



Kiama Coastline Coastal Management Program Stage 1 Scoping Study

July 2020



Document Control Sheet

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	Title	Kiama Municipal Council Coastal Management Program Stage 1 Scoping Study	Client Contact	Byron Robinson
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	Authors	Verity Rollason, Ainslie Downes, Geoff Withycombe	Synopsis	This Scoping Study fulfils Stage 1 of the NSW Government process for developing a Coastal Management Program (CMP). The report reviews existing information and data, establishes the strategic context for coastal management, outlines key management issues, reviews current management arrangements, identifies knowledge gaps and develops a forward plan for CMP Stages 2 to 5.

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Introduction

1 Introduction

1.1 Section Overview

This section provides an introduction as to why a Coastal Management Program (CMP) is being prepared for the Kiama Municipal Council's (KMC) 34 km coastline from Minnamurra River (Shellharbour LGA) to 2km south of Black Head (Shoalhaven LGA) and explains the NSW Coastal Framework and how this Scoping Study fits into the new five stage process for preparing CMPs. An introduction to the study area and the vision and objectives for the CMP are also given.

1.2 Introduction to the Project

KMC and the Department of Planning, Infrastructure and Environment (DPIE) have resolved to prepare a Coastal Management Program (CMP) for KMC's coastline. A CMP aims to provide a long term, coordinated strategy for managing the coastal zone in accordance with the *Coastal Management Act 2016* (CM Act) and local objectives. It shall be implemented through coordination between Council(s), state agencies and other key stakeholders.

The project is primarily focused on the open beaches and coastal waters of the Kiama Municipal Council Local Government Area that extends 34 km south of Minnamurra River (bordering Shellharbour LGA) to 2km south of Black Head (bordering Shoalhaven LGA). Further definition of the study area is provided in Section 1.4.

In accordance with the NSW Coastal Management Framework, Stage 1 of preparing a CMP is to undertake a Scoping Study. This report fulfils this requirement. The aims of a Scoping Study, as provided in this report, are to:

- review management arrangements and supporting technical information to determine elements that should be retained in the CMP;
- develop a shared understanding of the strategic context of the CMP, identifying priorities;
- establish the focus (purpose, vision, objectives and scope) of the CMP;
- provide a forward plan for undertaking subsequent stages (Stages 2 to 5) of the CMP;
- provide a business case to develop the CMP; and
- provide a stakeholder and community consultation and engagement strategy for the preparation of the Coastal Management Plan.

The Kiama Coastline CMP Stage 1 Scoping Study has been prepared in accordance with the NSW Coastal Management Framework, which includes the CM Act and the NSW Coastal Management Manual (OEH, 2018) (The Manual). It has been prepared by BMT for KMC and DPIE, and in consultation with relevant public authorities, other key stakeholders, and the community. Public authorities have endorsed the forward process proposed for preparing the CMP and expressed their ongoing intent to be involved in this process. Some public authorities also provided commentary that has been incorporated into this report.

1.3 NSW Coastal Management Framework

The NSW Government recently completed a re-invigoration of the NSW Coastal Management Framework for managing the open coast, estuaries and the marine estate. The new framework came into force in April 2018 and comprises the elements including legislation as outlined in Figure 1-1.

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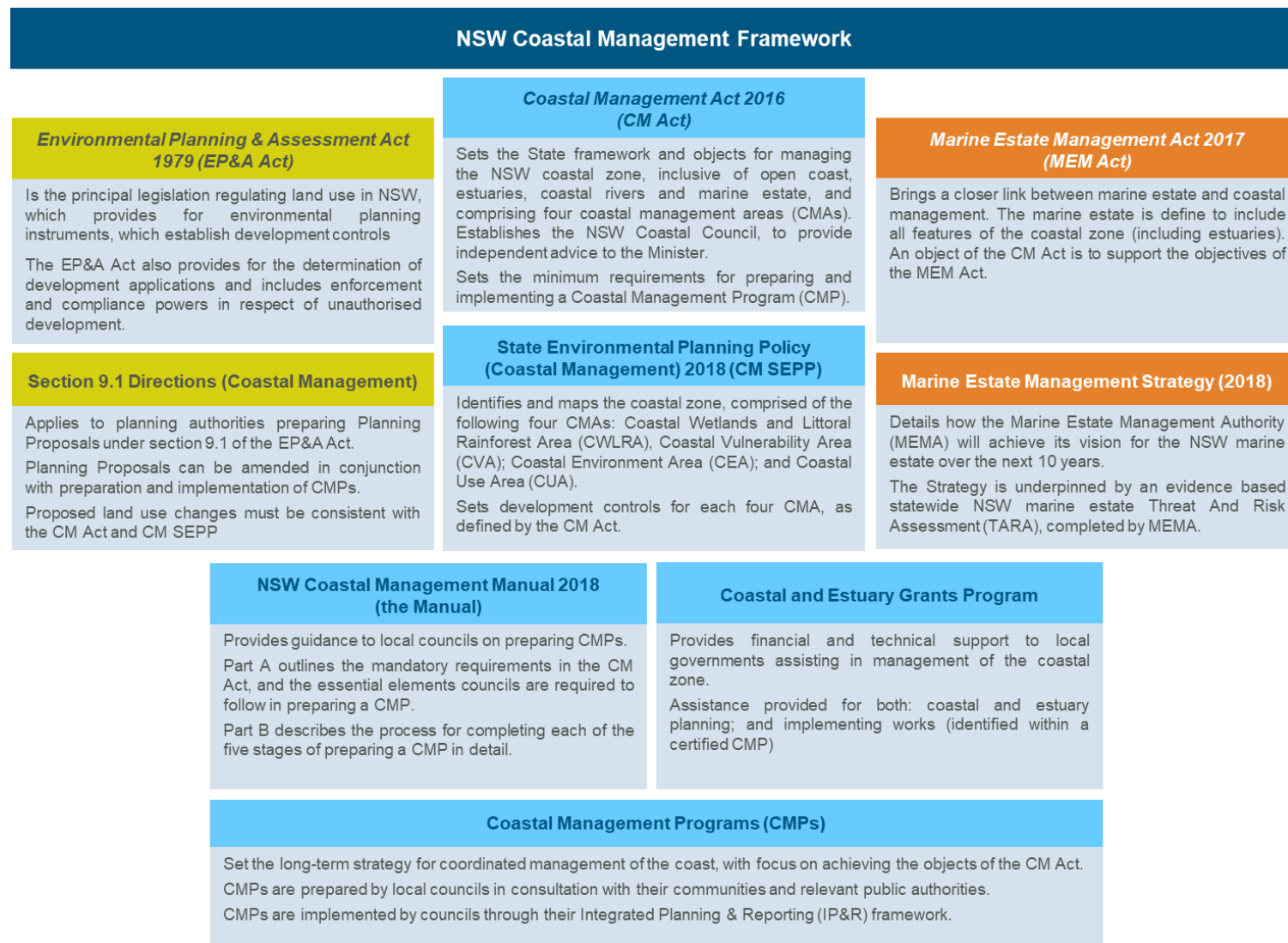


Figure 1-1 NSW Coastal Management Framework

Introduction

In relation to the preparation of CMPs, the framework includes the following elements:

- the *Coastal Management Act 2016* (the CM Act) which replaced the Coastal Protection Act 1979, and provides minimum requirements for preparing CMPs (which replace CZMPs previously made under the Coastal Protection Act 1979) and a revised definition of the coastal zone as comprising four coastal management areas;
- the *State Environmental Planning Policy (Coastal Management) 2018* (CM SEPP) which amalgamated and replaced SEPP No. 71 Coastal Protection, SEPP No. 14 Coastal Wetlands, and SEPP 26 Littoral Rainforest, and provides development controls for each of the four coastal management areas with supporting mapping for these areas; and
- the NSW Coastal Management Manual (OEHL, 2018), (the Manual) outlines the framework and the mandatory requirements for preparing CMPs in Part A, and guidelines for the five stages of CMP preparation in Part B (noting Part B is not mandatory). The Manual is the certified guideline document that, when followed, provides exemptions for liability for Council under Section 733 of the *Local Government Act 1993*.
- The *Marine Estate Management Act 2014* (MEM Act) repealed the Marine Parks Act 1997 to establish a new approach to managing the whole marine estate to reduce social conflict and improve effective management of coastal and marine resources beyond existing marine parks. The Marine Estate Management Authority (MEMA) was established as an advisory body by the NSW Government. MEMA is preparing the Marine Estate Management Strategy (2018), which will provide the overarching framework for marine estate management over the next decade, and outline management initiatives to address the priority threats to the NSW

marine estate and to maximise community benefits. The priority threats have been identified through the State-wide Threat and Risk Assessment (TARA), which is available for use in preparing CMPs. Consistency between the Marine Estate Management Strategy and CMPs is an essential element listed in the Manual. Key initiatives promoted by the Marine Estate Management Strategy (2018) include “Improving water quality and reducing litter”, which can be associated to management of threats in estuaries and coastal areas, and hence may relate back to CMPs.

1.3.1 What is a Coastal Management Program?

As stated in the CM Act (s12): “*The purpose of a coastal management program is to set the long-term strategy for the co-ordinated management of land within the coastal zone with a focus on achieving the objects of this Act*”.

That is, a CMP aims to provide a long-term, coordinated strategy for managing the coastal zone, considering the local context, priorities and objectives as well as the state objectives in accordance with the CM Act.

The mandatory requirements for preparing a CMP are set out in section 13 to 18 of the CM Act, and Part A of the Manual. Part B of the Manual provides guidance for how to prepare a CMP.

The Manual outlines five stages of preparation of a CMP, as illustrated in Figure 1-2. It is a requirement that Councils conduct Stage 1 (Scoping Study), regardless of the existence of any preceding CMP, Coastal Zone Management Plan (CZMP) or other management plans, policies and practices. However, if the existing CZMP and supporting reports meets the requirements set by the CM Act and Manual, preparation of the CMP may be fast tracked from Stage 1 to Stage 4 or 5 (certification and implementation of the CMP).

Introduction

A CMP shall be implemented through coordination between local government, state agencies and other key stakeholders. Councils are responsible for ensuring that their CMP(s) are reviewed at least once every 10 years. Nevertheless, any CMP may be amended (in whole or in part) or replaced by another CMP at any time.

This study relates to the Scoping Study (Stage 1) of preparing a CMP. It is the first step for Council along the new NSW Coastal Management Framework.

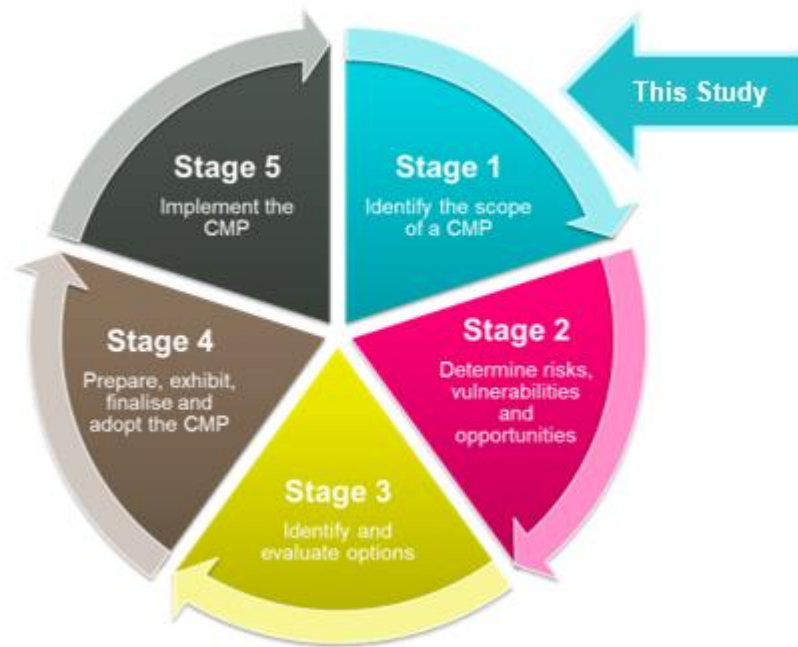


Figure 1-2 Stage Process for Developing a CMP (adapted from the Coastal Management Manual; NSW Govt, 2018)

1.3.2 What is the Purpose of the CMP Stage 1 Scoping Study?

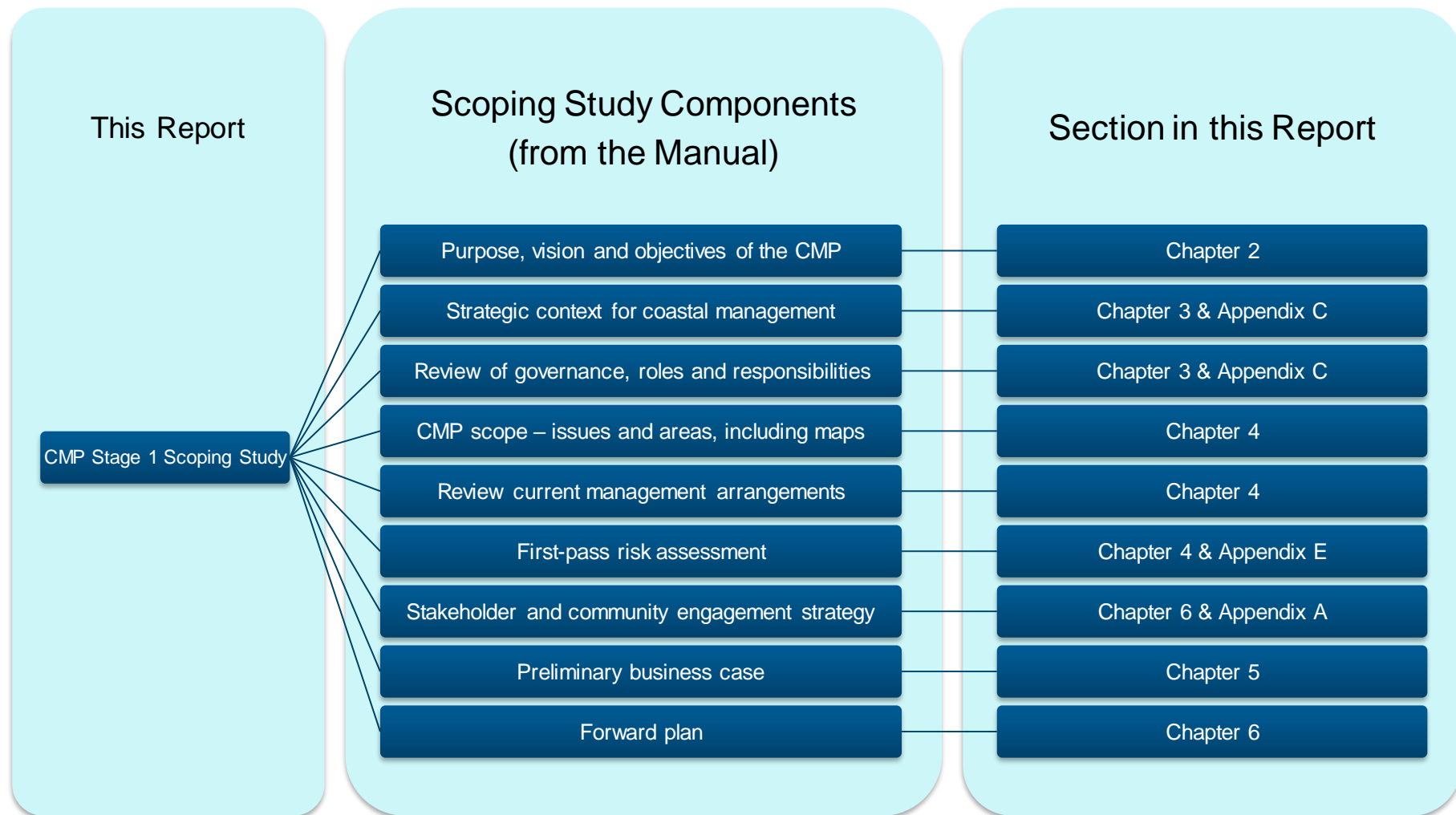
A Scoping Study (Stage 1) is instrumental in helping Councils to “get ready” and understand where their organisations are now, where they need to be, and how to make informed and confident decisions during development and implementation of the CMP. It is therefore about establishing a plan to complete the rest of the CMP stages (Stages 2 to 5).

The primary purpose of Stage 1 of a CMP is to determine the scope of the CMP and define a path for progressing further stages of the CMP. In this regard, the scope comprises: the strategic context for coastal management; the vision and objectives of the CMP; the areas to be covered (geographic extent and coastal management areas); the priority issues to be addressed, as well as knowledge and information gaps requiring attention; the communities and stakeholders to be involved; the governance, roles and responsibilities of stakeholders on the CMP; and a forward plan to complete the CMP, including the possibility of fast-tracking.

In cases where a Council has been implementing a CMP or CZMP, the Scoping Study should provide continuity to the planning cycle by evaluating and building on from previous plans or programs (Figure 1-2). In cases where no previous coastal management plans are in place, then the Scoping Study should provide a platform for development of a CMP, in accordance with the CM Act.

1.3.2.1 Report Structure

The required components of a Scoping Study as specified in the Manual, and their location in this report are outlined in Figure 1-3 below.

Introduction**Figure 1-3 Components of CMP Scoping Study and Structure of this Report**

Introduction

1.4 Study Area

The Kiama local government area (LGA) is located on the south coast of New South Wales, about 130 km south of Sydney. The study area for this CMP includes the open beaches, foreshore and coastal waters along the 34 km stretch of coastline from Minnamurra / Mystics Beach (Shellharbour LGA) to 2km south of Black Head (Shoalhaven LGA). The study area extends inland over the foreshore to the landward extent of mapped Coastal Use CMA. The study area includes coastal waters and extends to three nautical miles offshore.

It should be noted that the study area excludes the catchments of the Minnamurra River, Werri Lagoon, and Crooked River estuaries but includes the entrances inasmuch as open coastal processes influence the condition and stability of the entrances, and future management of the open coast. The study area is shown in Figure 1-4.

The Kiama coast is characterised by embayed pocket beaches, with the exception of Seven Mile Beach, interspersed with prominent rocky headlands and cliffs formed of Permian age sedimentary and volcanic rocks. At a regional scale, the coastline faces southeast and experiences a high energy wave climate. Locally, Kiama's beaches are compartmentalised, with steep shoreface slopes meaning that little sediment transfer is likely between adjacent beach systems. Tall cliffs and wide rocky shore platforms are a typical feature of Kiama's rocky sections of coast.

This CMP will primarily focus on beaches and bays within the Kiama LGA that are in close proximity to settlements, infrastructure and assets: Minnamurra Beach, Jones / Boyds Beach, Bombo Beach, Black's Beach / Kiama Harbour, Surf Beach, Kendall's Beach, East Beach, Werri Beach, Gerringong Boat Harbour and Seven Mile Beach (approximately 2km of the Northern section).

Section 2 details the overarching strategy for coastal management throughout the Kiama Local Government Area, and how the proposed Kiama CMP format fits within this strategy.

1.4.1 SEPP Coastal Management Area Overlay

The study area includes all four management areas that make up the coastal zone as defined by the CM Act and mapped under the CM SEPP, including:

- (1) Coastal Wetland and Littoral Rainforest Area (CWLRA);
- (2) Coastal Vulnerability Area (CVA) (not presently mapped);
- (3) Coastal Environment Area (CEA); and
- (4) Coastal Use Area (CUA).

The CM SEPP has defined and mapped areas for the CWLRA, CEA and CUA and these are shown for the study area in a series of figures (refer to Figure 1-5 to Figure 1-8), which includes a combined figure with all management areas overlaid. The overlay of imagery represents the identified precedence of coastal management areas. The precedence is CWLRA, CVA, CEA and finally the CUA. Note, there is no current mapping for CVA as there is currently no gazetted map. The suitability of existing information to develop a CVA for the study area is investigated in this report (see Section 4.5).

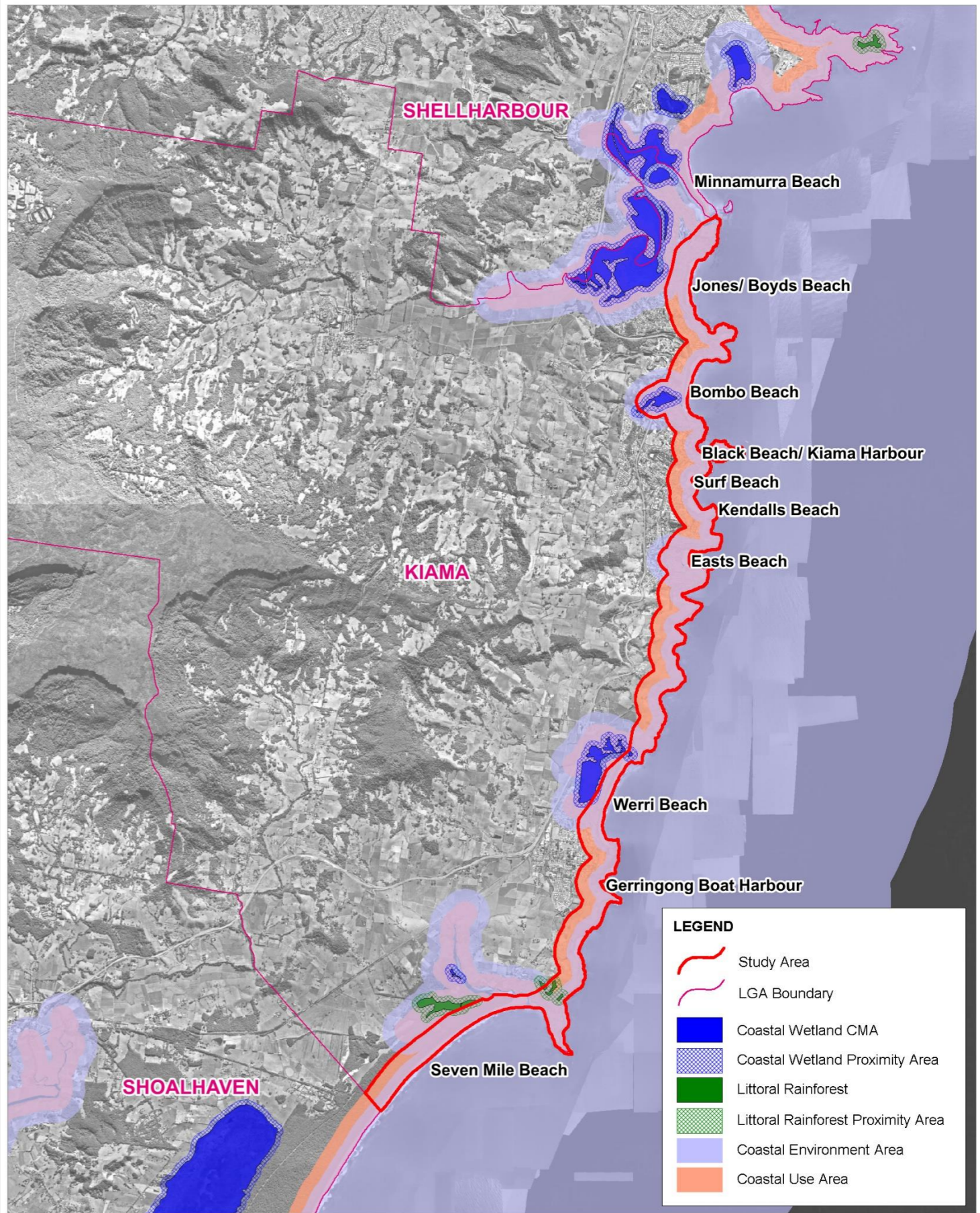
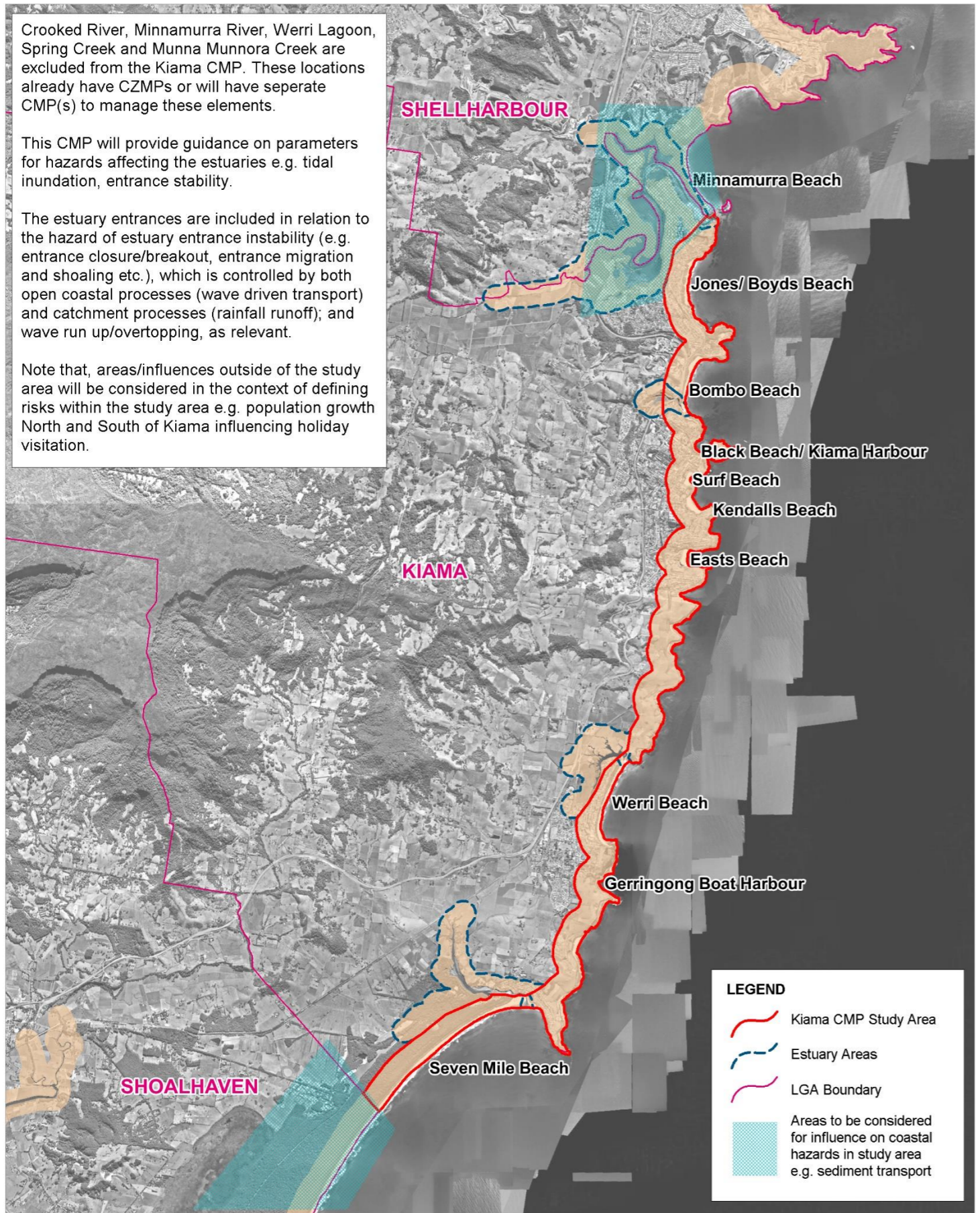
The current CM SEPP mapping identifies the following within the study area:

- There are several instances of mapped CWLRA within the Kiama LGA, however most of this is associated with the excluded river and lagoon systems. Within the study area itself there is a small section of mapped Littoral Rainforests at Gerroa behind Black Head and behind the northern end of Seven Mile Beach, south of Crooked River. Most of the instances of mapped Coastal Wetland areas across Kiama are outside of the study area

Introduction

(i.e. Werri Lagoon, Minnamurra and Crooked River). However, the study area includes a Coastal Wetland area at Spring Creek behind Bombo Beach and a small section at the entrance to Werri Lagoon;

- Much of the study area is located within the CEA, this includes the coastal waters, beaches and foreshores. A small portion of the study area, typically rural and urban areas located along the landward perimeter, is outside the CEA. Approximately 75% of the total study area is located within the CEA;
- All of the study area is within the CUA, effectively this includes the entire beach and foreshore area and only excludes the waterway and ocean areas which are part of the CEA.



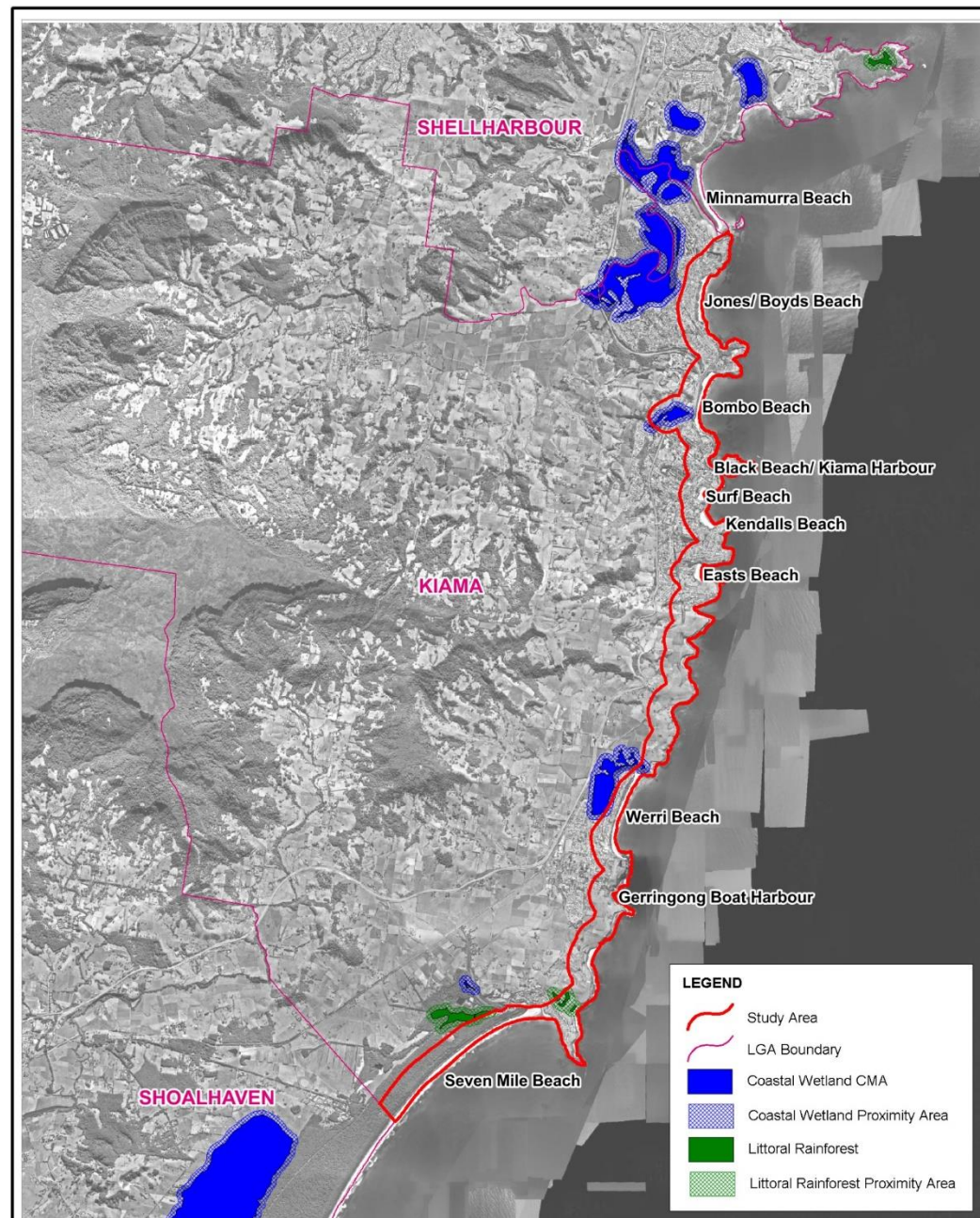
Introduction

Coastal Wetland and Littoral Rainforest Area

Coastal wetlands and littoral rainforest support high value biodiversity that are particularly sensitive to development. This management area is defined in the CM Act as land which displays '*the hydrological and floristic characteristics of coastal wetlands or littoral rainforests and land adjoining those features*' (NSW Government, 2016). This area focusses on protecting well established and more extensive vegetation communities (as opposed to single trees or isolated stands). The maps include a 100-metre proximity area, applying to all land use zones, around coastal wetlands and littoral rainforests.

The objectives of the coastal wetland and littoral rainforest management area within the CM Act are to:

- protect coastal wetlands and littoral rainforests in their natural state, including their biological diversity and ecosystem integrity,
- promote the rehabilitation and restoration of degraded coastal wetlands and littoral rainforests,
- improve the resilience of coastal wetlands and littoral rainforests to the impacts of climate change, including opportunities for migration,
- support the social and cultural values of coastal wetland and littoral rainforest communities, and
- promote the objectives of State policies and programs for wetlands or littoral rainforest management.



Title:
**Coastal Wetland and Littoral Rainforest
Coastal Management Areas**

Figure:
1-6

Rev:
A

BMT endeavours to ensure that the information provided in this map is correct at the time of publication. BMT does not warrant, guarantee or make representations regarding the currency and accuracy of information contained in this map.



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Not currently mapped. Stage 2 of the CMP will provide the base data for CVA mapping in the study area.

Coastal Vulnerability Area

The CM Act recognises seven coastal hazards within the NSW coastal zone, focusses on identifying land subject to current and future coastal hazards and ensuring that land use management undertaken in these areas recognises coastal risk. The summarised objectives of the coastal vulnerability management area within the CM Act are to:

- ensure public safety and prevent risks to human life,
- mitigate current and future coastal hazards,
- maintain the presence of beaches, dunes and other natural features,
- maintain public access, amenity and use of the coast,
- encourage land use that reduces exposure to hazards, including through siting, design, construction and operational decisions,
- adopt coastal management strategies that reduce exposure to hazards, in the first instance by restoring or enhancing natural defences such as dunes, and then by taking other action and if taking other action, to:
 - avoid significant degradation or disruption of biological diversity, ecosystem integrity, coastal processes (ecological, biophysical, geological, geomorphological), beach and foreshore amenity, and social and cultural values, and
 - avoid adverse offsite impacts, or otherwise restore the land if any impacts are caused by the action to reduce exposure to hazards,
- maintain essential infrastructure, and
- improve community resilience and reduce reliance on emergency responses.

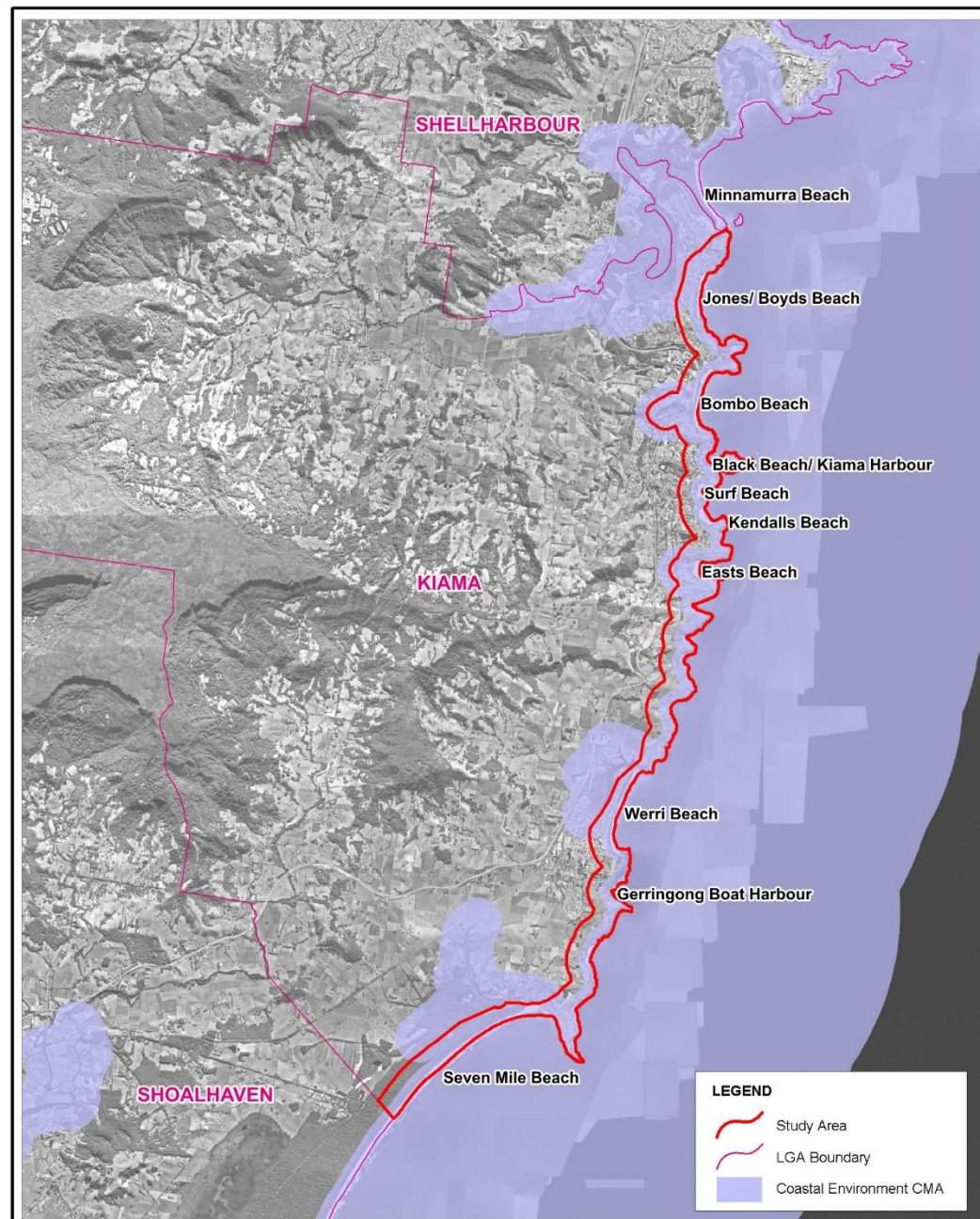
Introduction

Coastal Environment Area

The NSW coastal environment is diverse and encompasses a range of different landforms, processes and environments. The coastal environment management area is land containing features such as the coastal waters of the State, estuaries, coastal lakes and lagoons, and land adjoining those features such as headlands and rock platforms.

