

BELLINGEN SHIRE COASTAL MANAGEMENT PROGRAM

Prepared by Salients for Bellingen Shire Council

For Certification
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BELLINGEN SHIRE COASTAL MANAGEMENT PROGRAM

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EXECUTIVE SUMMARY

The Bellingen Shire Coastal Management Program (CMP) establishes a long-term strategy for coordinated land management in the coastal zone of Bellingen Shire. This includes managing approximately 10 kilometres of open coast, the Bellinger & Kalang River systems up to their tidal limits, and several intermittently closed and open lake or lagoons (ICOLLS), most notably Dalhousie Creek and Oyster Creek.

Key motivations for implementing the CMP include addressing ongoing threats to the natural coastal environment, cultural heritage and built infrastructure, and the uncertainty posed by climate change. These needs to be managed in a funding environment which has been notably constrained in the past. Bellingen Council, consistent with the *Coastal Management Act 2016* (CM Act) and its related *Coastal Management Manual*, is responsible for preparing and implementing the CMP, including monitoring and annual reporting on actions and outcomes. The CMP was developed following a five-stage process outlined in the Coastal Management Manual.

Development of the CMP involved extensive risk assessment and consultation to identify and evaluate potential management actions. The CMP preparation was guided by Council and the Department of Climate Change, Energy, the Environment and Water (DCCEEW) and involved consultation with other state government agencies and stakeholders to ensure their support and funding for the CMP's execution. Community and stakeholder engagement played a significant role throughout the development stages of the CMP.

The CMP does not recommend changes to existing planning controls but suggests that modifications to the maps referenced by *State Environmental Planning Policy (Resilience and Hazards) 2021* (RH SEPP) may arise upon the completion of studies required by the CMP. It also includes a Coastal Zone Emergency Action Subplan (CZEAS) to outline responses to emergencies required on account of hazards including beach erosion, coastal inundation, or cliff instability.

The CMP addresses various key issues within the Bellingen coastal zone, such as the complexity of managing Crown Land, respectful management of the cultural values of the Gumbaynggirr, the challenges of funding major works with a small rates base, and the need for strategic management despite reliance on opportunistic funding.

Key issues that the CMP aims to address are listed within this document. This is followed by a description of the actions included in the forward works. Projected forward expenditure on the CMP actions is presented in Table E1.

Table E1 Projected Expenditure on the CMP (to Nearest \$1000)

Year	Council Funds	External Funds
2024/2025	\$99,000	\$199,000
2025/2026	\$144,000	\$280,000
2026/2027	\$14,505,000	\$10,002,000
2027/2028	\$14,495,000	\$9,982,000

Total expenditure over four years is expected to be \$49,705,000. Large expenditure items include implementation of the *Sewering Coastal Villages Project* (\$38M), Upgrading foreshore stabilisation works at Mylestom (\$7.9M), and Upgrade of the Urunga Boardwalk and Lido (2.55M). Otherwise, actions include numerous studies, investigations other minor actions which will inform a review of the CMP at the end of the initial four-years.

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1 INTRODUCTION

1.1 The Bellingen Coastal Management Program

The purpose of the Coastal Management Program (CMP) is to set the long-term strategy for co-ordinated land management within the coastal zone of Bellingen Shire. This includes approximately 10 kilometres of open coast, the Bellinger & Kalang River systems to their tidal limits, and several intermittently closed and open lake or lagoons (ICOLLS) including Dalhousie Creek and Oyster Creek.

The location of the coastal zone within Bellingen Shire is shown in Figure 1. The area considered by this CMP is entirely within the Bellingen Local Government Area.

Bellingen Shire Council (Council) has adopted multiple plans for the coast and estuaries in the past including the Bellingen Coastal Zone Management Plan (CZMP) (BMT WBM, 2017a), Bellinger and Kalang Estuary Management Plan (EMP) (BMT WBM, 2008), and Bellinger and Kalang River Health Plans (Bellingen Shire Council, 2010).

Development of the CMP began in 2019, with the Scoping Study (Alluvium, 2020) (included as Appendix A) prepared in early 2020. Preparation of the CMP followed during 2021 through 2023, including ongoing consultation with the community and state government stakeholders.

The CMP has been developed in accordance with the requirements of the *Coastal Management Act 2016* (the CM Act) and Coastal Management Manual (State of NSW and OEH, 2018)

The coastal zone is defined by the CM Act and includes four coastal management areas:

- 1 Coastal wetlands and littoral rainforests area.
- 2 Coastal vulnerability area.
- 3 Coastal environment area.
- 4 Coastal use area.

The CM Act outlines management *objectives* for each of these areas. For the objectives to be addressed, the corresponding coastal management area should ideally be mapped in the State Environmental Planning Policy (Resilience and Hazards) 2021 (RH SEPP).

Maps showing the extents of the coastal management areas for the LGA are presented in Figures 2 through 4. No Coastal Vulnerability Area (CVA) is yet mapped within the SEPP.

Legend

-  Bellinghen LGA
-  Estuary
-  Bellinghen Coastal Zone

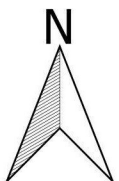
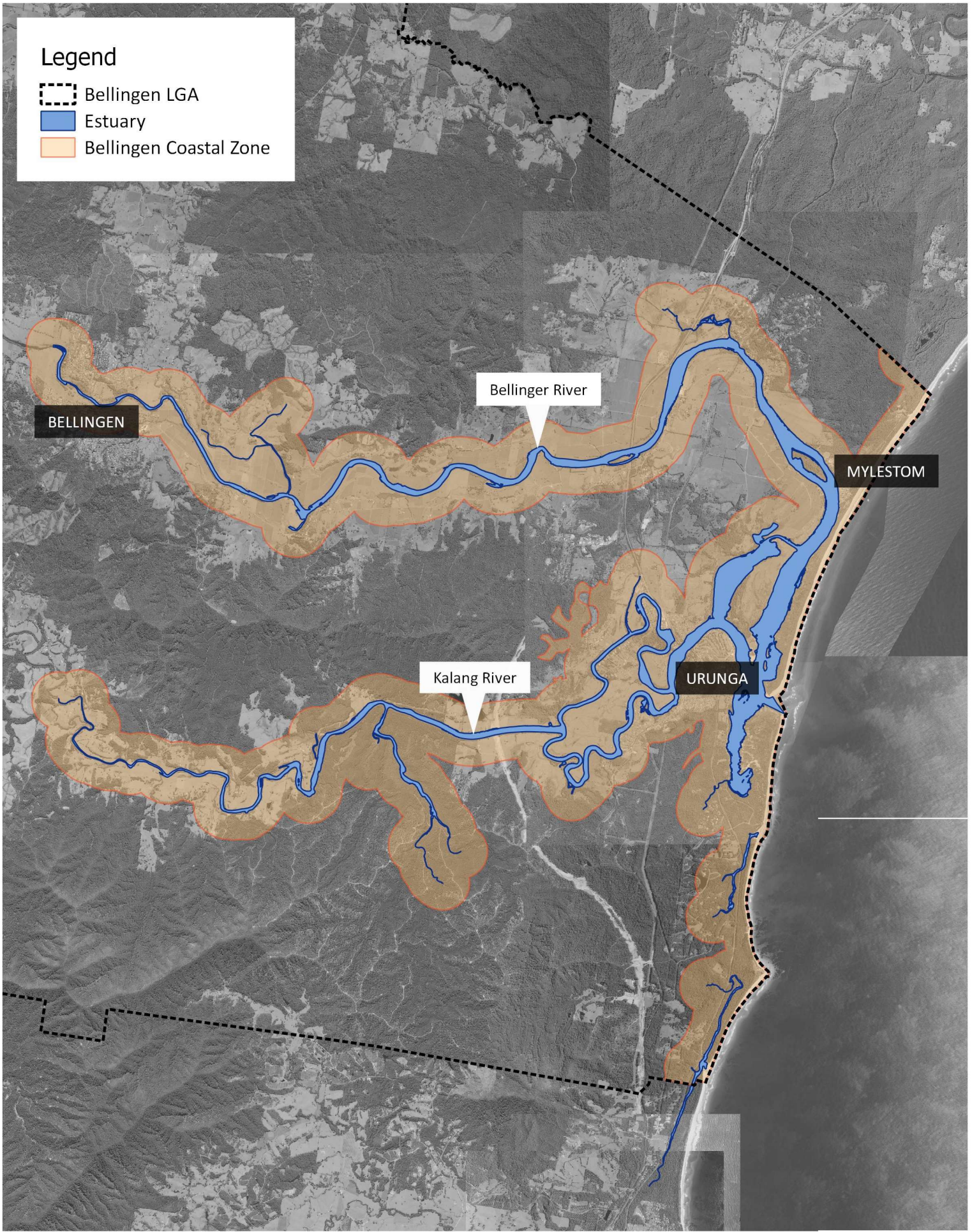


Figure 1 Bellinghen Shire Coastal Zone

Bellinghen Coastal Management Program

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REV	A
DRAWN	EG
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Legend

-  Bellingen LGA
-  Estuary
-  Coastal Wetland Area
-  Coastal Wetland Proximity Area
-  Littoral Rainforest Area
-  Littoral Rainforest Proximity Area

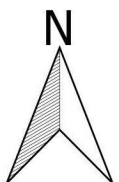
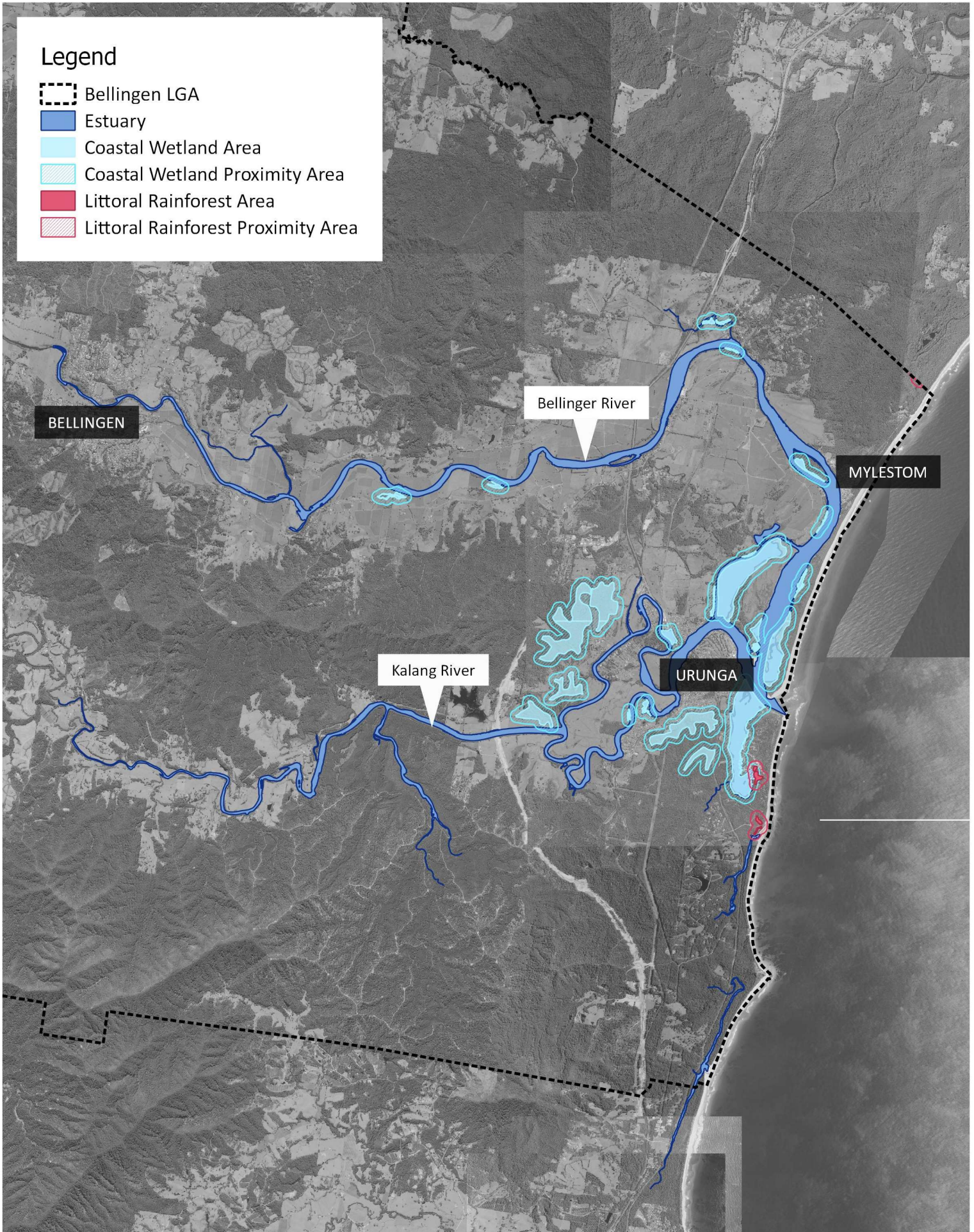


