation of coastal management options, that council proposes to rely on enables council to prepare the CMP in accordance with mandatory requirement 8 below and sections 14 and 15 of the CM Act;
- (ii) the effectiveness of the existing coastal management of that area; and
- (iii) whether any circumstances concerning the coastal management of that area have changed.



Key issues to be identified (Mandatory Requirement 8)

A CMP must:

- (i) provide a description of how the objects of the CM Act have been considered and promoted in preparing the CMP;
- (ii) provide a description of how the objectives of the coastal management areas covered by the CMP have been given effect to in preparing the CMP;
- (iii) identify the key coastal management issues affecting the areas to which the CMP is to apply and how these have been considered;
- (iv) identify any coastal management actions required to address those key coastal management issues in an integrated and strategic manner;
- (v) identify how the coastal management actions in (iv) have been considered and evaluated (including, without limitation, how council has evaluated the coastal management actions in light of the functions and responsibilities council has under legislation other than the CM Act);
- (vi) identify any environmental protection works, on land identified as 'coastal wetlands' or 'littoral rainforests' on the Coastal Wetlands and Littoral Rainforests Area Map under the RH SEPP, that are proposed to be carried out by or on behalf of a public authority;
- (vii) identify any coastal protection works that are proposed to be carried out by or on behalf of a public authority;
- (viii) set out the recommended timing for the proposed coastal management actions;
- (ix) identify a proposed monitoring, evaluation and reporting program in relation to the CMP, including by identifying key indicators, trigger points and thresholds relevant to the CMP; and
- (x) include a business plan.



Requirements for the business plan in the CMP (Mandatory Requirement 9)

The business plan included in the CMP must identify:

- (i) all proposed coastal management actions identified elsewhere in the CMP;
- (ii) the full proposed capital, operational and maintenance costs, and recommended timing, of proposed coastal management actions;
- (iii) any proposed cost-sharing arrangements and any other viable funding mechanisms for the proposed coastal management actions to ensure delivery of those actions is consistent with the timing for their implementation under the CMP; and
- (iv) the distribution of costs and benefits of all proposed coastal management actions

Requirements for preparing a CMP which includes a proposed or mapped coastal vulnerability area (Mandatory Requirements 10 and 11)

Where coastal hazards have been identified in a coastal management area, a CMP must identify proposed coastal management actions for those hazards.

If the CM Act requires that a coastal zone emergency action subplan be prepared, it must identify any requirements for how emergency coastal protection works, within the meaning of the RH SEPP, are to be carried out.

Note: Emergency Coastal Protection Works are defined in Clause 19(4) of the RH SEPP

Requirements for taking coastal change into account when preparing a CMP (Mandatory Requirements 12 and 13)

A CMP must demonstrate how a council has considered:

- (i) projected population growth and demographic changes; and
- (ii) projected use of coastal land for infrastructure, housing, commercial, recreational and conservation purposes.



A CMP must demonstrate how a council has considered:

- (i) current and future risks, at timeframes of immediate, 20 years, 50 years, 100 years and (if council considers it relevant based on expert advice) beyond;
- (ii) (if council considers it relevant) current and future risks of potentially high consequence, low probability events that may affect the relevant area;
- (iii) the effects of projected climate change and how it may affect the relevant area;
- (iv) the local and regional scale effects of coastal processes; and
- (v) the ambulatory and dynamic nature of the shoreline and how it may affect the relevant area.

Format and content required of a CMP (Mandatory Requirement 14)

A CMP is to include the following sections:

- (i) Executive summary.
- (ii) Introduction.
- (iii) A snapshot of issues.
- (iv) Actions to be implemented by the council or by public authorities.
- (v) Whether the CMP identifies recommended changes to the relevant planning controls, including any proposed maps.
- (vi) A business plan.
- (vii) Coastal zone emergency action subplan, if the CM Act requires that subplan to be prepared.
- (viii) Monitoring, evaluation and reporting program.
- (ix) Maps.
- (x) Reference list.



Community Engagement and Consultation (Mandatory Requirement 15)

A draft CMP must be exhibited for public inspection at the main offices of the councils of all local government areas within the area to which the CMP applies, during the ordinary hours of those offices, for a period of not less than 28 calendar days before it is adopted. This mandatory requirement does not prevent community consultation, or other consultation, in other ways.

Monitoring and reporting on implementation of a CMP (Mandatory Requirements 16 and 17)

When implementing a CMP, a council must:

- (i) carry out the monitoring, evaluation and reporting program in the CMP (MER); and
- (ii) monitor key indicators, trigger points and thresholds identified in the MER.

Councils must report on the implementation of a CMP through the IP&R framework on an annual, four yearly and ten-yearly basis.

Implementation of a CMP (Mandatory Requirement 18)

When an adjoining council or a public authority is affected, or is likely to be affected, by implementation of some aspect of a CMP, a council must liaise with that authority when implementing that aspect of the CMP.

Information to support a performance audit (Mandatory Requirement 19)

Councils must maintain sufficient information and records about its management of the relevant parts of the coastal zone that will enable it to demonstrate:

- (i) how the CMP has been implemented
- (ii) what has been achieved in connection with the CMP, including whether coastal management actions have been carried out within the timeframes identified in the CMP.



Appendix C Coastal Hazards Defined in the CM Act

FINAL DRAFT



C.1 Introduction

The coastal hazards identified in the CM Act differ in several ways from those commonly analysed under the previous coastal management framework. There are seven coastal hazards defined by the CM Act:

- “(a) beach erosion,*
- (b) shoreline recession,*
- (c) coastal lake or watercourse entrance instability,*
- (d) coastal inundation,*
- (e) coastal cliff or slope instability,*
- (f) tidal inundation,*
- (g) erosion and inundation of foreshores caused by tidal waters and the action of waves, including the interaction of those waters with catchment floodwaters.”*

A summary of the nature of these hazards is provided in the following sections.

C.2 Beach Erosion

Beaches change consistently under the effects of waves, ocean water levels, currents and wind. The *Beach Erosion* coastal hazard is concerned with the erosion which occurs during rare storm events where large ocean waves and elevated water levels (storm surge) occur. During these events sand can be stripped from the visible ("sub-aerial") beach, reducing the width and elevation of the beach.

The severity of erosion at a given location along the beach is affected by factors such as the direction of wave approach, rips, amount of sheltering by islands or headlands, wave period, and the presence of non-erodible rock outcrops. Beach vegetation also plays an important role in reducing the amount of sand eroded from the dunes behind the beach and recession of the erosion scarp which forms.

The roots of dune grasses and shrubs help to hold the sand together, hindering the collapse and washing away of sand. Beach vegetation also helps to promote recovery of a beach after a storm.

A simplified illustration of beach storm behaviour is shown in Figure C.1, wherein the sand stripped from the beach is carried offshore to form a storm bar.

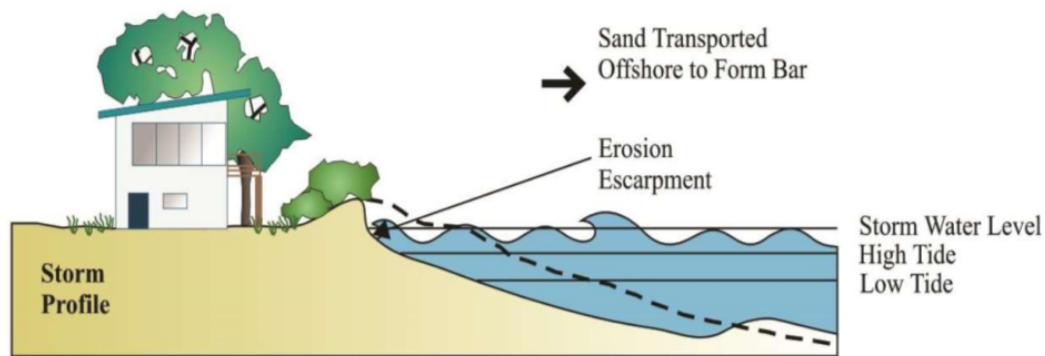


Figure C.1 Storm Erosion Profile (from NSW Government (2018b))

After the storm, more ambient wave conditions tend to move sand from the offshore bar back onto the visible part of the beach, rebuilding it to something closer to its pre-storm profile. The behaviour is rarely this simple, and erosion can be affected by many other factors including:

- Alongshore sand transport patterns.
- Sand bypassing of headlands and rock platforms as slugs, or alternatively, headlands preventing the alongshore transport of sand.
- Rotation of the beach due to seasonal to multi-annual changes in wave direction.
- State of the beach prior to a storm.

The location and state of the beach at any given time is a combination of all these factors. The beach erosion hazard is typically considered alongside shoreline recession in deriving coastal "hazard lines" which are used for planning purposes.

In deriving hazard lines, a design "storm demand" value is applied to the beach (in m^3 lost per meter of beach) to represent storm erosion. A commonly applied maximum storm demand in NSW has historically been $250 \text{ m}^3/\text{m}$ (NSW Government, 1990).

C.3 Shoreline Recession

Shoreline recession refers to a persistent landward movement of the shoreline over time, without recovery. In some locations in NSW, this has been a notable historical occurrence. Chronic ongoing recession to the north of coastal structures which interrupt the alongshore movement of sand has also occurred in NSW, noting that south to north alongshore transport tends to dominate along the NSW coast.

Future shoreline recession under the influence of climate change related sea level rise is of particular interest. Studies assessing this need to consider where beaches may migrate to within the coastal landscape in future and whether there are any barriers to that migration.



Long term beach "recession" behaviour typically has to be analysed alongside short term "erosion" behaviour. Long term recession may arise from a sequence of short-term events between which a beach is unable to fully recover.

The causes and extent of shoreline recession require a robust consideration of local geomorphology including:

- The evolutionary history of the coast.
- Sediment budgets including barriers to alongshore transport and the potential for offshore losses.
- Natural variability, including beach rotation.
- The presence of rock, including reefs and/or bedrock underlying or landward of beaches.
- The presence and quality of any coastal structures (seawalls, revetments).
- How the coast will respond to sea level rise and other climate related changes (potential changes to storm wave direction, storm intensity).

For many of these considerations, methods for analysis and data are limited. However, there are significant ongoing improvements in the quality and accuracy of available information.

Recession is often calculated using assumptions relating to the adjustment of the nearshore profile, without considering the three-dimensional nature of coastal change (e.g., neglecting variability in alongshore transport). The most commonly applied method for estimating shoreline recession due to sea level rise is the Bruun Rule (Bruun, 1988, 1962). The Bruun Rule assumes that the shoreface, extending from offshore to include the visible beach and dune system would maintain an equilibrium profile as sea levels rise, with that profile translated upwards by the same amount as sea level rise and landwards based on balancing the volume of sand across the profile. The concept is shown schematically in **Error! Reference source not found.**

The recession predicted by the Bruun Rule is sensitive to the adopted 'depth of closure'. In New South Wales, there is substantial variability in values used by different practitioners, with values ranging from 14 to 60m reported in the literature (Wainwright et al., 2014). The most commonly applied guidance is that published by Hallermeier (1983, 1985).

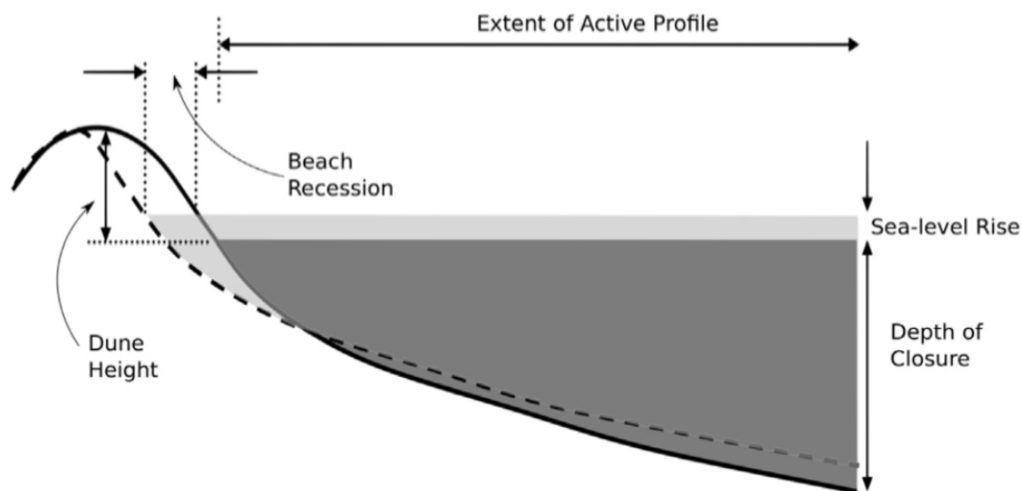


Figure C.2 Schematic Representation of the “Bruun Rule” (from Wainwright et al., 2014)

The Bruun Rule has been broadly criticised for its limitations (Pilkey et al., 1993; Cooper and Pilkey, 2004; Ranasinghe et al., 2007), but it is simple and there is no widely accepted and available method for completing these types of assessments (Ranasinghe et al., 2012).

C.4 Coastal Lake or Watercourse Instability

Concerns relating to this particular coastal hazard include:

- The impact of a closed entrance on flood behaviour, which can vary depending on the size of the flood and may be more of an issue for more frequent "nuisance" flooding. There is some overlap with other coastal hazards and for this reason it is useful to be clear. Extreme and nuisance flood impacts are considered herein to be addressed under the "Coastal Inundation" and "Tidal Inundation" hazards.
- Dynamic entrance behaviour which results in the constant redistribution of sand and shoaling, which can cause a hazard for navigation.
- Erosion of the foreshores inside and at the immediate entrance, resulting in the loss of adjacent land or a potential need for protective structures.
- Meandering of untrained entrances across beaches, potentially undermining structures along the beach and/or inhibiting access.

Entrance behaviour, and management actions which aim to address the resulting hazards, also interact with water quality and ecology inside the estuary and the operation of infrastructure (e.g., stormwater draining to the waterway).



The studies which might inform management of this hazard are varied. For example:

- If foreshores along a longer entrance channel are adjusting or the channel itself meandering, analysis of repeated survey and/or aerial photography may be used to quantify the rates of change. An entrance may be continually evolving due to some permanent change such as entrance training, and the impact of such changes can persist for centuries. Empirical relationships relating to the 'equilibrium' area of a tidal inlet (Van de Kreeke and Brouwer, 2017) may also be used to examine how the entrance channel may evolve in future.
- If the entrance intermittently opens or closes, then analysis of aerial photography and/or satellite imagery may be required. Such studies could be used to determine the location and proportion of time that an entrance is open or closed, or trends and tendencies for a channel across the beach to be aligned in a certain direction.

C.5 Coastal Inundation

The coastal inundation hazard refers to hazards that result from abnormally high wave and water level events in the ocean. There are two key mechanisms:

- 1 Storm Surge Inundation: Elevated ocean water levels (storm surge) arising from low pressure (barometric setup), wind set-up and other coastal water anomalies, combined with astronomical tides. These can elevate water levels by driving more flow through the open entrance of estuaries and flooding low lying coastal areas.
- 2 Wave Overtopping: Waves acting on top of the processes under Point 1, causing additional wave setup and runup which overtops a beach, dune, bluff, cliff or seawall.

With reference to Point 1, we note that NSW state government guidance for flood modelling in coastal areas has recommended that suitably elevated tailwater levels (representing storm surge) be adopted in flood modelling, and that this has been the case for over 15 years. A suitable recommendation in relation to coastal management programs is that duplication of development controls and/or emergency management of this inundation mechanism should not be duplicated and the provisions which have been developed under the standard floodplain risk management process in NSW should suffice.

With reference to Point 2, a typical study could involve initial assessment of an LGA's coastline to overtopping, perhaps by isolating and assessing areas that sit below what would be considered a typical limit for runup during storms in NSW, with an appropriate upper allowance for sea level rise added. Once a list of locations is identified, all of these, or a selected sample may be subject to more detailed analysis, potentially using wave modelling, Monte Carlo simulations, and modelling of overtopping and backshore inundation. A variety of methods can be used, and the



methods selected will depend on the nature of the site and the assets that could be affected by overtopping.

Probabilistic assessment could be adopted, ranking statistically derived storm events on the basis of the total overtopping volume and/or peak discharge rates during the storm. A detailed study should aim to map the extent of backshore area inundated by overtopping events of different likelihoods. The exercise may be repeated for different amounts of sea level rise.

One important aspect of overtopping studies is estimating the state of the shoreline during a storm event. With sandy beaches, for example, the shape of an eroded beach profile may need to be adopted, and an allowance for beach recession due to sea level rise may also need to be included.

Tsunamis are also discussed as part of the coastal inundation hazard within the Coastal Management Manual. A Tsunami is a series of waves caused by the displacement of a large volume of water, via mechanisms such as earthquakes, volcanic eruptions and underwater landslides.

A tsunami's wave height may be relatively small in the deeper ocean, but as it moves into shallower water the wave slows, shoals (rears up) and breaks. Due to the long period of the wave, a "drawback" of the ocean may initially be witnessed along the coast, with normally covered areas of the nearshore seabed exposed before the crest of the wave approaches the shoreline. Tsunami waves have a typical period of 12 minutes, but this can vary from 5 minutes to 2 hours.

Large tsunamis can traverse entire ocean basins. The 1960 Chile Earthquake, which is the largest earthquake ever recorded, generated a Tsunami wave which crossed the Pacific Ocean, reaching the NSW coast some 14-15 hours after the earthquake and causing waves of up to 1.7m high at tide gauges along the NSW coast with a period typically between 15 and 30 minutes. That Tsunami caused some moderate damage to boats inside harbours along the NSW coastline.

The NSW SES classifies individual Tsunamis as either "marine threat" or "land threat". A marine threat tsunami occurs, on average, every six years or so on the NSW coast, but these usually only represent a danger to swimmers and boaters, mainly due to the currents that these events can generate, noting that these can cause a sudden surge into an estuary and resonance inside harbours. There have been no "land threat" tsunamis recorded in Australia since European colonisation¹. Due to the overall moderate risk arising from land threat tsunamis in NSW, the tsunami threat has not been considered in land use planning, with the residual risk treated through emergency management.

¹ <https://www.ses.nsw.gov.au/resources-folder/tsunami-evacuation-map/>, accessed 28/10/2022.



The NSW SES is the controlling agency for Emergency management in NSW, and have developed a State Tsunami Plan (NSW Government, 2018a). In the event that a land threat tsunami warning is received by the NSW SES, the overriding strategy is for evacuation of low-lying areas to areas at least 10m above sea level or one kilometre away from the coast and rivers.

C.6 Coastal Cliff or Slope Instability

The CMM refers to "coastal cliff or slope instability" as occurring "*on the headlands and bluffs within and separating coastal sediment compartments*". It also, somewhat confusingly, refers to the "*collapse of unconsolidated materials (such as high dune escarpments), reduced foundation capacity...*". The latter infers that the collapse of sandy beach and geotechnical issues that arise from sandy beach erosion are considered under the *Coastal Cliff or Slope Instability* Hazard. In fact, post storm collapse of sandy slopes has traditionally been addressed as part of the combined beach erosion and recession hazard, and we recommend that this should remain the adopted approach. In addition, for clarity, the "*coastal sediment compartments*" referred to by the CMM in the above quote are seemingly not the sediment compartments defined in the CM Act but apparently refer to individual sandy beaches separated by headlands and bluffs.

The coastal cliff or slope instability hazard should refer only to areas where a wide, sandy beach is absent most of the time. In other words, coastlines where underlying bedrock or cliffs are exposed either permanently or most of the time and any sand deposits are ephemeral. There are locations along the coast where a rock platform exists but, from time-to-time slugs of sand will be transported along the shoreline, over the rock platform, forming a thin sandy beach. The ephemeral presence of sand along these lengths of the coast should be ignored.

A common study for coastal cliff or instability would use the methods outlined in the guidelines for landslide risk assessment published by the Australian Geomechanics Society (AGS, 2007). Studies would normally be completed by an Engineering Geologist or Geotechnical Engineer, and would be informed by:

- Assessment and understanding of the evolution of the coast including local geology, stratigraphy, and the extent of bedrock underlying beaches.
- Assessment of the effects of how constructed drainage may have altered surface runoff patterns and groundwater flows.
- Assessment of how climate change and sea level rise may affect weathering, erosion and undercutting of coastal cliffs and bluffs.
- Assessment of the frequency of rock falls and the potential for these to be an issue for public safety.



C.7 Tidal Inundation

In contrast to “*coastal inundation*” is the “*tidal inundation*” hazard defined by the CM Act. That hazard refers to inundation by “normal” tides, considering how these will be affected by sea level rise in future. Colloquially, such inundation is referred to as “sunny day” flooding and the CMM equates “*tidal inundation*” with “*nuisance flooding*”. Typically, determination of the extent of this inundation hazard would involve execution of numerical model scenarios which examine the propagation of “king tides” into an estuary. King tides are effectively the highest astronomical (normal) tides which could be marginally exceeded in the ocean and estuaries several times a year.

Where an entrance remains open to the tide, the required analyses would typically involve recalibration of existing flood models to ensure robust representation of tidal response inside the waterway, and then executing simulations and mapping peak king tide water level inundation extents around the foreshores for a variety of different sea level rise scenarios. If the opportunity arises, such studies can be completed economically alongside the corresponding flood study.

However, ICOLLs provide a different problem. The maximum “nuisance” or “sunny day” inundation for these types of systems normally occurs when the entrance is closed. When closed, the barrier in front of the ICOLL builds, and the water level landward of the barrier rises as the ICOLL fills with catchment runoff. This may occur rapidly, or over several months or years. Eventually the barrier overtops, and a channel is scoured to the ocean, allowing the ICOLL to drain. A question of key concern is how much sea level rise is likely to be acceptable before these water levels, which persist for months, are too high for existing land uses to continue.

A different type of study could be adopted for ICOLLs, involving consideration of the height to which the barrier might grow, including under a future sea level rise scenario; the historical water levels experienced inside the entrance, and the way in which the entrance has been managed (if at all). The outcomes of such a study are needed to inform an intervention that may be considered as part of an entrance management plan.

C.8 Erosion and Inundation of Foreshores caused by Tidal Waters and the Action of Waves, including the Interaction of those waters with Catchment Floodwaters

The seventh listed hazard in the CM Act is a complex, interacting “catch all” hazard which aims to capture many of the hazards that may cause problems inside estuaries. In reality, many aspects of these are already treated by Hazards 1 through 6.

Decomposing Hazard 7 (see Table C.1), there are two “Hazards”, namely the erosion of foreshores, and the inundation of foreshores; and three processes: “tides”, “waves”



(including entrance penetrating ocean swell, wind waves and boat wake) and "tides combined with catchment floodwaters". Table C.1 contains a summary of how the combinations of hazards and processes could realistically be handled, although this would depend on the particular location being considered.

Table C.1 Recommendations for Addressing Hazard 7

Hazard	Tides	Waves	Tides + Floodwaters
Erosion of Foreshores	May require bespoke study	Primary Concern is swell waves near entrances, which would be addressed by analyses under Hazard 3. Boat wake for may be a site-specific concern in some estuaries, but not where there is no navigation. Similarly, wind waves are only an issue where the estuary is large and open, and long fetches are present to enable development of sizeable wind waves.	May require bespoke study
Inundation of Foreshores	Addressed under Hazard 6	Addressed under Hazard 4 or, alternatively as part of freeboard under the NSW Floodplain Risk Management Process	Manage under NSW Floodplain Risk Management Process

Based on Table C.1, foreshore erosion is most likely the key hazard requiring consideration under Hazard 7. Typically, there is not enough data to probabilistically assess the likelihood of erosion occurring and it is most that a hazard of concern will be identified by the erosion being witnessed in the field.

A suitable study for most estuaries would be to undertake a detailed inspection of the foreshores, identifying and documenting those locations where erosion is active and then using high resolution, georeferenced aerial photographs to estimate existing rates of recession. Sites may then be ranked, and potential management options identified.



Appendix D Community Engagement and Outcomes Report

FINAL DRAFT

COMMUNITY ENGAGEMENT OUTCOMES REPORT

WOLLONGONG COASTAL MANAGEMENT PROGRAM

Stage one

We acknowledge that within the Wollongong Local Government Area boundaries are the Traditional Lands of the Dharawal people.

We acknowledge these Aboriginal peoples as the traditional custodians of the land on which this Project is located and pay our respects to Elders past and present.

We also acknowledge all other Aboriginal and Torres Strait Islander people who now live within the Wollongong Local Government Area.

DISCLAIMER

This report has been prepared by Spectrum Comms on behalf of Wollongong City Council and may only be used and relied on for the purpose as set out in the project scope.

Spectrum Comms otherwise disclaims responsibility to any entity other than Wollongong City Council arising in connection with this report. Spectrum Comms also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by Spectrum Comms in connection with preparing this report were limited to those detailed in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. Spectrum Comms has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date the report was prepared.

Spectrum Comms has prepared this report on the basis of information provided by the community and other stakeholders and which Spectrum Comms has not independently verified or checked beyond the agreed scope of work. Spectrum Comms does not accept liability in connection with such unverified information, including errors and omissions in the plan which were caused by errors or omissions in that information.

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This project is supported by the NSW Government's Coastal and Estuary Management Program.

EXECUTIVE SUMMARY

Wollongong City Council (Council) engaged Spectrum Comms to undertake community engagement to inform the preparation of a Scoping Study for the Wollongong Coastal Management Program (CMP).

This community engagement outcomes report covers the engagement undertaken between 31 May and 7 July 2022. The purpose of this engagement was to understand what the community value about the coastline, how they use and enjoy it, as well as how they have seen the coast and estuaries change over time. We also wanted to understand what issues stakeholders believe may threaten or challenge the coastline or estuaries in the future.

This information, along with technical reviews and a first-pass risk assessment being undertaken by Salients, will help determine the scope for what the CMP needs to include, what studies need to be prepared and who needs to be involved in developing management options in later stages.

Input from the community, elected representatives and staff was gathered using a range of engagement methods. A webpage was published on Council's engagement site, Our Wollongong, and included an online survey, interactive map, story sharing tool, FAQs and background information. Other activities included pop-up and roaming engagement stalls and key stakeholder meetings and interviews.

This report includes an overview of the 630 stakeholders who actively participated, a summary of engagement findings by theme, and a detailed review of the findings from each engagement method. Where appropriate, verbatim comments (italicised) have been included. Verbatim comments precisely represent the views of participants and help to illustrate the sentiment and desire of stakeholders.

At the time of preparing this report, engagement with First Nations people had not yet been concluded and is being facilitated directly by Council. The outcomes of this engagement will be reported separately.

The findings detailed in this report are both aspirational and reflective. They reveal the ways in which residents and visitors use the coastline, what they value and love about it and what they identify as issues or challenges.

It is worth mentioning that not all issues and challenges raised during engagement fall within the scope of this CMP. Many relate to Lake Illawarra, which is the subject of its own CMP, developed by Council in partnership with Shellharbour City Council and the NSW Government. While data outside the scope of this CMP has been omitted from this report, it has been included in the Appendices for transparency. The full survey results, interactive map comments and stories, written submissions, as well as the communication collateral, can be found in the Appendices under separate cover.

Where appropriate, and sufficient details were provided, enquiries and complaints from stakeholders were escalated through Council's customer request management system.

The findings contained in this, and subsequent engagement reports, should be considered by Council during development and finalisation of the CMP. Specifically, Council should be able to reference where community input has influenced the development of the CMP and is encouraged to close the loop to ensure the community and other stakeholders understand how they have helped shaped this important program.

SUMMARY OF KEY VALUES

The following values were identified from community input, discussions with Councillors and Council staff and key user groups during Stage One. The values in Table 1 are listed in order of frequency of mention during the engagement period and are not necessarily representative of the values of the Wollongong LGA.

Figure 1 Word cloud of values



Table 1 List of community values

VALUE	DETAIL
Recreation	From surfing to walking, swimming, snorkelling, kite surfing, cycling, fishing, people value the recreational opportunities along the coast. Most people surveyed said they used the coast for some kind of recreational activity.
Coastal views	People value their coastal views, both from private property and from community land. They like being able to enjoy these views while socialising, exercising, dining or simply appreciating nature.
Dog off leash areas	The beaches are popular with dog walkers and off-leash areas are particularly valued. In particular, people appreciate being able to walk their dogs 24/7 in some locations to accommodate shift workers.
Shared pathways and walks	The pathways and creek walks are popular assets enjoyed by residents and visitors of all ages. They value being able to ride and/or walk along the coastline with coastal views and easy access to playgrounds, dining options, toilets and parking. Creek walks are appreciated for their flora and fauna, native vegetation and shade.
Rockpools	The ability to access the LGA's rock pools year-round was broadly appreciated and recognised. People also commented on and were appreciative of the regular maintenance activity.
Water quality	People value clean, clear water to undertake recreational activities in as well to observe as part of the natural amenity and beauty of the coastline. Good water quality was linked to thriving fish and bird life.
Wellbeing	People value how the coast and nature can help with their physical, emotional and mental wellbeing. They say being connected to nature is important to their health. Many indicated they liked to walk among the native trees and bushes, littoral rainforests and see the local fauna.
Blue Mile	The Blue Mile is valued by residents and visitors as a safe location for dog walking, exercising, socialising and dining. This is particularly of value during winter as it has lighting.
Family-friendly	People value family-friendly locations, locations with seating, bins, playgrounds or recreational activities. They value safe swimming areas such as the rock pools or shallows. Recently developed and new playgrounds are highly valued by families with children, the timing of this consultation coinciding with the opening of three new playgrounds at Bulli, Clifton and Balgownie.
Birds and wildlife	Many people engage in bird watching along the coast and within the estuaries. People associate sightings of bird and other wildlife with a healthy natural environment and expressed

VALUE	DETAIL
	strong desires to protect native flora and fauna. Whale and dolphin sightings were also enjoyed by many.
Surf breaks	Locals and visitors love their regular surf breaks with many surfing the same breaks for decades.
Connection to country	People recognise the significant value of the coastline and estuaries to First Nations groups, despite there being only moderate awareness about local sites (see Table 2).
Seclusion	Beaches within the Royal National Park were valued for their seclusion and privacy, with many enjoying the clothing optional beach. Others said they valued unpatrolled beaches as they were less busy and crowded.

SUMMARY OF KEY ISSUES AND THREATS

The following issues and threats have been identified based on input from community and other stakeholders from the June to July 2022 engagement period.

Many issues and threats are interrelated such as the impact of more visitors and tourism on local infrastructure including parking and amenities. These issues and threats are discussed in detail in Section 4 and grouped by source.

The issues and threats in Table 2 are listed in order of frequency of mention during the engagement period and are not necessarily representative of the broader Wollongong LGA. The order does also not necessarily reflect the risk of the issue or threat to the Wollongong coastal area.

Figure 2 Word cloud of issues and threats



Table 2 List of issues or threats about the Wollongong coastline and estuaries

ISSUE or THREAT	DETAIL
Vegetation management	The issues of vegetation management, dune vegetation and vegetation vandalism were raised across all engagement activities, with a wide and varied range of opinions. People believe there is either too little dune vegetation (e.g. Port Kembla), too much dune vegetation impacting beach width and access (e.g. Bulli), too much vegetation affecting coastal views and amenity (e.g. Woonona) or a poor selection of vegetation plantings (coastal wattle and banksias). People were critical of historical and current vegetation management by Council and there was a perceived link between vegetation planting and/or removal to scarping, impacts to natural sand movements and surf break changes. Trees and other vegetation have also been the target of vandalism to protect coastal views and visual amenity.

ISSUE or THREAT	DETAIL
Dogs on beaches and pathways	<p>Dogs on beaches and shared pathways was both highly valued by the community and identified as a significant issue. Complaints and concerns related to:</p> <ul style="list-style-type: none"> • Misuse of designated off-leash areas • Dog waste left on beaches and pathways • Lack of suitable disposal facilities for dog waste • Dogs on rock platforms • Dogs disturbing/killing birds and other wildlife
Population growth, visitors and tourism	<p>Across the coastal zone, there were examples shared of user conflicts resulting from an increasing number of residents, visitors and tourists to the area. This in turn is increasing demand on local infrastructure, such as parking, playgrounds, barbecues, roads, waste, recreation facilities and public amenities. User conflicts included:</p> <ul style="list-style-type: none"> • On and off-leash dogs and their owners and other beach users • Shared pathways (cyclists, walkers, joggers, parkrun) • Antisocial behaviour – alcohol, fires and barbecues and litter • Campers and day visitors • Lack of parking • Traffic congestion <p>Council staff and Councillors also recognised the increase in visitors was pushing more people (especially visitors) onto unpatrolled beaches creating a public safety issue.</p>
Recreation	<p>Coastal recreation areas have been a victim of their own success, with increased demand from visitors and tourists. There is a call for more amenities, wider or separated pathways for cyclists and pedestrians, more seating and improved shaded grassy areas. People would also like to see investment in recreational improvements across the coastal area and not just around the Harbour/Blue Mile/North Wollongong Beach.</p>
Development	<p>There are concerns, particularly across the northern suburbs, about encroaching development and the increased density of new dwellings along the coastline and Lawrence Hargrave Drive. Issues related to development included impacts on visual amenity and coastal views, parking and traffic along Lawrence Hargrave Drive. It was also thought that more could be done to guide the development of dwellings and other buildings on cliffs and other areas that may be impacted by instability and inundation from sea-level rise.</p> <p>There were also concerns about the lack of enforcement of stormwater and run-off conditions during construction of new development.</p>
Water quality and stormwater	<p>There are concerns at various locations about stormwater run-off from development sites and general urban run-off, impacting water quality for both creeks and beaches. The debris and litter that is often washed</p>

ISSUE or THREAT	DETAIL
	down with stormwater was also a concern. People believe that an increasing number of storm events and frequent flooding was eroding creek banks and increasing sedimentation.
Erosion	Erosion of beaches, creek banks and under access points and pathways were identified across the coastal area. Many people associate an increase in erosion to an increasing number of storm events and flooding.
Pests and weeds	Pest species preying on native flora and fauna, as well as damaging environment e.g. deer, rabbits preventing revegetation, mosquito fish. Problem weeds are threatening native vegetation and some EECs and choking creeks. The lantana was the most commonly mentioned problem weed.
Accessibility	Broadly this issue related to physical access to infrastructure and sites, rather than disability access specifically. This included access from headlands down to rock pools, access onto beaches by way of informal infrastructure, impeded access from sand drift (such as at Port Kembla) and access to undertake activities previously undertaken (such as surf carnivals at Bulli).
Climate change/sea level rise	More frequent storm events are causing scouring, pollution and cliff destabilisation. Councillors and staff acknowledged that Council needs to plan for sea-level rise, make tough decisions about retreating assets and the upgrade and maintenance of coastal infrastructure. There was a perceived lack of strategy and policy for planning for climate change.
Beach safety	Lifesavers believe patrol views are being impeded by vegetation at Bulli, Woonona, City, Bellambi, Corrimal, Fairy Meadow, Towradgi, Port Kembla, Windang beaches as well as an increased number of people visiting unpatrolled beaches.
Community awareness and education	Councillors and Councils staff believe community expectations are often at odds with natural coastal processes, creating a greater demand for human intervention which can create new problems. They also believe there is a lack of community awareness and education relating to: <ul style="list-style-type: none"> • Cultural heritage and First Nations heritage • Value and importance of natural habitats • Endangered ecological communities (EECs)
Heritage	There is a lack of: <ul style="list-style-type: none"> • An agreed approach on historic (local) heritage obligations • Knowledge and awareness of sites and places and objects of historical significance, protection for historic heritage sites in planning instruments, policy direction • Community awareness of First Nations heritage
Rock fishing	Ongoing fatalities and rescues of people washed into the ocean while fishing from rock platforms. Since January 2021, six rock fishers have

ISSUE or THREAT	DETAIL
	lost their lives at the rock platform known as Honeycomb Rocks at Port Kembla.
Rock pools	The loss of rock pools due to sea-level rise or rationalisation of rock pools due to maintenance requirements is a threat to the much-loved community assets.
Governance	<p>There is a lack of strategy and policy direction relating to:</p> <ul style="list-style-type: none"> • Cultural heritage • Historic heritage obligations • Future planning for climate change • Coastal hazards • Protection for historic heritage sites in planning instruments <p>There is also a gap between strategy and works undertaken.</p>

DRAFT

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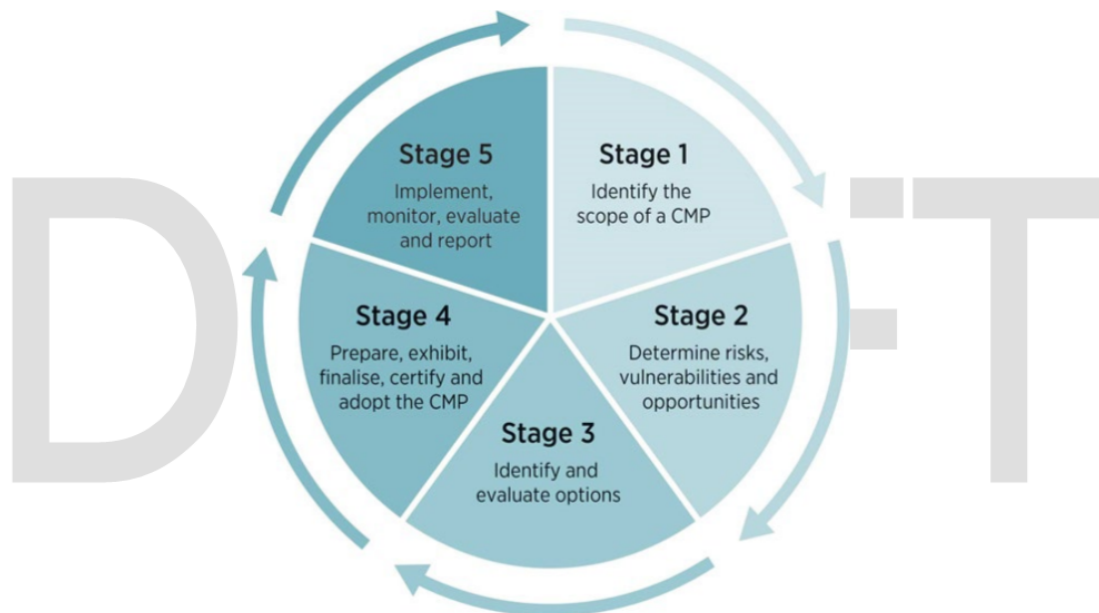
1. BACKGROUND

1.1 PROJECT SCOPE

The Coastal Management Act 2016 requires Council to prepare and implement a CMP which will detail the future use, management, and development of the Wollongong coastal environment in an ecologically sustainable way, for the social, cultural and economic well-being.

To meet these requirements, Council engaged Salients and Spectrum Comms, to work with Council to consult with local community, relevant public authorities and other stakeholders to inform the preparation of Stage One of the CMP - Scoping.

Figure 3 The five stages of developing and implementing a CMP



The objectives of engagement from Stage One were:

- Establish key relationships
- Build community awareness about CMP
- Establish a collective vision for the Wollongong coast
- Collate community themes and values related to the coast.

1.2 PROJECT NEGOTIABLES

Community engagement is a process of involving people that are affected by or interested in a decision. It enables good governance, problem solving and decisions that are balanced and informed, resulting in better outcomes.

However, engagement recognises that although communities may exert influence, in this instance they do not have the authority to make the final decision. The power to make this

decision rests with the elected Council. This requires Council to be clear about what elements of the CMP are open to influence from the community.

The following aspects of developing the CMP are negotiable and non-negotiable:

Table 3 List of negotiables and non-negotiables

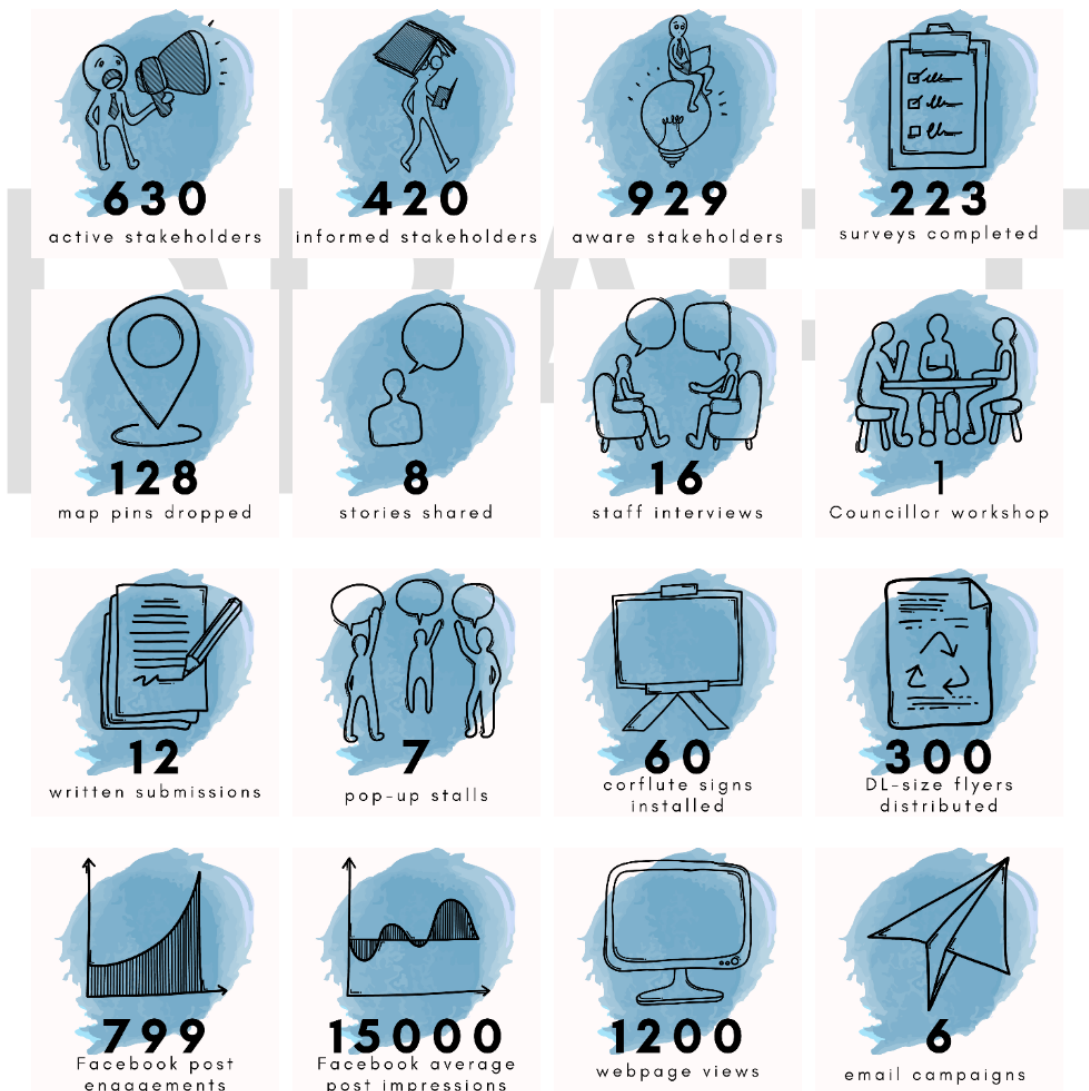
NEGOTIABLE	NON-NEGOTIABLE
Tools and methods to communicate and engage	Legislative requirements
Timing of engagement activities	CMP development budget
Identification of threats, challenges and issues	Project geographical scope including coastal zone area
CMP vision	Final decision-making
Management actions	

DRAFT

2 STAKEHOLDERS

A total of 630 people actively participated in Stage One engagement. This includes completing the survey, dropping a pin on the interactive map, sharing a story, attending a workshop, participating in an interview or attending a pop-up. As stakeholders could participate in more than one of the engagement activities, some stakeholders may have been counted more than once.