The objectives of the coastal environment areas within the CM Act are to:

- protect and enhance coastal environmental values and natural processes of coastal waters, estuaries, coastal lakes, coastal lagoons, and enhance natural character, scenic value, biological diversity and ecosystem integrity,
- reduce threats to and improve resilience of these coastal environments, including in response to climate change,
- maintain and improve water quality and estuary health,
- support social and cultural values of the coastal environments,
- maintain the presence of beaches, dunes and natural features of the foreshore, and
- maintain and improve public access, amenity and use of the coast.



Title:
**Coastal Environment
Coastal Management Areas**

Figure:
1-7

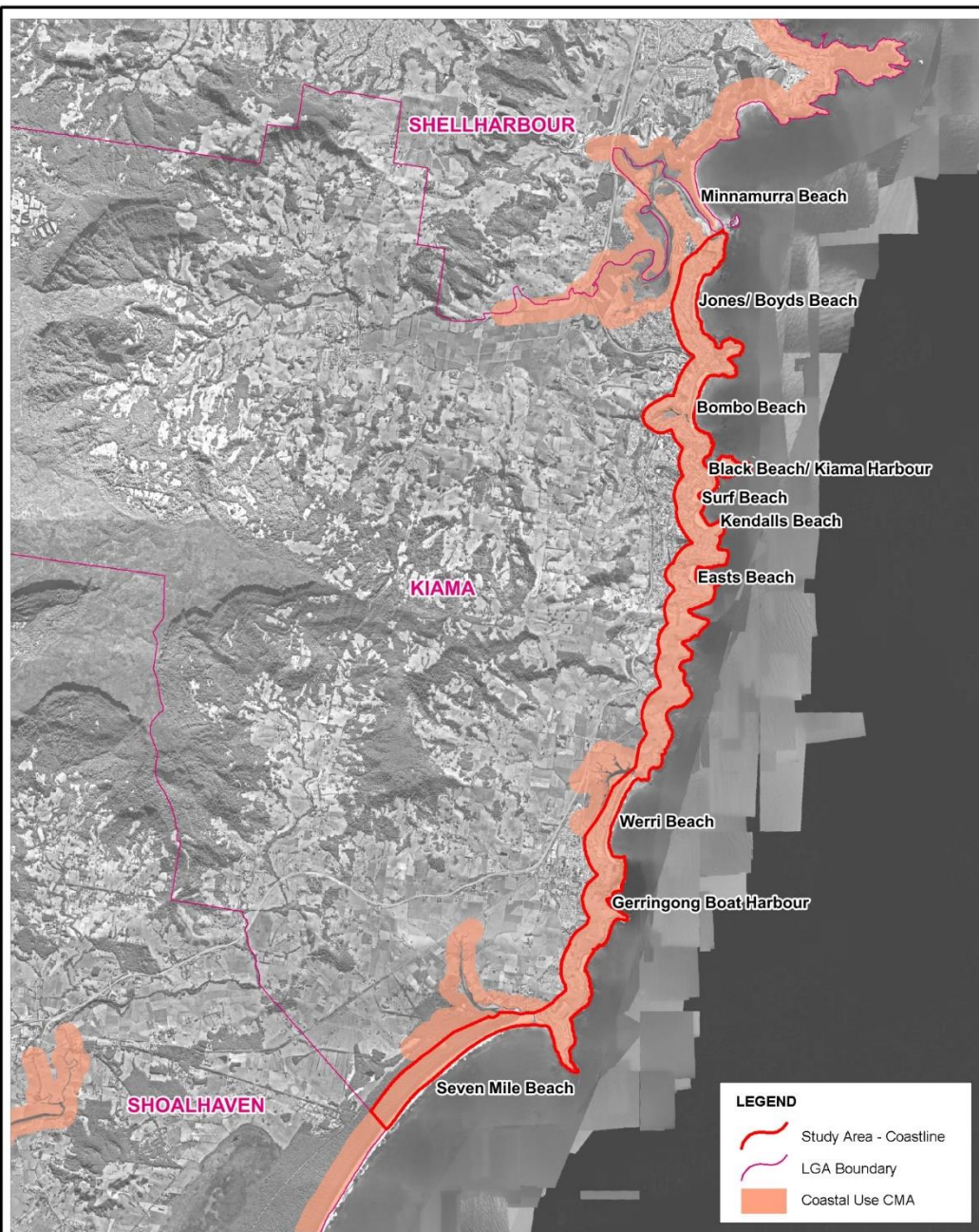
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BMT endeavours to ensure that the information provided in this map is correct at the time of publication. BMT does not warrant, guarantee or make representations regarding the currency and accuracy of information contained in this map.



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Approx. Scale





Title:
**Coastal Use
Coastal Management Areas**

Figure:
1-8

Rev:
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BMT endeavours to ensure that the information provided in this map is correct at the time of publication. BMT does not warrant, guarantee or make representations regarding the currency and accuracy of information contained in this map.



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Coastal Use Area

The coastal zone comprises land that is extremely valuable to the economy and society. Indeed, the coast supports a range of human uses and development types that enable the wider coastal community to live, work and play on the coast. The coastal use management area encompasses land adjacent to coastal waterways (ocean, estuaries, lakes etc.) where impacts of development on the use and enjoyment of the beaches, dunes, estuaries and lakes need to be considered.

The objectives of the coastal use area within the CM Act are to:

- protect and enhance the scenic, social and cultural values of the coast by ensuring that:
 - the type, bulk, scale and size of development is appropriate for the location and natural scenic quality of the coast,
 - adverse impacts of development on cultural and built environmental heritage are avoided or mitigated,
 - urban design, including water sensitive urban design, is supported and incorporated into development activities,
 - adequate public open space is provided, including for recreational activities and associated infrastructure, and
 - the use of the surf zone is considered.
- accommodate both urbanised and natural stretches of coastline.

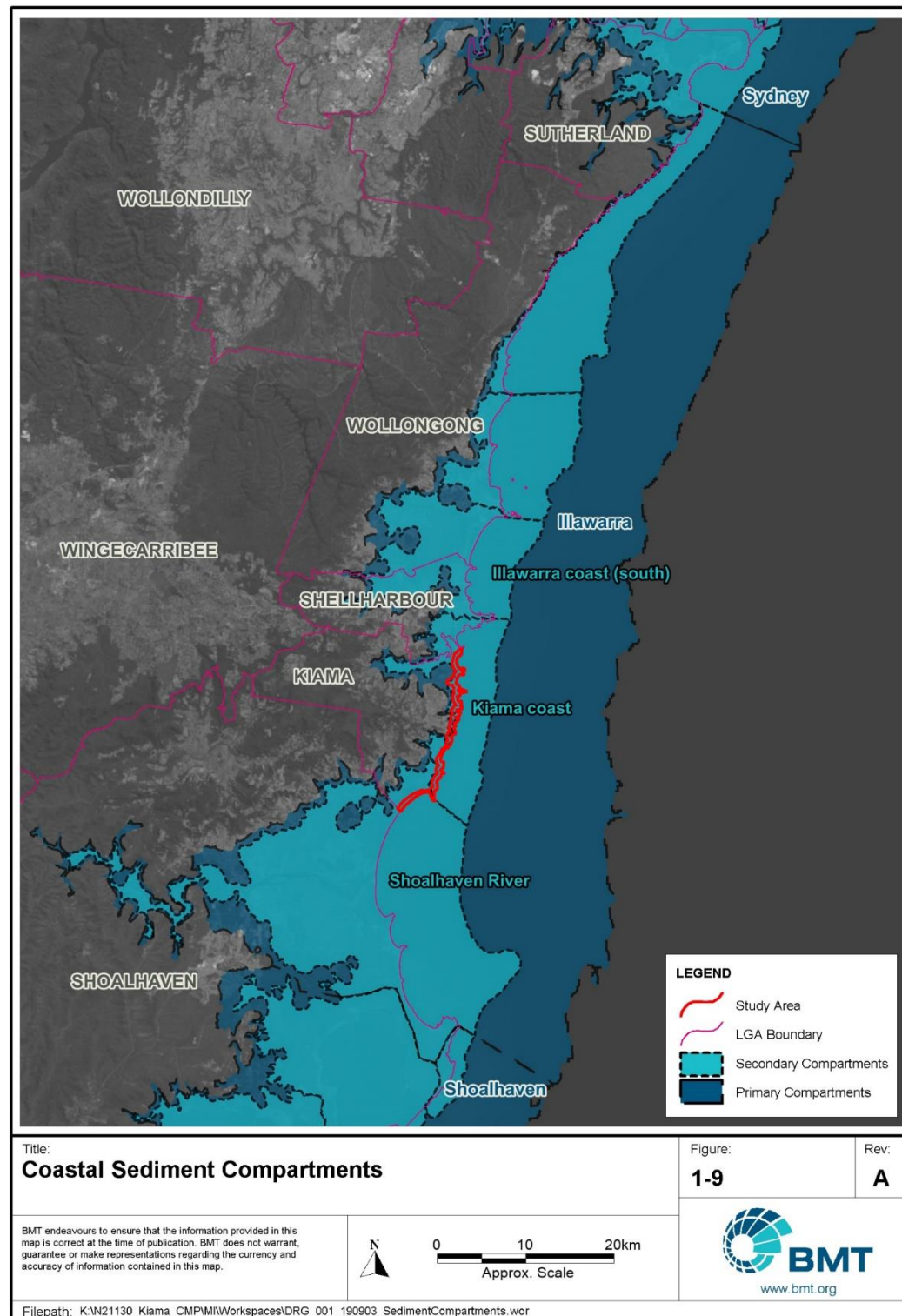


Introduction

1.4.2 Coastal Sediment Compartment

The study area spans both the Kiama Coast and Shoalhaven River coastal sediment compartments (shared with Shellharbour and Shoalhaven LGA's respectively (Shoreline Explorer on Coast Adapt, 2018), see Figure 1-9. The CM Act requires councils and public authorities to consider the study area for a CMP in the context of the broader regional coastal processes, which occur within the primary sediment compartment.

This means that management of the study area should consider the impact of activities that may affect natural sand transport as changes in management could result in surplus/deficit of sand in the northern portion of the primary coastal compartment, which is located north of the study area. Examples may include changes to coastal protection works (creation or removal) or coastal management practices such as beach nourishment, or even changes to estuary entrance management.



2 Overarching Strategy for the Kiama Municipal Council Coastal Management

2.1 Section Overview

This section details the overarching strategy for coastal management throughout the Kiama Municipal Council, and how the proposed Kiama Coastline CMP format fits within this strategy. The purpose, vision and objectives for coastal management of Kiama are then outlined.

2.2 Coastal Management in the Kiama LGA

The coastal zone of Kiama's LGA area comprises the open coastline extending 34 km from Minnamurra River (Kiama's boundary with Shellharbour LGA) to 2km south of Black Head (Kiama's boundary with Shoalhaven LGA). It also includes the estuaries of two river systems, Minnamurra River in the north of the LGA and Crooked River in the south of the LGA, as well as Werri Lagoon, Munna Munnora and Spring Creek waterways.

For the purposes of adequately encompassing and addressing coastal management issues for entire LGA area, the following format for CMP coverage is envisioned, however this is only one option, Council may consider a different format or approach to developing one or numerous CMPs for the coastal zone of Kiama LGA:

- **Kiama Coastline CMP Scoping Study** (i.e. this study) – this CMP covers the full length of Councils coastline. The study area for this CMP excludes the three estuaries and lagoon areas along the coast (Minnamurra River, Werri Lagoon and Crooked River) but will include the entrances where

relevant inasmuch as they influence the condition and future management of the open coast.

- **Minnamurra River Coastal Zone Management Plan (to be translated into a CMP in future)** – Council currently has an existing Coastal Zone Management Plan for the Minnamurra River Estuary that was prepared by Hydrosphere Consulting in 2015. The study area for this CZMP included the topographical catchment of the Minnamurra River and its tributaries and comprises the tidal waterways, foreshore and adjacent land of the Minnamurra River Estuary including the entrance. Thus, this study covers the extent of the estuary not proposed for inclusion in the Kiama Municipal Council CMP.
- **Crooked River Coastal Zone Management Plan (to be translated into a CMP in future)** – Council currently has an existing Coastal Zone Management Plan for the Crooked River Estuary that was prepared by Kiama Council staff in 2015. The study area for this CZMP comprised the entire Crooked River catchment area including the tidal waterways and foreshore adjacent to the Crooked River estuary including the entrance and tributaries. Greater emphasis was placed on the estuarine reach, however consideration was given to other areas of the catchment where issues or processes were potentially affecting estuary health, as the condition of the estuary is heavily influenced by catchment wide factors. As with the Minnamurra River, this CZMP covers the extent of the estuary not proposed for inclusion in the Kiama Municipal Council CMP.
- **Werri Lagoon, Spring Creek and Munna Munnora Creek** – there are no existing CZMPs for these systems. At some point in the future when funds permit, Council will pursue the development of a single CMP or multiple CMPs that cover these areas.

Overarching Strategy for the Kiama Municipal Council Coastal Management

Together the Kiama Coastline CMP and the above future estuary CMPs will encompass the entire coastal zone of the Kiama LGA area. Other neighbouring CMP Scoping Studies that are currently being or will be developed that may need to interact with the Kiama Municipal Council CMP, include the:

- **Shellharbour Coastal Zone Management Plan** (BMT, 2018) – certified by the Minister on 6 June 2018 and yet to be translated into a CMP.
- **Shoalhaven Coastal Zone Management Plan** (Advisian, 2018) – certified by the Minister in September 2018 and yet to be translated into a CMP.

2.3 CMP Purpose, Vision and Objectives

2.3.1 Purpose

The purpose of preparing this CMP is to provide the long term coordinated strategy for managing the coastal zone of the coastline of the Kiama Municipal Council. A coordinated whole of government and community approach is needed, to bring Council, DPIE, other NSW Government agencies, stakeholders and local communities together to achieve the strategy, and management objectives.

The purpose of this Kiama Coastline CMP Stage 1 Scoping Study is to identify the scope of the CMP and detail the forward works program and costs to complete the CMP from Stage 2 to Stage 5.

This report has been prepared on behalf of Council and DPIE and has been prepared in accordance with the CM Act, the Coastal Management Manual (the Manual) (OEH, 2018), consistent with the NSW Coastal Management Framework.

2.3.2 Vision Statement

As stated in the Manual (p7, the Manual Part B: Stage 1, OEH, 2018),

“A local vision statement that is consistent with the state’s vision while reflecting the local context, will help communities to identify with the future of their coast, encourage a sense of community ownership of the actions in the CMP and foster commitment to its preparation and implementation”.

The CM Act sets a vision for coastal management throughout NSW that is suitable for Kiama, provided the local and unique elements of the coastline are also captured. To feed into a more local vision statement, feedback about the vision for Kiama’s coast was sought from the community (e.g. from the online survey and drop-in sessions) and from Council, DPIE and other attendees at the Visioning and First Pass Risk Assessment Workshop (details provided in Section 4.5). The key community visions and stakeholder visions for the Kiama coastline are displayed in the word maps shown in Figure 2-1 and Figure 2-2, respectively.

Using the community and stakeholder feedback and combining this into the vision given in the CM Act, the following vision statement has been developed for the Kiama Coastline CMP. Whilst not explicitly stated in the Vision, climate change is implicit in the preparation and implementation of all CMPs, including for Kiama, in accordance with both the CM Act objectives and ESD principles.



Figure 2-1 Community Visions for the Kiama Coastline



Figure 2-2 Stakeholder Visions for the Kiama Coastline

Vision for the CMP

Kiama's colourful, diverse, beautiful and iconic coastline is managed in a manner consistent with the principles of ecologically sustainable development to ensure that it's biodiversity, cultural heritage, scenic landforms and natural beauty are preserved and enhanced for current and future generations. The Kiama coastline maintains its small connected communities feel and remains easily accessible and freely available for all users.

2.3.3 CMP Objectives

Council and DPIE have determined that for this Scoping Study Stage 1 of CMP development, the objectives for the Kiama Coastline CMP shall reflect those of the CM Act, being:

- (a) to protect and enhance natural coastal processes and coastal environmental values including natural character, scenic value, biological diversity and ecosystem integrity and resilience, and
- (b) to support the social and cultural values of the coastal zone and maintain public access, amenity, use and safety, and
- (c) to acknowledge Aboriginal peoples' (Wodi Wodi sub-group of the Dharawal people) spiritual, social, customary and economic use of the coastal zone, and
- (d) to recognise the coastal zone as a vital economic zone and to support sustainable coastal economies, and
- (e) to facilitate ecologically sustainable development in the coastal zone and promote sustainable land use planning decision-making, and

Overarching Strategy for the Kiama Municipal Council Coastal Management

- (f) to mitigate current and future risks from coastal hazards, taking into account the effects of climate change, and
- (g) to recognise that the local and regional scale effects of coastal processes, and the inherently ambulatory and dynamic nature of the shoreline, may result in the loss of coastal land to the sea (including estuaries and other arms of the sea), and to manage coastal use and development accordingly, and
- (h) to promote integrated and co-ordinated coastal planning, management and reporting, and
- (i) to encourage and promote plans and strategies to improve the resilience of coastal assets to the impacts of an uncertain climate future including impacts of extreme storm events, and
- (j) to ensure co-ordination of the policies and activities of government and public authorities relating to the coastal zone and to facilitate the proper integration of their management activities, and
- (k) to support public participation in coastal management and planning and greater public awareness, education and understanding of coastal processes and management actions, and
- (l) to facilitate the identification of land in the coastal zone for acquisition by public or local authorities in order to promote the protection, enhancement, maintenance and restoration of the environment of the coastal zone, and
- (m) to support the objects of the Marine Estate Management Act 2014.

In addition, the Kiama Coastline CMP shall give effect to the management objectives provided in the CM Act for the four coastal management areas described in Section 1.4.

It should be recognised that the above objectives will likely undergo refinement as the CMP progresses through the later stages of development (i.e. Stages 2-5) in consultation with stakeholders and the community so that they are consistent state-wide reflecting local issues and conditions.

Strategic Context for the CMP

3 Strategic Context for the CMP

3.1 Section Overview

This section sets the strategic context for coastal management in the Kiama Municipal Council coastline study area. This is achieved through a high-level interpretation of existing published materials and experiences gained by the study team through community and stakeholder engagement activities.

3.2 Data and Information Review

There is a wealth of information from a variety of sources relating to the functioning and management of the study area's coastal zone, including the following information sources:

- Technical studies and academic literature;
- Planning and management documents (e.g. strategic, operational and natural resource/coastal management policies); and
- Spatial mapping and data.

The review of information provided an understanding of the strategic context for the study area that supported the subsequent identification of values/benefits, hazards/threats and management issues, in addition to identifying critical information gaps for progressing with a CMP. Key documents reviewed include:

- State, regional and local strategic planning documents: including the Illawarra – Shoalhaven Regional Plan (DPE, 2015); the Coastal Management SEPP; Infrastructure SEPP and the draft Environment SEPP.

- Local planning instruments and policies: including the Kiama Local Environment Plan 2011 (LEP), Kiama Development Control Plan 2012 (DCP) and Kiama Community Strategic Plan 2017 – 2027 (CSP).
- Catchment-wide information sources, including existing plans of management, vegetation management/action plans, drainage and stormwater management plans and any other relevant available data.

A critical review of this information was conducted to determine content of the reports that is directly or indirectly relevant to:

- Understanding the physical, environmental, social and economic features and processes occurring within the study area;
- Identifying key values (or benefits), and known issues or threatening processes that may be reducing or undermining these values; and
- Determining existing management actions or strategies for managing the threats, and if possible, the effectiveness of these actions.

A full listing of documents and review of their adequacy or relevance to preparing the CMP is provided in Appendix B.

3.3 Strategic Direction for the Coast

The strategic direction for the study area is formulated acknowledging existing visions, strategies and directives outlined in existing documentation by state, regional and local strategic planning documents.

3.3.1 Related Visions

The following visions from existing relevant documentation are outlined below:

Strategic Context for the CMP

- **Coastal Management Framework 2018 (OEH)** - “aims to have thriving and resilient coastal communities living and working on a healthy coast, now and into the future”;
- **Coastal Management Act 2016** - “manage the coastal environment of New South Wales in a manner consistent with the principles of ecologically sustainable development for the social, cultural and economic well-being of the people of the State”;
- **Marine Estate Management Strategy 2018 – 2028** – “A healthy coast and sea managed for the greatest wellbeing of the community, now and into the future”
- **Illawarra – Shoalhaven Regional Plan (2015)** – “A sustainable future and resilient community, capable of adapting to changing economic, social and environmental circumstances”
- **Kiama Council Community Strategic Plan 2017-2027** – “Working together for a healthy, sustainable and caring community” which aims to be achieved by focusing on the following objectives:
 - A healthy, safe and inclusive community
 - Well planned and managed spaces, places and environment
 - A diverse thriving economy
 - Responsible civic leadership that is transparent, innovative and accessible”
- **Kiama Regional Economic Development Strategy 2018 – 2022** – “strong vibrant economy outside of current holiday peaks with carefully managed growth and employment opportunities in tourism, agribusiness

and other emerging industries and to capitalise on the regions unique opportunities in digital connectivity”.

- **Destination Kiama Strategic Tourism and Events Plan 2018 – 2021** – “Destination Kiama Vision: The Kiama areas will welcome and inspire visitors year-round to experience our distinctive natural landscapes, relaxed lifestyle, arts, culture and events.”

3.3.2 State Level Plans and Strategies

The key State level plan for the KMC coastline is the coastal management framework, as explained in Section 1.3. Additional key legislation that covers and supports management of this coastal environment are listed in Section 3.4 and detailed in Appendix C. A summary of the key State Environmental Planning Policies relevant to the Kiama Coastline CMP are outlined herein.

3.3.2.1 Coastal Management SEPP

The State Environmental Planning Policy (Coastal Management) 2018 (the ‘CM SEPP’) passed in Parliament in April 2018, defines the strategic planning objectives and development controls applicable to the four coastal management areas comprising the coastal zone as defined in the CM Act (i.e. coastal wetlands and littoral rainforests area, coastal vulnerability area, coastal environment area, and coastal use area). The CM SEPP amalgamated and repealed SEPP No. 71 – Coastal Protection, SEPP No. 14 – Coastal Wetlands and SEPP No. 26 – Littoral Rainforest. The CM SEPP also allowed for the repeal of compulsory LEP Clause 5.5 Development in the Coastal Zone.

The CM SEPP is supported by maps of the coastal management areas, except the coastal vulnerability area. Under the new process for the preparation of CMPs, Councils may submit a Planning Proposal (in accordance with the EPA Act via the Gateway process) to update any of the coastal management area

Strategic Context for the CMP

maps. It is anticipated that Councils will submit planning proposals to have existing or new coastal hazard mapping adopted as the coastal vulnerability area. Updating the coastal wetland and littoral rainforest management area maps is also likely to be common. The preparation of a planning proposal, and associated engagement activities to be undertaken through this CMP are further outlined in Section 4.2.5.

3.3.2.2 Infrastructure SEPP

The State Environmental Planning Policy Infrastructure (2007) assists the NSW Government, private infrastructure providers, local councils and the communities they support by simplifying the process for providing infrastructure like hospitals, roads, railways, emergency services, water supply and electricity delivery. December 2017 amendments to the Infrastructure SEPP included new provisions for health service facilities, public administration buildings, state sports and recreation centres, and lead-in sewer and water infrastructure. They also optimised the use of commuter hubs and enabled councils to better manage and maintain their lands, including their operational lands.

The aim of this Policy is to facilitate the effective delivery of infrastructure across the State by:

- (a) improving regulatory certainty and efficiency through a consistent planning regime for infrastructure and the provision of services, and
- (b) providing greater flexibility in the location of infrastructure and service facilities, and
- (c) allowing for the efficient development, redevelopment or disposal of surplus government owned land, and

(d) identifying the environmental assessment category into which different types of infrastructure and services development fall (including identifying certain development of minimal environmental impact as exempt development), and

(e) identifying matters to be considered in the assessment of development adjacent to particular types of infrastructure development, and

(f) providing for consultation with relevant public authorities about certain development during the assessment process or prior to development commencing, and

(g) providing opportunities for infrastructure to demonstrate good design outcomes.

3.3.2.3 Draft - Environment SEPP

The NSW Government is working towards developing a new State Environment Planning Policy (SEPP) – the Environment SEPP is proposed to repeal and replace a number of SEPPs and Regional Environmental Plans (REPs).

The proposed new Environment SEPP aims to consolidate seven existing state level planning provisions into a single instrument, that will set out provision under four parts, being: catchments, waterways, bushland and protected areas.

3.3.3 Regional Level Plans

Illawarra – Shoalhaven Regional Plan (2015)

The Illawarra – Shoalhaven Regional Plan applies to the LGAs of Kiama, Shellharbour, Shoalhaven and Wollongong. The regional plan provides the

Strategic Context for the CMP

strategic policy planning and decision-making framework to guide to achieving ecologically sustainable development for the region over the next 20 years. Eight key principles underpin the planning framework:

- identify and protect land with high environmental value and recognise cultural heritage values;
- support the sustainable use of land and water resources and build resilience to natural hazards and climate change;
- support a strong, resilient and diversified economy that will enable the community to respond to environmental, economic and social changes;
- integrate transport and land use planning, and support improvements in active transport (walking and cycling), public transport and transport infrastructure (including freight);
- take a balanced approach to housing that provides choice, affordability, and supports the orderly supply of land for development;
- increase housing density around centres that have access to jobs and transport and are already appealing to residents;
- encourage urban design that reduces car dependency, improved public domain, promotes energy efficiency and supports healthier environments; and
- improve infrastructure coordination.

To achieve the Regional Plan's vision of a sustainable future and resilient community, capable of adapting to changing economic, social and environmental circumstances goals and associated directions have been set, directions relevant to the Kiama region are outlined in Table 3-1 below.

Table 3-1 Regional Plan Goals & Relevant Directions to Kiama

GOAL 1 – A Prosperous Illawarra – Shoalhaven
<ul style="list-style-type: none"> • DIRECTION 1.4 Support new and expanded industrial activity by providing well-located and serviced supplies of industrial land
GOAL 2 – A Region with a Variety of Housing Choices With Homes That Meet Needs and Lifestyles
<ul style="list-style-type: none"> • DIRECTION 2.1 Provide sufficient housing supply to suit the changing demands of the region • DIRECTION 2.2 Support housing opportunities close to existing services, jobs and infrastructure in the region's centres • DIRECTION 2.3 Deliver housing in new release areas best suited to build new communities, provide housing choice and avoid environmental impact
GOAL 3 – A Region with Communities That Are Strong, Healthy and Well-Connected
<ul style="list-style-type: none"> • DIRECTION 3.2 Enhance community access to jobs, goods and services by improving connections between centres and growth areas • DIRECTION 3.3 Build socially inclusive, safe and healthy communities • DIRECTION 3.4 Protect the region's cultural heritage
GOAL 4 – A Region That Makes Appropriate Use of Agricultural and Resource Lands
<ul style="list-style-type: none"> • DIRECTION 4.1 Protect regionally important agricultural lands as an asset to food and fibre production
GOAL 5 – A Region That Protects and Enhances the Natural Environment
<ul style="list-style-type: none"> • DIRECTION 5.1 Protect the region's environmental values by focusing development in locations with the capacity to absorb development • DIRECTION 5.2 Build the Illawarra-Shoalhaven's resilience to natural hazards and climate change • DIRECTION 5.3 Improve the environmental outcomes for waste management and air quality • DIRECTION 5.4 Secure the health of coastal landscapes by managing land uses and water quality

Strategic Context for the CMP

3.3.4 Local Level Plans

Under the direction of the State Government, all NSW local governments are required to prepare a Local Environment Plan (LEP) that outlines particular aims for the use and development of land within their LGA. LEPs must be prepared in accordance with the relevant standard environmental planning instrument outlined under Section 33A of the Environment Protection and Assessment Act 1979. The relevant LEP for Kiama is the Kiama Local Environmental Plan 2011.

A Development Control Plan (DCP) provides detailed planning and design guidelines to support the planning controls in the LEP. The relevant DCP applying to the study area is the Kiama Development Control Plan 2012

All NSW Councils are required to prepare a Local Strategic Planning Statement (LSPS), which sets out the 20-year vision for land use in the local area, the special character and values that are to be preserved and how change will be managed into the future. The LSPS are to give effect the Regional and District Plan(s) and will inform amendments to LEPs and DCPs.

All Councils in NSW are tasked to produce the following documents as part of the State Government's Integrated Planning and Reporting (IPR) Framework (as set out in the Local Government Act 1993).

- Community Strategic Plan (10+ years) that identifies the community's main priorities and aspirations for the future. A Resources Strategy describes how a council will achieve the objectives and strategies outlined in its CSP.
- Delivery Program (4 years), that outlines to the community how council intends to achieve the community priorities and goals.
- Operational Plan (1 year), which outlines the details of the Delivery Program on an annual basis.

Under the CM Act, councils are required to establish links and alignment between strategies and actions in their CMPs and objectives and strategies in their CSP. The aim is to mainstream coastal management into councils' overall service delivery and asset management responsibilities, via the IPR Framework.

3.3.4.1 Alignment with the Kiama Community Strategic Plan

Community objectives in the Kiama CSP that align with the preparation of the Kiama CMP are listed below.

- Developing and implementing services and programs that promote social cohesion, healthy and active lifestyles for residents of all ages, abilities and interests (Community Objective 1);
- Our community and natural environments are adaptive, resilient and sustainable and informed of predicted climate change impacts (Community Objective 2);
- The principles of ecologically sustainable development and compliance underpin town planning and local development (Community Objective 2);
- Effectively manage our waste and resources (Community Objective 2);
- Effectively manage our transport, drainage and other infrastructure and assets (Community Objective 2);
- Promote and support tourism in the local area (Community Objective 3);
- Council embraces good governance and better practice strategies (Community Objective 4); and
- Council and the community working together (Community Objective 4).

Strategic Context for the CMP

3.3.5 Other Management Plans

Additional relevant plans of management developed and administered by Council relevant to the study area are listed below.

- Coastal Zone Management Plans (CZMP): Minnamurra River Coastal Zone Management Plan and the Crooked River Coastal Zone Management Plan.
- Destination Kiama Strategic Tourism and Events Plan 2018 – 2021.
- Generic Plans of Management – Council has prepared generic and / or specific plans of management for community land and operational lands within the study area.
- Business Development Strategy and Master Plan for Kendalls Beach Holiday Park for Kiama Municipal Council (2017).
- Kiama Harbour and Blowhole Point Headland Master Plan.
- Kiama Harbour Cabins Business Development Strategy and Masterplan.
- Surf Beach Business Development Strategy and Masterplan.
- Werri Beach Holiday Park Business Development Strategy and Masterplan.

3.4 Legislative and Policy Context

There are a number of legislation and policy that have a major influence in the management of the Kiama coastal zone. Table 3-2 provides a snap shot of these legislation and policy, with further details in Appendix C.

As outlined previously, the CM Act establishes the framework and overarching objectives for coastal management in NSW which focus on strategic, integrated and ecologically sustainable management of the NSW's coastal zone.

Table 3-2 Key Legislation Governing the Study Area

NSW Coastal Zone Legislation and Policy	Coastal Management Act 2016 Coastal Management SEPP 2018 Marine Estate Management Act 2017
Additional Key Legislation Supporting Coastal Management	Commonwealth Environment Protection and Biodiversity Conservation Act 1999 Japan-Australia Migratory Bird Agreement China-Australia Migratory Bird Agreement Republic of Korea-Australia Migratory Bird Agreement NSW National Parks and Wildlife Act 1974 Environmental Planning & Assessment Act 1979 Mining Act 1992 No 29 Local Government Act 1993 Fisheries Management Act 1994 Protection of the Environment Operations Act 1997 Water Management Act 2000 Local Land Services Act 2013 Crown Land Management Act 2016 Biodiversity Conservation Act 2016 Draft Environment SEPP

3.5 Environmental Context

3.5.1 Physical Features and Processes

The study area is comprised of a diverse range of environments including open water, beaches (intertidal areas), dunes and foreshores. Additionally, a variety of manmade features and cultural artefacts exist within the study area.

Strategic Context for the CMP

3.5.1.1 Coastal Processes and Hazards

There are 13 beach systems within the Kiama LGA that range from small pocket beach compartments to intermediate embayed beaches and to the large prograding Seven Mile Beach (Doyle, 2013). A summary of the characteristics of the beach systems in the Kiama LGA created by Doyle (2013) has been replicated below in Table 3-2.

The geological formations and embayed coastline that exists in Kiama are a product of climate, past sea level changes, and sediment supply. As Doyle (2013) explains, Kiama is “characterised by a steep continental shelf that rarely exceeds 50km in width, high wave energy, sand barriers and sandy beaches that are separated by rocky headlands or bluffs”. Most of the beaches in Kiama are wave dominated and backed by dune systems and/or foredune ridges.

There are limited studies on the coastal processes associated with the Kiama region. Past studies have outlined that the Kiama Municipal area experiences net northerly sediment transport which is interrupted by rocky headlands along the coast. The rocky headlands capture sediment which results in the compartmentalised systems and also result in decreased wave energy to the embayed beaches of Kiama (Thom 1983 in Doyle 2013).

The *Coastal Erosion in New South Wales Statewide Exposure Assessment* (OEH, 2017) provides a broad-scale overview of the potential for present and future impacts to coastal settlements and communities in NSW from erosion.

The results of the first pass assessment by OEH (2017) suggests there are areas within the Kiama LGA that are likely to be exposed to erosion risk at present and future timeframes. The analysis indicates:

- the far southern end of Werri Beach, Easts Beach and Jones Beach have development in close proximity to the shoreline (< 55m); and

- Surf Beach, Kendalls Beach, the southern end of Bombo Beach and Werri Beach have development in moderate proximity to the shoreline (< 110m).

The OEH (2017) findings do not replace the need for further detailed coastal hazard studies specific to Kiama. Indeed, the OEH (2017) analysis indicates there are the potential erosion risks in Kiama, further strengthening the case for detailed locally specific hazard assessment to better quantify the extent of coastal risks in Kiama.

3.5.1.2 Human Development of the Coast

Most of the beaches in Kiama are backed by urban or commercial development such as houses, surf clubs, caravan parks and beach amenities. Extensive coastal modifications have occurred at some of the beaches in Kiama, for example:

- Permanent sea walls at the two harbours located at Blacks Beach and Gerringong Harbour. In these locations public amenities (car parks, walkways etc) have replaced the dune barrier environments (Doyle, 2013);
- Boat ramp at Gerringong Harbour;
- In 1992 the dune system at Werri Beach was bulldozed and reshaped (Kesby and Druett 1992 as in Doyle 2013);
- The back dunes of Bombo beach were excavated to construct the railway line;
- Surf beach seawall;
- Believed to be buried seawalls at Easts Beach and Kendalls Beach.

Strategic Context for the CMP**Table 3-3 Characteristics of the beach systems in the Kiama LGA – Morphological type, aspect, length, wave height, safety rating, compartment type sediment supply and stability of each beach, adapted from Bryant 1981 (Replicated from Doyle, 2013)**

Beach	Beach Type	Beach Aspect	Beach Length (m)	Average Wave Height	Safety Index	Compartment type & compartmentalization	Sediment Supply	Stability (Bryant, 1981)
Kiama Downs (Boyd's)	TBR	East	900	1- 1.5m	7	Embayed Beach- normally closed	Fixed	Sth Eroding
Cathedral Rocks	R	North	150	<0.5m	4	Pocket Beach- closed	Fixed	-
Bombo	TBR/RBB	East	1200	1.5m	7	Embayed Beach- closed	Fixed	Sth Eroding
Blacks	R	East	130	<0.5m	4	Pocket Beach	Fixed	Stable
Surf	TBR	East	270	1- 1.5m	6	Pocket Beach- closed	Fixed	Eroding slowly*
Kendalls	LTT	North east	380	1m	4	Pocket Beach- closed	Fixed	Eroding slowly
Easts	LTT	East	350	1m	4	Pocket Beach- closed	Fixed	Eroding slowly
Werri	TBR/RBB →TBR	East-northeast (in south)	1900	1.6- 1.4m (north-south)	7 to 6	Embayed Beach- normally closed	Fixed	Sth Eroding
Gerringong Harbour	R +rock flats	East	120	<0.5m	4	Pocket	Fixed	-
Walkers	LTT/TBR	East-Southeast	350	1m	5	Embayed – normally closed	Fixed	Eroding slowly*
Shelly	R + rock flats	East	120	1- 1.5m	7	Pocket Beach- closed	Fixed	Stable*
Gerroa (North Seven Mile)	LTT/ TBR	West-southeast	2000	<1m	5	Drift Aligned Beach- Open	Fluctuating	Stable*
Seven Mile	Inner bar: TBR Outer bar: LBT	Southeast-East	10500	1.6m	6	Drift Aligned Beach- Open	Growing	Stable*

Strategic Context for the CMP

3.5.1.3 Water Quality

In relation to recorded water quality for the study area, Council participates in the NSW Government's Beachwatch program, coordinated by the DPIE (formerly OEH). This program was developed to provide the community with information on water quality to enable individuals to make decisions about choices to swim.