Figure 2 Coastal Wetlands and Littoral Rainforest Areas



Bellingen Coastal Management Program

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Legend

-  Bellinghen LGA
-  Estuary
-  Coastal Environment Area

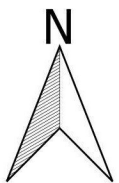
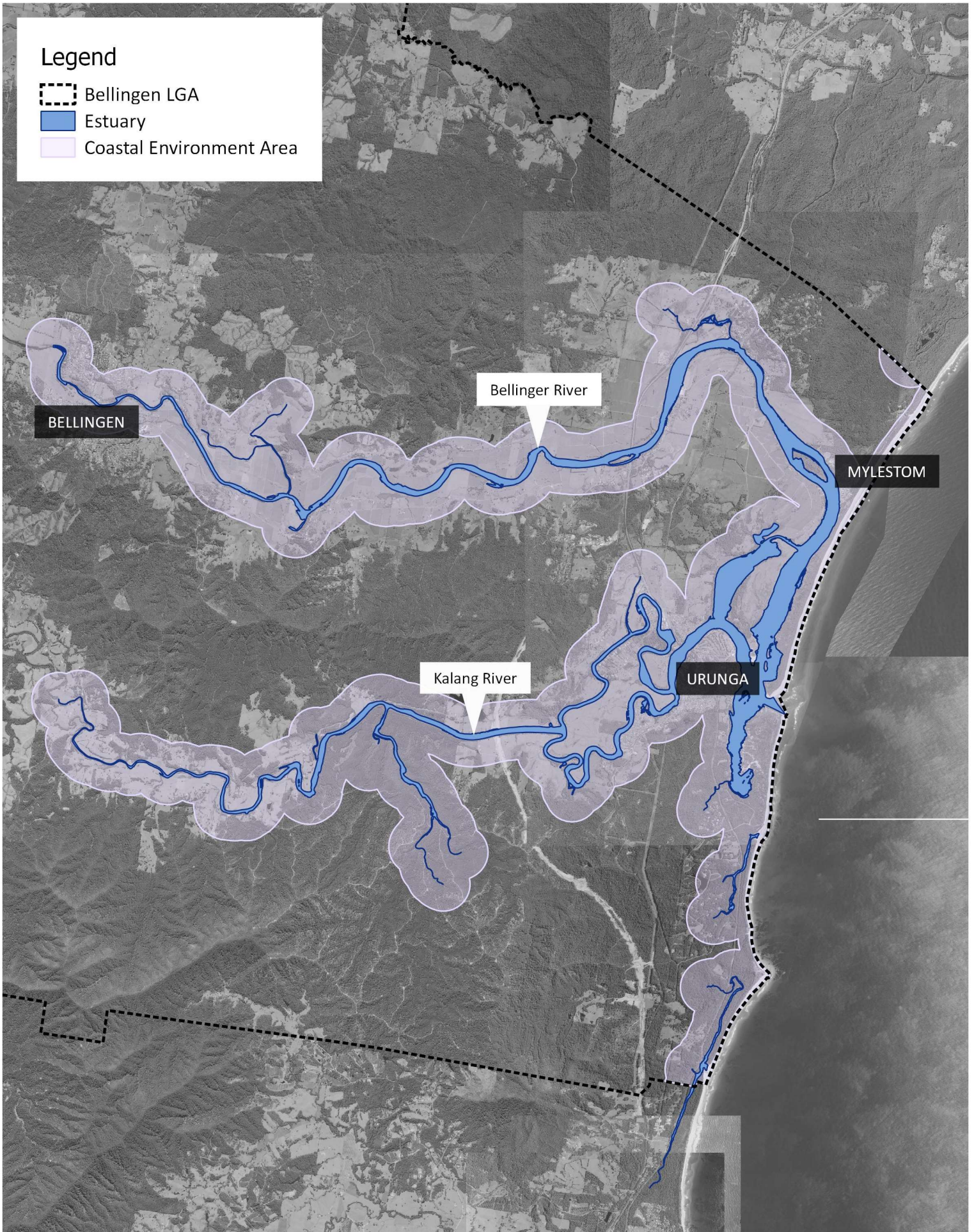


Figure 3 Coastal Environment Area

Bellinghen Coastal Management Program

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Legend

-  Bellinghen LGA
-  Estuary
-  Coastal Use Area

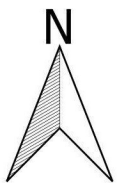
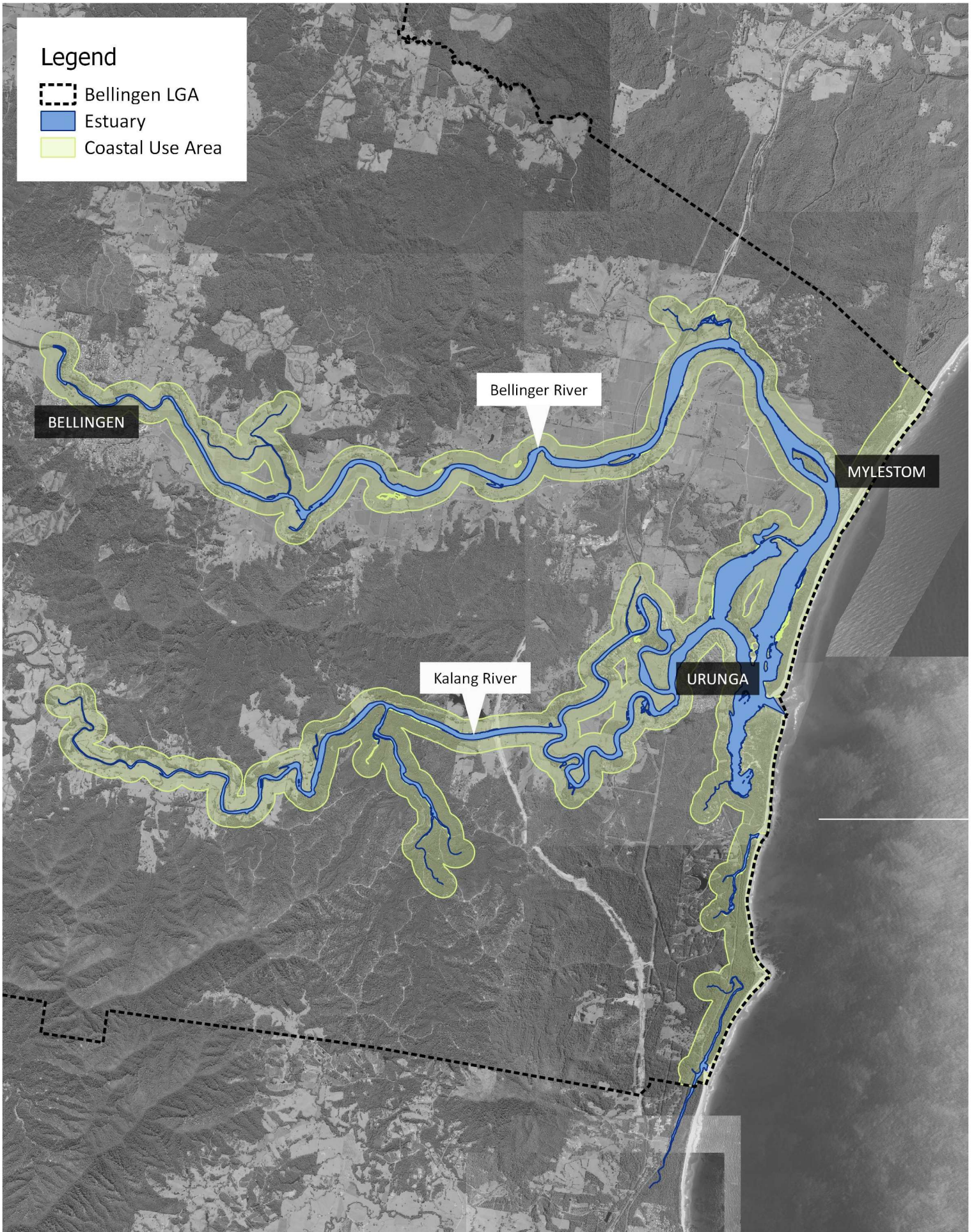


Figure 4 Coastal Use Area

Bellinghen Coastal Management Program

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1.2 Why is this CMP Required?

The future management of the Bellingen 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 to 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 provide a degree of exemption from liability to local councils under Section 733 of The *Local Government Act 1993*.
- 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).

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 Council's 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 required to take responsibility for actions, 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.

One important feature of a CMP is to identify actions comprising works that:

- Are environmental protection works on land identified as 'coastal wetlands' or 'littoral rainforests'. For this CMP, Action E2, which includes all weeds, not just priority weeds, is identified as comprising environmental protection works on 'coastal wetlands' or 'littoral rainforests' on the Coastal Wetlands

and Littoral Rainforests Area Map under *State Environmental Planning Policy (Resilience and Hazards) 2021*, that are proposed to be carried out by or on behalf of a public authority.

- Are proposed coastal protection works. For this CMP, Action U1, which involves the upgrade of foreshore stabilisation works at Myelstom Foreshore Reserve, is identified as coastal protection works that are proposed to be carried out by or on behalf of a public authority.

1.3 Roles and Responsibilities of Council and Public Authorities

Council is responsible for the preparation of the CMP in accordance with the requirements of the CM Act and Coastal Management Manual. Council must implement the CMP through their Integrated Planning & Reporting program and/or land use planning system according to law. The CMP must be monitored and reported on, with annual reporting required for planned actions and their outcomes in this period. Local Environmental Plan (LEP) and Development Control Plan (DCP) land use planning controls for the coastal zone should give effect to management objectives identified in the CMP.

Public authorities must have agreed to any actions identified in the CMP as their responsibility for implementation, or that affect their land or assets prior to certification. When preparing, developing, or reviewing Plans of Management, public authorities must have regard to the CMP to the extent that it is relevant to exercising their functions.

1.4 How was the CMP Developed?

The CM Act states that a coastal management program needs to be prepared in accordance with the Coastal Management Manual. The Coastal Management Manual (NSW Government, 2018) outlines a 5-stage process as shown in Figure 5.

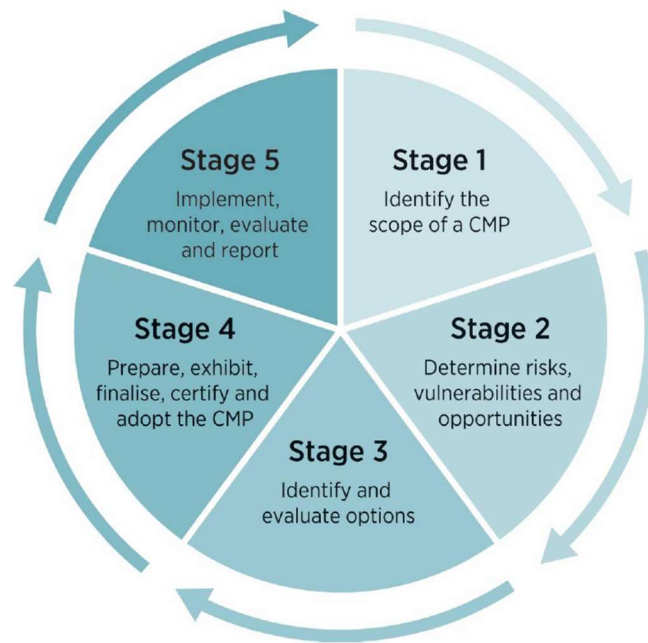


Figure 5 Stages in Preparing and Implementing a CMP
(Source: NSW Government, 2018)

1.4.1 Stage 1 Identify the Scope of the CMP

Appendix A contains the Scoping Study (Alluvium, 2020) which is the outcome of Stage 1 of the process. The primary purpose of the scoping study was to identify the required focus for the CMP (as outlined above), and the steps required in preparing that CMP. The scoping study considered existing information to review any progress already made in managing issues in coastal areas. Key tasks completed as part of the scoping study were:

- Gathering an understanding of the community and identifying stakeholders. Developing an engagement strategy for later stages and beginning development of a shared understanding of the existing coastal management situation. Identifying the organisations and communities that need to be involved in the CMP process and who holds responsibility for various issues that are likely to be involved.
- Determining the strategic context of coastal management for the area being considered and establishing the purpose, vision, and objectives of the CMP, identifying an appropriate scope, and expected key outcomes from the CMP.
- Determining the spatial extent of management areas, and which of the four management areas need to be considered by the CMP.

- Considering where coastal management areas overlap and how the hierarchy of management objectives outlined in the CM Act would operate. For the CMP, objectives relating to coastal wetlands are more important than those relating to the coastal vulnerability area, and objectives relating to coastal vulnerability area are more important than those relating to the coastal environment area (where those areas overlap). These in turn are more important than the objectives relating to the coastal use area.
- Reviewing the issues previously identified, current coastal management arrangements and progress with existing actions. Determining where further or different action is required via a first-pass risk assessment.
- Identifying the knowledge gaps and preparing the business case for filling those gaps. The business case also included a forward program for preparing the coastal management program.

1.4.2 Stage 2 Risks, Vulnerabilities and Opportunities

For Stage 2 of the CMP, BSC requested an updated risk assessment incorporating a review of existing information, building on the contents of the Scoping Study, and the inclusion of more recent information:

- 1 The findings of the *Bellingham Water Quality Management Plan* (Jeremy Benn Pacific, 2022) which was completed, in parallel, during the completion of Stage 2 (Provided as Appendix B).
- 2 The outcomes of additional consultation completed by (i) Salients and Spectrum Comms during Stage 2 (Provided in Appendix C); and (ii) by Jeremy Benn Pacific in the development of the Water Quality Management Plan.

The preliminary risk assessment completed during the scoping study was reviewed in detail and updated. The detailed risk assessment process involved more targeted risk identification, analysis, and prioritisation (see Figure 6).

To ground the risk assessment in the requirements of the CM Act, all risks were categorised in terms of the coastal management area of most relevance to the risk and the objectives from the CM Act which are related to the risks. The risk assessment is provided in the Stage 2 Report (Appendix D), alongside categorisations for likelihood and consequence and the assessment of risks into extreme, high, moderate, or low risk categories.