In addition to those who actively participated, 420 people were “informed” about the project, meaning they visited the webpage and showed interest in the project by clicking on something on the page. A further 929 people were “aware” of the project meaning they visited the webpage but did not click on anything further.

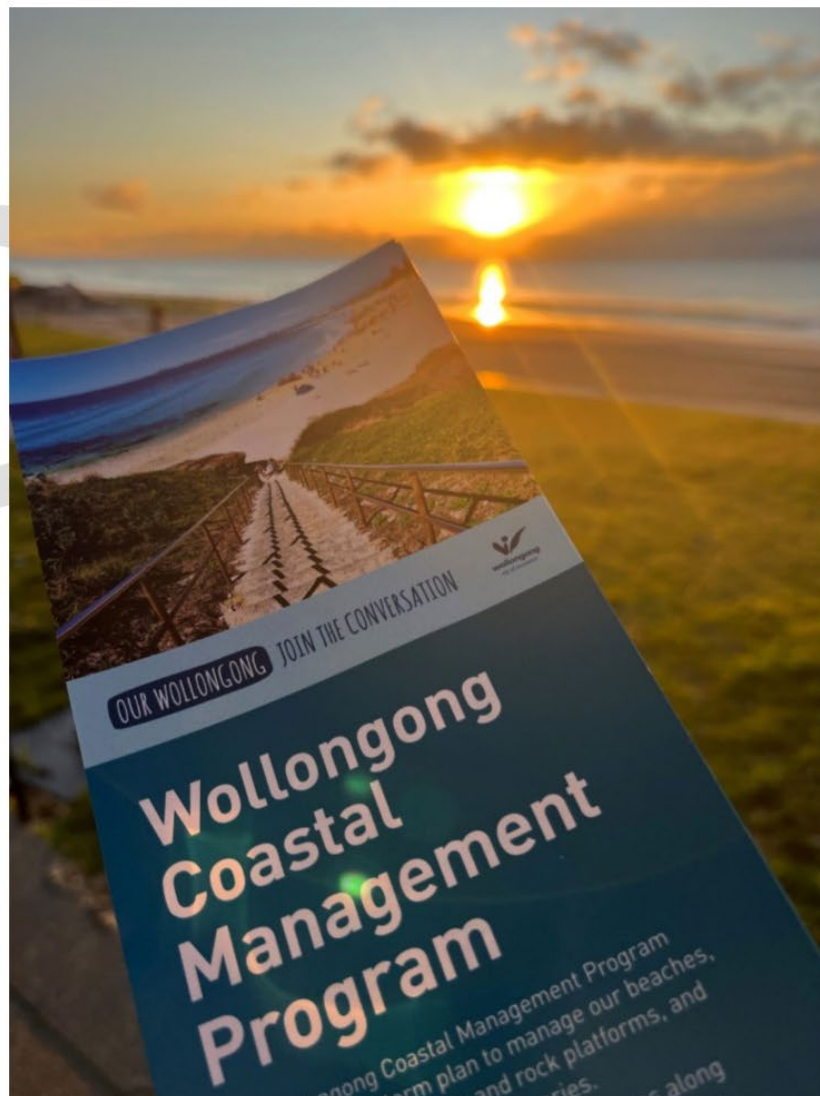


3 METHODOLOGY

The methodology was consistent with the Community Engagement Plan prepared for development of the CMP. While summer would have been the ideal time to undertake engagement about the coastline, Council was constrained by various factors related to the timing of the contract.

For future stages, it is recommended that engagement, where possible, be held during the warmer months to optimise the opportunity for resident and visitor engagement in the coastal environment.

Figure 4 A DL-sized flyer was distributed at pop-up stalls held across the coastline



3.1 METHODS

A range of online and offline methods were used to communicate with and engage the community and other stakeholders.

For full copies of the communication and engagement collateral, see the Appendices under separate cover.

Table 4 List of methods and outcomes/outputs

METHOD	DETAIL	OUTCOME or OUTPUT
Corflutes signs	Corflutes were installed at various locations along the coastline, at beaches, in parks and near playgrounds to inform people about the project with a QR code to visit the project webpage.	60 corflutes installed
Emails	Project information was sent via email to various stakeholder mailing lists with links to engagement opportunities. These included registers of interest through Council's online engagement platform, Bushcare volunteers, and coastal stakeholders including surf lifesaving clubs, Landcare, Bushcare, and Dunecare groups, Neighbourhood Forums, chambers of commerce, board riding groups, Tourism bodies, and holiday parks. Project information was also sent to stakeholders who use the beaches, parks, reserves or kiosks under a license agreement such as fitness services, surf schools, and food and drink vendors.	6 email campaigns sent to: 26 Advisory Working Group members 400 Bushcare volunteers 1,892 recipients on environment register 129 recipients on Lake Illawarra CMP register 50 key stakeholder groups 51 licensees
Facebook	Posts about the project were shared on Council's Facebook page to disseminate information with links to the project webpage.	3 posts averaging: 15,002 post impressions (the number of times a post was seen) 9,965 unique people reached 799 engagements
Flyer	A DL-sized information flyer was produced to share information and a QR code to the project webpage. The flyer was distributed while at pop-ups.	300 flyers distributed
Information note	An information note was provided to Councillors outlining the CMP background, process and engagement opportunities.	13 Councillors
Interactive map	An interactive map was hosted on Engagement HQ that allowed users to drop a pin on a place along the coast they valued or loved. They were then	128 pins dropped 53 participants

METHOD	DETAIL	OUTCOME or OUTPUT
	asked to complete some questions about that place.	
Interviews	Interviews were held with Council staff representing Lifeguards, Open Space and Environmental Services, Legal Services, Project Delivery, Land Use Planning, Development Assessment and Certification, Property and Recreation and Infrastructure Strategy and Planning.	16 staff interviewed
Letters	Letters were sent to local state and federal MPs as well as property owners with coastal hazard notations on their properties to make them aware of the project and engagement opportunities	5 MP letters sent 984 property owner letters sent
Media releases	A media release was issued to launch engagement for the Project and let people know how they could participate in engagement opportunities.	1 media release issued
Newsletters	Digital newsletters were sent to subscribers with project information and links to engagement opportunities. These included Council's Climate Emergency Update and Sustainable Wollongong.	2,769 Sustainable Wollongong recipients
Presentations	Presentations were provided to member clubs of Surf Life Saving Illawarra and the University of Wollongong Coastal Group.	2 presentations 25 participants
Pop-up stalls	A series of pop-up engagements were held at various locations to intercept residents and visitors and tell them how they could get involved.	7 x pop-up events 300 people engaged
Stories tool	An online tool called Seaside Stories that allowed users to share a story, including photos and videos, about something they love about the coast.	8 stories received
Submissions	Written submissions received by email.	12 submissions received
Survey	A short structured online questionnaire was hosted on Engagement HQ to obtain input about how residents and visitors value and use the coast and estuaries and any challenges or threats.	223 responses received
Webpage	A project page was created on Council's engagement website, <i>Our Wollongong</i> , which held project information, FAQs, reference documents, a timeline and links to the online engagement tools – interactive map, survey and stories tool.	1,200 page views 256 engaged visitors 420 informed visitors 929 aware visitors
Workshop	A workshop was held with Councillors and senior staff to obtain input on community values, coastline issues and challenges.	15 participants

METHOD	DETAIL	OUTCOME or OUTPUT
Yammer	Posts about the project were shared on Council's internal communication platform Yammer to inform staff about how they could get involved	2 posts 17 reactions 562 people reached

3.2 ENGAGEMENT TIMELINE

Table 5 Stage One engagement timeline

ACTIVITY	TIMING
Email to Environment register of interest	26 May 2022
Email to Lake Illawarra CMP register of interest	31 May 2022
Presentation to Surf Life Saving Illawarra, first social media post	31 May 2022
Online community engagement opened – webpage launched, survey opened, map opened, stories opened, Yammer post, email to key stakeholder groups, letters to property owners	1 June 2022
Media release issued	3 June 2022
Letter to local MPs	7 June 2022
Corflutes installed	2-3 June 2022
Sustainable Wollongong newsletter issued	20 June 2022
Post on Council staff platform Yammer, email to key stakeholder groups, presentation to University of Wollongong Coastal Group	22 June 2022
Council staff interviews	23-24 June 2022
Councillor workshop	23 June 2022
Pop-up – Crown Street Friday Markets, Climate Emergency Update newsletter issued	24 June 2022
Pop-up – North Wollongong parkrun, Fairy Meadow	25 June 2022
Pop-up – Bulli Beach, Bulli	25 June 2022
Pop-up – Bald Hill Lookout, Otford	26 June 2022
Pop-up – Port Kembla Beach Park, Port Kembla	26 June 2022
Pop-up – North Wollongong Beach	27 June 2022
Pop-up – Austinmer Beach Park, Austinmer	27 June 2022
Engagement period extended to 7 July 2022	29 June 2022
Email to licensees	1 July 2022
Online community engagement ended	7 July 2022

4. FINDINGS

4.1 INTERACTIVE MAP

During the engagement period, 343 people visited the interactive map and 53 people contributed by dropping a pin. In total, there were 128 pins dropped across the coastal zone area (highlighted in blue in Figure 1).

Figure 5 Interactive online map



Stakeholders who dropped a pin were predominantly from the Wollongong LGA, with 11 from Shellharbour LGA, one from MidCoast LGA and one from Wollondilly LGA. As stakeholders could drop multiple pins, further demographic profiling is unavailable.

After dropping a pin, participants were asked to identify what they loved about a specific location, how frequently they visited it, what they did there and any issues or threats they had identified there. They could also upload a photo to help illustrate their comments. There were 12 photos uploaded of which there were two lots of duplicates. The photos can be found in the Appendices.

It should be noted that the map of the coastal zone on the interactive map did not include the coastal area within the Royal National Park. Unfortunately, by the time this was brought to the attention of Council staff, the map layer could not be modified without losing data already input against the existing layer. Stakeholders were encouraged to provide input regarding the Royal National Park elsewhere on the map layer or through one of the other engagement tools.

For the full report by geospatial data, see the Appendices under separate cover.

Figure 6 Northern suburbs interactive online map

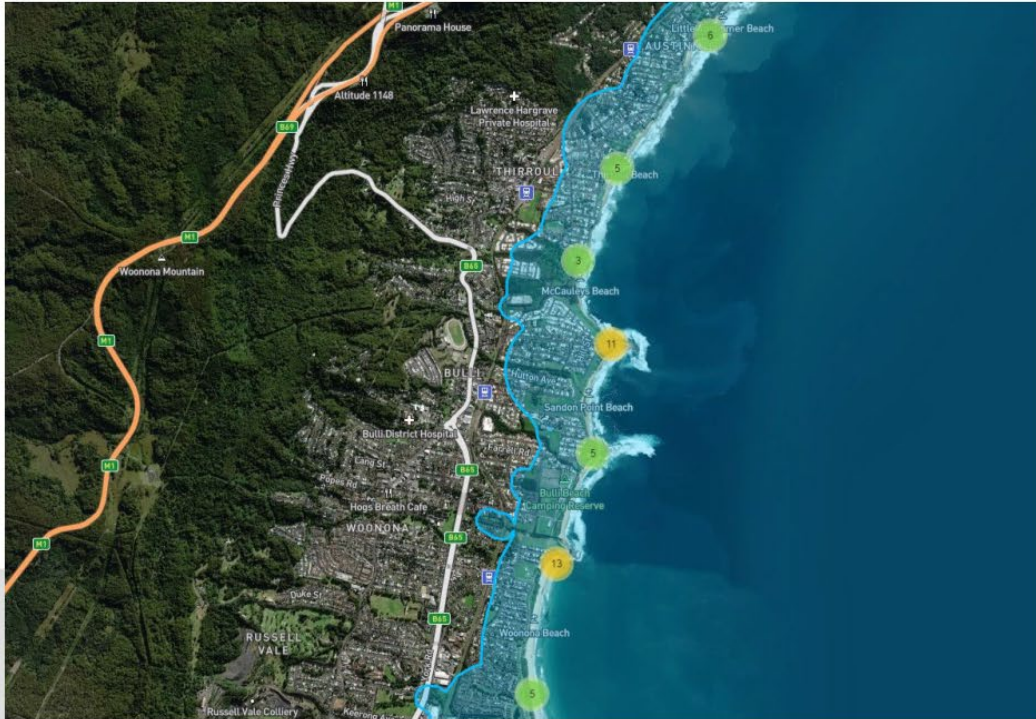


Figure 7 Bellambi to North Wollongong interactive online map

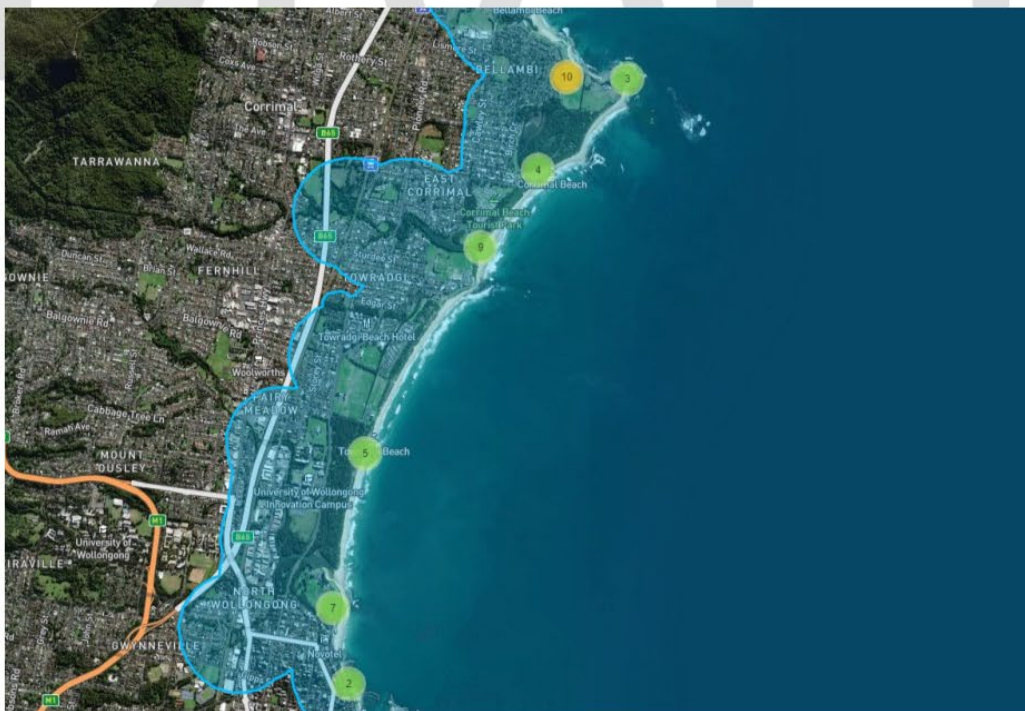
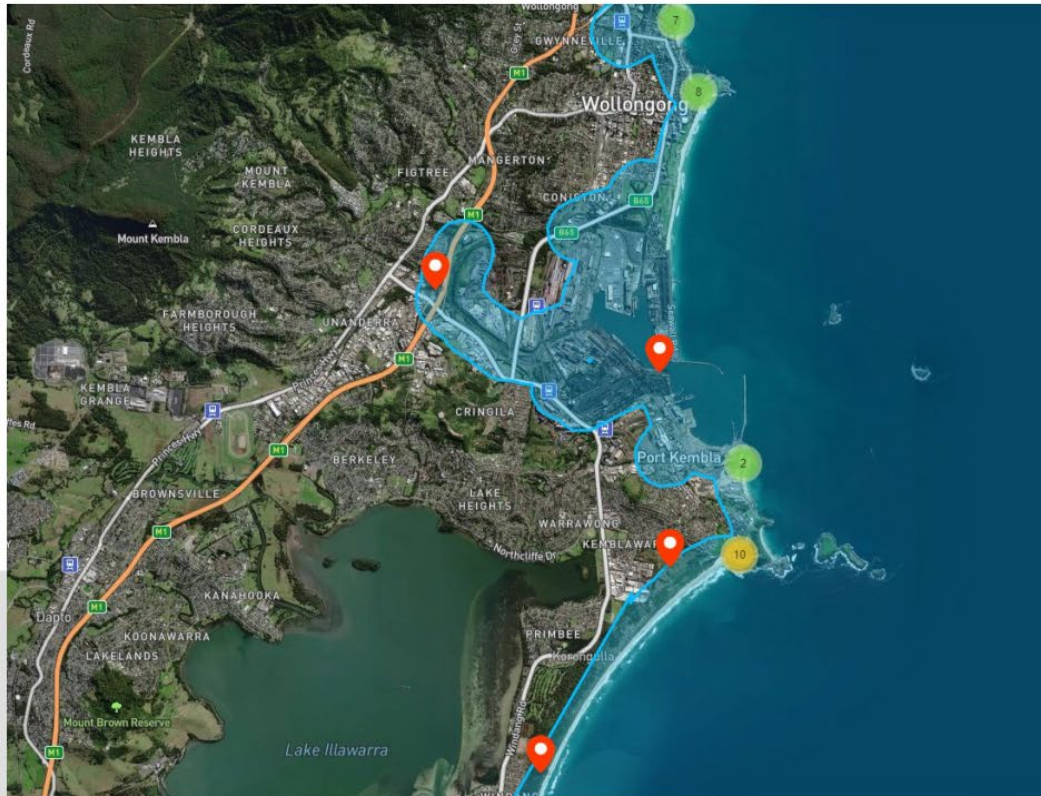


Figure 8 Wollongong to Port Kembla interactive online map



Participants said the main reason for visiting their pinned location was for nature appreciation and wildlife watching, followed closely by passive based water activities and walking/running.

Figure 9 Interactive map – main reasons for visiting pinned location

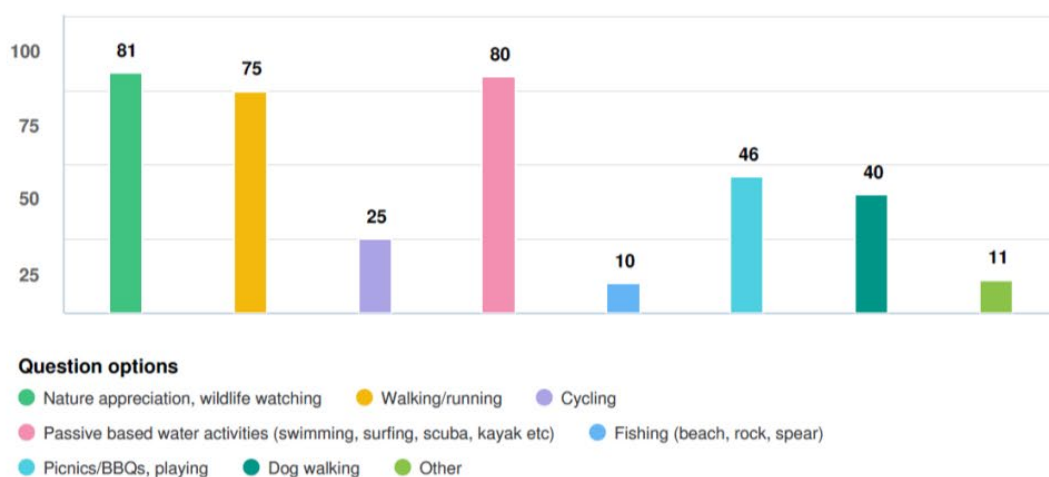
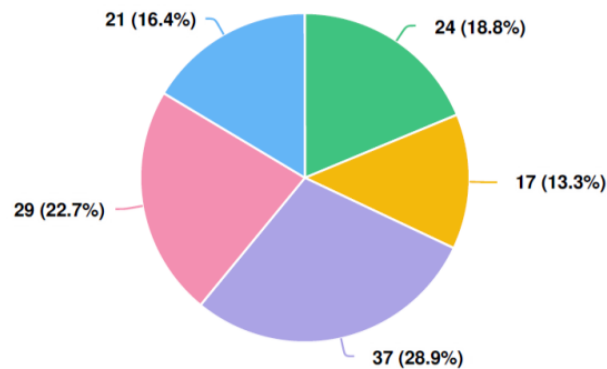


Figure 10 shows about 29% of people said they visited the pinned location weekly, while almost 23% said they visit the pinned location monthly.

Figure 10 Interactive map - frequency of visit to pinned location



Question options

● Daily
 ● 3-5 times a week
 ● Weekly
 ● Monthly
 ● A few times a year

Participants were also able to provide open text responses about why and what they loved about each pinned location. Responses included:

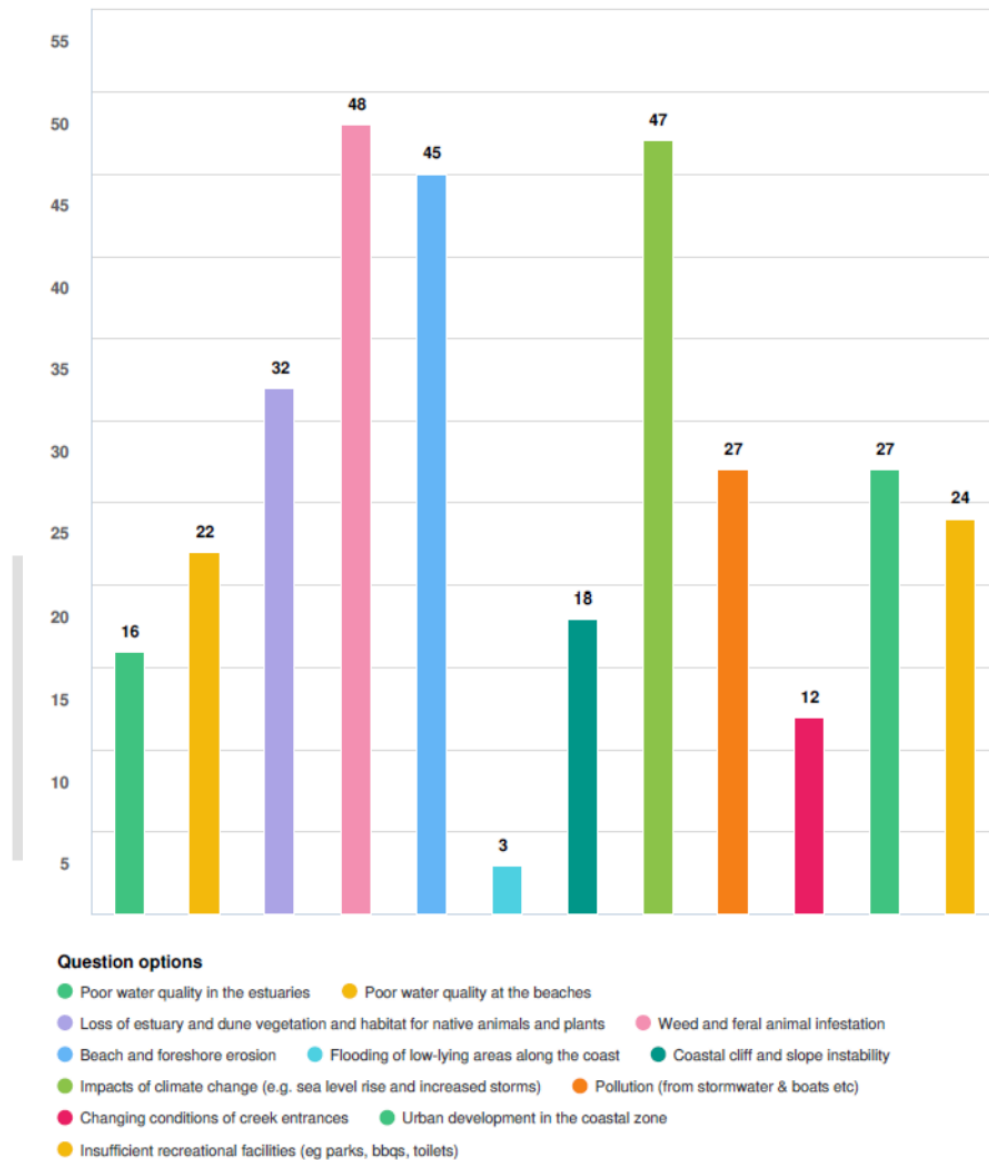
- Rock pools
- Family-friendly which included infrastructure and amenities like playgrounds and toilets
- Birds and wildlife
- Surfing – many had been surfing the same breaks their whole life
- Dog-friendly beaches and off-leash areas
- The number and amenity of beaches
- Recreation options including swimming, walking, cycling, running, snorkelling, fishing and surfing
- The coastal views
- Accessibility of beaches and coastline generally
- Cafes and social opportunities

Figure 11 Word cloud of values from interactive map



For each location, participants were asked if they considered there to be any threats or issues. The most common threat or issue was weed and feral animal infestation followed closely by the impacts of climate change.

Figure 12 Interactive map - most commonly identified threats or issues



4.2 STORIES

The purpose of the Stories tool was to provide a forum for participants to share unrestricted open text responses via the project website. Eight stories were received during the engagement period. These covered how the coastline is used recreationally for exercise and socialising, through to requests and complaints related to specific locations. Where appropriate and sufficient information provided, complaints and requests were escalated through Council's customer request system.

Key values from the Stories tool were:

- The natural beauty of the coast and beaches
- The opportunity for social and recreational activities using shared pathways
- The Blue Mile
- The natural process of local vegetation filtering the water, increasing wildlife, keeping people cool and protecting the shorelines from erosion
- Good places to swim, fish and watch birds
- Passive recreation areas
- Good air quality
- Links to Country and Aboriginal heritage

Key issues and threats from the Stories tool were:

- The increasing popularity of the coasts and beaches is having a social and environmental impact due to conflicting uses
- Increasing development is putting coastal areas at risk through pollution
- People would like to see investment in community infrastructure along the coastline, not just at specific locations such as the Blue Mile
- People would like to see increased heritage recognition and interpretative signage installed about local waterways
- Sustainable investment is needed to protect beaches and dunes from erosion through vegetation rather than built infrastructure
- Storms and subsequent erosion have exposed stones and pebbles along Thirroul Beach.

The eight stories have been included in full and verbatim in the Appendices. An example of one of the stories received is included below.

Walking and Coffee Group

About 10 years ago I joined a group of ladies (all ladies at that time!) who congregated on our very doorstep at 8am for a 7km walk over Sea Cliff Bridge to the Scarborough Hotel and back. Every Monday, Wednesday, Friday and Saturday this intrepid group would set off. Rain, hail, East Coast Low or shine, off they would go.

I was the first male to walk regularly with this group of girls. Over time, more of their male partners have joined in, and we have even had more men than women walking on an odd occasion! This group has given us great joy and brought us into the local Stanwell Park, Helensburgh and Coalcliff community in a way that we couldn't have imagined.

The local natural beauty has kept our spirits up throughout the past 3 years, and we've been able to continue walking and keeping our community alive despite the pandemic's best endeavours!

4.3 SURVEY

There were 223 completed survey responses received. Of those, 213 were residents of Wollongong LGA and 10 were visitors. Of the total responses received, 5 were aged 24 and under, 64 were aged 65 and older, 5 were Aboriginal and/or Torres Strait Islander, 18 identified as having a disability and 13 said they spoke a language other than English at home.

Table 6 Survey respondents by age group

AGE GROUP	NUMBER OF PARTICIPANTS
18-24	5
25-34	17
35-44	30
45-54	42
55-64	65
65-74	52
75 and older	12

Table 7 Survey respondents by Aboriginal identity

ABORIGINAL AND/OR TORRES STRAIT ISLANDER	NUMBER OF PARTICIPANTS
Yes	5
No	296
Prefer not to say	12

Table 8 Survey respondents by disability identity

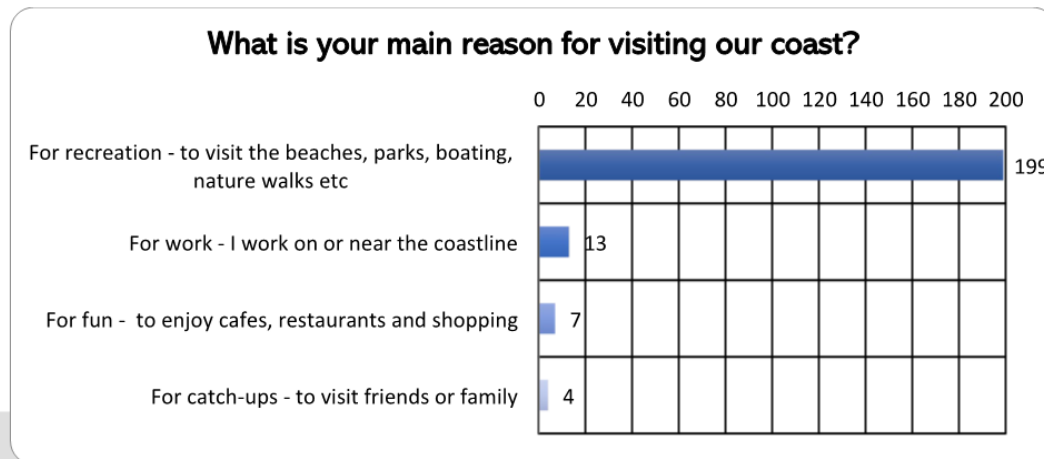
PERSON WITH DISABILITY	NUMBER OF PARTICIPANTS
Yes	18
No	195
Prefer not to say	10

Table 9 Survey respondents who speak a language at home other than English

SPEAK A LANGUAGE AT HOME OTHER THAN ENGLISH	NUMBER OF PARTICIPANTS
Yes	13
No	210

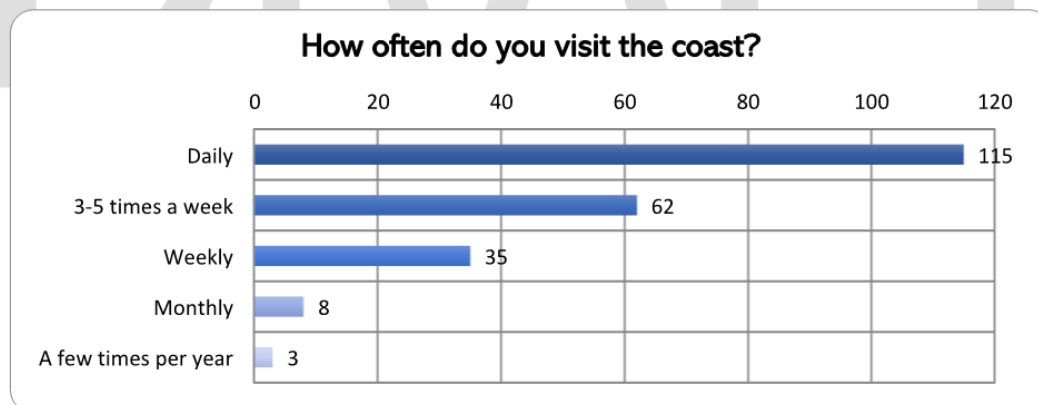
The majority of respondents (199 people) said the main reason for visiting the Wollongong coast was for recreation, which included to visit the beaches, parks, boating, nature walks etc. Thirteen said they visit for work, seven said they visit for fun to enjoy cafes, restaurants and shopping and four said they visit for catch-ups with friends or family.

Figure 13 Survey responses - main reason for visiting the coast



More than half of respondents (115 people) visit the coast daily, with 62 visiting 3-5 times per week, 35 visiting weekly, eight visited monthly and three only a few times per year.

Figure 14 Survey responses - frequency of visitation to the coast

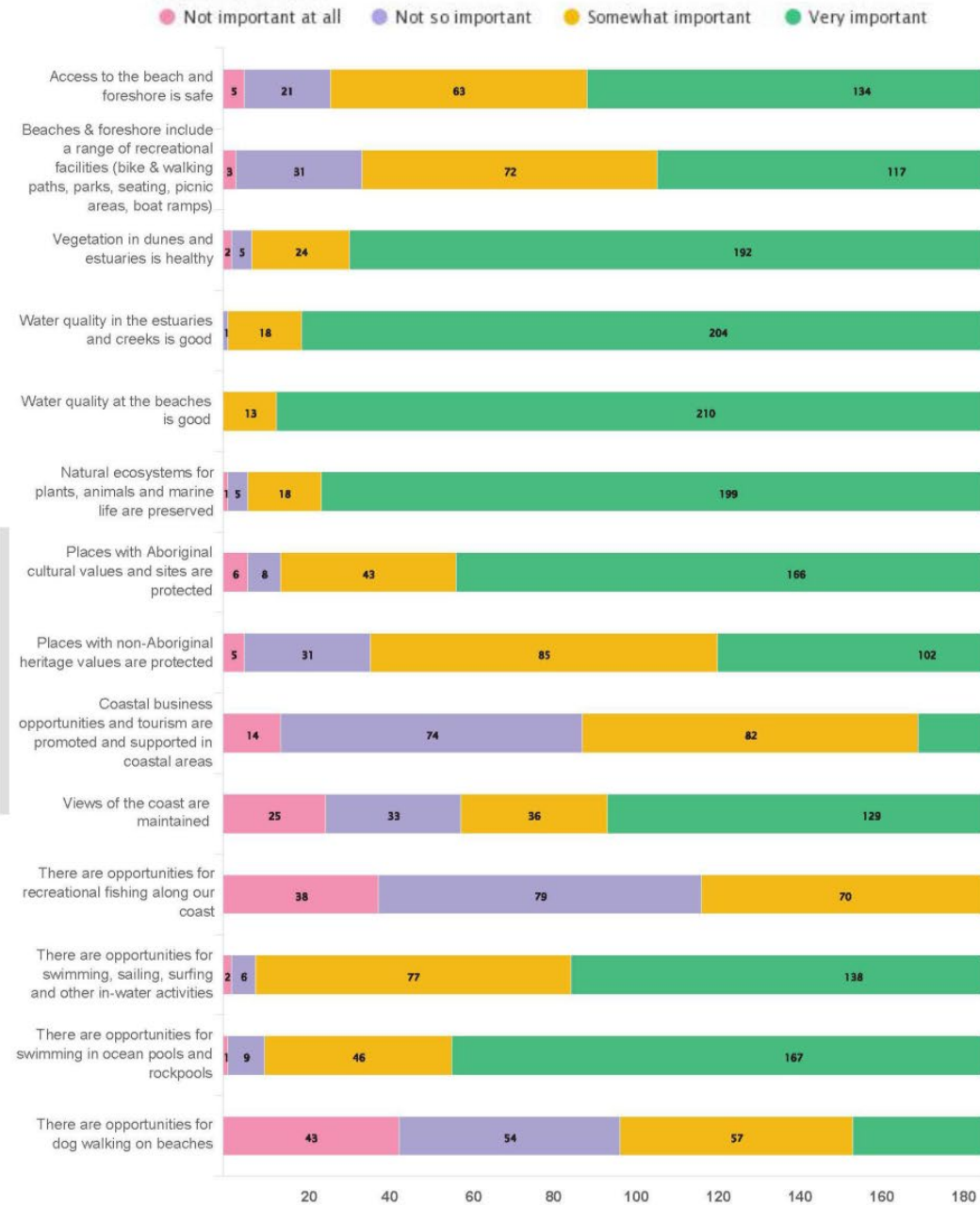


The survey sought to understand how important various aspects of the coastline were to different people. Participants were asked to indicate if the aspect was not important at all, not so important, somewhat important or very important.

Water quality at the beaches and in the estuaries and creeks were the most important aspects of the coastline to respondents. Opportunities for dog walking on beaches and recreational fishing along the coast were considered the least important.

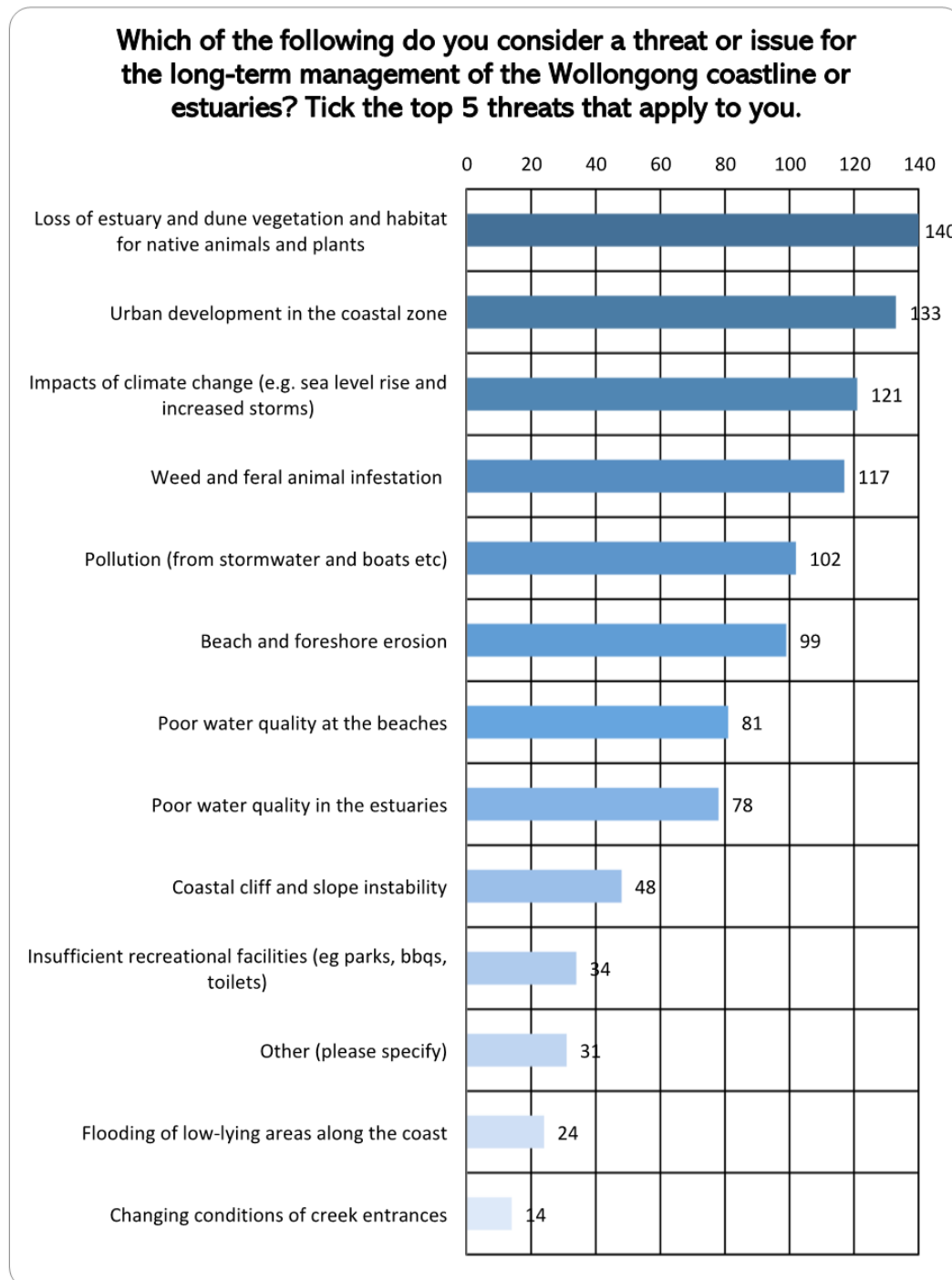
Protecting places with Aboriginal cultural values and sites was considered to be more important than protecting places with non-Aboriginal heritage values.

Figure 15 Survey responses - importance of various aspects of the coastline and estuaries



Respondents were then asked to select the top five threats or issues to the long-term management of the coastline and estuaries.

Figure 16 Survey responses - top five threats or issues for long-term management of coastline and estuaries



The top five threats or issues affecting the long-term management of the coastline and estuaries that were identified are:

- 1) Loss of estuary and dune vegetation and habitat for native animals and plants
- 2) Urban development in the coastal zone
- 3) Impacts of climate change eg sea level rise and increased storms
- 4) Weed and feral animal infestation
- 5) Pollution from stormwater and boats

There were 31 “Other” responses, however, many of these duplicated the threats and issues that were listed, particularly vegetation management, weeds, the impact of urban development on coastal areas, and insufficient recreational facilities. Other responses included:

- Dogs on beaches impacting amenity, use and wildlife
- Leadership and perceived mismanagement
- Loss of amenity and views of beaches
- Broken or poorly maintained infrastructure
- Insufficient access to beaches including accessible pathways
- Noise pollution from visitors to the coast e.g. motorcycles
- Sight lines of SLSC facilities
- Insufficient surf life saving resources to meet increased demand
- Increased tourism and visitation putting a strain on existing infrastructure and environment
- Tree vandalism
- User conflicts of recreation areas
- Litter
- Competition from Shellcove Marina impacting tourism and visitation
- Lack of tsunami warning system.

Respondents were also asked to identify specific locations where these threats or issues had been observed. Many were considered to be coastline-wide and included:

- Impacts of climate change and sea level rise
- Safe and easy access to ocean and pools
- Erosion and scouring of beaches
- Increased commercial and residential development
- Degradation of natural habitat
- Weed infestation
- Dune vegetation should be protected and conserved
- Dogs on beaches – off leash, waste collection, wildlife threat
- Pest animals eg deer and rabbits
- Impacts of floods and East Coast Lows
- Tree vandalism
- Illegal dumping
- Litter on beaches and off shared pathways
- Stormwater run-off and pollution

- Creek management and water quality
- Tourism and increased visitation
- Heritage protection

For a full copy of the survey results, see the Appendices under separate cover.

4.4 POP-UP STALLS

Seven pop-up stalls were held between 24 and 27 June 2022 at Crown Street Mall Friday Markets, North Wollongong Parkrun (Fairy Meadow), Bulli Beach, Bald Hill Lookout, Port Kembla Beach Park, North Wollongong Beach and Austinmer Beach Park.

Approximately 300 people were spoken to or provided a flyer across the seven events. More one-on-one conversations were held at Bulli and Austinmer than elsewhere, and the feedback below reflects this.

Feedback varied by location. For example, attitudes and values around vegetation management were significantly different at Bulli Beach compared to Port Kembla. Much of this related to historic and current management of the dune and vegetation systems.