The program monitors swimming sites and grades them from 'very good' to 'very poor' in accordance with the National Health and Medical Research Council's 2008 Guidelines for Managing Risks in Recreational Waters. The grades provide a long-term assessment of beach suitability for swimming and are determined from the most recent 100 water quality results (which can be 2 to 4 years of data depending on sampling frequency). The rating also includes a risk assessment of potentially polluting sources. Generally, water samples are analysed in a laboratory for enterococci and the results are combined with a sanitary inspection to determine an overall grading, noting that the statistical confidence in the result increases for a greater sample number.

Sites rated as 'very good' are considered suitable for swimming almost all of the time, with few potential sources of faecal contamination. Sites rated as 'good' are considered suitable for swimming most of the time, but they may have some susceptibility to contamination. 'Fair' rated sites should be avoided for the purposes of swimming during and for three days following rainfall or if there are signs of stormwater pollution, such as discoloured water or odour or floating debris.

There are five sites monitored in the Kiama LGA as outlined in Table 3-4. Four sites are monitored a weekly basis all year round, and one site is monitored weekly between October and April (swimming season). From 2010 – 2018 the

monitored beaches of Kiama have received Good or Very Good Beach Suitability Grades.

Table 3-4 Kiama Water Sampling Sites (Beachwatch - OEH, 2011-18)

Monitoring Site	Beach Suitability Grade							
	2010 -11	2011 -12	2012 -13	2013 -14	2014 -15	2015 -16	2016 -17	2017 -18
Boyd's Jones Beach	VG	VG	VG	VG	G	G	VG	VG
Bombo Beach	G	G	G	G	G	G	VG	VG
Surf Beach	G	G	G	G	G	G	G	G
Werri Beach	G	VG	VG	VG	VG	VG	VG	VG
Seven Mile Beach (Gerroa)	No Data	No Data	VG	VG	G	G	G	VG
								

Within the study area there are a number of stormwater pipe discharges to beaches. These occur at Kendall's Beach, Black Beach, Boyd's Jones Beach, and Surf Beach. The quality of stormwater discharge from these pipes will be lower than that of oceanic water and could contain a variety of typical urban stormwater pollutants including litter, sediments, nutrients, metals, pesticides, pathogens and altered physical characteristics.

Strategic Context for the CMP

3.5.1.4 Ecology

Flora and fauna attributes are associated with the different environments of the study area which include marine areas, sandy/rocky foreshores, coastal dunes, littoral rainforest and wetlands/heathlands and estuary entrances. The health and values of ecosystems of the study area have been considered in a limited number of studies (Harris 2002, Kevin Mills & Associates 2006a&b, Wollongong City Council 2011).

The natural or native vegetation of the entire Kiama LGA was assessed and mapped in 2006 (Kevin Mills & Associates, 2006a). The vegetation of the Illawarra region (inclusive of Kiama) is unique due to key environmental factors: high rainfall, volcanic soils, range in altitude from sea level to over 600 metres (Kevin Mills & Associates 2006a). Overall it was reported that very little vegetation within the LGA is in a completely natural condition, except for the sandstone communities of the plateaux. This is a result of almost all areas having been partially cleared or logged at some point in time since European settlement.

The Kiama LGA comprises approximately 40 vegetation communities, with the remaining vegetation mostly associated with the escarpment area as vegetation clearing has occurred on the lowland areas (Kevin Mills & Associates 2006a). As such, many of the lowland communities have been listed as endangered ecological communities under the *Biodiversity Conservation Act, 2016*. Illawarra Subtropical Rainforest is listed as Critically Endangered under *Environmental Protection and Biodiversity Conservation Act 1999* (the EPBC Act) as at September 2019.

Key communities identified within or in close proximity to the study area are:

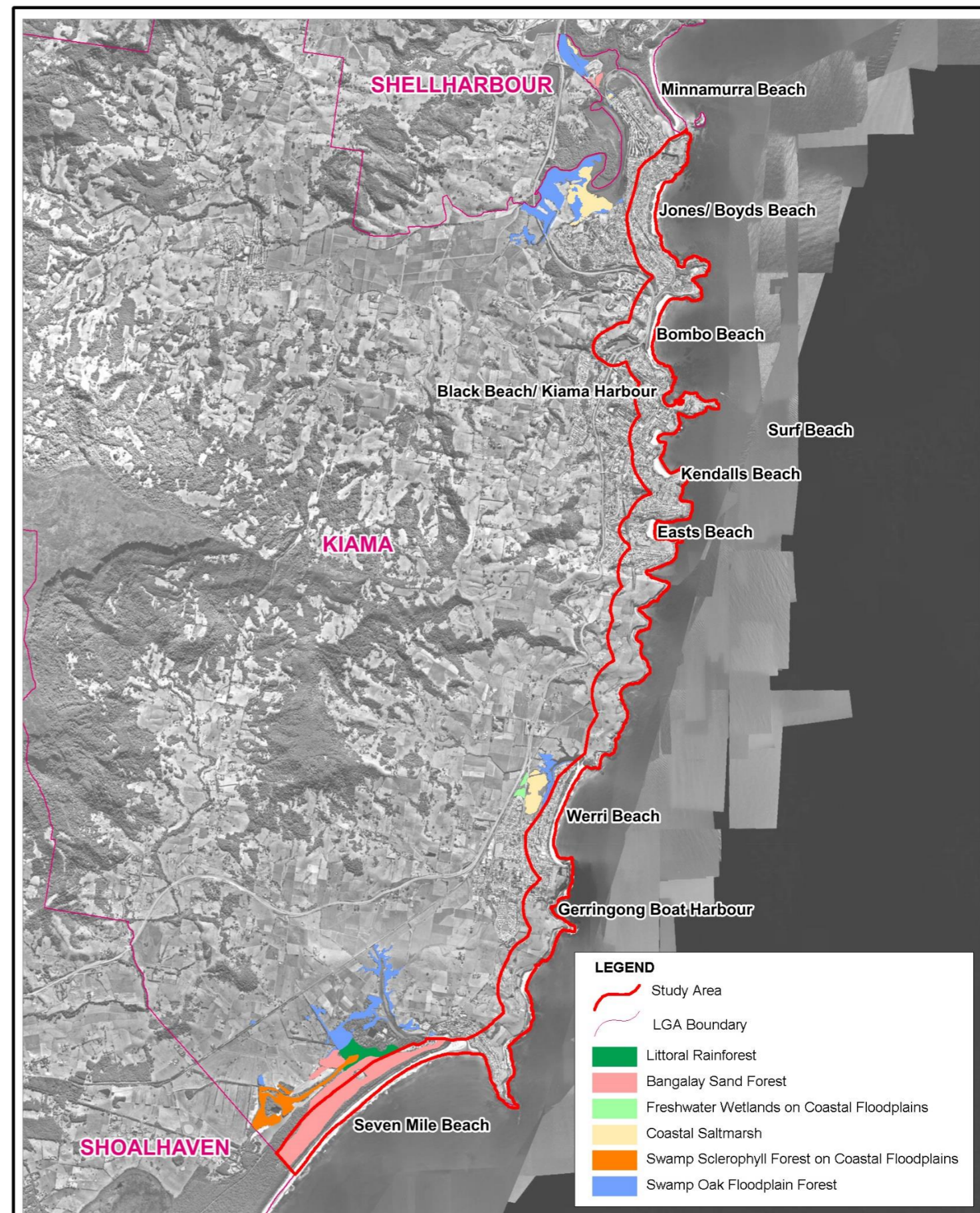
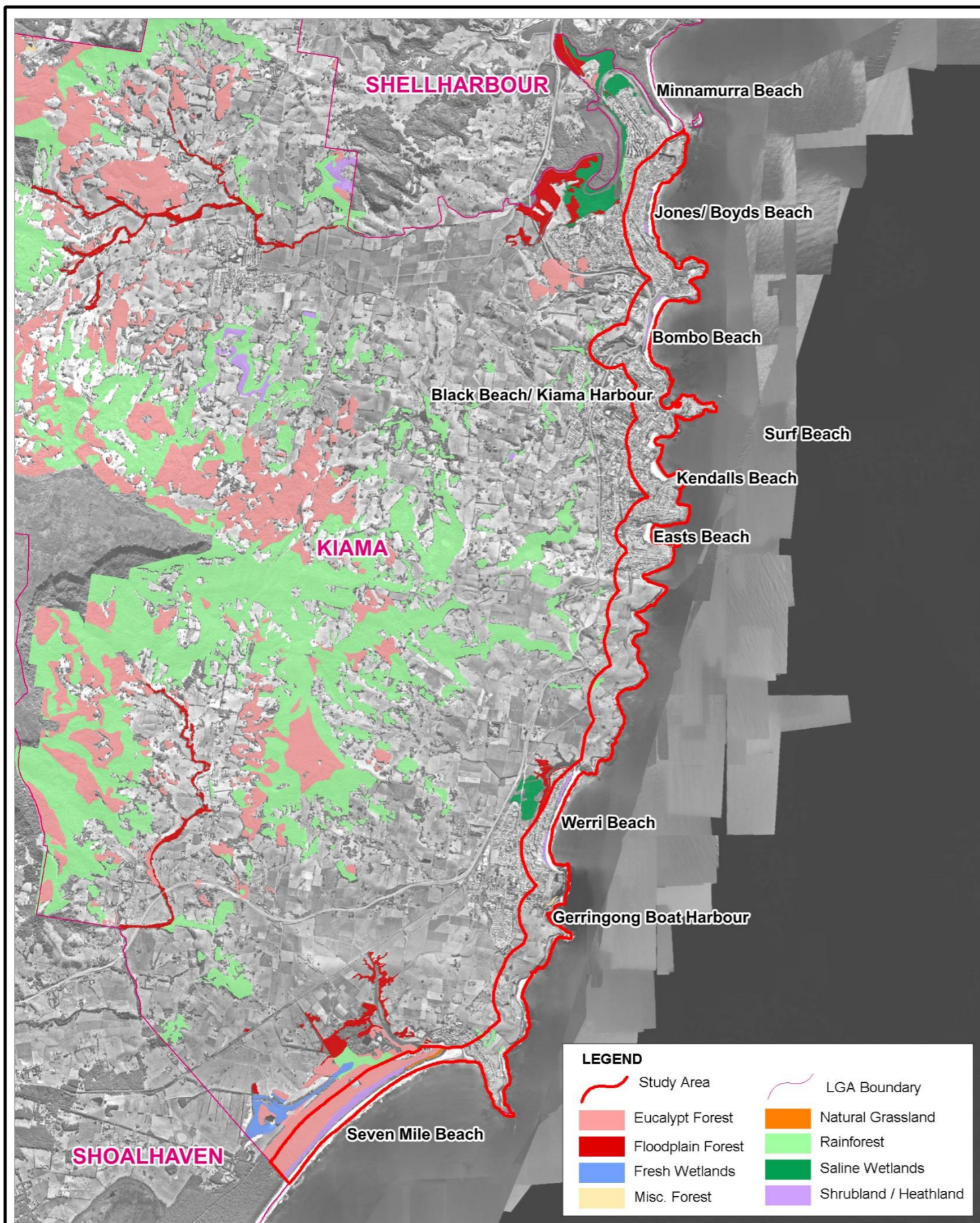
- Littoral Rainforest

- Bangalay Sand Forest
- Freshwater Wetlands on Coastal Floodplains
- Coastal Saltmarsh
- Swamp Sclerophyll Forest on Coastal Floodplains
- Swamp Oak Floodplain Forest
- Themeda Grassland on Seacliffs And Coastal Headlands

Key conservation reserves in the study area are:

- Seven Mile Beach National Park
- Spring Creek Wetland Reserve
- Minnamurra Point Reserve

The Kiama LEP 2011 Biodiversity mapping and identified endangered ecological communities located within or in close proximity to the study area are shown in Figure 3-1 and Figure 3-2 respectively.



Strategic Context for the CMP

The Fauna of Kiama (Kevin Mills & Associates, 2006b) provides an overview of the fauna found within the Kiama LGA and was the first comprehensive report on fauna for the area. Kevin Mills & Associates, 2006b produced a summary of the fauna species within each fauna group based upon a detailed literature and database search and review, as reproduced in Table 3-5.

Table 3-5 Fauna Species in Kiama LGA

Fauna Group	Natives	Exotics	Total
Frogs	20	-	20
Reptiles	28	-	28
Birds	308	11	319
Mammals	51	12	63
Fish	65	1	66
Total	472	24	496

Kevin Mills & Associates (2006b) reported that 58 threatened fauna species have been recorded within the Kiama Municipal Council area.

A recent search of the NSW OEH wildlife atlas indicated that there are currently 120 species within the Kiama LGA listed as vulnerable, endangered or critically endangered on the NSW or Commonwealth listing status, in Table 3-6.

Table 3-6 Threatened Species in Kiama LGA

Scientific Name	Common Name	NSW Status*	Comm. Status*
<i>Heleioporus australiacus</i>	Giant Burrowing Frog	V,P	V
<i>Mixophyes balbus</i>	Stuttering Frog	E1,P,2	V
<i>Pseudophryne australis</i>	Red-crowned Toadlet	V,P	
<i>Litoria aurea</i>	Green and Golden Bell Frog	E1,P	V
<i>Litoria littlejohni</i>	Littlejohn's Tree Frog	V,P	V
<i>Caretta caretta</i>	Loggerhead Turtle	E1,P	E
<i>Chelonia mydas</i>	Green Turtle	V,P	V

Scientific Name	Common Name	NSW Status*	Comm. Status*
<i>Eretmochelys imbricata</i>	Hawksbill Turtle	P	V
<i>Dermochelys coriacea</i>	Leatherback Turtle	E1,P	E
<i>Varanus rosenbergi</i>	Rosenberg's Goanna	V,P	
<i>Hoplocephalus bungaroides</i>	Broad-headed Snake	E1,P,2	V
<i>Oxyura australis</i>	Blue-billed Duck	V,P	
<i>Stictonetta naevosa</i>	Freckled Duck	V,P	
<i>Ptilinopus regina</i>	Rose-crowned Fruit-Dove	V,P	
<i>Ptilinopus superbus</i>	Superb Fruit-Dove	V,P	
<i>Hirundapus caudacutus</i>	White-throated Needletail	P	V,C,J,K
<i>Fregetta grallaria</i>	White-bellied Storm-Petrel	V,P	V
<i>Diomedea antipodensis</i>	Antipodean Albatross	V,P	V
<i>Diomedea exulans</i>	Wandering Albatross	E1,P	E,J
<i>Diomedea gibsoni</i>	Gibson's Albatross	V,P	V
<i>Phoebastria fusca</i>	Sooty Albatross	V,P	V
<i>Thalassarche bulleri</i>	Buller's Albatross	P	V
<i>Thalassarche cauta</i>	Shy Albatross	V,P	V
<i>Thalassarche melanophris</i>	Black-browed Albatross	V,P	V
<i>Ardenna carneipes</i>	Flesh-footed Shearwater	V,P	J,K
<i>Halobaena caerulea</i>	Blue Petrel	P	V
<i>Macronectes giganteus</i>	Southern Giant Petrel	E1,P	E
<i>Macronectes halli</i>	Northern Giant-Petrel	V,P	V
<i>Pterodroma leucoptera leucoptera</i>	Gould's Petrel	V,P	E
<i>Pterodroma neglecta neglecta</i>	Kermadec Petrel (west Pacific subspecies)	V,P	V
<i>Pterodroma nigripennis</i>	Black-winged Petrel	V,P	
<i>Pterodroma solandri</i>	Providence Petrel	V,P	J
<i>Puffinus assimilis</i>	Little Shearwater	V,P	
<i>Sula dactylatra</i>	Masked Booby	V,P	J,K
<i>Ephippiorhynchus asiaticus</i>	Black-necked Stork	E1,P	
<i>Botaurus poiciloptilus</i>	Australasian Bittern	E1,P	E
<i>Ixobrychus flavicollis</i>	Black Bittern	V,P	
<i>Circus assimilis</i>	Spotted Harrier	V,P	
<i>Haliaeetus leucogaster</i>	White-bellied Sea-Eagle	V,P	C
<i>Hieraaetus morphnoides</i>	Little Eagle	V,P	
<i>Lophoictinia isura</i>	Square-tailed Kite	V,P,3	
<i>Pandion cristatus</i>	Eastern Osprey	V,P,3	

Strategic Context for the CMP

Scientific Name	Common Name	NSW Status*	Comm. Status*
<i>Falco subniger</i>	Black Falcon	V,P	
<i>Burhinus grallarius</i>	Bush Stone-curlew	E1,P	
<i>Esacus magnirostris</i>	Beach Stone-curlew	E4A,P	
<i>Haematopus fuliginosus</i>	Sooty Oystercatcher	V,P	
<i>Haematopus longirostris</i>	Pied Oystercatcher	E1,P	
<i>Charadrius leschenaultii</i>	Greater Sand-plover	V,P	V,C,J,K
<i>Charadrius mongolus</i>	Lesser Sand-plover	V,P	E,C,J,K
<i>Thinomis rubricollis</i>	Hooded Plover	E4A,P	V
<i>Irediparra gallinacea</i>	Comb-crested Jacana	V,P	
<i>Rostratula australis</i>	Australian Painted Snipe	E1,P	E
<i>Calidris alba</i>	Sanderling	V,P	C,J,K
<i>Calidris canutus</i>	Red Knot	P	E,C,J,K
<i>Calidris ferruginea</i>	Curlew Sandpiper	E1,P	CE,C,J,K
<i>Calidris tenuirostris</i>	Great Knot	V,P	CE,C,J,K
<i>Limicola falcinellus</i>	Broad-billed Sandpiper	V,P	C,J,K
<i>Limosa lapponica baueri</i>	Bar-tailed Godwit (baueri)	P	V,C,J,K
<i>Limosa limosa</i>	Black-tailed Godwit	V,P	C,J,K
<i>Numenius madagascariensis</i>	Eastern Curlew	P	CE,C,J,K
<i>Xenus cinereus</i>	Terek Sandpiper	V,P	C,J,K
<i>Gygis alba</i>	White Tern	V,P	
<i>Onychoprion fuscata</i>	Sooty Tern	V,P	
<i>Procelsterna cerulea</i>	Grey Ternlet	V,P	
<i>Sternula albifrons</i>	Little Tern	E1,P	C,J,K
<i>^Callocephalon fimbriatum</i>	Gang-gang Cockatoo	V,P,3	
<i>^Calyptorhynchus lathamii</i>	Glossy Black-Cockatoo	V,P,2	
<i>Glossopsitta pusilla</i>	Little Lorikeet	V,P	
<i>^Lathamus discolor</i>	Swift Parrot	E1,P,3	CE
<i>^Neophema chrysogaster</i>	Orange-bellied Parrot	E4A,P,3	CE
<i>^Neophema pulchella</i>	Turquoise Parrot	V,P,3	
<i>^Pezoporus wallicus wallicus</i>	Eastern Ground Parrot	V,P,3	
<i>^Ninox connivens</i>	Barking Owl	V,P,3	
<i>^Ninox strenua</i>	Powerful Owl	V,P,3	
<i>^Tyto novaehollandiae</i>	Masked Owl	V,P,3	
<i>^Tyto tenebricosa</i>	Sooty Owl	V,P,3	
<i>Climacteris picumnus victoriae</i>	Brown Treecreeper (eastern subspecies)	V,P	

Scientific Name	Common Name	NSW Status*	Comm. Status*
<i>^Dasyornis brachypterus</i>	Eastern Bristlebird	E1,P,2	E
<i>Calamanthus fuliginosus</i>	Striated Fieldwren	E1,P	
<i>Anthochaera phrygia</i>	Regent Honeyeater	E4A,P	CE
<i>Epthianura albifrons</i>	White-fronted Chat	V,P	
<i>Daphoenositta chrysoptera</i>	Varied Sittella	V,P	
<i>Pachycephala olivacea</i>	Olive Whistler	V,P	
<i>Artamus cyanopterus cyanopterus</i>	Dusky Woodswallow	V,P	
<i>Petroica boodang</i>	Scarlet Robin	V,P	
<i>Petroica phoenicea</i>	Flame Robin	V,P	
<i>Petroica rodinogaster</i>	Pink Robin	V,P	
<i>Stagonopleura guttata</i>	Diamond Firetail	V,P	
<i>Dasyurus maculatus</i>	Spotted-tailed Quoll	V,P	E
<i>Phascogale tapoatafa</i>	Brush-tailed Phascogale	V,P	
<i>Sminthopsis leucopus</i>	White-footed Dunnart	V,P	
<i>Isodon obesulus obesulus</i>	Southern Brown Bandicoot (eastern)	E1,P	E
<i>Phascolarctos cinereus</i>	Koala	V,P	V
<i>Cercartetus nanus</i>	Eastern Pygmy-possum	V,P	
<i>Petaurus australis</i>	Yellow-bellied Glider	V,P	
<i>Petaurus norfolcensis</i>	Squirrel Glider	V,P	
<i>Petauroides volans</i>	Greater Glider population in the Seven Mile Beach National Park area	E2,P	V
<i>Petauroides volans</i>	Greater Glider	P	V
<i>Potorous tridactylus</i>	Long-nosed Potoroo	V,P	V
<i>Macropus parma</i>	Parma Wallaby	V,P	
<i>Petrogale penicillata</i>	Brush-tailed Rock-wallaby	E1,P	V
<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox	V,P	V
<i>Saccolaimus flaviventris</i>	Yellow-bellied Sheath-tail-bat	V,P	
<i>Micronomus norfolkensis</i>	Eastern Coastal Free-tailed Bat	V,P	
<i>Chalinolobus dwyeri</i>	Large-eared Pied Bat	V,P	V
<i>Falsistrellus tasmaniensis</i>	Eastern False Pipistrelle	V,P	
<i>Myotis macropus</i>	Southern Myotis	V,P	
<i>Phoniscus papuensis</i>	Golden-tipped Bat	V,P	
<i>Scoteanax rueppellii</i>	Greater Broad-nosed Bat	V,P	
<i>Pseudomys novaehollandiae</i>	New Holland Mouse	P	V

Strategic Context for the CMP

Scientific Name	Common Name	NSW Status*	Comm. Status*
<i>Dugong dugon</i>	Dugong	E1,P	
<i>Arctocephalus forsteri</i>	New Zealand Fur-seal	V,P	
<i>Arctocephalus pusillus doriferus</i>	Australian Fur-seal	V,P	
<i>Eubalaena australis</i>	Southern Right Whale	E1,P	E
<i>Balaenoptera musculus</i>	Blue Whale	E1,P	E
<i>Megaptera novaeangliae</i>	Humpback Whale	V,P	V
<i>Physeter macrocephalus</i>	Sperm Whale	V,P	
<i>Petalura gigantea</i>	Giant Dragonfly	E1	
<i>Miniopterus australis</i>	Little Bent-winged Bat	V,P	
<i>Miniopterus orianae oceanensis</i>	Large Bent-winged Bat	V,P	

*Status under the NSW *Biodiversity Conservation Act 2016*, NSW *Fisheries Management Act 1994* and Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999*. CE – critically endangered; E1 – endangered; E2 – endangered population; V – vulnerable; CD – conservation dependent; C – CAMBA - protected under the China-Australia Migratory Bird Agreement; J – JAMBA - protected under the Japan-Australia Migratory Bird Agreement; K – ROKAMBA - protected under the Republic of Korea-Australia Migratory Bird Agreement.

3.5.2 Environmental Values

Whilst there are not any recent studies assessing the environmental values of the study area, the consultation undertaken as part of this study (see Section 3.7.3 and Appendix D) identified community based environmental values. The key community based environmental values associated with the study area include its healthy environment, naturalness, cleanliness and geodiversity/scenic landscape amenity (i.e. natural structure, aesthetics, views). Main attributes of these values are described generally below.

3.5.2.1 Geodiversity and Scenic Landscape Amenity Values

Kiama's regional landscape is particularly scenic with its rugged coastline, picturesque coastal valleys and dramatic escarpment features. This

geodiversity is influenced by the underlying geology of the region which is highly variable but dominated by Permian sediments and volcanic rocks (Kevin Mills & Associates, 2006b).

There are numerous sites that have been identified as geologically special or of interest. In particular, the Kiama Blow Holes and Bombo Headland, shown in Figure 3-3, are unique and iconic landforms that are strongly linked to Kiama's identity. The Kiama Blow Hole (and The Little Blow Hole) are probably the most iconic and well-known geological site in Kiama and the broader Illawarra regions. The activity and spray height of the blow holes varies greatly and is dependent on sea conditions.

Bombo Headland Quarry is an impressive and visually stunning site that houses the remains of ancient columnar jointing. This site was nominated by the Geological Society of Australia (NSW Division) as a heritage site in 1979 and following lengthy consultation and site inspections, a Permanent Conservation Order was awarded to the site in 1983. The site was then transferred onto the State Heritage Register in 1999.



Figure 3-3 Bombo Headland Quarry (top) and Kiama Blow Hole (bottom) (Source: Cartoscope Pty Ltd, 2019)

Strategic Context for the CMP

3.5.2.2 Biodiversity Values

Kiama LGA is home to a great diversity and abundance of flora, fauna and ecological communities. The Illawarra Biodiversity Strategy (2011) determined there to be 12 endangered ecological communities (EECs) within the Kiama LGA, and 19 EECs in the Illawarra Region. Native fauna in the Kiama area is diverse, with 472 species identified (Kevin Mills & Associates, 2006b), of which at least 53 species listed as vulnerable or endangered under the *Biodiversity Conservation Act 2016*, *Fisheries Management Act 1994* and / or the *Environmental Protection and Biodiversity Conservation Act 1995*.

The study area is home to a section of the Seven Mile Beach National Park with this conservation area supporting a variety of biodiversity values whilst also being of environmental and recreational importance.

The region's high biodiversity is considered to support community values associated with naturalness and healthy environment.

3.5.2.3 Water Quality

The main impacts on water quality are typically from pollutants carried by stormwater runoff, untreated sewage/effluent entering waterways and agricultural runoff. However, Council has a range of measures in place in an attempt to minimise these impacts. This includes a Stormwater Management Plan (KMC, 2003), Water Sensitive Urban Design Policy (KMC, 2005), implementation of stormwater treatment projects, participation in water quality monitoring programs and Environmental Health Officers and Ranger Services officers who monitoring and investigates any water pollution complaints received.

The above management measures appear to be working reasonably effectively as good water quality across the Kiama coastline beaches is typical. As outlined previously in Section 3.5.1.3, the results of the NSW Government's

Beachwatch program from 2010 to 2018 reported that water quality at the five beach sites monitored across the Kiama LGA to be Good or Very Good.

Beach cleanliness and good water quality is of particular importance as it supports most of the community values i.e. it is associated with a healthy environment, naturalness, cleanliness and landscape amenity (scenic nature, aesthetics and views).

3.5.3 Environmental Pressures

Within the Kiama region, there are a number of threats and threatening processes that pose a risk to the biodiversity of the area. Past and present human activities within the waterways and the broader catchment continue to place pressure on many of the Kiama Municipal Council environmental values.

The Illawarra Biodiversity Strategy (2011), a joint regional strategy prepared by Wollongong City Council, Shellharbour City Council and Kiama Municipal Council, listed a number of key threats to the biodiversity of the Illawarra. The most significant threats to the biodiversity of the Kiama Municipal Council LGA include:

- Clearing of native vegetation;
- Human-induced climate change;
- Impacts associated with feral animals: rabbits, bees, deer, pigs, goats, exotic fish, cat, red fox and plague minnow;
- Invasion of exotic garden plants, exotic grasses, vine and scramblers
- Invasion of Lantana and Bitou Bush;
- The degradation of native riparian vegetation along NSW water courses;
- Alteration to the natural flow regimes of rivers and streams and their floodplains and wetlands;

Strategic Context for the CMP

- Ecological consequences of high frequency fires; and
- Infection of frogs by amphibian chytrid causing the disease chytridiomycosis.

It is noted that many of these are listed under NSW legislation as Key Threatening Processes, however others are not formally listed, but are known to have adverse impacts upon the biodiversity in the Illawarra.

In addition, the Fauna of Kiama report (Kevin Mills & Associates, 2006b) states that the Kiama district supports several pest species that are having an adverse impact on the environment (and/or economy). The main pest species include:

- *Felis catus* (Feral Cat);
- *Capra hircus* (Feral Goat);
- *Vulpes vulpes* (Fox);
- *Oryctolagus cuniculus* (Rabbit);
- *Dama dama* (Fallow Deer);
- *Acridotheres tristis* (Common Myna);
- *Sturnus vulgaris* (Common Starling); and
- *Gambusia holbrooki* (Plague Minnow).

It is also noted that several other species have been introduced to the area but have not become particularly troublesome.

Whilst not specifically documented in previous literature or reports, it is likely there are numerous other threats or pressures that are currently having or have the potential to have an impact on the vegetation, fauna and ecological

processes within the study area. These are likely to be human driven and could include:

- Diversion of natural channels and drainage;
- Dredging and mining activities;
- Industrial and commercial activities;
- Road and transport routes;
- Development of residential areas;
- Dumping of commercial and domestic waste;
- Land filling;
- Stormwater runoff; and
- Sewage overflow contamination.

3.6 Governance Context

3.6.1 Waterway and Land Ownership and Management

Land ownership and management within the study area includes both private and public lands with varying land uses.

The majority of land across the study area is privately owned. This area has various land uses but is predominately urban residential and agricultural with small sections of light industrial and commercial land uses centred around the townships. Local Government manages or owns much of the foreshore and parklands adjacent to the coastline, while State Government manages and/or owns the ocean areas of the study area up to the high tide point on the beaches. There is also a small section of National Park within the study area which is managed by the National Parks and Wildlife Service (NPWS).

Strategic Context for the CMP

A State Conservation Area lies north of Minnamurra Beach. The land ownership and management of the land to the north of the study area is unclear and needs to be clarified.

3.6.2 Roles and Responsibilities

The governance of the study area is relatively straight forward as there is only one local Council responsible for this area. However, all three levels of government have key management and regulatory roles and responsibilities across the study area. An overview of the Kiama coastline land zoning and land tenure is illustrated in Figure 3-4 and Figure 3-5, respectively.

In a Federal context, the Commonwealth Government is responsible for administering the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) protects nationally significant threatened species and communities within the Kiama region, such as the Eastern Bentwing-bat (*Miniopterus schreibersii oceanensis*) which has been recorded within the Kiama Municipal Council LGA.

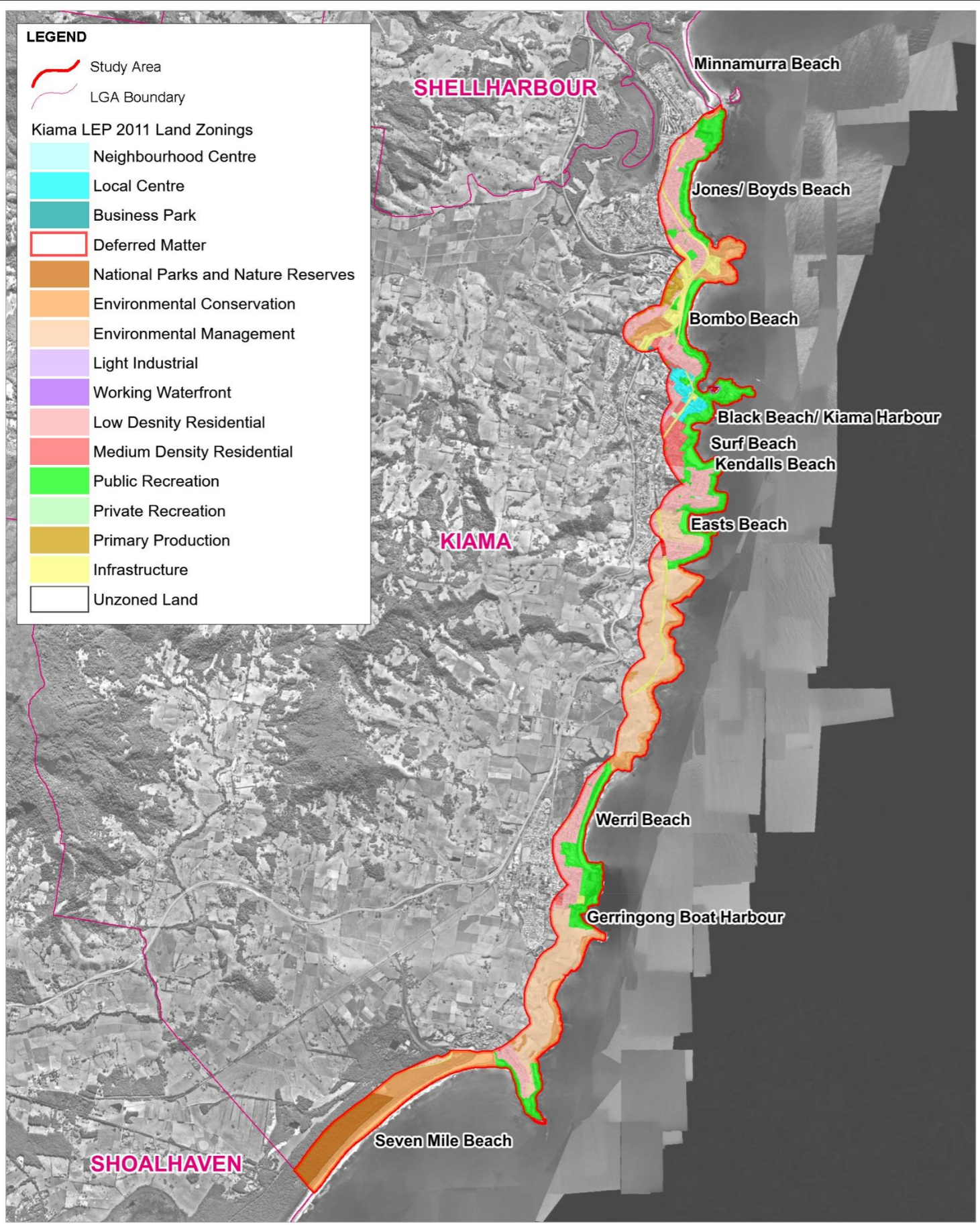
State and local governments share strategic and statutory planning responsibilities for land within the study area. Both DPIE and Council administer the *Environmental Planning and Assessment Act 1979*, which is the key legislation for land use planning and development assessment in NSW. LEPs (including the Kiama LEP 2011) are made under the *NSW Environmental Planning and Assessment Act 1979* (Part 3) and specify land zoning and permissible development for each local council area.

The bed of the waterways within the study area including the ocean and estuary entrances, and many tracts of land along the foreshore are publicly owned Crown Land. These areas are administered by DPIE (Crown Lands) - Crown Lands) under the *Crown Land Management Act 2016*. However, much of the foreshore areas of Crown Land are managed or maintained by Council. Other State Government agencies and entities such as Transport for NSW

(TfNSW, including TfNSW (Roads), NSW Maritime, and Sydney Trains) and Sydney Water have key assets or areas of responsibility within the study area which they oversee and administer.

Each local council is an independent entity responsible for administering the local government area over which it has jurisdiction as per the *Local Government Act 1993*. Council is responsible for administering various legislation and developing their own plans and policies for their LGA (i.e. LEPs, CMPs etc). Council has key responsibilities in relation to Coastal Zone Management in the LGA including: coastal management works, land use planning, development approval, water quality and pollution regulation, open space and stormwater management etc.

The CM Act provides the legislative framework for managing the coastal zone in a strategic and coordinated manner. The CM Act is administered by DPIE (Energy and Environment Services) and the Kiama Coastline CMP when completed is likely to be administered by Council. Acknowledging actions developed and certified in CMPs are to be implemented by local councils (through their Integrated Planning and Reporting Frameworks), state agencies (through written agreement) and other stakeholders as required.