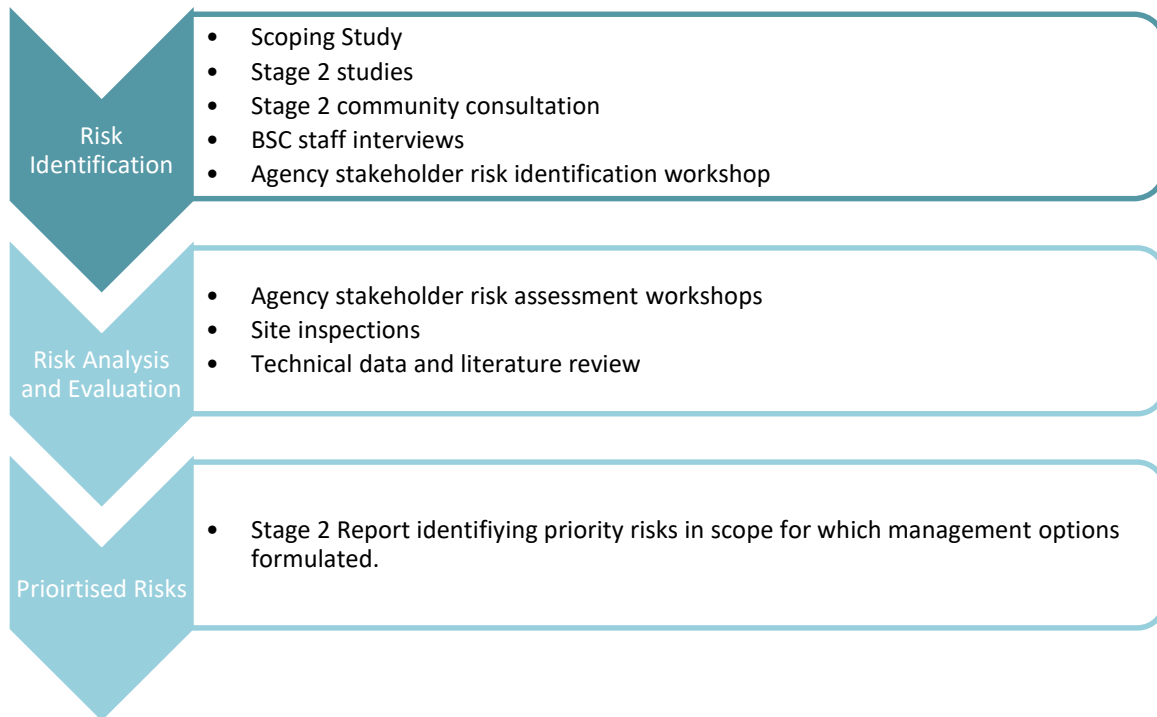


Figure 6 Detailed Risk Assessment Process

In isolation, the severity of a risk is not enough to enable assessment of when and how mitigative action should be undertaken. Knowing the timeframe over which a certain risk may impact helps to understand the urgency with which a risk should be addressed. The CMM requires that different timeframes be considered by a CMP, including immediate, 20, 50 and 100 years. While it could be argued that this type of assessment is more useful for assessments of coastal vulnerability, particularly with continuing sea level rise, it is also useful to assess broad timeframes to help drive actions associated mitigating risks to ecological/environmental values.

The risk assessment in Appendix D contains coarse assessments of timeframes for emergence of the risk, and timeframes for an impact requiring action. For the sake of consistency with the CMM, the timeframes required by the CMM have been applied in an indicative manner. The urgency expressed by the timeframes has been used as a guide in the assessment and timing of management actions designed to address the risks as part of Stages 3 and 4 of the CMP process.

1.4.3 Stage 3 Identify and Evaluate Options

Through ongoing consultation and the risk assessment process, potential management actions have been identified. Options identified as part of ongoing consultation and arising from the risk assessment were subjected to evaluation as presented in Appendix E. The evaluation comprised two stages:

- Filtering of an options 'long-list', where options were assessed against a series of 'roadblocks' such as being out of scope of a CMP, clearly infeasible or already being addressed as part of another process by Council. At this stage all proposed options had passed a preliminary assessment for viability, feasibility and acceptability, as per the Coastal Management Manual (State of NSW and Office of Environment and Heritage, 2018).
- A detailed assessment against all objects and objectives of the CM Act, regardless of the coastal management area to which it corresponds. In addition, an informed cost estimate was made, based on experience with similar works undertaken in other localities and/or standard published rates.

By linking actions to the objects and objectives of the CM Act, to categorise risks and assess management actions, the ways in which different management actions will promote and enact the varied foci and goals of the CM Act has been made clear.

Taking advantage of unforeseen opportunities as they arise should not be stifled by the CMP process. Adaptability is important, alongside a general awareness among estuary management agencies of where other agencies are active. During later stages of development of this CMP, several additional management actions which were accepted by the relevant stakeholders as being feasible, viable, practical, and highly likely to provide suitable benefits were identified. While these were not subject to the detailed assessment outlined above, the management actions have been qualitatively considered and align with the objectives of the CMP, promote the objects of the CM Act and are consistent with the objectives of the State Environmental Planning Policy (Resilience and Hazards) 2021 (RH SEPP). These actions have been included within the CMP on the proviso that a responsible agency for the action and funding source could be confirmed.

An overarching management action proposed by this CMP is that representatives from all the key agencies meet regularly to share information and ensure that overall effort from state and local government is coordinated, cohesive, and informed. It is through this regular contact that we expect that flexible, adaptive, and sometimes opportunistic management action can be accommodated.

1.4.4 Stage 4 Prepare, Exhibit, Finalise and Certify

The CMP has been prepared under the guidance of Council and the Department of Climate Change, Energy, the Environment and Water (DCCEEW). Furthermore, other state government agencies have been contacted to confirm that they are committed to supporting execution of the CMP, including providing funding where necessary and possible.

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 the Environment for certification.

1.4.5 *Community and Stakeholder Engagement*

Consultation has been an important feature through Stages 1 - 3 of the CMP development process. During Stage 1 in 2019, as outlined in Appendix A the following tasks were completed:

- An online survey to identify the key values and threats in the Bellingen Coastal Zone.
- Stakeholder interviews with coastal community groups (Surf Life Saving Clubs, recreational fishers)

These activities underpinned the identification of issues considered in the preliminary risk assessment during the scoping study.

Additional consultation was completed to accompany Stages 2 and 3 of the CMP development process during 2021/22, including:

- An online survey and interactive map allowing the community to identify issues and concerns, and to suggest management actions, between November and December 2021.
- Two face-to-face community consultation workshops held at Bellingen and Urunga in July 2022.
- Ongoing teleconferencing, telephone, and email correspondence with state government agencies from February 2022-January 2023.

The outcomes of these later stages of consultation are summarised in Appendix C to this CMP. Additional review of drafts by government stakeholders and exhibition of the document were also completed during Stage 4 of CMP preparation. During preparation of the CMP Nambucca Valley Council was consulted on the management of Oyster Creek.

1.5 Projected Population Growth, Demographics, and Changes to Coastal Land Use

The scoping study which underpinned development of this CMP (see Appendix A) noted that there was only expected to be a slight population growth within the Bellingen Shire over the next two decades. While there will be growth in the broader Mid-North coast region, this is expected to occur in the larger urban centres (Coffs Harbour, Port Macquarie, Taree). Between 2017 and 2023, the population of the largest coastal village (Urunga) grew by around 3.2%, to around 3200. This is smaller than the NSW regional average growth of 4.6%. Based on more recent State government projections from 2019, the

overall population of Bellingen is expected to hover around 13,000 people between 2016 and 2041, with natural change (births and deaths) balanced by migration into the Shire (Bellingen Shire Council, 2020).

Within land in the near vicinity of the open coast there is limited development at present and a low likelihood that areas would be developed, noting that most land along the coastline is contained within nature reserves, national parks, or managed as public Crown land. The most recent Regional Strategy for the North Coast of NSW (NSW DPE, 2022) only identified very small pockets of proposed urban release areas within Bellingen's coastal zone.

When comparing the extents of coastal hazards determined by consultants for Council in the past, almost all existing development within Bellingen's coastal zone seems well placed to remain resilient against the impacts of hazards including those related to both inundation and erosion and considering the effects of sea level rise over a long time frame (50-100 years). Key existing at-risk infrastructure and development includes the Hungry Head SLSC at the entrance to Dalhousie Creek, the foreshore reserve along the Bellinger River at Myelstom and properties subject to erosion around Newry Island. These matters are addressed in the CMP by Management Actions H4, H3/U1, and H2, respectively.

While the population is expected to remain stagnant, there is an expected trend of smaller household size, and therefore a need for more dwellings. By 2041, an expected additional 400 dwellings may be required. Noting that there is limited residential land slated for release, the trend will be towards infill and higher density dwellings. Within the coastal zone, this has implications for the quality of urban stormwater runoff to the Bellinger and Kalang Rivers. Alongside existing planning controls which work to mitigate against water quality risks associated with new development, several management actions aim to promote stormwater planning, water quality monitoring and the dissemination of data to better inform that development as it occurs (see Actions W2, W3, W6 and W7). A better understanding of planning constraints to new development will also be provided by Action E1, which will provide updated mapping of littoral rainforests and coastal wetlands.

1.6 Whether the CMP identifies recommended changes to the relevant planning controls, including any proposed maps.

The Coastal Management Manual, as a mandatory requirement, specifies that a section must be included in a CMP with the title *"Whether the CMP identifies recommended changes to the relevant planning controls, including any proposed maps"*. This section addresses that requirement.

In summary:

This CMP does not recommend any changes to existing planning controls. However, modifications to the RH SEPP mapping (Coastal Wetlands and Littoral Rainforests, Coastal Vulnerability Area) may arise once the studies required by this CMP are completed.



Figure 7 Signs placed at coastal locations informing of consultation opportunities in

1.7 Coastal Zone Emergency Action Subplan, if the Coastal Management Act 2016 requires that a subplan be prepared.

The CM Act (section 15(1)(e)) outlines that a coastal zone emergency action subplan (CZEAS) must be included in a coastal management program (CMP) if the local council's local government area contains

land within the coastal vulnerability area (CVA), and beach erosion, coastal inundation or cliff instability is occurring on that land.

Clause 15(3) of the CM Act states that a CZEAS is:

“A plan that outlines the roles and responsibilities of all public authorities (including the local council) in response to emergencies immediately preceding or during periods of beach erosion, coastal inundation or cliff instability, where the beach erosion, coastal inundation or cliff instability occurs through storm activity or an extreme or irregular event.”

BSC is yet to formalise a CVA as defined in the CM Act and the State Environmental Planning Policy (Resilience and Hazards) 2021 (RH SEPP). This may be done by way of a planning proposal in future. Whilst a CZEAS is not currently compulsory, Council has decided to prepare this subplan as part of the CMP (see Appendix H).

The purpose of a CZEAS is to identify and facilitate the implementation of appropriate responses to emergencies related to certain coastal hazards that will protect human life and public safety, minimise damage to property and assets, minimise impacts on social, environmental, and economic values, and not create additional hazards or risks.

1.8 Maps

The Coastal Management Manual, as a mandatory requirement, specifies that a section must be included in a CMP with the title “Maps”. This section addresses that requirement.

Maps are inserted into the relevant sections of the CMP as shown in Table 1.

Table 1 Schedule of Maps

Title	Page Number
Map 1: RH SEPP Coastal Management Areas for Bellingen Shire	9
Map 2: RH SEPP Coastal Wetland and Littoral Rainforest Areas for Bellingen Shire	10
Map 3: RH SEPP Coastal Environment Area for Bellingen Shire	11
Map 4: RH SEPP Coastal Use Area for Bellingen Shire	12
Map 5: Representative locations of key issues	38
Map 6: Representative locations of management actions	54

2 A SNAPSHOT OF ISSUES

The following section describes the key issues in the Bellingen coastal zone. Spatial representation of these issues is shown in Figure 21 at the end of Section 2.

2.1 Coordination of Coastal Management

ASSESSED RISK LEVEL

High.

RELATED ACTIONS

G1, G2, E1, E2, H1, E3,
E4, E5, E6, W3, W4, W5

Coordination of coastal zone management is complex due to the multiple agencies responsible for land management. Along the coastline, land is largely Crown Land with various management arrangements, apart from North Beach and an area around Hungry Head Surf Club where Council is the responsible Crown land manager. There are several outstanding Aboriginal land claims (ALCs), lodged under the *Aboriginal Land Rights Act 1983* (ALR Act), within the boundaries of this CMP.

This creates what is known as an inchoate (unformed) interest in the land.

Bellingen Council recognises that there are opportunities to strengthen the relationship between Council and Gumbaynggirr People through care and understanding of the coastal environment. A key strategic direction of the BSC 2022-2026 Delivery Plan is to *'Actively engage with and include the perspectives and knowledge of our Gumbaynggirr community'*.

2.2 Coastal Zone Management Funding

ASSESSED RISK LEVEL

High.

RELATED ACTIONS

G1, G2

BSC relies heavily on grant funding opportunities and an environmental levy for implementation of environmental restoration works. With a large geographical area, but small rates base, funding of major works within the coastal zone is challenging. Council has successfully accessed a range of grant opportunities as they have arisen in the past, however strategic management can be difficult when reliant on opportunistic funding. Council recognises that opportunities for coastal stakeholder

collaboration would be beneficial in attracting funding to prominent coastal use areas that may be under the management of other agencies. For example funding for the Atherton Drive Master Plan.

2.3 Coastal Wetlands and Littoral Rainforest Mapping

ASSESSED RISK LEVEL

High.

RELATED ACTIONS

E1, E2, E5, E6, H, W4

In 2011/2012 the NSW Office of Environment and Heritage completed fine-scale floristic vegetation mapping of the Bellingen LGA based on high resolution aerial photography and floristic field-based site data. Known as the 'Vegetation Map of Bellingen Local Government Area' (Office of Environment and Heritage, 2013), this mapping identifies an additional 18 patches of Littoral Rainforest totalling 21.82 hectares.

Comparatively, the RH SEPP mapping of Littoral Rainforest has a total area of 3.95 hectares which represents only 18% of the area identified as Littoral Rainforest in the more recent mapping.

The SEPP (Resilience and Hazards) 2021 mapping identifies 314.2 hectares of coastal wetlands in the coastal zone. As with Littoral Rainforest, local high resolution vegetation mapping has not been incorporated into the SEPP (Resilience and Hazards) 2021 mapping. The SEPP (Resilience and Hazards) 2021 mapping represents 33% of the total coastal wetlands identified in the 2013 vegetation mapping.

Based on these data, Coastal Wetlands and Littoral Rainforests may be heavily unrepresented in the RH SEPP mapping, and therefore inadequately protected by the provisions in the CM Act.

2.4 Weeds Impacting Littoral Rainforest and Coastal Wetlands

ASSESSED RISK LEVEL

High.