Key values from conversations during the pop-ups included:

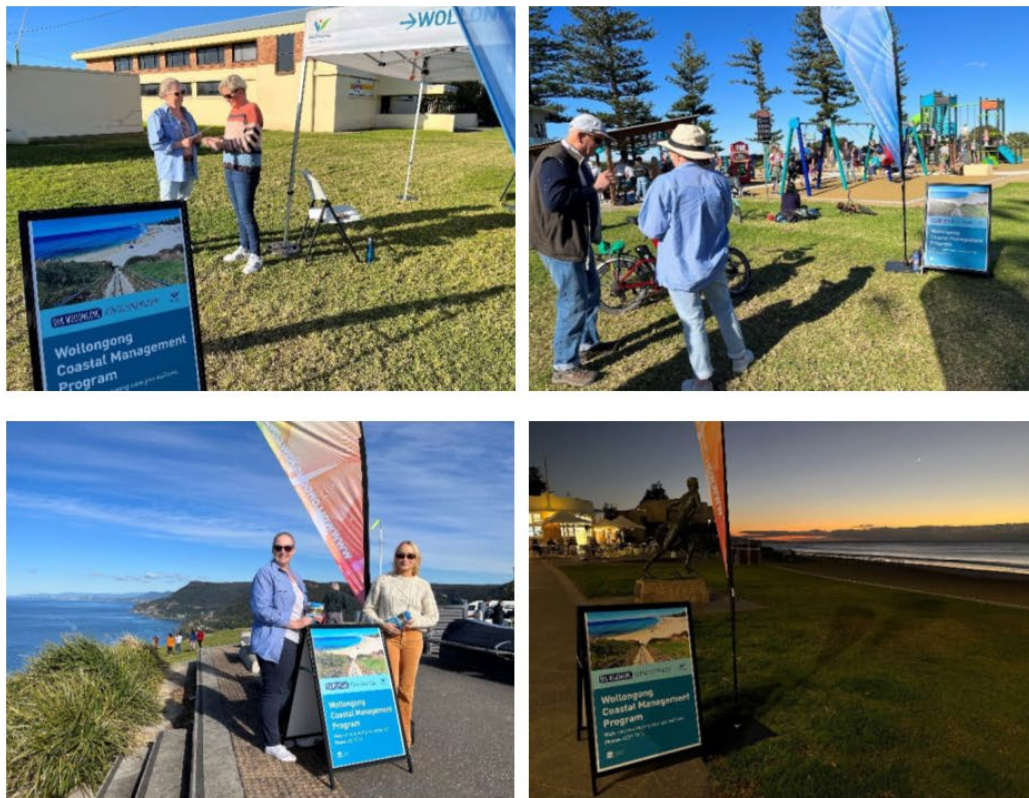
- Love parkrun and the range of recreational opportunities along the coast
- The Blue Mile and other shared pathways along the coast
- Coastal views and amenity
- Off-leash dog areas
- Wellbeing and peacefulness

Key issues and threats from conversations during the pop-ups included:

- The amount of vegetation at Bulli Beach is narrowing the beach and restricting the use of the beach for carnivals, impacting the clubs' capacity to make an income
- People living in the northern suburbs feel that Council invests more money on the Blue Mile and North Wollongong than elsewhere
- There is community frustration around consultation for coastal management, with some saying that it has all been said before and nothing has changed
- There is poor accessibility to Sandon Point Beach because of a lack of infrastructure and the "no dig" around Aboriginal sites
- Concerns about stormwater run-off into Slacky Creek at Bulli as there is not kerb, gutter or stormwater provisions
- Dogs on beaches where they should not be, impacting birdlife, and generating waste
- Request to formalise steps at the end of Alroy St, Bulli onto the beach which have been used by many including emergency services
- Request for improved access from the Bulli headland down to the rock pool
- Request for fencing at the new playground at Bulli Beach Reserve
- Request for public toilets at Bulli Beach
- Creek bank erosion behind Bulli High School

- Pathways around Whartons Creek, Bulli need stabilisation as many people walk in this area
- The popularity of the shared pathway from Woonona to Sandon Point means it has become dangerous for pedestrians sharing with cyclists – request for separation
- Not enough parking at Bulli due to the increasing number of visitors year-round
- The build-up of sand around the surf club storage building at Port Kembla – the building needs to be relocated and the dunes revegetated
- Noise from motorcyclists using Lawrence Hargrave Drive is disturbing residents, especially on weekends due to its growing popularity as a motorcycle route
- Concerns about over-development along the cliffs and coastline across the whole LGA.

Figure 17 Photos of the pop-up stalls held in late June 2022



4.5 INTERVIEWS

During the engagement period, Council interviewed 16 Council staff to understand their views on the coastal zone, its infrastructure, maintenance, management and governance. This information will inform the sections of the Scoping Study relating to existing management arrangements, as well as to highlight coastal management issues that the CMP should address.

The staff interviewed represented the areas of lifeguards, open space and environmental services, legal services, project delivery, land use planning, property and recreation and infrastructure strategy and planning.

Key findings included:

- **Asset Management**

To better manage and plan for assets, it would be beneficial to have precinct planning to holistically consider coastal hazards, more policy direction and guidance on development in coastal zone and an up-to-date policy on sea level rise.

- **Cultural Aboriginal Heritage**

It would be beneficial to have a better understanding of cultural and archaeological values and level of significance and agreed process on preserving Aboriginal heritage sites and navigating consent requirements.

- **Built Heritage**

There are complexities around protecting of built heritage areas from coastal hazards.

- **Dune Vegetation**

There has been misinformation in the community about the role of dune vegetation. There are conflicts between private views and vegetation. Vegetation vandalism has been a challenge in certain areas. Weed management is challenging without aerial spraying and there have been constraints on what can be planted in the dunes in patrolled areas (Dune Management Strategy).

- **Dune Erosion**

Storms are challenging for maintenance crews (making erosion scarps safe) and have consent requirements. Erosion has impacts on accessibility and sightlines for life savings activities.

- **Visitation**

There are pressures on the coast and Council services from high visitation in peak periods.

- **Dogs on Beaches**

Conflicts arise around dogs on beaches, including in culturally significant areas with increased foot traffic.

- **Entrance Management**

The need for, and the consent requirements of, manual creek and lagoon entrance openings should be investigated in the CMP process.

- **Coastal Policies and Framework**

Issues with mapping of wetlands and littoral rainforest in the State Environmental Planning Policy (SEPP) can add to consent requirements for projects and activities.

A decision will need to be made about whether to include coastal vulnerability area in the SEPP.

The Wollongong Coastal Zone Management Plan is challenging to navigate, and a future CMP should help to support consistent decision making.

4.6 WORKSHOP

An informal workshop was held with Councillors and senior Council staff (15 people in total) on 23 June 2022 to hear their concerns about the coastline and estuaries. It was also an opportunity to explain the CMP process and highlight important sections of the Coastal Management Act 2016, relevant to their role as Councillors.

Key points of discussion included:

- Managing community expectations around natural coastal processes
- Dune and vegetation management and its perceived and real impacts on erosion, scarping, surf breaks and landward sand drift
- The increasing impact of extreme weather events such as East Coast Lows and floods
- Climate change and sea-level rise
- Council's role in protecting private property from inundation and cliff erosion
- Balancing the different social, recreational, tourism and economic uses of the coastline and beaches
- Increasing number of visitors from outside the LGA using community infrastructure
- The obligation (or not) for Council to protect coastal views
- Protection of Aboriginal heritage places and artefacts
- Cost of maintenance of rockpools
- Maintaining safe sight lines for surf life savers as part of dune and vegetation management
- Maintaining and upgrading built coastal infrastructure that may be affected by sea level rise in the future
- Community conflicts about the use of shared pathways

4.7 WRITTEN SUBMISSIONS

There were two written submissions received during the engagement period. However, relevant emails from community received by Councillors prior to the engagement period have also been included in this section and considered as part of community input.

Key findings from submissions included:

- Concerns about dune reshaping practices contributing to wind-blown sand, especially at Port Kembla, Woonona, Towradgi and City Beach
- Debris and litter washing up on Puckeys Reserve and North Wollongong beaches
- Calls for volunteer programs to collect litter
- The loss of birdlife at Bellambi lagoon in the past two decades
- The rockpools are valued and loved and the maintenance program is appreciated

- A desire for completion of the Grand Pacific Walk in Clifton and upgrades south towards Austinmer
- Management of noxious weeds including lantana, madeira vine, senna and asparagus fern
- Improved access to the Scarborough train station
- Safer parking in Clifton with existing parking often busy due to the Seacliff Bridge and Imperial Hotel
- Need for more vegetation planting at Port Kembla
- Greater community education needed about beach geomorphology
- Desire to allow natural coastal processes over human intervention
- Request to review the use of plastic flag tape in coastal areas which often get blown loose and become litter
- Improved communication needed with communities about dune reshaping programs and dune revegetation work
- Concerns about beach haul fishing activities using Fishermans Beach to access the ocean over sensitive and cultural significant land.

The submissions have been included in full in the Appendices.



COMMUNITY ENGAGEMENT OUTCOMES REPORT APPENDICES

Wollongong Coastal Management Program

DISCLAIMER

This appendix has been prepared by Spectrum Comms on behalf of Wollongong City Council and may only be used and relied on by Wollongong City Council for the purpose as set out in the Community Engagement Outcomes Report.

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The opinions, conclusions and any recommendations in this appendix are based on information received to date. Spectrum Comms has no responsibility or obligation to update this appendix to account for events or changes occurring subsequent to the date the appendix was prepared.

Spectrum Comms has prepared this appendix on the basis of information collected during community and stakeholder consultation and which Spectrum Comms has not independently verified or checked. Spectrum Comms does not accept liability in connection with such unverified information, including errors and omissions in the appendices which were caused by errors or omissions in that information.

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This project is supported by the NSW Government's Coastal and Estuary
Management Program.

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APPENDIX 1 DL-size flyer



OUR WOLLONGONG JOIN THE CONVERSATION

Wollongong Coastal Management Program

The Wollongong Coastal Management Program (CMP) is a long-term plan to manage our beaches, dunes, cliffs, headlands and rock platforms, and small coastal creeks and estuaries.

The Wollongong CMP will identify issues along our coast and details actions to address them in partnership with First Nations groups, state government, community groups and residents.

Why do we need a CMP?

We have had plans in the past but the law in NSW has changed to facilitate a better approach to management so we need to make a new plan. This will allow us to address current issues and implement best practice coastal management. Once we have a certified CMP, we can access state government funding for projects to care for our coast. It also ensures everyone knows who is responsible for actions that care for our coastline.

How is a CMP prepared?

The preparation of the Wollongong CMP involves five stages. We are currently in Stage 1 - identifying the scope of the CMP. We will find out what information gaps we have and what priority issues the CMP should address. All stages will be completed in consultation with the community and other stakeholders.

Stage 1	Stage 2	Stage 3	Stage 4	Stage 5
We identify the scope of the CMP and ask what don't we know	We complete studies to fill any knowledge gaps	We decide what is important and what actions can help	We prepare a draft CMP and ask for feedback from the community	We implement the actions from the CMP

Join the conversation this June

Captivated by the coast

Help us better understand what you love, the activities you participate in and your priorities for our coast and coastal assets by dropping a marker on our interactive, online map.

Complete a survey

Our survey is short, simple and highly valuable, we invite you to share your insights and thoughts about our coast through an online survey.

Share your stories

We want to hear your favourite memories, interesting happenings and stories about the history of our beautiful coastline. Head to our website to share your story.

Talk to us

Visit our pop-up engagement stall or speak to our roving project team to share your thoughts about our coast:

- 24 June - Friday Markets, Wollongong, 10am-1pm
- 25 June - North Wollongong Parkrun, 8-10am
- 25 June - Bulli Beach carpark, 11am-1pm
- 26 June - Bald Hill Lookout, 10am-noon
- 26 June - Port Kembla beach playground, 1.30-3.30pm
- 27 June - Tramway, North Wollongong beach, 6.30-8.30am
- 27 June - Austinmer beach park, 2.30-4pm

our.wollongong.nsw.gov.au/cmp




Scan the QR code to find out more or to make a comment.




This project is supported by the NSW Government's Coastal and Estuary Management Program

APPENDIX 2 Corflute sign




OUR WOLLONGONG JOIN THE CONVERSATION




Wollongong Coastal Management Program

Council is currently scoping the Wollongong Coastal Management Program. The CMP will set the long-term strategy for the coordinated management of our coast and coastal assets.



To find out more or to make a comment:
Scan the QR code
Visit our.wollongong.nsw.gov.au/cmp
Phone 4227 7111
Feedback closes 30 June 2022



This project was supported by the NSW Government's Coastal and Estuary Management Program

000123456789

Summary Report

31 May 2022 - 7 July 2022

Our Wollongong

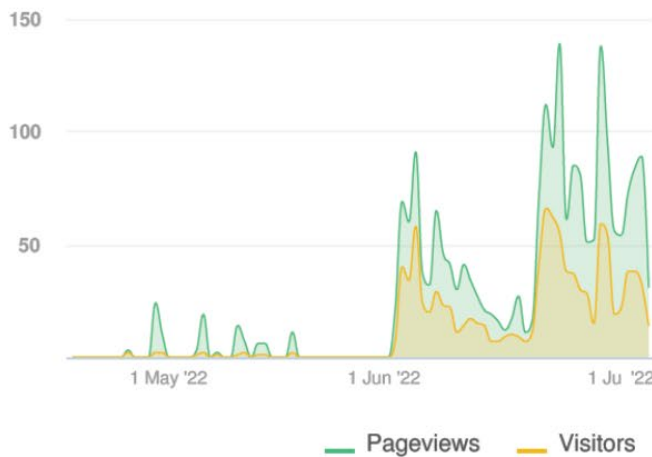
PROJECTS SELECTED: 1

Coastal Management Program - Scoping Study

FULL LIST AT THE END OF THE REPORT



Visitors Summary

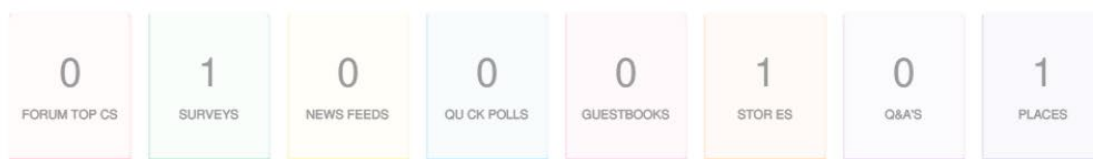


Highlights

TOTAL VISITS	MAX VISITORS PER DAY	
1.2 k	66	
NEW REGISTRATIONS		
24		
ENGAGED VISITORS	INFORMED VISITORS	AWARE VISITORS
257	424	934

ENGAGED	257 ENGAGED PARTICIPANTS			(%)
		Registered	Unverified	Anonymous
INFORMED	Contributed on Forums	0	0	0
	Participated in Surveys	23	11	184
	Contributed to Newsfeeds	0	0	0
	Participated in Quick Polls	0	0	0
AWARE	Posted on Guestbooks	0	0	0
	Contributed to Stories	7	2	0
	Asked Questions	0	0	0
	Placed Pins on Pages	26	27	0
	Contributed to Ideas	0	0	0
* A single engaged participant can perform multiple actions				* Calculated as a percentage of total visits to the Project
ENGAGED	424 INFORMED PARTICIPANTS			(%)
		Participants		
INFORMED	Viewed a video	0		Coastal Management Progr... 423 (45 %)
	Viewed a photo	0		
	Downloaded a document	0		
	Visited the Key Dates page	33		
AWARE	Visited an FAQs Page	32		
	Visited Inspiration Page	0		
	Visited Multiple Project Pages	177		
	Contributed to a poll (engaged)	257		
* A single informed participant can perform multiple actions				* Calculated as a percentage of total visits to the Project
ENGAGED	934 AWARE PARTICIPANTS			(%)
		Participants		
INFORMED	Visited a Resource Page	934		Coastal Management Progr... 934
AWARE				
* Aware user could have also performed an Informed or Engaged Action				* Total list of unique visitors to the project

ENGAGEMENT TOOLS SUMMARY



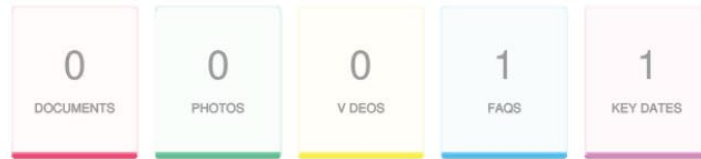
SURVEYS SUMMARY	
1	Surveys
218	Contributors
223	Submissions

TOP 3 SURVEYS BASED ON CONTRIBUTORS
<p>218</p> <p>Contributors to</p> <p>Join the Conversation</p>

PLACES SUMMARY	
1	Places
53	Contributors
128	Plans

TOP 3 PLACES BASED ON CONTRIBUTORS
<p>53</p> <p>Contributors to</p> <p>Capva ed by the Coas</p>

INFORMATION WIDGET SUMMARY



FAQS	
1	Faqs
32	V s ors
38	V ews

TOP 3 FAQS BASED ON VIEWS	
38	Views
Coas a Managemen Program Scop ng S udy	

KEY DATES	
1	Key Da es
33	V s ors
38	V ews

TOP 3 KEY DATES BASED ON VIEWS	
38	Views
Coas a Managemen Program Scop ng S udy	

TRAFFIC SOURCES OVERVIEW

REFERRER URL	V s ts
m.facebook.com	179
m.facebook.com	101
.facebook.com	65
www.wo ongong.nsw.gov.au	30
www.goog e.com	19
andro d-app	19
wo ongong.nsw.gov.au	14
www.b ng.com	5
www.waxheads.com	3
ema .te stra.com	3
us6.campa gn-arch ve.com	3
ma .goog e.com	3
www.peacekeeperhq.com	2
ma ch .mp	2
www.redd t.com	2

SELECTED PROJECTS - FULL LIST

PROJECT TITLE	AWARE	INFORMED	ENGAGED
Coastal Management Program - Scoping Study	934	424	257

APPENDIX 4 Media release

Starting a coastal conversation - 3 June 2022

Wollongong's coastline offers us a great lifestyle, enviable views and its role in supporting a diverse range of flora and fauna.

We're proud of our coastline and as part of our commitment to protect and care for it we're embarking on the first stage a new Wollongong Coastal Management Program (CMP). This long-term project will ultimately see the development of a strategy for the coordinated management of our coast and estuaries, guided by the Coastal Management Act 2016.

Our community has an important role to play in the CMP's development. Our community's voices are important in this scoping phase, which will determine what the CMP needs to include, what studies need to be prepared and who needs to be involved. We will also review the work that has been undertaken in the past to manage issues and challenges in our coastal areas.

Now is the time for our community to share their thoughts on changes – both good and bad – to our coast and estuaries, how they use and enjoy our beaches, headlands and rock platforms and what they love about this environment.

"Our coastal environment is a big part of who we are as a community and is intrinsically linked to our identity as a city," Wollongong City Lord Mayor Councillor Gordon Bradbery AM said.

"When you talk about Wollongong to anyone, it's inevitable we reference our beach lifestyle – whether you're a swimmer, walker or a whale watcher. We all have a voice and opinions about our coastal environment and now is the time to share them with Council so that this feedback can influence the Wollongong Coastal Management Program."

Engagement will start on 1 June 2022 with the launch of an interactive online mapping tool and online survey. There will be a series of pop-up stalls held across the city in late June to provide residents and visitors the opportunity to speak directly with the project team.

We will also be meeting with key stakeholders including representatives from local Aboriginal groups and surf life saving clubs.

"Wollongong City Council is responsible for about 60km of coastline that stretches from the Royal National Park in the north to Lake Illawarra in the south," Wollongong City Council General Manager Greg Doyle said.

"We take our role as a caretaker and advocate seriously and we want to have the right measures in place for our mix of beaches, dunes, cliffs, headlands and rock platforms, small coastal creeks and estuaries.

"Each of these elements play an integral part in the experience of the city for our residents and visitors to our city. They're some of our greatest assets and are highly valued. By developing the CMP we're able to have an evidence-based approach to the ongoing care and management of these volatile and dynamic environments.

"The CMP also provides us with an opportunity to seek funding support from the state and federal government to deliver improvements to these assets and put us in the best possible position to adapt to, or mitigate against, the challenges of climate change."

Developing a CMP is made up of five stages:

Stage 1: Identify the scope of the CMP

Stage 2: Determine risks, vulnerabilities, and opportunities

Stage 3: Identify and evaluate options

Stage 4: Prepare, exhibit, finalise, certify, and adopt the CMP

Stage 5: Implement, monitor, evaluate and report

For more information about the CMP or how to join the conversation, visit our website.

"We all have a role to play in supporting our much-loved coastal environment into the future," Cr Bradbery said.

"It's critical we hear from as many people as possible as we start the first stage of preparing our new CMP and I encourage people to hop online or talk with staff at one of our face-to-face engagement opportunities to understand how they can contribute to our city's future."

This project was supported with \$66,000 from the NSW Government's Coastal and Estuary Program.

APPENDIX 5 Letter to property owners

**WOLLONGONG CITY COUNCIL****Address** 41 Burelli Street Wollongong • **Post** Locked Bag 8821 Wollongong, NSW 2500**Phone** (02) 4227 7111 • **Fax** (02) 4227 7277 • **Email** council@wollongong.nsw.gov.au**Web** www.wollongong.nsw.gov.au • ABN 63 139 525 195 Registered

«PAFBSP»

«Owner»

«StreetNoandAddress»

«SuburbStatePostcode»

Our Ref

22061024

Date

1 June 2022

Dear Sir/Madam

JOIN THE CONVERSATION – WOLLONGONG COASTAL MANAGEMENT PROGRAM SCOPING STAGE

You're invited to join the conversation as part of the first stage of developing the new Wollongong Coastal Management Program (CMP). The purpose of the CMP is to set the long-term strategy for the coordinated management of our coast and estuaries, guided by the *Coastal Management Act 2016*.

The first step in developing a CMP is the scoping stage. This involves engaging with our community to understand what they love about our coastline, how they use and enjoy our beaches, headlands and rock platforms, and coastal creeks as well any concerns about the way the coast is managed. This will help Council decide what the CMP needs to include, what studies need to be prepared and who needs to be involved in developing management options in later stages.

We will also be reviewing the coastal management work that has been undertaken in the past.

Engagement starts 1 June 2022, with the launch of an interactive online mapping tool and online survey which you can find at the website below.

There will also be a series of activities held across the city in late June 2022 to provide residents and visitors the opportunity to speak directly with the project team -

- Friday markets, Crown Street Mall, Wollongong – Friday 24 June, 10am-1pm
- North Wollongong Parkrun, Elliott Street, Fairy Meadow – Saturday 25 June, 8am-10am
- Bulli Beach carpark – Bulli – Saturday 25 June, 11am-1pm
- Bald Hill Lookout – Otford – Sunday 26 June, 10am-noon
- Port Kembla Beach carpark – Sunday 26 June, 1.30pm-3.30pm
- Tramway, North Gong Beach to Belmore Basin – Monday 27 June, 6.30am-8.30am
- Austinmer Beach Park - Monday 27 June, 2.30pm-4pm.

This project is supported by the NSW Government's Coastal and Estuary Management Program.

For more information on the project and to join the conversation online you can scan the QR Code below or head to: <https://our.wollongong.nsw.gov.au/cmp>

**This letter is authorised by**

Chris Stewart
Manager City Strategy
Wollongong City Council
Telephone (02) 4227 7111

APPENDIX 6 Email to stakeholder groups and mailing lists

You're invited to join the conversation as part of the first stage of the new Wollongong Coastal Management Program (CMP). The purpose of the CMP is to set the long-term strategy for the coordinated management of our coast and estuaries, guided by the Coastal Management Act 2016.

The first stage in developing a CMP is the scoping stage. This involves engaging with our community to understand what you love about our coastline, how you use and enjoy our beaches, headlands and rock platforms, and coastal creeks as well any concerns you may have about the way the coast is managed. This will help Council decide what the CMP needs to include, what studies need to be prepared and who needs to be involved in developing management options in later stages.

We will also be reviewing the coastal management work that has been undertaken in the past.

The first stage of engagement starts today - 1 June - with the launch of an interactive online mapping tool and online survey.


There will also be a series of activities held across the city in late June to provide residents and visitors the opportunity to speak directly with the project team:

- Friday markets, Crown Street Mall, Wollongong – Friday 24 June, 10am-1pm
- North Wollongong Parkrun, Elliott Street, Fairy Meadow – Saturday 25 June, 8am-10am
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- Austinmer Beach Park - Monday 27 June, 2.30pm-4pm.

For more information about the CMP or how to join the conversation, head to <https://our.wollongong.nsw.gov.au/cmp>

Stage 1 of the CMP is supported by the NSW Government's Coastal and Estuary Program.


APPENDIX 7 Social media posts




City of Wollongong

May 31 at 3:00 PM · 🌐


Wollongong's coastline is important to all of us. We're starting a long-term project that sets out how we'll look after our coast and estuaries into the future. Our community's views are an important part of this process and we want to hear from you about how we're going now and what issues are important to you.

Don't miss your opportunity to join the conversation at <https://our.wollongong.nsw.gov.au>





 31

6 Shares


City of Wollongong


June 21 · 🌐

Did you know that Wollongong has a staggering 60km of coastline? This includes the beaches, dunes, cliffs, headlands and rock platforms that we're well known for. Let's make sure we protect our coastline from hazards such as extreme weather, erosion and the effects of climate change.

Based on research and advice and input from the State Government and the community, we're developing a plan to help preserve our coastline. Now, we want your input on how you use the coastline, what you love and what the issues are. You can drop into seven locations round the LGA and chat to us or leave your feedback online <https://our.wollongong.nsw.gov.au/cmp>

We'll be at the following locations at these times:

- 📍 Friday markets, Crown Street Mall, Wollongong – Friday 24 June, 10am-1pm
- 📍 North Wollongong Parkrun, Elliott Street, Fairy Meadow – Saturday 25 June, 8am-10am
- 📍 Bulli Beach carpark – Bulli – Saturday 25 June, 11am-1pm
- 📍 Bald Hill Lookout – Otford – Sunday 26 June, 10am-noon
- 📍 Port Kembla Beach carpark – Sunday 26 June, 1.30pm-3.30pm
- 📍 Tramway, North Gong Beach to Belmore Basin – Monday 27 June, 6.30am-8.30am
- 📍 Austinmer Beach Park – Monday 27 June, 2.30pm-4pm.





OUR.WOLLONGONG.NSW.GOV.AU


Coastal Management Program - Scoping Study

Learn more

Project Overview We understand that our beaches and our coastal lifestyle a...



 You, Cath Blakey, Greens and 240 others

49 Comments 44 Shares




Top fan

Michael Ed

Our once beautiful beaches were the jems of the area that locals and visitors alike loved to use. Successive Councils have neglected them by allowing introduced vegetation to grow unchecked to spoil the best assets that greater Wollongong has, and will always have.

Like Reply 10w

6




Brodie Thompson

More beach side footpaths please we should be able to walk from south Beach to North beach along to fairy meadow Beach with a bridge from the Lagoon resturant endof north beach to fairy meadow Beach all the way to Bulli Beach. The boardwalk should be all along the beach side along the coast one long Beach boardwalk. That we don't have such a walk way is councils failure to provide .

Like Reply 10w


8



Richard Ross


Brodie Thompson I thought there was a bike/walking path from Wollongong to Thirroul, which council is extending to Stanwell Park

Like Reply 10w



Geoff Payne


<https://wollongong.nsw.gov.au/.../ongong.../grand-pacific-walk>



WOLLONGONG.NSW.GOV.AU

Grand Pacific Walk


Like Reply 9w



Isabel Velasco

Brodie Thompson Exactly would be a Great Continueing walk 🙌🙌

Like Reply 9w



Tim Brown

Brodie Thompson am

I missing something ? There's a path from south beach via north beach all the way to thirroul/sandon point been there for years

Like Reply 9w


Cath Blakey, Greens · [Follow](#)

Brodie Thompson this part of the scoping study asks for what we love and value about the coast, not specific management actions. TBH I'd rather a bridge across Fairy Creek from near the PCYC to Little Steamers so it's easy to get from North Gong station to the Beach without taking on the hill and traffic on Bourke St. There is a walking route all the way from North Beach to Fairy Meadow beach - either along the coastal path through Stuart Park and Puckeys, or along the beach at low tide. The fact that the entrance to Puckey's Lagoon is sometimes open and sometimes closed is a natural feature that I love. To me it shows how dynamic our coastal estuaries and beaches are. I think we could get better outcomes working with nature, then against it, by ensuring any built environment is sympathetic to the natural forces. Anyway, I look forward to hearing more about what the community values on the Coastal Management Plan

Like Reply 8w


 Reply to Brodie Thompson...








Jan May Top fan

We do and I wish Our Council would make the most of beautifying our remarkable region for The World to see. One stunning suggestion to follow is Geelong Victoria who have adapted a long term initiative in creating a stunning foreshore. My first visit apart from when I was a child was in 2006 and then recently. They have achieved an amazing regional City 🍷

Like Reply 10w


Alan Bond

First of all, don't let anyone build next to the ocean.

Like Reply 10w


Stefan Formica

Alan Bond why not ? Are you still waiting for the oceans to rise . Gillard , Turnbull and co live in waterfront properties for a reason

Like Reply 10w Edited


Ruth Garland

Stefan Formica Its been around for a couple of thousand years: Build your home upon the rock and not upon the sand...

Like Reply 10w



Pamela Hartley
A few more seats near the beaches would be nice . And some shade over them .
Thanks .

Like Reply 9w



Isabel Velasco
Pamela Hartley . That's right as we're not all young enough to sit around
bending to sit on the Grass as Some elderly just can't 😞 more seating &
Shaded areas 🍃

Like Reply 9w Edited



Pamela Hartley
Isabel Velasco I hope the council takes notice of us . Sometimes we like
to sit and look
At the water . Even though we cannot swim.

Like Reply 9w

Reply to Pamela Hartley...



Isabel Velasco
Didn't know how long but it's a very Long Continuing beautiful ❤️ coast line, We're
so Lucky to be able to Enjoy it 🍷

Like Reply 9w Edited



Bruce Reyburn
The Wollongong City Council LGA starts, in the north, just south of Garie. The Royal
National Park stops, i understand, at the high water mark so a significant stretch of
this coast is not part of the RNP.

Why is this part of the WCC LGA south of Garie to Otford not shown on the map for
this Coastal Management Scoping study?

There are many management issues including recreational fishing and safety.
Invasive weeds which may come further south in the currents.

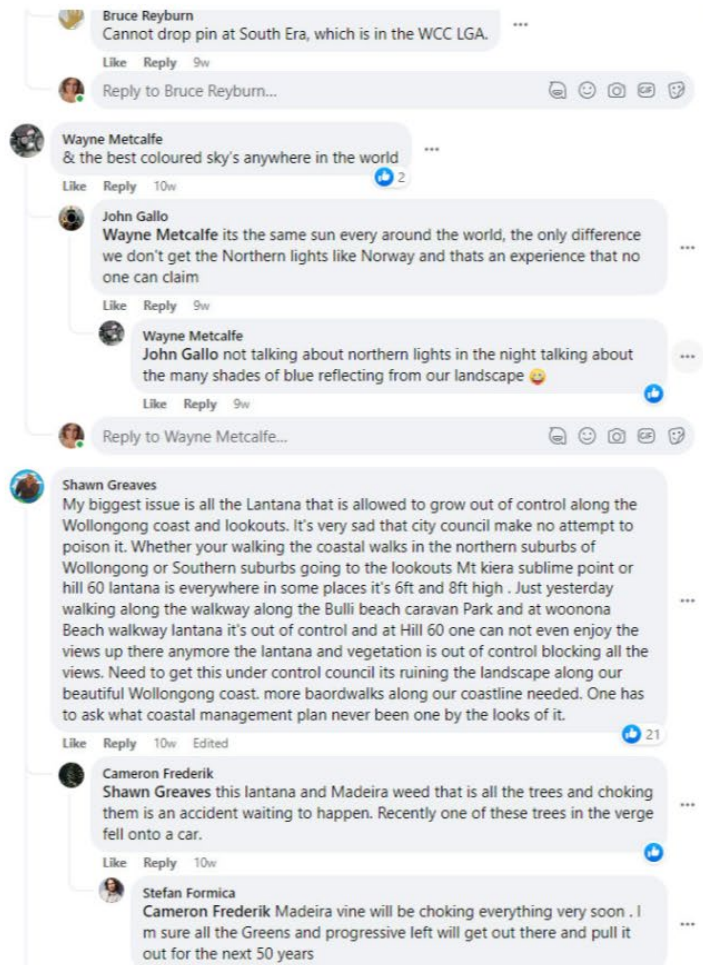
There is, for example, a very high rate of visitors to the Figure 8 pools (below High
Water mark) and their sunscreens etc have a negative affect on the life in those rock
platform pools.


Like Reply 10w Edited




Author
City of Wollongong
Bruce Reyburn Thanks for flagging this. We're looking into this. In the
meantime, if you have a comment about locations in the National Park, or off
the coast of the NP, they can be dropped anywhere in that northern section of
the map and you can note the specific location in the questions.

Like Reply 9w





Michael McKeogh
Shawn Greaves I totally agree. It appears that Wollongong Council has an anti-tourism and anti-local pride policy. You can't see the beaches from the pathways along the beach. This is partly because of over growth but mainly because they've built high mounds beside the pathways and planted trees to block any chance of a view.
 If you go to Mooloolahbah or areas interested in tourism and giving the residents a great place to live, they open up the views, elevate the walkways and plant low shrubs.


Like Reply 10w


Leigh Stewart
Michael McKeogh so much wrong atm .. have no idea how to change it ... all will be find because of a week of bike riding


Like Reply 10w


Michael McKeogh
 I hope they listen and act with this consultation process 🙏.


Like Reply 10w


Leigh Stewart
Michael McKeogh thats the problem in this crazy world the majority that speak out in consultation are the outspoken minority. I would say if you went out to the local Woolworths and questioned 10000 people only a small majority would know the councilors names or know anything other than their rates amount .. a few more would know the LM .. hardly any would know when council meetings are .. however they would all have an opinion on the Trees in the mall, bike lanes on Smith St The pot holes, the over grown weeds and lack of facilites and ground drainage at their kids or grand kids soccer fields .. i really dont know how the system can change

Like Reply 10w


Binks Tracey
Leigh Stewart they are so focused on the bike race they don't give a crap about us ratepayers.

Like Reply 10w


Stefan Formica
Michael McKeogh the UN Building Better Cities and Sustainable Cities programs havent hit Mooloolahbah yet . Dont worry, they will though . There wont be any tourism allowed by 2030 as it produces too much carbon omissions so we dont need to worry about the views

Like Reply 10w



Stacey Em

Shawn Greaves I'm not a fan of all the lantana either but I believe you have to be careful removing it as it is home to lots of smaller bird species

Like Reply 10w



Dave Brain

Shawn Greaves agree- even the bench seat on the 76 steps from Cliff Road to the Continental pool which has had magnificent views forever is now just a view of scrub directly in front of it. Used to be such a fabulous spot to sit and relax on the way up or down these steps but no more!

Like Reply 10w



Lorrae Catchpole

Shawn Greaves the RMS have been eliminating lantana from their lands at Bulli for the last 6mths (or be fined) as lanatana has been classified as a fire hazard.

Like Reply 9w

Reply to Shawn Greaves...



Dave Brain

Get rid of the trees and shrubs that have been planted along the cliff-face destroy the view of our beautiful foreshore and ocean from Cliff Road. Smaller plants like those at the eastern end of the cliff would be good- rest are rubbish with no apparent forethought on what was planted

Like Reply 9w



Cameron Frederik


With hardly any safe and usable footpaths.

Like Reply 10w




Bruce Reyburn

The shack communities at Little Garie, Era, Burning Palms and Bulgo were of great importance for miners at Helensburgh during the Depression. At that time the land south of Garie (within WCC LGA) was private land and not part of the then National Park. These many family connections with that coast have continued until the present day, long after that land was included in the RNP. Three Shack Communities (Little Garie, Era, Burning Palms) are now listed on the State Heritage Register. These links include Surf Clubs at Era and Burning Palms. This area of coast should be part of the WCC Coastal Study - it is not in the Sutherland City Council LGA.




Dawn Smith
 Dalene Viljoen
 Charles Van Collier ...
 Ann Rays
 Sally Mynhardt

Like Reply 9w 2




Allen Harris
 Yeh and the most traffic lights per kilometre of it ...

Like Reply 10w




Bruce Reyburn
 What part of the WCC Coast is tsunami ready? (None - my view). Compare NZ-Aotea. And read <https://www.theguardian.com/.../marseille-alexandria-and...> ...




THEGUARDIAN.COM
 Marseille, Alexandria and Istanbul prepare for Mediterranean tsunami

Like Reply 9w




Maria Vee
 To help the coastline stop the overdevelopment that is going on and don't let any developers anywhere bear the coastline. ...

Like Reply 9w




Geoff Payne
<https://wollongong.nsw.gov.au/.../ongo.../grand-pacific-walk> ...




WOLLONGONG.NSW.GOV.AU
 Grand Pacific Walk


Like Reply 9w




Ray Alger
 A desert in the Mall ...

Like Reply 9w



Mikey Mikey
 Pathetic harbour response WCC 3 months after the event. ...




Like Reply 10w


Mark Tom
 Would be nice to walk along beachside pathways without being run down by cockroaches on wheels. ...


Like Reply 9w


Geoff Payne
 \$6m may help. <https://fb.watch/dQ30luB1EF/> ...

Like Reply 9w


Ray Smith
 Typical Thirroul left out again ...

Like Reply 10w


Sean Byrne
 Ray Smith . Is Austinmer too far for you to travel ? ...

Like Reply 10w


City of Wollongong
 July 5 at 5:07 PM · 🌐 ...

Feedback for the first state of the scoping study for the Coastal Management Program closes this Thursday.

If you haven't already explored the interactive map, dropped a 'pin' and shared with us about places along the coastline you visit most often and why, now is the time. Your feedback will help us better understand issues in our coastal areas and develop a plan to address them into the future. For more information, visit <https://our.wollongong.nsw.gov.au/cmp>



 21
 2 Shares

APPENDIX 8 Sustainable Wollongong June 2022 extract



Starting a Coastal Conversation

Wollongong's coastline offers us great lifestyle, enviable views and its role in supporting a diverse range of flora and fauna. We're proud of our coastline and as part of our commitment to protect and care for it we're embarking on the first stage of a new Wollongong Coastal Management Program (CMP).

This long-term project will ultimately see the development of a strategy for the coordinated management of our coast and estuaries, guided by the *Coastal Management Act 2016*. We already have a CMP for Lake Illawarra so this project is looking at the remainder of the coast.

Our community has an important role to play in the CMP's development. Our community's voices are important in this scoping phase, which will determine what the CMP needs to include, what studies need to be prepared and who needs to be involved. We will also review the work that has been undertaken in the past to manage issues and challenges in our coastal areas.

Now is the time for our community to share their thoughts on our coast and estuaries, how they use and enjoy our beaches, headlands and rock platforms and what they love about this environment.

Engagement started on 1 June 2022 with an interactive online mapping tool and online survey. There will be a series of pop-up stalls held across the city in late June to provide residents and visitors the opportunity to speak directly with the project team. Engagement closes on 30 June 2022.

Developing a CMP is made up of five stages and we are at the first stage:

- Stage 1: Identify the scope of the CMP
- Stage 2: Determine risks, vulnerabilities, and opportunities
- Stage 3: Identify and evaluate options
- Stage 4: Prepare, exhibit, finalise, certify, and adopt the CMP
- Stage 5: Implement, monitor, evaluate and report

For more information about the CMP or how to join the conversation, [visit our website](#).

This project is supported by the NSW Government's Coastal and Estuary Program.

APPENDIX 9 Climate Emergency Update June 2022 extract

Sustainable Transport Update

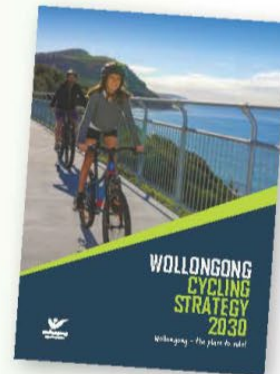
Council is investigating current and emerging ways to gather pedestrian and cyclist data across the Local Government Area (LGA). To effectively plan transport for the future for people to move between places, we need to understand how and where our community moves. Cycling reduces congestion dramatically on our road network and helps to reduce emissions that would have been otherwise produced by cars and other vehicles.

Fixed counters are in place along the Wollongong Pop-Up Cycleways in Smith Street and Kembla Street, to log the number of cycling trips, their direction and speed.

The use of the Coastline Cycleway and Blue Mile Shared Path is continuing to grow. To help us better understand this use we have also installed three new pedestrian/cyclist counters at key locations along this route. These counters do not capture personal information, but they do count the number of the people using the path, the direction they are travelling and whether they are a pedestrian or a cyclist.

The data collected from the counters will help us achieve key priorities outlined in the Cycling Strategy 2030 and uphold our prestigious label of UCI Bike city. We will be able to measure our performance against the targets set in the strategy such as increasing weekly cycling activity participation from 12.9% to 20% by 2030. An increase in cycling participation will help to decrease the city's carbon emissions and supports our Climate emergency commitments.

You can read the Cycling Strategy 2030 [here](#).



Calling for Coastal Conversations!

The Wollongong LGA has approximately 60km of coastline, from the Royal National Park in the north to Lake Illawarra in the south. Our unique coastline is valued and used by our community in many ways and is a key part of the identity of the City of Wollongong. We want to hear from our community and other stakeholders so that we can manage these valuable assets in the best way to make an Extraordinary Wollongong.

Council is inviting residents, visitors and other stakeholders to join the conversation as part of the first stage of development of the new Wollongong Coastal Management Program (CMP). The CMP will set the long-term strategy for the coordinated management of our coast and estuaries, guided by the Coastal Management Act 2016.

Stage 1 is the scoping phase, which will determine what the CMP needs to include, what studies need to be prepared and who needs to be involved. To do this we will be engaging to the community to understand what you love about our coastline, how you

use and enjoy our beaches, headlands and rock platforms, and coastal creeks as well any concerns you may have about the way the coast is managed. We will also review the work that has been undertaken in the past to manage issues and challenges in our coastal areas.

Engagement for the scoping phase started on 1 June 2022 with the launch of an interactive online mapping tool and online survey which are open until 30 June 2022. There will be a series of pop-up stalls held across the city in late June to provide residents and visitors the opportunity to speak directly with the project team.



Head online and join the conversation or come and talk to us at one of our pop-up stalls. For more information about the CMP or how to join the conversation, head to our.wollongong.nsw.gov.au/cmp or scan QR code.



This project is supported by the NSW Government's Coastal and Estuary Program.

APPENDIX 10 Survey questionnaire

Coastal Management Program - Scoping Study

Our Wollongong

Join the Conversation

We invite you to join the conversation to help us identify the scope of the CMP and to better understand what you love and value about our coastline and estuaries. This CMP does not include Lake Swarrah.

What is your main reason for visiting our coast?

(Choose any 1 options (Required))

- ☐ For work – work on or near the coastline
- ☐ For recreation – to visit the beaches, parks, boating, nature walks etc
- ☐ For fun – to enjoy cafes, restaurants and shopping
- ☐ For catch ups – to visit friends or family
- ☐ For holidays – live outside the City of Wollongong

How often do you visit the coast?

(Choose any one option (Required))

- ☐ Daily
- ☐ 3-5 times a week
- ☐ Weekly
- ☐ Monthly
- ☐ A few times per year

Our coast is many things to different people. How important are these aspects of our coastline to you?

(Required)

Questions	Very important	Somewhat important	Not so important	Not important at all
Access to the beach and foreshore is safe				
Beaches and foreshore include a range of recreational facilities (bike and walking paths, parks, seating, picnic areas, boat ramps)				
Vegetation in dunes and estuaries is healthy				
Water quality in the estuaries and creeks is good				
Water quality at the beaches is good				
Natural ecosystems for plants, animals and marine life are preserved				
Places with Aboriginal cultural values and sites are protected				
Places with non-Aboriginal heritage values are protected				
Coastal business opportunities and tourism are promoted and supported in coastal areas				
Views of the coast are maintained				
There are opportunities for recreational fishing along our coast				
There are opportunities for swimming, sailing, surfing and other in-water activities				
There are opportunities for swimming in ocean pools and rockpools				
There are opportunities for dog walking on beaches				

Coastal Management Program - Scoping Study

Our Wollongong

Which of the following do you consider a threat or issue for the long term management of the Wollongong coastline or estuaries?

Tick the top 5 threats that apply to you.