Title:
**Kiama Municipal Council CMP
LEP Land Zoning**

Figure:
3-3

Rev:
A

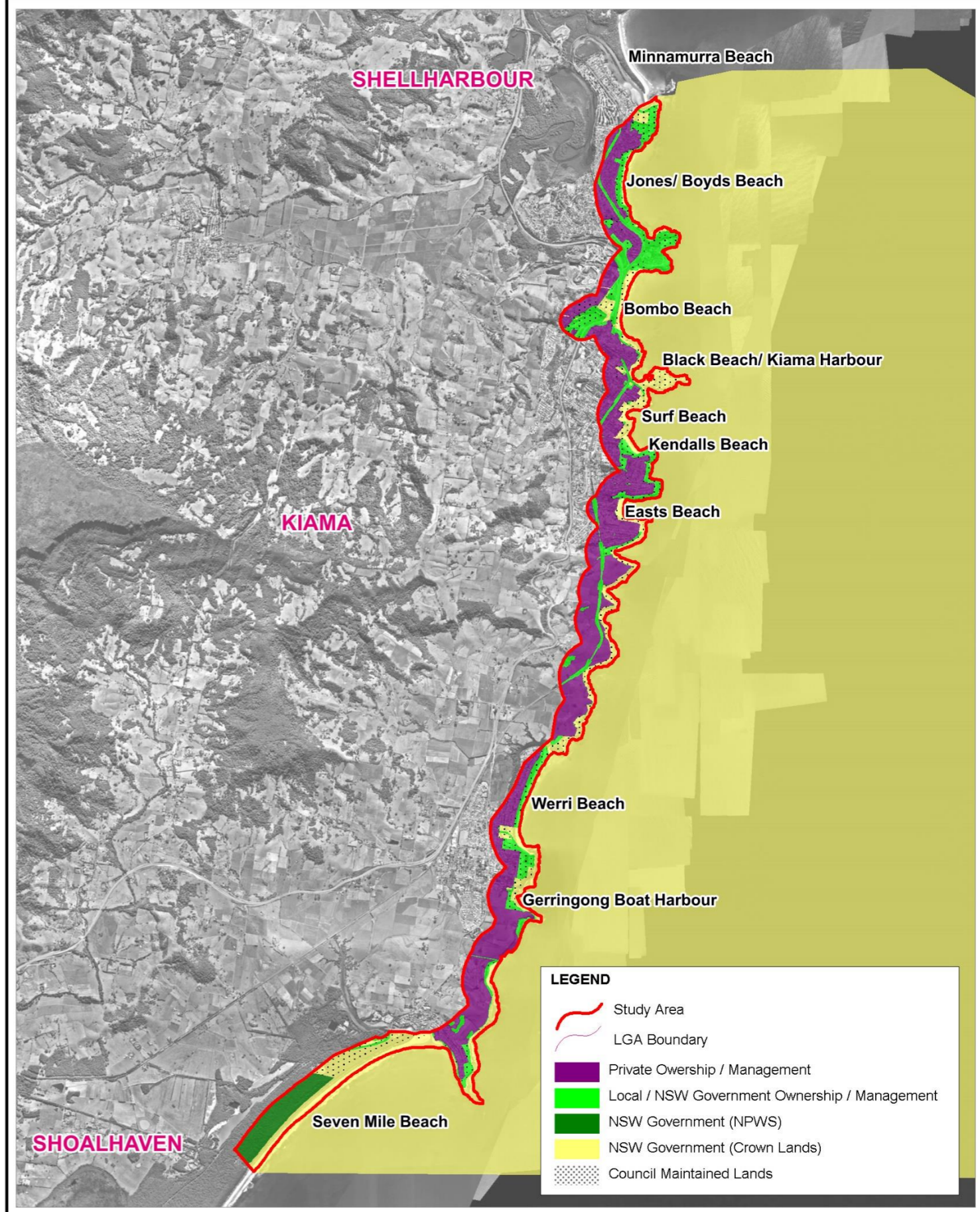
BMT endeavours to ensure that the information provided in this map is correct at the time of publication. BMT does not warrant, guarantee or make representations regarding the currency and accuracy of information contained in this map.



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Approx. Scale



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Title:
**Kiama Municipal Council CMP
Land Tenure**

Figure:
3-4

Rev:
A

BMT endeavours to ensure that the information provided in this map is correct at the time of publication. BMT does not warrant, guarantee or make representations regarding the currency and accuracy of information contained in this map.



0 2 4km
Approx. Scale



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Strategic Context for the CMP

3.7 Social Context

3.7.1 Population and Demographics

The estimated resident population of the Kiama Municipal Council Area (LGA) in 2018 was 23,006. This represents an increase of 3,073 people (15.4%) from the 2008 total. This growth rate is equivalent to that experienced by NSW over this period (15.0%), whereas the Illawarra had a marginally smaller growth rate (11.8%) (REMPAN, 2019b).

Kiama LGA has an aged population, with a median age of 46, compared to the NSW median of 39 years old (KMC, 2017a). It has been estimated that over the next years to 2031: Kiama's age profile will be skewed towards older residents (65+), the number of working age residents aged between 15 and 64 will increase by approximately 25% above 2014 levels, the population aged under 15 will increase by one-third (SGS Economics and Planning, 2014).

The Illawarra Region Plan (NSW Planning and Environment, 2017) projected that Kiama should be able to accommodate 2,850 new homes by 2036 to accommodate for greater housing choice. However, it has been identified that the need for additional greenfield land release to accommodate growth will have to be determined.

The spread of this population by localities within Kiama Municipal Council (as at the 2016 census) is approximately as follows:

- Gerringong - Gerroa - Werri Beach— 5,205;
- Kiama – Kiama Heights—7,695;
- Kiama Downs - Minnamurra – Bombo – 5,875
- Rural communities – 2,710

General population demographics are outlined in the Kiama Community Strategic Plan 2017 – 2027 (KMC, 2017a) and summarised below in Table 3-7.

Table 3-7 Key Demographic datasets for Kiama Municipal council (KMC, 2017a)

Indicator	Kiama
% population in 0 – 17 age groups	20.4%
% population over 60 years	29.5%
Median age	46 years old
Residents that identify as Aboriginal or Torres Strait Islanders	1.6%
Australian born residents	82.4%
Residents aged 15 years or above carrying out regular volunteering work	26.1%

3.7.2 Tourism and Visitation

Since the mid 1800's Kiama has been a popular tourism destination and tourism continues to be an important contributor to the Kiama economy. With 983 000 visitors to Kiama annually, tourism contributes approximately \$187 million annually and an estimated 1,510 direct and indirect jobs (Destination NSW, 2017). Kiama's Strategic Tourism and Events Plan 2018 – 2021 (Destination NSW, 2017) outlines Kiama's vision for tourism:

“Kiama will welcome and inspire visitors year-round to experience our distinctive natural landscapes, relaxed lifestyle, arts, culture and events.”

Kiama is a well-established destination for annual holidays, short breaks and weekend getaways as it is located just over an hour from Sydney and two and a half hours from Canberra (Integrated Site Design, 2017). The main tourism attractions include: the natural environment (the Kiama Blowhole, pristine

Strategic Context for the CMP

beaches, Kiama Coastal Walk, Minnamurra Rainforest, Illawarra Fly Tree Top walk, Seven Mile Beach National Park, etc.), the historic villages of Kiama and Jamberoo, Jamberoo Recreation Park, arts and crafts shops and markets (SGS Economics and Planning, 2014).

Kiama Municipal Council manages five holiday parks under the group Kiama Coast Holiday Parks: Kendalls Beach Holiday Park, Kiama Harbour Cabins, Surf Beach Holiday Park, Werri Beach Holiday Park and Seven Mile Beach Holiday Park. Kendalls Beach Holiday Park is located on Council freehold land and the other four parks are located on Crown reserves (Integrated Site Design, 2017).

The Kiama Economic Development Strategy (SGS Economics and Planning, 2014) outlined key aspects of the nature of tourism in Kiama as below:

- More than 50 percent of trips are for two nights or less
- The importance of outdoor and nature activities to the economy, although these activities were mostly undertaken as a part of overnight trips, rather than day trips
- Families are the most dominant segment of the tourist market, followed by young / midlife couples without kids and midlife singles.

The importance of the coastal zone (i.e. study area containing the near shore waters, beaches and foreshores) is clearly linked to drivers of tourism in the LGA. As such, the Tourism Opportunities Plan prepared for Kiama Municipal Council (EarthCheck, 2018) outlined three priorities specifically related to maintaining and increasing the coastal utility of Kiama:

- Beach and foreshore activation program
- Headland, harbour and foreshore activation

- Activating walking and trail experiences

It is likely that further local level investigations are required to better understand the socio-cultural, economic and environmental impacts of tourism to the community, environment and Council as supplier of core services. An understanding of the impacts can be used in the derivation of approaches to sustainably address key issues.

3.7.3 Recreation

The study area provides for a diverse range of recreational and associated commercial use on the foreshores, beaches and in the coastal waters. The community consultation undertaken as part of this project (see Section 3.7.3 and Appendix D) has demonstrated that the study area is used extensively by locals and tourists throughout the year, especially across the summer months, for a range of recreational pursuits. The community expressed that common uses include surfing, walking/running, dolphin/whale watching, birdwatching, studies/investigations, swimming, bush walking, nature appreciation, sand play, sunbathing, fishing, paddle boarding, kayaking, diving/snorkelling, picnics, boating, camping, land care/bush regeneration, windsurfing and cycling, amongst other uses.

3.7.4 Community Values and Issues

Values

As part of this study, BMT completed various community consultation activities including developing a community survey that was open for completion for 5 weeks from 15 July 2019 to 16 August 2019. The community survey was aimed at eliciting information on community values, uses, threats and issues associated with the Kiama coastline and desired future management responses. The survey response was considerable with 171 surveys

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registered. As part of the community consultation, three public drop-in sessions were also held for locals and visitors to provide their thoughts.

Based on the community drop in sessions and survey responses received, the following condensed list of community values for the study area have been derived in an approximate order of priority:

- (1) Free, safe, easily accessible coastline with the provision of facilities (i.e. toilets, walkways, parking)
- (2) Cleanliness (and pollution control)
- (3) Healthy wildlife habitat and preserved natural environment
- (4) Fair and equitable public usage of beaches
- (5) Natural beauty and scenic values
- (6) Naturalness (i.e. undeveloped nature, in terms of human structures)
- (7) Clean and clear waters / high water quality
- (8) Sustainability
- (9) Provision of a range of recreational values

Threats

The community survey for this project also asked respondents to rank a preselected list of potential issues/threats and also identify what they believe are the key threats of concern for the study area. Based on the survey responses received, the following condensed list of community threats/issues for the study area have been derived in an approximate order of priority:

- (1) Inappropriate development and over development of the coastline
- (2) Commercialisation of public beaches and space (i.e. surf schools, sand mining activities)

- (3) Pollution (mainly plastics but also rubbish, fishlines, hooks etc.)
- (4) Climate change and associated issues (i.e. sea level rise)
- (5) Overcrowding and population growth
- (6) Tourism (or more specifically “excess/over-tourism”)
- (7) Lack of dune management / maintenance
- (8) Council priorities (preserved pro development stance over preserving natural environment and amenity)
- (9) Illegal vegetation clearing

Further information on threats and issues applicable to the study area identified for consideration during this study are outlined in Sections 4.4 and 4.5. A summary of the community consultation outcomes is provided in Appendix D.

3.8 Cultural and Heritage Context

As outlined in the Illawarra – Shoalhaven Regional Plan, the region “has a rich and diverse heritage reflected in the strong links between the Aboriginal people and the region’s coastline and escarpment – which are important cultural landscapes - and in the historic sites and townships associated with early European settlement” (DPE, 2015). Directive 3.4 of the Regional Plan identifies protecting this cultural heritage is important to the region’s communities, its identity and character and contributes to the visitor economy.

The original inhabitants of the Kiama area were the Wodi Wodi Aboriginal people of the Dharawal language group (KMC, 2017b). Aboriginal midden sites in the region include: Bass Point, Minnamurra River, Minnamurra Point, Blackhead Reserve, Gerroa and Gerringong and quarry sites in Shellharbour, Killalea, Knights Hill and Saddleback (KMC, 2017b). There are also stone arrangements in the Jamberoo Valley and engravings in Foxground which is

Strategic Context for the CMP

outlined as Aboriginal Places listed under the National Parks and Wildlife Act. It has been suggested that the Bass Point campsites have occupation dating back 17,000 years which would make them the oldest coastal campsites in NSW (KMC, 2017b).

The study area partly resides within the Illawarra Local Aboriginal Land Council (LALC), and within the Jerrinja LALC that takes in Seven Mile Beach, Crooked River, Gerroa and some parts close to Gerringong. Nowra LALC is to the south. The objects of each LALC are to "*improve, protect and foster the best interests of all Aboriginal persons within the Council's area and other persons who are members of the Council*". LALC's operate to acquire and manage land, promote/protect culture and heritage and facilitate business enterprise.

European settlement in the Kiama region dates back to the early 1800s with the town site reserved in 1826. It was initially driven by cedar cutters which transformed into wheat farming and then a thriving dairy industry and eventually quarrying (KMC, 2019). As such Kiama has thirteen sites listed under the NSW Heritage Act, and a number of sites listed by local government and state agencies.

3.9 Economic Context

As per the Illawarra-Shoalhaven Regional Plan (DPE, 2015), Kiama is described as a Regional Centre:

A Regional Centre is described as a major town centre which services the local area and surrounding suburbs, providing a range of business, retail and entertainment uses, including supermarkets, health and other services. They include some higher density residential development.

Employment Profile

Kiama's economic profile has transformed from the diary and quarrying industries to a more diverse economic base, where tourism is a major contributor (SGS Economics and Planning, 2014).

The broader employment profile of Kiama Municipal Council is provided in Table 3-8. Comparative data for NSW is also provided. The highest employment industry type is accommodation and food services (i.e. supporting tourism), followed by construction, health care and social assistance, retail trade and education and training. Compared to NSW, the accommodation and food services and construction industries have a far greater representation in Kiama than other industry types which are broadly on par with State averages. Arts and recreation is another industry which notably exceed the state average. The lower than average industry representation includes: manufacturing, wholesale trade, and finance and insurance services.

Table 3-8 Kiama Employment by Industry Type and Comparisons to NSW (REMPAN, 2019a)

Employment (Total)	2017/18		% Change in Jobs (2011- 2016)	
Industry	Kiama %	NSW %	Kiama %	NSW %
Accommodation & Food Services	18.20%	7.46%	+14.3 %	+20.0%
Construction	13.90%	8.77%	+31%	+31.2%
Health Care & Social Assistance	10.94%	13.13%	+1.2%	+22.1%
Retail Trade	10.46%	10.17%	-10.1%	+5.7%
Education & Training	8.79%	8.76%	+0.6%	+18.5%

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Employment (Total)	2017/18		% Change in Jobs (2011- 2016)	
Professional, Scientific & Technical Services	6.23%	8.51%	+24.6%	+16.3%
Public Administration & Safety	5.82%	6.14%	+12.0%	+11.1%
Other Services	4.54%	3.87%	+13.3%	+11.1%
Administrative & Support Services	4.20%	3.65%	+10.3%	+20.7%
Transport, Postal & Warehousing	3.67%	4.95%	-8.8%	+8.0%
Arts & Recreation Services	3.15%	1.61%	+8.6%	+17.2%
Agriculture, Forestry & Fishing	2.95%	2.29%	-7.8%	10.0%
Rental, Hiring & Real Estate Services	2.17%	1.85%	+6.1%	20.8%
Financial & Insurance Services	2.05%	5.22%	+5.5%	+10.4%
Manufacturing	1.64%	6.15%	-20.7%	-21.2%
Wholesale Trade	0.77%	3.25%	-50.6%	-21.5%
Electricity, Gas, Water & Waste Services	0.25%	0.99%	-36.4%	-2.9%
Information Media & Telecommunications	0.23%	2.28%	-72.9%	+5.7%
Mining	0.05%	0.95%	0%	+5.9%
Total Jobs	5,620	3,358,119		

Also, of interest are changes in industry sector growth in the industries of construction, professional, scientific and technical services and accommodation and food services all recording significant growth over the 5-year period between 2011 and 2016. Declines in a number of industry sectors such as information, media and telecommunications, wholesale trade and electricity, gas, water and waste services were experienced over this period. Overall employment is estimated to have increased by approximately 295 jobs over the five-year period. This increase represents an over 5.5% increase in the total job market of 5325 over the period (REMLPAN, 2019a). Unemployment rates in Kiama have ranged from 3.2% to 1.9% in the period from March 2016 to March 2019 which are consistently below State and Regional Averages (REMLPAN, 2019a).

Kiama Municipal Council's gross regional product (GRP) of \$890.18 million (REMLPAN, 2019a) accounts for 3.73% of Illawarra's GRP and 0.15% of NSW Gross State Product (GSP). GRP has grown steadily over the past few years with rates of ~ 1.8% to 13%. Significant annual growth of 13% was experienced in 2016, with rates increasing steadily at 1.8% and 4.8% in 2017 and 2018 respectively (REMLPAN, 2019a).

Kiama has a relatively skilled and educated workforce with low unemployment rates. This contradicts suggestions from the economic development workshop that Kiama LGA cannot attract a skilled and educated residents workforce. Combined with the low number of high skilled jobs in Kiama, the corollary is manifest in high number of professionals and other white collar workers travelling to other locations for employment. The implication from an economic development perspective is that this highly skilled labour market could be leveraged to create knowledge economy skills (SGS Economics and Planning, 2014).

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Kiama has a skilled and educated workforce with low unemployment rates, however approximately 60% of employed Kiama residents travel outside the LGA to work. This is not unexpected as Kiama is relatively close to higher skilled employment opportunities in nearby LGAs (SGS Economics and Planning, 2014).

Kiama has the highest average median land prices in New South Wales outside of the Sydney Greater Metropolitan Area (SGS Economics and Planning, 2014), with residential land value increases of 11.3% in Kiama over 2016/2017 period. It is suggested that land value for the Illawarra region has increased over this period due to high demand for affordable residential land within commuting distance of Wollongong and Sydney.

Overall, the employment and economic indicators have been positive for Kiama Municipal Council with an expanding employment market, increasing GRP, falling unemployment and increasing land value.

There is a wide range of economic and commercial values provided by the Kiama coastline and the study area, these broadly include:

- The Kiama coastline is a vibrant holiday and tourist destination on the NSW coast, providing both employment and bringing economic stimulation to the region;
- Catchment areas have extensive agricultural areas supporting productive farmlands and dairy industries;
- Commercial recreational providers and fisherman use the coastline to support their industries; and
- Sand mining is undertaken in the region that provides a significant resource.

3.10 Future Context

3.10.1 Climate Change and Adaptation

The threat of climate change and its implications is expected to place stress on species, ecosystems and human settlements and industries. In recognition of this threat, Council has tailored individual approaches to climate change mitigation and that assist in gaining a better understanding of climate risk and adaptation pathways. This includes the Climate Change Adaption Strategy and Action Plan (SKM, 2009) which aimed to:

"protect the diversity of the Illawarra region by taking a proactive approach in adapting to climate change; one which seeks to minimise climate change risks and capitalise on opportunities raised, by promoting an integrated response from all levels of Government, businesses and the local community to safeguard the economic, environmental and social sustainability of the region."

A suite of actions were created as part of this adaption strategy that were related to planning and development controls, corporate and community services, environment, and infrastructure.

Climate change may affect coastal areas through sea-level rise, increased temperatures, and changed storm events. Natural coastal systems such as estuaries, wetlands and reefs are likely to experience difficulty adapting to such projected changes in climate (CSIRO, 2011). In addition, development trends due to population and economic growth in coastal areas will place further pressure on natural coastal systems that are already vulnerable due to climate stress, leading to greater community risk and exposure to current and future hazards (CSIRO, 2011).

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3.10.1.1 Sea Level Rise

Sea level variation, atmospheric, hydrologic and hydrodynamic processes are all predicted to shift under climate change, all of which influence coastal landforms and ecosystems. Climate models are used to develop multiple projections of the Earth's future climate. Drivers of these projections are social, economic and technical which will impact the future release of greenhouse gas emissions into the atmosphere. The most recent Intergovernmental Panel on Climate Change (IPCC) emissions scenarios used are described as Representative Concentration Pathways (RCPs) and range from very low (RCP2.6) to very high (RCP8.5) concentrations.

Sea level Rise (SLR) future climate information based on these RCP scenarios was produced for Australian coastal councils. Projections for Kiama indicate a predicted median increase of between 0.38m (range 0.22 to 0.55 m) for RCP2.6 and 0.67m (range 0.46 to 0.89m) for RCP8.5 by 2100 (CoastAdapt, 2017). These scenarios are presented in Figure 3-6 with solid lines indicating median SLR and dashed lines indicating additional allowances based on projections and modelled scale parameters incorporating tides and storm surges.

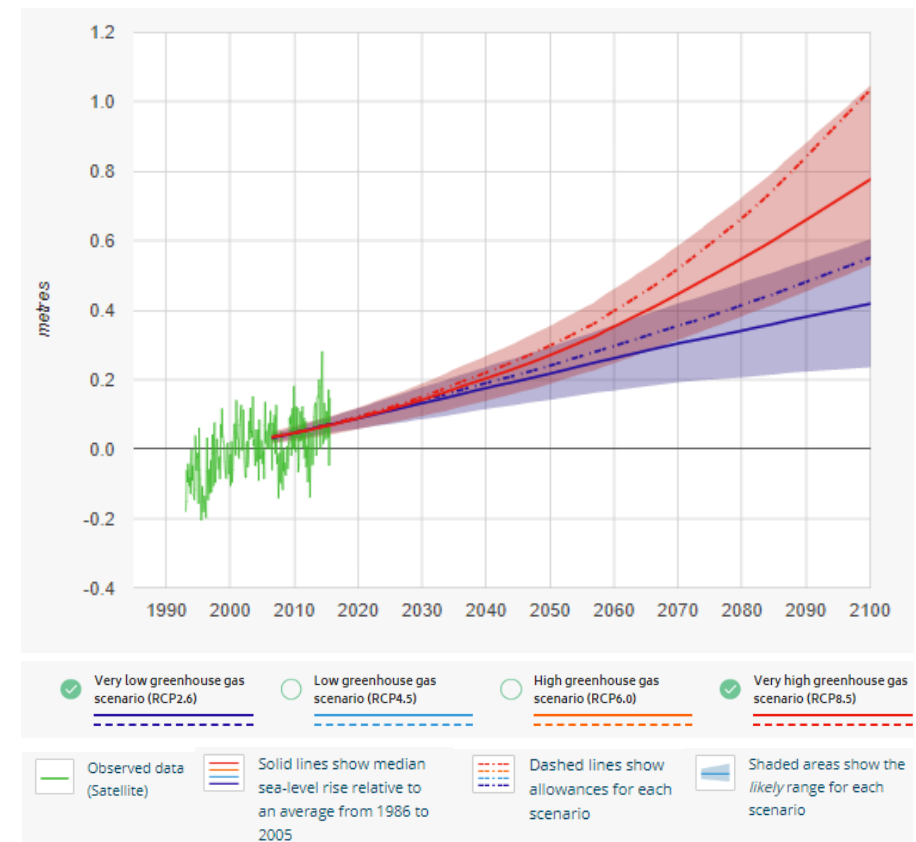


Figure 3-6 Predicted SLR for Kiama for Very Low and Very High Scenarios (Coast Adapt, 2018)

The South Coast Regional Sea-level Rise Planning and Policy Response Framework (Whitehead & Associates, 2014) provides guidance regarding sea level rise scenarios for the south coast region. The report recommended “RCP8.5 is a suitable basis for sea level rise projection” and “that RCP8.5 be adopted as a basis for decision making”. RCP8.5 or Representative Concentration Pathway 8.5 is the very high greenhouse gas emissions

Strategic Context for the CMP

scenario modelled for the IPCC's fifth climate change assessment report (Climate Change 2014 Synthesis Report, or AR5). Modelling completed for the IPCC's AR5 found that scenarios without additional efforts to constrain emissions ('baseline scenarios') lead to pathways ranging between RCP6.0 (an intermediate mitigation scenario) and RCP8.5 (the very high greenhouse gas emission scenario).

3.10.1.2 Temperature

CSIRO investigated a range of future potential temperature extremes based on the same RCP scenarios and determined increases for:

- **Hot days** - Mean annual number of days with a maximum temperature greater than 30°;
- **Warm nights** - Mean annual number of nights with a minimum temperature greater than 25°; and
- **Heatwaves** - Average of longest run of days in each year with maximum temperature greater than 30°.

These are presented in Figure 3-7 and indicate the number of hot days is expected to increase to between 29 and 56 days (RCP4.5 and RCP8.5) for Kiama by 2090 compared to the historic average of 13 days. The number of warm nights is expected to increase to between 0.3 and 4.5 days (RCP4.5 and RCP8.5) by 2090 compared to the historic average of 0. The length of heatwaves is expected to increase to between 4 and 6.3 days (RCP4.5 and RCP8.5) by 2090 compared to the historic average of 2.4 days.

Sea surface temperatures around Australia are expected to rise by around 0.4-1.0°C by 2030 and around 2-4°C by 2090 under RCP 8.5 (CCIA, 2018).

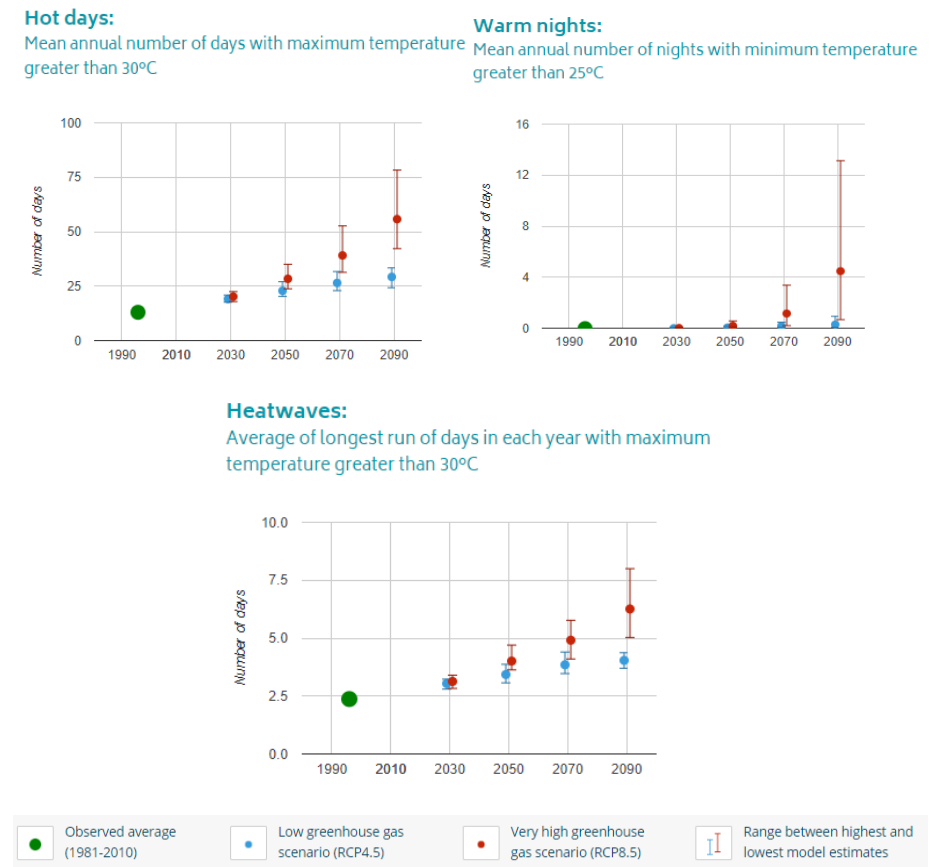


Figure 3-7 Future Temperature Information (CoastAdapt, 2017)

Strategic Context for the CMP

3.10.1.3 Rainfall

Future rainfall projections have been determined based on the RCP scenarios including:

- **Very wet days** – mean annual number of days where rainfall exceeds the observed 99.9th percentile; and
- **Dry conditions** – mean annual (May to Apr) number of months when the total rainfall is less than the historic 10th percentile.

These results are presented in Figure 3-8 and indicate the middle range number of very wet days is expected to be between 0.3 and 0.4 days (RCP4.5 and RCP8.5) for Kiama by 2090 compared to the current 0.3 days. The number of dry months is expected to increase to between 1.31 and 1.38 months compared to the historic average of 1.1 months.

Very wet days:

Mean annual number of days when rainfall exceeds the observed 99.9th percentile

Dry conditions:

Mean annual (May to Apr) number of months when total rainfall is less than the historic 10th percentile

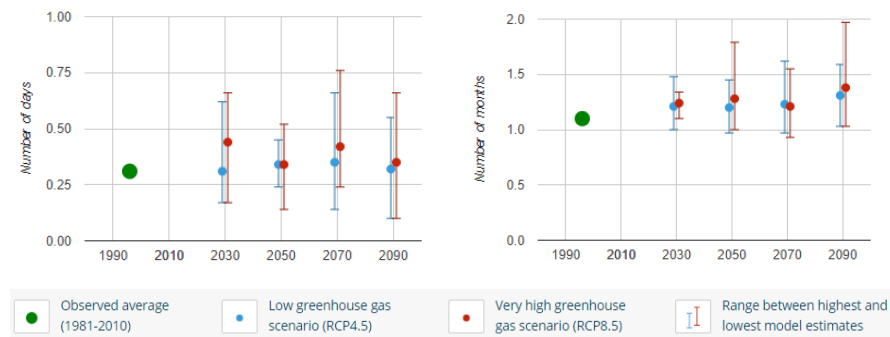


Figure 3-8 Future Rainfall Information (CoastAdapt, 2017)

3.10.1.4 Water Quality

Higher water temperatures and increases in extreme hydrological events, including floods and droughts, are projected to affect water quality and exacerbate many forms of water pollution – from sediments, nutrients, dissolved organic carbon, pathogens, pesticides and salt, as well as thermal pollution with possible negative impacts on ecosystems, human health, and water system reliability and operating costs (UNESCO, 2011). Increasing atmospheric carbon dioxide concentrations are causing a global decline in oceanic pH leading to ocean acidity. Again, having a potentially negative impact on coastal ecosystems, for example a reduction in calcium carbonate availability for the protective shells of some species.

3.10.2 Population Growth

Population growth in the region will place additional pressure on the planning process and the need to ensure sustainable practices are used. The 2019 NSW Population and Household Projections estimate an increase in Kiama LGA of 4000 people between 2016 and 2041, to 26,100 people.

The Illawarra Shoalhaven Region Plan (DPE, 2015) projected that Kiama to accommodate 2,850 new homes by 2036 to provide for greater housing choice. As shown in Figure 3-9, the Plan's Strategy Map identifies Kiama as a regional centre. A large regionally significant release areas (i.e. for urban growth) lies north of Kiama between Albion Park and Dapto, with other smaller areas around Nowra to the south.

Population growth in these nearby areas will increase recreational visitation and holiday populations in the Kiama coast. This will increase demand and usage of recreational facilities and amenities along the coast, including beaches, but also boating, swimming and fishing that may damage or stress aquatic, estuarine and riparian habitat (flora and fauna).

Strategic Context for the CMP



Figure 3-9 Excerpt of Illawarra – Shoalhaven Regional Plan Strategy Map

Setting the CMP Scope

4 Setting the CMP Scope

4.1 Section Overview

As outlined in the Manual (Part B), the scope of a CMP needs to be determined through the course of the scoping study, and should identify for the CMP:

- The geographic scope, spatial extent or area to be covered;
- The coastal management areas to be included (mapping their extent, where possible); and
- The key coastal management issues to be addressed (considering values and threats).

This section summarises the definition of the above listed elements, to clarify the scope of the Kiama Municipal Council CMP.

4.2 Geographical Scope

The geographical scope assigned for the Kiama Coastline CMP will match the study area defined for this scoping study in Figure 1-4, being the open beaches, foreshore and coastal waters along the 34 km stretch of coastline from Minnamurra River to 2km south of Black Head within the Kiama LGA. The scope may include adjacent contiguous coastline where relevant to defining hazards to Kiama's coast, for example, the southern end of Minnamurra / Mystics Beach (in the Shellharbour LGA) that may impact upon the Minnamurra River entrance.

The geographical scope extends inland over the foreshore to the landward extent of mapped Coastal Use CMA. The study area includes coastal waters and extends to 3 nautical miles offshore.

The geographical scope excludes the catchments of the Minnamurra River, Werri Lagoon, and Crooked River estuaries but includes the entrances inasmuch as they influence the condition and future management of the open coast, e.g. in defining beach erosion, shoreline recession and entrance stability hazards.

4.3 Coastal Management Areas included in the CMP

All four coastal management areas are to be included in the scope of the Kiama Municipal Council CMP. All of the coastal management areas within the geographical scope of the study area are shown in a series of figures (refer to Figure 1-5 to Figure 1-8).

Presently, there is no mapping for CVA gazetted with the CM SEPP. In order to have a CVA gazetted for the study area Council will need to submit a Planning Proposal. The planning proposal process is outlined in Section 4.3.1.

Currently, there is only statewide scale first pass assessment of coastal erosion hazards for the Kiama LGA, from the *Coastal Erosion in New South Wales Statewide Exposure Assessment* (OEH, 2017). This report provides an overview of potential exposure of properties and infrastructure to erosion risks at present and in future. The assessment was done at a statewide scale, and so is not expected to replace the need for detailed local studies, such as recommended for Kiama in Stage 2. Once suitable local information is available and a CVA map can be developed, Council will be in a position to undertake a CVA planning proposal.

Setting the CMP Scope

4.3.1 Planning Proposal Process

Under the new process for the preparation of CMPs, Councils may submit a Planning Proposal (in accordance with the EPA Act via the Gateway process) to update any of the coastal management area maps. It is anticipated that Councils will submit planning proposals to have existing and/or new coastal hazard mapping adopted as the CVA.

Planning Proposals are assessed by the DPIE through the 'Gateway' process. There are important legislative requirements for preparing a Planning Proposal in relation to technical information and engagement processes. The preparation of a Planning Proposal, and associated engagement activities to be undertaken through the Kiama Coastline CMP (if pursuing a planning proposal to map the CVA area) are outlined in Figure 4-1 below. It is noted that whilst most of the technical and engagement components of the planning proposal can be carried out in parallel to the CMP development, assessment of the planning proposal will be completed once the CMP has been certified.

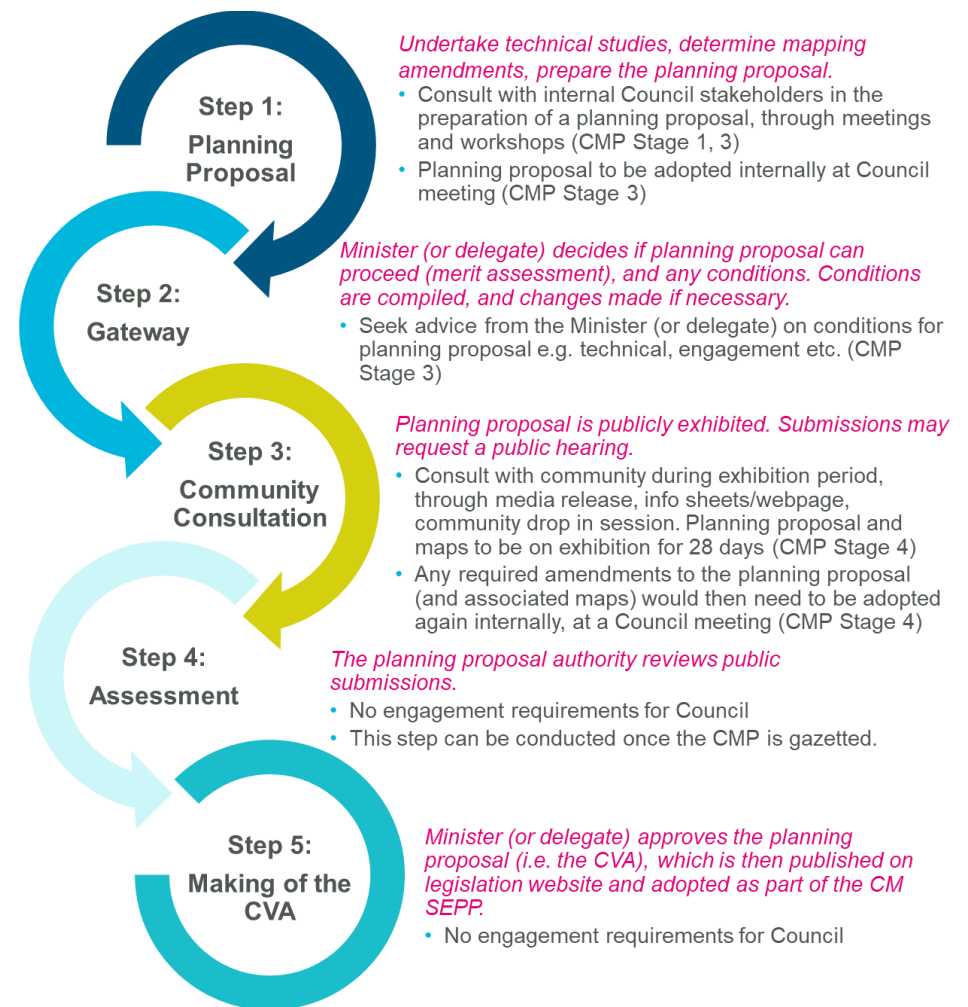


Figure 4-1 Gateway Determination Process

Setting the CMP Scope

4.4 Coastal Management Issues Considering Values and Threats

In order to undertake the first pass risk assessment, the values of the coastline and threatening processes or issues affecting the coastline and its values require definition. Understanding the values of the coastline in terms of environmental, social and economic assets and benefits provides a pathway to understanding activities or processes that threaten them and need to be managed through a program of management (i.e. the CMP). The first pass risk assessment is used to determine the level of risk from the threats at present and in the future, to determine the issues of focus, or scope, of the CMP.

4.4.1 Values of the Coastal Zone

Values of the study area as identified by both the community and other stakeholders are extensive. These values are diverse and include environmental, social and economic values related to various facets of the coastline, including:

- the physical assets of the coastline itself e.g. the natural character and scenic beauty of the Kiama coastal landscape;
- the recreational and leisure activities that are enjoyed and highly prized by both residents and visitors alike;
- the way community interacts with the coastline; e.g. social connectivity, interaction and nature appreciation; and
- the economic benefits of the coastline and its flow on effects through the Municipality e.g. tourism, commercial fishing etc.

A classic “triple-bottom line” approach was used to define the environmental, economic and social values of the Kiama Municipal Council coastline. The list

of values across these categories was developed based upon the NSW Marine Estate Statewide Threat and Risk Assessment (TARA) (BMT WBM, 2017), and refined using outcomes from the data and information review, community consultation and feedback during the first pass risk assessment workshop. The resulting list of 9 priority values for the Kiama Coastline CMP includes:

Value 1: Biodiversity, habitat and ecosystem integrity

Value 2: Scenic landforms, natural beauty and geodiversity

Value 3: Clean waters

Value 4: Easy and equitable access

Value 5: Small connected communities

Value 6: Heritage and culture

Value 7: Ample recreation opportunities and facilities

Value 8: Tourism industry

Value 9: Sustainable economic growth and development

4.4.2 Threats to the Kiama Municipal Council Coastline

A substantial list of potential threats was developed from the same sources as used for the values (i.e. TARA and data and information review), plus the seven coastal hazards defined in the CM Act. The threats were initially determined to be high, medium or low based upon the data review, to derive a refined list of threats for the first pass risk assessment workshop, to allow workshop attendees to focus their time and attention towards the higher threats. The comprehensive list of threats that was collated and reviewed through the first-pass risk assessment process documented in D.2.