RELATED ACTIONS

E1, E2, E5, E6, H, W4

The Littoral Rainforest at Hungry Head was assessed as part of the 2019 Vegetation Management Plan (VMP) for Dalhousie Creek (Bellingen Bush Regenerators, 2019). The VMP states that the vegetation is generally in good condition but would benefit from bush regeneration to remove mid-story woody weeds and ground-layer invasive species that restrict native species recruitment. Except for the Urunga sand mass and the Littoral Rainforest adjoining Hungry Head

SLSC, the condition of the remaining remnants is undocumented although similar infestation is expected. Many areas of coastal wetlands are susceptible to weed invasion due to their linear nature and large perimeter-to-area ratios. The '*National Recovery Plan for the Littoral Rainforest and Coastal Vine Thickets of Eastern Australia*' identifies transformer weeds as a key threat to Littoral Rainforest (Australian Government Department of the Environment and Energy, 2019). Transformer weeds are highly invasive with the potential to alter the structure and function of the ecological community. Updated vegetation mapping is required to identify those vegetation communities most under threat.



Figure 8 Bitou Bush at North Beach, Mylestom

2.5 Coastal Hazard and Climate Change Impacts on Coastal Wetlands and Littoral Rainforest

ASSESSED RISK LEVEL

High.

RELATED ACTIONS

E1, E2, E5, E6, H, W4

Areas of littoral rainforest are at risk from coastal hazards, with the severity of the risk increasing over time due to sea level rise and erosion. As Littoral Rainforest tends to occupy slopes it is largely safe from direct coastal inundation. Nevertheless, due to proximity of some patches of Littoral Rainforest to the coastline, it is threatened by beach erosion. Littoral Rainforest on North Beach, Hungry Head and Wenonah Head are at immediate risk from beach erosion with the area at risk increasing over time because of coastal recession due to sea

level rise. The '*National Recovery Plan for the Littoral Rainforest and Coastal Vine Thickets of Eastern Australia*' identifies climate change as a key threat to Littoral Rainforest (Australian Government Department of the Environment and Energy, 2019). Sea level rise, coastal erosion and storm surge are expected to result in changes to the structure, function, and composition of the ecological community.

Where the landward edge of coastal wetlands is bordered by hard structures such as roads, there is little room to migrate in response to rising tides due to sea level rise (i.e., the "Tidal Inundation" hazard). In many areas coastal wetlands are bordered by agricultural land and could be reasonably expected to migrate landward. Other sites, such as the wetlands north-east of Burrawong Parade, Urunga will likely be squeezed out due to previous placement of fill south of the wetland to facilitate residential development.

Figure 9 Coastal Wetlands, Urunga



2.6 Mylestom Erosion and Overtopping

ASSESSED RISK LEVEL

High.

RELATED ACTIONS

H3, E6, W5, U1

The riverbank at Mylestom has a long history of stabilisation works to facilitate public jetties, boat mooring, public access, and swimming. The existing works along the foreshore consist of a revetment made from concrete half-pipes and columns, constructed circa 1970s. Due to the age of the infrastructure and the hydrodynamics of the Bellinger River, the revetment is failing in numerous locations. Similar impacts are evident at the boat ramp, kayak launch and tidal pool with functionality

reducing as the infrastructure condition deteriorates.

Five hundred metres south of Mylestom township, there is risk of potential breakthrough associated with overtopping and low elevations of the Mylestom Spit dune system. Ongoing erosion of the inside edge of this spit may be increasing the risk of breakthrough by coastal overtopping and/or flood erosion.

Figure 10 Damage to infrastructure at Mylestom Reserve foreshore.



2.7 Dalhousie Creek Entrance Management

ASSESSED RISK LEVEL

High.

RELATED ACTIONS

G1, H4

In conjunction with erosion from extreme coastal storms, movement of the Dalhousie Creek entrance could result in undermining of the access road to the Urunga SLSC and given even more severe conditions, undermining of the SLSC building itself. Under current conditions, the SLSC observation tower is already under threat. A management strategy has been developed for the Dalhousie Creek Entrance (Hydrosphere Consulting, 2018). However, a data gap which remains is whether

bedrock is present to limit movement of the Dalhousie Creek entrance. Understanding these factors will be necessary to make informed choices on maintenance and management of the surf club infrastructure into the future.



Figure 11 Dune fencing at Urunga SLSC site

2.8 Uncontrolled Vehicle Access on Dunes

ASSESSED RISK LEVEL

High.

RELATED ACTIONS

G1, H3, H4, E3

Four-wheel drive access to beaches is permitted at Mylestom, Urunga and Valla. These beaches fall under several land management arrangements but for the most part they are the responsibility of DPHI-Crown Lands and/or Council.

Currently, a beach access permit is not required for vehicles. Several issues have been identified relating to vehicle access on beaches. User conflicts have been reported between passive recreation (walking, running, dog walking) and vehicles, largely around public safety. Signs explaining the permissible areas and conditions of beach access are in poor condition, resulting in vehicles entering prohibited areas and exacerbating user conflicts. There is evidence of vehicles driving above the high-water mark or across foredunes where beach scarping prevents access. This results in damage to dunes, dune vegetation and threats to species such as shorebirds that use the foredune for nesting and habitat.



Figure 12 4WD tracks through dune vegetation, North Beach Mylestom

2.9 Shorebirds

ASSESSED RISK LEVEL

High.

RELATED ACTIONS

G1, H3, E3, E4, U2

Community consultation as part of Stage 2 of the CMP identified predation of migratory shorebirds as a concern particularly in areas where off-leash dog walking occurs. Little Terns, Beach Stone-curlews, Sooty Oystercatchers, Pied Oystercatchers and Curlew Sandpipers are threatened shorebirds known to utilise the habitat of the Bellinghen coast. Additional threats include predation of eggs and chicks by foxes and the disturbance of nesting birds by four-wheel drive vehicles, domestic dogs, and tidal inundation.

2.10 Urunga Island and Yellow Rock Road

ASSESSED RISK LEVEL

High.

RELATED ACTIONS

G1, G2, E1, E2, H1, E4, E5, E6, W4, W5

Urunga Island and the land adjoining Back Creek along Yellow Rock Road is culturally and ecologically significant. Urunga Island is located at the confluence of the Bellinger and Kalang Rivers. The southern tip and western foreshore of Urunga Island is Crown land, whilst the remainder is a privately owned freehold lot. Urunga Island holds cultural and historical significance for the Gumbaynggirr People and the Crown reserve is the subject to ALC lodged under the ALR Act.

Urunga Island has one of the largest contiguous areas of coastal wetland and the most extensive areas of saltmarsh and mangroves in the Bellinghen coastal zone. Urunga Island and the land adjoining Yellow

Rock Road is a highly productive ecological area and provides refuge and resources for several threatened shorebirds.



Coastal inundation presents an assessed “medium” level threat to Urunga Island and north of Back Creek. Whilst the threat level is medium, there are significant benefits to considering coastal inundation when addressing the ecological and cultural degradation that has occurred due to land use impacts. There is approximately 1800m of sporadic moderate erosion on the eastern side of the island adjacent to the Bellinger estuary. Erosion processes here are exacerbated by the shallow water profile, low floodplain, poorly consolidated bank materials, exposure to both north-easterly and southerly wind waves, and ongoing disturbance by stock to banks and fringing mangrove vegetation. An area of candidate coastal saltmarsh EEC is also present at this site.

2.11 Riparian Vegetation Extent and Condition

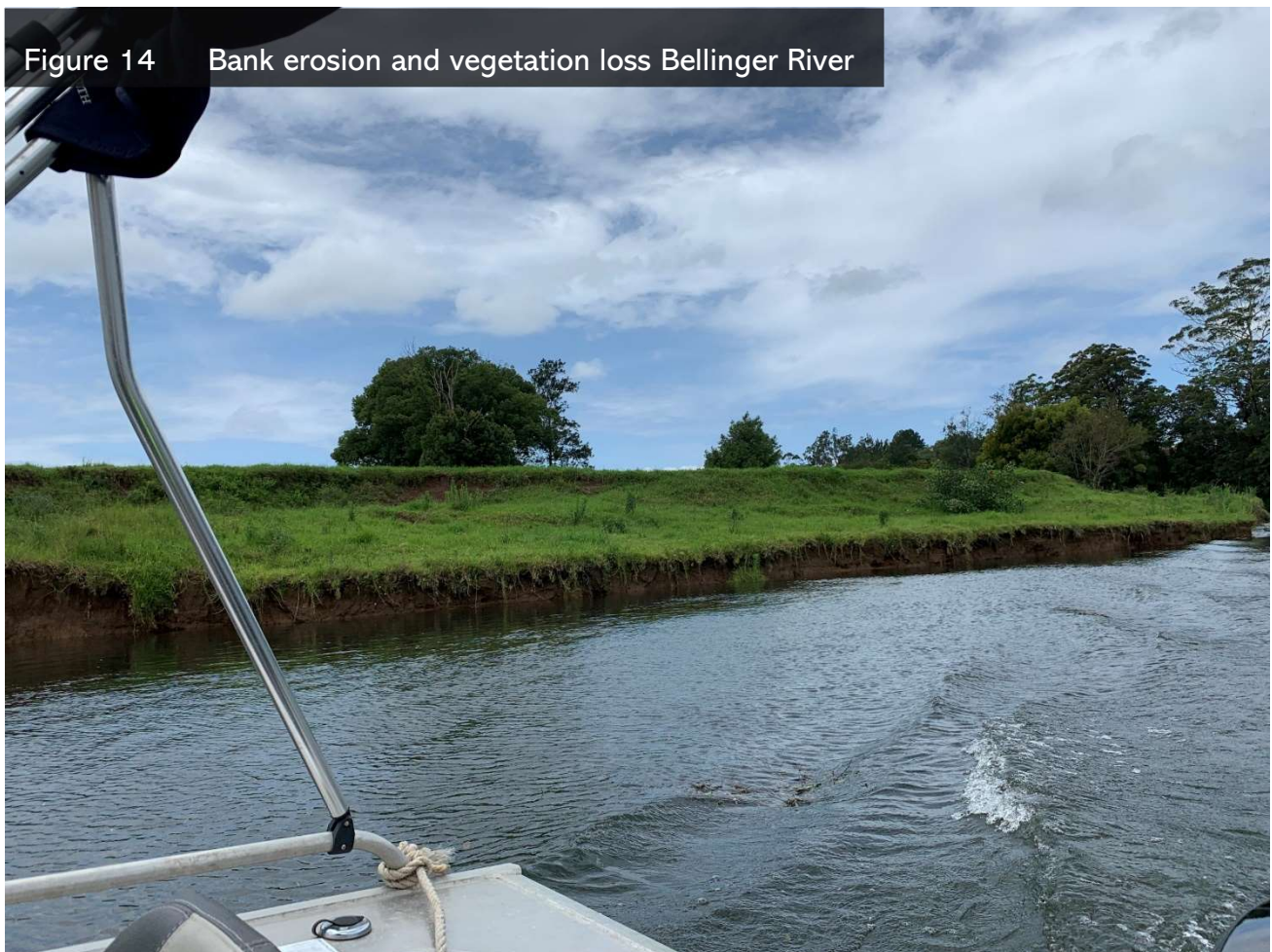
ASSESSED RISK LEVEL

High.

RELATED ACTIONS

G1, E1, E2, W4, W5

Floodplain and riparian vegetation have been extensively cleared in the past for agricultural purposes. Native subtropical rainforest and grasslands confined to poorly drained low-lying alluvial soils, have been largely replaced by mixed pastures and legumes. Ongoing pressures to floodplain and riparian vegetation include grazing, cattle access to riverbanks and loss of riparian vegetation due to bank erosion. Weeds are also a significant issue in the riparian zone. Camphor Laurel, Privet, and vine weeds such as Morning Glory, Cats Claw Creeper, Balloon Vine, and Madeira Vine, are particularly evident along both the Kalang and Bellinger Rivers. These species alter the structure of riparian vegetation and prevent natural regeneration of native species.



2.12 Faecal coliforms

ASSESSED RISK LEVEL

High.

RELATED ACTIONS

G2, W1, W2, W3, W4

The monitoring of faecal coliforms is not part of the Riverwatch, DCCEEW, or Ecohealth data collection. However, in response to public health concerns relating to oyster consumption, studies were conducted between 2011 and 2016. All sampled sites in the lower estuary contained some level of faecal contamination (Alluvium, 2020; Mika et al., 2016). Based on the Australian Shellfish Quality Assurance Program standards, all sites surveyed were classified as 'unconditionally restricted' or 'restricted', which means oysters must undergo depuration (the purging of contaminants either in tanks or within another, less polluted estuary) prior to being considered safe for consumption.

Decreased water quality and subsequent contamination is largely attributed to failing septic tanks.

Figure 15 Oyster leases on the Bellinger River



2.13 Urban stormwater

ASSESSED RISK LEVEL

High.

RELATED ACTIONS

W2, W3

The impacts of urban stormwater on water quality are not well understood. Management actions for urban stormwater discharge were proposed in the (Draft) Bellingen and Urunga Stormwater Management Plans (BMT WBM, 2011) which was not adopted by Council. Many of the recommendations are now outdated and do not reflect the current urban context or best practice.

2.14 Water quality monitoring

ASSESSED RISK LEVEL

High.

RELATED ACTIONS

G1, W1, W2, W3, W4,
W5

Water quality monitoring has been undertaken by a range of organisations throughout the catchment. Most detailed monitoring programmes have been over restricted timeframes, except for the Riverwatch volunteer program with near continuous data whilst in operation. Although past monitoring has been extensive, it is inconsistent in timing, locations, and parameters (due to participating organisations using different methodologies). Funding is inconsistent. This limits the ability to compare results and poses a challenge for future

interpretation.

Figure 16 Waterwatch volunteers.



2.15 Bank erosion on rural land.

ASSESSED RISK LEVEL

High.

RELATED ACTIONS

G1, E5, E6, W4, W5

The Bellinger-Kalang system is dynamic with complex morphologic processes. In the middle to lower reaches, the tidal influence creates new sedimentation patterns, flow dynamics, and erosion effects. Whilst these processes lead to a naturally dynamic watercourse, sustained bank erosion is being experienced throughout the estuary which is unable to naturally recover. Previous bank surveys have indicated up to one third of riverbanks are experiencing some type of erosion. The

erosion is caused by a range of factors, including inundation and slumping, scour during high flows at the bank toe, undercutting due to wave action, erosion due to unrestricted stock access, boat wash, and loss of riparian vegetation. The banks were last surveyed over 10 years ago (Telfer and Cohen, 2010) and require resurvey and comparison in order to program and prioritise works.