(Choose any 5 options (Required)

- ☐ Poor water quality in the estuaries
- ☐ Poor water quality at the beaches
- ☐ Loss of estuary and dune vegetation and habitat for native animals and plants
- ☐ Weed and feral animal infestation
- ☐ Beach and foreshore erosion
- ☐ Flooding of low lying areas along the coast
- ☐ Coastal cliff and slope instability
- ☐ Impacts of climate change (e.g. sea level rise and increased storms)
- ☐ Pollution (from stormwater and boats etc)
- ☐ Changing conditions of creek entrances
- ☐ Urban development in the coastal zone
- ☐ Insufficient recreational facilities (eg parks, BBQs, toilets)
- ☐ Other (please specify)

Can you please tell us more about any specific locations where these threats or issues apply to?

(Required)

Finally, tell us about you. What is your age?

(Choose any one option (Required)

- ☐ 7 and under
- ☐ 8-24
- ☐ 25-34
- ☐ 35-44
- ☐ 45-54
- ☐ 55-64
- ☐ 65-74
- ☐ 75 and older

Are you Aboriginal and/or Torres Strait Islander?

(Choose any one option (Required)

- ☐ Yes
- ☐ No
- ☐ Prefer not to say

Are you a person with disability?

(Choose any one option (Required)

- ☐ Yes
- ☐ No
- ☐ Prefer not to say

Do you speak a language at home other than English?

(Choose any one option (Required)

Coastal Management Program - Scoping Study

Our Wollongong

- ☐ No
☐ Yes (please specify)

What s your post code?

(Required)

APPENDIX 11 Survey results



Join the Conversation

SURVEY RESPONSE REPORT

31 May 2022 - 08 July 2022

PROJECT NAME:

Coastal Management Program - Scoping Study



Join the Conversation : Survey Report for 31 May 2022 to 08 July 2022



Personal identifying information has been excluded from this report.

Matters and issues pertaining to Lake Illawarra are outside the scope of this project, however, have been included for transparency. They have not been considered in the Engagement Outcomes Report.

Join the Conversation : Survey Report for 31 May 2022 to 08 July 2022



Q1 What is your main reason for visiting our coast?



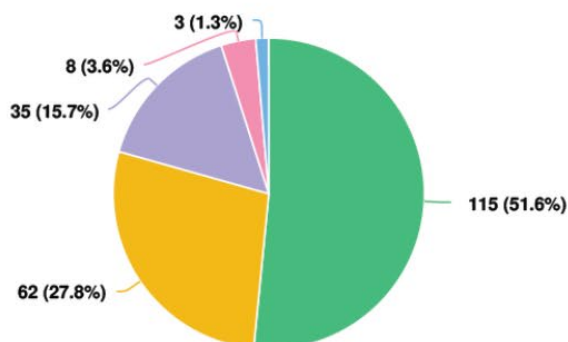
Question options

- For work I work on or near the coast
- For recreation over the beaches parks boating nature walks etc
- For fun to enjoy cafes restaurants and shopping
- For catch ups over friends or family
- For holidays I live outside the City of Wollongong

Mandatory Question (223 response(s))

Question type: Checkbox Question

Q2 How often do you visit the coast?



Question options

- Daily
- 3-5 times a week
- Weekly
- Monthly
- A few times per year

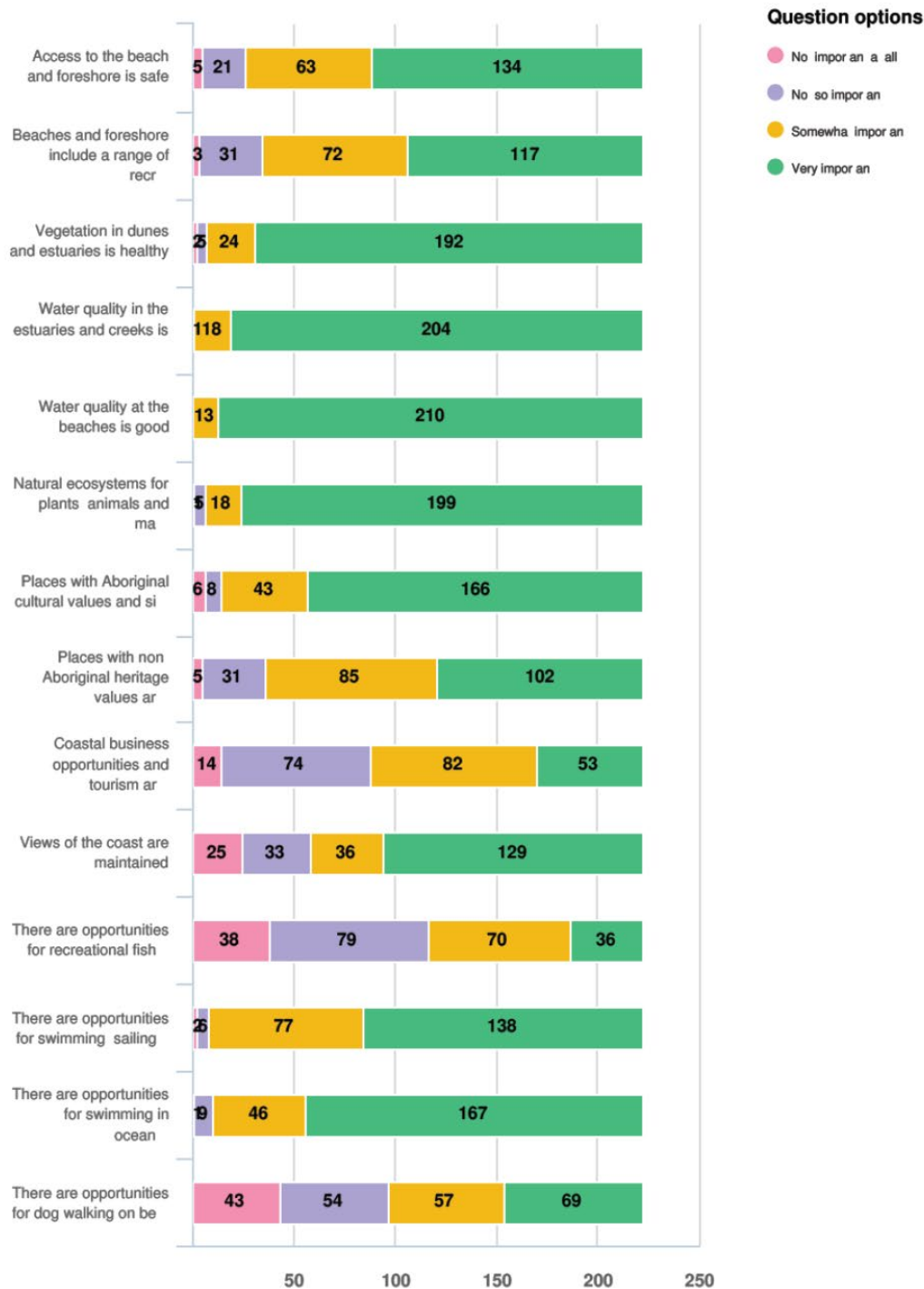
Mandatory Question (223 response(s))

Question type: Radio Button Question

Join the Conversation : Survey Report for 31 May 2022 to 08 July 2022



Q3 Our coast is many things to different people. How important are these aspects of our coastline to you?

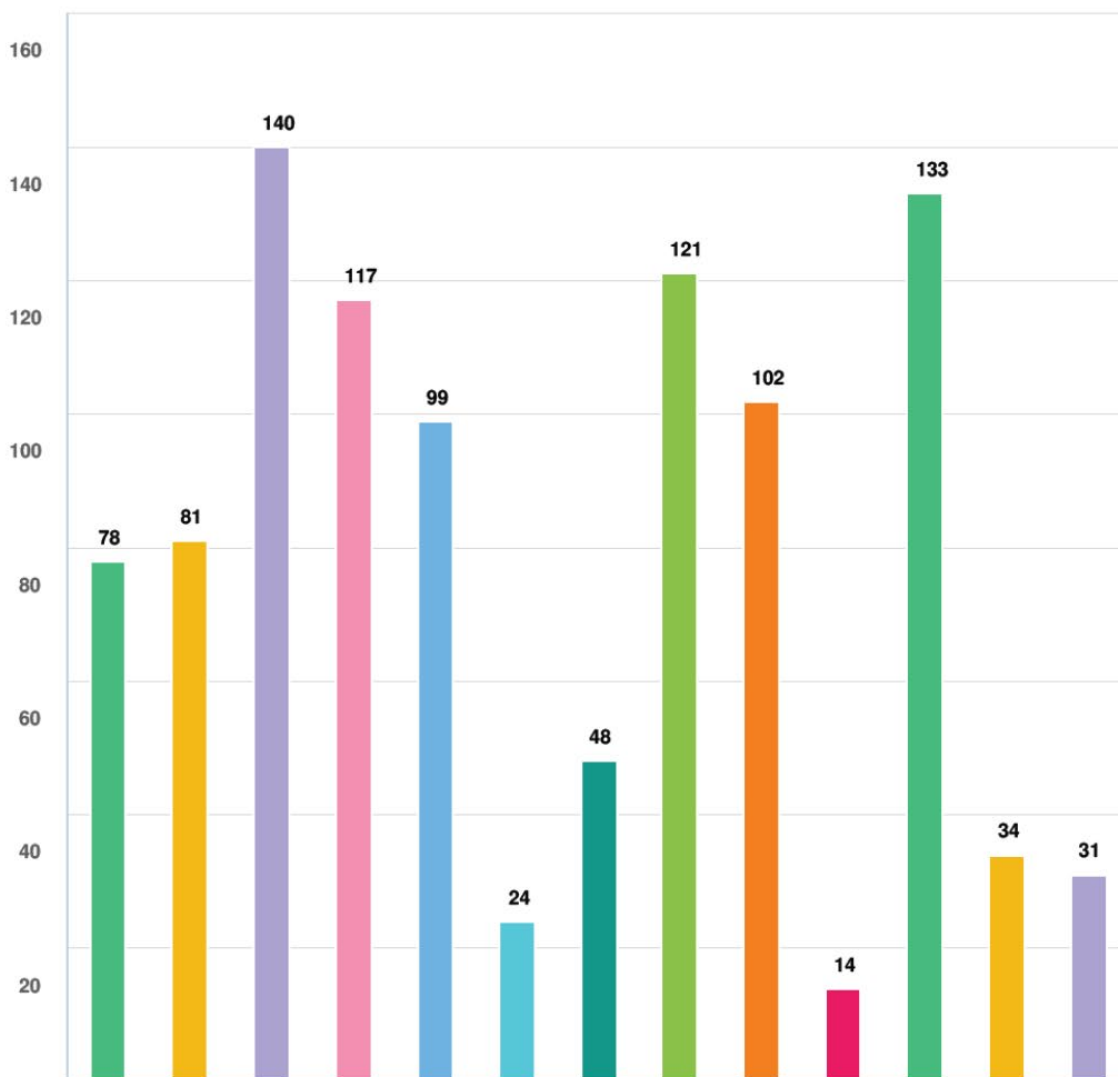


Mandatory Question (223 response(s))
Question type: Likert Question

Join the Conversation : Survey Report for 31 May 2022 to 08 July 2022



Q4 Which of the following do you consider a threat or issue for the long-term management of the Wollongong coastline or estuaries? Tick the top 5 threats that apply to you.



Question options

- Other (please specify)
- Insufficient recreational facilities (eg parks, BBQs, etc)
- Urban development in the coastal zone
- Changing conditions of creek entrances
- Pollution (from stormwater and boats etc)
- Impacts of climate change (eg sea level rise and increased storms)
- Coastal cliffs and slopes at risk
- Fooding of low lying areas along the coast
- Beach and foreshore erosion
- Weed and feral animal infestation
- Loss of estuary and dune vegetation and habitat for native animals and plants
- Poor water quality at the beaches
- Poor water quality in the estuaries

Mandatory Question (223 response(s))

Question type: Checkbox Question

Join the Conversation : Survey Report for 31 May 2022 to 08 July 2022



Q5 Can you please tell us more about any specific locations which these threats or issues apply to?

Screen Name Redacted
5/31/2022 08:02 PM

McCau eys Beach - eros on and and destab sat on

Screen Name Redacted
6/01/2022 08:29 AM

Dune remova and eros on at Port Kemb a nc ud ng Coomad tch e reserve.

Screen Name Redacted
6/01/2022 11:44 AM

Bu , Woonona, Be amb , Corr ma , Towradg , Fa ry Meadow, Wo ongong C ty, Port Kemb a

Screen Name Redacted
6/01/2022 02:22 PM

Not spec f ca y

Screen Name Redacted
6/01/2022 07:46 PM

A ot of beaches have been severe y cut back th s year e.g. at Fa ry Meadow, W ndang. A so there has been some concern w th stormwater dur ng th s year's bad weather. Perhaps a system to warn about poor water qua ty (and b uebott es) n seas de rock poo s wou d be a good dea. A so the grass area above Towradg poo seems to have been fenced off and abandoned n a state of d srep r for at east 6 months

Screen Name Redacted
6/02/2022 06:54 AM

Eros on

Screen Name Redacted
6/02/2022 07:40 AM

-

Screen Name Redacted
6/02/2022 09:04 AM

Be amb Lagoon and Dunes p us Corr ma Dunes

Screen Name Redacted
6/02/2022 09:39 AM

There s poor contro of storm water n ow y ng areas and mprovements to the wastewater network wou d be benef c a Nat ve vegetat on sn't ma nta ned or we managed n most areas fr ng ng the coasta creeks and agoons New deve opments shou d have more or better po ced contro s dur ng bu d ng but then a so once bu t re ated to ons te stormwater detent on. Increas ng deve opment a so needs to be ref ected n ncreas ng serv ces and amen tes.

Join the Conversation : Survey Report for 31 May 2022 to 08 July 2022



Screen Name Redacted 6/02/2022 06:07 PM	City Beach
Screen Name Redacted 6/02/2022 03:23 PM	Coomaditchie Lagoon and Lake Illawarra shorelines. I notice not as many shorebirds as usual this year.
Screen Name Redacted 6/02/2022 03:41 PM	Whole coastline
Screen Name Redacted 6/02/2022 04:05 PM	Complete coastline of Wollongong
Screen Name Redacted 6/02/2022 06:23 PM	Just in general, the topics above that I've selected will have a great impact on our coastline and potential use of our beaches (I only access dog friendly beaches and like the ones that provide a long walk for myself and my dogs) but at some of them, we need more bins so that we can correctly dispose of our waste, and we need rangers to frequent them more often as there are people who don't pick up after their dogs which will eventually have a negative impact on those of us who are doing the right thing.
Screen Name Redacted 6/02/2022 05:39 PM	WOLLONGONG BLUE MILE AND STUART PARK LAGOON
Screen Name Redacted 6/02/2022 07:05 PM	Especially between the coast and escarpment in the northern Illawarra
Screen Name Redacted 6/02/2022 07:26 PM	Puckeys Reserve and Fairy Creek Lagoon - see stores. Korrungua Nature reserve - repair of walking track - needs stepping stones through flooded area. Use of past decking will destroy the spiritual beauty of the most beautiful bridge in the Illawarra. Can you name a more beautiful bridge?
Screen Name Redacted 6/02/2022 07:50 PM	Impacts of climate change will apply to all areas. I am concerned about the predicted rise of sea levels and the impact this will have on our coastline. I do not want to see development along our coastlines and want to see the same amounts of forest that link the escarpment to the foreshore/coastline maintained
Screen Name Redacted 6/02/2022 09:34 PM	Along the way along Corrimal Beach, Towradg Beach and East Corrimal sand dunes.

Join the Conversation : Survey Report for 31 May 2022 to 08 July 2022



Screen Name Redacted

6/03/2022 05:38 AM

Weeds n dunes at w ndang

Screen Name Redacted

6/03/2022 06:04 AM

W ndang. There's mass ve ans ps and fa en over trees and encroach ng vegetat on at the ake, oca s p ck ng up p ast c and rubb sh, f sh ng p ers just get d sconnected from shore and left to rot, p us the abandoned park on W ndang road.

Screen Name Redacted

6/03/2022 07:49 AM

The foreshore of Lake I awarra Perk ns beach

Screen Name Redacted

6/03/2022 09:58 AM

Be amb /Corr ma

Screen Name Redacted

6/03/2022 12:15 PM

I cha r the Port Kembra Harbour Env ron menta Group and have observed many changes n the coast fr nge n the past few years. The waters of the harbour have mproved dramt c y over the past few years.

Screen Name Redacted

6/03/2022 12:43 PM

Bu beach front, Bu pass, Northern d str butor, a creeks are gett ng over taken by antana

Screen Name Redacted

6/03/2022 02:22 PM

Northern beaches - ots of rabb ts, tree vanda sm and weeds

Screen Name Redacted

6/03/2022 04:03 PM

Coast

Screen Name Redacted

6/03/2022 04:31 PM

Towradg Beach, East Corr ma Beach

Screen Name Redacted

6/03/2022 05:21 PM

More contro of f sher men/women act v tes, that s c ean ng of f sh at ocat ons, removab e of eft over ba t and tang ed nes, espec a y at Stanwe Park Bach from v s tors from the western suburbs.

Screen Name Redacted

6/03/2022 05:36 PM

Any ow y ng areas

Screen Name Redacted

between northern Th rrou and Aust nmer

Join the Conversation : Survey Report for 31 May 2022 to 08 July 2022



6/03/2022 06:15 PM

Screen Name Redacted

Lake I awarra at W ndang and the dunes at Port Kembra

6/03/2022 08:48 PM

Screen Name Redacted

A ocean beaches and pools are precious and access should be easy and safe.

6/03/2022 09:06 PM

Screen Name Redacted

Lake I awarra and its foreshore is extremely neglected !!

6/03/2022 09:36 PM

Screen Name Redacted

Area around W ndang boat ramp has been fenced off for years now! When will it be fixed? Amenities and play areas terrible compared to Shellharbour yet the tourism on W ndang is devastating. The flow past W ndang boat ramp is very dangerous and should have a groynes to slow the flow at the immediate ramp with a tidal jetty like Port Kembla boat ramp

6/04/2022 12:23 AM

Screen Name Redacted

Moderate on mature trees along the roads will suffocate the trees. Overcollection of shellfish sea snails etc from rock platforms

6/04/2022 08:18 AM

Screen Name Redacted

Severe sinking in Lake I awarra

6/04/2022 08:35 AM

Screen Name Redacted

Lake I awarra foresaw and water pollution is a disgrace, professional fishing are rampant the lake and they should be stopped

6/04/2022 10:40 AM

Screen Name Redacted

Woonona beach

6/04/2022 11:53 AM

Screen Name Redacted

I am concerned primarily about the cliffs, rock platforms and beaches that run from Sandon Point to Austmer. There are many problems of erosion in those areas and Council does not apply the strict building controls that are stated to be applied in the WCZMP 2017.

6/04/2022 04:57 PM

Screen Name Redacted

Beach areas with limited access PARTICULARLY between Towradg and Fairy Meadow; and between Port Kembla and W ndang.

6/05/2022 03:01 PM

Screen Name Redacted

Foreshore between Coedale and Throu

6/05/2022 03:18 PM

Join the Conversation : Survey Report for 31 May 2022 to 08 July 2022



Screen Name Redacted

6/05/2022 03:32 PM

Between Fairy Meadow SLSC and Towradg SLSC.

Screen Name Redacted

6/05/2022 10:00 PM

During heavy rainfall it happens along the coastline where fresh water runs into salt water, Lake Illawarra is a good example. This is caused by erosion through over development along or close to our waterways which includes pollution.

Screen Name Redacted

6/06/2022 07:23 AM

From Coledale all the way down to Wollongong

Screen Name Redacted

6/06/2022 09:47 AM

Bu Beach, Sandon Point Beach and Sandon Point

Screen Name Redacted

6/06/2022 09:18 AM

No

Screen Name Redacted

6/06/2022 09:58 AM

Runoff from urban streets affecting water quality, dogs on rock platforms and outside of a fenced dog-zones

Screen Name Redacted

6/06/2022 07:00 PM

No

Screen Name Redacted

6/06/2022 07:31 PM

A

Screen Name Redacted

6/06/2022 09:27 PM

Wendang boat ramps dangerous, Wendang boat ramp surrounds are unfenced for years now. Wendang tourism is so busy every weekend however there is no money being spent to even maintain it. Needs to catch up to the harbour council - look at Reddles Reserve etc

Screen Name Redacted

6/07/2022 12:14 AM

In having lived here for 58 years and studied both business, horticulture and travelled widely I believe that we are very slow in choosing our living and recreation areas and not listening to our coastline opportunity of returning to a relaxed setting outside the CBD. Everyday I see people litter, watch storms and large surf impact our coastline, watch the uninformed remove many species of flora and fauna that keeps us physically and mentally on track to ensure a better life for all now and in the future. But taking a leaf from David Attenborough that we cannot continue to treat our environment the same way otherwise it will make us pay in many ways we don't see.

Join the Conversation : Survey Report for 31 May 2022 to 08 July 2022



Screen Name Redacted

6/07/2022 12:45 PM

It's up to YOU ,US and ME to take respons b ty to do someth ng TODAY!! "Try ask ng someone to he p you p ckup some rubb sh at the ghthouse and see what the answer wou d. Thankyou.

Screen Name Redacted

6/07/2022 12:45 PM

Many foreshore areas have s gn f cant numbers of weed spec es, eg. Puckeys Estate. Wh e the amount of urban deve opment a ong the coast s genera y okay, I wou dn't want to see t get c oser to the beach than t a ready s or to turn the who e coast ne nto North Wo ongong.

Screen Name Redacted

6/07/2022 02:23 PM

vacant and bes de our house sn't ma nta ned as t shou d be. Lantana, b dou and morn ng g ory p ants nvad ng a a ong the coast.

Screen Name Redacted

6/07/2022 04:46 PM

A ong the ent re l awarra foreshore

Screen Name Redacted

6/07/2022 07:13 PM

Wombarra

Screen Name Redacted

6/08/2022 08:23 AM

Co eda e and Wombarra beach

Screen Name Redacted

6/08/2022 08:56 AM

Eros on of c ffs between McCau eys Beach and Th rrou Beach

Screen Name Redacted

6/08/2022 10:12 AM

more mprovements to creek ne and catchment vegetat on ocated w th 2km of beaches or out ets nto water bod es

Screen Name Redacted

6/08/2022 11:35 AM

North Wo ongong beach and agoon. C ty beach

Screen Name Redacted

6/08/2022 12:36 PM

Lake l awarra s exper enc ng s gn f cant b o og ca changes s nce the open ng of the lake, ncreased hous ng deve opments has ed to an ncrease n storm water po utants, rubb sh and cr me w th cutt ng down nat ve vegetat on such as our mangroves.

Screen Name Redacted

6/08/2022 10:46 AM

From my observat on and work as a vo unteer do ng Council act v tes such as F Ready, Bush Regenerat on and revegetat on, a the above t cked statements n paragraph 4 current y occur between Be amb and Th rrou . Impact s across the coasta p a n up to and nc ud ng the escarpment.

Join the Conversation : Survey Report for 31 May 2022 to 08 July 2022



Screen Name Redacted

6/08/2022 11:10 AM

Lawrence Hargrave Drive, starting from Bad Hookout (Otford),
across the Seaff Bridge, and along the way along the Drive

Screen Name Redacted

6/08/2022 11:12 AM

not at this stage, the main worry is outrageous commercial
development.

Screen Name Redacted

6/08/2022 12:02 PM

N

Screen Name Redacted

6/08/2022 01:40 PM

Too many dogs on McCauley beach, too coastal views are being lost
by pandering to minority groups.

Screen Name Redacted

6/08/2022 04:00 PM

Lake Iawarra tributaries need preservation

Screen Name Redacted

6/08/2022 06:59 PM

Everywhere I go there are dogs not complying with council rules on
beaches Puckey's dogs off leash and using it as a toilet Seaff
Bridge despite bags bins and advertising dog owners let the dog use
the bridge as a toilet and leave it. I have sent photos to council
Walking on the walk track in Coedale having a dog jump all over me
Dog dumps on the beach These are just a few As your dog
rangers how no one complies with council rules I am very happy to
show you lots of dogs ignoring your no dog signs

Screen Name Redacted

6/09/2022 07:24 AM

Stormwater run-off from numerous sources in the escarpment areas

Screen Name Redacted

6/09/2022 11:24 AM

Coastal beach experiencing continued erosion. Sandbagging should
be a temporary solution.

Screen Name Redacted

6/09/2022 11:26 AM

The northern Iawarra beaches from Bull to Stanwell Park

Screen Name Redacted

6/09/2022 02:54 PM

The strip between Throu and Wombarra needs special attention
due to over development of the existing residential land. The constant
demolition of single residences being replaced by two or more is
putting stress on the character, amenity and environment of the area.

Join the Conversation : Survey Report for 31 May 2022 to 08 July 2022



Screen Name Redacted 6/09/2022 03:27 PM	At a development in Wombarra a developer has been able to provide free access as council does not have sufficient oversight of this type of development. It is catastrophic to the water quality and rock platform creatures etc.
Screen Name Redacted 6/09/2022 07:35 PM	Along the development coast throughout Wollongong
Screen Name Redacted 6/10/2022 10:09 AM	Preserving the overall conditions of the coast.
Screen Name Redacted 6/10/2022 10:20 AM	Kuradj = McCauleys Beach
Screen Name Redacted 6/10/2022 01:02 PM	Concerns that the area of Pucky's reserve will not be maintained for the future. And erosion will affect the vegetation.
Screen Name Redacted 6/10/2022 01:27 PM	Fairy Meadow
Screen Name Redacted 6/10/2022 02:52 PM	City Beach: Dogs being off lead and running through dunes damaging vegetation. Invertebrates living in dunes and damaging vegetation. Pollution from industry on the coast is ongoing issue.
Screen Name Redacted 6/11/2022 01:13 PM	Increased rainfall has led to sediment filled creeks carrying rubbish which pollute the beaches. Bjo bush and asparagus fern at East Corrimal and beambes a concern.
Screen Name Redacted 6/11/2022 01:55 PM	Anywhere developers want to get their greasy paws on
Screen Name Redacted 6/11/2022 04:27 PM	Coastline along northern suburbs is at risk of erosion. More should be done to protect this area.
Screen Name Redacted 6/12/2022 11:36 AM	Don't have any comment here
Screen Name Redacted 6/12/2022 09:34 PM	The whole coastline. Over development and degradation of natural habitats is a major issue. We must protect and rehabilitate our natural environment to ensure it survives and flourishes. Development must

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not be at the expense of our environment and protection of native flora and fauna.

Screen Name Redacted

6/12/2022 09:51 PM

North end of Bu beach became heavily eroded during the rains.
Vegetation on dunes not good

Screen Name Redacted

6/13/2022 10:19 AM

The creeks that run into a lot of the beaches are degraded polluted and completely uncared for. I have lived in the Illawarra all my life and I have never seen Council or anybody revegetate creeks, or assess water quality and audit the land management in these areas. With all the money that goes into places like Wollongong markets an absolute shame on a lot of the residents of the Illawarra that the environment is so badly cared for. There is an opportunity for the Illawarra to become the most beautiful landscaped and protected natural space in Australia. Council or residents have no vision.

Screen Name Redacted

6/13/2022 10:29 AM

Puckies creek system, water quality seems quite poor. Some litter in waterway. Add to that stormwater treatment devices could be installed where possible. Water quality and flood conveyance could be improved through entrance training but understand that this would be very unlikely to be approved due to environmental concerns and safety issues. Creeks in the region have been totally denuded of vegetation since flooding events. Worst spots could have erosion control implemented to stop excess sediment entering ocean. Mcauley beach. Ongoing erosion issue. Reduces water quality of local beaches during high surf. Don't know if possible to prevent this. Maybe reduce gradient through remodeling. Place down those massive sandbags. Create benches that could be repainted? Good luck with the CMP

Screen Name Redacted

6/14/2022 03:10 PM

Sade Park and south of Aust Beach at risk of erosion. Overdevelopment of the region at risk of increasing air, water and traffic pollution. Dog walking must be protected along the foreshore. Many older people walk dogs near their homes for recreation and should not be forced to do this restricted hours eg early morning or late afternoon for safety reasons.

Screen Name Redacted

6/14/2022 07:25 PM

Wollongong City Beach. I am a volunteer surf lifesaver and I find it frustrating we can't see the ocean clearly due to the overgrown dune vegetation. I understand the necessity of the dunes but would like them to be maintained to ensure safety and visibility.

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Screen Name Redacted 6/15/2022 11:29 PM	unsure
Screen Name Redacted 6/17/2022 11:03 AM	Wo ongong Harbour, North Wo ongong
Screen Name Redacted 6/17/2022 12:56 PM	It seems c mate change s hav ng an mpact on beach and foreshore ocat ons a ong the coast
Screen Name Redacted 6/17/2022 03:30 PM	I worry about the Coa c ff Creek, f there s deve opment on the coke Works ste, somet mes I wonder about the water qua ty on the Stanwe Park creeks
Screen Name Redacted 6/18/2022 07:18 PM	> C ty Beach former y South Beach > North Beach northern end > Fa ry Meadow & Towradg Beaches
Screen Name Redacted 6/19/2022 06:00 PM	Our group often ceans up bes de Lake I awarra. The area around the f sh and ch p shop needs more fac tes, part cu ar y pub c to ets.
Screen Name Redacted 6/20/2022 06:32 PM	New house b ng bu t above Aust nmer poo - ess than 10m from the act ve y-crumb ng c ffs. The past 15 years have seen ud crous y nappropr ate, nsens tve deve opment of the Northern beaches and a so r ght a ong the coast. Th s needs to stop - and the reent storm eros on ought to be a warn ng s gn.
Screen Name Redacted 6/21/2022 10:04 AM	I wou d ke pub c parks a ong our coast to rema n open for a to use, restr ct ons on commerc a act v ty c os ng off parks
Screen Name Redacted 6/21/2022 12:03 PM	Be amb , Wo ongong, Th rrou
Screen Name Redacted 6/21/2022 11:03 AM	No
Screen Name Redacted 6/21/2022 01:16 PM	A creeks. Brokers Nose bush and s ttered w th p ast c bott es by b ke r ders
Screen Name Redacted 6/21/2022 02:48 PM	F sherman s Beach near Port Kembra. Won t be ab e to wa k a ong the beach at h gh t de soon. MM beach needs a pub c to et as the

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pedestr an traff c s overwhe m ng at t mes and there s no to et: need
a ded cated / perm tted overn ght camp ng for the ever ncreas ng
campervan trend. Had a m ted t me eg 1 n ght camp ng on y. no
ong term. Th s w ncrease tour sm and nject money nto the oca
economy.

Screen Name Redacted
6/21/2022 02:58 PM

Wou d ove to see an ocean rock poo at MM Beach / F sherman
Beach so many fam es congregate there over summer:

Screen Name Redacted
6/21/2022 03:10 PM

A genera statement

Screen Name Redacted
6/21/2022 04:32 PM

A over Wo ongong you see weeds such as Lantana thr v ng and the
arge deer popu at on s overa seem ng y unchecked. Years of
gnored damage to our coast due to these two th ngs a one.

Screen Name Redacted
6/21/2022 07:33 PM

North I awarra.

Screen Name Redacted
6/21/2022 06:30 PM

Most Wo ongong beaches were p anted w th 'dune stab sat on'
programs n the 80's. Th s has ntroduced a range of p ants n p aces
where they never prev ous y ex sted and where they cont nue to grow
unmanaged, w th negat ve consequences for the qua ty of surf
breaks wh ch, n Wo ongong LGA are predom nant y beach breaks
depend ng on regu ar seasona movement of sand back and forth
from dunes nto the wave zone. Surf ng s a core recreat ona act v ty
for Wo ongong ratepayers and a major econom c dr ver. The number
of surfers ncreases exponent a y wh e the number of surfab e waves
stead y d m n shes because there are now forests where there used
to be dunes. Prev ous po cy n th s area has been r sk-based
(prevent what m ght happen one day) nstead of user-based (enhance
day-to-day exper ence) Parts of Woonona, Corr ma and South
Beaches were treated n 2015, restor ng the funct ona ty of sect ons
of dunes and mprov ng the ab ty of these sect ons to cope w th
storms, yet so ated act on w th n a 60km coast ne does tt e to
mprove pub c amen ty to qua ty surf. T me for who esa e
restructur ng of fronta dunes.

Screen Name Redacted
6/21/2022 10:03 PM

Th nk ng about ake awarra w th regard to water qua ty n part cu ar
and eros on / c mate change mpact a ong south beach

Screen Name Redacted

Wo ongong Harbour, C ty Beach, North Beach, Fa ry Meadow,

Join the Conversation : Survey Report for 31 May 2022 to 08 July 2022



6/21/2022 09:53 PM

Corr ma , Be amb , woonona, Bu , Stanwe Park, Port Kemb a.

Screen Name Redacted

East Corr ma beach Corr ma beach

6/22/2022 12:26 AM

Screen Name Redacted

I ve not ced a ot of peop e sw mm ng n Be more Bas n and the Lagoon where there are s gns warn ng of hazardous po ut on n the water.

6/22/2022 08:50 AM

Screen Name Redacted

No oca to ets near MM beach or f sherman s beach

6/22/2022 10:08 AM

Screen Name Redacted

The farm n She harbour

6/22/2022 10:50 AM

Screen Name Redacted

Hea thy commun tes of nat ve dune vegetat on are v ta for promot ng shore ne stab ty, espec a y n the context of future sea- eve r se and ncreased eros on resu t ng from storms. These commun tes at paces ke Corr ma , Woonona and Bu need to be we ma nta ned and protected.

6/22/2022 01:09 PM

Screen Name Redacted

A a ong our beaches.

6/22/2022 03:49 PM

Screen Name Redacted

A p aces affected by recent foods and prev ous east coast ows

6/22/2022 04:58 PM

Screen Name Redacted

Wombarra beach has not ced a ot of sand oss n the past 12 months

6/23/2022 08:19 AM

Screen Name Redacted

There s ots of p ast c washed up on the beach a the way a ong the coast.

6/23/2022 09:04 AM

Screen Name Redacted

perk ns beach, dunes and banga ay sand forests

6/23/2022 04:51 PM

Screen Name Redacted

Bu Beach- vegetat on that s overgrown and fu of weeds. Not ma nta ned. Encroach ng on to beach

6/23/2022 10:47 PM

Screen Name Redacted

Northern suburbs

Join the Conversation : Survey Report for 31 May 2022 to 08 July 2022



6/23/2022 10:47 PM

Screen Name Redacted

6/24/2022 08:40 AM

Most of the beaches don't need grasses and stability fences or barriers as they were in better condition before the planting of the grasses and have become overgrown and attracted vermin

Screen Name Redacted

6/24/2022 12:09 PM

Pt Kembla, ridiculous dune moving works undertaken. The money could have actually improved environmental outcomes rather than creating a huge problem. I don't think I can ever forgive Wollongong Council for the massive display of stupidity and lack of common sense, and ignorance of the importance of that dune for social cohesion in that area. The whole coast is under pressure. Too much housing development. Too many lobby groups like Beachcare Australia undermining scientific research and not enough work being done to restore and enhance the natural beauty of the coast.

Screen Name Redacted

6/24/2022 12:42 PM

In and around the north Wollongong to Corrimal areas especially, with the unique dune and estuary ecosystems that exist there.

Screen Name Redacted

6/24/2022 06:48 PM

Need to conserve natural values and avoid congestion by cars especially in northern suburbs

Screen Name Redacted

6/25/2022 10:52 AM

But beaches need maintenance

Screen Name Redacted

6/25/2022 10:54 AM

Puckey's estate needs careful monitoring. Beaches in Wollongong area where I surf so I'm concerned about water quality and erosion issues there. Increasing visitor numbers puts pressure on facilities and protection of Stuart Park needs careful oversight.

Screen Name Redacted

6/25/2022 05:32 PM

Weed infestation on coastal areas

Screen Name Redacted

6/25/2022 09:15 PM

Dune vegetation should be protected & conserved at all coastal locations. It serves an important role for protecting assets and the beach in the face of climate change impacts

Screen Name Redacted

6/26/2022 12:14 PM

Too many taboos going up on the coastline

Join the Conversation : Survey Report for 31 May 2022 to 08 July 2022



Screen Name Redacted 6/26/2022 02:06 PM	NA
Screen Name Redacted 6/26/2022 03:14 PM	Coastal views are sometimes obscured by clutter e.g. buildings fences and other structures along cliffs that impede views from what used to be grassy open headlands
Screen Name Redacted 6/26/2022 03:21 PM	Wombarra, Stanwell Park, Coariff
Screen Name Redacted 6/26/2022 05:42 PM	Nowhere specific
Screen Name Redacted 6/27/2022 06:41 AM	T
Screen Name Redacted 6/27/2022 07:55 AM	Wollongong Blue Mallee - proliferation of dog walkers and the dog poo that goes with it. Not good at all. Disgusting and really downgrades the experience and area. Council need to create grassy patches along the way with dog poo bins where they can do the right thing and people made to clean up. Woonona Beach - full height Lantana growing right up to the walking track making the water completely hidden. We need more well designed walking locations along the coast that attract walkers away from overpopulating the Blue Mallee. Too much of the walking tracks are too far back from the coast to make them attractive to use. Eg: Puckeys Estate - an elevated boardwalk along the beach side of the bush. Walking track between Sandon Point and Bull - too narrow and bad condition. A separate cycle track to walking track at selected points along the coast, including that position, would be awesome for all. A proper walking track on the northern end of city around - Throuth to Coedale? Appreciate what Council does now but so much opportunity to make it better!
Screen Name Redacted 6/27/2022 07:56 AM	Wollongong rock pool at the blue mallee water quality. South/city beach and dune erosion.
Screen Name Redacted 6/27/2022 11:31 AM	The Heritage communities in the Royal National Park at Little Garra, Era and Burning Palms are within the WCC LGA and this area should be included in the scoping study. The NPWS does not take responsibility for coastal management as their control stops at the high water mark. Protection of coastal heritage, indigenous and non-indigenous is important. A Tsunami warning system should be

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developed for the whole LGA

Screen Name Redacted

6/27/2022 02:39 PM

Theagoon by Stuart Park Wollongong beach (in front of WIN stadium)

Screen Name Redacted

6/27/2022 03:27 PM

South Beach, North Beach, Throu Beach (Pool, cafe, surf club)

Screen Name Redacted

6/27/2022 04:36 PM

Puckeys estate andagoon area. North Wollongong to City Beach

Screen Name Redacted

6/27/2022 04:42 PM

Loss of Wollongong City beach foreshore to further development. Open areas near the stadium need to remain. Add fresh water tap and shower at dog beach access point near Bank st. There are 2 hotels nearby and no way of showering or even washing ones feet.

Screen Name Redacted

6/27/2022 09:02 PM

Woonona and surrounds, East, Corrimal, Towradg and dune areas are to be maintained to provide our beach areas with a 70% style foreshore for all to enjoy. Examples byron bay and noosa

Screen Name Redacted

6/27/2022 11:31 PM

I have noticed that beaches without a stable vegetated dune result in sand drift andward eg Port Kembla

Screen Name Redacted

6/28/2022 01:36 PM

Coastal vegetation is good but plant selection needs to be suitable for scrubs otherwise it gets destroyed - make correct decisions in the future. Regarding dogs - off leash beaches should be at least 100m out of dog hours. The good coast does this and Wollongong needs to follow.

Screen Name Redacted

6/29/2022 08:21 AM

Creeks flowing into LHD area need a clean out

Screen Name Redacted

6/29/2022 01:19 PM

Have witnessed significant pollution from Corsons creek this year which has negatively impacted quality of the ocean water at Woonona and Bull beaches. This negativity of increased ocean pollution has had a flow onto the closure of Woonona rock pool. Increased urban development has increased the risks of sewerage and storm water in our creeks.

Screen Name Redacted

6/29/2022 05:17 PM

1. East corrimal beach. the public area where dogs are supposed to be on leash is rarely used correctly and people simply let the dogs off

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beach from the foreshore and NOT go north to the beach free area. We previously suggested that this should be removed and beach area should only be from beach to boat ramp to the rocks at northern end of east corner beach meaning there would be no interaction between surfers and other beach users and the dog walkers. Access only from boat ramp and or Bott Drive reserve 2. Walkways were damaged at numerous beaches during the rain event in February and large surf as well but specifically note that at sandon point 4 of the 5 entry points are damaged, have been reported but not fixed 4 months later. Also the ramp for disabled people to use the toilets doesn't go all the way to the facilities. Also the pathway at Austmer beach has been covered in sand and unusable for prams, walkers and disabled for 3 plus years with numerous reports but no action taken. Eventually someone will be run over in the carpark.

Screen Name Redacted

6/29/2022 05:59 PM

There are too dogs on McCauley Beach.

Screen Name Redacted

6/29/2022 11:27 PM

My experience is generally of the beaches, pools, rock shelves and headlands north of Wollongong to Stanwell Park but apply to the whole length of the WCC coastline.

Screen Name Redacted

6/30/2022 02:19 PM

Woonona beach is subjected to an ongoing misinformation campaign by "Beach Care Australia". They hate dune vegetation, and want to see all vegetation on the foredune area removed. They make videos that misconstrue physics but seem compelling to the lay person. This needs to be countered by a consistent and ongoing community education campaign on dune geomorphology and the importance of dune vegetation. Council should invest in Bushcare and Dune care staff to support volunteers to do weed control and ecological restoration, and stop wasting money in profiling dunes.

Screen Name Redacted

6/30/2022 03:00 PM

With rising sea levels and increased erosion it's important to maintain the dunes as a protective buffer with good biodiversity and native planting.

Screen Name Redacted

6/30/2022 03:08 PM

Nature vegetation foreshore is degraded at Fairy Meadow, and Beach. The best parts are no big concrete, manmade paces, but sand and dune vegetation.

Screen Name Redacted

6/30/2022 03:32 PM

Fairy Creek

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Screen Name Redacted 6/30/2022 03:34 PM	Coasta vegetat on s extreme y mportant and shou d not be removed.
Screen Name Redacted 6/30/2022 03:45 PM	The b ggest one s tree vanda sm. Peop e need educat on on the mportance of our de cate natura coasta env ronment. We must protect and preserve coasta vegetat on. It p ays a huge ro n stab sat on of the dynam c coast ne and prov des a rare ttora env ronment for mportant oca endem c spec es
Screen Name Redacted 6/30/2022 03:56 PM	Any oss of dune vegetat on s a b g ssue and w become more so w th the unpred ctab ty of c mate co apse
Screen Name Redacted 6/30/2022 04:59 PM	Th rrou , McCau ey's beach, Port Kemb a Beach
Screen Name Redacted 6/30/2022 05:02 PM	Dune vegetat on s cr t ca to prevent eros on a ong the ocean front a ong a l awarra beaches
Screen Name Redacted 6/30/2022 05:11 PM	Shark es Beach
Screen Name Redacted 6/30/2022 05:51 PM	Ent re coast ne. Low y ng recreat ona areas
Screen Name Redacted 6/30/2022 06:04 PM	There are peop e who th nk of noth ng but the v ews of the ocean and ag tate to take the vegetat on off the dunes. The vegetat on he ps to prevent eros on and a so prevents sand com ng nto the areas of hous ng and roads. S nce the vegetat on was str ppd at Towradg there have been more nc dents of sand on the cyc e track. Vegetated dunes are beaut fu and funct ona . I don't want b eak w de beaches w th b ow ng sand.
Screen Name Redacted 6/30/2022 06:34 PM	Tree vanda sm at Sharkeys beach. Water qua ty around Lake l awarra .
Screen Name Redacted 6/30/2022 06:44 PM	A of the northern suburbs
Screen Name Redacted 6/30/2022 07:40 PM	Creeks prone to backup f ood ng

Join the Conversation : Survey Report for 31 May 2022 to 08 July 2022



Screen Name Redacted

6/30/2022 08:06 PM

Port kemb a

Screen Name Redacted

6/30/2022 08:40 PM

North Wo ongong beach estuary. Poor water qua ty enter ng Port
Kemb a beach. Damage to sand dunes south of Port Kemb a

Screen Name Redacted

6/30/2022 10:36 PM

The b ggest threat to our coasta zone s f WCC cont nues ts
program of bu doz ng nat ve coasta dune vegetat on wh ch has ed to
extens ve and repeated sand nundat on at Port Kemb a. Dune
vegetat on s mportant for protect ng coasta assets, prov d ng hab tat
and ho d ng dunes n p ace and needs to be re-estab shed here.
P ease focus on remov ng weeds (coasta watt e s not a weed,
however acac a sa gna, antana, cestrum, coasta morn ng g ory,
turkey rubabrb and b tou s an ssue n PK). Weed management cou d
be mproved by better engagement w th bushcare and dunecare
groups. WCC shou d do th s by fund ng a pos t on for a ded cated
commun ty engagement bushcare off cer. From my exper ence
runn ng a dunecare group, the bushcare off cers are too busy
manag ng contractors to g ve vo unteers the ass stance we need.