Setting the CMP Scope

After further refinement using the workshop feedback and background knowledge, a final shortlist of 8 priority management issues (that cover a collective group of similar threats) for the Kiama Coastline CMP were identified, including:

Issue 1: Inappropriate or excessive development

Issue 2: Disturbance of biodiversity and habitat

Issue 3: Coastal hazards and sea level rise

Issue 4: Poor quality catchment runoff

Issue 5: Degradation of heritage and culture

Issue 6: Lack of engagement, governance and compliance

Issue 7: Overuse by recreation and tourism

Issue 8: Conflict over resource use and access availability

Table 4-1 lists the identified values and the threats that may impact upon those values. In this manner, a clear link can be drawn between the values and objectives for the study area, the processes occurring that may threaten these values, and the likely future threat from these processes to known values.

The outcomes of the first pass assessment for the threats, assessment of adequacy of existing management arrangements, knowledge and data, and potential gaps, and the determination of further studies for Stage 2 is outlined in the following sections.

Setting the CMP Scope**Table 4-1 Priority Coastal Values and Management Issues**

Priority Values		What the local community and stakeholder praises	Main Threats	Priority Management Issues	
No.	Description			No.	Description
V1	Biodiversity, habitat and ecosystem integrity	<ul style="list-style-type: none"> Preserved natural environment, wildlife habitat and environmentally significant areas Variety of natural areas and habitats i.e. wetlands, dunes, beach and river systems Coastal dune systems with natural vegetation for biodiversity and natural defences Diversity of vegetation communities on coastal plain and escarpment Presence and health of flora and fauna including birds, fish, mammals, other animals and plants 	<ul style="list-style-type: none"> Over development in coastal zone Poorly sited or inappropriate development 	I1	Inappropriate or excessive development
			<ul style="list-style-type: none"> Invasive vegetation species, pests and feral animals (e.g. foxes, dogs, cats, bitou bush) Illegal removal of dune vegetation by residents Habitat disturbance due to recreation activities (e.g. boating, surf schools, fishing, bush walking, dogs etc.) Overfishing by recreational or commercial fishers 	I2	Disturbance of biodiversity and habitat
			<ul style="list-style-type: none"> Wave overtopping Coastal inundation Beach erosion Shoreline recession Tidal Inundation Coastal lake or watercourse entrance instability Coastal cliff or slope instability 	I3	Coastal hazards and sea level rise

Setting the CMP Scope

Priority Values		What the local community and stakeholder praises	Main Threats	Priority Management Issues	
No.	Description			No.	Description
V2	Scenic landforms, natural beauty and geodiversity	<ul style="list-style-type: none"> Diverse range of landforms and interesting coastal geology i.e. escarpment, floodplain and coastline Special geological formations i.e. fossils and volcanic remnants Unique, beautiful scenic landscape Spectacular scenery, natural beauty, scenic values and aesthetics 	<ul style="list-style-type: none"> Over development in coastal zone Poorly sited or inappropriate development 	I1	Inappropriate or excessive development
			<ul style="list-style-type: none"> Invasive vegetation species, pests and feral animals (e.g. foxes, dogs, cats, bitou bush) Illegal removal of dune vegetation by residents Habitat disturbance due to recreation activities (e.g. boating, surf schools, fishing, bush walking, dogs etc.) 	I2	Disturbance of biodiversity and habitat
			<ul style="list-style-type: none"> Wave overtopping Coastal inundation Beach erosion Shoreline recession Tidal Inundation Coastal lake or watercourse entrance instability Coastal cliff or slope instability 	I3	Coastal hazards and sea level rise
			<ul style="list-style-type: none"> Stormwater runoff including nutrients, sediment, litter and waste i.e. plastics, pesticides, herbicides and other litter e.g. fishing lines/hooks Agricultural runoff including nutrients and sediment Sewage effluent and septic runoff 	I4	Poor quality catchment runoff
V3	Clean waters	<ul style="list-style-type: none"> Clean waters with high water quality Supporting mangrove and floodplain health as well as recreational activities and amenity Pollution is controlled ensuring cleanliness of beaches and waterways 	<ul style="list-style-type: none"> Stormwater runoff including nutrients, sediment, litter and waste i.e. plastics, pesticides, herbicides and other litter e.g. fishing lines/hooks Agricultural runoff including nutrients and sediment Sewage effluent and septic runoff 	I4	Poor quality catchment runoff

Setting the CMP Scope

Priority Values		What the local community and stakeholder praises	Main Threats	Priority Management Issues	
No.	Description			No.	Description
V4	Easy and equitable access	<ul style="list-style-type: none"> • Easy public access to public areas, reserves and coastal walk (on private lands) • Fair and equitable usage of the beaches and public spaces to support recreation, participation, social interaction and sense of community responsibility for the coast • Provision of access for various uses i.e. off-leash dog areas, fishing access etc. 	<ul style="list-style-type: none"> • Overuse and overcrowding at the beach and associated facilities • Anti-social behaviour 	I7	Overuse by recreation and tourism
			<ul style="list-style-type: none"> • Conflicts between various user groups on the beaches and in waterways (e.g. boat launching in swimming areas) • Commercial activities causing crowding and lack of space for other users • Poorly maintained or located recreational facilities and beach access points • Insufficient facilities and accessways 	I8	Conflict over resource use and access availability
			<ul style="list-style-type: none"> • Wave overtopping • Coastal inundation • Beach erosion • Shoreline recession • Tidal Inundation • Coastal lake or watercourse entrance instability • Coastal cliff or slope instability 	I3	Coastal hazards and sea level rise
V5	Small connected communities	<ul style="list-style-type: none"> • Strong community identity and sense of community • Well-connected communities via coastal activities and shared values 	<ul style="list-style-type: none"> • Over development in coastal zone • Poorly sited or inappropriate development 	I1	Inappropriate or excessive development

Setting the CMP Scope

Priority Values		What the local community and stakeholder praises	Main Threats	Priority Management Issues	
No.	Description			No.	Description
V6	Heritage and culture	<ul style="list-style-type: none"> Tangible and intangible Aboriginal cultural heritage Presence of historical sites – colonial and settlement heritage 	<ul style="list-style-type: none"> Aboriginal culture not being recognised and preserved; including values and sites Community not valuing culture and heritage generally 	I5	Degradation of heritage and culture
			<ul style="list-style-type: none"> Lack of community awareness and engagement with the coastal environment and its management Lack of regulation compliance and compliance success from authorities Insufficient or inappropriate governance and management of the coastal environment 	I6	Lack of engagement, governance and compliance
			<ul style="list-style-type: none"> Over development in coastal zone Poorly sited or inappropriate development 	I1	Inappropriate or excessive development
			<ul style="list-style-type: none"> Wave overtopping Coastal inundation Beach erosion Shoreline recession Tidal Inundation Coastal lake or watercourse entrance instability Coastal cliff or slope instability 	I3	Coastal hazards and sea level rise

Setting the CMP Scope

Priority Values		What the local community and stakeholder praises	Main Threats	Priority Management Issues	
No.	Description			No.	Description
V7	Ample recreation opportunities and facilities	<ul style="list-style-type: none"> Abundance of recreational opportunities on the foreshore and in the water (i.e. swimming, surfing, sand play, running, cycling, picnicking, bird/ whale watching, kayaking, boating, fishing and nature appreciation etc.) Adequate facilities to ensure recreational values can be undertaken i.e. toilets, walkways, parking etc. Social interactions through coastal activities i.e. surfing groups, nippers etc. 	<ul style="list-style-type: none"> Overuse and overcrowding at the beach and associated facilities Anti-social behaviour 	17	Overuse by recreation and tourism
			<ul style="list-style-type: none"> Conflicts between various user groups on the beaches and in waterways (e.g. boat launching in swimming areas) Commercial activities causing crowding and lack of space for other users Poorly maintained or located recreational facilities and beach access points Insufficient facilities and accessways 	18	Conflict over resource use and access availability
			<ul style="list-style-type: none"> Lack of community awareness and engagement with the coastal environment and its management Lack of regulation compliance and compliance success from authorities Insufficient or inappropriate governance and management of the coastal environment 	16	Lack of engagement, governance and compliance
			<ul style="list-style-type: none"> Wave overtopping Coastal inundation Beach erosion Shoreline recession Tidal Inundation Coastal lake or watercourse entrance instability Coastal cliff or slope instability 	13	Coastal hazards and sea level rise

Setting the CMP Scope

Priority Values		What the local community and stakeholder praises	Main Threats	Priority Management Issues	
No.	Description			No.	Description
V8	Tourism industry	<ul style="list-style-type: none"> Strong tourism industry that provides opportunities and money to local economy Sustainable tourism that is balanced with capacity e.g. not overcrowded or overcommercialised Opportunities provided by Kiama Harbour 	<ul style="list-style-type: none"> Overuse and overcrowding at the beach and associated facilities Anti-social behaviour 	17	Overuse by recreation and tourism
			<ul style="list-style-type: none"> Conflicts between various user groups on the beaches and in waterways (e.g. boat launching in swimming areas) Commercial activities causing crowding and lack of space for other users Poorly maintained or located recreational facilities and beach access points Insufficient facilities and accessways 	18	Conflict over resource use and access availability
V9	Sustainable economic growth and development	<ul style="list-style-type: none"> Sustainable economic growth and development but not overly commercialised or overdeveloped Sustainable empathetic development to maintain connected villages character and feel Reasonable planning outcomes to "Keep Kiama Kiama" 	<ul style="list-style-type: none"> Over development in coastal zone Poorly sited or inappropriate development 	11	Inappropriate or excessive development
			<ul style="list-style-type: none"> Lack of community awareness and engagement with the coastal environment and its management Lack of regulation compliance and compliance success from authorities Insufficient or inappropriate governance and management of the coastal environment 	16	Lack of engagement, governance and compliance
			<ul style="list-style-type: none"> Wave overtopping Coastal inundation Beach erosion Shoreline recession Tidal Inundation Coastal lake or watercourse entrance instability Coastal cliff or slope instability 	13	Coastal hazards and sea level rise

Setting the CMP Scope

4.5 First Pass Risk Assessment

4.5.1 Methodology

The first pass risk assessment provided the methodology for determining the severity of known threats in the study area, at present and in future (e.g. with climate change, population growth, urban development and so on).

In addition to this, the first pass risk assessment methodology for this Scoping Study was designed to provide an evaluation of current management arrangements and identify key knowledge gaps in managing the threats. Based on this information and other expert input, studies are designed for Stage 2 that target the high priority threats and focus on aspects of management and /or information that are needed to better treat the threat. That is, the current management arrangements and knowledge basis are investigated and evaluated for each known threat. When combined with the level of threat, this information provides a sound basis for identifying studies to be completed in Stage 2, or to make recommendations for those threats or potential management actions that should be investigated in Stage 3 and 4 of preparing the CMP.

The first pass risk assessment is different to the full-scale risk assessment that will be conducted in Stage 3 of preparing the CMP. A full-scale risk assessment involves detailed analysis of the likelihood and consequence of the risks, using a range of sources and data inputs. The likelihood and consequence are combined to derive the level of risk.

The first pass risk assessment does consider both consequence and likelihood in determining the level of threat. However, this is simplified in recognition that there may be gaps in data that preclude a full scale, separate analysis of

consequence and likelihood at this early stage of preparing a CMP. In determining the level of risk in the first pass assessment, likelihood and consequence are considered intrinsically, and the risk is given a ranking of high, medium or low, see Figure 4-2.

The first pass risk assessment aims to recognise that data gaps may exist and that not all information may be available at the present time to adequately assess risks. Instead, the aim of the first pass risk assessment is to direct efforts for preparing the CMP to those risks that are likely to pose the greatest risk now or in the future, but also, towards filling data gaps or management information for threats that are not able to be adequately assessed or managed at present.

Full Scale Risk Assessment

		Consequence				
		Insignificant 1	Minor 2	Moderate 3	Major 4	Catastrophic 5
Likelihood	Almost Certain 5	Medium	High	High	Very High	Very High
	Likely 4	Medium	Medium	High	High	Very High
	Possible 3	Low	Medium	High	High	High
	Unlikely 2	Low	Low	Medium	Medium	High

First-pass Risk Assessment

	Level of Risk		
Risk / Issue / Threat	High	Medium	Low

Figure 4-2 First Pass Risk Assessment vs Full Scale Risk Assessment

Setting the CMP Scope

The first pass risk assessment process was as follows, with the scales used illustrated in Table 4-2.

- (1) Assess the level of risk from known threats as high, medium or low, considering intrinsically the likelihood and consequence of the threat.
- (2) Assess the future trajectory of the risk (as high, medium or low) taking into account future pressures such as population growth, tourism, urban development and climate change and considering intrinsically the likelihood and consequence of the threat in future.
- (3) Determine an overall level of risk as high, medium or low, considering current and future risk.
- (4) Assess the adequacy and effectiveness of existing management arrangements (i.e. controls, actions and governance) as adequate, moderate or inadequate by considering to what degree the action(s) may reduce or mitigate the risk (i.e. the 'residual risk' after management actions is accounted for). The assessment of management also considers governance complexity for each management theme (e.g. single vs multi Council and/or stakeholder governance).
- (5) Consider the suitability of existing data as adequate, moderate or inadequate to support the management of the risk now and into the future, considering the temporal and spatial extent of existing information and data.
- (6) The combination of level of risk, adequacy of management arrangements and adequacy of data to support management of the threat, and why, is used to develop further studies. The studies are considered in terms of their priority (high, medium, and low) for completion in Stage 2 to support preparation of the CMP. That is, some

studies are essential to preparation of the CMP, and other studies are identified through the first pass risk assessment as potentially essential to management of the coastline but may not be needed to develop the CMP. These studies are still documented and are recommended for consideration in Stage 3 as actions to go into the CMP.

Table 4-2 Scales used in the First Pass Risk Assessment

Assessment	Scale		
Current Risk <i>(based on existing threats)</i>	High	Medium	Low
Future Risk <i>(based on projected threats)</i>	High	Medium	Low
Overall Level of Risk <i>(combination of current and future threat)</i>	High	Medium	Low
Adequacy of Existing Management Arrangements*	Inadequate	Moderate	Adequate
Suitability of Existing Data **	Inadequate	Moderate	Adequate
Recommended CMP Studies <i>(for further CMP Stages)</i>	High Priority	Medium Priority	Low Priority

* Defined based on input to the first-pass risk assessment workshop.

** Defined based on expert judgement with 'Adequate' considered to be only for issues with data up to date and full coverage over the study area; 'Moderate', only partial information available and/or not up to date; 'Inadequate', when information is inexistent, outdated or not covering the study area.

Setting the CMP Scope

4.5.2 Inputs to the First Pass Risk Assessment

4.5.2.1 Data and Information Review

Outcomes of the data and information review were used in the first pass risk assessment to help identify coastline values and threats, and to help determine the adequacy of existing management and of existing information to manage known threats at present and in the future. The outcomes of the first pass risk assessment lead to the design of further studies to be completed in Stages 2 to 4 of preparing the CMP.

4.5.2.2 First Pass Risk Assessment Workshop

A first pass risk assessment workshop with key stakeholders was held, to provide input to the ranking of threats, existing management actions and information, particularly where this may not have been identified through the data review, and to provide insight from key stakeholders as to how particular actions are enacted and implemented in practise.

Attendees to the workshop included those key stakeholders involved in the management of the Kiama Municipal Council coastline, such as:

- Kiama Municipal Council staff from various departments (e.g. Environment, Strategic Planning, Community and Cultural Development, Design and Development, Development Assessment, Risk Management);
- State agency representatives, from DPIE (Environment, Energy and Science, and Planning), TfNSW (Roads) and NSW Maritime;
- Sydney Water; and
- South East Local Land Services.

First pass risk assessment worksheets with outcomes are provided in D.2.

Following the workshop, the assessment results were expanded upon using the information gathered from the data and information review. The results of the first pass risk assessment are used in the subsequent sections of this CMP Scoping Study and to inform forward works program.

4.5.2.3 Community and Stakeholder Consultation

Various stakeholder consultation activities were undertaken to capture information for use in this Scoping Study. These activities have the additional advantage of establishing a stakeholder engagement process that will be carried through the entire CMP preparation and implementation. Activities included:

- Regular contact with Council and DPIE representatives allowed for a flow of information relevant to the CMP;
- The First Pass Risk Assessment Workshop where activities were conducted to gather feedback from the state agencies and other stakeholders who are involved in coastal management; and
- Input from the community regarding what they consider to be the key values of the Kiama coastline, what are the priority issues and threats that could put the area at risk and their aspirations for future management of the area.

Outcomes of consultation were used to develop sections of the strategic context (i.e. Section 3) and the first pass risk assessment, in particular, to identify and rank coastline values and threats, and to help determine the adequacy of existing management and existing information to manage known threats at present and in the future. The outcomes of this critical assessment lead to the design of further studies to be completed in Stages 2 to 4 of preparing the CMP.

Setting the CMP Scope

4.6 Outcomes of the Assessment of Risk, Management Arrangements, Data Gaps and Recommended Studies

This section presents the key coastal management issues that were identified within the first-pass risk assessment, it provides information in relation to their current and future risk, the adequacy of current management arrangements and suitability of existing data as well as identifying knowledge and information gaps. Table 4-4 presents a summary of the overall current and future risk level for each management issue and threat, whilst Table 4-4 presents the details of the first pass risk assessment for each. For each tabled issue, an outline of the recommended relevant studies and information needs are presented, with priority for completion in Stage 2 or recommendation for future consideration during CMP development. Note that, priority (for Stage 2 studies) is in terms of the need for the study in Stage 2, to support delivering the subsequent stages of the CMP. This may be different to the priority or need for the study itself, which may still be high-medium-low in terms of its value to managing the coastline of Kiama Municipal Council.

A full collated list of the recommended studies defined through this first pass risk assessment are then transferred to the forward program in Section 6 providing their priority, timing, indicative cost and responsibility.

Table 4-3 Summary of Management Issues and Threats Risk Level

Issue		Threat	Current Level	Future Level
1	Inappropriate or Excessive Development	Over Development	High	High
		Poorly Sited or Inappropriate Development	Medium	High
2	Disturbance of Biodiversity and Habitat	Invasive Species, Pests and Feral Animals	High	High
		Illegal Dune Vegetation Removal	Med-High	Med-High
		Recreational Activities	Medium	High
		Overfishing	Medium	High

Issue		Threat	Current Level	Future Level
3	Coastal Hazards and Sea Level Rise	Beach Erosion	Medium	High
		Shoreline Recession	Low	High
		Coastal Inundation	Medium	High
		Wave Overtopping	Medium	High
		Tidal Inundation	Low	Medium
		Coastal Lake or Watercourse Entrance Instability	Low	Medium
		Coastal Cliff Instability	Medium	Medium
		Dune Slope Instability	Medium	High
4	Poor Quality Catchment Runoff	Stormwater Runoff	Medium	High
		Agricultural Runoff	Medium	Medium
		Sewage Effluent and Septic Runoff	Low	Medium
5	Degradation of Heritage and Culture	Aboriginal Culture Not Preserved	Medium	High
		Community Not Valuing Culture and Heritage	Low	Medium
6	Lack of Engagement, Governance and Compliance	Lack of Community Awareness and Engagement	Medium	Medium
		Lack of Compliance	Medium	High
		Insufficient Governance and Management	Medium	High
7	Overuse by Recreation and Tourism	Overuse and Overcrowding	Medium	High
		Anti-social Behaviour	Low	Medium
8	Conflict Over Resource Use and Access Availability	User Group Conflicts	Low	Medium
		Commercial Activities Causing Overcrowding	Low	Medium
		Poorly Maintained Facilities and Access	Low	Medium
		Insufficient Facilities and Access	Medium	High

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Table 4-4 First Pass Risk Assessment

Issue 1: Inappropriate or Excessive Development			
Overall Level of Risk <i>(considering existing management arrangements)</i>		HIGH	
Threat	Description of Current and Future Risk <i>(and threats)</i>	Current Risk	Future Risk
Over Development	Current: Over development or excessive development occurring within the coastal zone. Future: This threat will present greater pressure in the future due to an increase in population size. Greater resident and tourist numbers will increase demand for development resulting in intensification and expansion of coastal development. This will place added pressure on environmental and recreational values and amenity of the study area. Key Locations: North Werri Headland, Permissible development in town centre, Caravan park redevelopment, urban zoned lands, and Spring Creek and Bombo areas.	High	High
Poorly Sited or Inappropriate Development	Current: Approval and construction of inappropriate development and/or development that is poorly sited. Future: Threat is likely to get worse in the future due to climate change and population increases. Climate change could result in previously viable land for development being placed at risk due to sea level rise and/or coastal hazards. Additionally, future sea level rise will likely increase the pressure on coastal habitats which will be “squeezed” between existing (and future) land development and rising waters. A population increase will result in amplified pressure for additional development. Key Locations: Bombo asset infrastructure, low lying areas (including Jones Beach, Werri Beach, Surf Club, East Beach and Kendalls Beach), urban areas, Spring Creek and Bombo.	Medium	High
Perception of Threats	Community: The community perception is that inappropriate and excessive development that detracts from Kiama’s natural beauty is a key issue for the region. Inappropriate and highly visible development along the coastline is particularly disliked.	High	
	Stakeholder: The overall perception is that development present a medium level of risk currently, however this will increase with population growth and climate change. Whilst the risk from inappropriate or excessive development will increase, it is thought that development controls should be able to manage this.	Medium	High
Data and Management		Current	Future
Adequacy of Existing Management Arrangements	Numerous management policies and planning controls are in place to manage development including the LEP, DCP, Coastal SEPP, Urban Strategy and the Illawarra-Shoalhaven Regional Plan. Several studies have also been undertaken to provide relevant information including the Kiama Town Centre Study, and Kiama Traffic and Carparking Study.	Adequate	Inadequate
Suitability of Existing Data	The existing planning controls are considered adequate to manage development currently and in the future. There is also vegetation mapping available across the Kiama LGA to inform future land zoning decisions. However, there is currently no Coastal Management SEPP CVA mapping (and no existing hazards studies to inform this). Additionally, existing foreshore building line and stormwater management policies could be updated and improved however these are not consider crucial to the management of this issue.	Moderate	
Recommended Studies for CMP Stage 2			
Study No.	Description	Priority	
N/A	No stage 2 studies are required to specifically address inappropriate or excessive development. Mapping of a CVA will aid in improving the management of this threat and this is addressed and recommended as a stage 2 study for Issue 3: Coastal Hazards and Sea Level Rise.	N/A	

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Issue 2: Disturbance of Biodiversity and Habitat			
Overall Level of Risk <i>(considering existing management arrangements)</i>		HIGH	
Threat	Description of Current and Future Risk <i>(and threats)</i>	Current Risk	Future Risk
Invasive Species, Pests and Feral Animals	Current: Invasive vegetation species, pests and feral animals (e.g. foxes, dogs, cats, bitou bush). Future: This threat is likely to remain a consistent risk or worsen. Invasive species typically have a better tolerance to different environmental conditions meaning it is likely they will adapt better to changes brought on by climate change than native species will. This could result in invasive species growing more prolifically than native species in the future and increasing their abundance and distribution across the study area. Key Locations: LGA wide particularly already stressed communities, weed and rabbit infested dune vegetation and littoral rainforest areas.	High	High
Illegal Dune Vegetation Removal	Current: Illegal removal of dune vegetation by residents to improve views from private properties. This issue is complex and particularly difficult to monitor and mitigate. And the issue is highly emotive due to the strongly held views in the community about dune vegetation (on all sides of the debate). Future: The issue is likely to remain consistent (or possibly worsen) and this will be heavily dependent on the management approach and community engagement undertaken. Key Locations: Jones Beach and Werri Beach	Medium - High	Medium - High
Recreational Activities	Current: Habitat disturbance due to recreation activities (e.g. boating, surf schools, fishing, bush walking, dogs etc.) Future: This threat is likely to worsen in the future due to population increases and subsequent increase in the volume of people pursuing recreational activities in the study area. Additionally, climate change and sea level rise could add pressure as recreational activities and biodiversity and habitat values are likely to be restricted into smaller areas. Key Locations: Nesting areas, fragile coastal organisms and habitats, Seven Mile Beach, Coastal Walk and dog off leash beaches.	Medium	High
Overfishing	Current: There is a community perception of overfishing by recreational and/or commercial fishers, and a depletion of natural resources due to lack of respect for catch sizes, bag limits and size limits. The MEMA TARA assessed the threat on the South Coast from various commercial fishing, charter fishing and recreational fishing activities on fish assemblages (harvest and by-catch) to be medium for most activities and low for some activities. DPI Fisheries advises that the community perception of overfishing as a currently ‘high’ risk is not supported by its data on fishing activities, fishing stock levels and fisheries management arrangements. The current risk has therefore been adopted as medium to reflect the varying information. Future: This threat is likely to increase in severity with future population growth and added tourist and recreational pressures. Future risk has been stated as high, to support the need for continued update of statewide fisheries management arrangements over time, as is currently done by DPI Fisheries. Key Locations: Whole coastal area due to a perceived lack of policing. May be particularly relevant to Minnamurra River and Crooked River due to their relatively small size and accessibility.	Medium	High
Perception of Threats	Community: The community hold key concerns for threats to biodiversity and habitat, with particular regard to the perceived lack of apparent action with existing threats i.e. illegal dune vegetation removal and illegal, damaging and/or excessive recreational activities. The community feedback indicates there is a strong local community driven Landcare and Dunecare groups that are keen to be involving in helping to address some of the threats associated with this issue.	Medium	
	Stakeholder: Stakeholders have varying views on these threats. Overall the issue is seen as being of high risk and importance, although there is a lot of uncertainty around some threats i.e. overfishing as evidence is anecdotal only and illegal vegetation clearing, as without solid evidence it is hard to regulate this.	High	High
Data and Management		Current	Future
Adequacy of Existing Management Arrangements	Biodiversity legislation, LGA regulations, plans of management, local and regional biodiversity-related management policies e.g. Feral Animal Management Plan and Weed Management Plan, and support from community groups such as Landcare partly control threats to biodiversity. Council also has vegetation mapping and a fauna study for the entire LGA which provides detailed information about the flora, fauna and vegetation communities and their distributions. Additionally, Council Rangers and Maritime Boating Safety Officers are responsible for regulation (e.g. dogs and illegal camping and fishing) in the study area and NPWS and LLS carry out and provide guidance on pest control.	Adequate	Adequate
Suitability of Existing Data	Whilst there is vegetation mapping and a fauna study for the Kiama LGA which provides information about biodiversity values within the study area, both of these studies are reasonably old. An opportunity exists to update biodiversity and habitat data for the study area in order to assess risks in more detail as well as to improve conservation of biodiversity and protection of threatened species, communities, and ecosystems.	Moderate	
Recommended Studies for CMP Stage 2			
Study No.	Description	Priority	
2.01	Study into biodiversity including flora and fauna of the coastal zone A comprehensive review of flora and fauna, habitat characteristics, ecological patterns and processes throughout the study area. This study should identify current condition, identify areas for remediation and protection and investigate migration pathways, barriers and resilience to future threats such as climate change, sea level rise and coastal hazards.	Medium	
2.02	Study into invasive species, pests and feral animals A comprehensive investigation into the presence of invasive species, pests and feral animals across the study area. This study should identify the presence, status and origin of invasive species with the aim of informing subsequent invasive species management strategies and plans. The study should also identify invasive species that do not currently exist in the study area but are a risk for the future, identify opportunities for monitoring programs for key species of concern and identifying additional plans or engagement activities that could be undertaken to support the management of invasive species.	Medium	

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Issue 3a: Coastal Hazards and Sea Level Rise - <i>Beach Erosion and Shoreline Recession</i>			
Overall Level of Risk <i>(considering existing management arrangements)</i>		HIGH	
Hazard	Description of Current and Future Risk <i>(and threats)</i>	Current Risk	Future Risk
Beach Erosion	<p>Current: Severity of beach erosion hazard varies along the coastline of the study area depending on the individual beach or location attributes. Overall, current risk from beach erosion is medium with a number of key hotspot areas that are currently at risk.</p> <p>Future: The risk from beach erosion in the future is considered notably higher with the currently at risk sites likely to be at greater risk and some of the sites considered low risk at the moment likely to have increased risk moving forward.</p> <p>Key Locations: Whilst the sandy beaches and developed foreshores may be generally considered at risk from beach erosion, the severity of risk varies across key locations as follows:</p> <ul style="list-style-type: none">• Minnamurra Beach: low risk as no development or infrastructure and generally natural environment (medium risk in the future)• Jones / Boyd Beach: low to medium risk as currently the dune and vegetation is reasonably low (medium to high risk in the future)• Bombo Beach: medium risk as important infrastructure located in this vicinity i.e. Sydney Water, road and rail assets, and it is a longer and more exposed beach. Water flows from Spring Creek and the existing Quarry present a localised erosion issue in this area (high risk in the future)• Black Beach / Kiama Harbour: medium risk due to presence of existing rock walls however this needs to be rebuilt and maintained (medium to high risk in the future)• Surf Beach: medium risk as existing rock wall at the northern end provides some protection (medium risk in the future)• Kendalls Beach: medium risk as there is a large expanse of sand but only low dune formation and limited vegetation to provide protection (medium to high risk in the future)• East Beach: medium risk as there is headland protection to the south and potentially a seawall at the back of the beach of unknown condition (medium to high risk in the future)• Werri Beach: low to medium risk as houses are located in close proximity to beach but the existing dunes and vegetation is providing some protection (medium to high risk in the future)• Gerringong Boat Harbour: low risk as relatively rocky environment (low to medium risk in the future)• Seven Mile Beach: low risk as undeveloped hind area / limited assets at risk (low to medium risk in the future)	Medium	High
Shoreline Recession	<p>Current: This current risk of shoreline recession is considered to be reasonably low across the entire Kiama coastline.</p> <p>Future: Shoreline recession risk increases dramatically in terms of future risk. The overall risk is considered medium with some key areas of concern.</p> <p>Key Locations: Whilst the sandy beaches and developed foreshores may be generally considered at risk from shoreline recession, the severity of risk varies as follows:</p> <ul style="list-style-type: none">• Minnamurra Beach, Surf Beach, Black Beach / Kiama Harbour, Gerringong Boat Harbour and Seven Mile Beach: low risk; low to medium risk in the future• Jones / Boyd Beach, Kendalls Beach, Easts Beach: low risk; medium risk in the future• Werri Beach: low to medium risk; medium to high risk in the future• Bombo Beach: medium risk; medium to high risk in the future	Low	High
Perception of Hazards	<p>Community: As coastal hazards are complex and diverse, the community were only asked about coastal hazards in general (and not individual hazards i.e. beach erosion), however, the general view amongst community members is that climate change and sea level rise is a serious concern and a key issue to be addressed.</p>	High	
	<p>Stakeholder: Overall, beach erosion and shoreline recession are considered by stakeholders to be relatively low risk currently across the length of the Kiama coastline (with a handful of key hot spots that are considered medium risk). However, it is acknowledged that in the future these coastal hazards will pose a high risk to the study area.</p>	Low	High
Data and Management		Current	Future
Adequacy of Existing Management Arrangements	There is currently a range of plans, policies and programs in place that will help manage beach erosion and shoreline recession, these include: the generic Kiama Plan of Management for public reserves, LEP (i.e. coastal building setback line for residential areas), plans of management for specific sites and Seven Mile Beach National Park Management Plan. Additionally, on ground works including rock placement on headlands, brick walls along the back of beaches, beach and entrance access works, vegetation planting, dune creation and dune restoration works are currently undertaken or have previously been undertaken by Council which will assist in mitigation these hazards. As part of its asset management and planning processes, Sydney Water does use Adapt Water (<i>an online climate change adaptation and asset-planning tool designed to quantify the risk associated with climate change and extreme events and perform cost-benefit analyses of proposed adaptation options in order to inform planning and investment decisions</i>).	Inadequate	Inadequate
Suitability of Existing Data	There is not currently adequate information to determine the risk from beach erosion and shoreline recession. The OEH (2017) Statewide Exposure Assessment for erosion indicates potential exposure to high risk in the Kiama LGA, strengthening the case for locally specific hazards assessments to better quantify erosion and other coastal risks. The level of risk given here is based on anecdotal information and what individuals have observed. More information is also considered necessary to allow for integrated incident planning. Key knowledge gaps include: coastal hazards and processes information, extent of sea-level rise and storm events and a review of local planning provisions (considering coastal hazard)	Inadequate	
Recommended Studies for CMP Stage 2			
Study No.	Description	Priority	
2.03	<p>Probabilistic analysis of beach erosion and shoreline recession assessment</p> <p>Modelling simulations should be conducted using probabilistic methods (e.g. Monte Carlo simulations), based upon model input parameters, and considering the NSW Sediment Compartments Framework. Outputs for beach erosion and shoreline recession can be then be used to develop maps of relevant probable erosion extents (e.g. 10th percentile, 50th percentile, 90th percentile, etc). It is recommended for the hazard mapping approach to incorporate (where relevant and possible) the presence of bedrock and other such features that provide a limit to erosion extents. The latest data e.g. sea level rise projects, wave measurements, bathymetry (marine lidar etc), photogrammetry / lidar etc. should be incorporated.</p>	High	

Setting the CMP Scope

Issue 3b: Coastal Hazards and Sea Level Rise – <i>Coastal Inundation, Wave Overtopping and Tidal Inundation</i>			
Overall Level of Risk <i>(considering existing management arrangements)</i>		HIGH	
Hazard	Description of Current and Future Risk <i>(and threats)</i>	Current Risk	Future Risk
Coastal Inundation	<p>Current: The risk currently presented by coastal inundation varies in severity along the Kiama coastline, however overall is of medium risk.</p> <p>Future: Acknowledging changes that will occur with climate change and sea level rise, coastal inundation will increase in severity in the future presenting a high risk overall.</p> <p>Key Locations: Whilst the entire coastline is generally considered at risk from coastal inundation, the severity of risk varies across key locations as follows:</p> <ul style="list-style-type: none">• Minnamurra Beach: low risk as only vegetation exposed to storm events; low risk in the future• Jones / Boyd Beach: low to medium risk as dunes provide a certain amount of inundation protection from storm surges; medium to high risk in the future• Bombo Beach: low risk however potential to impact on sewer infrastructure at south Bombo; medium risk in the future• Black Beach / Kiama Harbour: medium risk noting that much of Black Beach was impacted by inundation during the 2016 East Coast Low event; high risk in the future• Surf Beach: medium risk with Coronation Park likely exposed; high risk in the future• Kendalls Beach: high risk as lots of infrastructure located right near the beach; high risk in the future• East Beach: high risk as lots of infrastructure located right near the beach and has had previous exposure to inundation; high risk in the future• Werri Beach: medium to high risk with carpark and road both exposed to threat; high risk in the future• Gerringong Boat Harbour: low risk as not a lot of infrastructure at risk; low risk in the future• Seven Mile Beach: low risk; medium risk in the future	Medium	High
Wave Overtopping	<p>Current: The risk of wave overtopping overall is medium but varies along the coastline.</p> <p>Future: Wave overtopping is considered a high risk for the Kiama coast in the future due to climate change and sea level rise influences.</p> <p>Key Locations: The risk at individual locations reflects the risk outlined above for coastal inundation at key locations for both current and future risk.</p>	Medium	High
Tidal Inundation	<p>Current: Existing risk of tidal inundation is considered low across the entire Kiama coastline.</p> <p>Future: With climate change and sea level rise, tidal inundation is considered a medium risk to the coastline in the future, with some key locations at greater risk.</p> <p>Key Locations: Tidal inundation is currently considered to present only a low risk to the entire study area. In the future this risk remains low for Gerringong Boat Harbour and Seven Mile Beach. However, future risk of tidal inundation is considered low to medium risk at Bombo Beach, Black Beach / Kiama Harbour, Kendalls Beach, East Beach and Werri Beach, medium risk at Minnamurra Beach and Jones / Boyd Beach, and high risk at Surf Beach.</p>	Low	Medium
Perception of Hazards	<p>Community: As coastal hazards are complex and diverse, the community were only asked about coastal hazards in general (and not individual hazards i.e. coastal inundation), however, the general view amongst community members is that climate change and sea level rise is a serious concern and a key issue to be addressed.</p>	High	
	<p>Stakeholder: Stakeholders have diverse views on the risk present by each of the above hazards depending on the specific location considered, however overall the level of risk presented by coastal inundation, wave overtopping and tidal inundation is currently thought to be medium and in the future with climate change considerations is high.</p>	Medium	High
Data and Management		Current	Future
Adequacy of Existing Management Arrangements	Government and academic research about future inundation and climate change adaption have been undertaken; however, there is no consistent policy nor long-term adaptation management plan for climate change issues and threats across the study area. There is no specific coastal assessment in terms of tidal or coastal inundation and wave overtopping for the Kiama coastline either. Council does have existing plans of management and asset management plans however these have limited detail on coastal hazards. Natural and manmade infrastructure including dune vegetation, harbour walls and rock walls are currently seen as management measures for these risks in some locations.	Inadequate	Inadequate
Suitability of Existing Data	Information and data about coastal inundation and climate change exist mostly at the regional level, with no studies or data about the potential impacts of coastal hazards or climate change specific to the study area.	Moderate	
Recommended Studies for CMP Stage 2			
Study No.	Description	Priority	
2.04	<p>Regional coastal processes conceptual model</p> <p>Develop a regional coastal processes model for the Kiama sediment compartment. This should involve analysis of data (sediment compartment analysis, waves, water levels, marine lidar, lidar, aerial photography, historical beach behaviour information), a thorough site inspection and geomorphic analysis (which shall also support the coastal cliff and slope assessment see Study No. 2.07), SWAN wave modelling and sediment transport potential analysis (using accepted cross-shore and longshore sediment transport equations). The regional coastal processes conceptual model should define: the sediment transport pathways, sources and sinks, and net longshore and onshore transport rates (if any); the influence of coastal structures on sediment transport and beach state (i.e. natural headlands, reefs, etc but also manmade structures such as seawalls); embayment and exposure of the beaches; and critical wave conditions (i.e. what wave direction is of greatest impact to a particular beach).</p>	High	
2.05	<p>Coastal inundation assessment</p> <p>A coastal inundation assessment should be undertaken that combines the various components of elevated oceanic water level (i.e. astronomical tide, wind set up, wave set up, barometric set up, wave run up, and future sea level rise and wave climate change) for relevant return periods and storm durations, at timeframes of interest. The assessment should consider the potential location of the shoreline in future with shoreline recession and map the elevated ocean levels to illustrate potential areas of inundation from wave overtopping. In mapping the hazard, careful consideration will need to be given to estuary entrances that may experience wave run up impacts.</p>	High	