Figure 17 Bank erosion Bellinger River



Figure 18 Stock access degrading riverbanks on the Bellinger River



2.16 Bank erosion on residential land.

ASSESSED RISK LEVEL

High.

RELATED ACTIONS

G1, H2, H3, E6, U1

On the Kalang River in particular (esp. around Newry Island), there are waterfront properties with a range of ad-hoc foreshore protection structures in place. These include tyres, rock revetments, gabions, vertical concrete seawalls and timber structures. Some structures are effective in preventing erosion, but may have unintended impacts, such as creating greater erosion along neighbouring foreshores or reducing the ecological value of the foreshore environment. All foreshore structures for waterfront properties require a development application and, in some cases, approval from DPI Fisheries. If located on Crown Land (including Crown Waterway) Landowner's Consent from DPHI-Crown Lands will be required and, if the development is approved, a Crown Lands licence.



Figure 19 Ad hoc foreshore protection measures Urunga.

2.17 Urunga Boardwalk and Lido

ASSESSED RISK LEVEL

High.

RELATED ACTIONS

U2

The Urunga boardwalk is a heavily used facility by both residents and visitors. It provides an opportunity to access the open coast beach via the mudflats and to observe the dynamics of the entrance channel whilst protecting the sensitive coastal wetland environment. The existing boardwalk is in poor condition, with the southern arm of the boardwalk currently closed due to damage incurred during flood and severe marine borer damage present in a large number of piles within the main arm.

The Urunga boardwalk is a popular location for watching wildlife, fishing, exercise, and sightseeing, however, despite its high usage and value to the community, without replacement the Urunga boardwalk structure is nearing the end of its useful life and may require closure. The Lido is a popular swimming and recreation facility. The Urunga Lido suffers from sand migration, which fills deep water around the structure, reducing water depth and posing safety hazards to users.



Figure 20 Urunga Boardwalk

Note that some key issues occur in multiple areas. Locations indicated on map are representative locations.

Coordination of Coastal Management

Coastal Zone Management Funding

Urban Stormwater Impacts on Water Quality

Bank Erosion on Rural Land

Riparian Vegetation Extent and Condition

Coastal Inundation and Erosion at Urunga Island and Yellow Rock Road

Mylestom Erosion and Overtopping

Predation of Migratory Shorebirds

Uncontrolled Vehicle Access on Dunes

Water Quality Monitoring Inconsistencies

Coastal Hazard and Climate Change Impacts on Coastal Wetlands and Littoral Rainforest

Width of Urunga Boardwalk

Bank Erosion on Residential Land

Coastal Wetland and Littoral Rainforest Mapping

Weeds Impacting Coastal Wetland and Littoral Rainforest

Dalhousie Creek Entrance Management

Uncontrolled Vehicle Access on Dunes

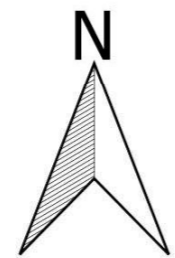


Figure 21 Representative Locations of Key Issues

Bellinghen Coastal Management Program

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3 ACTIONS TO BE IMPLEMENTED BY COUNCIL OR PUBLIC AUTHORITIES

The following section describes the CMP Actions. Spatial representation of these issues is shown in Figure 22 at the end of Section 7.

3.1 Action G1: Establish and Coordinate Coast and Estuary Reference Group

A formalised Coast and Estuary Reference Group is to be established. The Group shall meet on a regular basis and focus on the operational requirements of delivering the CMP. The Group will be chaired by Council and is to comprise staff from the following agencies / organisations:

- Council.
- Local Aboriginal Land Councils.
- Gumbaynggirr Wenonah Head Aboriginal Corporation RNTBC (GWHAC)
- Lease holders of Coastal Holiday Parks.
- Local Land Services.
- Department of Primary Industries (Fisheries).
- Department of Climate Change, Energy, the Environment and Water (EES).
- Transport for NSW Maritime (TfNSW).
- DPHI–Crown Lands.

The Group will be responsible for the following:

- Ensuring that there is broad understanding across government of ongoing Coastal Management matters in the Bellingen Shire.
- Identifying and assessing additional management actions that should be considered for completion as part of the CMP, as new issues arise and/or funding becomes available.

- Recording and tracking the progress of different Management Actions to facilitate subsequent reporting by Council.
- Applying for grant funding from State and Federal Government (which varies from year to year) A primary role of the Reference Group will be to identify these opportunities and to access additional funding to carry out or expand upon the actions identified in this CMP.
- To ensure that all relevant parties are suitably familiar with new information, such as the outcomes of studies arising from Marine Estate Management Strategy initiatives, so that informed advice can be provided, and actions can be coordinated.
- To investigate and develop triggers to initiate dredging for recreational safety at the Urunga Lido.
- Indigenous representatives advised concern regarding the protection of various cultural values in the coastal zone. An investigation will be undertaken into these matters under Action E5. The Reference Group will organise for that investigation and, where appropriate, and possible, provide advocacy for the protection of identified sites and cultural values. Similarly, the Reference Group will advocate for mandatory cultural heritage assessments as part of the state government approval process for moderate and high-density developments, when these arise.

Some of these activities may require external assistance from research organisations and/or independent consultants. The Reference Group should also consider consistency between the Local Strategic Planning Statement, the Local Environment Plan, Development Control Plan, and the CM SEPP.

Where problems are identified, the Reference Group should take actions to rectify these inconsistencies in a way that is consistent with the CM Act. In many cases, this may take the form of appropriate correspondence to the agencies that would normally take responsibility for the identified inconsistency. This Reference Group will have a very important role in tracking progress against the CMP as part of the monitoring, evaluation, and reporting program.

3.2 Action G2: Funding for CMP

BSC and the Coast and Estuary Reference Group will undertake the following actions with the aim of establishing an increased and consistent funding stream for coastal management actions:

- Investigate introduction of a stormwater levy.

The *Local Government Act 1993* was amended in 2005 to allow Councils to levy a stormwater management service charge (SMSC) for improved stormwater management. The annual SMSC is currently capped at \$25 for a residential dwelling with an area-based pro-rata cap applying to

commercial properties. If adopted, it would provide Council with an additional funding stream of ~\$100,000 per year to tackle river health and water issues that could be further leveraged through a range of state and federal funding program sources including the NSW coastal and estuary grant, and NSW environmental trust grants.

- Consider an increase to the environmental levy.

In May 2005, the Minister for Local Government approved a special variation to increase General Income by 4% for environmental projects. The environmental levy supports the implementation of projects to achieve the strategic directions, outcomes, and aspirations for the future for local communities. The key focus areas are invasive plant management; biodiversity management; coastline, estuary, and river management; sustainable food production; and climate change adaptation and mitigation. An application for an increase to the environmental levy would need to demonstrate the need for, and purpose of an increase which in this case is to facilitate implementation of this CMP. The community must be made aware of the need for and extent of the rate rise, and Council must demonstrate consideration of the community's capacity and willingness to pay the increased levy.

- Continue to seek grant funds where appropriate.

This 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). Council has been successful in obtaining a range of grants for various coastal projects in the past. The Coast and Estuary Reference Group, with its broad range of agency stakeholders, can assist Council through awareness and communication of suitable alternate funding streams, as they arise. Examples include 'Boating Now' and the NSW Environmental Trust.

3.3 Action G3: Shared responsibility, care and understanding of the coastal environment with the Gumbaynggirr People

The aim of this action is to establish relationships with representatives of the Gumbaynggirr People to gain a shared understanding of the values and management of Country in the coastal zone. The following tasks will be undertaken to achieve this action:

- Invite representatives of the Gumbaynggirr People and Gumbaynggirr Wenonah Head Aboriginal Corporation RNTBC (GWHAC) to join the Coastal & Estuary Reference Group (Option G1)
- Establish project groups, where appropriate, to prioritise management and understanding of culturally and ecologically significant sites to be managed within the coastal zone, such as the Atherton Drive precinct, Urunga Island and the Myelstom foreshore.

- Provide support and seek shared grant opportunities where coastal LALC land adjoins public land (for example there may be a future opportunity to support the development of the Wenonah Head Plan of Management, including involvement of the GWHAC).
- Investigate the possibility of and, if appropriate, support an application for of an Indigenous Protected Area covering Mylestom/Tuckers Island and potentially Urunga Island.

Management actions undertaken on Crown land are required to consider Aboriginal Land Claims lodged under the ALR Act. All activities relating to the use of Crown land must be consistent with the *Commonwealth Native Title Act 1993*.

4 COASTAL WETLAND AND LITTORAL RAINFOREST ACTIONS

4.1 Action E1: Review Coastal Wetlands and Littoral Rainforest SEPP Mapping

Coastal Wetland and Littoral Rainforest SEPP mapping requires updating to accurately reflect vegetation extent and to allow appropriate implementation of relevant planning controls. Council will also complete a Plan of Management under the Local Government Act, to enable environmental protection works within the Coastal Wetlands and Littoral Rainforest Areas under RH SEPP. This will support the implementation of Action E2.

The 'Vegetation Map of Bellinghen Local Government Area' (Office of Environment and Heritage, 2013) provides finer scale and more recent mapping of vegetation communities than that currently reflected in the SEPP. To accurately map the Coastal Wetlands and Littoral Rainforest, ground truthing of the previously mapped areas is necessary to confirm both the vegetation community and extent. An output of this process would be a map where revisions (extension or reduction) to the boundaries of the SEPP mapping are recommended. Furthermore, the mapping should identify areas where weeds are present so that weed control efforts under Action E2 can be targeted to protect areas of coastal wetland and/or littoral rainforest.

Ground truthing provides an opportunity to assess the condition of the vegetation and can be subsequently used to prioritise rehabilitation and weed management efforts (see Action E2).

Upon completion, Council will work towards developing a Planning Proposal for amendment of the SEPP mapping to include the refined Coastal Wetland and Littoral Rainforest extents.

4.2 Action E2: Control Weeds in Coastal Wetlands and Littoral Rainforest

Action E1 will provide the basis for this action through provision of the Coastal Wetlands and Littoral mapping and condition assessment, and the identification and mapping of areas where weeds are present. The actual location of works under Action E2 will not be known until Action E1 is complete. The total extent of activities completed under Action E2 will depend on the subsequent prioritisation of areas

identified by Action E1, the intensity of required effort within priority areas, and how this matches against the funding allocated within the Business Plan (see Section 8.3)

All works under this action would be aimed at rehabilitating the land towards a more natural state, using typical bush regeneration techniques limited to weed pruning, clearing and removal (either physical or chemical), replanting, mulching, and the exclusion of livestock through fencing (if needed). Replanting will use species that are locally indigenous and naturally occurring within the area of coastal wetland or littoral rainforest being rehabilitated and protected. Weeding would generally be conducted in accordance with the NSW weedwise guidelines².

As is common, follow up or maintenance weeding, mulching, and/or repair of fencing may be required as a part of the works included under this action. The works proposed under this action are "Environmental Protection Works" as identified in the *Bellingen Local Environment Plan (2010)* and referred to in Section 2.7(3) of the RH SEPP.

Sites will be identified to undertake weed management works with priority given to sites on public land, where active Landcare, Dunecare, or custodian groups are present. Where possible, a weed containment buffer to the vegetation community would be established. Upon completion of the initial works, periodic inspection and maintenance works would be conducted on an ongoing basis.

The North Coast Regional Weed Management Plan emphasises shared management of priority weeds on both private and public land (North Coast Local Land Services, 2021). As part of the CMP, the Coast and Estuary Reference Group will advocate for the NCWMP to specifically include education on all weeds impacting on Coastal Wetlands and Littoral Rainforest, not just those listed as priority weeds.

5 COASTAL HAZARD ACTIONS

5.1 Action H1: Understand and Monitor Coastal Hazard Impacts on Coastal Wetlands and Littoral Rainforest

This action allows Council to take advantage of the research being undertaken by DCCEEW Science, as well as the outputs of the Marine Estate Management Authority (MEMA) through the Marine Estate Management Strategy. It involves a range of tasks that will become possible at various times throughout the duration of this CMP including:

² <https://weeds.dpi.nsw.gov.au/>

- Monitoring the future development of coastal hazard risks by way of an annual invitation to DCCEE Science by the Coast & Estuary Reference Group to present on latest coastal hazard data and observable trends.
- Use new vegetation mapping (see Action E1) to identify paths for migration of Coastal Wetlands and Littoral Rainforest. Utilise sea level rise projection tidal modelling and research on the limiting rate at which ecosystems can adapt (e.g., through vertical accretion) if there are physical barriers.
- Review adequacy of the existing planning controls to accommodate migration for priority sites,

5.2 Action H2: Develop a Foreshore Management Guideline for Residential Properties

Many of the current treatments to manage foreshore erosion on residential property do not meet contemporary standards and are ad-hoc in nature. Retrospective compliance is not appropriate; However, Council can look to provide guidance and establish development controls for all new protection works or when new development occurs within proximity of the foreshore. This action involves the following tasks:

- Develop a Foreshore Management Guideline to provide property owners with acceptable solutions for foreshore treatments. These guidelines should include information on foreshore processes, and environmentally friendly treatment solutions. They would include basic design drawings for acceptable solutions and an outline of the development approval process for foreshore structures. A targeted education program and distribution of the guideline to waterfront property owners should accompany the release of the guideline.
- Make any necessary amendments to Council's Development Control Plan to ensure consistency with and reference to the Foreshore Protection Guideline.
- Provide education to development assessment and compliance staff at Council regarding the Guideline and its implementation. Integrate consideration of the guideline into development assessment and compliance activities.

5.3 Action H3: Undertake Technical Studies at Mylestom Spit and Mylestom Reserve Foreshore to Inform Infrastructure Upgrade, Location, and Design

This action is a key measure to underpin future planning for Mylestom and the foreshore reserves, spit, and associated infrastructure. Significant investment is likely required to maintain or improve infrastructure

and assets in this location and therefore a thorough understanding of the hydrology and geomorphology is paramount to ensure asset life and functionality. Tasks will include:

- Update of historical channel migration information to cover period from 1980 (post the previous Lower Bellinger Waterway Study (Public Works Department New South Wales, 1983)), using more recent methods and data (e.g. satellite data, LIDAR & detailed aerial photography).
- Geotechnical investigation to identify any limits to erosion (e.g. underlying bedrock) and the founding capacity for any structures.
- Cultural Assessment of Myelstom foreshore.
- Assessment of wave climate and detailed hydraulic and morphodynamic modelling of floods to assess potential erosion/scour depths from flood events of various sizes, including loss of width from Mylestom Spit. Test and qualitatively validate models against response to recent historic events. Existing numerical models can be augmented to complete this study. Outputs from modelling should precede and be used to inform the detailed design of the works proposed in Option U1.