Screen Name Redacted

6/30/2022 11:38 PM

Ma nta n ng ex st ng vegetated areas s mportant for hab tat and
d versity of w d fe and f ora . There shou d not be any devopement
such as caracan parks or hous ng estates n these areas. Remov ng
vegeta on wou d destroy ex st ng hab tat, create eros o po nts,
ncrease the amount of sand be ng b own up onto ex st ng propert es,
roadways and wa kways/reserves. and be of great detrmnt to the
exper ence of wa k ng a ong a pathway. Imag ne wa k ng a ong a
concrete path surrounded by grass w th no other vegetat on to
prov de w nd protect on, no b rds or other an ma s and no var at on n
the genera scenery. It wou d be a ster e and b and exper ence.

Screen Name Redacted

7/01/2022 07:00 AM

P ease preserve the nat ve vegetat on and the natura dune shapes.

Screen Name Redacted

7/01/2022 09:07 AM

T s app s to t w o coast

Screen Name Redacted

7/01/2022 09:28 AM

East Corr ma Beach and agoon area

Screen Name Redacted

7/01/2022 09:47 AM

Sandon pt Beach between won ora pt and sandon pt. Won ora s
bad y eroded due part y to ack of vegetat on, espec a y on the north

Join the Conversation : Survey Report for 31 May 2022 to 08 July 2022



Screen Name Redacted

7/01/2022 09:55 AM

s de wh ch s bo stered by nfrastructure. Whereas sandon pt area
benef ts from vegetat on + nfrastructure .e the steps to the c fftop.
Damage near the surf c ub s bad w th steps washed away. The rock
bo sters are work ng so far but for how ong. The dune vegetat on n
th s area a so protects from w nd .

Screen Name Redacted

7/01/2022 09:55 AM

Very concerned about po ut on from coa m nes that recent y
mpacted beaches after Be amb Creek outflow of coa wash.
Concerned about mpact of dogs on w d fe. Concerned about money
be ng wasted on bu doz ng sand around. Concerned about
unrea st c coasta deve opment.

Screen Name Redacted

7/01/2022 10:18 AM

I ve adjacent to Shark e Beach, Co eda e. I'm gratefu for the work
done protect ng the dune vegetat on. I am ncreas ng y see ng h gh
t des encroach ng on the coast ne due to c mate change and can
c ear y see the protect ve effect that our hea thy nat ve vegetat on has
on the and between the coast and the road. Th s shou d be
ma nta ned at a cost. At Aust nmer beach wh ch s both ower and
c eared of vegetat on, the h gh t de regu ar y washes across the
carpark and w soon reach the thoroughfare. Sand and seaweed s
d sp aced from the beach. In a c mate emergency cond t on, remova
of coasta vegetat on s the ast th ng we shou d be do ng.

Screen Name Redacted

7/01/2022 10:40 AM

Co eda e rock poo - where s the outdoor shower?

Screen Name Redacted

7/01/2022 10:45 AM

There are cont nu ng attempts a ong the who e of the coast ne to get
vegetat on from the dunes removed. In the past, even ow p ant ngs
have been vanda sed because of fears of oss of v ews or qu te
b zarre c a ms about the mpacts of coasta vegetat on on the surf.
Trees have been vanda sed at Br ckyard on the border between
Aust nmer and Co eda e.

Screen Name Redacted

7/01/2022 11:28 AM

.

Screen Name Redacted

7/01/2022 11:54 AM

A areas of the I awarra coast need protect ng, espec a y the dunes
and natura vegetat on. Sad y the protect on needs to be from human
act v ty - e over deve opment n these areas.

Screen Name Redacted

7/01/2022 01:22 PM

Any of the I awarra coasta areas are at threat from C mate change

Join the Conversation : Survey Report for 31 May 2022 to 08 July 2022



Screen Name Redacted

7/01/2022 04:56 PM

generally apply to a

Screen Name Redacted

7/01/2022 07:03 PM

Puckeys Beach

Screen Name Redacted

7/01/2022 07:40 PM

Erosion and flooding applies to most of the Wollongong coast. Stuart Park for example is over used. Lots of other areas could be developed to be just as good Eg Belconnen - Bott Reserve ...

Screen Name Redacted

7/01/2022 08:16 PM

Belconnen

Screen Name Redacted

7/02/2022 12:10 PM

We need dune vegetation for flora, fauna and stability. It's madness to remove vegetation then engineer management of dune erosion through concretising and other means. This applies to Belconnen and Corrumbidgee beaches and any others marked for this approach

Screen Name Redacted

7/02/2022 12:40 PM

Conston Beach - loss of dunes leading to erosion of the slopes leading to the golf course. City beach - much of the sand at the northern end of the beach is causing increased erosion of the dunes that protect the building behind the beach.

Screen Name Redacted

7/02/2022 01:51 PM

I am very concerned by the removal of dune vegetation at Corrumbidgee/Belconnen as it plays a vital and natural role in beach erosion. In 2022 to see something like that saddens and infuriates me, as we keep being human-centred instead of looking at a system where everything plays a role which we need to preserve as simple custodians of this land.

Screen Name Redacted

7/02/2022 02:02 PM

I have lived at Stanwell Park for 50 years where there has been a successful regeneration of the critically endangered littoral rainforest, both naturally and with human assistance. Preserving residents' views of the beach and seas is important and can be achieved by the judicious choice of coastal plants that do not have the effect of those views disappearing. The recent lobbying of some surfing groups about beach and bank erosion does not appear to be based on any serious scientific study. Any decisions by Council affecting coastal vegetation must be based on solid science, and not anecdotal memories, given the unreliability.

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Screen Name Redacted

7/02/2022 02:31 PM

Stanwe Park Lagoon has a weed infestation between the reeds and the park on the western edge.

Screen Name Redacted

7/02/2022 04:14 PM

Along the coast! Development in the coastal zone has to stop and consideration made to sustain coastal management strategies. Approval of building applications in the coastal zone must be restricted e.g the building of a swimming pool at a residence in Craig Street/Tasman Parade in Throu. This house sits on top of a cliff face which has a readily seen major erosion over the years and an increased rate of slippage in the last few years. How are these developments permitted? Hard engineering options interfere with natural geomorphological processes. We regularly see vegetation removal/destruction and the subsequent erosion of sand dunes and the coastal zone. We have to change our way of thinking to the preservation of our coastline and greater control over the activities allowed there. The use of boats and jet skis increases shore erosion and the obvious environmental destruction by local residents who want to maintain the coastline view, has to be taken seriously. We have to adopt an ecocentric rather than anthropogenic worldview.

Screen Name Redacted

7/02/2022 08:39 PM

Woonona beach. Such a large area of vegetation was removed. Was the ecological EIS taken into account?

Screen Name Redacted

7/03/2022 10:08 AM

Coedale beach and the creeks that feed into it.

Screen Name Redacted

7/03/2022 12:45 PM

The growing popularity of Wollongong as a place to live and the voracious appetite of developers for coastal property means that Council will need to be very strong to retain the natural coastal vegetation which makes this area so attractive. I would hate to see Greater Wollongong deteriorate to resemble the Gold Coast or the Central Coast. Please retain the current green spaces and ensure that new high or medium density housing or commercial developments replace existing built environment.

Screen Name Redacted

7/03/2022 05:12 PM

The environmental threats of climate change, loss of vegetation and weeds and feral animals are interconnected and affect the whole coastline of the region and beyond. Climate change is likely to place huge pressure on natural areas and stress the natural ecosystems, including what's left of the coastal ecosystems, that provide vital ecosystem services to the community. Continued expansion of the number and extent of invasive species also stresses and degrades natural ecosystems. Any continued development, intensification of development work, in the face of rising sea levels and increased rainfall

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ntens ve, resu t n more and more requests for defens ve and
env ronmenta y destruct ve ntervent ons such as sea wa s.
Unfortunate y the preference of some res dents for ocean v ews
un mpeded by vegetat on s a so resu t ng n de berate destruct on of
nat ve coasta vegetat on and ecosystems. There's a ack of
understand ng of these ecosystems among many res dents that
m ght, f changed, resu t n ess pressure to remove ta er shrubs and
trees. Can I add that my ma n reason for v s t ng the coast s not
nc uded n your st of opt ons! I go to educate myse f about the
natura ecosystems of coasta areas.

Screen Name Redacted

7/03/2022 11:06 PM

Wo ongong c ty beach North wo ongong beach Towradg beach

Screen Name Redacted

7/04/2022 07:34 AM

C ty beach and port Kemb a beach have recent eros on of sand and
oss of vegetat on due to recent unseasona storms. The answer s
not to remove ex st ng vegetat on but to m t gate ongo ng damage n
some way.

Screen Name Redacted

7/04/2022 09:40 AM

Co eda e, Th rrou and wombarra

Screen Name Redacted

7/04/2022 01:09 PM

I am part cu ar y worr ed about the c ear ng of coasta nat ve
vegetat on e.g. at Port Kemb a. Th s vegetat on stab ses the dunes
and protects areas further n and from sand storms. We a so need to
respect natura dynam c coasta processes and a ow a buffer zone
for these processes between the coast and any deve opments.

Screen Name Redacted

7/04/2022 04:06 PM

We need to be carefu w th a estuar ne areas.

Screen Name Redacted

7/04/2022 05:24 PM

DAY VISITORS FROM OUTSIDE WOLLONGONG SHOULD PAY
FOR PARKING, TO ASSIST WITH OUR BUDGET. MANY BRING
THEIR OWN FOOD AND DRINKS AND DO NOT CONTRIBUTE TO
OUR ECONOMY. WATER QUALITY IN OUR CREEKS IS VERY
POOR, EG BELLAMBI CREEK, TOWRADGI CREEK, FAIRY CREEK

Screen Name Redacted

7/05/2022 11:29 AM

Counc sourced p ast c beach tter Wo ongong to Be amb . Fa ry
Meadow dune vegetat on d e back. B tou bush between East Corr ma
and Be amb .

Screen Name Redacted

C mate change s mak ng weather events more extreme. Impacts on

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7/05/2022 03:16 PM

beaches will be great unless we ensure that dune vegetation is protected. Pollution in terms of chemical runoff and in terms of plastics or other solid wastes are a ready existing problems from what I observe. I visit City Beach, North Beach, Port Kembla, most, and beaches north of North Wollongong up to Coaff occasionally.

Screen Name Redacted

Big sand erosion on beach after storms

7/05/2022 05:21 PM

Screen Name Redacted

Stormwater drainage into Wollongong harbour.

7/05/2022 05:41 PM

Screen Name Redacted

Thank you for maintaining our rockpools and ocean water pools - they are such a great asset to our community

7/05/2022 06:35 PM

Screen Name Redacted

Coaff Road Wollongong

7/05/2022 08:06 PM

Screen Name Redacted

Water quality and pollution of animals is important for the community and for businesses

7/06/2022 08:20 AM

Screen Name Redacted

Development too close to the coast and cliffs along northern suburbs. Loss of dune vegetation and vandalism of trees and dune vegetation along Woonona and Sandon Point/Macaulays. Stormwater is generally untreated - need more WSUD not just in new subdivisions.

7/06/2022 08:42 AM

Screen Name Redacted

A of the Illawarra coastline

7/06/2022 10:34 AM

Screen Name Redacted

Councils constant "fixing" with dune reshaping at the request of groups like Beach Care Illawarra who only really care about views is the biggest threat. Using safety as a trump card to reduce vegetation leading to our sand being lost to the road and nearby assets. It hasn't worked anyway, after works at Towadg, Woonona and Port Kembla costing 100's of thousands of dollars sand had to be trucked away from roadways for the first time in 20+ years. The ocean has a major impact on beach shape, vegetation doesn't create reflective or dissipative beach forms as these structures tend to be stronger. The ocean does! And the fact is the ocean is going to maintain beach shape or dismember it. We have to adjust and live with whatever it does not the other way around. Watch what nature does and work with it, educate the public and ignore BCI and maybe eventually they

7/06/2022 12:20 PM

Join the Conversation : Survey Report for 31 May 2022 to 08 July 2022



w just go away. Its a se f interest!

Screen Name Redacted

7/06/2022 12:40 PM

I'm rea y concerned about tree/ vegetat on vanda sm a ong our coast ne. It upsets me to th nk that peop e want trees removed so they can have an unspo t v ew of the ocean. I not ce the vanda sm up the track at shark es beach (co eda e) and the sand dunes a ong Th rrou beach..

Screen Name Redacted

7/06/2022 02:59 PM

Port Kemb a and Be amb dunes

Screen Name Redacted

7/06/2022 05:11 PM

Rubb sh on beaches: I wa k da y on East Corr ma Beach to Be amb , and I p ck up arge amounts of p ast c rubb sh each t me. A ot of th s p ast c comes d rect y from oca creeks and storm water f ows, wh ch are not proper y managed. Th s ssue needs to be addressed w th proper stormwater rubb sh screen ng. I a so suggest that the counc cou d a so n t ate a scheme to educate and reward beach users for p ck ng up rubb sh, as a ot of da y beach users I see just wa k r ght on by when they see arge umps of p ast c or po ystyrene tter ng the foreshore. Perhaps there cou d a so be an educat on program for schoo ch dren to take stewardsh p of part cu ar beaches, or an emp oyment program for d sadvantaged peop e, e.g. suffer ng menta ness or one y ret red peop e, to have sma part-t me jobs co ect ng beach rubb sh, wh ch m ght g ve them opportun ty for a hea thy outdoor soc a act v ty and a sense of purpose. I a so suspect that the arge sh ps that anchor offshore are dump ng rubb sh as ots of a um n um cans appear on the shore ne, so th s aspect needs po c ng. Weeds and Fera An ma s: I am a so concerned about the arge amounts of nox ous and env ronmenta weeds that the counc a ows to pro ferate a ong the dunes and bush and beh nd the beach. Bou bush, antana and asparagus fern are out of contro from the dune area near Murray Road carpark southwards. I have a so prev ous y reported to the counc the nvas ve weed, Beach Gad o us, appear ng for the frst t me n the dunes a ong the northern end East Corr ma beach, but t was not removed. Now w th the recent beach eros on events the Beach Gad o us bu bs are spread ng en-masse w th the currents to other p aces. The Be amb Bushcare peop e do a good job w th the bush and area beh nd the dunes but ser ous nvas ve weed spread a so needs counc nvo vement, as t seems po nt ess that north of Be amb Lagoon the weeds are be ng managed by vo unteers but 100 metres away on the south s de, the counc s a ow ng nox ous weeds to run rampant. The presence of fera deer on the beach and n the bush and around East Corr ma and Be amb s a so undo ng a ot of revegetat on p ant ng work, and the deer spread weed seeds through the r dropp ngs as we as eat ng and push ng over trees etc. Ten years ago there were ech dna v ng

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n the area but now I don't see them any more, and the diversity of vegetation seems to be diminishing. Impacts of climate change/increased storms/sea level rise: This needs to be accepted as a natural process and accommodated. The council spends a lot of ratepayers money on engineering solutions grading and dredging the outflow channel of Beamb Lagoon from its natural meandering paths, and attempting to flatten the edge of the dunes. This is a complete waste of time and ratepayers money, and also damages the natural ecosystem, and natural forces quickly re-establish the original state of the creek and the dunes every time there is a major weather event. For example, the council graded and re-positioned the outflow of Beamb Creek from the Lagoon several months ago to a straight channel in a more southerly direction. Then about one month ago the area experienced gauge-force winds from the north-west which blew half-metre waves from the lagoon along the artificial straightened channel - pushing large amounts of lagoon water out to sea. The channel was scoured to bedrock and the water level in the lagoon dropped to unnatural lows, impacting the aquatic life. If the channel had been left in its natural meandering shape this would not have happened. Council coastal management needs to view the coastal landscape as a living entity, on which hundreds of species depend. It is not just inert sand and rock to be engineered into neat straight lines, and these straight line approaches always fail eventually. Urban development in the coastal zone: Sea level rise, climate change, and extreme weather patterns are upon us and becoming increasingly worse every year. I believe council needs to be realistic about restricting development along the coast and waterways (including the Corrimal Coke Works site) and plan for tactical retreat of housing etc which has already been positioned too close to the coast and waterways.

Screen Name Redacted

7/06/2022 05:21 PM

East corrimal

Screen Name Redacted

7/06/2022 07:09 PM

A of the coastline

Screen Name Redacted

7/06/2022 08:30 PM

East corrimal

Screen Name Redacted

7/06/2022 09:59 PM

Along the very rare natural vegetation and beach areas, there is so much destruction of flora and fauna as people are increasingly destroying these rare places that are normally cared for by Bushcare volunteers. Can there please be more emphasis towards preserving, protecting and maintaining these areas. For example, areas from north wongong Puckeyes. Fairy Meadow and northwards. Especially over

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Screen Name Redacted

7/06/2022 11:56 PM

the last few years a sorts of heavy furniture and destruction of flora and death of rare species has occurred. Doesn't seem to be Rangers or police around. There are a sorts of vandalism and breaking of road rules.

Screen Name Redacted

7/06/2022 11:56 PM

Beamb Creek is close to & flows directly to the coast & has a history of serious pollution from the Russell Vale coal mine not least recently. The mine itself has not completed its regulatory restoration of the creek to fulfil state government regulatory requirements of 12+ yrs ago. Council has no authority over the mine however it has an ethical responsibility to the wellbeing of the Wollongong community & the environment. The mine's reopening promising to be larger than ever. Council is in a position to negotiate with Wollongong Coastal Environmental works on the creek that will complement WCC exemplary Beamb dunes restoration & to advocate with the NSW government on behalf of the community for enforcement of state government regulation. Cabbage Tree Creek Faymeadow that flows to Fairy Creek & the sea & American Creek flowing towards PK Harbour have suffered the eroding & scouring from 2022 intense weather events + rubbish deposits, but for years from weed infestation. These are just a couple of waterways I can name. Wollongong's waterways seem particularly neglected. If they were cared for they could be biodiversity corridors between the escarpment & the sea

Screen Name Redacted

7/07/2022 09:00 AM

Wollongong, Towradg, Fairy Meadow

Screen Name Redacted

7/07/2022 11:38 AM

Warrawong storm water entry into Lake Iawarra. Currently looks like Whites Gu y rubbish tip. Also Fairy Creek where rubbish comes from bins at rear of Montague Ave. Much past pollution on egg bottles

Screen Name Redacted

7/07/2022 12:04 PM

Along Lawrence Hargrave Drive from back down, impacting those attempting to enjoy the grand Pacific walk, native wildlife, people enjoying cafes and local residents.

Screen Name Redacted

7/07/2022 12:11 PM

Corrimal and towradg beach.

Screen Name Redacted

7/07/2022 12:16 PM

Along the coast

Screen Name Redacted

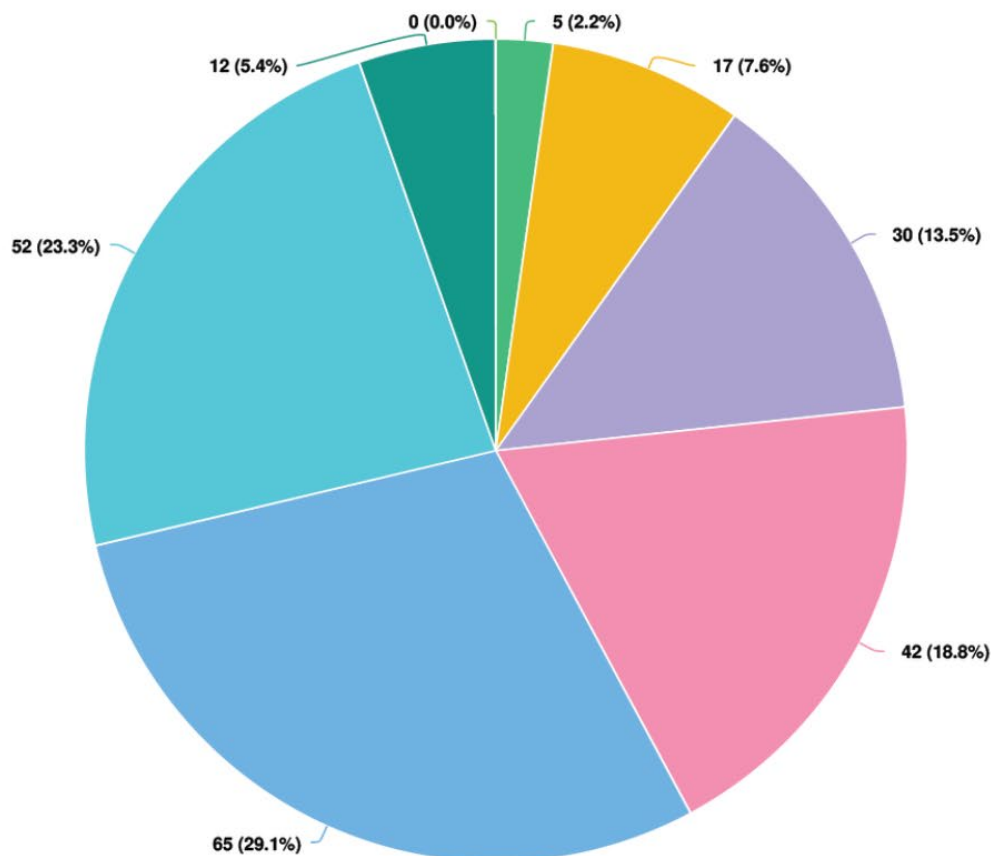
7/07/2022 09:07 PM

Poor water quality and pollution in Towradg creek from stormwater flowing into Corrimal beach

Join the Conversation : Survey Report for 31 May 2022 to 08 July 2022



Q6 Finally, a little about you. What is your age?



Question options

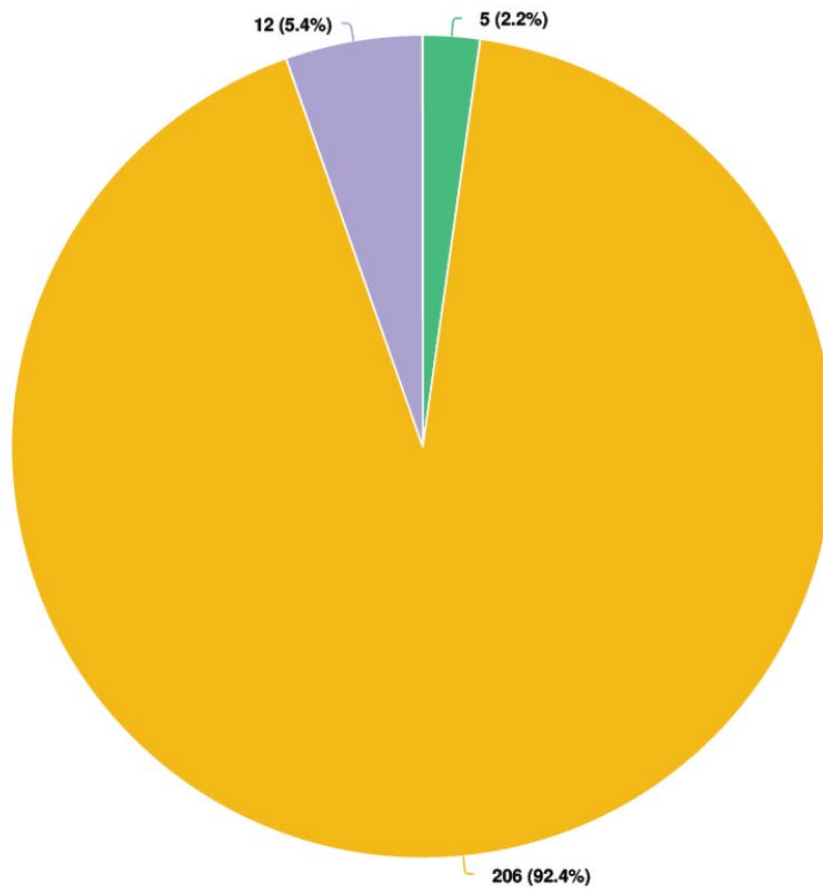
● 17 and under
 ● 75 and over
 ● 65-74
 ● 55-64
 ● 45-54
 ● 35-44
 ● 25-34
 ● 18-24

Mandatory Question (223 response(s))
 Question type: Radio Button Question

Join the Conversation : Survey Report for 31 May 2022 to 08 July 2022



Q7 Are you Aboriginal and/or Torres Strait Islander?



Question options

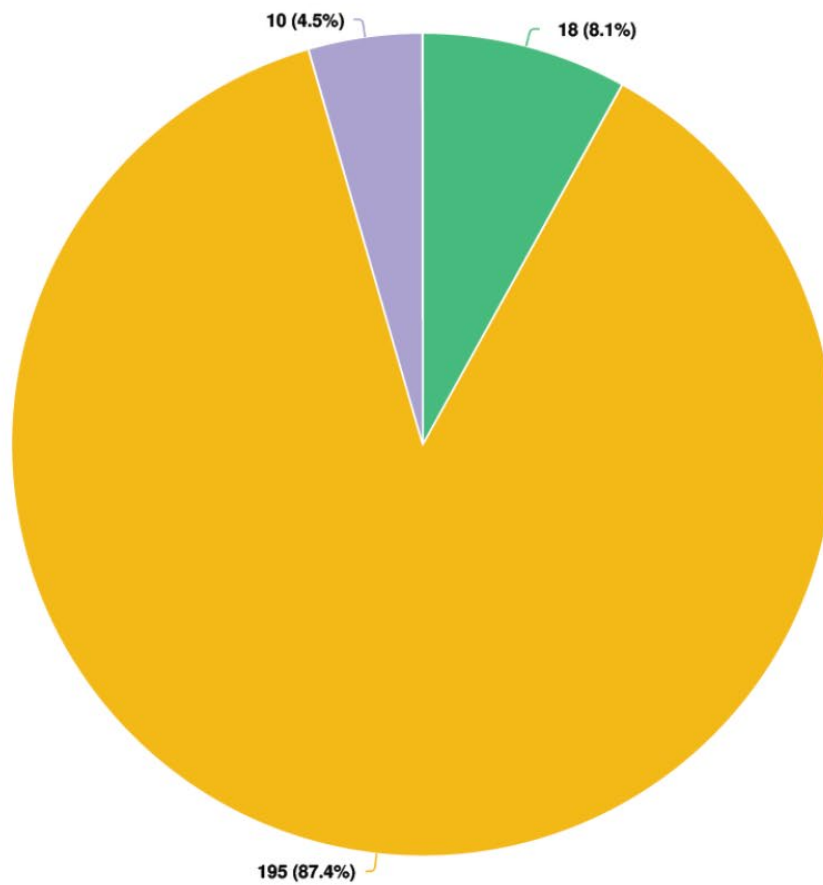
☐ Prefer not to say
 ☒ No
 ☐ Yes

Mandatory Question (223 response(s))
 Question type: Radio Button Question

Join the Conversation : Survey Report for 31 May 2022 to 08 July 2022



Q8 Are you a person with disability?



Question options

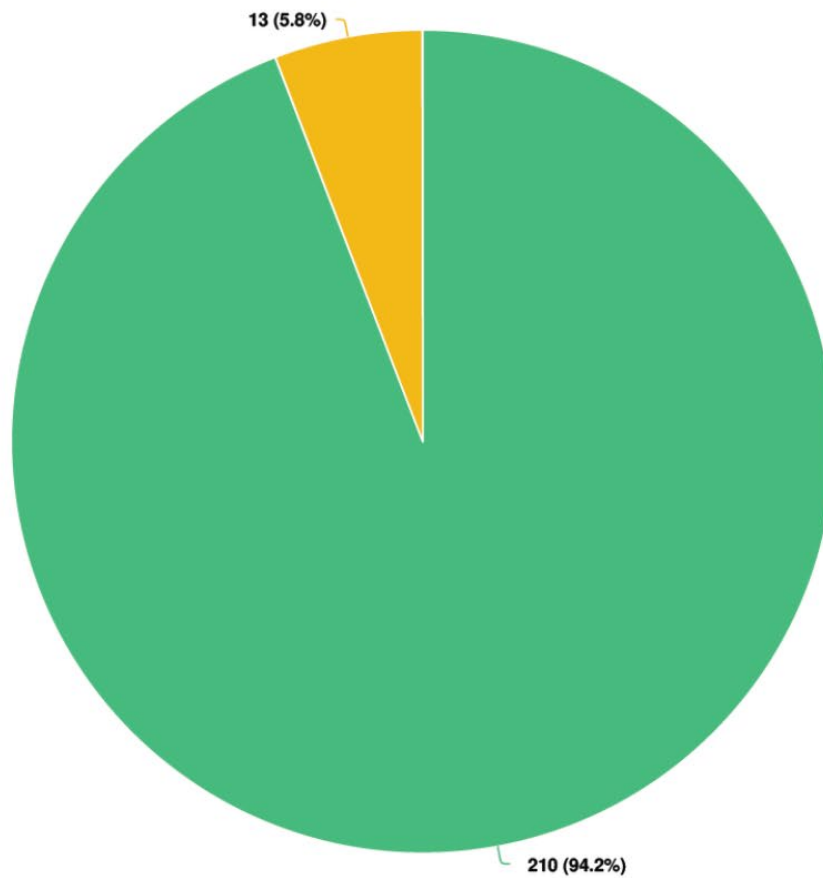
☐ Prefer not to say
 ☐ No
 ☐ Yes

Mandatory Question (223 response(s))
 Question type: Radio Button Question

Join the Conversation : Survey Report for 31 May 2022 to 08 July 2022



Q9 Do you speak a language at home other than English?



Question options

☒ Yes (please specify)
 ☐ No

Mandatory Question (223 response(s))
 Question type: Radio Button Question

Table 1 Threat or issue by location from the survey results

LOCATION	THREAT OR ISSUE
All areas	Impacts of climate change and sea level rise Safe and easy access to ocean and pools Erosion and scouring of beaches Increased commercial and residential development Degradation of natural habitat Weed infestation Dune vegetation should be protected and conserved Dogs on beaches – off leash, waste collection, wildlife threat Pest animals eg deer and rabbits Impacts of floods and East Coast Lows Tree vandalism Illegal dumping Litter on beaches and off shared pathways Stormwater run-off and pollution Creek management and water quality Tourism and increased visitation Heritage protection
Austinmer	Over development along cliffs
Austinmer Beach	High tide regularly washes across the carpark and will soon reach the thoroughfare. Sand and seaweed is displaced from the beach making paths unusable for prams, walkers and disabled
Bellambi and Corrimal beaches	We need dune vegetation for flora, fauna and stability. It's madness to remove vegetation then engineer management of dune erosion through concreting and other means.
Bellambi Creek	Pollution from coal mines
Belmore Basin and the Lagoon	People swimming despite signed warning of pollution in the water
Between McCauleys Beach and Thirroul Beach	Erosion of cliffs
Between Thirroul and Wombarra	Over development of the existing residential land. The constant demolition of single residences being replaced by two or more is putting stress on the character, amenity and environment of the area.
Brickyard on the border between Austinmer and Coledale	There are continuing attempts along the whole of the coastline to get vegetation from the dunes removed. In the past, even low plantings have been vandalised because of fears of loss of views or quite bizarre claims about the impacts of coastal vegetation on the surf.
Brokers Nose bushland	Litter from bike riders

LOCATION	THREAT OR ISSUE
Bulli Beach	Vegetation that is overgrown and full of weeds. Needs maintenance Vegetation encroaching on beach
Cabbage Tree Creek Fairy Meadow that flows to Fairy Creek	Erosion and scouring from 2022 intense weather events and rubbish deposits, but for years from weed infestation
City Beach	Dogs being off lead and running through dunes damaging vegetation. Itinerants living in dunes and damaging vegetation Pollution from industry Increased erosion of dunes at northern end that protect buildings behind the beach Loss of foreshore to development Retain open areas near stadium Lack of showers and taps at dog beach access point Sight lines for surf life savers
Cliffs, rock platforms and beaches that run from Sandon Point to Austinmer	There are many problems of erosion in those areas and Council does not apply the strict building controls that are stated to be applied in the WCZMP 2017.
Coalcliff Beach	Erosion
Coalcliff Creek	Future impact on water quality on Stanwell Park creeks if there is development of the Coke Work site
Coledale rock pool	Outdoor showers needed
Collins Creek	Have witnessed significant pollution this year which has negatively impacted quality of the ocean water at Woonona and Bulli beaches. This negativity of increased ocean pollution has had a flow onto the closure of Woonona rock pool. Increase in urban development has increased the risks of sewerage and storm water in our creeks.
Coniston Beach	Loss of dunes is leading to erosion of the slopes leading to the golf course
Continental Pool	Water quality
Coomaditchie lagoon/reserve	Not as many shorebirds as usual this year
Corrimal and Bellambi	Retain dune vegetation to prevent beach erosion Invasive weeds - Bitou bush, lantana and asparagus fern, Beach Gladiolus Litter on beaches Feral deer Impacts of climate change and sea level rise Damaged walkways during East Coast Lows Dogs on beaches

LOCATION	THREAT OR ISSUE
Corrimal, Woonona and Bulli	Healthy communities of native dune vegetation are vital for promoting shoreline stability, especially in the context of future sea-level rise and increased erosion resulting from storms.
Fisherman's Beach	Won't be able to walk along the beach at high tide soon
Lake Illawarra (outside the scope of this CMP)	Severe silting Neglected foreshore Water pollution Professional fishing Over development Preserve tributaries Stormwater run-off
McCauleys Beach	Erosion and land destabilisation Too many dogs Coastal views are being lost
MM Beach	Need for public toilets Would like to see increased maintenance to accommodate visitation
Northern beaches	Pest species eg deer and rabbits Tree vandalism Weeds Erosion
Port Kembla Beach	Dune removal and erosion Landward sand drift Vegetation needed to stabilise dunes Weed management Improved engagement with Bushcare and Dunecare groups Over development
Puckeys Creek and Reserve	Water quality Litter Stormwater treatment Dogs Walking track maintenance Pressure of increased visitation
Royal National Park	The Heritage communities in the Royal National Park at Little Garie, Era and Burning Palms are within the WCC LGA and this area should be included in the scoping study. The NPWS does not take responsibility for coastal management as their control stops at the high-water mark.
Sandon Point	Damaged entry points Off leash dogs
Sandon Point Beach between Waniora Point and Sandon Point	Erosion due partly to lack of vegetation, especially on the north side which is bolstered by infrastructure Damage near the surf club is bad with steps washed away The rock bolsters are working so far but for how long

LOCATION	THREAT OR ISSUE
Sharkys Beach	Tree vandalism Maintain healthy native vegetation
Slade Park and south of Austinmer Beach	Erosion Dog walking must be protected along the foreshore. Many older people walk dogs near their homes for recreation and should not be forced to do it in restricted hours eg early morning or late afternoon for safety reasons.
Stanwell Park	Continue successful regeneration of the critically endangered littoral rainforest Preserving residents' views of the beach and sea is important and can be achieved by the judicious choice of coastal plants that do not have the effect of those views disappearing.
Stanwell Park Beach	More control of fishermen/women activities, that is cleaning of fish at locations, removable of left over bait and tangled lines.
Stanwell Park Lagoon	Weed infestation between the reeds and the park on the western edge
Thirroul	Over-development causing increased air, water and traffic pollution
Towradgi Creek from stormwater flowing into Corrimal beach	Poor water quality and pollution
Towradgi Pool	Grassed area has been fenced off and abandoned in a state of disrepair
Windang and Windang boat ramp	Weeds in dunes Poor amenities and play area
Wollongong Blue Mile	Dog walkers and waste collection and disposal Increased visitation
Wollongong Harbour	Stormwater drainage
Wombarra	Overdevelopment Sand loss on beach
Woonona Beach	Weed infestations Misinformation about dune vegetation

APPENDIX 12 Interactive map survey

- Please tell us why and what you love about this coastal location

- Why do you visit this location? Select all that apply.

- ☐ Nature appreciation, wildlife watching
- ☐ Walking/running
- ☐ Cycling
- ☐ Passive based water activities (swimming, surfing, scuba, kayak etc)
- ☐ Fishing (beach, rock, spear)
- ☐ Picnics/BBQs, playing
- ☐ Dog walking
- ☐ Other

- How often do you visit this location? Please select the most relevant option.

- ☐ Daily
- ☐ 3-5 times a week
- ☐ Weekly
- ☐ Monthly
- ☐ A few times a year

- Which (if any) of the following do you consider to be a threat or issue at this location:

- ☐ Poor water quality in the estuaries
- ☐ Poor water quality at the beaches
- ☐ Loss of estuary and dune vegetation and habitat for native animals and plants
- ☐ Weed and feral animal infestation
- ☐ Beach and foreshore erosion
- ☐ Flooding of low-lying areas along the coast
- ☐ Coastal cliff and slope instability
- ☐ Impacts of climate change (e.g. sea level rise and increased storms)
- ☐ Pollution (from stormwater & boats etc)
- ☐ Changing conditions of creek entrances
- ☐ Urban development in the coastal zone
- ☐ Insufficient recreational facilities (eg parks, bbqs, toilets)

- Finally, a little about you. What is your age?

- ☐ 17 and under
- ☐ 18-24
- ☐ 25-34

- ☐ **35-44**
- ☐ **45-54**
- ☐ **55-64**
- ☐ **65-74**
- ☐ **75 and older**

- Are you Aboriginal and/or Torres Strait Islander?

- ☐ **Yes**
- ☐ **No**
- ☐ **Prefer not to say**

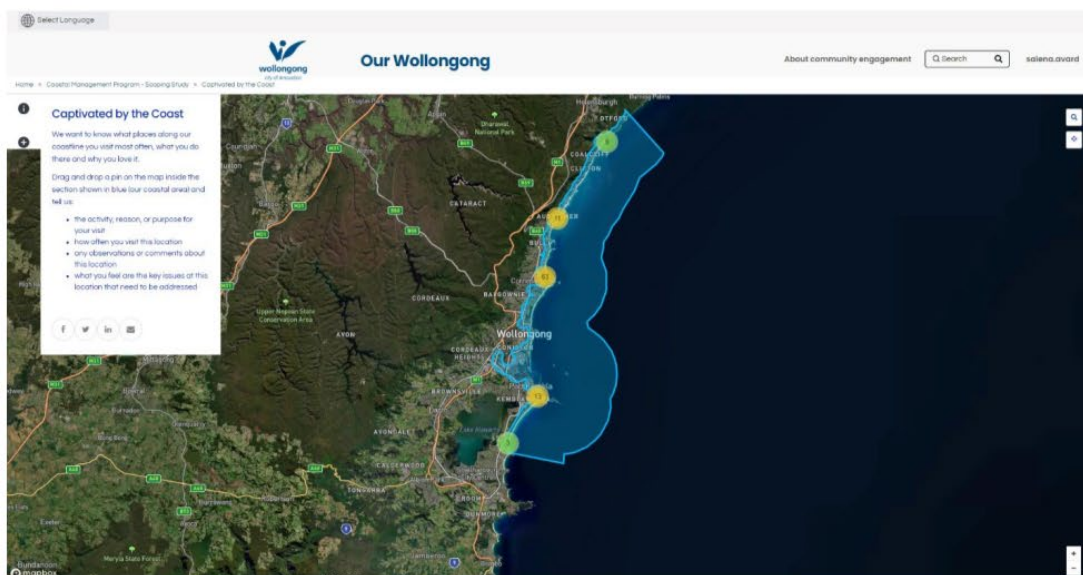
- Are you a person with disability?

- ☐ **Yes**
- ☐ **No**
- ☐ **Prefer not to say**

- Do you speak a language other than English when at home?

- ☐ **Yes**
- ☐ **No**
- ☐ **Prefer not to say**

- What is your post code?



APPENDIX 13 Interactive map results

Survey for Map - 7181

SURVEY RESPONSE REPORT

31 May 2022 - 8 July 2022

PROJECT NAME:

Coastal Management Program - Scoping Study

Q1 Please tell us why and what you love about this coastal location

[REDACTED]

6/01/2022 02:30 PM

B rd watch ng-rcord b rds n area regu ar y w th IBOC

[REDACTED]

6/01/2022 02:32 PM

Great p ayground, sea poo and beach area. good for todd ers.

[REDACTED]

6/01/2022 02:34 PM

Dog wa k ng and b rd watch ng

[REDACTED]

6/01/2022 02:36 PM

P ayground s the best n the area

[REDACTED]

6/01/2022 02:38 PM

Great v ews a ong coast, good snorke ng and rock poo s

[REDACTED]

6/01/2022 02:40 PM

Great v ews of b rds on 5 ls ands and wha es

[REDACTED]

6/01/2022 02:42 PM

Good access to foreshore

[REDACTED]

6/01/2022 02:44 PM

Scen c v ews

[REDACTED]

6/01/2022 04:38 PM

Sandon Po nt s a popu ar surf ng ocat on w th h story of the I awarra Area

[REDACTED]

6/02/2022 04:24 PM

24 hr eash free dog wa k ng beach

[REDACTED]

6/02/2022 04:27 PM

dog eash free beach

[REDACTED]

6/02/2022 04:29 PM

Great ong beach to wa k dogs but not a ot of b ns to be ab e to d spose of rubb sh proper y

[REDACTED]

Great ocat on, c ose to p ayground, agoon and rockpoo .

6/04/2022 11:00 AM

[REDACTED]

Good surfing

6/06/2022 08:53 AM

[REDACTED]

Good surfing

6/06/2022 08:54 AM

[REDACTED]

Swimming in rock pools

6/06/2022 08:59 AM

[REDACTED]

It's close to home and I like the outlook and variety of walking tracks I can take

6/06/2022 09:14 AM

[REDACTED]

Dog leash free beach 24/7

6/07/2022 02:09 PM

[REDACTED]

a beautiful rock shelf, however fishers gather on a regular basis.

6/07/2022 02:15 PM

[REDACTED]

secluded nude beach with wonderful nature all around

6/07/2022 02:17 PM

[REDACTED]

Surfing/swimming, meeting friends, morning coffee, cycling along the coast, cycling to get there. Looking forward to reopening of the surf club.