Setting the CMP Scope

Issue 3c: Coastal Hazards and Sea Level Rise – <i>Coastal Lake or Watercourse Entrance Instability</i>			
Overall Level of Risk <i>(considering existing management arrangements)</i>		Medium	
Hazard	Description of Current and Future Risk <i>(and threats)</i>	Current Risk	Future Risk
Coastal Lake or Watercourse Entrance Instability	<p>Current: Kiama has a variety of both frequently closed entrances, permanently open entrances and frequently open entrances. Entrance instability at the present time is generally associated with entrance breakout processes i.e. for the more frequently closed estuaries. However, there is currently good management of these risks in place.</p> <p>Future: With sea level rise, entrance berms are likely to increase in height in line with the rise in sea level, reducing the likelihood of breakout. Depending on the landuses around the various creeks and lagoons (e.g. Spring Creek, Munna Munnora Creek, Werri Lagoon, Crooked River), this may result in increased risk of inundation, and may affect entrance breakout behaviour.</p> <p>Key Locations:</p> <ul style="list-style-type: none">• Minnamurra Beach / River: low risk as natural system with minimal infrastructure and consistent tidal movement with strong catchment flows. Risks increase as you move upstream however the estuary is excluded from the study area. In future, there may be a risk associated with the narrowing and potential overtopping or breakthrough of the entrance spit that is essentially Minnamurra Beach, which would substantially change and impact the Minnamurra entrance.• Spring Creek: At present, natural entrance breakouts occur, and are considered low risk as there is relatively less flow and the creek is adaptive to flow changes. Future changes in entrance configuration could impact the railway and major road that exist immediately adjacent to the creek’s entrance.• Munna Munnora, Werri Lagoon and Crooked River are also all considered low risk at present. The frequency of closure, berm height and associated inundation may all change in future with sea level rise, therefore the risk is considered to increase in future.	Low	Medium
Perception of Hazards	Community: As coastal hazards are complex and diverse, the community were only asked about coastal hazards in general (and not individual hazards i.e. watercourse instability), however, the general view amongst community members is that climate change and sea level rise is a serious concern and a key issue to be addressed.	High	
	Stakeholder: Coastal lake and watercourse entrance instability is not seen as a key coastal hazard or a particularly high threat to the Kiama region. The stakeholders believe that the risk across all locations is low and will remain that way in the future. Additionally, they think that the available information and management of these entrances is adequate as they are low risk and effectively “self-managed”.	Low	Low
Data and Management		Current	Future
Adequacy of Existing Management Arrangements	The management arrangements currently in place for coastal lake or watercourse entrance instability include revetment works, leaving entrances to “self-manage”, occasional artificial entrance opening as required, and using Adapt Water for forward planning and having ongoing discussions with service providers regarding infrastructure outlets at watercourse entrances.	Adequate	Moderate
Suitability of Existing Data	There is limited existing information or data on entrance stability and dynamics for the Kiama coastline, except for Minnamurra River. Panayotou (2004) investigated the stability of the river entrance as part of her PhD thesis titled “Geomorphology of the Minnamurra River estuary, southeastern Australia: Evolution and management of a barrier estuary”. There is also very good existing knowledge and scientific understanding about the behaviour and potential risks associated with entrance breakout and instability for estuaries and Intermittently Closed and Open Lakes or Lagoons (ICOLs) in NSW in particular.	Moderate	
Recommended Studies for CMP Stage 2			
Study No.	Description	Priority	
2.06	<p>Watercourse entrances stability assessment</p> <p>This study should investigate the change in morphology of the creek entrance (e.g. entrance position/meander, flood tide delta depth/width, sedimentation/erosion characteristics) and sand adjacent shorelines for each of the watercourse entrances along the study area with regard to sea level rise, under the interactions between the coast (i.e. waves and tides causing erosion and recession) and the catchment (i.e. flooding and drought on creek outflow). This study is important but could be conducted in combination with future estuary CMPs.</p>	Medium	

Setting the CMP Scope

Issue 3d: Coastal Hazards and Sea Level Rise – <i>Coastal Cliff or Slope Instability</i>			
Overall Level of Risk <i>(considering existing management arrangements)</i>		HIGH	
Hazard	Description of Current and Future Risk <i>(and threats)</i>	Current Risk	Future Risk
Coastal Cliff Instability	Current: Low / Medium, based upon the general lack of cliff-related incidents, however there is very little information regarding this risk. Future: The risk of cliff instability can increase where the driving mechanism for cliff failure relates to wave action at the base of the cliff. The potential for this is currently unknown. Key Locations: currently unknown but will be related to headlands and other bedrock areas.	Medium	Medium
Dune Slope Instability	Current: the potential for dune slope failure is driven by the occurrence of beach erosion events that will create vertical escarpments in the dune face that are then unstable. The area affected by potential dune slope failure and reduced foundation capacity is directly dependent on the height of the dunes (i.e. low dunes = narrow risk zones, high dunes = larger risk zones). Future: With sea level rise, it is expected that the beach and dune will shift upward and landward in response. This will manifest as more frequent erosion events that do not fully recover, therefore increasing the risk of exposure of dunes to erosion, and risk of dune slope instability. Key Locations: This risk relates to the slumping of the foredune after beach erosion events, and so applies only to sandy dune areas.	Medium	High
Perception of Hazards	Community: As coastal hazards are complex and diverse, the community were only asked about coastal hazards in general (and not individual hazards i.e. cliff instability), however, the general view amongst community members is that climate change and sea level rise is a serious concern and a key issue to be addressed.	High	
	Stakeholder: Overall there was limited knowledge regarding this risk, however respondents believed the current risk to be medium.	Moderate	High
Data and Management		Current	Future
Adequacy of Existing Management Arrangements	Coastal cliff or slope instability risk is currently managed across the study area using planning control such as the foreshore building lines . However the apparent lack of knowledge regarding this risk suggests that management could be inadequate.	Moderate	Inadequate
Suitability of Existing Data	There is very limited existing information or data on cliff or slope instability for the Kiama coastline.	Inadequate	
Recommended Studies for CMP Stage 2			
Study No.	Description	Priority	
2.07	Cliff and slope instability screening assessment A geomorphic assessment of cliff stability should be undertaken, based upon a review of literature, lidar and site inspection relating to the geology; coastal cliff/slopes types and failure mechanisms, and assets. The assessment will need to provide a first pass screening for cliff and slope stability as it will be used to develop recommendations for areas requiring a detailed geotechnical assessment; and interim planning controls. The study should determine if cliff stability is likely to pose a coastal hazard in the study area at present and in future with sea level rise, and if there are location(s) requiring further detailed assessment to define, map and project the hazard and conduct a risk assessment for public safety (e.g. risk to life) from proximity to cliff edges, rock/land slip etc risk. The site inspection and geomorphic analysis outcomes should also be fed into the regional coastal processes conceptual model (Study 2.04).	High	

Setting the CMP Scope

Issue 4: Poor Quality Catchment Runoff			
Overall Level of Risk <i>(considering existing management arrangements)</i>		HIGH	
Threat	Description of Current and Future Risk <i>(and threats)</i>	Current Risk	Future Risk
Stormwater Runoff	<p>Current: The existing risk from stormwater runoff is from nutrients, sediment, litter and waste i.e. plastics, pesticides, herbicides and other litter e.g. fishing lines/hooks . The study area is made up of various land uses being predominately rural grassed areas with small urban communities along the coastline. As the urban area is not overly dense or dominating the study area, and based on past water quality observations, the overall risk from stormwater runoff is rated as medium.</p> <p>Future: The risk from stormwater runoff is likely to increase in severity in the future, this is primarily due to predicted population growth leading to added urban development and pressure from additional tourists. Overall the risk from stormwater runoff in the future is perceived to be high.</p> <p>Key Locations: Whilst the entire coastal zone is at risk of being impacted by stormwater runoff, key locations identified with stakeholders include: Bombo, Kendalls and Surf Beaches along with Kiama Harbour. Pollution generation hotspots are thought to include the river and estuary mouths generally and Black Beach, Gerringong and Surf Beach. Rocky headlands, fishing locations, Beaches with easy access and the blowhole points are also considered key locations for potential litter and waste pollution generation.</p>	Medium	High
Agricultural Runoff	<p>Current: Agricultural runoff including nutrients and sediment is currently thought to be of a medium risk to the Kiama coastline. There is a large area of agricultural and/or rural land within the study area, however this is not intensively farmed. Overall, the existing level of risk presented by agricultural runoff is medium.</p> <p>Future: Agricultural runoff is not expected to intensify in the future as additional agricultural activities are not anticipated within the study area and the knowledge, technology and capacity of landholders is improving so existing farming practices in terms of water quality management will likely improve in the future.</p> <p>Key Locations: Agricultural run-off is likely to present the highest risk at the river and estuary mouths including Minnamurra River, Crooked River, Werri Lagoon and Spring Creek.</p>	Medium	Medium
Sewage Effluent and Septic Runoff	<p>Current: Sewage effluent and septic runoff is currently considered a low risk to the Kiama coastline. This is based on the historical track record of typically good water quality readings and a low number of incidents related to sewage overflow. In instances where incidents have occurred, the water quality impacts have been relatively low with stakeholders reporting that conditions return to normal within a couple of days.</p> <p>Future: The risk present from sewage effluent and septic runoff is expected to increase to medium in the future due mostly to expected population growth and additional pressure being placed on these systems with increased resident and visitor numbers.</p> <p>Key Locations: Stakeholders identified the following as key hotspots in terms of sewage: Kiama Downs to Bombo, Seven Mile Beach, Bombo due to the ocean outfall, Kendalls Beach and Spring Creek (have experienced pump overflows previously), and in terms of septic runoff: Minnamurra River, Crooked River and Werri Lagoon.</p>	Low	Medium
Perception of Threats	<p>Community: Poor quality catchment runoff is viewed as a medium risk threat to Kiama’s coastline and associated values. Runoff carrying pollution and waste particularly plastics is a very high priority and of great concern to the local community.</p>	Medium	
	<p>Stakeholder: Stakeholder views on the various threats that comprise this issue vary however overall the level of risk these threats pose t o the Kiama coastline is perceived to be medium currently with the risk from all threats increasing in the future. Of the individual threats, stormwater runoff from urban areas is considered the highest risk.</p>	Medium	High
Data and Management		Current	Future
Adequacy of Existing Management Arrangements	<p>In terms of water quality management, water testing is undertaken, Council is part of the NSW Beachwatch monitoring program, Sydney Water have various policies and programs in place around their assets, environmental licences and EPA regulations apply. Council also has an On-site Sewage Management policy and program, and a Stormwater Management Policy.</p> <p>In terms of litter and pollution management, Council has waste minimisation education activities, maintenance regimes for existi ng GPTs and other stormwater assets, awareness and education programs and conducts compliance activities.</p>	Adequate	Inadequate
Suitability of Existing Data	<p>In general, there is reasonable information and data availability related to water quality across the Kiama study area. Whilst additional information would be ideal, the information related to these threats is generally well understood as are the management options available to mitigate these threats.</p>	Moderate	
Recommended Studies for CMP Stage 2			
Study No.	Description	Priority	
N/A	<p>No Stage 2 studies required</p> <p>DPIE’s Risk Based Framework is the currently mandated method for testing and specifying stormwater management requirements for new and existing developments. A wealth of information relating to the Risk Based Framework such as modelling of waterways is already available from DPIE. When preparing the CMP, an action to be considered that requires the implementation of DPIE’s Risk Based Framework as part of the DA process (e.g. as a requirement for subdivisions/major developments) and as part of the asset management plan process (i.e. for replacing stormwater infrastructure by Council). Similarly, existing knowledge on sewerage overflow and agricultural runoff management is considered adequate however the existing resources, coordination, and legislation, policy and regulation compliance are limited and will make the existing management arrangements inadequate in the future when the level of risk from poor quality catchment runoff increases.</p>	N/A	

Setting the CMP Scope

Issue 5: Degradation of Heritage and Culture			
Overall Level of Risk <i>(considering existing management arrangements)</i>		HIGH	
Threat	Description of Current and Future Risk <i>(and threats)</i>	Current Risk	Future Risk
Aboriginal Culture Not Preserved	Current: Aboriginal culture, including both values and sites, not being recognised and preserved is currently considered a medium level risk for the study. This is largely due to that fact that there are many unmapped sites and it is not known where everything of importance is currently. It should be noted that this is a widespread issue across NSW and not exclusive to Kiama. Future: It is anticipated that this threat will increase in the future climbing to a high overall future risk rating. This is due to climate change, development, population growth (tourism and recreational pursuits) placing additional threat on existing Aboriginal sites. Key Locations: This threat presents a risk to the whole coastal area and in particular the foreshore and waterway areas which traditionally are rich in Aboriginal heritage values.	Medium	High
Community Not Valuing Culture and Heritage	Current: Community not valuing culture and heritage generally is only considered a low risk threat within the study area currently. The population within broader Kiama LGA appear to have some level of appreciation for culture and heritage values. This was demonstrated through responses provided as part of the community online survey and drop-in sessions where culture and heritage values were identified as being important to conserve and protect. Future: It is expected that this threat will worsen in the future and present a medium risk. This is likely to occur due to population growth and the associated development pressure and increased use of the study area as a resource for recreational activities etc. Key Locations: Areas of cultural and heritage significance that could be affected include the Kiama town centre, Pheasants Point and Manning Street (heritage conservation areas) and beaches, foreshore and waterways more generally.	Low	Medium
Perception of Threats	Community: The community generally considers Aboriginal Culture and other Heritage places to be of high importance and value, as demonstrated through the online community survey where over 65% of respondents identified “ <i>continuing cultural, heritage and spiritual connection of Aboriginal people</i> ” and “ <i>presence of heritage palaces and features on the coastline</i> ” to both be very important (a further at least 20% identified it as important). Threats to these values were identified as an issue, but not as high risk as other threats the area faces.	Low - Medium	
	Stakeholder: Overall stakeholders believe threats to these important cultural and heritage values are of medium risk and likely to increase into the future. It is acknowledged that Council is currently attempting to raise the profile and awareness around heritage conservation however additional pressures are likely to worsen this risk in the future.	Medium	High
Data and Management		Current	Future
Adequacy of Existing Management Arrangements	There are extensive management arrangements in place to protect cultural and heritage items and places including, Due diligence assessments, site registers and listings, appropriate legislation and planning instruments such as the LEP. Council is currently also undertaking a review of heritage within the LGA. The existing management policies and approaches that are currently in place are considered adequate, however the effectiveness of these is limited to known sites. The larger issue involving Aboriginal heritage is the limited knowledge of existing sites.	Adequate	Inadequate
Suitability of Existing Data	The data and information available for Aboriginal and heritage sites is available on the Aboriginal Heritage Information Management System, the NSW Heritage Database, and via DPIE directly. Other information on historical and cultural sites is available and/or documented in various locations, including the Kiama Council website, LEP and the Kiama Historical Society. Other resources to consider as referred to on the Aboriginal Kiama website (KMC, 2017b) include: <ul style="list-style-type: none">Aboriginal Illawarra, (2005), Department of Environment and Conservation (NSW), (pamphlet)A History of Aboriginal people of the Illawarra 1770-1970 (2005), Department of Environment and Conservation (NSW)Murni Dhungang Jirrar: Living in the Illawarra, (2005). Department of Environment and Conservation (NSW)Blue Haven: A history of Kiama Municipality NSW (1976), William A. BailyIllawarra and South Coast Aborigines 1770-1850, (1990), compiled by Michael Organ, Aboriginal Education Unit, University of Wollongong.Aboriginal history of our area, Gerringong and District Historical Society. (pamphlet)The Wodi-Wodi people of the Illawarra (1981) by Basil GriffinLocal Aborigines in the Illawarra, Don Nash, (unpublished paper)	Moderate	
Recommended Studies for CMP Stage 2			
Study No.	Description	Priority	
2.08	Review of Aboriginal and heritage sites register and documentation Review existing management techniques and recommendations, as well as databases of sites of heritage and cultural significance, including location, description and other relevant attributes of both Aboriginal significant sites and other Heritage significant sites. This review should also consider the naming of significant sites and places.	Medium	
2.09	Aboriginal and heritage sites vulnerability assessment Undertake a heritage sites vulnerability assessment with key responsible agencies and the Illawarra LALC (and/or other relevant persons). This assessment needs to utilise outcomes of key hazards assessments and identify key issues and locations of concern for risk treatment.	Medium	

Setting the CMP Scope

Issue 6: Lack of Engagement, Governance and Compliance			
Overall Level of Risk <i>(considering existing management arrangements)</i>		HIGH	
Threat	Description of Current and Future Risk <i>(and threats)</i>	Current Risk	Future Risk
Lack of Community Awareness and Engagement	<p>Current: Lack of community awareness and engagement with the coastal environment and its management is currently considered a medium risk. A key issue associated with this threat is conflict over competing values, i.e. cutting dune vegetation for personal or private benefit (i.e. enhanced views) versus habitat values and healthy dune vegetation which is key environmental value but also important to community members as demonstrated through local Landcare and Dunecare groups.</p> <p>Future: This risk posed to the study area by this threat is not expected to worsen in the future. Due to increasing community awareness the risk is expected to remain the same, even with increased resident and tourist numbers.</p> <p>Key Locations: The entire study area is impacted by this threat however notable hotspots include Jones Beach and Warri Beach, both being places where private interest and public use meet and there is conflict over values.</p>	Medium	Medium
Lack of Compliance	<p>Current: Lack of compliance with regulations and lack of compliance resources and/or success from authorities is rated as a medium risk currently. Whilst there are compliance measures in place, limited resources make it difficult to mitigate or eradicate this threat entirely.</p> <p>Future: It is expected that this threat will worsen and become a high risk in the future. Due to increases in population numbers, both residents and tourists, it is likely that there will be an associated increase in the number of compliance related issues (e.g. off leash dogs in the incorrect areas, overfishing, illegal camping or fires etc.).</p> <p>Key Locations: Jones Beach, Warri Beach and Seven Mile Beach are key hotspots associated with lack of compliance, however this threat is present along the entire coastline.</p>	Medium	High
Insufficient Governance and Management	<p>Current: Insufficient or inappropriate governance and management of the coastal environment has been identified as a medium risk currently. It was acknowledged by stakeholders that if there is no trust in the process of the CMP development that the community will not respect it and this presents a threat to broader management of the coastal environment.</p> <p>Future: This threat will increase to high risk in the future due to several factors, including climate change, population pressure and changing political agendas.</p> <p>Key Locations: This threat applies across the entire study area.</p>	Medium	High
Perception of Threats	Community: The community has particularly strong views on governance and compliance within the coastal zone of Kiama. Lack of engagement, compliance and governance is seen as a high risk for the area and is very topical amongst active community members.	High	
	Stakeholder: Overall, lack of engagement, governance and compliance within the study area is viewed as presenting a medium risk currently increasing in severity to present a high risk in the future. Climate change, political agenda and population pressures are seen as the key drivers that will be responsible for increasing the risk present by this issue.	Medium	High
Data and Management		Current	Future
Adequacy of Existing Management Arrangements	The existing management arrangements for engagement, governance and compliance centre around Councils roles, responsibilities, plans and policies. Various legislation is in place that outlines requirements, responsibilities and rules for coastal management and activities including the CM Act and CM SEPP. Education and compliance programs are run through Council with local enforcement rangers and RID (regional illegal dumping squad) officers carrying out these duties. In the instance of major compliance or governance issues, these can be elevated to the Land and Environment Court. Numerous environmental programs are also undertaken to ensure the coastal zone is managed in an appropriate manner. Within the Kiama region, agency collaboration and community consultation are strong and proactively undertaken for key issues. The existing management arrangements are likely to be inadequate in the future due to under resourcing.	Adequate	Inadequate
Suitability of Existing Data	There is adequate information available associated with engagement, governance and compliance. Opportunity for improvements and/or key gaps in being able to manage these threats are centred around inadequate policing and lack of resources rather than lack of knowledge, data or awareness over the issues. Knowledge and awareness is improving and the opportunity for smarter decisions and planning exists.	Adequate	
Recommended Studies for CMP Stage 2			
Study No.	Description	Priority	
N/A	<p>No Stage 2 studies required</p> <p>Governance, engagement and compliance within the Kiama region is well understood and managed currently. Future issues with managing this issue is likely to be centred around lack of resources rather than the need for additional knowledge. Whilst no stage 2 studies are required it is recommended that actions to increase and enhance community education to support environmental values within the coastal zone are continued or enhanced. This will help in reducing the need for compliance and governance activities as it will build community awareness over the coastal environment, its values, vulnerabilities and threats that human pursuits are creating and / or driving.</p> <p>Likewise, actions to support and / or expand compliance, and to support and / or improve governance and implementation of the CMP should also be considered for inclusion, when the CMP is being prepared.</p>	N/A	

Setting the CMP Scope

Issue 7: Overuse by Recreation and Tourism			
Overall Level of Risk <i>(considering existing management arrangements)</i>		MEDIUM	
Threat	Description of Current and Future Risk <i>(and threats)</i>	Current Risk	Future Risk
Overuse and Overcrowding	Current: Overuse and overcrowding at the beach and associated facilities is currently seen as presenting a medium risk to the study area. However, it is noted that this related to summer usage and is a very seasonal issue. Future: This threat is likely to increase to present a high risk in the future due to increasing population both in terms of residents and tourists. Key Locations: Areas along the Kiama coastline that are particularly susceptible to this threat include the Minnamurra River and its entrance including James Oates Reserve, Surf Beach, Northern Gerroa Beach including the boat launching facility, Gerroa, Kiama township, North Bombo and the Blow Hole.	Medium	High
Anti-social Behaviour	Current: Anti-social behaviour for example illegal camping or bonfires on the beach are currently viewed as a low risk currently to the Kiama coastline. Future: Whilst anti-social behaviour itself is not likely to increase, the number of people utilising the coast will increase in the future and as such the threat of anti-social behaviour will increase to medium overall as assuming the same ratio of incidents occur, the additional people will result in an increased total number of anti-social behaviour issues. Key Locations: All areas along the coastline however notable hotspots include Jones Beach, Seven Mile Beach, the Boneyard and the Bombo and Minnamurra River entrance car parks.	Low	Medium
Perception of Threats	Community: The community perceive the threat from overuse by recreation and tourism to be high. Overuse/ overcrowding is a very high priority issue for residents however it is noted that this is likely to be restricted to only certain times of the year.	High	
	Stakeholder: The overall risk presented from overuse by recreation and tourism is believed to currently be medium by stakeholders as there are existing management arrangements in place that mitigate most of these threats although it is extremely difficult to reduce overuse or overcrowding in peak seasons. Its thought this issue will increase to a high risk in the future based on population growth placing additional pressure on the coastline and their being limited additional funds to manage this.	Medium	High
Data and Management		Current	Future
Adequacy of Existing Management Arrangements	Various programs and policies are in place to manage recreational activities, facilities and usage of the Kiama coastline. This includes: <ul style="list-style-type: none">Capital works programs for implementing new facilities or upgrading existing facilities i.e. car parks, toilets, lifeguard stations etc.Section 94 contributions which assist in funding new facilitiesMaintain and upgrade programs, however it is difficult to keep up with maintenance during peak periodsPolicies including Plans of Management that are implemented for the management of recreational spaces and all community land The existing management arrangements are adequate to manage this issue currently, however in the future with increasing resident and tourist numbers utilising the coast the existing management arrangements will be inadequate. The management actions, policies and programs currently in place are adequate, however it is likely that the existing funding for maintenance and capital works programs will not be sufficient moving forward.	Adequate	Inadequate
Suitability of Existing Data	In general, there is good information and data availability about recreation and tourism activities, the upkeep of facilities and new facility development within the study area, including: <ul style="list-style-type: none">various master plans for individual holiday park sites and key locations such as the Kiama Harbour and Blowhole Point Headlandstrategic planning documents regarding tourism including the Strategic Tourism and Events Plan 2018-2021 and the Kiama Tourism Opportunities Plan (2018)operational plans and delivery programs. Whilst there is currently a reasonable amount of information additional data is always useful to inform coordinated coastal management. Key areas that additional data would be useful to assist and inform forward planning include a demand analysis and/or visitation numbers to determine with greater certainty the most used and popular beaches and areas.	Moderate	
Recommended Studies for CMP Stage 2			
Study No.	Description	Priority	
2.10	Kiama beaches demand analysis Assessment of existing usage across the Kiama coastline to determine the most valued locations for recreation and tourism activities to enable better forward planning. This assessment should include gathering of visitation numbers and analysis of beach usage and popularity as well as community consultation to identify key recreational activities at each location to inform what additional facilities would be the most valuable to the public at each location. It should be noted that this study is not vital to the preparation of the CMP, and instead could form an action for consideration in the CMP. However, the ongoing growth in tourism and popularity of the Kiama coastline is certainly an issue that will need to be specifically investigated and managed, in order to protect the substantial values associated with the study area.	Low	

Setting the CMP Scope

Issue 8: Conflict Over Resource Use and Access Availability			
Overall Level of Risk <i>(considering existing management arrangements)</i>		MEDIUM	
Threat	Description of Current and Future Risk <i>(and threats)</i>	Current Risk	Future Risk
User Group Conflicts	<p>Current: This threat involves conflict between various user groups on the beaches and in waterways, for example boat launching in swimming areas. This threat is currently rated as low risk as this is very seasonal due to increased usage over a set period of the year. It is not unexpected to have some level of conflict over values / uses at a shared public space.</p> <p>Future: Whilst the incidents of conflict ratio that exists currently is not expected to increase, the overall level of risk in the future is likely to increase to medium as user group conflicts will increase in total with population growth and an increase in the number of people using the shared public spaces.</p> <p>Key Locations: Whilst the entire coastline could be affected, the more population beach and waterway locations where various recreational activities are undertaken will be most impacted by this threat. These areas may include the boat ramp at Northern Gerroa Beach, the Minnamurra River area, Seven Mile Beach and Werri Beach.</p>	Low	Medium
Commercial Activities Causing Overcrowding	<p>Current: The threat presented by commercial activities causing crowding and lack of space for other users is currently considered a low risk overall for the entire study area. As with most other access availability issues this is seasonal based and location specific.</p> <p>Future: It is considered likely that this threat will increase to medium risk in the future as additional people will be using the beaches and lack of space and overcrowding will be increasingly topical in the region.</p> <p>Key Locations: This threat is specific to a small number of areas currently including Seven Mile Beach, Gerroa and Minnamurra River.</p>	Low	Medium
Poorly Maintained Facilities and Access	<p>Current: Poorly maintained or located recreational facilities and beach access points is considered a low risk for the study area. The Kiama coastline attracts high tourist and visitor numbers each year due to its accessibility.</p> <p>Future: The risk presented by this threat is likely to increase slightly in the future thus presenting a medium risk. However, this threat is considered easier to manage than other threats associated with this issue.</p> <p>Key Locations: This threat applies to the entire study area.</p>	Low	Medium
Insufficient Facilities and Access	<p>Current: The threat of insufficient facilities and accessways in the study area is a medium risk currently, however it is noted that public expectations need to be managed regarding facilities in a regional coastal area as cost is typically an issue.</p> <p>Future: This threat is expected to increase in the future, presenting a high risk. Population increase in both local residents and tourists will place additional pressure on the existing facilities and access points.</p> <p>Key Locations: Areas along the Kiama coastline that are particularly susceptible to this threat include the Minnamurra River and its entrance including James Oates Reserve, Surf Beach, Northern Gerroa Beach including the boat launching facility, Gerroa, Kaiama township, North Bombo and the Blow Hole.</p>	Medium	High
Perception of Threats	Community: The community considers this issue to be a high risk. It was very topical during the community consultation undertaken particularly commercial activities on public lands which are seen as a key area of concern currently.	High	
	Stakeholder: Overall the risk posed by conflict over resource use and access availability is currently considered to be low and increasing to medium in the future due to population growth and additional usage of the coast. However, the stakeholders note that expectations of the community need to be managed and the risk to providing resource and access availability in the future is linked to cost of management as it will be increasingly more expensive to deliver the current level of service in the future.	Low	Medium
Data and Management		Current	Future
Adequacy of Existing Management Arrangements	<p>A range of management options exist to manage resource use conflict and accessibility. Policies exist within the Local Government Act, POEO Act, National Parks and Wildlife Service Act and can be in the form of Plans of Management, land use zoning and DCPs. There are capital works programs, maintenance and facility upgrade programs and Section 94 contributions all of which aim to enhance public space usability and access. Council also has a Use of Public Land Policy which outlines exclusions, permitted uses, approval pathway etc. for the use and hire of public land and property.</p> <p>In terms of commercial activities on public space, these require Council consent to occur and are licenced under the Local Government Act and various planning controls are in place to manage these. Additionally, rangers monitor these activities to ensure compliance.</p> <p>These management measures are considered adequate to manage the risk both now and moderate for the risk in the future. The key risk to ensure adequate management arrangements are in place in the future is budgetary constraints.</p>	Adequate	Moderate
Suitability of Existing Data	There is limited information available on resource use and access availability within the study area. As such, various key gaps in knowledge exist in terms of this issue, the key gap being information and data on usage of areas and facilities, and the key recreational pursuits in these areas, which would assist in informing whether existing facilities are adequate for demand.	Moderate	
Recommended Studies for CMP Stage 2			
Study No.	Description	Priority	
N/A	<p>No Stage 2 studies required</p> <p>Study 2.10 outlined for Issue 7 will address the key information and data gap that exists for this priority management issue.</p>	N/A	

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5 Preliminary Business Case

5.1 Section Overview

This section presents the reasoning for preparing a CMP including the economic, environmental and social basis, and evidence and analysis supporting coastal management.

This is followed by an outline of the benefits of preparing a CMP; risks of preparing and not preparing a CMP; and the funding and financing considerations of preparing the CMP.

5.2 Reasoning for Preparing a CMP

A CMP aims to provide for the coordinated, strategic and integrated coastal zone management of the coastal zone of the study area over the immediate and medium term with consideration of long-term vision and trends (i.e. 10-year plan, considering hazards to 2100). By providing a consolidated and coordinated management strategy for the Kiama Municipal Council coastline, a CMP will provide the action plan for maintaining and improving the health of the coast and the environmental, social and economic values underpinned by this.

Reforms to the NSW coastal management legislative and regulatory framework present a unique opportunity to build on the existing coastal management work considering lessons learnt, and improved engagement and collaboration with relevant stakeholders and agencies, to prepare a holistic, inclusive CMP for the Kiama Municipal Council study area.

5.2.1 Economic, Environmental and Social Basis

The Kiama coastline is an important environmental, cultural, social and economic resource that forms the basis of and supports Kiama's regional economy.

The local tourism industry is estimated to generate over \$153 million, equivalent to almost 10% of Kiama's \$1.57 billion total gross revenue generated by businesses (REMPPLAN, 2019a). Kiama's tourism industry is driven by the dramatic natural beauty of the coastline, clear air and waters, wildlife and abundance of accessible recreational activities provided by the beaches and waterways. This is evident through the Kiama Tourism Opportunities Plan (KMC, 2018) that documents Kiama's "hero experiences", based on community and stakeholder inputs, with all four experiences centred around the area's natural beauty, recreational activities and stunning coastline.

The natural environment which is highly bio-diverse and is also locally enriched by a long history and ongoing connection of Aboriginal people with this coast, post-European settlement heritage and a unique modern surfing culture. However, the coastline is used for a wide variety of passive and recreational pursuits beyond surfing.

The study area is highly bio-diverse, comprising a variety of environments including open water, beaches (intertidal areas), dunes and foreshores. The Illawarra Biodiversity Strategy (2011) determined there to be 12 endangered ecological communities (EECs) within the Kiama LGA. Native fauna in the Kiama area is diverse, with 472 species identified (Kevin Mills & Associates, 2006b), of which at least 53 species listed as vulnerable or endangered under State and Federal legislation. These natural features are enriched by a long history and ongoing connection of Aboriginal people, post-European

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settlement heritage and today a strong local identity as a string of connected communities along the coastline.

As such the coastline supports many significant and important environmental, economic, sociocultural values and community benefits. These values and benefits are threatened by increasing pressures including coastal hazards, climate change, sea level rise, population and tourism growth and coastal development.

A CMP will provide comprehensive strategic vision and action plan, locally contextualised and enabled through a government supported process, for managing the priority issues affecting the study area.

5.2.2 Evidence and Analysis Supported Coastal Management

One of the key issues impeding effective coastal management is not having the appropriate information and data available for analysis in order to make well-informed decisions. The CMP process provides an excellent framework and opportunity for any relevant data and information gaps to be identified and filled to ensure an adequate understanding of the environment, social, cultural, economic and governance context of a study area. For example, the extent and level of coastal hazards, the ongoing changes in community and tourism use and the changing economic activity and trends at the local and regional scale.

A detailed risk assessment and fit-for-purpose cost benefit analysis to guide the selection of management options is a key requirement when preparing a CMP. Thus, the CMP process provides a mechanism for developing effective management of short-term risks, and for developing adaptation pathways for long term risks, such as shoreline recession and tidal inundation from sea level

rise; or effective planning schemes to manage the expected population and tourism pressures that threaten coastal and marine health.

The CMP process allows for the continuing development of information and knowledge to fulfil its needs but also utilises and builds upon the existing body of information and knowledge of local processes, values and issues that has been developed in the past.

5.3 Benefits of Preparing a CMP

There are a range of benefits associated with preparing a CMP, these include:

- **Informed coastal management decision making** – making decision on coastal management options typically involves deep uncertainty and complexity due to the numerous coastal processes at play and the extensive number of future scenarios and pressures. Added complexity is introduced due to the large number of possible management and mitigation options available to coastal managers. With a CMP in place, decision makers have a well-considered and proper understanding of the risks and opportunities within the coastal zone and the consequences of specific courses of action. Accurate and detailed information about risk and consequence is necessary to assist decision makers generate effective management strategies which identify and prioritise future actions and investment or justify a business-as-usual approach.
- **Engagement with various land owners and coastal managers** – the preparation of the CMP represents a significant strategic opportunity to improve engagement with the various land owners, coastal managers and stakeholders within the study area (as previously outlined in Section 3.6). The CMP provides the opportunity to establish their commitment to

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contribute towards the necessary studies and implementation of management actions as agreed within the final CMP.

- **Clear and strategic value proposition for achieving a shared vision of the coast** – a robust CMP that has been developed in collaboration with the community, relevant government agencies and stakeholders will support the necessary partnerships to better align all stakeholders' priorities and investments, thus allowing for collaborative seeking and raising additional funding to achieve identified strategic objectives.
- **Improved capacity to address strategic and sediment compartment wide issues** – collaboration between Councils within the same sediment compartment (as directed via s16, CM Act, 2016) should result in benefits that contribute to improved environmental, economic and social outcomes through strategically addressing regional issues and interests such as:
 - Resilience generated by improved networks and relationships;
 - Improved knowledge and capacity building;
 - Improved access to skills, expertise, experience and specialist services;
 - Adequate consideration and agreed approaches to cross-boundary issues; and
 - Improved communication, advocacy and promotion.

5.4 Risks of Not Preparing and Preparing the CMP

5.4.1 Key Risks of Not Preparing the CMP

There are a number of key risks that arise from not preparing a CMP, these include:

- **Liability exposure for coastal risks and management** – Section 733 of the *Local Government Act 1993* provides an exemption from liability for public authorities for coastal risks where they have identified and made publicly available coastal risk information using the specified guidelines, namely the Manual. By not pursuing a CMP, Councils and state agencies in the study area increase their exposure to liability for decisions made or not made relating to coastal risk. This inherently includes climate change related risks (especially sea level rise), as climate change related hazards are a core component of the CM Act and the Manual's requirements for CMPs.
- **Risk to coastal values and associated cost implications** – By not pursuing a CMP for the study area, key values of the Kiama coastline are placed at risk from threats and coastal hazards. Pressures on coastal values are expected to increase due to climate change, population growth, coastal development, tourism and recreation. As such, it is likely that in the long term this will have cost implications for council trying to manage these issues and diminishing values.
- **Coastal management funding limitations** – Actions in a CMP are eligible grant funding (if successful) through the NSW Government Coastal and Estuary Grants Program. Not preparing a CMP will prevent Council from applying for and thus obtaining funds from this program and this is likely to significantly limit Councils ability to implement coastal management actions across the Kiama coastline.
- **Opportunity cost** – Failing to develop a long-term strategic plan could result in a long-term missed opportunity cost, i.e. the opportunity to reduce future risks and associated financial costs through planning for future outcomes is diminished or lost. The preparation of a CMP provides an

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excellent mechanism for assessing these risks, and developing actions relating to strategic land use planning and development controls.