5.4 Action H4: Undertake Technical Studies at Dalhousie Creek entrance to inform Future Management of the Urunga SLSC Building.

It seems possible that the Urunga Surf Life Saving Club building is founded on or above rock, which would be resistant to erosion. For this reason, a small geotechnical study to identify the extent and depth of rock has been recommended for this area in the past and such an action should be carried forward to the CMP, including:

- Undertake Geotechnical investigation to identify depths to bedrock under roadway and founding area of SLSC Building.
- If required, undertake a refined Coastal Hazard investigation, to identify the extent of hazards (informed by geotechnical investigation).
- If needed, investigate optional locations for the SLSC Building and access and an assessment of costs associated with relocation.

6 COASTAL ENVIRONMENT AREA ACTIONS

6.1 Action E3: Manage Vehicle Access on Beaches

As with most compliance issues, a range of tasks are necessary to manage this issue, from physical deterrents to education. This action is focused on environmental outcomes and therefore all tasks and location of works should be for the primary benefit of improving ecological outcomes in the coastal zone.

- Develop a beach driving permit system in consultation with Nambucca Valley Council, the National Parks and Wildlife Service, DPHI-Crown Lands, the LALC, and GWHAC.
- Prepare information and a Code of Conduct for beach driving and provide to permit holders at time of purchase. Provide information and regulatory signs at beach access points and key locations.
- Enforce compliance via issue of penalty notices or permit cancellations.
- Exclude vehicle use through signs, markers, and access controls at sensitive or degraded areas (North Beach Mylestom, Hungry Head).
- Implement beach driving closures where threatened species are identified (i.e., shorebird nesting sites) or seasonally as required.

6.2 Action E4: Protect Threatened Shorebirds

The Bellingen Biodiversity Strategy (Ecological Australia, 2021) recommends a community program to educate dog owners about protection of the Beach Stone-curlew and its nesting sites. There is an absence of baseline information on shorebirds and their habitat in the Bellingen coastal zone to allow targeted recovery programs. This action involves a study to identify shorebird species, quantify shorebird population size, map suitable shorebird habitat, and identify threats to shorebirds and shorebird habitat. The study should include a review of existing off leash dog walking areas and policies, in relation to impact on threatened shorebirds. The study should recommend a range of management actions to enhance shorebird protection and will provide a baseline to evaluate the effectiveness of these actions.

6.3 Action E5: Investigate and Enhance Ecological Values at Urunga Island and Yellow Rock Road, Dalhousie Creek, along the Kalang River.

Urunga Island and the area adjoining Yellow Rock Road is of high biodiversity and cultural value. The site has also been identified for restoration works (see Action E6) to improve bank stability and vegetation.

This area is also susceptible to future climate change impacts due to its low elevation and position in the estuary. Potential funding opportunities to enhance the ecological and cultural values of Urunga Island and Yellow Rock are to be investigated. These may include eligibility as a Blue Carbon project site (and the acquisition of carbon credits), public acquisition opportunities (possibly via the Coastal Lands Protection Scheme) and eligibility and willingness of private owners to undertake grant funded restoration work.

A cultural assessment will also be undertaken to identify and subsequently pursue, where possible, protection of middens on Urunga Island, Cultural Harvesting Sites in the Kalang River, and Cultural sites in Dalhousie Creek. The study will also consider and provide clarification on rights associated with the access to waterways for cultural purposes.

6.4 Action E6: Undertake an Estuarine Bank Condition Assessment

The bank condition mapping for the Bellinger and Kalang Rivers is over 10 years old and warrants a review and update. A comparative bank condition assessment is recommended, where priority sites are chosen based on a multi-criteria analysis. Factors to be included in the assessment are water quality parameters (for example contribution of sediment and turbidity), protection of natural assets, land use and riparian vegetation condition. This will provide a consistent base to access permits and funding opportunities and, could use the Decision Support tool developed under MEMA. The updated assessment would give a clear understanding as to why it's useful to invest in those bank reaches identified in the assessment.

6.5 Action E7: Business Case for Community Engagement Programs

Several potential avenues for community engagement programs have been identified during the development of the CMP. Following from early studies during the first year of the CMP (mapping coastal wetlands and littoral rainforests, studying ecological and cultural values, and establishing improved water

quality monitoring) there is the potential that enhanced community engagement programs may be warranted to help communicate new findings to the broader community.

Action E7 will endeavour to complete an investigation and develop a business case for a preferred enhanced engagement strategy. This would consider options such as a Riverkeeper (akin to the long running Georges Riverkeeper in Sydney), Riverwatch and/or other citizen science initiatives.

The business case will aim to form a foundation which the Reference Group (Action G1) can leverage to seek funding to develop the business plan and get the program up and running. Depending on available funding, the preferred initiatives may start within the forward timeframe of this CMP (into 2028) or may be added as relevant actions upon CMP review.

6.6 Action W1: Implement the Sewering Coastal Villages Project

This large-scale project involves the connection of coastal villages in the lower estuary to a reticulated sewerage system. This will reduce local sewage overflows into the estuary, reducing faecal contamination and wastewater pollution. This aligns with the Bellinger Shire Biodiversity Strategy (Ecological Australia, 2021) which aims for measurable improvements in water quality across Bellinger-Kalang waterways; protection of foreshores, coastal lagoons, significant wetlands, and coastal saltmarsh; and restoration of the ecological function of high priority waterways and wetlands.

The project has already been designed and costed by Council in collaboration with the NSW Government and has received partial funding to improve wastewater treatment and infrastructure, including an upgrade of the Urunga Sewerage Treatment Plant and new pump stations. The project involves expansion of the sewer network to include:

- Mylestom – 180 residential lots, Mylestom Surf Life Saving Club and Reflections Holiday Park.
- Repton – 31 residential properties and the Bellinger River Tourist Park.
- Raleigh – 23 residential lots.
- Raleigh Industrial – 25 industrial lots with the capacity to connect to an additional 75 lots.

6.7 Action W2: Implement and Review Urban Stormwater Management Plans for Bellinger and Urunga

A refined understanding of urban stormwater impacts, and exploration of Water Sensitive Urban Design principles will be of future benefit to water quality improvements. Council is presently undertaking a shire

wide stormwater asset investigation and condition assessment. The investigation will culminate in the preparation of an Urban Stormwater Management Plan for BSC. The plan will provide guidance on urban water quality management objectives, stormwater quantity management and stability of urban waterways.

This action covers an allowance for the implementation and review of these stormwater management plans.

6.8 Action W3: Improve the Consistency of Water Quality Monitoring in Waterways

With the support of the Council, Riverwatch monitoring efforts can be improved with volunteer training, updated techniques, upgraded equipment, and the inclusion of more monitoring parameters. These actions will minimise the need for additional monitoring programs and can provide a long term, consistent dataset of water quality throughout the catchment.

Actions to improve and continue the Riverwatch programme include:

- Secure Council commitment and funding to allow the Riverwatch programme to continue.
- All water quality monitoring analysis will implement the new Bellinger-Kalang Catchment specific freshwater guideline values presented in the Bellinger Water Quality Management Plan (Jeremy Benn Pacific, 2022) and apply the new forthcoming estuary guideline values once published by DCCEEW.
- A review will be conducted into the approach and equipment used within the Riverwatch programme to measure Turbidity and Phosphorus to gain consistency between the DCCEEW and Riverwatch sampling.
- Continuing and/or funding experienced water quality experts occasionally attending Riverwatch monitoring to support volunteers and assess/validate monitoring techniques.
- Review sample site locations.

6.9 Action W4: Promote Programs and Grants for Stock Management on Riparian Land

The management of grazing on riparian land involves stock exclusion and fencing which would optimise the capacity for vegetation recovery and reduce turbidity, bank erosion, and faecal contamination of the estuary. This action would reduce the high-risk to water quality of stock grazing of riparian and aquatic vegetation. Areas suitable for stock exclusion are primarily on freehold, private land, which Council does not directly manage. In these areas, Council should advocate for the riparian management, supporting

any opportunities to collaborate with landholders or other government departments. Examples would include promotion of programs run through LLS via Council's social media channels, web page, and media releases.

Opportunities are dependent on landholder agreement, which may not necessarily occur in areas of highest priority. For example, initial landholders interested in applying riparian exclusions may be within medium-erosion risk areas. However, support should be given for any area where stock have direct access to the waterway to mitigate future issues.

6.10 Action W5: Review of Boating Regulatory Initiatives

The impacts of boating and boat wash can be minimised to reduce bank erosion, loss of seagrass habitat and aquatic biodiversity. Strategies which may be considered include education, advisory signage, navigation aids, imposed restrictions, and compliance monitoring. Key affected areas currently include the southern branch of the Kalang around Newry Island and Back Creek.

TfNSW will undertake a review of boating regulatory initiatives at the key affected areas in consideration of bank erosion.

6.11 Action W6: Permanent Water Quality Monitoring Station

This action reflects Action "MON2" from the Water Quality Management Plan (Appendix B). A continuous water quality monitoring station capable of measuring physiochemical parameters is to be installed in the catchment. The action aims to support the continuation of water quality monitoring programmes for the measurable improvement in water quality across Bellinger-Kalang waterways.

The monitoring station could be configured to record a range of water quality parameters with the results shared in real-time through an online portal. This station would:

- Provide high-frequency data on the natural variability within the system.
- Provide a baseline dataset that can be used for training and validation.
- Provide consistent and precise monitoring of pH, EC, nutrients, turbidity, temperature.
- Potentially include metals, microbiological, and physiochemical parameters (depending on availability of funding).

A suitable location for the station will be investigated prior to implementation.

6.12 Action W7: Expand Public Water Quality Website

This action reflects Action “MON4” from the Water Quality Management Plan (Appendix B). Bellingham Shire Council currently has a Water and Wastewater Public Data Portal which displays information on wastewater quality and water usage plus information on upcoming weather and the Sewering Coastal Villages Project.

This existing website could be expanded to include the proposed continuous water quality monitoring station (Action W6) and Riverwatch data. The site would display recent monitoring data against thresholds and could include score-card style reporting. The website would provide a transparent communication of current water quality to the public and stakeholders.

7 COASTAL USE AREA ACTIONS

7.1 Action U1 – Upgrade foreshore stabilisation and recreational facilities (boat ramp, kayak launch and swimming area) at Mylestom Foreshore Reserve

Upon completion of the technical studies outlined in Option H3, sufficient understanding of the foreshore dynamics will allow for the informed design and construction of replacement stabilisation works that are fit for purpose. Restoration works are likely to include a range of strategies including removal of historic concrete pipe protection, toe protection, reprofiling, revegetation and other structural protection works.

The foreshore works could include construction of a new kayak launching facility on the footprint of the existing northern boat ramp at Mylestom. Mylestom tidal pool also requires renewal to address the deteriorating condition of the timber boardwalk and retaining wall.

Key tasks for this action include:

- Prioritisation of failing foreshore protection structures adjoining infrastructure assets (such as stormwater pipes, access stairs / ramps) for repair.
- Refurbishment of the Mylestom Boast Ramp
- Refurbishment of the Mylestom Tidal Pool
- Construction of a new kayak launch facility

7.2 Action U2 – Urunga Boardwalk

Due to the poor condition and limited useful life left in the boardwalk structure, opportunities should be sought for replacement to ensure the entrance channel, coastal wetland environment, mangroves and dunes are protected yet accessible for residents and visitors alike. The Urunga wetland is an important feature to the local indigenous population and consultation with the indigenous community should be undertaken throughout. The Urunga boardwalk fails to meet current compliance standards in terms of suitable width for two-way pedestrian access and disability access. When being replaced opportunities to address these issues should be sought.

Note that some management actions apply to multiple areas. Locations indicated on map are representative locations.