6/08/2022 10:22 AM

[REDACTED]

This is where I typically go and get takeaway coffee with my parents on a Sunday morning when I'm visiting. I have done this for years with them and have great memories of watching my dad do triathlons or aquathons in the harbour

6/08/2022 10:36 AM

[REDACTED]

Seacroft Bridge - gorgeous location for exercising, appreciating nature and the coast, dog walking, riding bikes with kids, etc

6/08/2022 11:07 AM

[REDACTED]

This is one of the quieter beach locations in the northern suburbs. I love sharing the rockpools with my two daughters. I also surf the reefhand point break.

6/08/2022 12:44 PM

[REDACTED]

90% of the time Little Australia beach is used by dog owners to walk the dogs without interrupting other beach users who may not like to

6/09/2022 03:06 PM

	be surrounded by off leash dogs and, relative to other beaches in the immediate area, it is very quiet.
<div></div> <div>6/13/2022 10:43 AM</div>	Swimming in the pool and family beach time
<div></div> <div>6/13/2022 10:44 AM</div>	Walking, running, dog walking
<div></div> <div>6/13/2022 10:45 AM</div>	Walking, running, dog walking
<div></div> <div>6/13/2022 10:47 AM</div>	Surfing, swimming, family beach time, walking, running, picnics
<div></div> <div>6/13/2022 10:48 AM</div>	Bike riding, walking, family activities
<div></div> <div>6/13/2022 10:49 AM</div>	Through park, pool, beach activities
<div></div> <div>6/13/2022 10:50 AM</div>	Cycling track, beach
<div></div> <div>6/13/2022 10:51 AM</div>	Cycling, running, walking, surfing
<div></div> <div>6/13/2022 10:52 AM</div>	Surfing, walking, snorkelling, picnics
<div></div> <div>6/13/2022 10:53 AM</div>	Lovey beach for kids and surfing
<div></div> <div>6/13/2022 10:54 AM</div>	Lovey spot for family coastal activities
<div></div> <div>6/13/2022 10:55 AM</div>	Cycling, running, lovely
<div></div> <div>6/13/2022 10:55 AM</div>	Lovey spot for swimming after a bike ride

 6/13/2022 10:56 AM	Nice for kids surfing
 6/13/2022 10:57 AM	Cycling and running
 6/13/2022 10:58 AM	Nice surfing and swimming spot
 6/13/2022 10:59 AM	Nice beach for activities
 6/13/2022 11:00 AM	Love y park and nice destination
 6/16/2022 08:37 PM	Love above this spot
 6/17/2022 09:18 AM	Beautiful beach, nice views to Wollongong and nature. Great fishing spot
 6/17/2022 09:20 AM	Perfect beach spot for kids
 6/17/2022 09:22 AM	Fishing spot and view location to be impressed with big ships
 6/21/2022 01:29 PM	I'm concerned about the amount of dog droppings that are left on the beach on a daily basis. Maybe more patrols to catch the grubs out.
 6/21/2022 08:54 PM	Open space, great recreational area with playground
 6/21/2022 08:56 PM	Great spot for the kids to play in the water
 6/21/2022 08:58 PM	Great views and a place for a walk

<div></div> <div>6/21/2022 09:00 PM</div>	Great shared path and foreshore area with food and coffee
<div></div> <div>6/21/2022 09:02 PM</div>	Views and cafe
<div></div> <div>6/22/2022 05:44 PM</div>	A strong beach-oriented community. Since vegetation removal, major oca, State, National and International sporting events are now held here. More importantly beach health has returned which in turn has seen the return of previously unseen Fauna.
<div></div> <div>6/22/2022 07:40 PM</div>	This is my home beach but the dune plants are a problem and need to be removed to get it back to its previous glory. But it's the same as the Corram.
<div></div> <div>6/23/2022 09:16 AM</div>	Sweeping coastal views, whale watching
<div></div> <div>6/23/2022 09:18 AM</div>	Awesome place to walk the dogs
<div></div> <div>6/23/2022 09:20 AM</div>	My favourite beach in the Illawarra
<div></div> <div>6/23/2022 09:22 AM</div>	Awesome natural area with beautiful birds and a strong sense of connection to country
<div></div> <div>6/23/2022 09:25 AM</div>	The Blue M is the best place to walk dogs in winter as it has lighting after dark. Great for oca and tourists. Stunning ocean views and great coffee options!
<div></div> <div>6/23/2022 09:27 AM</div>	Sweeping coastal views, whale watching, bird watching
<div></div> <div>6/23/2022 09:29 AM</div>	Georgous hike through national park to a stunning cycling option beach
<div></div> <div>6/23/2022 09:30 AM</div>	Sweeping coastal views, whale watching

<div></div> 6/23/2022 09:32 AM	Iconic tourist destination to walk or drive across
<div></div> 6/23/2022 09:35 AM	Best views from an ocean pool in the Illawarra! Awesome footpath for walking.
<div></div> 6/23/2022 09:37 AM	This place is stunning, amazing example of a dune that is healthy and intact. The walk through here is great and the views from the top are so unexpected.
<div></div> 6/23/2022 04:27 PM	banks a food trees for black cockatoos. At risk from dune blow out
<div></div> 6/23/2022 04:31 PM	kayak access to fishos
<div></div> 6/23/2022 04:35 PM	Love the presence of greenery amongst this otherwise industrial landscape
<div></div> 6/23/2022 04:38 PM	bangalay sand forests
<div></div> 6/23/2022 04:42 PM	foreshore facilities used to be maintained
<div></div> 6/23/2022 04:45 PM	The ngarabaarn trail has so much potential but investment is lacking
<div></div> 6/23/2022 04:53 PM	no car access to fishos is great but a bike rack would be handy
<div></div> 6/24/2022 02:21 PM	Love my beach with facilities
<div></div> 6/25/2022 08:33 AM	This beach pool is truly wonderful. I visit it as a weekly refresher, and a nice alternative to the nearby beaches.
<div></div> 6/25/2022 08:52 PM	Swim

<div></div> 6/25/2022 08:55 PM	beach and dune vegetation
<div></div> 6/25/2022 08:58 PM	Special Aboriginal place
<div></div> 6/26/2022 08:52 AM	I have surfed in this location for 48 years
<div></div> 6/26/2022 09:13 AM	I have surfed in this location for 48 years
<div></div> 6/26/2022 09:13 AM	I have surfed in this location for 48 years
<div></div> 6/26/2022 09:20 AM	I have surfed in this location for 48 years
<div></div> 6/26/2022 09:20 AM	I have surfed in this location for 48 years
<div></div> 6/26/2022 09:22 AM	Too much antana and other weeds on the dune
<div></div> 6/26/2022 11:14 AM	Natural beauty. Lack of crowds. Clean water and pristine sand
<div></div> 6/26/2022 01:07 PM	I dove the surf break before dune vegetation ruined it, see my comments.
<div></div> 6/26/2022 02:14 PM	Love the fact it's not developed
<div></div> 6/26/2022 08:44 PM	Best beach on the coast with clean open space to enjoy whilst not being overcrowded
<div></div> 6/27/2022 02:08 PM	Decent walking track with scattered views, and that's the problem. Can council please remove the overgrown antana it's an eyesore!
<div></div>	No surf clubs and dogs allowed

6/27/2022 10:23 PM

[REDACTED]

Great tte spot away from the crowd

6/27/2022 10:33 PM

[REDACTED]

Amaz ng safe beach

6/27/2022 10:54 PM

[REDACTED]

This ocat on s great for surf ng n the ocean, sw mm ng n the adjacent Woonona poo and f sh ng from the shore ne (when the t de s not too h gh)

6/28/2022 07:33 PM

[REDACTED]

What I don't ove s the fact the vegetat on s st out of contro .

6/28/2022 07:49 PM

[REDACTED]

I have grown up n the area, c ose to the beach, and I v s t the ocean and rock poo regu ar y.

6/29/2022 02:09 PM

[REDACTED]

The Perk ns Beach Sandforrests are amaz ng, ts so ove y to wa k through a forest ke th s to get to the beach. It makes me fee amaz ng com ng out of the trees onto the beach. I w sh more was done to manage the weeds though. ,

6/30/2022 09:51 PM

[REDACTED]

This area s beaut fu but extreme y degraded due to weed nfestat ons.

6/30/2022 10:00 PM

[REDACTED]

This s mt oca beach, I ove the peace, nature, sand and surf, the dunes w th a the r vegetat on and w d fe, espec a y the b rds!

7/01/2022 11:22 AM

[REDACTED]

Open beacjh w th reef, waves and ong stretch of beach fronted w th nat ve coasta shrubs.

7/01/2022 02:38 PM

[REDACTED]

Open beach w th reef, waves, grassy areas and a ong stretch of beach that s not fronted by hous ng/deve opment.

7/01/2022 03:40 PM

[REDACTED]

Stanwe Park beach, ts sand dunes and agoons s the p ace I connect w th nature. It he ps my phys ca and menta we be ng and fts my sp r ts.

7/02/2022 02:53 PM

<div></div> <p>7/03/2022 03:31 PM</p>	<p>Wa k ng amongst the nat ve trees and bushes, and see ng the oca fauna.</p>
<div></div> <p>7/03/2022 09:22 PM</p>	<p>It's rea y sad and depress ng that th s ocat on s used to dump arge volumes of po uted waste water nto the catchment to be "d uted" n port Kembra harbour. D ut on s not the so ut on to po ut on.</p>
<div></div> <p>7/03/2022 09:36 PM</p>	<p>The dunecare restorat on of th s area s a huge success. enjoy surf ng, wa k ng, b ke r d ng and b rdwatch ng here.</p>
<div></div> <p>7/03/2022 09:40 PM</p>	<p>The Towradg Creek wa k s one of the best kept secrets n Wo ngong! It's a great examp e of a successfu bushcare project ed by the commun ty.</p>
<div></div> <p>7/03/2022 09:42 PM</p>	<p>I ove the tea trees here and that the wa k from the park to the sand s shaded by nat ve vegetat on. It's beaut fu and a so prov des a great w nd buffer.</p>
<div></div> <p>7/03/2022 09:49 PM</p>	<p>There seems to be a ot of dune "experts" around here. A sophorae & L. ev g atum are oca nat ves. Just because they were c eared and m ght not have been there back n the '80s, doesnt make them weeds.</p>
<div></div> <p>7/05/2022 03:27 PM</p>	<p>Comb nat on of beach, poo , cafe and c ose prox m ty to pub c transport</p>
<div></div> <p>7/05/2022 06:32 PM</p>	<p>The Gent emens Baths rockpoo</p>
<div></div> <p>7/05/2022 10:56 PM</p>	<p>Abor g na she m dden, nat ve vegetat on</p>
<div></div> <p>7/06/2022 08:47 AM</p>	<p>Great spot for k ds - park, ocean poo , rock poo and ca m beach.</p>
<div></div> <p>7/06/2022 08:50 AM</p>	<p>A ove y qu et beach w th beaut fu vegetat on a ong the dunes. Great p ace to come to re ax and apprec ate the coast.</p>
<div></div>	<p>Loca beach for n ppers and sw mm ng.</p>

7/06/2022 08:52 AM

[REDACTED]

7/06/2022 08:55 AM

Great poo and the rock poo s are great too (there s a tte poo out
on the rock she f that we ca the merma ds poo)

[REDACTED]

7/06/2022 08:59 AM

Great spot for k ds - park, ocean poo , rock poo and cafe and
p ayground

[REDACTED]

7/06/2022 09:02 AM

An ok beach that s popu ar w th fam es. Great wa k ng path.

[REDACTED]

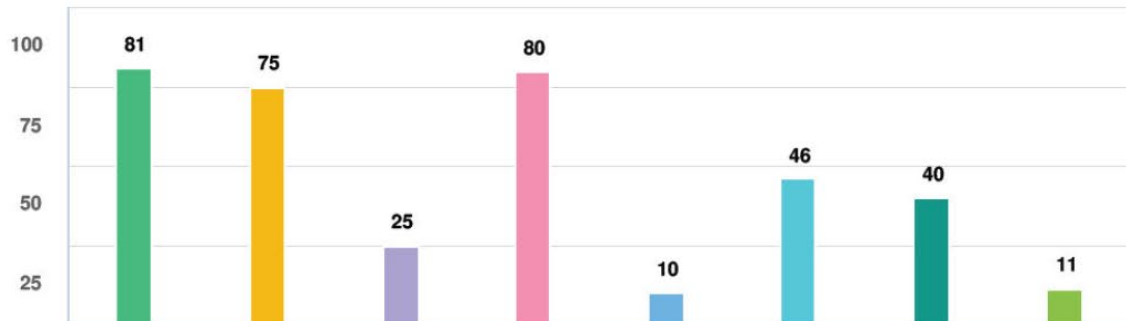
7/07/2022 08:46 PM

Puckeys Lagoon

Optional question (117 response(s), 11 sk pped)

Question type: S ng e L ne Quest on

Q2 Why do you visit this location? Select all that apply.



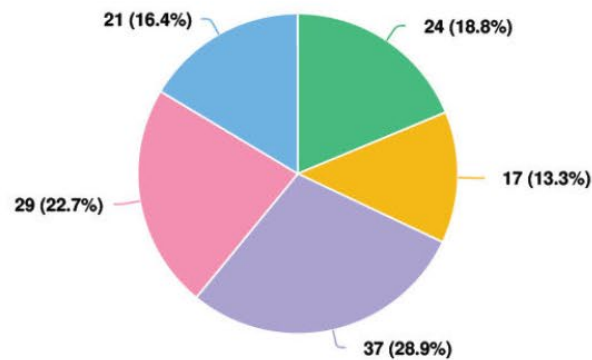
Question options

- Nature appreciation
 ● Walking/running
 ● Cycling
- Passive based water activities (swimming, surfing, scuba, kayak etc)
 ● Fishing (beach, rock, spear)
- Picnics/BBQs
 ● Dog walking
 ● Other

Mandatory Question (128 response(s))

Question type: Checkbox Question

Q3 How often do you visit this location? Please select the most relevant option.



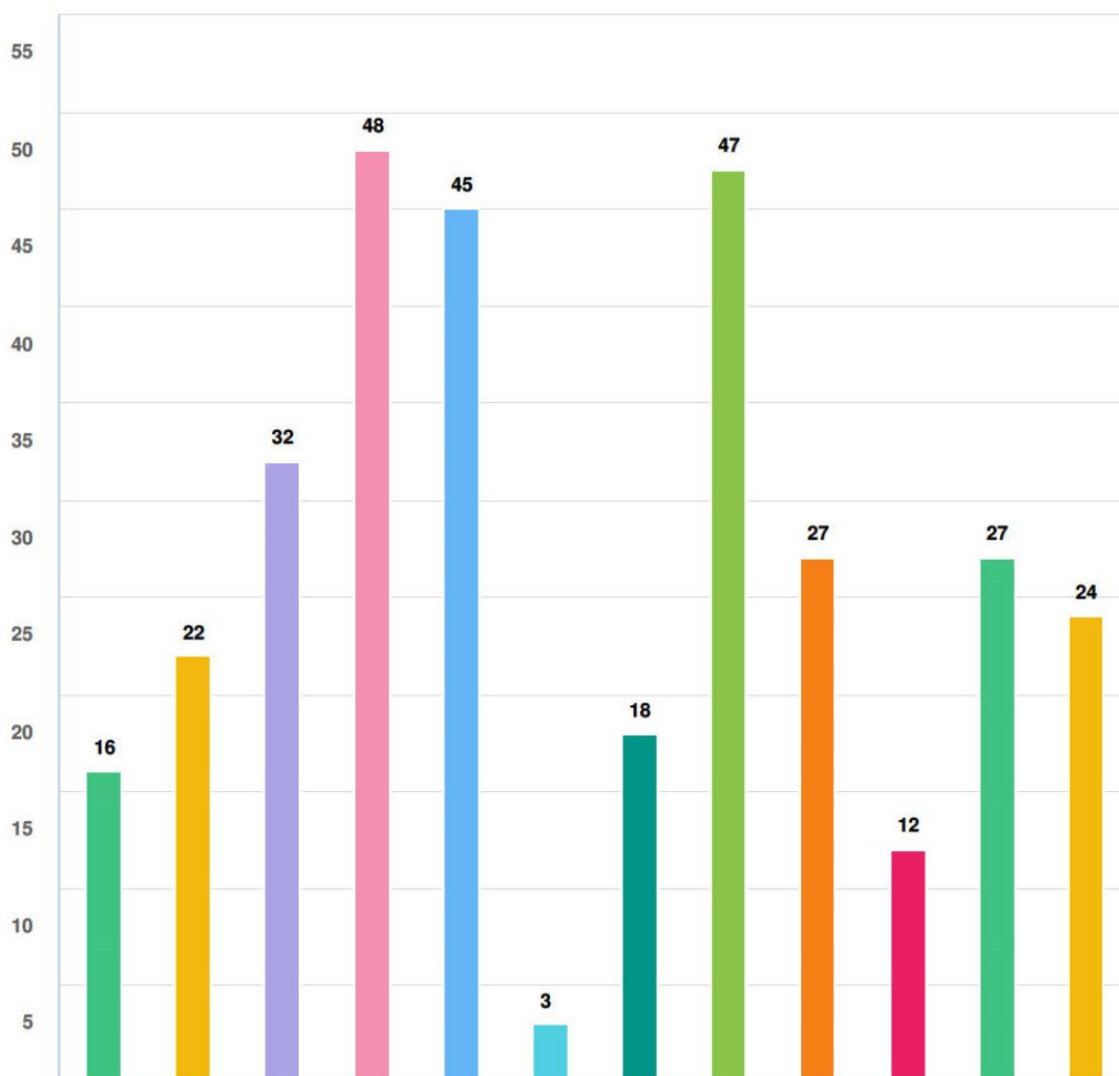
Question options

- Daily
 ● 3-5 times a week
 ● Weekly
 ● Monthly
 ● A few times a year

Mandatory Question (128 response(s))

Question type: Dropdown Question

Q4 Which (if any) of the following do you consider to be a threat or issue at this location:



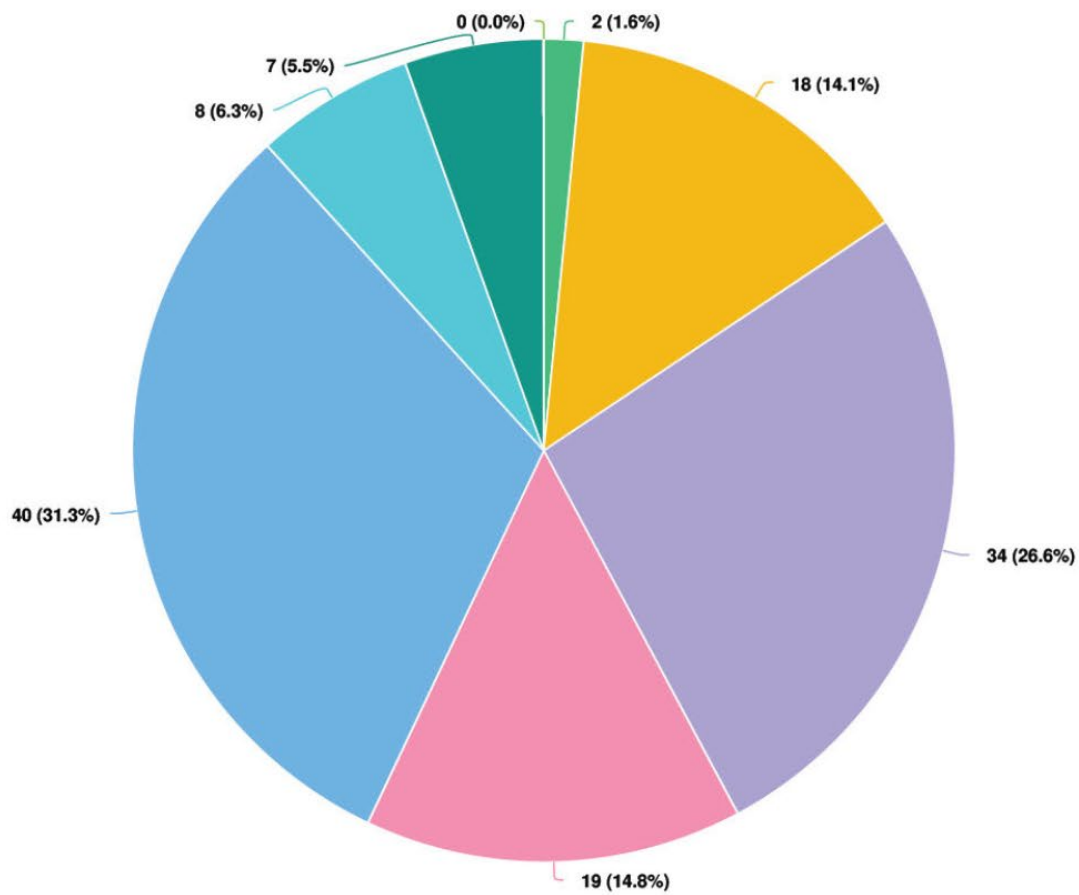
Question options

- Poor water quality in the estuaries
- Poor water quality at the beaches
- Loss of estuary and dune vegetation and habitat for native animals and plants
- Weed and feral animal infestation
- Beach and foreshore erosion
- Flooding of low lying areas along the coast
- Coastal cliff and slope instability
- Impacts of climate change (e.g. sea level rise and increased storms)
- Pollution (from stormwater & boat sewage)
- Changing conditions of creek entrances
- Urban development in the coastal zone
- Insufficient recreational facilities (e.g. parks, BBQs, etc)

Optional question (111 response(s), 17 skipped)

Question type: Checkbox Question

Q5 Finally, a little about you. What is your age?

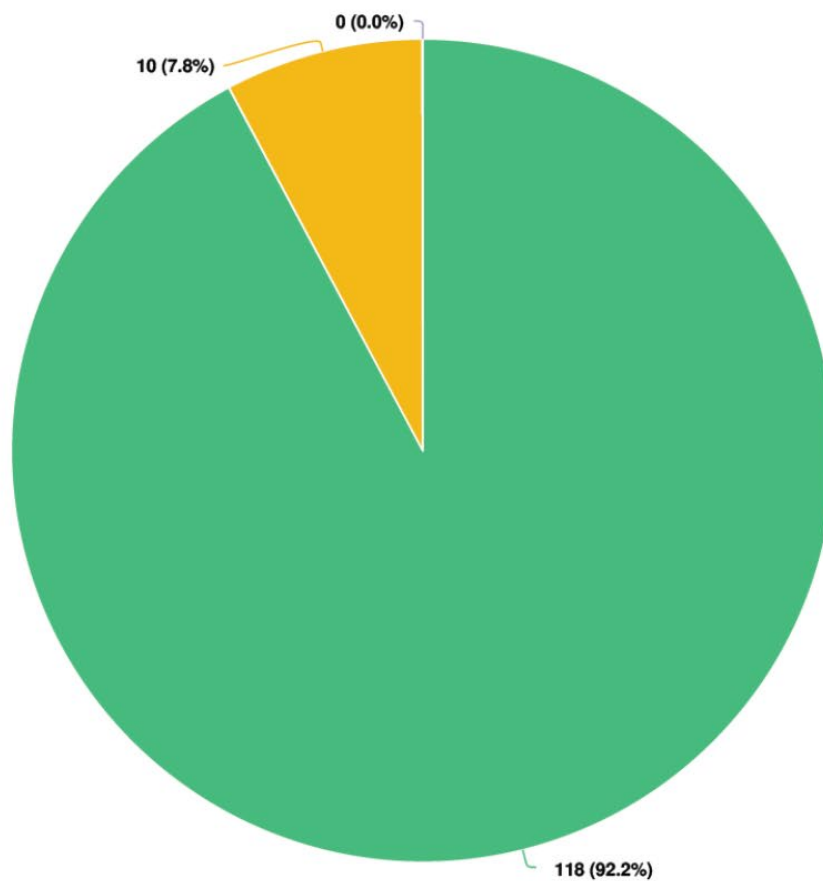


Question options

● 18-24
 ● 25-34
 ● 35-44
 ● 45-54
 ● 55-64
 ● 65-74
 ● 75 and over
 ● 17 and under

Mandatory Question (128 response(s))
 Question type: Dropdown Question

Q6 Are you Aboriginal and/or Torres Strait Islander?



Question options

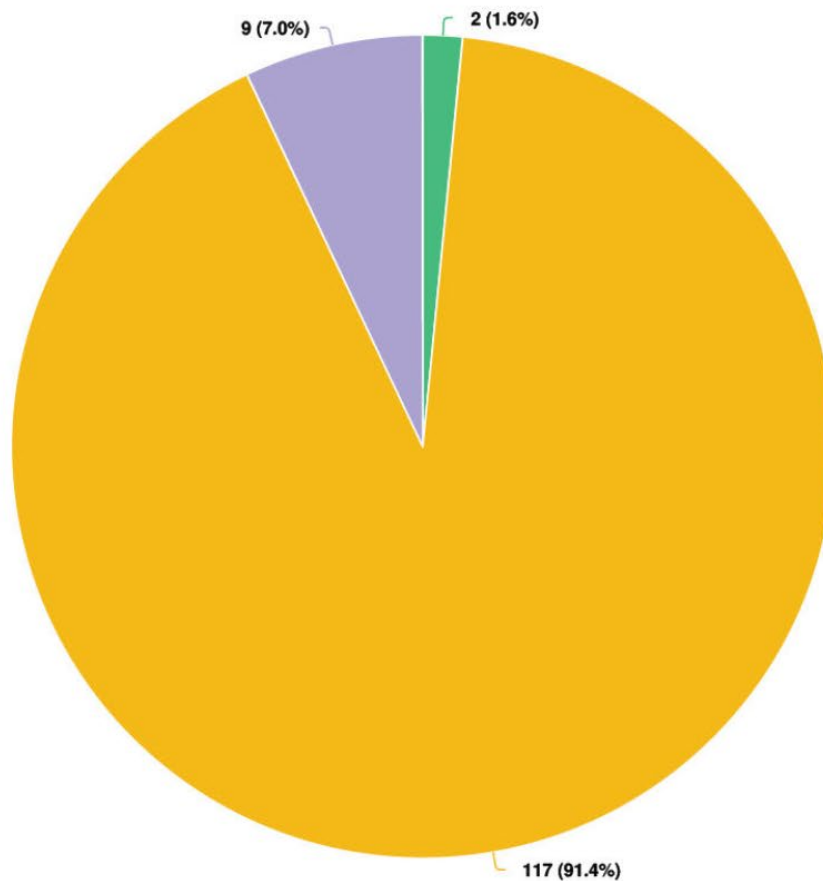
☒ No ☐ Prefer not to say ☐ Yes

Mandatory Question (128 response(s))

Question type: Dropdown Question

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Q7 | Are you a person with disability?



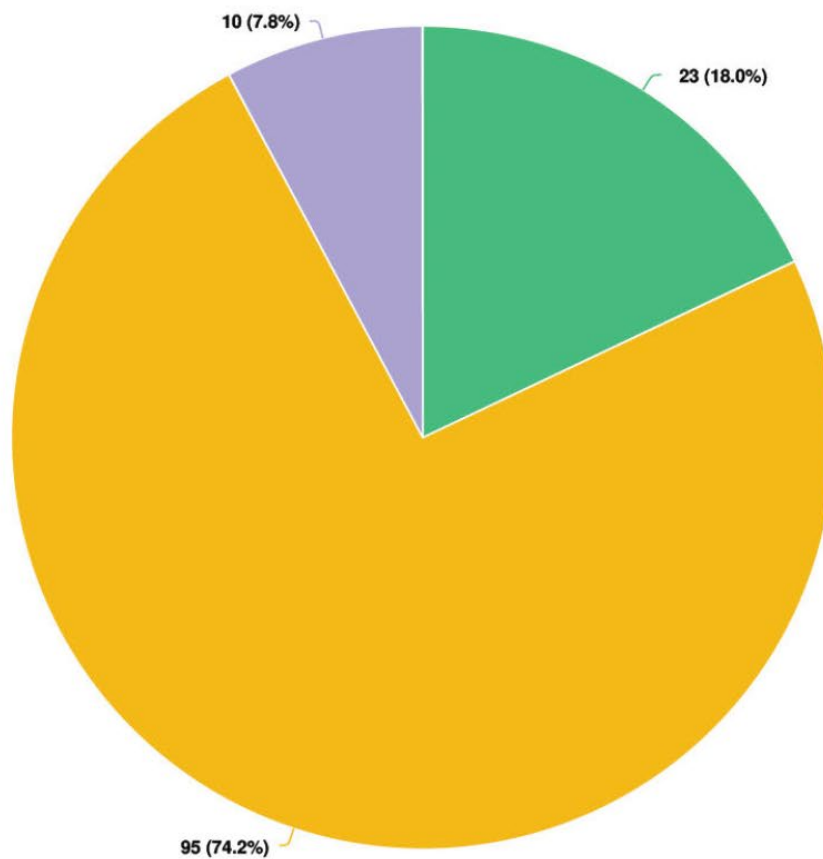
Question options

● Yes
 ● No
 ● Prefer not to say

Mandatory Question (128 response(s))
 Question type: Dropdown Question

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Q8 Do you speak a language other than English when at home?



Question options

☒ Yes
 ☒ No
 ☐ Prefer not to say

Mandatory Question (128 response(s))
 Question type: Dropdown Question

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Q9 Your Comment

[REDACTED]

6/01/2022 02:32 PM

For heavens sake do I have to f th s nformat on our for every marker!

[REDACTED]

6/01/2022 02:34 PM

Good beach to v ew a batross from a so wha es n season

[REDACTED]

6/02/2022 04:27 PM

More pub c park ng and fac t es at th s beach wou d be great as t s a good one to v s t w th o d dogs that can't wa k that far

[REDACTED]

6/02/2022 07:53 PM

I am concerned at the ack of ma ntenance / management of the ntroduced vegetat on on the dunes. S nce the dune c ear ng took p ace, sand s bu d ng up, vegetat on s b nd ng and captur ng the sand and gradua y encroach ng further and further nto the beach zone.

[REDACTED]

6/02/2022 08:00 PM

The vegetat on needs to be c eared a ong the ent re stretch of th s beach, on e ther s de of the prev ous y c eared zone. B g seas create dangerous scarp ng - c eared zone no scarp ng. Beach zone s s gn f cant y d m n shed. V ew ng areas to the beach from beh nd the dunes s d s appear ng. There s no usefu purpose for th s vegetat on a ong th s beach, t has/ s spo ng the beach.

[REDACTED]

6/02/2022 08:04 PM

These dunes were the source of much fun and recreat on, they are just a m smanaged d s grace now. Much of the vegetat on needs to be removed so that t can be returned to t's g ory days.

[REDACTED]

6/03/2022 09:56 AM

A v ta part of the area wh ch a ows for exerc se and soc a act v t es for humans and for dogs, t needs to be preserved and enhanced

[REDACTED]

6/03/2022 11:22 AM


Invas ve weeds nc ud ng fenne , b ackberry, agave, pr vet and cestrum are tak ng over and there s accumu ated rubb sh . Th s extraord nary coasta edge cou d be such an nsp rat on s a depress ng waste and, and w thout care and management w become a n ghtmare to restore

[REDACTED]

6/04/2022 11:00 AM

Dutch


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 6/06/2022 08:59 AM


Consider reocating the baby poo to the northern side of the big pool to allow for natural southern south westerly water flow and sand migration. Baby poo is constantly full of sand and I assume is expensive and inefficient to use WCC resources/assets to remove sand. Impact of above action may be headland erosion and instability due to increased water movement south to north. Consider mitigation on approach/action on headland.


 6/07/2022 02:09 PM

I think that banning dogs from the rock shelf here is unnecessary. Sooty Oyster Catchers are not impacted by one small beach being dog friendly when they have the rest of the coastline.


 6/07/2022 02:15 PM

Fishers leave rubbish, including fish hooks on the beach. They have a so-called kunj off the rocks to use as bait. I would like to walk our dogs on this rock shelf but this is not permitted. Birds would be mainly impacted by dogs being permitted. The fishers are much more dangerous to birds as they leave food, plastic bags and other hooks behind.


 6/07/2022 02:17 PM

a piece of paradise near home.


 6/08/2022 10:22 AM

Surf/swim daily after cycling along cycleways from Mt St Thomas. Water quality varies but is usually average. Poor after rain. Beach highly eroded after long rain events of summer/autumn 2022, but recovering well. Like the beach cleaning via tractor.


 6/08/2022 11:07 AM

My concerns with no separation - Visitors to the coast using vehicles with noisy exhausts ruin the experience for everyone else (adults, children and animals) enjoying the natural coast while on the bridge


 6/16/2022 08:37 PM

Before Council budgets was to stop the cay being dissolved I would like them to seriously consider various ways to make the wave energy dissipate further out to sea.


 6/17/2022 09:18 AM

Ukrainian



Ukrainian

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6/17/2022 09:20 AM

[REDACTED]

Ukrainian

6/17/2022 09:22 AM

[REDACTED]

Remove a vegetation from the Berm (Seaward of Fence-lines) this has proven to reduce erosion Improves Line-of-Sight for Lifesavers, improves beach amenity, improves beach Fauna (small crabs and rare seabirds return), and reduces the incidence of vermin.

6/22/2022 05:44 PM

[REDACTED]

Puckey's Estate is a beautiful asset to the City of Wollongong and this fantastic that it is protected for years to come. Great work to Council and bushcare volunteers for keeping it healthy.

6/23/2022 09:14 AM

[REDACTED]

Could have better facilities here to make it safer

6/23/2022 09:27 AM

[REDACTED]

Council needs to re-establish a vegetated foredune if they want to prevent the dune crest from growing higher and cause ongoing sand blowouts onto community infrastructure

6/23/2022 04:27 PM

[REDACTED]

Open a shed/pergo with rentable bays for kayak storage

6/23/2022 04:31 PM

[REDACTED]

I realise there are significant ACH values to manage along this beach but eradicating weeds, increasing indigenous species of shade trees and shrubs, interspersed with picnic facilities would greatly enhance this part of our coast

6/23/2022 04:35 PM

[REDACTED]

these amazing forests have been neglected for too long. Please invest in long-term weed control and restoration initiatives

6/23/2022 04:38 PM

[REDACTED]

please re-nest jetties and allow foreshore erosion to be managed softly without rock or other hard engineering - see Narooma's living foreshore example of living with an increased tidal range resulting from training works


6/23/2022 04:42 PM

[REDACTED]


please invest in the Ngarabaarn infrastructure and cultural tourism operators

6/23/2022 04:45 PM


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 6/23/2022 04:53 PM

A bike rack would be handy since the track entrance is next to the bike track.... It was suggested during recent track upgrades but no one listens


 6/25/2022 08:58 PM

This place should be given more respect and not be a dog beach


 6/26/2022 08:52 AM

This section of beach is well used by swimmers, surfers etc but the dunes are not covered by any dune management plan. Plantings from the 80s have reduced available beach by over 50% and are now infested with weeds and rubbish. Adverse effects on surf quality. Plan 1982


 6/26/2022 09:13 AM

Gabon boxes placed in 1982 have been re-engineered, yet there is no investment in the original intent or purpose. They have caused degradation of the surf breaks. Why were they first installed? Do they work? Plan 1978


 6/26/2022 09:13 AM

Gabon boxes placed in 1982 have been re-engineered, yet there is no investment in the original intent or purpose. They have caused degradation of the surf breaks. Why were they first installed? Do they work? Plan 1978


 6/26/2022 09:20 AM

These coastal 'forests' are unnatural. Unmanaged plantings from the 1980s have dramatically altered the dune system with impacts on surf quality and user safety. This 'habitat' doesn't exist pre-artificial introduction of unsuitable species and neither did the 'wildlife' living here. It should be significantly reduced to preserve a wind buffer for the caravan park but reduce overall vegetation. Plan 1986


 6/26/2022 09:20 AM

These coastal 'forests' are unnatural. Unmanaged plantings from the 1980s have dramatically altered the dune system with impacts on surf quality and user safety. This 'habitat' doesn't exist pre-artificial introduction of unsuitable species and neither did the 'wildlife' living here. It should be significantly reduced to preserve a wind buffer for the caravan park but reduce overall vegetation. Plan 1986


 6/26/2022 11:14 AM

Vegetation on the dunes needs to be removed, this detrimental to the natural movement of sand and is causing ongoing beach scarping, reducing the resilience of the coastline to storm events, and loss of natural habitat. It is the biggest threat to the beach acting as a natural barrier to sea level rise and storm events.

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6/26/2022 01:07 PM

The photo attached is borrowed from Beach Care I awarra, it shows the recent state of North Woonona Beach. Please note the tide reach close to the road at the head and. Unfortunately, there is provision for only 1 photo otherwise I would have included an historical photo showing more sand gathered in the location, which once protected the head and Council assets. The point is this. The Coastal Dune Management Manual, which Council follows states: "If vegetation is successfully locking up sand on one embayment there may be unintended erosion in the next embayment." This is easily described by the following. If a large wide object, like an oval shaped serving dish hundreds of metres long, is placed on a beach it would divert wave run ups downways. Wave run up naturally dissipates wave power. This diverted wave power needs to go somewhere, which is along the sides of the dish. In this way the diverted wave power removes sand from along the front of the serving dish, making the water deeper which allows more wave power to be diverted. In Woonona's case evidence of this example is the increased erosion of sand at the northern end during storms. The northern end of the beach is at the end of the serving dish, where this wave power is diverted adding to direct wave power already in this location. It is now easy to observe increased wave power, during storms, slamming into the northern head and and the backwash which reflects sand from this area causing erosion. The once wide beach here dissipated wave power naturally but now that wide beach is gone. The increase of sand locked under vegetation is causing an increase in erosion described by the Coastal Dune Management effecting beach amenity, surfing sandbanks, coastal stability and safety etc. Some locals are commenting that they have never seen many rocks after storms. The trend here is increasing and more severe erosion events after each large storm. The natural flow of sand needs to be restored along our coastline to curtail this "unintended erosion" and avoid loss of coastal amenity and expensive damage bills, footed by ratepayers. North Avon Beach is another example which suffered damage in recent storms. The cause is introduced dune vegetation and its removal is the solution.

6/26/2022 08:44 PM

Woonona beach is an ideal location for everyone to enjoy. The issues faced are beach erosion from invasive vegetation spreading onto the beach causing issues with tide flow and eroding our beach. This issue is prevalent from Woonona point through to Belamb Surf Club. Simply looking at Woonona Surf Club area you can see the vegetation again encroaching on the beach after being removed a few years ago. All of this vegetation should be removed completely and replaced with non-invasive plants. An added benefit of removal would be the reduction in ferocious pests which breed amongst the

Survey for Map - 7181 : Survey Report for 07 June 2013 to 28 July 2022


overgrowth.


 6/27/2022 11:27 AM

Why does your map stop here WCC? Your coastline extends into the Royal National Park to just south of Garra beach and includes the three heritage listed communities of Little Garra, Era and Burning Palms. Please extend this map.


 6/27/2022 02:08 PM

So much potential on the Wollongong coastline, so little being done.


 6/27/2022 10:23 PM


better protection of our beach and foreshores will enable flora and fauna to regenerate. Ask yourself when night or day did you see some native wildlife. why don't we educate people/tourists to look and feed but don't remove. Count marine life you can see on the rocks and come back in 10 years and count again. Suppose people like beaches without things to look at on our beaches. but who will we feed our left over Maccas or kfc too.


 6/27/2022 10:33 PM

Foreshore improvements with a few trees and low evergreen trees to reduce erosion, provide shelter for waterbirds and wildlife that live in our creeks.


 6/28/2022 07:33 PM

This location is great as it is the beaches on our coast. The main 2 issues in this area are 1. Local fooding in Carrington and Lawrence St Woonona, The fooding appears to be from the vegetation blocking Coopers creek. 2. The second issue in this area is the beach scarping due to the over vegetated sand dunes. During high tides there is no beach left to fish from. This is a problem as the next best spot is off the rocks. The beach access is a so made dangerous due to the excessive scarping. This is causing a safety issue for beach users, especially parents with children. If the vegetation was removed and replaced with the correct non invasive vegetation as has been carried out on the other side of the point at Woonona Beach. In front of Woonona surf club there is no scarping. The only scarping appears to be where the invasive vegetation is. Woonona beach is a great example of what needs to be carried out on all beaches in the Wollongong LGA. This would make our beautiful beaches safer for all users.


 6/28/2022 07:49 PM

Vegetation should never have been planted back in the eights to the extent it was along all beaches, it is once again on the march and will continue to be a fight to control and controlling with cost rate payers thousands of dollars for years to come as it is ready has to

Survey for Map - 7181 : Survey Report for 07 June 2013 to 28 July 2022

clear in front of surf clubs. The long stretches between surf clubs are simply running wild. Luckily huge storms as in 2016 rec a med meters of beach but 6yrs on and those areas are once again on the march towards the water line. I wish I had something positive to say but for me the big picture says the damage is done and from here on no matter how many reports or surveys are undertaken the problems here to stay at a huge cost to the beach eco system, tourism and the council bank account. O d say ng .. " f t a n't broke don't f x t". It worked just fine before humans interfered.


6/29/2022 02:09 PM

This year we have seen excessive pollution spilling over from Coon Creek into the ocean causing authorities at times to close the beaches at Woonona and Bulli. The influence of sewerage has a so negatively impacted on the pool water quality at Woonona rock pool. Severe Scarping of the vegetation on dune area at the most northern end of Woonona beach has been a safety problem this year with a 3 metre scarp witnessed in March 2022.


7/01/2022 11:22 AM

It would be even better without dogs!


7/01/2022 02:38 PM

The carpark is dangerous with uneven surfaces, poor entry from the road and walkways onto the beach. Key hazards are the lack of proper carpark surfacing, limited maintenance, beach side access paths that are never mown which hide rocks, drops and slippery surfaces. On the roads the key hazard is the large volume of cars and people with poorly marked access. Headlands beach and carpark is much better. Another issue is the huge number of dogs with lazy owners who do not supervise their pets and let them shit everywhere without picking up. Most dog owners are responsible but the volume of dogs and unlimited access times what is creating the problem. I would like to see off leash times limited to before 9am and after 4pm each day. I am a dog owner so value the off leash but the sheer volume is running t for everybody. I also think the overly large trees used for coastal regeneration have ruined the views.


7/01/2022 03:40 PM

The carpark is dangerous with uneven surfaces, poor entry from the road and walkways onto the beach. Key hazards are the lack of proper carpark surfacing, limited maintenance, beach side access paths that are never mown which hide rocks, drops and slippery surfaces. On the roads the key hazard is the large volume of cars and people with poorly marked access. Headlands beach and carpark is much better. Another issue is the large number of dogs with lazy owners who do not supervise their pets and let them crap everywhere without picking up. Most dog owners are responsible but the volume

Survey for Map - 7181 : Survey Report for 07 June 2013 to 28 July 2022

of dogs due to un m ted access t mes s what s creat ng the prob em . I wou d ke to see off eash t mes m ted to before 9am and after 4pm each day. I am a dog owner so va ue the off eash but the sheer vo ume s ru n ng t for everybody. I a so th nk the over y arge trees used for coasta regenerat on have ru ned the v ews. F na y I am surpr sed by the ssues st prov ded n th s survey as few of these app y to I awarra beaches and they ke y create s gn f cant b as n th s survey.

7/02/2022 02:53 PM

I'm concerned about v s tors wa k ng over the dune vegetat on, camp ng on the dunes, remov ng vegetat on (fresh and dead) to burn, dr v ng on the veg (most y Coasta Watt e and Coasta Sp n fex). The h nd dunes are fu of b rd fe and the dunes must be protected. I p ck up rubb sh on the beach every day, much of t eft by f sherman. They a so eave mar ne fe to d e ke sharks, st ngrays & crabs.