- **Adaptation cost** – Substantial costs are expected for failing to prepare a CMP with thorough consideration and assessment of coastal and climate change adaptation options. According to the Australian Business Roundtable for Disaster Resilience and Safer Communities (November 2017) current insurance and damage costs of natural disasters in Australia is \$9B per year, while in NSW over the past decade these costs have averaged \$3.2B per year, with storms accounting for 49% of this cost and flooding 23%. Climate change is projected to increase the frequency and severity of climate-related natural disasters. It is predicted that annual costs of natural disasters in Australia will be \$33B by 2050 with the total economic cost of natural disasters in NSW predicted to reach \$10.6B per year by 2050, a growth rate of 3.4% per year. A CMP provides a mechanism to assess the risks to existing assets (natural and built) from coastal and climate related hazards and provide a subset of adaptation outcomes. The CMP should serve as a basis for suitable, practical and most affordable actions to manage the risks to existing assets, and a pathway for when and how such actions shall be implemented over the short to long term. Stage 3 of preparing a CMP enables potential actions to be subject to detailed cost benefit analysis, such that the economic cost savings from avoided damages to natural and built assets can be estimated.

5.4.2 Key Risks of Preparing a CMP

There are a number of key risks that arise from not preparing a CMP, these include:

- **Community and stakeholder expectations** – The community and stakeholder engagement and consultation to support preparation of the

CMP is likely to create (or exacerbate) expectations in the community for implementation of actions for coastal management. An inherent risk lays thereafter if the CMP process then fails to deliver the actions, or if these actions do not achieve the vision and objectives of the CMP.

- **Council accountability and obligations for implementing the CMP** – As the leading entity preparing and driving the CMP process, once gazetted Council has accountability and implementation obligations, which include:

Under Division 4 section 22 of the Coastal Management Act:

(1) A local council is to give effect to its coastal management program and, in doing so, is to have regard to the objects of this Act.

(2) In particular, without limiting subsection (1), a local council is to give effect to its coastal management program in:

- the preparation, development and review of, and the contents of, the plans, strategies, programs and reports to which Part 2 of Chapter 13 of the Local Government Act 1993 applies, and*
- the preparation of planning proposals and development control plans under the Environmental Planning and Assessment Act 1979.*

Also, Part 5 Miscellaneous (Section 30), the Minister to report failures to comply with directions to Local Government Minister also has implications for councils in regards to implementing a CMP; in that

(1) The Minister administering this (the CM) Act may:

- report any failure by a local council to comply with a direction under section 13 (1) or 14 (2) to the Minister administering the Local Government Act 1993, and*

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(b) *cause a copy of the report to be published on the website of the Department.*

(2) *The Minister administering the Local Government Act 1993 may consider any such report in determining whether to take action in relation to the local council, including, but not limited to, action under Part 6 (Performance management) or Part 7 (Temporary suspension of council) of Chapter 13 of that Act.*

- **Conflict with other resource commitments and demands of Council and agencies** – Preparing a CMP may result in conflict within Council and contributing agencies, in terms of competing need for scarce resources (including but not limited to funding and staff). However, the CMP preparation process should be thorough, so any potential conflicts are identified, and controls are implemented to mitigate associated risks.

5.5 Funding and Financing Considerations of Preparing the CMP

5.5.1 Estimated Cost of Preparing the CMP

The total cost of preparing the Kiama Coastline CMP is estimated to cost between \$173,000 and \$274,000.

The range provides for uncertainty around the inclusion or exclusion of the medium and low priority studies as recommended in the forward program, thus respectively representing the upper and lower cost.

The reasoning and benefits of conducting the CMP are evident, as outlined in the preceding section. Funding opportunities, responsibilities and cost sharing opportunities are detailed below.

5.5.2 Funding Opportunities

The NSW Government is committed to managing the coastal environment and marine estate of NSW. Major reforms have recently taken place and associated government funding has been allocated for coastal management (\$87M package) and managing the marine estate (an initial \$46M package). These funding packages should be available to support preparation of CMPs, and further studies that support the management of the marine estate.

Kiama Municipal Council received grant funding under the NSW Government Coast and Estuary Management Program in 2017-18 in order to prepare the Kiama Coastline CMP, with the grant funds being matched by a monetary contribution from Council.

There are other grant programs that may be suitable for funding further studies associated with preparing the CMP. Many of these programs, such as the NSW Environmental Trust, may also be available to fund implementation of actions specified in a CMP. Funding contributions may also be available through partnerships, aligned groups and individuals. Supporting in-kind resources may also be available via community participation and input from other interests particularly research institutions and universities.

5.5.3 Alignment with Kiama's IPR Framework Goals

Kiama's Operational Plan 2019-20 and Delivery Program 2017-21 requires a target of 100% completion by end of 2021 of the Kiama coastline CMP. Funding for the remaining stages of preparation of Kiama's CMP has already been allocated. Completion of the remaining stages of the CMP will therefore enable Council to achieve the specific actions, goals and objectives of its IPR Framework, documented in Table 5-1, fitting with its CSP objectives.

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Goals and objectives of the Kiama CSP that align with preparing a CMP were documented in Section 3.3.4.1.

Table 5-1 IPR Framework Hierarchy Linking to Preparation of the Remaining Stages of the CMP

IPR Framework Hierarchy	Details
Kiama CSP Objective 2.2	Our community and natural environments are adaptive, resilient and sustainable and informed of predicted climate change impacts
Kiama Delivery Program Action 2.2.1	Implement adopted Coastal Management Programs and legislative requirements
Kiama Operational Plan Action 2.2.1.2	<p>Implement programs required as a result of the NSW Coastal Reforms process.</p> <p>Performance measure: Develop Kiama Local Government Area (LGA) Coastal Management Program in line with agreed work program.</p> <p>Target: 100% completed by 31/12/2021</p>

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6 Forward Plan

6.1 Section Overview

As stated in the Manual and as outlined in Section 1.3, preparation of the CMP is to be completed following a staged process (illustrated in Figure 1-2). The subsequent stages in this process after this Stage 1 Scoping Study are:

- *Stage 2 – Determine risks, vulnerabilities and opportunities* (through further detailed studies);
- *Stage 3 – Identify and evaluate options* (through risk assessment and cost, benefit analysis);
- *Stage 4 – Prepare, exhibit, finalise, certify and adopt a CMP* (leading to implementation); and
- *Stage 5 – Implement, monitor, evaluate and report* (feedback to the cycle).

This section provides:

- CMP implementation obligations for the Councils and public authorities;
- A summary of the requirements, process and expected outcomes for Stages 2 to 4 outlined from the Manual (Part B);
- A section with considerations and recommendations related to governance of the CMP project going forward; and
- A summary of the recommended studies, investigations and assessments proposed forming the forward program, as an outcome of this Stage 1 Scoping Study.

The section summarises with details of the way forward for Council through the CMP.

6.2 CMP Implementation Obligations for Councils and Public Authorities

Obligations for Councils and public authorities for implementation of the CMP are defined with Division 4 (22 and 23) of the Coastal Management Act, 2016. These are:

- **Councils**

(22). Implementation of coastal management program by local councils

(1) A local council is to give effect to its coastal management program and, in doing so, is to have regard to the objects of this Act.

(2) In particular, without limiting subsection (1), a local council is to give effect to its coastal management program in:

(a) the preparation, development and review of, and the contents of, the plans, strategies, programs and reports to which Part 2 of Chapter 13 of the Local Government Act 1993 applies, and

(b) the preparation of planning proposals and development control plans under the Environmental Planning and Assessment Act 1979.

- **Public Authorities**

(23). Other public authorities to have regard to coastal management program and coastal management manual

(1) Public authorities (other than local councils) are to have regard to coastal management programs to the extent that those programs are relevant to the exercise of their functions.

(2) In particular, those public authorities are to have regard to relevant coastal management programs and the coastal management manual in the

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preparation, development and review of, and the contents of, any plans of management that those public authorities are required to produce and, in doing so, are to have regard to the objects of this Act.

6.3 CMP Stages 2 to 4 Key Requirements – from the Manual

6.3.1 Stage 2 – Determine risks, vulnerabilities and opportunities (through further detailed studies)

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

In summary, the Coastal Management Manual identifies Stage 2 as including the following:

- Engaging with the community and stakeholders;
- Refining understanding of key management issues;
- Identifying areas exposed to coastal hazards and threats to coastal values;
- Analysing and evaluating current and future risks (detailed risk assessment);
- Identifying scenarios for social and economic change and related opportunities for coastal communities;
- Preparing a planning proposal to amend maps of coastal management areas, to commence the Gateway process; and

- Identifying timing and priorities for responses, thresholds and lead times.

6.3.2 Stage 3 – Identify and evaluate options (through risk assessment and cost, benefit analysis)

Stage 3 of the CMP process requires Council to identify and evaluate possible management options in order to select preferred coastal management actions to address the issues identified as affecting the CMP study area. The aim of Stage 3 is to develop strategies and actions that reduce exposure to coastal hazards, address coastal management issues and take advantage of opportunities.

In summary, the Coastal Management Manual identifies Stage 3 as including the following:

- Identifying and collating information on management options;
- Evaluating management actions, considering:
 - Feasibility (is it an effective and sustainable way to treat the risks?);
 - Viability (economic assessment);
 - Acceptability to stakeholders;
- Engaging public authorities about implications for their assets and responsibilities;
- Evaluating mapping options and implications if a planning proposal is being prepared;
- Identifying pathways and timing of actions; and
- Preparing a business plan for implementation.

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6.3.3 Stage 4 – Prepare, exhibit, finalise, certify and adopt a CMP (leading to implementation)

Stage 4 of the CMP process involves a draft coastal management program being prepared, exhibited and then submitted to the Minister for certification. It is a mandatory requirement of the Coastal Management Manual that a draft CMP be exhibited for a period of at least 28 calendar days. It is also a requirement under Section 16 of the CM Act that consultation is carried out during the preparation of the draft CMP.

Once the CMP is certified by the Minister, Council must publish it in the Gazette. The CMP takes effect on the date on which it is published in the Gazette (or on a later date if specified in the CMP).

6.4 CMP Project Governance Recommendations

The NSW Coastal Management Framework provides flexibility around the scope, structure and governance arrangements of a CMP.

A CMP provides a unique opportunity for Council, state government agencies and their communities to achieve a strategic and coordinated approach to manage coastal risks and improve coastal habitats and environments, for the environmental, social (community) and economic benefit of the Kiama coastline and broader region.

As the entire study area is located wholly within the Kiama Municipal Shire LGA, Council is best placed to lead and manage the preparation, implementation and reporting process for the Kiama Coastline CMP, with financial and technical support from DPIE (and other agencies as appropriate). The following recommendations are made regarding the governance of the Kiama Coastline CMP:

- Council will manage the preparation and implementation of the Kiama Coastline CMP including reviewing and contributing to any studies undertaken throughout stages 2 to 4.
- Councils role will include the preparation, development and review of the plans, strategies, programs and reports to which Part 2 of Chapter 13 of the *Local Government Act 1993* applies. They will also be responsible for the preparation of any relevant planning proposals and development control plans under the *Environmental Planning and Assessment Act 1979* that are deemed necessary throughout the CMP development.
- It is also recommended that Council engages and collaborates with neighbouring Councils in the development of the CMP as per Section 16 Consultation of the *Coastal Management Act 2016*, engagement and collaboration are required (and encouraged) for CMP development and implementation within the same coastal sediment compartment.
- It is recommended that a Coastal Advisory Committee (or Working Group) be convened by Council to assist in preparing and implementing the CMP from here onwards. The Committee should include key Council staff, representative Councillors, and the state agencies (i.e. DPIE, DPI, NPWS etc) who oversee, fund or are otherwise involved in coastal management within the Kiama LGA.
- In investigating (Stage 2) and managing (Stage 3 to 5) threats, it is recommended that opportunities to link resourcing with or seek funding through the MEMA strategy should be sought.

The proposed potential governance and management arrangements for the CMP are outline in Table 6-1.

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Table 6-1 Proposed CMP Governance and Management Arrangements

Entity	Role and Responsibility
Kiama Municipal Council	Lead agency, coordination, preparation and implementation of the CMP
State Agencies <ul style="list-style-type: none"> • DPIE (EES) • DPIE (Crown Land) • DPI (Fisheries) • NPWS • NSW EPA • TfNSW (NSW Maritime) • TfNSW (Roads) • SE LLS • Others as appropriate 	Written agreement to CMP Actions for which they are responsible (as a primary or supporting organisation).
Coastal Advisory Committee <ul style="list-style-type: none"> • Key Kiama Municipal Council staff • Representative Kiama Municipal Council Councillors • Relevant state agencies • Relevant regional bodies 	<p>Non-statutory committee to assist in facilitating local community and stakeholder involvement and oversight of the CMP planning and implementation process.</p> <p>Noting, advisory only, potentially a committee of council under Section 355 of the <i>Local Government Act 1993</i></p>
Community	To be engaged with throughout the CMP to ensure community buy-in and ownership in the process.

6.5 The Way Forward: CMP Stages 2 to 4 Recommended Studies, Investigations and Assessments – Indicative Cost and Timeline

The recommended studies, investigations and assessments for Stages 2 to 4 of the CMP are listed in Table 6-2 and Table 6-3, as derived from the first-pass risk assessment, review of current management arrangements and data and information review. Table 6-2 outlines studies that are critical to the preparation of the CMP, whilst Table 6-3 details studies that are desirable but are not critical and may be considered as actions for the CMP i.e. in Stage 3.

Table 6-2 and Table 6-3 provides indicative costs for the studies, and a combined cost for undertaking the CMP stages. The table also provides a timeline for completion of the studies. It further includes recommendations of responsibilities and partnerships for those actions (in order of responsibility and investment).

Note, cost estimates are based on available information, past experience, and expert judgement. A range of cost (low – high) is provided to account for uncertainty regarding application and level of detail required to provide sufficient detail of management action purposes (i.e. fit for purpose).

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Table 6-2 Critical Items for CMP Preparation: Forward Plan, Indicative Costs, Timeline and Responsibility for Preparation

Item	Recommended Studies / Components	Priority	Timing*	Cost (Low)	Responsible
All Stages					
1.01	Community and Stakeholder Engagement Strategy	Complete	-	-	Council
S2-S4	Finalisation and Implementation of Community and Stakeholder Engagement Strategy through S2 to S4. Strategy provides for internal and external engagement activities throughout remaining stages of the CMP, for example: Stage 2: expert workshop, community information sessions, presentations, surveys, meetings; Stage 3: workshop, presentations, brochure, online survey, community information sessions, meetings; and Stage 4: public exhibition sessions, presentations, consultation with DPIE to finalise CMP, meetings.	High	Year 1 and ongoing	Already resourced	Council DPIE (EES)
Stage 2: Risks, Vulnerabilities and Opportunities					
2.03	Probabilistic analysis of beach erosion and shoreline recession assessment Modelling simulations should be conducted using probabilistic methods (e.g. Monte Carlo simulations), based upon model input parameters, and considering the NSW Sediment Compartments Framework. Outputs for beach erosion and shoreline recession can be then be used to develop maps of relevant probable erosion extents (e.g. 10th percentile, 50th percentile, 90th percentile, etc). It is recommended for the hazard mapping approach to incorporate (where relevant and possible) the presence of bedrock and other such features that provide a limit to erosion extents. The latest data e.g. sea level rise projects, wave measurements, bathymetry (marine lidar etc), photogrammetry / lidar etc. should be incorporated.	High	Year 1	Already resourced	Council DPIE (EES)
2.04	Regional coastal processes conceptual model Develop a regional coastal processes model for the Kiama sediment compartment. This should involve analysis of data (sediment compartment analysis, waves, water levels, marine lidar, lidar, aerial photography, historical beach behaviour information), a thorough site inspection and geomorphic analysis (which shall also support the coastal cliff and slope assessment see Study No. 2.07), SWAN wave modelling and sediment transport potential analysis (using accepted cross-shore and longshore sediment transport equations). The regional coastal processes conceptual model should define: the sediment transport pathways, sources and sinks, and net longshore and onshore transport rates (if any); the influence of coastal structures on sediment transport and beach state (i.e. natural headlands, reefs, etc but also manmade structures such as seawalls); embayment and exposure of the beaches; and critical wave conditions (i.e. what wave direction is of greatest impact to a particular beach).	High	Year 1	Already resourced	Council DPIE (EES)
2.05	Coastal inundation assessment A coastal inundation assessment should be undertaken that combines the various components of elevated oceanic water level (i.e. astronomical tide, wind set up, wave set up, barometric set up, wave run up, and future sea level rise and wave climate change) for relevant return periods and storm durations, at timeframes of interest. The assessment should consider the potential location of the shoreline in future with shoreline recession and map the elevated ocean levels to illustrate potential areas of inundation from wave overtopping. In mapping the hazard, careful consideration will need to be given to estuary entrances that may experience wave run up impacts.	High	Year 1	Already resourced	Council DPIE (EES)
2.07	Cliff and slope instability assessment A geomorphic assessment of cliff stability should be undertaken, based upon a review of literature, lidar and site inspection relating to the geology; coastal cliff/slopes types and failure mechanisms, and assets. The assessment will need to provide a first pass screening for cliff and slope stability as it will be used to develop recommendations for areas requiring a detailed geotechnical assessment; and interim planning controls. The study should determine if cliff stability is likely to pose a coastal hazard in the study area at present and in future with sea level rise, and if there are location(s) requiring further detailed assessment to define, map and project the hazard and conduct a risk assessment for public safety (e.g. risk to life) from proximity to cliff edges, rock/land slip etc risk.	High	Year 1	Already resourced	Council DPIE (EES)
Stage 3: Identify and Evaluate Options					
3.01	Full Scale Risk Assessment	High	Year 2	Already resourced	Council / DPIE (EES)
3.02	Identify Potential Management Options and evaluate through Tiered Approach: Tier 1 – Identify potential management options, Tier 2 – Multi-Criteria Analysis (MCA) of options and Tier 3 – Cost Benefit Analysis (CBA) of options (required for options > \$1M)	High	Year 2	Already resourced	Council / DPIE (EES)
3.03	Prepare Planning Proposal	High	Year 2	Already resourced	Council / DPIE (EES)
3.04	Draft Business Plan for CMP Implementation	High	Year 2	Already resourced	Council / DPIE (EES)
Stage 4: Prepare, Exhibit, Certify and Adopt the Coastal Management Program					
4.01	Prepare CMP (draft) document, including; executive summary, introduction, a snapshot of issues, actions to be implemented by the local council, actions to be undertaken by public authorities, a business plan, a coastal zone emergency action subplan, mapping, reference list and supporting documentation	High	Year 2	Already resourced	Council / DPIE (EES)
4.02	Stakeholder Workshop and Incorporation of Feedback into Draft CMP	High	Year 2	Already resourced	Council
4.03	Public Exhibition of CMP	High	Year 2	Already resourced	Council
4.04	Planning Proposal Exhibition and Amendment	High	Year 2	Already resourced	Council / DPIE (EES)
4.05	Finalising the CMP (with Community and Stakeholder public exhibition feedback)	High	Year 2	Already resourced	Council / DPIE (EES)
CMP PLANNING AND PREPARATION (High Priority Studies and Components Only)		TOTAL	1-2 Years	Already Resourced	

Forward Plan

Table 6-3 Desirable Items for CMP Preparation: Forward Plan, Indicative Costs, Timeline and Responsibility – May be considered through Stage 3

Item	Recommended Studies / Components	Priority	Timing*	Cost (Low)	Cost (High)	Responsible
2.01	Study into biodiversity including flora and fauna of the coastal zone A comprehensive review of flora and fauna, habitat characteristics, ecological patterns and processes throughout the study area. This study should identify current condition, identify areas for remediation and protection and investigate migration pathways, barriers and resilience to future threats such as climate change, sea level rise and coastal hazards.	Medium	-	\$40,000	\$60,000	Council DPIE (EES), NPWS, LLS
2.02	Study into invasive species, pests and feral animals A comprehensive investigation into the presence of invasive species, pests and feral animals across the study area. This study should identify the presence, status and origin of invasive species with the aim of informing subsequent invasive species management strategies and plans. The study should also identify invasive species that do not currently exist in the study area but are a risk for the future, identify opportunities for monitoring programs for key species of concern and identifying additional plans or engagement activities that could be undertaken to support the management of invasive species.	Medium	-	\$15,000	\$25,000	Council DPIE (EES), NPWS, LLS
2.06	Watercourse entrances stability assessment This study should investigate the change in morphology of the creek entrance (e.g. entrance position/meander, flood tide delta depth/width, sedimentation/erosion characteristics) and sand adjacent shorelines for each of the watercourse entrances along the study area with regard to sea level rise, under the interactions between the coast (i.e. waves and tides causing erosion and recession) and the catchment (i.e. flooding and drought on creek outflow). This study is important but could be conducted in combination with future estuary CMPs.	Medium	-	\$20,000	\$50,000	Council DPIE (EES)
2.08	Review of Aboriginal and heritage sites register and documentation Review existing management techniques and recommendations, as well as databases of sites of heritage and cultural significance, including location, description and other relevant attributes of both Aboriginal significant sites and other Heritage significant sites. This review should also consider the naming of significant sites and places.	Medium	-	\$5,000	\$15,000	Council DPIE (EES), DPIE (Crown Land, NPWS (supporting)
2.09	Aboriginal and heritage sites vulnerability assessment Undertake a heritage sites vulnerability assessment with key responsible agencies and the Illawarra LALC (and/or other relevant persons). This assessment needs to utilise outcomes of key hazards assessments and identify key issues and locations of concern for risk treatment.	Medium	-	\$5,000	\$15,000	Council DPIE (EES), DPIE (Crown Land, NPWS (supporting)
2.10	Kiama beaches demand analysis Assessment of existing usage across the Kiama coastline to determine the most valued locations for recreation and tourism activities to enable better forward planning. This assessment should include gathering of visitation numbers and analysis of beach usage and popularity as well as community consultation to identify key recreational activities at each location to inform what additional facilities would be the most valuable to the public at each location. It should be noted that this study is not vital to the preparation of the CMP, and instead could form an action for consideration in the CMP. However, the ongoing growth in tourism and popularity of the Kiama coastline is certainly an issue that will need to be specifically investigated and managed, in order to protect the substantial values associated with the study area.	Low	-	\$15,000	\$20,000	Council DPIE (EES), DPIE (Crown Land) (supporting)

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Appendix A Kiama Coastline CMP Stakeholder and Community Engagement Strategy

Kiama Coastline CMP Stakeholder and Community Engagement Strategy

A.1 Introduction

This engagement strategy has been prepared in accordance with:

- The Coastal Management Act 2016 and related Guidelines for Community and Stakeholder Engagement in Coastal Management
- The Kiama Council Community Engagement Strategy (2016)

A.1.1 Project Context

Kiama Municipal Council is preparing a Coastal Management Program (CMP) for the Kiama Coastline from Minnamurra River to 2km south of Black Head.

This Community and Stakeholder Engagement Strategy ('the Strategy') establishes a framework and sets the strategic direction for how communication and engagement will be undertaken with internal and external stakeholders, including the community, throughout development of the Kiama Coastline CMP through Stages 1 to 4.

The Strategy has been prepared in accordance with the Coastal Management Act 2016 (the CM Act) and associated Coastal Management Manual (OEH, 2018) ('The Manual'), which requires each of the 5 stages for preparing a CMP to be aligned with opportunities for community and stakeholder input and education.

This Strategy is focussed on the development of the CMP and is expected to be revised once the CMP is certified, to support implementation of the CMP in Stage 5.

Effective and ongoing engagement with stakeholders and the community substantially supports the success of the CMP to be completed, funded and implemented. Therefore, it is essential that the engagement strategy is meaningfully resourced.

A.1.2 Engagement Requirements

The CM Act requires councils to consult with the community and stakeholders throughout the preparation of and before adopting a CMP. Part A of the Manual includes mandatory requirements relating to community and stakeholder engagement processes. The mandatory requirements specify that a draft CMP must be exhibited for public inspection for no less than 28 calendar days before it is adopted.

A.2 Principles of Engagement

The engagement framework for the Strategy is based on leading practice, including consideration of the International Association for Public Participation (IAP2), in particular the IAP2 engagement spectrum as outlined below and shown in Figure A-1. A range of engagement activities are provided, that can be applied in a fit for purpose manner.

- Inform (Stakeholders are informed about the project and process)
- Consult (Engaged and feeding advice and information into the project)
- Involve (Two-way engagement and joint learning)
- Collaborate (Two-way engagement; joint learning, decision-making and actions)
- Empower (To place final decision-making in the hands of the public).

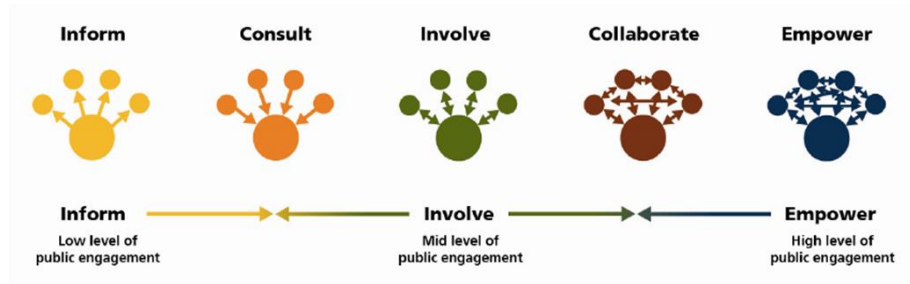


Figure A-1 IAP2's Public Participation Spectrum

The IAP2 has a set of core values which should be considered when designing a coastal engagement strategy. The Kiama Council Community Engagement Strategy also outlines principles that underpin effective decision-making and community engagement. These perspectives of what is required for effective community engagement are outline below:

Council's Community Engagement Golden Rules for Effective Community Engagement as per the Kiama Council Community Engagement Strategy (KMC, 2016) include:

- (1) Be visible, open and transparent
- (2) Encourage feedback from, and provide feedback to, participants and the wider community
- (3) Encourage communication between groups so that individuals and groups can better understand each other and the challenges facing Council; and to maximise working relationships
- (4) Provide a clear record and obvious link or evaluation between the stages of engagement; consultation, decisions made, and projects/activities taking place
- (5) Be used to collect representative views as well as stakeholders' views

- (6) Use a coordinated, well-planned approach
- (7) Use clear and concise messages
- (8) Use communication methods that appropriately target the audience/recipient(s)
- (9) Monitor and evaluate communication methods
- (10) Be consistent with corporate branding
- (11) Be proactive
- (12) Be timely

The IAP2 core values include:

- (1) Public participation is based on the belief that those who are affected by a decision have a right to be involved in the decision-making process.
- (2) Public participation includes the promise that the public's contribution will influence the decision.
- (3) Public participation promotes sustainable decisions by recognizing and communicating the needs and interests of all participants, including decision makers.
- (4) Public participation seeks out and facilitates the involvement of those potentially affected by or interested in a decision.
- (5) Public participation seeks input from participants in designing how they participate.
- (6) Public participation provides participants with the information they need to participate in a meaningful way.
- (7) Public participation communicates to participants how their input affected the decision.

A.3 Stakeholder Analysis

Engagement outcomes are best achieved when consultation activities have specific objectives and are tailored to a specific audience/participant group. Table A-1 identifies a number of stakeholder groups which need to be informed about the CMP and the process and suggests the type of engagement that is required. The below can and should be continually reassessed and as the project progresses.

Table A-1 Stakeholder Analysis

Stakeholder	IAP2	CMP Stage
Government – Federal and State		
Members of Federal and State Parliament	Inform / Consult	Stage 1-4
Government Agencies – Federal and State		
Department of Environment and Energy Department of Planning, Industry and Environment Department of Primary Industries NSW Environment Protection Authority Transport for NSW South East LLS SES	Inform/ Involve/ Consult/ Collaborate	Stage 1-5
Local Government		
Kiama Municipal Council	Collaborate	Stages 1-5
Shellharbour City Council	Inform/ Consult	Stages 2-5
Shoalhaven City Council	Inform / Consult	Stages 2-5
Advisory Bodies		
Coastal Advisory Committee	Involve/ Collaborate	Stages 2-5

Stakeholder	IAP2	CMP Stage
First Nations People		
Local Aboriginal Land Councils Individuals	Consult / Involve Collaborate	Stages 1-5
Community Organisations		
Business Chamber Community volunteer service providers Local environmental organisations Recreation groups Local, regional and resident associations Media	Consult / Involve Consult / Involve Consult / Involve Consult / Involve Consult / Involve Consult / Involve	Stages 1-5
Private Organisations		
Local Businesses Education facilities Research facilities Commercial/business operators Media	Consult / Involve Consult / Involve Consult / Involve Consult / Involve Consult / Involve	Stages 1-3 Stages 1-3 Stages 1-3 Stages 1-3 Stages 1-3
Individuals		
Residents* Ratepayers Landowners Volunteers Visitors/ Tourists	Inform / Consult / Involve / Collaborate Inform/ consult/ Involve	Stages 1-5 Stage 1-5

** (Including children, youth, older residents, families, marginalised individuals, peoples with a disability – and their carers, culturally and linguistically diverse communities)*

A.4 Frequently Asked Questions

FAQs that may arise during stakeholder engagement activities are to be developed as required in consultation with Council.

Categories may include:

- CMP processes
- CMP stages and activities
- Council roles and responsibilities
- Community engagement and consultation (how to get involved)
- CMP area
- Technical questions
- Coastal hazards
- Dune management and vegetation
- Areas not covered in the CMP
- Who is the consultant?
- How is this being funded?
- How is climate change being addressed?
- Other

A.5 Engagement Strategies

Engagement approaches for Stage 1 to 5 of the CMP are outlined in Sections A.5.1 to A.5.5 respectively to enable effective communication with different stakeholders for each stage. These strategies have been prepared in accordance with:

- The CM Act and related Guidelines for Community and Stakeholder Engagement in Coastal Management
- The Kiama Council Community Engagement Strategy (2016)

A.5.1 Stage 1 – Identify the Scope of the CMP

Table A-2 Stage 1 Engagement Strategy

Stage 1 – Identify the Scope of a CMP	
Timing	January 2019 – October 2019
Engagement intent	<p>Community/stakeholders Bring all interested parties on board early to share information and ideas (before decisions are made).</p> <p>CMP content Identify stakeholders and prepare stakeholders profile. Review existing information about stakeholder perspectives to help set focus and priorities of subsequent stages of the CMP.</p>
IAP2 levels of engagement	Inform, consult, involve
Level of community influence on decisions	Council retains decision-making about the scope of subsequent stages and will incorporate community input.
Engagement Outcomes	<ul style="list-style-type: none"> • stakeholders and the community understand how they can be involved in the preparation of a CMP • establish working relationships built on mutual trust and respect • understand community goals, aspirations, values and priorities • understand community motivations to participate in planning and implementation • help community understand dynamic nature of coastal processes and the need to set long-term objectives • increase community understanding of the new legislative and planning framework –CM Act, CM SEPP and manual • determine the engagement activities that are required during the preparation of subsequent stages of the CMP
Engagement Activities, Aims and Audiences	<p><u>Deliverable:</u> Community Consultation and Engagement Strategy</p> <p><u>Aims:</u> provide aims, activities and audiences for the life of the CMP, which will likely include all activities outlined in this table</p> <p><u>Audiences:</u> all</p>
	<p><u>Activity:</u> First Pass Risk Assessment Workshop</p> <p><u>Aim:</u> promote CMP start up, gather specific information on current and future risk potential, data gaps, management and governance arrangements and performance.</p> <p><u>Audience:</u> Council, state agencies, asset owners, key community groups, other key stakeholders as determined at project initiation</p>
	<p><u>Activities:</u> 3 x Community Drop-in Sessions, Poster and Online Survey</p> <p><u>Aim:</u> promote CMP start up, and gather input to community values and issues</p> <p><u>Audience:</u> general / broad community</p>
	<p><u>Activity:</u> Presentation of Draft Scoping Study Report</p> <p><u>Aim:</u> Present key findings</p> <p><u>Audience:</u> Councillors</p>
Assistance from Council	<ul style="list-style-type: none"> • Online Survey to be hosted on council's website • Poster shall be disseminated by Council to key locations, e.g. SLSCs, beach hire, kiosks • Council to arrange locations for 3 x drop in sessions with community at separate locations along the LGA coastline

Kiama Coastline CMP Stakeholder and Community Engagement Strategy**A.5.2 Stage 2 – Determine Risks and Vulnerabilities and Opportunities****Table A-3 Stage 2 Engagement Strategy**

Stage 2 – Determine Risks and Vulnerabilities and Opportunities	
Timing	July 2019 – June 2020
Engagement intent	<p>Community/stakeholders Empower community and stakeholders with knowledge to contribute to decisions in subsequent stages. Share information equitably among stakeholders.</p> <p>CMP content Explore risks, vulnerabilities and opportunities of coastal management. Explore different perspectives on coastal risk management.</p>
IAP2 levels of engagement	Inform, consult, involve
Level of community influence on decisions	Council retains decision-making. Community and stakeholders may contribute to detailed studies on issues of concern & participate in risk assessment & evaluation.
Engagement Outcomes	<ul style="list-style-type: none"> • a shared understanding of risks and opportunities over different timeframes, and the range of actions that could address different risks • a shared understanding of the varied perspectives about coastal management within the community • council understands community's 'attitude to risk' • community and stakeholders understand vulnerabilities, risk and opportunity studies, including technical aspects such as scenarios for sea level rise, hazards and impacts • increased community trust of technical information based on their involvement and understanding of assumptions
Engagement Activities, Aims and Audiences	<p>Activity: Expert Panel Workshop Aim: agree on model input parameters, promote confidence and trust in project outcomes. Audience: OEH experts, academic leaders, core BMT project team delivering hazard assessments</p>
	<p>Activities: <ul style="list-style-type: none"> • Online Survey Aim: begin dialogue about hazard and risk, and gather hazard data and information Audience: general / broad community</p>
	<p>Activity: Risk Assessment Workshop Aim: conduct full-scale risk assessment to critically evaluate consequence of coastal hazard impacts and exposure, assess other risks in the coastal zone relating to community use and environmental values Audience: Council, state agencies, asset owners, key community groups, other key stakeholders as determined during the project</p>
	<p>Activity: Presentation of Draft Stage 2 Report Aim: Present key findings Audience: Committee, Council</p>
Assistance from Council	<ul style="list-style-type: none"> • Online Survey 2 to be hosted on council's website

A.5.3 Stage 3 – Identify and Evaluate Options

Table A-4 Stage 3 Engagement Strategy

Stage 3 – Identify and Evaluate Options	
Timing	July 2020 – Jan 2021
Engagement intent	<p>Community/stakeholders Share the decision-making dilemma. Establish a process that will be used to choose between options, incorporating community preferences and criteria.</p> <p>CMP content Identify and evaluate opportunities to address coastal risks for relevant coastal management areas, consistent with management objectives. Commence preparation of planning proposal for Coastal Vulnerability Area (CVA).</p>
IAP2 levels of engagement	Inform, involve, collaborate
Level of community influence on decisions	Council, stakeholders and community collaborate to identify the full range of potential responses to manage coastal vulnerabilities and to evaluate options.
Engagement Outcomes	<ul style="list-style-type: none"> • strong working partnerships • managers within council aware of coastal hazards, threats, risks and vulnerabilities, opportunities and actions relevant to their responsibilities and potential conflict with other council priorities • public authorities contribute to identification and evaluation of management options, are aware of responsibilities and accept the adaptive nature of the CMP • council understands stakeholder views about cost-benefit distribution, willingness to pay and potential trade-offs • robust options, understood by all stakeholders in terms of risks, cost and benefits
Engagement Activities, Aims and Audiences	<p>Activity: Management Options Workshop Aim: evaluate options, considering acceptability, financing and funding, resourcing, governance and political will to implement an option Audience: Council, state agencies, asset owners, community groups, others determined in the project</p>
	<p>Activities: 3 x Community Drop -in Sessions, Brochure and Online Survey Aim: present hazard / risk outcomes with potential management options, to gauge acceptability. Present preliminary detail for planning proposal for CVA Audience: general / broad community</p>
	<p>Activity: Presentation of Draft Stage 3 Report Aim: Present key findings Audience: Committee, Council</p>
Assistance from Council	<ul style="list-style-type: none"> • Council to arrange location for Management Options Workshop • Council to arrange locations for 3 x drop in sessions with community at separate locations along the LGA coastline • Brochure to be hosted on Council's website and disseminated at key locations (by Council), e.g. SLSCs, beach hire, kiosks etc • Online Survey 3 to be hosted on council's website

A.5.4 Stage 4 – Prepare, Exhibit, Finalise, Certify and Adopt the CMP

Table A-5 Stage 4 Engagement Strategy

Stage 4 – Prepare, Exhibit, Finalise, Certify and Adopt the CMP	
Timing	February 2021 – December 2021
Engagement intent	<p>Community/stakeholders Gain community confidence and support for decisions that are in the documented CMP.</p> <p>CMP content High involvement stakeholders participate in the detailed process of finalising a plan, e.g. in the coastal management advisory committee or other activities relevant to the risks. Exhibition and amendment of planning proposal for Coastal Vulnerability Area to be coupled with CMP finalisation process</p>
IAP2 levels of engagement	Inform, consult, involve
Level of community influence on decisions	Council retains decision-making about the CMP. Community involvement and feedback refine actions in the CMP to address risks considered unacceptable by the community; and refine elements of the planning proposal for the CVA.
Engagement Outcomes	<ul style="list-style-type: none"> community and stakeholder support for actions and priorities in the CMP increased awareness about funding options and how CMP implementation will be integrated with council's Resourcing Strategy and Delivery Program under IP&R public authorities accept roles and responsibilities in the CMP
Engagement Activities, Aims and Audiences	<p>Activity: Implementation and Operations workshop Aim: review and update costings and other implementation details., outline plan for putting CMP into operation, Audience: Council, state agencies, asset owners, community groups, others determined in the project</p>
	<p>Activity: Presentation of Draft CMP document for endorsement for public exhibition Aim: Present document Audience: Councillors</p>
	<p>Activities: Consultation on the Public Exhibition Draft arranged by Council Aim: present the Public Exhibition Draft of the CMP and the Planning Proposal Exhibition Draft, and opportunity for feedback / submissions Audience: general / broad community</p>
Assistance from Council	<ul style="list-style-type: none"> Council to arrange locations for Implementation and Operations Workshop Arrange Councillor Briefing for endorsement of public exhibition Council to host public exhibition of Draft CMP Report Council to host public exhibition of draft Planning Proposal for CVA (and which may be combined with draft CMP exhibition)

A.5.5 Implement, Monitor, Evaluate & Report

Table A-6 Stage 5 Engagement Strategy

Stage 5 – Implement, monitor, evaluate and report	
Timing	January 2022 ->
Engagement intent	<p>Community/stakeholders Maintain community support for a commitment to the CMP, especially among those directly involved in, or impacted by the implementation.</p> <p>CMP content Active community participation in implementation of CMP actions, and in monitoring and review of CMP implementation.</p>
IAP2 levels of engagement	Inform, involve, collaborate
Level of community influence on decisions	Council retains decision-making but will look to the community for advice, innovation and resources to improve implementation of the CMP actions.
Engagement Outcomes	<ul style="list-style-type: none"> community understanding of how CMP will be implemented through the IP&R framework and land use planning system; and by other public authorities community informed about progress on actions community is aware of the effectiveness of actions in terms of changes to coastal risk profile, coastal condition and community satisfaction continue partnership with community by creating opportunities for community involvement in implementing, monitoring, evaluating and reporting effectiveness of CMP
Engagement Activities, Aims and Audiences	Activities will be determined as part of the preparation of the CMP, and within Council as Stage 4 of the CMP progresses and future needs to promote implementation of the CMP are made apparent.