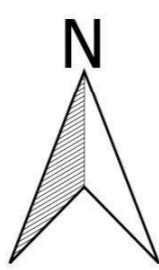
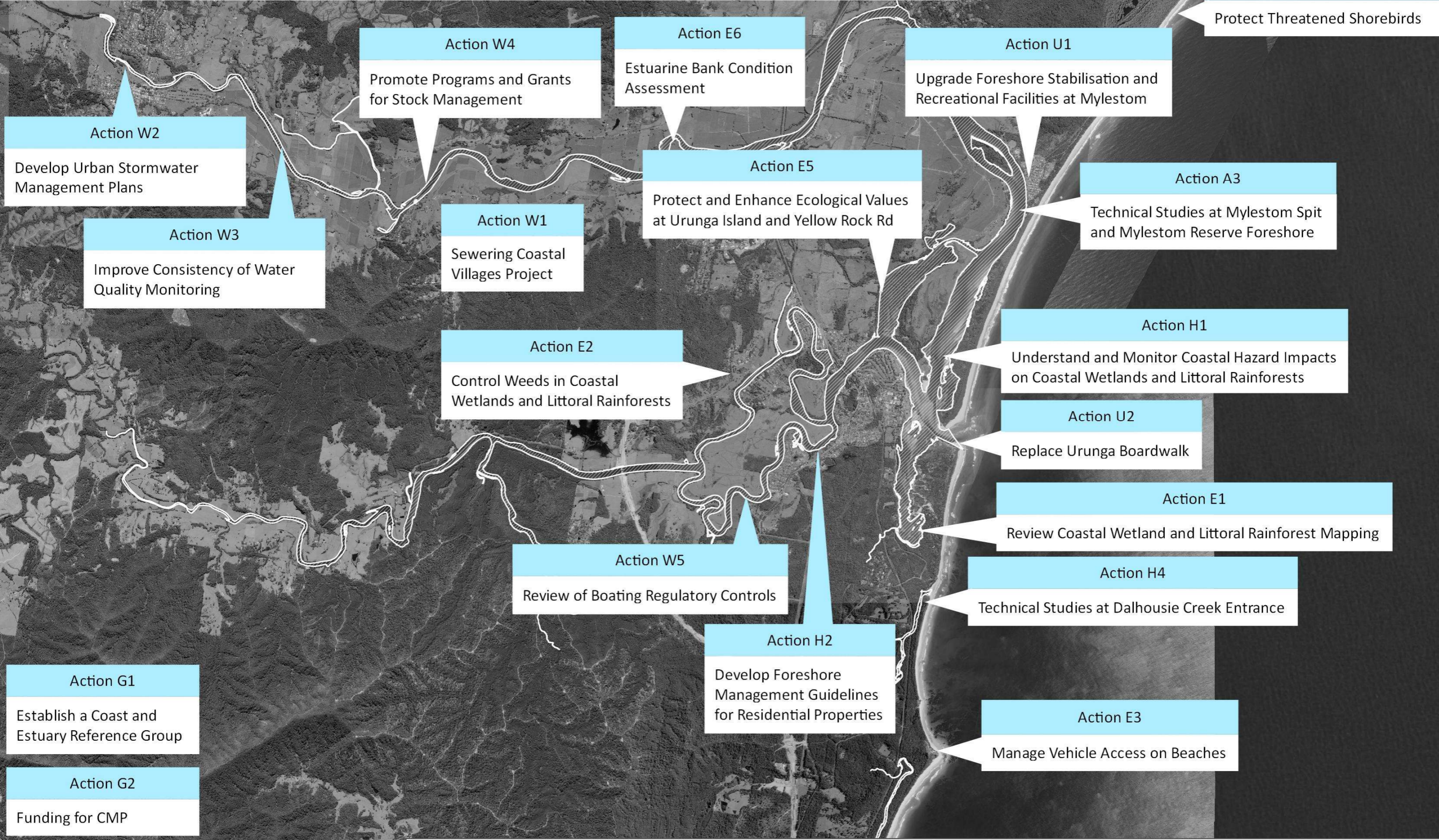


Figure 22 Representative Location of Management Actions

Bellingin Coastal Management Program

GIS File: Z:\BusinessShare\Them\Projects\P00127_BellinginShireCMP\Outgoing\Figures\CMPMaps.qgz



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8 A BUSINESS PLAN

8.1 Intent of the CMP

Key to determining the timing and way that different actions of the CMP will be funded and implemented is understanding the benefits that will arise from the CMP, and who the beneficiaries are.

Examination of the key management objectives for each issue demonstrates that:

- The focal Coastal Management Areas are the Coastal Wetland and Coastal Hazard Areas.
- Where objectives aren't seen to have "Environmental Benefit" as the focus, such as preservation of public access, or public facilities, the objectives can be seen as contributing to building or maintaining collective wealth within the community.

From these two points, most benefits are widespread and not targeted to any group or individual. The beneficiaries of the proposed CMP Actions are the broader community. Individual consideration of each proposed action (Sections 3 - 7) also supports this conclusion.

In summary, all actions presently included in this CMP can be seen to overwhelmingly accrue benefits to public and not private interests.

Accordingly, all funding should come from public sources (Local, State and Federal Government).

8.2 Cost and Funding Arrangements

One substantial difficulty for small local councils when planning for coast and estuary management in NSW is that future funding from grant sources, at both state and federal level is uncertain in the medium term. Grant funding programs are normally contestable, and the likelihood of success can be affected by:

- Demand for the program.
- The rules surrounding the matching funding required changing from year to year.
- Variability in the pool of available funding, depending on other demands on public funds.

BSC most commonly uses funds from general revenue, mostly derived from ordinary council rates and the Environmental Levy, to leverage additional funding from external grants programs that provide funding for coast and estuary-related management activities. A review of Council's operational plan at Scoping

Study stage indicated that council used around \$260,000 of its Environmental fund, largely derived from an environmental levy, for coast and estuary management in the 2021/2022 financial year. However approximately \$180,000 of that funding had been carried over from previous years.

Several grant programs have been identified:

- Coast and Estuary Planning and Implementation Funding from DCCEEW (presently funding on a 1:2, Local: State Govt. ratio).
- Floodplain Management Grant Funding from DCCEEW (presently funding on a 1:2, Local: State Govt. ratio).
- NSW Environmental Trust, Environmental Education, Environmental Research and Restoration and Rehabilitation Administered by DCCEEW (funding ratio is variable, success more likely with some contribution, a 1:2 funding assumption seems reasonable).
- DPI Fisheries: Habitat Action Grants (1:1 funding available for projects up to \$40,000).
- DPI Flagship Fish Habitat Rehabilitation Grants (very limited program but supports works including hydrological and environmental investigations and on-ground works, A maximum of \$400,000 with projects running for up to two years).

In addition to these grant sources, North Coast Local Land services also has funds to help with environmental repair and restoration works. There may also be opportunities for Council to access Federal grant programs. However, these tend to be ephemeral, rather than a regularly programmed funding scheme. As such, they should be considered a supplementary source of funding and should not be relied upon for completing the actions programmed into the CMP.

A substantial proportion of the CMP budget is for the Sewering Coastal Villages Program. BSC has allocated \$25.3 million for this project.

Consultation with state government agencies has secured advice committing to support the management actions proposed in the CMP. The relevant advice is provided as Appendix G. For contestable grants programs, Council has secured commitment that the proposed projects will be eligible for consideration. Expenditure for the four-year period has been outlined, covering the short and medium terms. After four years, we expect the CMP will be reviewed. This is necessary as a significant number of the actions proposed are studies and research which are needed to inform future management actions that could result in the recommendation of further on-ground works.

The breakdown of funding, indicating expected Council contributions and funding from external sources for each calendar year is presented in Table 2. A more detailed breakdown of funding for all management actions is presented in Section 8.3.

Table 2 Projected Expenditure on the CMP (to Nearest \$1000)

Year	Council Funds	External Funds
2024/2025	\$99,000	\$199,000
2025/2026	\$144,000	\$280,000
2026/2027	\$14,505,000	\$10,002,000
2027/2028	\$14,495,000	\$9,982,000

8.3 Program for Delivery

A program for delivery of the Management Actions in the CMP, including funding sources, contributions and timing is presented in Table 3. Actual timing for different actions is dependent on both the expected value to be derived from the action, the urgency surrounding the issues each action is intended to address and the availability of funds from year to year. Table 3 highlights that operational costs are expected to be incidental to the ongoing operations of Council and other responsible agencies, and variable over time. Variability is dependent on the urgency surrounding different issues and any opportunistic funding which may arise during CMP delivery. The effort required from the delivering agencies has been considered, but the nature of that effort and makes it difficult to put a precise dollar amount against the operational costs.

Table 3 Program for Delivery

	Management Option	Cost			Total BSC Contribution	Total External Contribution	External Funding Source	Responsibility for Delivery		Funding and Delivery Program								
		Capital	Maintenance (annual)	Operational				Primary	Supporting	2024/25		2025/26		2026/27		2027/28		
										BSC	External	BSC	External	BSC	External	BSC	External	
Ecosystem Health	E1: Review Coastal Wetlands and Littoral Rainforest SEPP Mapping	\$45,000.00		(1)	\$15,000.00	\$30,000.00	C & E Grants	Council		\$15,000	\$30,000.00							
	E2: Control Weeds in Coastal Wetlands and Littoral Rainforest	\$150,000.00	\$60,000.00	(2)	\$70,000.00	\$140,000.00	C&E Grants, Environmental Trust, Landcare Grants	Council	NPWS, LLS			\$50,000.00	\$100,000.00	\$10,000.00	\$20,000.00	\$10,000.00	\$20,000.00	
	E3: Manage Vehicle Access on Beaches	\$45,000.00	\$36,000.00	(1)	\$27,000.00	\$54,000.00	C & E Grants, Crown Reserve improvement Fund	Council	Crown Lands, NPWS	\$15,000.00	\$30,000.00	\$4,000.00	\$8,000.00	\$4,000.00	\$8,000.00	\$4,000.00	\$8,000.00	
	E4: Protect Threatened Shorebirds	\$90,000.00		(2)	\$30,000.00	\$60,000.00	C & E Grants	Council	NPWS	\$30,000.00	\$60,000.00							
	E5: Investigate and enhance ecological values at Urunga Island and Yellow Rock Road and along the Kalang River	\$30,000.00		(3)	\$10,000.00	\$20,000.00	C & E Grants, Environmental Trust	Council	DOCEEW, Crown Lands	\$10,000.00	\$20,000.00							
	E6: Assess Riparian and Estuarine Bank Condition	\$102,000.00		(1)	\$34,000.00	\$68,000.00	C & E Grants, Australian Government Environment Restoration Fund, NSW Recreational Fishing Trusts Fund, NAB Environmental Resilience Fund, Environmental Levy	Council	Private Landholders, LLS			\$34,000.00	\$68,000.00					
	E7: Business Case For Community Engagement Programs	\$30,000.00		(1)	\$10,000.00	\$20,000.00	C & E Grants, Australian Government Environment Restoration Fund	Council	DOCEEW					\$10,000.00	\$20,000.00			
Water Quality	W1: Implement Sewering Coastal Villages	\$38,000,000.00		(2)	\$25,333,333.00	\$12,666,667.00	Stormwater Levy, Building Better Regions Fund, Australian Government Environment Restoration	Council							\$12,666,666.50	\$6,333,333.50	\$12,666,666.50	\$6,333,333.50
	W2: Investigate and develop Urban Stormwater Management Plans including a stormwater asset condition assessment	\$400,000.00		(1)	\$133,333.33	\$266,666.67	Resilience NSW Grant (Local & Regional Risk reduction scheme)	Council							\$66,666.67	\$133,333.33	\$66,666.67	\$133,333.33
	W3: Improve consistency of Water Quality Monitoring in Waterways		\$9,000.00	(1)	\$3,000.00	\$6,000.00	C & E Grants, NSW Environmental Trust, Environmental Levy	Council	Riverwatch	\$750.00	\$1,500.00	\$750.00	\$1,500.00	\$750.00	\$1,500.00	\$750.00	\$1,500.00	
	W4: promote Programs and Grants for Stock Management on Riparian Land	\$5,000.00	\$6,000.00	(1)		\$11,000.00	C&E Grants, Australian Government Environment Restoration Fund, NSW Recreational Fishing Trusts Fund, NAB Environmental Resilience Fund	Council	LLS, Private Landholders		\$5,000.00		\$2,000.00		\$2,000.00		\$2,000.00	
	W5: Review of Boating Regulatory Initiatives			(1)			In House funding, Transport for NSW (Maritime)	TfNSW										
	W6: Permanent Water Quality Monitoring Station	\$20,000.00	\$10,000.00	(1)	\$15,000.00	\$15,000.00	C&E Grants, NSW Environmental Trust, Environmental Levy	Council	DOCEEW	\$7,500.00	\$15,000.00	\$2,500.00		\$2,500.00		\$2,500.00		
	W7: Expand Public Water Quality Website	\$3,000.00	\$1,500.00	(1)	\$2,500.00	\$2,000.00	C & E Grants, NSW Environmental Trust, Environmental Levy	Council	DOCEEW	\$1,000.00	\$2,000.00	\$500.00		\$500.00		\$500.00		
Coastal Hazards	H1: Understand and Monitor Coastal Hazard Impacts on Coastal Wetlands and Littoral Rainforests			(1)				Council	DOCEEW									
	H2: Develop a Foreshore Management Guideline for Private Properties	\$22,500.00		(1)	\$7,500.00	\$15,000.00	C & E Grants	Council		\$7,500.00	\$15,000.00							
	H3: Undertake technical studies at Mylestom Spit and Mylestom Reserve Foreshore to inform infrastructure upgrade, location and design	\$150,000.00		(1)	\$50,000.00	\$100,000.00	C & E Grants	Council	Crown Lands			\$50,000.00	\$100,000.00					
	H4: Undertake technical Studies at Dalhousie Creek Entrance to inform infrastructure upgrade, location and design	\$30,000.00		(1)	\$10,000.00	\$20,000.00	C & E Grants	Council	SLSC, Crown Lands	\$10,000.00	\$20,000.00							
Coastal Use	U1: Upgrade Foreshore stabilisation and recreation facilities(boat ramp, kayak launch, and swimming pool) at Mylestom foreshore reserve	\$7,900,000.00		(2)	\$2,633,333.33	\$5,266,666.67	Recreational Fishing Trusts, Crown Reserve improvement Fund, Boating Now	Council	Crown Lands					\$1,316,666.67	\$2,633,333.33	\$1,316,666.67	\$2,633,333.33	
	U2: Upgrade Urunga Boardwalk and Lido	\$2,550,000.00		(2)	\$850,000.00	\$1,700,000.00	C&E Grants, Recreational Fishing Trusts, Crown Reserve Improvement Fund, Boating Now	Council	Crown lands					\$425,000.00	\$850,000.00	\$425,000.00	\$850,000.00	
Governance	G1: Establish and Co ordinate Coast and Estuary Reference Group		\$10,000.00	(1)	\$10,000.00		C&E Grants	Council		\$2,500.00		\$2,500.00		\$2,500.00		\$2,500.00		
	G2: Funding for CMP			(1)			In kind funding from Council and responsible agencies for delivery of actions under the CMP.	Council	other agencies on the coast and estuaries reference group									
	G3: Shared Responsibility, Care, and Understanding of the coastal Environment with the Gumbaynggir people			(1)			In kind funding from Council.	Council	LALC & Gumbaynggir Representatives									
Total		\$49,572,500.00	\$132,500.00		\$29,243,999.66	\$20,461,000.34				\$84,250.00	\$198,500.00	\$144,250.00	\$279,500.00	\$14,505,249.84	\$10,001,500.16	\$14,495,249.84	\$9,981,500.16	

- (1) Operational costs include expenses associated with staff salaries, ongoing costs, internal overheads, and costs associated with the normal functioning of local government and other state agencies. In most cases, these are provided as an 'in-kind' contribution, as required, and are absorbed within the normal operational budget of the responsible agencies.
- (2) Essentially, the approach here is similar to (1), except that where contractors are used to complete on-ground works of any kind, the operational cost would be a nominal 10% of the contract cost.
- (3) In this instance, Council will provide in-kind contributions (staff time and resources) to complete all parts of this action except for the cultural assessment, which would be outsourced.