7/03/2022 03:31 PM

Ma n obv ous prob em s weeds. Nat ve p ants are we estab shed. Good to see a s gn f cant vegetated buffer beh nd the beach to prevent eros on.

7/03/2022 04:06 PM

I ove th s ocat on because of the work that has been done to re estab sh ocat on vegetat on a ong the dunes and c ff top. I enjoy observ ng the var ety of b rds and nat ve an ma s attracted by the natura food sources of nat ve Correa, p g face, Banks as and grasses, Westr ng a etc. By re estab sh ng these p ants t w reduce weeds and he p prov de food, she ter and hab tat to nat ve fauna wh ch makes me exc ted. I wou d ke to see more of th s a a ong the I awarra coast ne nstead of eav ng weeds to cont nue to b ght the andscape. It saddens me to st see areas of ntroduced p ants ke agapanthus, wa k ng r ses Buffa o, k kuyu grass, antana be ng a owed to cont nue to spread desp te be ng nvas ve and often tox c to fauna. I encourage Counc cont nue to partner w th Landcare to extend nat ve vegetat on a ong our coast ne.

7/05/2022 10:56 PM

N ce dune and rock p atform w th ev dence of use over thousands of years. Be ng eroded by storms

7/06/2022 08:47 AM

There s a most no dune vegetat on and the amen ty s a so pretty ow. Dune vegetat on here wou d he p to stab se the beach and dunes and he p reduce eros on from storms and c mate change.

It s n ce to have a beach that s qu et and st has some dune

Survey for Map - 7181 : Survey Report for 07 June 2013 to 28 July 2022

7/06/2022 08:50 AM

vegetat on and s not deve oped.

[REDACTED]

Wou d be n ce to have pub c to ets at the surf c ub.

7/06/2022 08:52 AM

[REDACTED]

Great that there s a k ds poo as we . There s a b g sand eros on
ssues here due to there be ng so tt e dune vegetat on to ho d the
sand n p ace and protect the dunes from eros on. Some

7/06/2022 08:59 AM

[REDACTED]

The ack of dune vegetat on here ser ous y mpacts on the amen ty of
th s beach. Increas ng dune vegetat on a ong th s stretch of beach w
he p to protect the dunes from be ng eroded n the future w th sea
eve r se and ncreased storms.

7/06/2022 09:02 AM

[REDACTED]

I am th rd generat on Be amb res dent

7/06/2022 12:47 PM

[REDACTED]

Is the \$10.5m on seawa a good use of money? W th s seawa
cause any adverse eros on? Shou d coun c be ead ng by exampe
when t comes to retreat due to sea eve r se and reocat ng bu d ngs?
<https://www.wollongong.nsw.gov.au/my-community/news-and-articles/news/news/2021/february-2021/north-wollongong-seawa-and-cub-refurbishment-moves-forward>

7/07/2022 08:43 PM

[REDACTED]

Th s s a great p ace to exp ore w th my todd er. We v s ted t a few
t mes a week n a sorts of weather dur ng ock down, but not as
much now she's back at daycare. I subm tted some photos as part of
the Stuart Park pre-masterp an engagment that shows how popu ar t
s w th peop e of a ges on a hot sunny day.

7/07/2022 08:46 PM

Optional question (60 response(s), 68 sk pped)

Question type: Essay Quest on

Q10 Add Image

[REDACTED]

No f e up oaded

6/01/2022 02:30 PM

[REDACTED]

No f e up oaded

6/01/2022 02:32 PM

Photos uploaded by participants to pinned locations on the interactive map.



Port Kembla Beach



Untitled



Cowper Road, Port Kembla



Corrimal Beach Park 1978



Corrimal Beach 1986



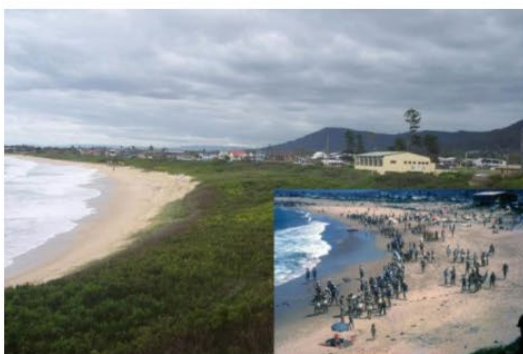
Corrimal Beach 1986



Below Woodland Avenue, Thirroul



Werrong Beach, Royal National Park



Bellambi Beach now and then, undated

APPENDIX 14 Seaside Stories

The pebbles, stones, rocks and bricks on Thirroul beach

by John Groom, 29 Jun 2022

The huge seas and associated erosion in the first half of 2022 have exposed worse than usual the presence of stones buried longtime under the sand, Ongoing wave action redistributes these stones all along Thirroul Beach. They can be seen from the pool pumping station all the way north to the rock shelf past Flanagan's Beach. It is not just a natural phenomenon. This morning I removed one and a half housebricks complete with cement.

As part of Council's coastal strategy I ask that Council remove these stones. They are a serious safety hazard to swimmers particularly when obscured below the water surface at high tide.

A suggested method of doing this would be to have a front end loader scoop up piles of the rocks. They could be then be filtered to ensure no excess sand is removed. The filtering system could be similar to that currently employed on council's existing mechanised beach cleaners. Council could then sell/use the pebbles and stones for garden usage and recover some costs.

Someone is going to be seriously hurt coming into contact with house bricks. Thirroul Beach is a gem. May it stay that way.

The Blue Mile is great, but we need to divert some of the attention away from it.

by GKew, 27 Jun 2022

For years we have walked the section of coastline Council has called the Blue Mile, well before it was called "The Blue Mile".

Council has done a great job, hat tip to you, but with the increase in use and general interest in healthy activities it no longer copes with the volume of traffic.

We have such an amazing coastal location in Wollongong, but in truth, most of it is inaccessible or not utilised the best it could be.

We're not about over commercialising the location but Council needs to come up with more options for where people want to walk. Another 2, 3 or 4 locations, equivalent in amenity or close to, the Blue Mile would be very well received and used.

The walking track between Woonona Beach and Sandon Point is probably the 2nd most attractive location but there is simply not sufficient space between walkers and cyclists to make it enjoyable for either. Could we look at creating separate cycle tracks in parallel with walking tracks at selected locations and widening it in others? The ROI on this for the community would be amazing.

Other locations:

Windang to Port Kembla

Beach side of Wollongong Golf Course

Beachfront elevated boardwalk - Puckeys Estate

Elevated Boardwalk - Towradgi Beach (Why should the caravan park residents get it all? :))

Ditto - Corrimal Beach...

Austinmer - there is scope for something better than current.

The message is, we love what you've done, thank you... we need to spread people out now.

History and Heritage

by saREN, 21 Jun 2022

Could we please have all the little creeks and waterways flowing from the Escarpment to the sea named with clear signage. In addition can we have interpretive signage telling the background/stories of where the name of these water-ways originated and other local stories which relate to that site/waterway. If we know the names and heritage of these places we can then do more to look after them. For example, Hicks Creek is not labelled, no naming/place sign, no interpretive signage about who Hicks was. The creek is infested with weeds and industrial waste and yet it could be a wildlife corridor and tell the story of its local area and its links to the ancient aboriginal world long ago.

Hopelessness

by libbywibbly, 9 Jun 2022

A current development at Wombarra has polluted the ocean and adjacent rockshelf and yet neither council nor the EPA are able to stop it. Miniscule fines are imposed and the developers continue to destroy the delicate rockshelf microcosmic life and fill the gills of passing fish with their runoff at Coledale and Wombarra. I believe that until council has enough officers and teeth to impose properly enforced restrictions on those who seek only to make \$\$\$ from our magnificent coastline then this conversation is cursory. It has been heartbreaking to watch the effects of this devastation on that which we love and cherish.

Walking and Coffee Group

by Philip Shore Comans, 07 Jun 2022

About 10 years ago I joined a group of ladies (all ladies at that time!) who congregated on our very doorstep at 8am for a 7km walk over Sea Cliff Bridge to the Scarborough Hotel and back. Every Monday, Wednesday, Friday and Saturday this intrepid group would set off. Rain, hail, East Coast Low or shine, off they would go.

I was the first male to walk regularly with this group of girls. Over time, more of their male partners have joined in, and we have even had more men than women walking on an odd occasion!

This group has given us great joy and brought us into the local Stanwell Park, Helensburgh and Coalcliff community in a way that we couldn't have imagined.

The local natural beauty has kept our spirits up throughout the past 3 years, and we've been able to continue walking and keeping our community alive despite the pandemic's best endeavours!

Passive recreation in Puckeys Reserve

by John Prior, 2 Jun 2022

For more than twenty years, a group of friends met on Saturday morning at 8.00 am with our dogs on leads to walk through Puckeys reserve. Many other groups also regularly met and we all got to know each other.

Unfortunately we can no longer walk through this passive recreation area because Council has allowed Parkrun to run the track at this time. No one walks the track at this time, the time when the track was most heavily used for passive recreation. My wife, who has scleroderma, was hit by a runner, running flat out over the lagoon bridge. We walk elsewhere now, but my wife has given up now.

I know you wanted positive stories, but since Parkrun started in the Nature Reserve, part of our social get togethers and the Social get togethers of many other people has been destroyed . People running flat out are not doing this to enjoy the natural beauty of the area, or to enjoy the company of friends, and I cannot see why this group is allowed to destroy other peoples enjoyment of the area at the time when it would normally be at its busiest. I ask that you have some Councillors try to walk the track at 8.00 am on a Saturday morning and tell me that they found it a pleasurable experience

Crushing lack of foresight and memory

By Ten thousand tonnes of sense, 6 July 2022

I recently saw that blown sand from the recently cleared port kembla beach crushed the surf clubs own shed under tonnes of sand. I guess the surf club members didn't want to listen to the councils dune care staff about the importance of the spinifex and dune vegetation. They wanted to listen to the green wash group, beach care illawarra. They have some cherry picked paragraphs from science papers, and borrow drawings from dune vegetation texts to try and give their lack of science credibility the appearance of legitimacy.

Around most of Australia councils have been planting beach vegetation and restoring the dune structure. Clearly, there were substantial problems the councils were trying to solve by doing so. Could it be that without the beach vegetation that thousands of tonnes of sand can blow onto the council and private assets beside the beach and cause problems?

Has the council considered the possible litigation and damages bills it will be liable for by removing a perfectly function sand control vegetation system, and exposing multi million dollar properties to sand inundation and roof or wall collapse from blown sand?

Additionally, the shared paths for cycling and walking will be regularly unsafe to ride due to sand. Roads and drains will also need regular clearing. Additionally, due to rising sea levels, more expensive hard engineered sea walls will likely need to be installed to protect the exposed homes and council assets.

Does this council really have to repeat history by removing plants to find out why they were installed across the country in the first place? A few humble, and occasionally unattractive plants save the council thousands of paid work hours, machinery and fuel costs, footpath and road management problems, private litigation and compensation issues. Perhaps the council should cost how much it would be to install seawalls along the entire coastline? Then compare that cost to the work produced by some humble plants that get a little scarped sometimes.

Bondi beach has a seawall. They had to replace some railings on it recently that were destroyed in rough seas. Those seas produced very damaging reflective waves too.

A recent CSIRO paper estimated the cost of soft engineering (plants and vegetation) was ten times less expensive than hard engineering solutions to dissipate the increasing damage from coastal risks and storm events.

A better result at a tenth of the cost? That's the solution council needs to support and educate the community about!

The Blessings of Illawarra Mother Nature

By Annie Marlow, 7 July 2022

What do you reckon it means to look after our coastline? I'm pretty convinced that to make sure we have a good place to swim, have lots of fish to catch & birds to watch, to have some shade to walk in & sit under when its hot, good air to breath when we are running or working hard on a bike, the best way to go is to nurture Illawarra Mother Nature. She is among the best in the world for diversity & so eager to grow if you give her a bit of room.

Plenty of local veg in the right places will filter our water, increase our wildlife, keep us cool, protect the shorelines from erosion & keep the dunes in the right place. I can remember walking on PK beach before the dunes were wandering all over the place, it was lovely.

I really hope the Coastal CMP is going to pave the way for Illawarra Mother Nature to offer us more & more of these priceless but free services. Nurture her & she will nurture us.

APPENDIX 15 Written submissions

There were three written submissions received during the engagement period. However, Councillors regularly received other correspondence from residents relating to coastal issues. They have been considered in the engagement outcomes report and included here, verbatim.

Submission 1 – 15 June 2022



Doctors pool beneath Scarborough school



Old Clifton school pool

Dear sirs, I was very interested to read your recent Management Plan. a few comments.

1. Much the most obvious is the gross amount of sand lost along the coastline since this plan was written, with heavy erosion of the fore dune in a large area.
2. Possibly related to this, is the exposure of an engraving "COOK " with a "U" beneath.
3. I mentioned this to the library, who thought it could not be original, although a few of his crew came ashore about this point.
3. No mention is made in this report of the gross amount of sediment left in Bellambi Lagoon during this time. The lagoon is over 1 metre more shallow,) such that it is no longer possible for lilies to grow, hence swans no longer inhabit the area.
4. 18 years ago we usually had about 20 pelicans, 50 + ducks and similar number of coots, about 12 or more cormorants and pied cormorants, large and small, then we usually had ibis, egret, spoonbill and royal spoonbill, and the odd swan , plus infrequent visits by other birds. How very sad.
5. Is it possible to do 2 things. Dredge the lagoon again. and
6. have a smaller area upstream where the water could settle and drop its soil prior to flowing into the Lagoon?
7. Obviously the many hard road and roof surfaces have sped up the water flow into the lagoon, enabling it to carry so much sediment.
8. Toilets. I am aware that Mums who use the beautiful play area sometimes need access to a toilet. The neighbours next door have (rightly) strongly resisted one next door to their house.

However, I wondered whether one could be sited south of the shower area, backing into the fore dune in this area where it would not be too intrusive? Public access to this beach has increased greatly, many seeming to come from Sydney's Western suburbs. People from out of area also need access to such facilities.

Thankyou indeed for all the work you put into rubbish removal, mowing and general care of this beautiful area.

Submission 2 – 4 July 2022

Thanks so much for the opportunity to participate and contribute to the coastal Management program. A few quick things I have discussed with council previously listed below. I realise some of these are in due process already

1. I love the ocean pools (great maintenance program too).

There are several old pools (coalminer wash pools) that are no longer maintained however. The recent flooding and weather has unfortunately filled these pools in with huge bolders, slippage and silt and the are no longer that accessible to swim

- The old Clifton School Pool beneath Moronga park just south of the sea cliff bridge (photo attached)

- The school masters Pool beneath Scarborough Public school (Photo attached)

2. The plans for the great pacific walk way and bike track are great.

I would like to see these prioritised and completed which was meant to be completed in June this year.

The walk along the coast foot path currently next to Lawrence Hargrave drive LHD is dangerous at parts. The piece completed from Seacliff bridge to coalcliff is excellent! More of this please. Id love to be able to walk, run to down to the Wollongong on this pathway. Presently is stops at Morongo park in Clifton and then becomes difficult to negotiate heading south towards Austinmere

3. The noxious weeds on the coast have got out of control.

There are parts of the coast that are horrendous with Lantana, madeira vine, Sena and asparagus fern. They have been made that much worse with the recent flooding and water courses. The Section on both sides of Lawrence Hargrave drive from the Scarborough station to the renovated imperial hotel are particularly bad with Lantana. As is the headland at Moronga park at Clifton sth of Sea cliff bridge down towards the bridge (also parts from Coalcliff to Stanwell Park). It would be great to stop all this Lantana seed spreading and cut back the lantana and start planting endemic tube stock of the local natives. Coastal banksia, wattle, wstringa, teatree, etc and supressing the invasive lantana. More Bush regen please. A spot on the verge opposite the scarborough school is crying out for lantana control aswell

4. Railway Station access at Scarborough

The pedestrian 4WD ramp running north down to Lawrence Hargrave Drive LHD from the station is no longer accessible to get to the station. People catching the train to Scarborough have to

frogger across the road through the lantana and over the rail guard. Ideally a safety island would be introduced on LHD to meet this 4WD ramp, eg about 200 M north of the Scarborough school. This will provide safe access to the station when redoing the coastal walk and ease for patrons walking from the station to the Imperial pub.

5. Parking at Clifton

The seacliff bridge and Imperial pub have made parking an issue in Clifton. This causes issues for pedestrians doing the coastal walk as they have to take a risk and veer out onto the road to get past the cars. Another reason for better train station access and safer parking and a better coastal footpath to protect pedestrians.

Submission 3 – 6 July 2022



City Beach after dune reshaping



Cowper Street, Port Kembla



Olympic Boulevard, Port Kembla



Port Kembla Surf Club



Woonona after dune reshaping



Towradgi after dune reshaping



Towradgi after dune reshaping



Olympic Boulevard, Port Kembla



City Beach after dune reshaping



Woonona after dune reshaping

"This is the definition of insanity. Doing the same thing over and over expecting a different result. Why do BCI never comment on these issues. They show videos with little handpicked moments of success. Anything looks like it worked if that's all you show." They never show what it's like on a stormy day, or other beaches that have been scaped and in a short time will accrete again

Also, will the consultants talk to the dune vegetation contractors? They've been absolutely frustrated at the futile planting efforts at Port Beach where seedlings are blown out of the ground, or buried in sand.

Since the dune reshaping was done Cowper St it has been closed by sand a number of times.

One surf life-saver said "It eroded 10metres in a day, and then a week later, a change in the weather accreted in 20m.

The beach does repair itself really quickly if there is dune vegetation

But for the 10m of dune that bulldozers removed at Port Kembla Beach, it is now back in the swash zone, getting cycled around between the berm and the bank, and often blown into the road, onto the storage shed, on to the promenade, and over the pool outtake pump.

Our community needs some community education about beach geomorphology – there is so much misinformation like "dune vegetation destroying the surf". We still get sand banks offshore that makes good surf.

I'm concerned that the wheelchair ramp hasn't taken sand movements and beach geomorphology into account, and will be vulnerable to being buried or have a sharp drop-off.

https://www.wollongong.nsw.gov.au/_data/assets/pdf_file/0025/163276/Item-7-Tender-T1000055-Port-Kembla-Beach-Access-Ramp.pdf

- This work was necessitated by the Disability Inclusion Plan:
https://www.wollongong.nsw.gov.au/_data/assets/pdf_file/0026/117791/Disability-Inclusion-Action-Plan-2020-2025-accessible.PDF

To complement the accessible change facilities

- https://www.wollongong.nsw.gov.au/_data/assets/pdf_file/0024/133926/Item-18-Tender-T21-06-Port-Kembla-Beach-and-Pool-Amenities-Construction-of-an-Adult-Accessible-Change-Facility.pdf

I don't understand why disability at Wollongong Harbour, as a low energy wave environment wasn't chosen instead of Port Beach which is often has very high energy waves.

Once the PK dune was bulldozed (at a cost of \$114,000):

https://www.wollongong.nsw.gov.au/_data/assets/pdf_file/0015/37212/Tender-T18-50-Port-Kembla-Beach-Dunal-Reshaping.pdf

it has created many more problems, such as work on the Port Surf Shed.

It lead to the need for the pool intake pipe being smothered in sand, and led to this:

https://www.wollongong.nsw.gov.au/_data/assets/pdf_file/0026/143468/Item-10-Tender-T1000013-T2130-Port-Kembla-Pool-Intake-Stage-2.pdf

Plus building a viewing platform involved clearing more dune vegetation and concerns about cultural heritage: https://www.wollongong.nsw.gov.au/_data/assets/pdf_file/0021/104709/Item-10-Tender-T20-06-Construction-of-a-Viewing-Platform-at-Port-Kembla-Beach.pdf

This is an "end of pipe" engineering approach where an intervention leads to escalating intervention, with ever increasing expenses due to unforeseen flow-on effects, due to lack of holistic analysis.



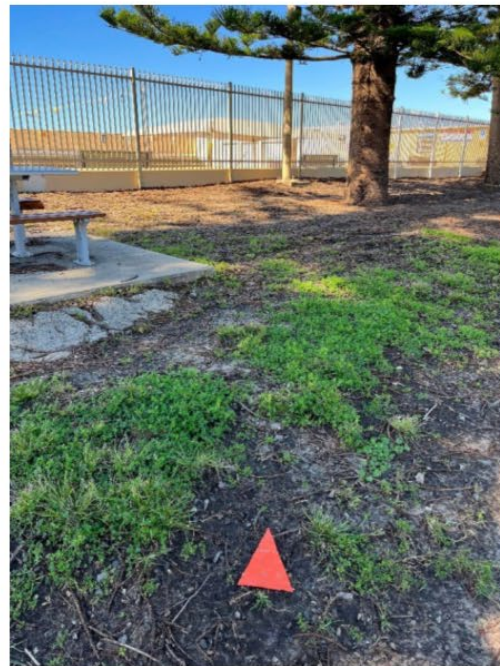
The last photo taken yesterday (6 July 2022), during a storm is 3km south of Port Kembla Pool. Showing the beach repair happening with vegetation intact. Erosion and sand replacement over kilometres of beach happens very quickly. Trying to step in and manipulate this thinking it's going to last is naive.

Submission 4a – 22 April 2022



Just picked up flags all over the beach and hill from a “safety fence” put up at Thirroul. Would you be able to ask for a review of plastic flag tape being currently used. More than 1/2 had blown off the rope in the wind. Lots are already out to sea. The remaining ones pulled off the rope with a slight tug. They’re sewn onto the rope with a single layer of fine thread. Not suitable for coastal installations. Just let the kids jump and collapse the sand scarp.

Submission 4b – 14 April 2022



“Oh FFS Thirroul beach. Same flag product along the whole park near the beach. Broken off flags everywhere

Council needs to stop using them. They’re a menace

Submission 5 – 11 April 2022



I am writing to you with concerns of the current state Puckey's and North Wollongong Beaches is in due to the heavy rains and flash floods.

My letter ... is about the current state Puckey's and North Wollongong beaches is experiencing.

After a month of heavy rain and the sun out yesterday, Sunday 10th April, I decided to drive to Puckey's beach for a long walk to Flagstaff Hill's light house. It has weeks since I visited there but upon arriving on the sand, were a group of Life Savers in yellow collecting debris after myself noticing broken sharp cans and rubbish, I turned around and walked back to a Life Saver standing at their buggy on the sand and asked if I could help and he gave me a large strong canvas white bag. He told me they had collected 4 syringes. I can only wear thongs at moment as my toenail has split.

Anyway, yesterday 2 hours later, I dragged the full and heavy bag and gave it to the Life Saver's like he told me to do when I finished, leaving it alongside their white Ute on North Wollongong Beach near the change rooms.

So, this morning I returned to Puckey's beach but no one was there. I used the council doggy green bags but I took my own gloves. Sadly it was worse this morning, the amount of debris was overwhelming and heart breaking.

Honestly, towards the end this morning after spending nearly 2 hours picking rubbish out of the debris. I felt tearful. I was alone, no other volunteers but only people walking or going in to surf.

I collected about 6 tennis balls ruined from the ocean but obviously lost by dog owners not far from Fairy Beach washed up. So many straws and bottle lids and so on and so on. Just enormous. This is no exaggeration.

I want to do this regularly but not on my own. We need volunteers who care about our ocean and beach. There was a lot of pieces of broken foam and the tiny lose white balls are far too many to collect. I collected the chunks of foam and disposed it into the red bin and the many glass and plastic bottles into the yellow bin.

Councillor, is there any volunteer groups whom I could contact to manage this area weekly?

Submission 6a – 9 September 2021

Very disappointed to see the dozer on the beach again.

When we met almost 12 months ago - I pleaded with you all to keep us informed about any dune reshaping or mechanical interventions. Why do you refuse to keep us in the loop?

Council staff assured us that revegetation of the dune would commence once conditions were favourable - why was the dune left to bare sand for another winter season allowing huge volumes of sand to be transported onto hard assets AGAIN??

Council seemed to be able to destroy the dune pretty quickly - surely the problem can be addressed in a timely and economically sustainable manner using recurrent resources like the 'dune crew'?

During the meeting, Council staff suggested they were applying for funding to fix the problem that council created in the first place. Has the dozer been funded using revegetation fund reported in media? How does the dozer fit that plan? Does Council even have a plan? It's anyone's guess.

Similar to last year, I'm calling on council to cease any further works unless:

1. Council provides the Port Kembla community adequate notification of any emergency beach scraping with a map or plan of where sand will be deposited, and how council will manage the sand from being transported rapidly back onto assets.
2. The reveg/dune stabilisation plan and timeline for commencement of works is shared publicly for feedback
3. Any dune scraping, sand placement and any other mechanical interventions are outlined and triggered by an appropriate scenario and environmental impact assessment as part of the attached mentioned coastal management program

Submission 6b – 20 September 2020

really disappointed to see a bulldozer on the beach this morning. who knows what the objective is - I could make all manner of assumptions or rumours. Council appears to refuse to communicate their intentions with the community.

A bulldozer is not routine maintenance - so I would expect to be consulted or informed at the very least of Council's intentions. Especially since we have a meeting planned for next week and I have explicitly expressed my interest in being consulted on this matter over the past 18 months.

It appears that the bulldozer was in fact removing establishing searocket (*Cakile* spp.) - incredulous given that its establishment following the winter storm season is a great sign for some sort of stability to the area that has been plagued by mobile sands following council's removal of vegetation from the dune 18 months ago. This indicates to me that council indeed has no intention of managing this area in a sustainable manner - that council is prepared to continue wasting our rates to remove sand from the road and boulevard on a weekly basis. I would love to see the dune crew spending their time managing bitou and revegetating unstable areas instead of driving bobcats.

Council has completely lost our trust. The initial dune works (approx 18 months ago) were not consistent with those outlined in the dune management strategy - they have extended well beyond the areas indicated in the strategy. As a result various subsequent works are now taking place in an attempt to rectify these mistakes. Therefore, I call on council to cease any further works until they clearly communicate their intentions, and provide an opportunity for the whole community to contribute ideas and feedback to any future works.

Submission 7



Port Kembla



Port Kembla



Port Kembla



Port Kembla

Hey Cath, with the coastal dune management. If i remember right there were three sites it was done. Woonona, towradgi, and port kembla.

Before there is a decision made on the continuation or cessation of this approach, surely there should be a costing for it?

At woonona and towradgi there was sand in the neighbours properties that was removed by council after complaints. What did that cost? How much money has been spent on using heavy machinery to move blown sand on the beach. How much to clear the roads and footpaths? How many council labor hours have been spent to "manage" the dune sand (when it was done for free by plants before)?

The surf club shed at port kembla has been crushed with blown sand. The sheer tonnes of sand now mean a new shed will have to be built. Will this cost \$500,000 to replace? Will the road need to be

shut at port due to blown sand destroying and killing the hind dune leptospermum (tea tree) and banksia's, and constantly making the road and footpaths dangerous?

Costing is essential, and those costs will just grow with time. Rock walls like near bulli point cafe, or concrete walls like north wollongong beach will end up being needed without vegetation. Very costly, ineffective, and they produce reflective waves. The dreaded result beach care illawarra says we need to avoid.

I'll send you some pics. Of port, but you should look for yourself too.

That picture with workers in it is the engineering inside the port kembla surf club 'shed'. It was pictured earlier being crushed by sand. How much did this engineering cost?

Submission 8 – 1 May 2022



I would like to make a complaint about beach hawl fishing activity in Port Kembla.

Not content with just trashing the ocean with unsustainable fishing practices and driving all over the beaches squashing ghost crabs, today I observed a convoy of beach hawl fishers accessing Fisherman's Beach in Port Kembla illegally over sensitive land.

The access track is currently closed due to being upgraded, so the fishers have removed bollards on the bike track and are driving over the land to get to the beach. The area they are driving on is a no dig zone due to it being of very high cultural significance. No dig includes no driving on when it is sodden. Council can't even mow due to it being so wet. Council also can't weed or plant in this area due to the no dig status - it is not ok that it's being trashed by fishers. See pics attached.

The fishers had a convoy of 4 fully loaded 4wds and 2 boats. The license number on the side of 3/4 of the vehicles was "987". One vehicle was unmarked.

I would appreciate a response at your earliest convenience.



Appendix E First Nations Engagement Report

FINAL DRAFT



OUR WOLLONGONG JOIN THE CONVERSATION



Coastal Management Program First Nations Engagement Report

October 2022

ECM:23818254 - Coastal Management Program - First Nations Engagement Report, October 2022

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The information in this report is based on data collected from community members who chose to be involved in engagement activities and therefore should not be considered representative.

This report is intended to provide a high-level analysis of the most prominent themes and issues. While it's not possible to include all the details of feedback we received, feedback that was relevant to the project has been provided to technical experts for review and consideration.

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Executive Summary

Wollongong City Council is developing a Coastal Management Program (CMP) to ensure our coast and coastal assets are protected, enhanced, and effectively managed.

The NSW Government requires all coastal Councils to prepare CMPs in accordance with the NSW Government's Coastal Management framework. This framework set out five specific stages to develop a CMP. We are currently at Stage One, identifying the scope of the CMP.

Community Engagement

Council contracted consultants to deliver both the output of Stage One, the Scoping Study, as well as the community engagement required to inform the Scoping Study.

As the coast holds significant cultural and historical value to First Nations peoples, target community engagement was undertaken with our Aboriginal community. This was carried out internally by Council's Engagement team.

The stakeholders identified prior to the engagement period included Traditional Custodians and Owners, knowledge holders, Aboriginal groups, organisations, and individual community members.

The engagement for Stage One followed the key principles of our Aboriginal Engagement Framework and aimed to inform, engage, build trust, and connect with the local Aboriginal community. The engagement was designed to create the building block for deeper and focused engagement in future stages of the project.

Based on these principles, our approach ensured we:

- had an extensive engagement period to allow organic and appropriate engagement opportunities to be pursued
- held any engagement activities where our stakeholders would feel most comfortable
- showed our appreciation by catering for most meetings.

This approach was shaped by the learning of several recent Aboriginal engagements, in particular the Stuart Park engagement. From this, we learned the importance of developing a relationship first, before asking for feedback, and the value of persistent follow up.

Methods

A variety of communication methods were used to contact and inform stakeholders, including phone calls, emails, text messages and the distribution of a flyer (both printed and electronic copies).

We left the engagement method open so we could adapt to the preferences of the stakeholders. In the end, however, all stakeholders chose to meet with us in person.

Participation

Engagement activities included:

- 10 face to face meetings with six stakeholders.
- Participation in two workshops by one stakeholder.
- Two informal discussions with two stakeholders.

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Results

The project was positively received by stakeholders, and they wished to be further engaged by the project. We were extended invitations to meet with all stakeholders again.

All stakeholders expressed interest in meeting face to face again and when asked, expressed that it was their preferred method of engagement.

Some coastal issues were discussed in our meetings, including erosion, threat of development, invasive species, fire, and accessibility, however, it is acknowledged that further engagement is required to properly engage on values and issues.

One participant cautioned us to remember to take a wholistic approach, and consider the coastal zone in relation to the surrounding landscape. Another stakeholder expressed interest in the project creating employment opportunities for Aboriginal people or businesses.

Illawarra Local Aboriginal Land Council (ILALC) provided detailed feedback covering a variety of aspects of the project and have expressed a strong interest in playing an active role in future phases of engagement.

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Background

The CMP will set the long-term strategy for the coordinated management of our coast. It will identify coastal management issues and actions, and balance priorities for environmental, cultural, recreational, and commercial values, along with adaptation to emerging issues such as sea-level rise and a changing population. The CMP will also detail how and when those actions are to be implemented, their costs, how they will be funded and by whom.

The NSW Government encourages all coastal Councils to prepare CMPs. CMPs must be prepared in accordance with the NSW Government framework that includes meeting the obligations under NSW Coastal Management Act 2016 and the five stages outlined in the NSW Coastal Management Manual.



In 2022, we commenced Stage One and began the scoping phase. The primary objective of the scoping phase is to understand what our community values about our coast and identify current and future issues in coastal areas. This is to help us develop a shared understanding of the current state of the coastal zone, and identify issues and areas of focus of the new CMP.

Community Engagement

Community engagement is critical to developing a shared understanding of community values, and to identify risks and focus areas for the CMP. Due to the scale of the project and resources required to deliver within the project timeframe, Council contracted consultants, Salients, and their partners, Spectrum Comms, to deliver both the Scoping Study and the broader community engagement required in Stage One.

The First Nations engagement was carried out by Council's Engagement team instead of the project's consultants.

First Nations Engagement

We recognise the coast holds enormous cultural importance to First Nations peoples. There are many sites across the coastal areas of the Wollongong City Council Local Government Area that are significant to the Traditional Custodians of the land on which the city is built, the Aboriginal people of Dharawal Country.

Stakeholders

Stakeholders identified prior to the start of the engagement period included:

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Purpose of Engagement

The purpose of the engagement during Stage One was to:

- **Inform** – tell the Aboriginal community about the project and invite them to be part of it. Share information about how the project might benefit them.
- **Engage** – Have conversations and find out how each group or individual want to be engaged in the future.
- **Build trust** – open doors and built relationships with the Aboriginal community.
- **Connect** - Create connection and spark collaborations.

Connections and information from Stage One will support future engagement with Aboriginal people, in future stages of the CMP.

Aboriginal Engagement Framework

Wollongong City Council's [Aboriginal Engagement Framework](#) requires projects that directly impact Aboriginal people to include targeted engagement with Aboriginal people. Due to the significance of the coastal area, this project is considered to directly impact Aboriginal people.

The Framework also outlines our commitment to the Aboriginal community to engage in a meaningful and consistent way. The First Nations engagement was carried out by Council's Engagement team to deliver on these commitments and to continue to build trusting, meaningful and long-lasting relationships. The numerous stages of this project provide space for these to be developed over the duration of this project and beyond.

We are committed to continually learning and improving our engagement so that Aboriginal people have increasingly genuine opportunities to contribute their voice to the projects that affect them.

Approach

Wollongong City Council's Aboriginal Engagement Framework includes key principles that have shaped this engagement. The principles convey that we will:

- allow time for authentic engagement
- include Aboriginal people in matters that directly affect them and involve them throughout the life of the project
- seek to build trust.

In implementing the principles, we allowed for an extensive engagement period, which took place from June to October 2022. This ensured our engagements were organic, instead of rushed or forced, and were organised around our stakeholders' busy schedules rather than a project timeline.

We also sought to meet our stakeholders where they were most comfortable, whether that be at their office or centre, or a café or venue in their local area. In many cases, we also brought morning tea or shared a meal or snack with our stakeholders to show respect and appreciation of their time, participation, and valued contribution.

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Our approach was also influenced by some of the learnings of other Aboriginal engagements, notably, the Stuart Park Aboriginal engagement. From this engagement we learnt the importance of building a relationship first, before asking for feedback. As such, this has been the focus of our engagement in Stage One of the CMP. We hope to build from these relationships a trusted channel for our stakeholders to provide honest input into this project.

The Stuart Park engagement also taught us the value of consistent and repeated follow up with stakeholders. We learned that it's important to remember that just because you haven't heard from stakeholders, it doesn't mean they aren't interested. This may mean contacting the same stakeholders at different times of day, or via different methods until you make contact. This approach can take time but is effective.

Methods

A variety of communication methods, which were tailored to each stakeholder's preferences, were used to reach the stakeholders. Additionally, the engagement method was left open and flexible so we could adapt to each stakeholders preferred method. However, in the end we only used one method, as all stakeholders chose to meet with us in person.

Table 1: Details of Communication and Engagement Methods

Methods	Details of Methods
Communication Methods	
Phone calls	At least 20 phone calls were made to stakeholders to introduce the project, arrange and confirm meetings and follow up.
Email	At least 25 emails were sent to key stakeholders identified through an analysis process to introduce the project, provide further information and to follow up.
Flyer	A printed flyer about the project was handed out to stakeholders at events and engagements. An electronic version was emailed to stakeholders.
Text message	Text messages were used ad hoc to communicate with stakeholders, arrange and confirm meetings and follow up.
Engagement Methods	
Stakeholder meetings	A summary of each discussion and any feedback given was documented in meeting notes.
Informal discussions	Informal discussions were initiated at events where it was appropriate to discuss the project and flyers were provided.

Results

All stakeholders identified in the analysis were contacted and invited to be involved in the project, and stakeholders who didn't response were followed up multiple times.

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Engagement Participation

This section provides details on the participation in engagement activities and feedback received during the exhibition period. Details of the number of participants for each engagement activity are presented in Table 2.

Table 2: Participation in Engagement

Engagement Activities	Participation
Face to face meetings with stakeholders	10 meetings with 6 stakeholders
CMP Advisory Working Group attendance	1 stakeholder
Workshop participation – attendance at CMP Risk Assessment (Coastal Use Area) Workshop	1 stakeholder
Informal discussions at events	2 discussions with 2 stakeholder groups

Submission results

We received feedback from six stakeholders, including Aboriginal organisations, groups, Elders, Traditional Owners/Custodians, and individuals.

Project positively received

The stakeholders we met with appeared to receive the project information positively. There were no concerns raised at this point about Council developing a CMP, except from one specific stakeholder group. Their feedback is summarised in a specific section further in this report.

Some stakeholders asked questions to clarify aspects of the project or to gain more detail or understanding.

Some stakeholders asked who we had already engaged and who else we will be talking to. The detail provided varied as the number of stakeholders we spoke with grew.

One stakeholder group suggested we present the project to a special interest group and provided an introduction. This has been followed up and we will include this group in any future engagement.

Interest in being further engaged

All stakeholders expressed interest in being further engaged with the project.

One stakeholder group offered to assist with cultural mapping if it was to be undertaken in a future stage of the project.

One participant expressed concern with the authenticity of our engagement due to historical interactions with Council. They expressed that in the past, they have talked to Council, but things do not change.

Engagement method

All stakeholders expressed interest in meeting face to face again and when asked, expressed that it was their preferred method of engagement. We were invited back to have a yarn as needed.

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Coastal Issues

Erosion – Two stakeholders queried the project team about erosion issues in the local area and whether the project can address this. It was explained that erosion will be looked at in the CMP process, and that this will include identifying the priority issues and where they occur, followed by identifying and collaborating with stakeholders on the best management options.

Threat of development – One stakeholder group discussed the threat of development as an issue related to coastal management. This topic was raised in general discussion and could benefit from further exploration in future stages.

Invasive species – One stakeholder group, with experience in bush regeneration along coastal lands and passionate about caring for Country, identified invasive species as a prominent coastal issue. This has impacted native species and diminished the availability of bush tucker.

Fire – Fire was raised briefly by one stakeholder group as a perennial issue and something they actively mitigate by planting fire-retardant species in strategic sites within their local area.

Accessibility – One stakeholder group suggested the accessibility of the coastal area could be improved to provide people with mobility issues access to the beach area for recreation. They suggested that it could also improve passive surveillance of the dune area (where it was suggested anti-social behaviour takes place). It was suggested that formalising accessways would have an added benefit of helping to protect the dunes and vegetation.

General Comments

Wholistic approach - One participant cautioned us to remember that even though this process only covers the coastal zone, its relationship with the broader landscape needs to be understood and it cannot operate in isolation.

Employment opportunities – One stakeholder expressed interest in the project creating employment opportunities for Aboriginal people or businesses.

Illawarra Local Aboriginal Land Council – Proposal

Illawarra Local Aboriginal Land Council (ILALC) have been engaged in the project throughout 2022, and have given highly valued and detailed feedback on the CMP process.

ILALC have consistently expressed a strong interest in being actively involved in the community engagement process and have committed to directly facilitating engagement with their membership in future engagement activities.

ILALC also provided feedback related to the general approach for development of CMPs by local governments. ILALC's jurisdiction covers five LGAs, of which three have coastlines and therefore need to develop CMPs (Wollongong, Shellharbour and Kiama).

Due to this, ILALC have proposed an integrated approach be developed to enable their organisation to provide wholistic input, instead of input into each separate Council's CMP process. This approach has been pursued over several meetings, resulting in the possibility of ILALC providing input into Wollongong and Shellharbour's CMPs through an integrated process.

In relation to coastal values and issues, ILALC have expressed that they believe there is an immediate and tangible threat to Aboriginal coastal values due to natural and cultural factors. ILALC believes that any scoping study that aims to identify the risk to coastal assets needs to address and include the

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substantial threats to coastal cultural values and assets, both of increasing environmental risks and any management solutions developed to mitigate the risks to other assets, including roads etc.

See Appendices 1 for ILALC's full response.

Next Steps

Our conversations with the Aboriginal community are ongoing, and will continue after this report has been finalised.

Further engagement is required to gain deeper feedback from the Aboriginal community, specifically around coastal values and issues. It was premature to discuss values and issues with stakeholders in our meetings, as the purpose of the first meetings was to build trust and establishing a relationship. The engagement undertaken to date has laid the groundwork for this to occur.

The next step in the project is the finalisation of the Scoping Study, which needs to be adopted by Council and the NSW Government before we can progress to Stage Two. Stage Two will determine the risks, vulnerabilities and opportunities for the program. This stage will require further engagement with both the Aboriginal community and broader community which is anticipated to take place in early 2023.

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Appendices

Appendices 1: Illawarra Local Aboriginal Land Council - Proposal

Scoping Study – Aboriginal Cultural Assets and Values

1. Background

The coastal region of the Wollongong LGA is extremely important to Aboriginal Traditional Owners and Custodians, Aboriginal people who have historical ties and connection with this region, as well as the broader Aboriginal community. The landscape that is the focus of the Coastal Management Programs (CMP) lies within the lands of the Dharawal speaking people of the Dharawal Nation. This coastal land holds deep family kinship connections embodied through memories and lives of people and community, extending through time to the ancestors that created this part of the Country.

Continuing cultural practices, interwoven with the land and sea environment, have been maintained for a millennium. Cultural practices across the coastal region, such as food and medicine gathering, teaching and learning, ceremonies and crafts, instil a great sense of wellbeing and responsibility for the conservation of resources in the extended Aboriginal community and demonstrate a continual and deeply rooted held respect for Country.

This coastal region within the Wollongong LGA is integral to a number of dreaming narratives and is an important place for resource gathering and use, occupation, connection to Country and teaching and learning.

As outlined in the Illawarra – Shoalhaven Regional Plan, the region "has a rich and diverse heritage reflected in the strong links between the Aboriginal people and the region's coastline and escarpment – which are important cultural landscapes - and in the historic sites and townships associated with early European settlement" (DPE, 2015). Directive 3.4 of the Regional Plan notes that protecting this cultural heritage is important to the region's communities, its identity and character, and contributes to the visitor economy.

2. Threats to Cultural Values

Past studies have identified a number of cultural values and assets associated with the Wollongong coastal region. There are approximately 50 previously recorded Aboriginal sites registered on the Aboriginal Heritage Information Management System (AHIMS) database, including artefact scatters, middens and a burial site located along the Wollongong LGA coast. An additional 60 Aboriginal sites are located around the fringe of Lake Illawarra (within the Wollongong LGA boundary). Additionally, there are three Aboriginal Places located within the coastal region of the Wollongong LGA: Sandon Point, Bellambi Point and Era Beach Resting Place Aboriginal Place.

The full extent of Aboriginal cultural values and assets has not previously been established. Aboriginal people are the primary source of information about Aboriginal cultural heritage values (cultural significance), and determining the cultural values within a region can only be done by Aboriginal knowledge holders. Additionally, the full extent of tangible Aboriginal sites remains unknown and previously unrecorded sites may occur.