9 MONITORING, EVALUATION AND REPORTING PROGRAM

9.1 Monitoring of CMP Delivery

Beyond action implementation, the CMP requires ongoing monitoring, evaluation, and reporting (MER). The objective of this process is to maintain focus on program implementation, highlight successful actions and provide early warning of potential problems. The responsibility for the MER program will sit mostly with the Coast and Estuary Reference Group, chaired by Council, with membership from relevant public authorities. The Group would be established upon certification of the CMP.

The implementation of CMP actions for which the Council is to take responsibility, including the MER program, will be through the Integrated Planning and Reporting (IPR) System. The IPR framework provides a means by which State Plans and Strategies, and Councils Community and Strategic Plans are activated into meaningful operational projects, with progress reported back to stakeholders and the community. The CMP will form one of the “Other Strategic Plans” within this framework.

The Bellinghen Shire Council Community Strategic Plan (2022), Delivery Program (2022-2026) and Operational Plan (2022-2023) were reviewed in 2022. The CMP integrates with the IP&R Framework as follows:

- The updated Community Strategic Plan is consistent with the vision and key objectives of this CMP.
- The implementation of the CMP is listed within the local government responsibilities for relevant delivery plan outcomes, such as those relating to enhancing biodiversity and the natural environment.
- The CMP is listed as a Key Supporting Document within the Delivery Program.
- Implementation of the CMP is identified as a Key Project within the Operational Plan.
- Under the IP&R framework, Council produces an Annual Report documenting the progress of key project actions within the Delivery and Operational Plan. Bellinghen Shire Council produces an annual

report. It is via this mechanism that the progress and outcomes of the CMP will be reported to stakeholders and the community.

To facilitate the monitoring required by the IP&R Framework, progress of CMP management actions against the Business Plan Delivery Table (Table 3) will be tracked by the Coast and Estuary Reference Group. More specifically, the Reference Group's role includes:

- Evaluation and delivery of all actions including those which are not included in the IP&R framework.
- Determining the implementation status of all actions, including:
 - Identifying the cause of delay for any actions that have failed to be implemented within projected timeframes and developing compensatory actions to facilitate future implementation.
 - Updating the Business Plan Delivery Table to reflect any changes in timeframe or funding for delayed actions.
- Evaluating completed actions against the performance measures for that action and the relevant objectives of the CM Act. Did the action perform as expected? What worked? What could be improved upon? Does the action require ongoing monitoring or subsequent actions?
- Identifying potential funding opportunities for upcoming actions and reporting on submitted funding applications.

The Coast and Estuary Reference Group will review the Business Plan Delivery on at least an annual basis, with quarterly review and planning of actions within the current and upcoming implementation phases.

The entire CMP must be reviewed at least every 10 years. However, due to the number of studies required to progress this CMP, a thorough review after around four years will be required, with the timing of that review set to enable provision of new actions into the next round of Delivery Program Planning (around 2026).

A suitable mechanism for completing the review would be to re-visit the CMP risk assessment to determine if:

- Key risks have been addressed or moved to a lower priority through implementation of the CMP actions.
- Any new risks have arisen.

- Any existing risks have escalated in priority.
- New actions can be considered.

Table 4 outlines the recommended performance measures and stages associated with different actions that could be used to gauge whether the actions have been successfully implemented. These measures are indicative and will depend largely on decisions made by the Reference Group and its member agencies regarding how different actions will be most appropriately implemented as delivery of the CMP progresses.

Table 4 CMP Action Performance Measures

Management Action	Performance Measures
Overarching Actions	
G1: Establish and Coordinate Coast & Estuary Reference Group	<ul style="list-style-type: none"> • Reference Group formed. • Regular meetings with minutes kept.
G2: Funding for CMP	<ul style="list-style-type: none"> • Stormwater Levy Investigation Report complete. • Environmental Levy Increase Investigation Report complete. • Available grant opportunities to be a standing item in the Coast & Estuary Reference Group agenda.
G3: Shared Responsibility, Care and Understanding of the Coastal Environment with the Gumbaynggirr People.	<ul style="list-style-type: none"> • Regular review of performance, by Reference Group against key actions including E5, H3 and E7 as a standing item in the agenda.
Coastal Wetland and Littoral Rainforest Actions	
E1: Review Coastal Wetlands and Littoral Rainforest SEPP mapping	<ul style="list-style-type: none"> • Prepare Brief • Engage consultants to complete study. • Monitor study progress. • Review and finalise report and deliverables (mapping in GIS format) • Complete Planning Proposal to amend RH SEPP mapping. • Carry results forward into Actions E2 and H2

Management Action	Performance Measures
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E2: Control weeds in Coastal Wetlands and Littoral Rainforest

Records of:

- Decisions relating to prioritisation of areas for treatment.
- Preparation of maps in GIS showing treated areas and areas identified for future treatment.
- All works completed, including photographs, costs and follow-up inspections, issues encountered etc.
- Timetabling and facilitation of follow up maintenance.
- Follow-up maintenance completed.

Coastal Hazard Actions

H1: Develop a Foreshore Management Guideline for private properties

- Prepare Brief
- Engage consultants to complete guideline.
- Monitor progress.
- Review and finalise the Guideline.
- Amendments to Development Control Plan to create consistency with the guideline.
- Education on Guideline provided to Council development assessment staff.
- Targeted education for waterfront property owners

H2: Understand and monitor coastal hazard impacts on Coastal Wetlands and Littoral Rainforests

- Annual invitation to DCCEEW – Coast and Estuary for update on coastal hazard studies of relevance.
- Review outcome of MEMA actions in relation to migration of coastal wetlands in response to sea level rise.
- Record of review of planning controls to consider protection of migration pathways.

H3: Undertake technical studies at Mylestom Spit and Mylestom Reserve Foreshore to inform infrastructure upgrade, location, and design

- Prepare Brief.
- Engage consultants to complete study.
- Monitor study progress.
- Historical channel migration assessment complete.
- Geotechnical investigation complete.
- Assessment of wave climate and detailed hydraulic and morpho-dynamic modelling complete.
- Review and finalise report and deliverables.
- Carry results forward into Action U1.

Management Action	Performance Measures
<p>H4: Undertake technical studies at Dalhousie Creek entrance to inform infrastructure upgrade, location, and design</p>	<ul style="list-style-type: none"> • Prepare Brief. • Engage consultants to complete study. • Monitor study progress. • Geotechnical investigation complete. • Coastal Hazard investigation complete (if required). • Urunga SLSC location options assessment complete (if required). • Review and finalise report and deliverables.
<p>Coastal Environment Actions</p>	
<p>E3: Manage vehicle access on beaches</p>	<p>Record of</p> <ul style="list-style-type: none"> • Development and implementation of a beach driving permit system. • Code of Conduct for beach driving. • Installation of regulatory signage at beach access points and key locations. • Compliance via issue of penalty notices or permit cancellations. • Signage, markers, and access controls at sensitive or degraded areas to exclude vehicle access (North Beach Mylestom, Hungry Head). • Beach driving closures where threatened species are identified (i.e., shorebird nesting sites) or seasonally as required.
<p>E4: Protect Threatened Shorebirds</p>	<ul style="list-style-type: none"> • Prepare Brief. • Engage consultants to complete study. • Monitor study progress. • Review and finalise report and deliverables.
<p>E5: investigate and enhance ecological values at Urunga Island and Yellow Rock Road, Dalhousie Creek and along the Kalang River.</p>	<ul style="list-style-type: none"> • Prepare Brief. • Engage consultants to complete Ecological and Cultural Values study and recommendation report. • Monitor progress. • Review and finalise report and deliverables.

Management Action	Performance Measures
E6: Assess Riparian and Estuarine Bank Condition	Records of: <ul style="list-style-type: none"> • Decisions relating to prioritisation of areas for treatment. • Preparation of maps in GIS showing treated areas and areas identified for future treatment.
E7: Business Case for Community Engagement Programs	<ul style="list-style-type: none"> • Prepare Brief. • Engage consultants to complete Business Case. • Monitor progress. • Review and finalise report and deliverables.
W1: Implement the Sewering Coastal Villages Project	Records of project implementation as per the requirements of the grant funding body.
W2: Implement and Review Urban Stormwater Management Plans for Bellingen and Urunga.	<ul style="list-style-type: none"> • Monitor ongoing development of Urban Stormwater Management Plan (underway). • Upon finalisation, identify actions suitable for funding under the CMP. • Prepare briefing/tendering materials as appropriate for selected actions. • Contract external organisations for action delivery. <p>Manage and monitor delivery of actions, including any follow up maintenance that may be required.</p>
W3: Improve consistency of water quality monitoring in waterways	Record of: <ul style="list-style-type: none"> • Water quality monitoring analysis implementing the new Bellinger-Kalang Catchment specific freshwater guideline values and upcoming estuary guideline values once completed and provided by DCCEEW. • Turbidity and Phosphorus measurement review and consistency between the DCCEEW and Riverwatch sampling. • Mentoring of volunteers Riverwatch to support and assess/validate monitoring techniques. • Review of sample site locations.
W4: Promote Programs and Grants Stock Management on Riparian Land	Record of promotion of programs run through LLS via Council's social media channels, web page and media releases.
W5: Review of Boating Regulatory Initiatives	Record of TfNSW review of boating regulatory controls at the southern branch of the Kalang River around Newry Island and Back Creek.

Management Action	Performance Measures
W6 Permanent Water Quality Monitoring Station	<ul style="list-style-type: none"> • Seek quotes and commission installation of water quality monitoring station. – Confirm successful installation. • Organise for and review regular maintenance and data backup reports.
W7: Expand Public Water Quality Website	<ul style="list-style-type: none"> • Organise and review inclusion of additional data streams into website. • Annual review of performance and adjustment where necessary.
Coastal Use Actions	
U1: Upgrade foreshore stabilisation and recreation facilities (boat ramp, kayak launch and swimming pool) at Mylestom Foreshore Reserve	<p>Records of:</p> <ul style="list-style-type: none"> • Decisions relating to prioritisation of areas for foreshore stabilisation treatment. • All works completed, including photographs, costs and follow-up inspections, issues encountered etc. • Timetabling and facilitation of follow up maintenance.
U2: Upgrade Urunga Boardwalk and Lido	<p>Records of:</p> <ul style="list-style-type: none"> • All works completed, including photographs, costs and follow-up inspections, issues encountered etc.

9.2 Trigger Points, Thresholds, and Key Indicators

While the preceding section addresses monitoring progressive delivery of the CMP as planned, it is entirely possible that circumstances arise which prompt a change in the adopted management strategy or necessitate more timely delivery of some actions. Relevant “Trigger Points, Thresholds, and Key Indicators” which may be used to decide upon a change of program delivery are listed in Table 5. Several triggers are embedded in the Coastal Zone Emergency Action Subplan (Appendix H), where the appropriate action to be taken during an emergency is also identified. To avoid future inconsistencies as documents are revised, these triggers have not been presented in Table 5, but can be found in Table 1 of Appendix H. Triggers are normally related to specific management actions. Breach of a threshold or trigger will not necessarily require an immediate response, but these breaches should be considered when the CMP is formally reviewed at the end of its four-year timeframe.

Table 5 Triggers Points, Thresholds and Key Indicators

Related Action	Trigger Point, Threshold or Key Indicator (and relevant Actions)
E6	<p>If the study proposed under Action E6 identifies that erosion at a location (or locations) is presenting a concerning threat to property, infrastructure, or assets. An appropriate action may be to initiate more detailed investigation, survey, design, and environmental assessment of remediation works to be delivered following review of the CMP.</p>
W2, W3, W6 and W7	<p>Estuary specific water quality trigger values have been developed for the Bellinger-Kalang Rivers by the NSW Government. These cover pH, Electrical Conductivity, Dissolved Oxygen, Turbidity, Nitrous Oxide, Ammonia, Total Phosphorus and Total Nitrogen. The thresholds are presented and discussed in Section 2.3 of Appendix B. Any collected data is to be regularly assessed against these thresholds as per Action W3. Where these water quality thresholds are exceeded, an appropriate action may be immediate investigation and diagnosis, or to consider more strategic approaches as part of CMP review.</p>
E1, E2, E5 and H1	<p>Coastal Wetlands and Littoral Rainforests have particularly stringent protection under the CM Act and associated RH SEPP. Once mapped under Action E1, ongoing assessment through weed control (Action E2) and new information relating to pathways for migration under rising tide levels (Action H1) may highlight threats to these ecosystems where they may be ‘squeezed’ against adjacent development or infrastructure. If a concerning coastal ‘squeeze’ situation is noted to be occurring faster than expected, it may become necessary to bring forward investigations to determine whether land may be purchased and/or managed differently to mitigate against the loss of these important ecosystems. Low lying land around Urunga Island and Yellow Rock Road are key sites where this needs to be monitored.</p>
H3	<p>It is expected that the study proposed under Action H3 could propose a monitoring program to keep abreast of the potential for breakthrough of this spit. Prior to that monitoring program being developed and following any significant flood event, (or at least once a year) available data (aerial photographs and satellite imagery, field inspection) should be collated and assessed to determine if there has been a notable or concerning narrowing of the spit downstream of Myelstom. It may be that Action H3 would need to be fast tracked and any proposed management actions implemented earlier than expected.</p>

10 REFERENCE LIST

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APPENDIX A SCOPING STUDY FOR THE BELLINGEN COAST

APPENDIX B STAGE 2 WATER QUALITY MANAGEMENT PLAN

APPENDIX C CONSULTATION OUTCOMES

APPENDIX D REVISED RISK ASSESSMENT

APPENDIX E MANAGEMENT OPTIONS ASSESSMENT

APPENDIX F SUMMARY OF
LEGISLATIVE AND POLICY CONTEXT
FOR COASTAL MANAGEMENT IN NSW

APPENDIX G AGENCY CORRESPONDENCE IN SUPPORT OF CMP ACTIONS

APPENDIX H COASTAL ZONE EMERGENCY ACTION SUBPLAN