Previously identified cultural values and assets along the Wollongong coastline are being actively destroyed. Aboriginal coastal cultural values and assets will increasingly be at risk due to a number of threats/hazards, including:

- Coastal Hazards:
 - Wave overtopping
 - Coastal inundation
 - Beach erosion
 - Shoreline recession
 - Tidal Inundation

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- Dune instability
- Coastal cliff or slope instability
- Surface runoff/direct erosion from increased storm frequency.
- Overdevelopment in the coastal zone
- Poorly suited or inappropriate development
- Risk of damage from people who are not aware of their presence/significance (i.e. by trampling)
- Deliberate damage (i.e. vandalism)
- Population growth (tourism and recreational pursuits)
- Management measures to protect other coastal values (i.e. dune stabilisation, revegetation etc.)
- Insufficient or inappropriate governance and management of this coastal environment

3. Gaps in Cultural Values Knowledge

The Aboriginal cultural values and assets within the Wollongong LGA coastal region remain partly unknown. This scoping study has identified that previously recorded Aboriginal coastal cultural values and assets, and those still to be identified, are at risk due to coastal hazards. These risks are significant enough to warrant a detailed technical study to inform the CMP. This technical study should be undertaken in Stage 2 of the CMP process.

This technical study will apply a community-led placed-based approach to identify the known and predicted Aboriginal cultural values within the Wollongong LGA coastal regions. These values will be determined by Traditional Owners, custodians and knowledge holders. Aboriginal people will play an active role in the cultural values assessments and be central to controlling how these values are best protected, conserved, and/or managed.

The technical study will undertake a cultural values vulnerability assessment, utilising the outcomes of the key hazards assessments to determine the risks, vulnerabilities and opportunities relevant to Aboriginal Cultural Values. Coastal management issues relating to Aboriginal cultural values and assets and high-level actions and/or interventions to manage the impacts of coastal hazards as identified by the Aboriginal community will inform Stages 3 – 5 of the CMP process.

Table 1: Desired items for CMP Preparation: Forward plan, indicative cost, timeline and responsibility

Recommended Studies/Components	Priority	Timing	Cost (low)	Cost (high)	Lead Organisation	Support Agency/Organisation
Wollongong Coastal Values Project – Aboriginal cultural values, current status, risks and vulnerabilities.	HIGH	2023-2024	\$30,000	\$80,000	ILALC	DPE, NPWS, Crown Lands (in principle support)



Appendix F Community and Stakeholder Engagement Plan

FINAL DRAFT

COMMUNITY ENGAGEMENT PLAN

WOLLONGONG COASTAL MANAGEMENT PROGRAM



SPECTRUM COMMS.

We acknowledge that within the Wollongong Local Government Area boundaries are the Traditional Lands of the Dharawal people.

We acknowledge these Aboriginal peoples as the traditional custodians of the land on which this Project is located and pay our respects to Elders past and present.

We also acknowledge all other Aboriginal and Torres Strait Islander people who now live within the Wollongong Local Government Area.

DISCLAIMER

This plan has been prepared by Spectrum Comms on behalf of Wollongong City Council and may only be used and relied on for the purpose as set out in section 1 of this plan.

Spectrum Comms otherwise disclaims responsibility to any entity other than Wollongong City Council arising in connection with this plan. Spectrum Comms also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by Spectrum Comms in connection with preparing this plan were limited to those detailed in the plan.

The opinions, conclusions and any recommendations in this plan are based on conditions encountered and information reviewed at the date of preparation of the plan. Spectrum Comms has no responsibility or obligation to update this plan to account for events or changes occurring subsequent to the date the plan was prepared.

Spectrum Comms has prepared this plan on the basis of information provided by Wollongong City Council and which Spectrum Comms has not independently verified or checked beyond the agreed scope of work. Spectrum Comms does not accept liability in connection with such unverified information, including errors and omissions in the plan which were caused by errors or omissions in that information.

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DOCUMENT CONTROL

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Draft V1	Salena Avarð	Salena Avarð	1 March 2022
Draft V3	Alysia Norris	Alysia Norris	23 May 2022
Draft V4	Alysia Norris	Alysia Norris	24 May 2022
Draft V5	Alysia Norris	Alysia Norris	30 May 2022
FINAL	Alysia Norris	Alysia Norris	15 June 2022

REFERENCE DOCUMENTS

DOCUMENT	AUTHOR
Project Specification – E1000081	City of Wollongong
Guideline for Community and Stakeholder Engagement in Coastal Management	NSW Government
Community Engagement Policy	City of Wollongong
Aboriginal Engagement Framework	City of Wollongong

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1 INTRODUCTION

1.1 ABOUT THE PROJECT

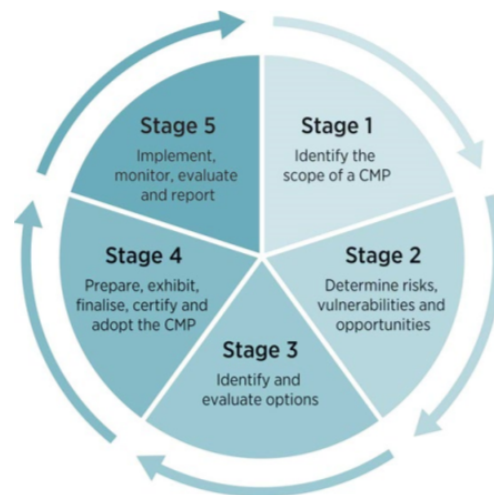
Wollongong LGA is home to approximately 60km of coastline, from the Royal National Park in the north to Lake Illawarra in the south. The character and functionality of Wollongong's coastline; a blend of beaches, dunes, cliffs, headlands and rock platforms, plays an integral part in the experience of the city for residents and visitors alike.

The Coastal Management Act 2016 requires Wollongong City Council (Council) to prepare and implement a Coastal Management Program which will detail the future use, management, and development of the Wollongong coastal environment in an ecologically sustainable way, for the social, cultural and economic well-being.

To meet these requirements, Council has engaged Salients Pty Ltd and Spectrum Comms, to work with Council to consult with local community, relevant public authorities and other stakeholders to inform the preparation the Wollongong Coastal Management Program (CMP).

The preparation of the Wollongong CMP involves five stages:

- Stage 1: Identify the scope of the CMP
- Stage 2: Determine risks, vulnerabilities, and opportunities
- Stage 3: Identify and evaluate options
- Stage 4: Prepare, exhibit, finalise, certify, and adopt the CMP
- Stage 5: Implement, monitor, evaluate and report

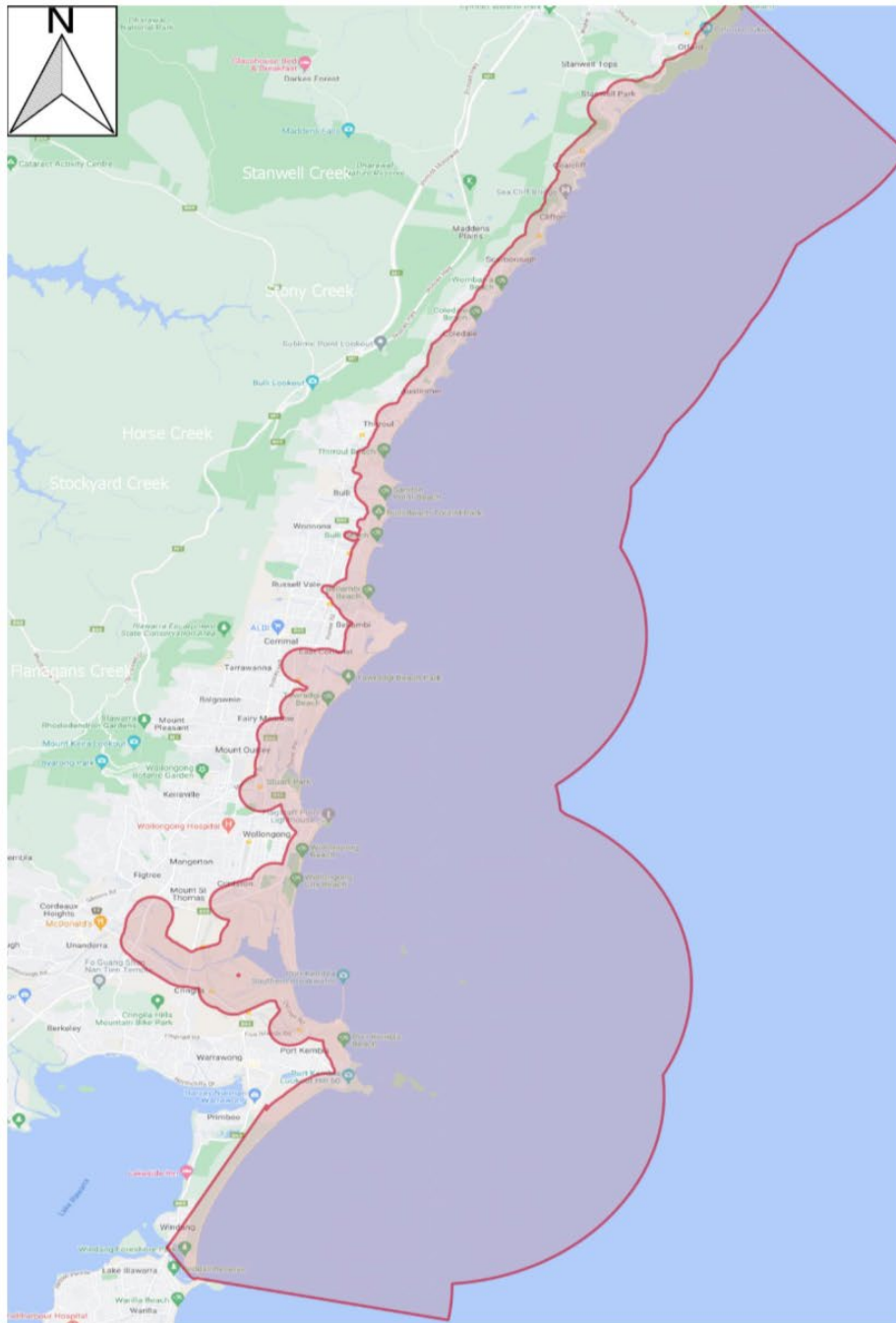


This Community Engagement Plan (CEP) outlines the methods and tools for effective engagement with the Wollongong community and other stakeholders to inform preparation and implementation of the Wollongong CMP.

1.2 PROJECT LOCATION

This project encompasses the full length of the coastal zone, approximately 60km of coast within the City of Wollongong LGA.

Figure 1 Locality map



1.3 OBJECTIVES

The objectives of this CEP are to:

- Deliver an honest, innovative, flexible and transparent community engagement process
- Inform the community and other stakeholders about the preparation of the CMP and the associated engagement activities
- Ensure the commitments made to the community during project discussions, are tracked and met
- Close the loop with community and other stakeholders to ensure they understand how their input is incorporated into the final plan.

During the five stages of this project, the level of consultation and the types of conversations will vary, as will the desired outcomes:

PROJECT STAGE	OUTCOMES
Stage One	<ul style="list-style-type: none"> • Establish key relationships • Build community awareness about CMP • Establish a collective vision for the Wollongong coast • Collate community themes and values related to the coast
Stage Two	<ul style="list-style-type: none"> • Establish an understanding of the risks and opportunities presented by the Wollongong coast • Identify risks • Identify opportunities
Stage Three	<ul style="list-style-type: none"> • Establish local targets for change • Ratify community prioritisation of actions • Explore management options
Stage Four	<ul style="list-style-type: none"> • Encourage community ownership of priority actions • Grow awareness of funding opportunities for key actions • Clarify the roles of key contributors to action
Stage Five	<ul style="list-style-type: none"> • Inform the community of the plan actions and outcomes • Articulate opportunities for community involvement in the plan implementation • Close the loop with participating stakeholders

1.4 ROLES AND RESPONSIBILITIES

Council has ultimate responsibility and accountability for engaging the community to an appropriate level to inform development and implementation of the Wollongong CMP. The development and delivery of related communication and engagement activities for Stage One is supported by Salients and Spectrum Comms.

Communication and engagement during Stages Two to Five will be delivered collaboratively between Council and Council's preferred consultants. This is a living document that will be updated regularly as the project progresses, with each stage informed by engagement processes in the previous stages.

Table 1 Key roles for communication and stakeholder engagement

ORGANISATION	ROLE	RESPONSIBILITIES AND AUTHORITIES
Council	Project Principal	<ul style="list-style-type: none"> Convene meetings between key parties, as required Provide a conduit for communication between key parties Provide relevant background information, studies, reports required to inform this Project Be the key point of contact for this Project within Council Oversee the Project budget Media spokesperson for the Project
	Community engagement team	<ul style="list-style-type: none"> • Provide the consultants any raw consultation data that may be relevant to the Project • Liaise with other Council teams to roll out communication related to the project • Provide advice on engagement opportunities • Undertake First Nations engagement
	Councillors	<ul style="list-style-type: none"> • Adopt the final Coastal Management program • Support the communication and engagement activities for the Project
	Executive team	<ul style="list-style-type: none"> • Endorse the CEP for implementation • Support the communication and engagement activities for the Project
Salients	Technical consultants	<ul style="list-style-type: none"> • Development of the Scoping Study for the CMP • Support the communication and engagement activities for Stage One
Spectrum Comms	Communication and stakeholder engagement	<ul style="list-style-type: none"> • Development of the CEP • Delivery of communication and engagement activities as described in the CEP for Stage One
Consultants	Technical and stakeholder engagement	<ul style="list-style-type: none"> • Delivery of communication and engagement activities as described in the CEP for Stages Two to Four Support the communication and engagement activities for Stages Two to Four

2 ENGAGING THE KEY STAKEHOLDERS

Community engagement is a process of involving people that are affected by or interested in a decision. It enables good governance, problem solving and decisions that are balanced and informed, resulting in better outcomes. It supports transparency, builds trust in the decision-making process and an understanding of decisions.

Council has recently completed an extensive conversation with the community in the preparation of the Community Strategic Plan. The coast and coastal assets featured prominently during this engagement as well as many of Council's other engagements in the past. Relevant existing data, along with stakeholder contributions, have influenced the development of this CEP.

2.1 REPRESENTATIVE ENGAGEMENT

With a population of more than 300,000 residents the vibrant coastal region of Wollongong LGA is the third largest city in NSW and the 10th largest in Australia, by population.

The median age of Wollongong residents is 39 years and according to statistics from the 2016 Census there are almost 80,000 families who call Wollongong and surrounds home.

Of this community, 78.5% said they were born in Australia. The top five countries of the remaining 21.5% who were born overseas are listed as UK, China, Former Yugoslav Republic of Macedonia, Italy and New Zealand.

In the 2016 Census, Wollongong's indigenous population was counted as 5,343 people including Aboriginal and Torres Strait Islander communities.

There are more than 13,000 businesses operating in the diverse economy of the Wollongong LGA, with the vast majority being small to medium enterprise.

The three largest industries represented in Wollongong, based on employment and value-add, are:

- Hospitals, Health Care and Aged / Social Assistance
- Education and Training
- Service Industries; including hospitality, supermarkets and grocery stores.

This engagement plan aims to engage a true representation of the Wollongong community and coastal zone users.

2.2 IDENTIFYING THE KEY STAKEHOLDERS

For the purpose of this CEP, Council defines community as individuals, groups and organisations that have a vested interest in the people of and the Wollongong LGA.

To facilitate the greatest possible knowledge sharing, and to provide effective and genuine input into the creation of the Coastal Management program, stakeholders will be divided into stakeholder groups.

Table 2 List of stakeholders

STAKEHOLDER GROUP	STAKEHOLDER	CONSIDERATION/INSIGHT
Residents	<ul style="list-style-type: none"> Coastal property owners Neighbourhood groups Vicinity Local Regional CALD focused groups: <ul style="list-style-type: none"> Mandarin and Cantonese Language Group Macedonian Orthodox Community Of The City of Greater Wollongong Multicultural Communities Council Interagency 	<p>Erosion and recession, inundation</p> <p>Access and infrastructure</p> <p>Recreation and sport, health and well-being,</p>
Visitors	<ul style="list-style-type: none"> Coastal users who reside outside of the Wollongong LGA Domestic visitors International visitors 	<p>Visitor economy considerations</p>
Businesses	<ul style="list-style-type: none"> Immediate vicinity Tourism / Visitor Economy <ul style="list-style-type: none"> tour operators (e.g Pines Surfing Academy, Illawarra Surf Academy, Australia Surf Tours) accommodation operators (e.g. tourist parks) industry and advocacy groups (e.g Destination Wollongong Board, South Coast Tourism Industry Association, Business Illawarra, Invest Wollongong) Local Regional Coastal event organisers University of Wollongong Sydney Water Corporation 	<p>Opportunities, concerns</p> <p>Illawarra Infrastructure & Investment Summit</p>
First Nations People	<ul style="list-style-type: none"> Illawarra Local Aboriginal Land Council Aboriginal Reference Panel Coomaditchie Aboriginal United Corporation Illawarra Local Aboriginal Land Council (ILALC) Illawarra Aboriginal Corporation (IAC) Illawarra, Wingecarribee Alliance Aboriginal Corporation South Coast Native Title Claimants <p>Local Aboriginal Community groups</p>	<p>Traditional custodians, insight and observances</p> <p>Knowledge sharing, coastal accessibility</p>

STAKEHOLDER GROUP	STAKEHOLDER	CONSIDERATION/INSIGHT
	<ul style="list-style-type: none"> Wollongong Northern District Aboriginal Corporation Illawarra Aboriginal Community Base Working Group IAC Aboriginal Elders Group – women elder's group Illawarra Koori Mens Support Group – men elder's group Sandon Point Joint Management Partnership 	
Recreation & Sporting Organisations	<p>Surf Life Saving Illawarra</p> <ul style="list-style-type: none"> Stanwell Park Beach Windang Beach North Wollongong Beach Wollongong City Beach Bulli Beach Sandon Point Beach Thirroul Beach Austinmer Beach Coledale Beach Corrimal Beach Port Kembla Beach Woonona Beach Fairy Meadow Beach Towradgi Beach Bellambi Beach Coalcliff Beach Scarborough/Wombarra Beaches <p>Marinas & Yacht Clubs</p> <ul style="list-style-type: none"> Wollongong Yacht Club Illawarra Yacht Club <p>Boardrider groups</p>	Knowledge sharing, concerns, opportunities
Environmental Interest Groups / Organisations	<ul style="list-style-type: none"> Landcare Illawarra Illawarra Intrepid Landcare Bushcare Dunecare Surfrider Foundation - South Coast 	Knowledge sharing, concerns, opportunities
Government Agencies	<ul style="list-style-type: none"> Department of Planning and Environment (Coastal and Estuary, Planning, Crown Lands) Department of Primary Industries (Fisheries) Office of Local Government National Parks and Wildlife Service Marine Estate Management Authority Local Land Services Transport for NSW (RMS) Housing and Property 	Knowledge sharing, context, historical data
Emergency Services	<ul style="list-style-type: none"> Marine Rescue State Emergency Service 	Knowledge sharing, historical data, concerns
Elected Representatives	<ul style="list-style-type: none"> City of Wollongong Councillors Paul Scully MP Lee Evans MP Ryan Park MP Alison Byrnes MP Stephen Jones MP 	Knowledge sharing, concerns, opportunities

STAKEHOLDER GROUP	STAKEHOLDER	CONSIDERATION/INSIGHT
Media	<ul style="list-style-type: none"> • Illawarra Mercury • Wollongong Northern Leader • Illawarra Star (Daily Telegraph) • i98 FM • ABC Illawarra • Wave FM 96.5 • Vox 106.9 • WIN News • Nine News 	Media opportunities


3 OUR APPROACH TO ENGAGEMENT

The NSW Government guidelines for community and stakeholder engagement related to the CMP process recommend the use of the International Association for Public Participation (IAP2) spectrum.

As shown in Figure 2, the spectrum identifies five levels of engagement, the goal of each level and the community's role in decision-making and implementation. The greater the impact of the Project on a stakeholder, the greater their input into the decision-making participation should be. The selection of tools and methods should reflect the required participation level.

Using the IAP2 spectrum, the communication and engagement approach for the Project will be a combination of Inform, Consult, Involve and Collaborate.

Figure 2 IAP2 Public Participation Spectrum

INCREASING IMPACT ON THE DECISION 					
	INFORM	CONSULT	INVOLVE	COLLABORATE	EMPOWER
PUBLIC PARTICIPATION GOAL	To provide the public with balanced and objective information to assist them in understanding the problem, alternatives, opportunities and/or solutions	To obtain public feedback on analysis, alternatives and/or decisions	To work directly with the public throughout the process to ensure that public concerns and aspirations are consistently understood and considered	To partner with the public in each aspect of the decision including the development of alternatives and the identification of the preferred solution	To place the final decision making in the hands of the public
PROMISE TO THE PUBLIC	We will keep you informed	We will keep you informed, listen to and acknowledge concerns and aspirations, and provide feedback on how public input influenced the decision	We will work with you to ensure that your concerns and aspirations are directly reflected in the alternatives developed and provide feedback on how public input influenced the decision	We will look to you for advice and innovation in formulating solutions and incorporate your advice and recommendations into the decision to the maximum extent possible	We will implement what you decide

3.1 ENGAGEMENT AND COMMUNICATION METHODS

A range of online and offline methods may be used to communicate with and engage the community and other stakeholders during each stage of the Project. Methods should remain open to change and be negotiated with the community and other stakeholders at each stage of the Project.

Table 3 List of communication and engagement methods

METHOD	OPPORTUNITY	PARTICIPATION LEVEL
Advertising	Paid notices to promote engagement opportunities including public exhibition of the draft CMP	Inform
Briefings	Formal meetings with key stakeholders including Councillors and MPs	Inform Consult Involve
Community drop-in sessions	Local drop-in sessions for community to drop in and speak to the project team, view documents and maps, ask questions and provide feedback	Inform Consult
Conversations and site visits	Meet First Nations groups or individuals in appropriate locations to have conversations	Inform Consult Involve
Discussion Forums	Develop online discussion forums to enable to community to generate ideas, identify issues and to discuss community values.	Consult Involve
EDMs	Coordinated emails to stakeholder databases to provide Project updates, an overview of engagement opportunities and information	Inform
Engagement HQ online platform	Establish a project webpage for use throughout the stages of CMP development. Utilise built-in tools such as surveying, interactive mapping, stories, events, FAQs and galleries.	Inform Consult Involve
Media releases	Proactive media statements or announcement provided to the media and other key stakeholders to provide updates, address concerns or clarify information	Inform
Meetings	One-on-one or small group meetings to discuss the CMP, identify issues and concerns related to the coast and problem solve	Consult Involve
Photography	A visual representation of changes in the landscape and the usage along the coast over time	Inform
Pop-up engagements	Host pop-up engagement stalls and roving engagement to have conversations at key events (ideally focussed on or around the coast) to engage and inform the community	Inform Consult Involve
Presentations	A presentation delivered to a group of interested persons, club or committee on request or by invitation about the Project	Inform
Signage	Utilise corflute signage in key locations along the coast to encourage participation by beach goers from both within the Wollongong LGA and visitors to the area	Inform
Social Media	Utilise Council's social media platforms to inform the community about the importance and value of the CMP and promote participation in engagement activities	Inform
Surveys	Seek input and feedback on coastal issues, challenges and threats as well as information on stakeholder values	Consult
Video	Explanatory or informational videos to explain technical issues and bridge literacy and language barriers.	Inform
Workshops	A structured method working with groups of stakeholders to identify and/or solve problems and suggest solutions for Project issues and concerns	Involve Collaborate

4 ENGAGEMENT ACTION PLAN

This CEP is a living document and the engagement action plan for each stage will be informed by community and stakeholder feedback during the preceding stages.

A high-level suggested plan has been included for Stages Two to Five. These should be reviewed and finalised in consultation with Council.

4.1 STAGE ONE

Key messages for Stage One are:

- The purpose of the CMP is to set the long-term strategy for the coordinated management of our coast and estuaries, guided by the Coastal Management Act 2016.
- The first stage in developing a CMP is the scoping phase. This involves reviewing the work that has been undertaken in the past to manage issues and challenges in our coastal areas and identify knowledge gaps and information needs.
- It also includes speaking to the community to understand what they love about the coastline, how they use and enjoy Wollongong's beaches, headlands and rock platforms, as well as how they have seen the coast and estuaries change over time – for good and for bad.
- This will help Council to determine the scope for what the CMP needs to include, what studies need to be prepared and who needs to be involved in developing management options in later stages.

The outcomes of engagement from this stage are:

- Establish key relationships
- Build community awareness about CMP
- Establish a collective vision for the Wollongong coast
- Collate community themes and values related to the coast.

ACTION	PURPOSE	STAKEHOLDERS	TIMING	RESPONSIBILITY
Establish a project webpage on Engagement HQ to include: <ul style="list-style-type: none"> • Project overview • Project stages and timeline • Opportunities for participation • Resources and reference documents • Engagement tools 	To provide a single portal of information related to the Project	All stakeholders	May 2022	Spectrum Comms
Presentation to Surf Life Saving Illawarra branches meeting	To provide an overview of the Project and detail engagement opportunities	Surf Life Saving Clubs	31 May 2022	Salients
<ul style="list-style-type: none"> • Launch EHQ webpage – survey, stories and map open • Issue media release • Share first social media post • Install corflutes in coastal areas • Send EDMs to stakeholder lists • Upload digital posters • Send briefing note to Councillors • Upload notice on staff intranet • Send letter to local MPs 	To provide an overview of the Project, detail engagement opportunities and how to get involved	All stakeholders	1 June 2022	Council staff
Share social media posts	To provide information about opportunities to get involved and to promote pop-up engagements	Residents Visitors Businesses	1-30 June 2022	Council staff
First Nations engagement: Introduce and inform	To share information about project, seek interest to be involved and how they would like to be involved	First Nations Community stakeholders	15-30 June 2022	Council staff
First Nations engagement - Internal Review	To review existing information from engagements with local Aboriginal communities	First Nations Community stakeholders	15 June – August 2022	Council staff

ACTION	PURPOSE	STAKEHOLDERS	TIMING	RESPONSIBILITY
Hold staff interviews	To seek feedback and input on coastal issues, challenges and threats as well as information on current management activities	Council staff	23 June 2022	Salients
Facilitate Councillor workshop	To provide an overview about the Project, what's involved, engagement opportunities and seek feedback and input on their coastal issues, challenges and threats	Councillors	23 June 2022	Salients Spectrum Comms
Issue media release	To promote pop-up engagement opportunities	Media	24 June 2022	Council staff
Community conversation roving event – Friday Markets, Crown St Wollongong	To provide an opportunity to speak to community about the Project, direct them to website and collect input about what they value about the coast, where they visit, what they do there as well as any issues	Residents Visitors Businesses	24 June 2022	Spectrum Comms Salients
Community conversation pop-up event – North Wollongong Parkrun, Fairy Meadow	To provide an opportunity to speak to community about the Project, direct them to website and collect input about what they value about the coast, where they visit, what they do there as well as any issues	Residents Visitors	25 June 2022	Spectrum Comms Salients
Community conversation pop-up event – Bulli Beach, Bulli	To provide an opportunity to speak to community about the Project, direct them to website and collect input about what they value about the coast, where they visit, what they do there as well as any issues	Residents Visitors	25 June 2022	Spectrum Comms Council staff
Community conversation pop-up event – Bald Hill, Otford	To provide an opportunity to speak to community about the Project, direct them to website and collect input about what they value about the coast, where they visit, what they do there as well as any issues	Residents Visitors	26 June 2022	Spectrum Comms Council staff
Community conversation pop-up event – Port Kembla Beach	To provide an opportunity to speak to community about the Project, direct them to website and collect input about what they value about the coast, where they visit, what they do there as well as any issues	Residents Visitors	26 June 2022	Spectrum Comms Council staff

ACTION	PURPOSE	STAKEHOLDERS	TIMING	RESPONSIBILITY
Community conversation roving event – Tramway between North Gong and Belmore Basin	To provide an opportunity to speak to community about the Project, direct them to website and collect input about what they value about the coast, where they visit, what they do there as well as any issues	Residents Visitors	27 June 2022	Spectrum Comms Council staff
Community conversation pop-up event – Austinmer Beach Park	To provide an opportunity to speak to community about the Project, direct them to website and collect input about what they value about the coast, where they visit, what they do there as well as any issues	Residents Visitors	27 June 2022	Spectrum Comms Council staff
Engagement closes		All stakeholders, excluding First Nations groups	30 June 2022	
Remove corflutes Close interactive map and survey Update EHQ	To close Stage One opportunities and update the webpage to reflect closed events	All stakeholders	1 July 2022	Council staff Spectrum
First Nations Engagement: Conversations	To understand local Aboriginal communities uses, values, issues and ideally how they want to be engaged in future about this project using stakeholder specific methods e.g individual or small group conversations	First Nations Community stakeholders	July-early August 2022	Council staff
Collation and analysis of engagement data	To review collected data to identify common themes, issues, challenges and concerns		1-8 July 2022	Spectrum
Submission of draft Community and Stakeholder Engagement Summary Report	To provide an overview of engagement findings and outcomes	Council staff	8 July 2022	Spectrum
Council review of draft Community and Stakeholder Engagement Summary Report	To review the draft report and advise any changes	Spectrum	11-15 July 2022	Council staff
Revisions to finalise Community and Stakeholder Engagement Summary Report	To incorporate any changes into the report	Council staff	18-22 July 2022	Spectrum

ACTION	PURPOSE	STAKEHOLDERS	TIMING	RESPONSIBILITY
First Pass Risk Assessment Workshops with stakeholders	Assess priority risks to inform Stage 1 Scoping Study	Council staff Agencies	20-22 July 2022	Salients Council staff
Issue final Community and Stakeholder Engagement Summary Report	To finalise the report for Council and community consumption	All stakeholders	25 July 2022	Spectrum
Prepare First Nations engagement outcomes report	To collate and summarise outcomes of Stage One engagement with First Nations groups	First Nations groups	August 2022	Council staff
Develop content and design a one-two page summary of the Scoping Study	To provide an easy-to-read summary of the Scoping Study	All stakeholders	August 2022	Spectrum
Evaluation meeting	To evaluate the effectiveness of engagement during Stage Three and propose an action plan for Stage Four	Council staff Spectrum Salients	August 2022	Council staff
Executive Management Committee briefing	To provide an overview about the Stage 1 Scoping Study	Council executive	November 2022	Salients Council staff
Councillor briefing	To provide an overview about the Stage 1 Scoping Study	Councillors	November 2022	Salients Council staff

4.2 STAGE TWO

Key messages for Stage Two are:

- The purpose of Stage Two is to determine the risks, vulnerabilities and opportunities the coast presents for our community now and in the future.
- Part of this stage involves undertaking any studies that might be needed to fill any knowledge gaps.
- It also involves completing a risk assessment of the issues and threats identified by our community and other stakeholders. By categorising different issues by their level of risk to people or environment, we can prioritise the order in which these issues should be addressed and managed.

The outcomes of engagement from this stage are:

- Establish an understanding of the risks and opportunities presented by the Wollongong coast
- Identify risks
- Identify opportunities.

ACTION	PURPOSE	STAKEHOLDERS	TIMING	RESPONSIBILITY
Risk assessment workshops	To identify and assess risks and opportunities	Government agencies First Nations groups Land managers Council staff		
Social media EDMs Media release	To provide an update on any studies that may be undertaken during Stage Two, if appropriate and/or if requiring consultation	All stakeholders		
Evaluation meeting	To evaluate the effectiveness of engagement during Stage Three and propose an action plan for Stage Four	Council staff Consultants		

4.3 STAGE THREE

Key messages for Stage Three are:

- The purpose of Stage Three is to identify and evaluate options for managing the risks and challenges to our coast.
- Management options need to be funded, resourced and viable under the requirements for a CMP.
- We will work closely with key stakeholders such as government agencies, First Nations groups, Landcare and environment groups during this stage as they will have an important role to play in the implementation of actions.
- We will also seek input and feedback from the community to help us come up with feasible, viable and innovative solutions to coastal issues.

The outcomes of engagement from this stage are:

- Establish local targets for change
- Ratify community prioritisation of actions
- Explore management options.

ACTION	PURPOSE	STAKEHOLDERS	TIMING	RESPONSIBILITY
Update EHQ	To provide an update on the Project and promote community workshops	All stakeholders		
Social media EDMs Media release	To promote the community workshops and invite registrations	Residents General community		
Letters	To invite private landowners who may be impacted by the CMP to register for a community workshop	Private landowners		
Facilitate community workshops	To provide input into the development of draft management actions to address and manage the risks and opportunities	Residents Businesses Community groups First Nations groups		
Facilitate technical workshops	To provide input and refine the draft management actions proposed by the community and identify their feasibility, viability and funding	Government agencies Land managers Council staff		
Evaluation meeting	To evaluate the effectiveness of engagement during Stage Three and propose an action plan for Stage Four	Council staff Consultants		

4.4 STAGE FOUR

Key messages for Stage Four are:

- The purpose of Stage Four is to prepare our CMP so it can be certified and adopted by Council.
- This involves placing the draft CMP on public exhibition and considering any community and stakeholder feedback. Where relevant and appropriate, we will incorporate this feedback into the final CMP.
- The CMP needs to be certified by the Department of Planning and Environment to ensure it meets all the requirements of the Coastal Management Act 2016.
- An important part of this is ensuring that any management actions that have been committed to have the resources and funding to make them happen.
- Once the CMP is certified, the CMP is formally adopted by the elected Council and implementation can begin.

The outcomes of engagement from this stage are:

- Encourage community ownership of priority actions
- Grow awareness of funding opportunities for key actions
- Clarify the roles of key contributors to action

ACTION	PURPOSE	STAKEHOLDERS	TIMING	RESPONSIBILITY
Update EHQ	To provide an update on the Project and promote community drop-in sessions	All stakeholders		
Briefing	To provide a briefing about the draft CMP and proposed management actions ahead of the document being placed on public exhibition	Councillors		
Social media EDMs Advertising Media release	To promote community drop-in sessions	Residents General community		
Staff intranet/memos	To inform staff about the public exhibition period	Council staff		

ACTION	PURPOSE	STAKEHOLDERS	TIMING	RESPONSIBILITY
Facilitate community drop-in sessions	To provide an opportunity for the community to review the draft CMP, speak to the project team and provide feedback	Residents General community		
Presentations	To provide an overview of the CMP and draft management actions and how the community can make a submission	First Nations groups Community groups Surf Life Saving Clubs		
Meetings/Phone/Email	To notify private landowners of any draft management actions that may impact them and advise how they can make a submission	Private landowners		
Letters	To notify MPs about the exhibition period and how the community can make a submission	Government MPs		
Evaluation meeting	To evaluate the effectiveness of engagement during Stage Three and propose an action plan for Stage Four	Council staff Consultants		

4.5 STAGE FIVE

Key messages for stage five are:

- The purpose of Stage Five is to implement the actions in our certified CMP.
- This may require partnering with adjoining councils, government agencies and community groups where relevant.
- We will monitor the effectiveness of management actions and report back to ensure we're on track.

The outcomes of engagement from this stage are:

- Inform the community of the plan actions and outcomes
- Articulate opportunities for community involvement in the plan implementation
- Close the loop with participating stakeholders.

ACTION	PURPOSE	STAKEHOLDERS	TIMING	RESPONSIBILITY
Update EHQ EDMs Social media Media release	To close the loop and advise that the CMP has been certified and adopted	All stakeholders		
Establish CMP implementation group	To establish a stakeholder group to monitor and report on implementation of the CMP	Government agencies Private landowners Land managers First Nations groups Community groups Council staff		
Report Media release	To provide regular feedback and reports on the implementation of the CMP	All stakeholders		

5 MONITORING, REPORTING AND EVALUATION

5.1 MONITORING

Regular monitoring of engagement and communication activities ensures this CEP is delivering on the engagement objectives.

Monitoring can take many forms and includes environmental scanning to track community and stakeholder sentiment. This can be by way of media and social media monitoring, feedback received through formal and informal channels, feedback received through Council's customer service team and regular analysis of complaints and enquiries received.

5.2 REPORTING

Progress against this CEP will be reported to the Project team at regular meetings as well as to Councillors and executive staff on request.

A community engagement outcomes report will be prepared by Spectrum at the conclusion of Stage One.

5.3 EVALUATION

Council evaluates its activities so that its engagement approach can be adjusted if needed and improve future stages of engagement. It is recommended multiple sources are used to collect evaluation data and that they include both quantitative and qualitative metrics.

A suggested evaluation method is detailed in Table 3. At the completion of each stage of the CMP, the engagement activities will be reviewed against the engagement outcomes.

Table 4 Evaluation methodology

AREAS OF EVALUATION	QUANTITATIVE METRICS	QUALITATIVE METRICS	SOURCE
Process - how well was the engagement designed and implemented?	# complaints received about engagement process # enquiries received about engagement process How much active moderation was required on map tool?	Participant sentiment to engagement process Nature of any moderation Availability of resources to respond to complaints/enquiries Availability of resources to undertake moderation	EHQ analytics Places tool Survey Project team debriefs Councillor feedback Pop-up feedback CRM analytics
Relevance - was the engagement appropriate and did the community accept the engagement process?	# survey responses # markers on map # people attending F2F engagements	Media sentiment Facebook and Instagram sentiment	Survey Map tool Pop-up stalls Feedback surveys Webpage analytics EDMs analytics

AREAS OF EVALUATION	QUANTITATIVE METRICS	QUALITATIVE METRICS	SOURCE
	<p>Click through rates on EDMs</p> <p>Facebook and Instagram post reach and engagement</p> <p>Posters/corflutes remained in place/were not vandalised for the duration of the project</p>	<p>Pop-up, drop-in sessions, workshop participation and engagement in discussion</p>	<p>Facebook and Instagram analytics</p> <p>Councillor feedback</p>
<p>Reach - did we reach those affected and/or interested in the decision?</p>	<p># people who viewed the Project webpage</p> <p># people who visited the map tool</p> <p># stories received</p> <p># Aboriginal participants</p> <p># CALD community participants</p> <p># visitors out of area representation by age group</p> <p>representation by gender</p>	<p>diversity of participants across stakeholder groups</p> <p>participation from previously known stakeholders</p> <p>participation from existing user groups</p> <p>participation from potential future user groups</p> <p>participation from land managers</p>	<p>Webpage analytics</p> <p>EHQ analytics</p> <p>Surveys</p> <p>Pop-ups</p> <p>Drop-in sessions</p> <p>Interviews</p> <p>Councillor feedback</p>
<p>Outcomes - did we achieve the objectives of the engagement process?</p>	<p># risks identified</p> <p># opportunities identified</p> <p># management actions identified</p> <p>% of actions fully funded</p> <p># actions community took ownership of</p>	<p>Did the community help prioritise actions?</p> <p>Were the community informed about the plan actions and outcomes</p> <p>Were there opportunities for community involvement in the plan implementation?</p> <p>Did we close the loop with participating stakeholders?</p>	<p>Project team debrief</p> <p>Feedback surveys</p> <p>Project budget</p> <p>Action plan</p> <p>Media monitoring</p> <p>Social media analytics</p> <p>Councillor feedback</p>





Wollongong City Council

Wollongong Coastal Management Program

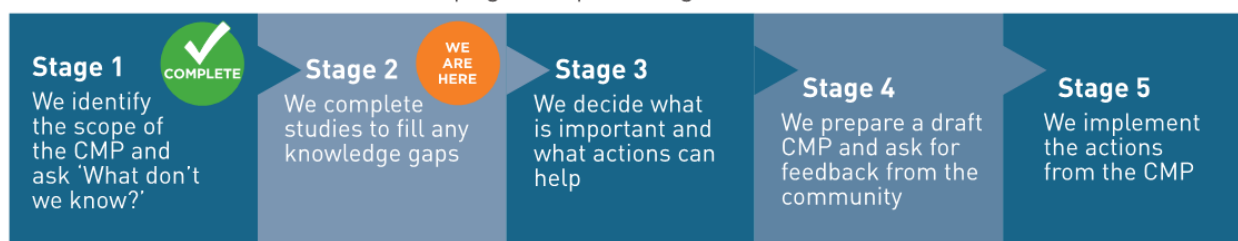
March 2023 update

Wollongong City Council is preparing a long-term plan to manage our beaches, dunes, cliffs, headlands and rock platforms, and small coastal creeks and estuaries. Called a Coastal Management Program (CMP), it will identify current and future issues along our coast and detail actions to address them in partnership with residents, First Nations people, community groups and the NSW Government.

Having a certified CMP will allow Council to access funding for projects to care for our coast. It will also ensure everyone knows who is responsible for actions that care for our coastline.

TIMELINE

This timeline shows where we are in developing and implementing a CMP.



2022

Stage 1: Identify the scoping of a CMP

In 2022, we developed a Wollongong CMP Scoping Study which involved:

- A review of past management of the Wollongong Coast.
- A review of the latest coastal and climate change science.
- Engagement with our community.
- A first-pass risk assessment.
- Identification of knowledge and data gaps.
- A forward plan developed for remaining CMP stages.



223
surveys
completed

128
map pins
dropped

16
staff interviews
and a councillor
workshop

8
online
stories
shared

Community engagement

Stage 1 involved learning what our community values about our coastline, how they use it and the challenges they see now and in the future.

Between May and July 2022, we spoke to and heard from 630 stakeholders at pop-up stalls, workshops, interviews, meetings and by way of an online survey, interactive map, written submissions, and online stories.

We also undertook specific engagement with local First Nations communities to inform, engage, build trust, and connect. This will form a building block for deeper engagement as the project progresses.

7
pop-up
stalls



These are the coastal threats our community are concerned about:

- Growth in the local population and visitors resulting in user conflicts in shared public spaces, inadequate public recreation facilities and increased development pressure.
- Lack of community and visitor awareness of the safety risks associated with recreational activities such as swimming and rock fishing.
- Water quality, loss of habitat and degradation of cultural items, places and assets.
- Quality of access paths and infrastructure to facilities and beaches.
- Lack of clarity around governance in coastal management, particularly heritage issues.
- Climate change and sea level rise.

This is what our community told us they value about the coast:

- Recreation: dog walking (on and off leash), surfing, swimming, snorkelling, kite surfing, cycling, scenic views.
- Facilities: ocean pools, shared pathways, playgrounds, seating, bins.
- Environmental values: Recreational water quality, birds and wildlife.
- Social values: Contribution to wellbeing, family friendly environment, connection to country.

2023 - 2024

Stage 2: Values, threats and opportunities

We will complete these studies to obtain new data and update our knowledge base:

1. Littoral Rainforest and Coastal wetlands mapping
2. Mapping of coastal hazards, including coastal cliff or slope instability, inundation, erosion, recession and creek entrance instability, followed by a combined coastal hazard risk assessment
3. Identification of Aboriginal Cultural Heritage values and assets, and vulnerability assessment
4. Port Kembla Beach – options for management of windblown sand

Council will apply for grant funding from the NSW Government to complete these studies.

WE
ARE
HERE

2024 - 2025

Stage 3: Identify and evaluate options

We will work with stakeholders and engage with the community to decide what is important and what actions can help.

Stage 4: Prepare, exhibit, finalise and adopt the CMP

Council will prepare a draft CMP and ask for feedback from the community. We will then seek certification by the NSW Government.

2025 onwards

Stage 5: Implement and monitor

We will implement the actions from the CMP and keep the community informed.



Next steps

Now that we have completed the scoping study, the community input and data it collected will be used to guide Stages 2, 3 and 4 of the project.

To stay informed as the Wollongong CMP progresses, and be involved in future engagement opportunities, visit our.wollongong.nsw.gov.au/cmp



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