A.6 Consultation Risks





Table A-7 Consultation Risks

Risk	Mitigation Measure
Poor Engagement of internal staff	<ul style="list-style-type: none"> Send email internally to ensure relevant teams/ staff are notified of the project and the input that will be required of them. Provide update emails to relevant staff to keep updated on issues and progress.
Poor Engagement with external stakeholders (agencies)	<ul style="list-style-type: none"> Send emails/ phone calls to ensure relevant agencies are notified and informed of workshops they are encouraged to participate in
Poor engagement in online survey	<ul style="list-style-type: none"> Poster/Survey Monkey link promoted in council newsletters (e.g. Kimunico and e-newsletters), Council's website, Facebook page, Twitter page, and the "Community News" space in the Kiama Independent and Gerringong Whispers. Outreach events in the form of Community Information and Drop- In Sessions to inform community members of the survey opportunity. Hard-copy surveys and online survey Dissemination of FAQ sheets
Poor engagement for Drop-In Sessions and Workshops	<ul style="list-style-type: none"> BMT consultation team to set up a range of dates/times for the consultations to ensure a diverse variety of individuals can attend. Council to ensure relevant people are available for workshops Council to ensure meeting room(s) are available for workshop (and include catering where needed)
Poor collation of consultation outcomes	<ul style="list-style-type: none"> BMT to record all drop-in session conversations, for detailed write up BMT to ensure succinct and practical workshop sheet to record all workshop outcomes with nomination of table scribe
Unrealistic community aspirations or expectations around issues they raise	<ul style="list-style-type: none"> Council to define appropriate and consistent governance/ positions when interacting with the community Council to develop and adopt management responses that are consistent.

Data and Information Review

Appendix B Data and Information Review

To provide a quick reference within the review tables, the following colour-coded assessment of the data and reports was applied:

Colour	Interpretation
	Priority data or report – contains information and/or data that is directly relevant to developing the CMP.
	Secondary data or report – contains information and/or data that is indirectly relevant to developing the CMP, such as data used for comparison with results, a CMP for adjacent area etc.
	Non relevant data or report – contains little or no information and/or data relevant to the preparation of the CMP and does not need to be reviewed at later stages of the CMP preparation.
	Data gap – data and/or report is not currently known to exist or has not been provided.

Data and Information Review

Doc Ref.	Full Title	Author / Agency	Date	Format	Doc Status	Relevance / Importance	Brief Description
001	Black Head Reserve Community Land: Plan of Management	Kiama Municipal Council	Jun-01	Plan	Received	May be relevant for subsequent stages	<p>A Plan of Management developed by Council in conjunction with the community to identify the important features of the land, clarify how Council will manage the land, and how the land may be used or developed. The land covered by this plan includes all the community land extending from the northern side of Blackhead Point Gerroa around the headland to Burke Parade (public owned land).</p> <p>The Local Government Act 1993 requires that Council prepare a Plan of Management in conjunction with the community to identify the important features of the land, clarify how Council will manage the land and how the land may be used for developed. This POM has been prepared to achieve a balanced, responsible and ecologically sustainable use of the land and to ensure that it addresses the needs of both local and neighbourhood groups and the broader community. It provides appropriate outcomes for the reserve and provides a way for achieving these outcomes through a series of clear strategies and detailed actions.</p>
002	Bonaira Native Garden: Plan of Management	Kiama Municipal Council	Dec-04	Plan	Received	May be relevant for subsequent stages	<p>A Plan of Management developed by Council in conjunction with the community to identify the important features of the land, clarify how Council will manage the land, and how the land may be used or developed.</p>
003	Bonaira Playing Field: Plan of Management	Kiama Municipal Council	Aug-11	Plan	Received	May be relevant for subsequent stages	<p>A Plan of Management developed by Council in conjunction with the community to identify the important features of the land, clarify how Council will manage the land, and how the land may be used or developed. (Near Kendalls Beach).</p>

Data and Information Review

Doc Ref.	Full Title	Author / Agency	Date	Format	Doc Status	Relevance / Importance	Brief Description
004	Kendalls Beach Reserve: Plan of Management	Kiama Municipal Council	Feb-04	Plan	Received	Review in further detail	A Plan of Management developed by Council in conjunction with the community to identify the important features of the land, clarify how Council will manage the land, and how the land may be used or developed. Divided into 4 management units: Beach, grassed areas and embankments, the holiday park and watercourse.
005	Minnamurra Headland Reserve Community Land: Plan of Management	Kiama Municipal Council	Jun-01	Plan	Received	Review in further detail	A Plan of Management developed by Council in conjunction with the community to identify the important features of the land, clarify how Council will manage the land, and how the land may be used or developed. Divided into 2 management units - James Oates Reserve and Headland.
006	Walkers Beach Community Land: Plan of Management	Kiama Municipal Council	Jun-01	Plan	Received	Review in further detail	A Plan of Management developed by Council in conjunction with the community to identify the important features of the land, clarify how Council will manage the land, and how the land may be used or developed.
007	Werri Beach Community Land: Plan of Management	Kiama Municipal Council	Jun-01	Plan	Received	Review in further detail	A Plan of Management developed by Council in conjunction with the community to identify the important features of the land, clarify how Council will manage the land, and how the land may be used or developed.
008	Werri Headland & Boat Harbour Reserve: Plan of Management	Kiama Municipal Council	Jul-09	Plan	Received	May be relevant for subsequent stages	A Plan of Management developed by Council in conjunction with the community to identify the important features of the land, clarify how Council will manage the land, and how the land may be used or developed. Includes: physical features and condition of the land and structures.
009	The Fauna of Kiama Municipality of Kiama South Coast New South Wales - Final Report	Kevin Mills & Associates Ecological and Environmental Consultants	2006	Report	Received	May be relevant for subsequent stages	This report provides an overview of the fauna in the municipality of Kiama. Contains a list of vertebrate fauna species recorded in the area and describes the various types of fauna habitats presents and identifies key habitats and key localities for native fauna.

Data and Information Review

Doc Ref.	Full Title	Author / Agency	Date	Format	Doc Status	Relevance / Importance	Brief Description
010	Illawarra Biodiversity Strategy Vol, 1 Action Plan	Wollongong City Council, Shellharbour City Council and Kiama Municipal Council	2011	Plan	Received	Review in further detail	The aim of this Strategy is to outline how the Illawarra Councils will help meet national and state biodiversity targets and respond to regional issues by identifying key priorities for the next five years. The Local Government Act 1993 charter specifies Council's responsibility to '... properly manage, develop, protect, restore, enhance and conserve the environment of the area for which it is responsible, in a manner that is consistent with and promotes the principles of ecologically sustainable development'. Outlines threats to biodiversity, a summary of biodiversity values and management options/ implementation strategy.
011	Climate Change Adaptation Strategy and Action Plan	Kiama Municipal Council	Jul-09	Plan	Received	May be relevant for subsequent stages	Climate change will present a number of risks and opportunities to Council which will need to be managed or capitalised on to maintain and secure the ongoing prosperity of the region. The Climate Change Adaptation Strategy and Action Plan (CCASAP) have been prepared to provide a coordinated and regional approach to tackling the challenges which climate change will present. Key components of the report are: Strategy: describes main themes for adaption and a framework for how these can be integrated into Councils' existing planning and management framework and Adaption Action Plan: Provides detailed adaption actions to address key climate change risks and is underpinned by strategy.
012	Potential Impacts of Climate Change on the Kiama Local Government Area	CSIRO	Mar-05	Report	Received	May be relevant for subsequent stages	Climate change report that outlined climate change projections and how the climate of Kiama may change (temperature, rainfall, winds, extreme temperatures, drought, extreme rainfall)

Data and Information Review

Doc Ref.	Full Title	Author / Agency	Date	Format	Doc Status	Relevance / Importance	Brief Description
013	Final Kiama Municipal Council Climate Change Risk Assessment	Kiama Municipal Council	Jul-09	Report	Received	May be relevant for subsequent stages	<p>This report documents the first stage of the Climate Change Risk Assessment and Adaptation Project, which was being undertaken for Kiama Municipal Council. The risk assessment focussed on two climate change scenarios, 2050 and 2070. The predicted changes in climate variables were determined using the most up to date information on climate change for the Illawarra region, which included the CSIRO, (2007) Climate Change in Australia and DECC (2008) Summary of climate change impacts – Illawarra region.</p> <p>The risk assessment framework was designed to identify, assess and evaluate risks across four functional areas of Council; planning and development, corporate and community services, infrastructure and infrastructure services and environment.</p>
014	The Natural Vegetation in the Municipality of Kiama New South Wales: Final Report	Kevin Mills & Associates Ecological and Environmental Consultants	Mar-06	Report	Received	May be relevant for subsequent stages	<p>This report was prepared for Kiama Municipal Council, to accompany a map of the natural vegetation in the Kiama Local Government Area (LGA), also prepared by Kevin Mills & Associates in 2005a. The map is stored digitally in Council's Geographic Information System (GIS).</p> <p>The term "natural vegetation" refers, in this report, to areas of native vegetation that have retained most of their structural and floristic characteristics. The term also refers to regrowth that has achieved or has the potential to achieve a near natural structure. Very little vegetation in the Kiama LGA is in a completely natural condition; almost all areas have been logged or partially cleared at some time since European settlement, except for the sandstone communities of the plateaux. Artificial communities are included in the study, for completeness. These include stands of planted trees, patches of exotic trees and Lantana scrub.</p>

Data and Information Review

Doc Ref.	Full Title	Author / Agency	Date	Format	Doc Status	Relevance / Importance	Brief Description
015	Minnamurra River Estuary Management Plan Review	Kiama Municipal Council and Shellharbour City Council	May-03	Plan	Received	May be relevant for subsequent stages	The Minnamurra River Estuary Management Plan was finished in 1995 and was adopted and implemented by KMC and Shellharbour City Councils, Government agencies and community representatives. It was noted that for the plan to remain useful and current, new information and re-evaluation of management recommendations and actions would need to be implemented on a regular basis. Accordingly, this document provides a detailed evaluation of the management issues, objectives, options and results of management actions in the original plan. Key issues identified were: Riverbank erosion and sedimentation, water quality, conservation, road transport corridors, entrance stability, land use management and recreation.
016	Stormwater Management Plan Review	Kiama Municipal Council	Jul-03	Plan	Received	May be relevant for subsequent stages	Review of the Stormwater management plan 1999- in accordance with requirements of Section 12 of the Protection of the environment administration act 1991. Has reviewed all actions set out in original plan to assess the progress made and the appropriateness of ongoing actions and those actions that have not been implemented.

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Doc Ref.	Full Title	Author / Agency	Date	Format	Doc Status	Relevance / Importance	Brief Description
017	Coastal Zone Management Plan for the Crooked River Estuary	Kiama Municipal Council	Nov-15	Plan	Received	May be relevant for subsequent stages	The Crooked River Coastal Zone Management Plan (CRCZMP) recognises the achievements of the CREMP 2003 and seeks to identify new and ongoing threats to the health of the Crooked River estuary, and propose management responses which aim to maintain and improve estuary health. The key management issues identified under this CZMP have been grouped under key strategic areas, these are: 1. Management of catchment inputs 2. Estuary processes 3. Management of aquatic and terrestrial biodiversity 4. Balancing community uses, cultural heritage and ecological values 5. Governance and implementation.
018	Bushland Reserves Plan of Management	Kiama Municipal Council	Jun-96	Plan	Received	No further review required	Management plan is a response to Local Government Act 1992 and is a generic plan of management for community land - Bushland Reserves in this plan. It covers overall management basis, management procedures and action plan

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Doc Ref.	Full Title	Author / Agency	Date	Format	Doc Status	Relevance / Importance	Brief Description
019	Kiama Council Community Strategic Plan 2017-2027	Kiama Municipal Council	-	Plan	Received	Review in further detail	<p>This plan is used by Council to inform decisions made and to set the agenda for long-term planning of projects, infrastructure and services. NSW Integrated Planning and Reporting legislation requires that, with the election of a new Council, as we had in September 2016, this plan be reviewed and updated to ensure it reflects the community's priorities.</p> <p>This Community Strategic Plan (CSP) forms the first layer of the Integrated Planning and Reporting framework. It identifies the Community's vision and objectives for a minimum ten-year period and identifies strategies to work towards achieving these long-term objectives. It addresses social, environmental, economic and civic leadership issues in an integrated manner. Core information used to guide the development of this Plan include demographic profiles, analysis of past performance and projections of future demand. The objectives of this Plan have been aligned with the NSW State Plans 2021 and Destination 2036, the NSW Premier's Priorities, the Illawarra/South Coast Regional Action Plan, and other relevant state and regional plans.</p> <p>"There continues to be strong feelings within the community that any future development must be managed in a way that will maintain and enhance this positive sense of community. Council will be guided and supported by up-to-date knowledge and research into the effects of fire, flood and coastal hazards, potentially exacerbated by future climate change and their risks to both new and existing development."</p>

Data and Information Review

Doc Ref.	Full Title	Author / Agency	Date	Format	Doc Status	Relevance / Importance	Brief Description
020	Regional Scale Coastal Mapping to Underpin Strategic Land Use Planning in Southeast Australia	NSW Office of Environment and Heritage	2016	Academic Paper	Received	May be relevant for subsequent stages	This study develops spatial data to inform strategic land use and coastal planning which considers coastal hazards and the protection, maintenance and in some cases, restoration of our waterways. With climate change and increasing use of coastal systems there is increasing need to identify and manage both current and possible future risk exposure. Mapping is undertaken to allow upfront identification of risks and benefits associated with potential future land use as well fundamental data to help inform coastal assessments. This will help ensure impacts on the coastal environment are minimised and impacts on proposed development from coastal hazards are avoided. The study has several parallel components addressing estuarine water quality and ecosystem health, sea level rise inundation, coastal erosion and sediment/geomorphic setting. Additional benefits of the project include risk-based assessment to enable prioritisation of effort to address existing development which is either exposed to coastal hazards or having an impact on coastal waterways (case study location at Lake Illawarra).
021	Illawarra Shoalhaven Regional Plan: Monitoring Report	NSW Government Planning & Environment	Nov-17	Report	Received	Review in further detail	This report provides an overview of work undertaken by Government and stakeholders to deliver on the regional plans so far, as well as setting out priorities and scheduled work for the next 12 months to continue delivering on the goals for the region.

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Doc Ref.	Full Title	Author / Agency	Date	Format	Doc Status	Relevance / Importance	Brief Description
022	Illawarra Shoalhaven Regional Plan: Implementation Plan 2017-2019	NSW Government Planning & Environment	Nov-17	Plan	Received	Review in further detail	<p>The purpose of this Implementation Plan is to:</p> <ul style="list-style-type: none"> • ensure ongoing collaboration and agreement on the implementation of actions; • assign accountabilities for the implementation of actions; • explain the role of different groups and committees involved in implementation; • guide the Delivery Coordination and Monitoring Committee in its role of overseeing delivery of the Regional Plan; and • inform the Monitoring Report. <p>10 priority actions have been identified for implementation in 2017-19.</p>
023	Illawarra Shoalhaven Regional Plan	NSW Government Planning & Environment	Nov-15	Plan	Received	Review in further detail	<p>The Illawarra-Shoalhaven Regional Plan applies to the Local Government Areas of Kiama, Shellharbour, Shoalhaven and Wollongong. This Regional Plan for the Illawarra-Shoalhaven provides the strategic policy, planning and decision-making framework to guide the region to sustainable growth over the next 20 years. The Plan will be used to drive economic growth in the region. It integrates economic, social and environmental considerations in the interests of achieving ecologically sustainable development for the region. The Regional Plan comprises five goals, 19 directions and 41 actions.</p>

Data and Information Review

Doc Ref.	Full Title	Author / Agency	Date	Format	Doc Status	Relevance / Importance	Brief Description
024	Second-Pass Assessment of Potential Exposure to Shoreline Change in New South Wales, Australia, Using a Sediment Compartments Framework	Michael A. Kinsela, Bradley D. Morris, Michelle Linklater and David J. Hanslow	Aug-17	Academic Paper	Received	May be relevant for subsequent stages	This paper describes a simple and scalable approach for estimating the potential for beach erosion and shoreline change on wave-dominated sandy beaches, using a coastal sediment compartments framework to parameterise the geomorphology and connectivity of sediment-sharing coastal systems. The regional-scale application estimates potential present and future asset exposure to coastal erosion in New South Wales, Australia. The assessment suggests that shoreline recession due to sea-level rise could drive a steep increase in the number and distribution of asset exposure in the present century. The local-scale example demonstrates the potential sensitivity of erosion impacts to the distinctive coastal geomorphology of individual compartments.
025	Jones Beach and Cathedral Rocks Reserve: Plan of Management	Kiama Municipal Council	Aug-14	Plan	Received	Review in further detail	<p>This amended plan of management has been prepared in order to achieve balanced, responsible and ecologically sustainable use of the land and addresses the needs of both local residents and the broader community. It has been prepared to meet the requirements of the Local Government Act 1993. The original plans of management for Jones Beach Reserve and Cathedral Rocks Reserve, adopted by Council on 19 June 2001 as two separate plans of management, have been combined into a single plan of management. The plan of management identifies outcomes and how these outcomes will be achieved through an action plan.</p> <p>The land covered by this plan is located at Jones Beach incorporating the rocky headland at the south end known as Cathedral Rocks and extending further up to the embayment known as the Boneyard in Kiama Downs. The land is public land owned by Kiama Municipal Council and has been classified "community" land under the provisions of the Local Government Act 1993.</p>

Data and Information Review

Doc Ref.	Full Title	Author / Agency	Date	Format	Doc Status	Relevance / Importance	Brief Description
026	Business Development Strategy & Master Plan for Kendalls Beach Holiday Park for Kiama Municipal Council	Integrated Site Design	Aug-17	Plan	Received	May be relevant for subsequent stages	A review of the current design and management of Kendalls Beach Holiday Park (Council freehold land), and a prepared Business Development Strategy and Master Plan to guide future development and operation of the park over the next 10–20 years. This report examines issues associated with the improvement and management of Kendalls Beach Holiday Park. The objective is to develop a commercially sustainable business strategy and master plan with capacity to guide the future operation and improvement of the park.
027	Kiama Council Community Engagement Strategy	Kiama Municipal Council	Dec-15	Plan	Received	Review in further detail	Strategic plan that outlined KMC's framework for how they conduct community engagement following KMC's community vision of to working "together for a healthy, sustainable and caring community". It aims to " Foster positive relationships with our community through open communications, opportunities for participation in decision making and sharing of information." and outlined "golden rules of community engagement" Kiama Council's Community Strategic Plan identifies the long-term community vision as "working together for a healthy, sustainable and caring community".

Data and Information Review

Doc Ref.	Full Title	Author / Agency	Date	Format	Doc Status	Relevance / Importance	Brief Description
028	Kiama Development Control Plan 2012	Kiama Municipal Council	2012	Plan	Received	Review in further detail	<p>Development Control Plans (DCPs) are documents that provide planning and building design guidelines for new development or alterations to existing development. This plan applies to the Kiama Local Government Area</p> <p>The DCP aims to:</p> <ul style="list-style-type: none"> To provide detailed development controls which support the Kiama Local Environmental Plan 2011 To ensure future development responds positively to the qualities of the site and the character of the surrounding locality To ensure that development does not detract from the natural, cultural and agricultural values of the Kiama Local Government Area. To promote development that is sustainable, appropriately designed for the climate and adaptable To promote development that is accessible and adaptable to meet the existing and future needs of all residents To ensure appropriate information is submitted with Development Applications To ensure that development contributes to the quality of the natural and built environments To ensure development is of a high design standard and energy efficient To promote development that encourages liveable, safe and sustainable living and working environments To promote development that adds to the character of Kiama and assists in promoting a liveable, sustainable environment.
029	Kiama Development Control Plan 2012 - Gerringong Headland Site - Chapter 25	Kiama Municipal Council	2012	Report	Received	Review in further detail	Chapter 25 of the 2012 Kiama DCP outlining site specific controls for the Gerringong Headland.

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Doc Ref.	Full Title	Author / Agency	Date	Format	Doc Status	Relevance / Importance	Brief Description
030	A Flexible Approach to Forecasting Coastline Change on Wave-Dominated Beaches	Michael A. Kinsela, Bradley D. Morris, Mare J. A. Daley and David J. Hanslow	2016	Report	Received	May be relevant for subsequent stages	This paper presents a simple yet flexible approach to forecasting coastline change on wave-dominated beaches. The method combines a Monte Carlo simulation approach with a volumetric coastline response model that features a parameterised sediment budget. Model complexity reflects the levels of topographic and geomorphic data typically available for beaches in south-eastern Australia, allowing for the sediment budget parameterisation to be broad or refined.
031	Drainage & Stormwater Factsheet	Kiama Municipal Council	-	Plan	Received	May be relevant for subsequent stages	KMC Drainage and Stormwater factsheet: outlining individual and council responsibilities.
032	Coastal Zone Management Plan for the Minnamurra River Estuary	Kiama Municipal Council	Jun-15	Plan	Received	Review in further detail	This Coastal Zone Management Plan (CZMP) for the Minnamurra River Estuary recognises the achievements of the previous EMP (1995), identifies new management issues that have arisen since the original plan was adopted and addresses the new (2013) State government requirements for coastal zone management. The CZMP supports the goals and objectives of the NSW Coastal Policy 1997 and assists in implementing integrated coastal zone management for the Minnamurra River Estuary. The study area is bounded by the topographical catchment of the Minnamurra River and its tributaries and comprises the tidal waterways, foreshore and adjacent land of the Minnamurra River Estuary including the entrance. The key management actions have been grouped into 6 key strategies: Administration and Delivery of Management Actions, Water Quality Management, Control of Bank Erosion, Protection of Estuarine and Foreshore Habitat, Recreational facilities, Floodplain management.

Data and Information Review

Doc Ref.	Full Title	Author / Agency	Date	Format	Doc Status	Relevance / Importance	Brief Description
033	Remnant Vegetation and River Corridor Action Plan for the Minnamurra Catchment 2002	Kate Harris	2002	Plan	Received	No further review required	An action plan developed for those involved with vegetation management in the Minnamurra Catchment. It was hoped that the maps and information in this report would help to adopt a catchment approach to management. Recommendations for future actions are presented.
034	South Coast Regional Sea Level Rise Policy and Planning Framework	Whitehead & Associates Environmental Consultants	Oct-14	Framework	Received	Review in further detail	A Regional Sea level Rise Planning and Policy Response Framework that will inform coastal planning within the two Local Government Areas (LGAs). This study report outlines the context, methodology and outcomes of our study. Key aims were to develop: Develop regionally relevant sea-level rise projections for the Shoalhaven and Eurobodalla coasts; Develop a "Risk Assessment and Policy Response Framework" to address sea level rise for use by the Partner Councils in strategic planning, development control and consent activities.
035	Stormwater Pollution	Kiama Municipal Council	-	Plan	Received	No further review required	Fact sheet outlining the basics of stormwater pollution.
036	Kiama Urban Strategy	Kiama Municipal Council	Sep-11	Plan	Received	Review in further detail	An urban strategy that addresses population growth, housing needs and land release.
037	Tree Management Procedure for Trees on Public Land	Kiama Municipal Council	Jan-09	Report	Received	No further review required	Kiama Council's Tree Management Procedure will specify the future management of the treescape. Whilst Council can only directly manage trees on land under its control (streets, reserves and Council land) it trusts that this tree management procedure will also assist all property managers in the Municipality to develop an integrated approach to the development of this part of our natural environment. Objectives include: To formally

Data and Information Review

Doc Ref.	Full Title	Author / Agency	Date	Format	Doc Status	Relevance / Importance	Brief Description
							recognise the value of trees as fundamental and intrinsic landscape elements in the urban environment.
038	Werri Lagoon Interim Entrance Management Policy	Kiama Municipal Council	Mar-05	Report	Received	May be relevant for subsequent stages	This Entrance Management Policy describes the procedures and responsibilities for artificial openings of Werri Lagoon entrance and the required response of authorities to natural opening events.
039	East Coast Study Project - National Geomorphic Framework for the Management and Prediction of Coastal Erosion	A Mariana, F Flocard, J T Carley, C Drummond, N Guerry, A D Gordon, R J Cox and I L Turner	May-13	Academic Paper	Received	May be relevant for subsequent stages	Coastal response to extreme events and climate change was assessed at two case study sites along the coast of NSW, Australia. Numerical modelling techniques were used to estimate beach erosion due to storm events with average return periods ranging from 1 to 100 years. Long-term recession due to sea level rise and ongoing sediment imbalance was estimated at the two study sites for the 2100 timeframe using a coastal compartment sediment budget approach.

Data and Information Review

Doc Ref.	Full Title	Author / Agency	Date	Format	Doc Status	Relevance / Importance	Brief Description
040	Kiama Municipal Council Water Sensitive Urban Design Policy	Kiama Municipal Council	Aug-05	Report/Policy	Received	May be relevant for subsequent stages	Outlines KMC's policies relating to WSUD. The objectives of the policy document are to ensure that building design and development incorporates effective water and soil management measures that: minimise adverse impacts on the natural water cycle (where post development conditions mimic the natural hydrologic regime for the broadest range of storm events practicable); reduce nuisance flooding and drainage impacts; reduce potable water demand and promote more efficient use of water; remove water-borne pollutants prior to stormwater discharge to receiving waters; minimise maintenance and infrastructure costs of new development where possible; to protect the biodiversity and ecosystems of local waterways by retaining watercourses, remnant native vegetation, and habitat where possible; avoid concentration of flows prior to discharge into natural streams/receiving waters; meet the Ecologically Sustainable Development requirements set out under the Water Management Act 2000 and the Local Government Act 1993
041	Strategic Tourism and Events Plan 2018 - 2021	KMC, Destination NSW, Peter Valerio	2017	Plan	Received	May be relevant for subsequent stages	Brief Strategic framework brochure outlining Kiama's tourism and events plan for 2018- 2021
042	Kiama Economic Development Strategy	KMC, SGS Economics and Planning	2014	Report	Received	Review in further detail	This Economic Development Strategy aims to prioritise where Kiama Council's resources should be directed to achieve its economic and employment development goals. The six sections showcase the research and consultation underpinning the strategies and actions contained in Section 7 of the report . These recommendations identify specific activities where Council can have a lead role, as well as partnering with other key agencies.

Data and Information Review

Doc Ref.	Full Title	Author / Agency	Date	Format	Doc Status	Relevance / Importance	Brief Description
043	Kiama Local Environmental Plan 2011	KMC	2011	Plan	Received	Review in further detail	<p>This Plan aims to make local environmental planning provisions for land in Kiama in accordance with the relevant standard environmental planning instrument under section 33A of the Act.</p> <p>A Local Environmental Plan (LEP) is a legal document prepared by Council and approved by the State Government to regulate and guide Council's planning decisions regarding land use and development. LEPs allow Council to regulate the ways in which all land, both private and public, can be used and protected through zoning and development controls. They are used to zone and classify land for a range of uses such as for housing, commercial and industrial development, open space and rural development. They are the main planning tool to shape the future of communities and to ensure local development is done appropriately and in an environmentally sensitive manner.</p>
044		EarthCheck	2018	Plan	Received	May be relevant for subsequent stages	<p>The Kiama Tourism Opportunity Plan (TOP) provides direction on the public and private sector investment and activation opportunities which will be instrumental for Kiama in achieving its economic, community and environmental ambitions over the next decade.</p>
045	Valuer General's Report on NSW Land Values at 1 July 2017	NSW Government - Office of the Valuer General	Jan-18		Received	May be relevant for subsequent stages	

Data and Information Review

Doc Ref.	Full Title	Author / Agency	Date	Format	Doc Status	Relevance / Importance	Brief Description
046	State of the beaches 2017-2018	OEH	2018	Report	Received	May be relevant for subsequent stages	The water quality of beaches and other swimming locations is monitored under the NSW Government's Beachwatch programs to provide the community with accurate information on the cleanliness of the water and to enable individuals to make informed decisions about where and when to swim. In 2017–2018 swimming sites in New South Wales performed well with 85% of monitored swimming sites graded as Good or Very Good.
047	Coastal erosion... A "Shore" Thing? A study into the Erosion, Coastal Processes and Management occurring at Kiama's beach-dune systems.	Thomas B. Doyle - UOW	2013	Theses	Received	Review in further detail	A research project was undertaken within the Kiama Local Government Area (LGA), south-eastern Australia, which summarised key baseline information for the coastal zone; and attempted to integrate several methodologies that operate at differing spatial and temporal scales. This will assist the Kiama Municipal Council to assess the effectiveness of current management regimes and develop ongoing management strategies for the future.
048	Kiama Regional Economic Development Strategy 2018 – 2022	AgEconplus Consulting on behalf of KMC	2018	Report	Received	May be relevant for subsequent stages	Regional Economic Development Strategies articulate a framework for identifying actions crucial to achieving the regional vision. Projects listed within this strategy should therefore be viewed as example projects that have emerged from the initial application of the framework. Adoption of these projects would be subject to further evaluative processes.
049	Coastal Erosion in New South Wales Statewide Exposure Assessment	OEH	2017	Report	Received	May be relevant for subsequent stages	This report provides an overview of potential exposure of properties and infrastructure to erosion risks at present and in future. The assessment was done at a statewide scale, and so is not expected to replace the need for detailed local studies, such as recommended for Kiama in Stage 2. However, it may contain useful information for the more detailed Stage 2 hazard assessment.

Governance and Key Legislation**Appendix C Governance and Key Legislation**

Govt Level	Agency / Organisation	Responsibility: Agency / Organisation
Federal	Department of the Environment and Energy	<ul style="list-style-type: none"> • Designs and implements Australian Government policy and programs to protect and conserve the environment, water and heritage, promote climate action, and provide adequate, reliable and affordable energy. • Administers the <i>Environmental Protection and Biodiversity Conservation Act 1999</i> (the EPBC Act). • Heritage items of national environmental significance in and around the Kiama LGA are protected under the EPBC Act. • Threatened species occurring in and around the Kiama LGA are protected under the EPBC Act.
Federal	National Health and Medical Research Council	<ul style="list-style-type: none"> • Australian government body expert body promoting the development and maintenance of public and individual health standards. • Oversees the ongoing development of the National Water Quality Management Strategy, that consists of policy, process and guidelines (including the 'ANZECC guidelines')
State	Department of Planning, Industry and Environment (DPIE)	<ul style="list-style-type: none"> • The department is a combination of a variety former departments/offices, including the Department of Planning and Environment, Department of Industry (DOI), Office of Local Government, Office of Environment and Heritage, Environment Protection Authority, National Parks and Wildlife Service, Marine Infrastructure Delivery Office (MIDO) and DOI Lands and Water. Relevant sections of this department are explained below.
State	DPIE – Environment, Energy and Science (EES)	<ul style="list-style-type: none"> • Agency within the DPIE portfolio. Formerly known as the Office of Environment and Heritage (OEH) • Cares for and protects NSW's environment and heritage (natural, cultural and built), and supports the community, business and government in protecting, strengthening and making the most of a healthy environment and economy in NSW. • Administers the <i>Coastal Management Act 2016</i>, which provides framework for strategic management of the NSW coastal zone now and into the future. • Provides technical advice and financial assistance to Councils with preparing and implementing Coastal Management Programs, in line with the Coastal Management Manual and CM Act. • Administers the <i>Biodiversity Conservation Act 2016</i>, which establishes a balanced approach to land management and biodiversity conservation in NSW.

Governance and Key Legislation

Govt Level	Agency / Organisation	Responsibility: Agency / Organisation
State	DPIE – Crown Lands	<ul style="list-style-type: none"> Agency within DPIE. Formerly known as Department of Industry – Lands and Water. Develops strategy, programs and policy for the management of the Crown land estate and Water, with key business areas aiming to deliver social and economic outcomes for the state. Administers the <i>Crown Land Management Act 2016</i>, which provides for ownership and management of NSW Crown land. Many Crown reserves are managed by Local Government either through appointment as trust managers or by devolvement under the <i>Local Government Act 1993</i>. Approves jetties and other domestic waterfront structures on estuaries not covered by TfNSW. Investigates and assesses Aboriginal land claims across the state under the <i>NSW Aboriginal Land Rights Act 1983</i>. The Crown estate is managed in accordance with Commonwealth Native Title legislation. Manage NSW water resources, both groundwater and surface waters, through planning, policy and regulation including implementing the <i>Water Management Act, 2000</i>.
State	DPIE – Planning and Assessment	<ul style="list-style-type: none"> Administers the Environmental Planning and Assessment Act, including the review and making of LEPs and other gateway determinations, and providing regional to state scale strategic planning, such as documented in the relevant regional plans.
State	DPIE - Office of Local Government	<ul style="list-style-type: none"> Agency within the Department of Planning and Environment portfolio. Formerly known as the Office of Local Government. Is responsible for local government across NSW and is an advisor to the NSW Government on Local Government matters. Has a policy, legislative, investigative and program focus in matters ranging from Local Government finance, infrastructure, governance, performance, collaboration and community engagement. Administers the <i>Local Government Act 1993</i>, which provides the legal framework for the system of local government for New South Wales.
State	DPIE - National Parks and Wildlife Service (NPWS)	<ul style="list-style-type: none"> NPWS manages more than 870 protected areas in NSW including national parks, nature reserves, flora reserves, World Heritage areas, beaches etc. This includes the management on various sites within the Kiama LGA including the Seven Mile Beach National Park, Budderoo National Park and Barren Grounds Nature Reserve
State	DPIE Environment Protection Authority (EPA)	<ul style="list-style-type: none"> The EPA is the primary environmental regulator for NSW and aims to reduce pollution and waste, protect human health and prevent degradation of the environment. The NSW EPA is an independent statutory authority that sits in the Environment Portfolio under the Minister for the Environment as part of the Planning and Environment Cluster. Responsible for administering the <i>Protection of the Environment Operations Act 1997</i>.

Governance and Key Legislation

Govt Level	Agency / Organisation	Responsibility: Agency / Organisation
State	Department of Primary Industries Fisheries	<ul style="list-style-type: none"> Agency within the Department of Primary Industries. Administers the <i>Fisheries Management Act 1994</i>, which provides the legislative framework for conserving, developing and sharing the fishery resources of NSW for present and future generations. Supports economic growth and sustainable access to aquatic resources through commercial and recreational fisheries management, research, aquaculture development, marine protected areas management, habitat protection and rehabilitation, regulation and compliance. Also mitigates and manages risks from use of land and water. Responsible for ensuring that fish stocks are conserved and key fish habitat is protected. Responsible for ensuring the sustainable management of commercial, recreational and Aboriginal cultural fishing, aquaculture, aquatic habitat and biodiversity, and marine protected areas within NSW. Involved in the delivery of the MEM Strategy particularly in regional areas (funding gone directly to Fisheries).
State	Local Land Services	<ul style="list-style-type: none"> LLS are a regionally based NSW Government agency that delivers quality services to farmers, landholders and the community. LLS have 11 regions, one of which is South East (that covers the Kiama LGA). The <i>Local Land Service Act 2013</i> requires the development of regional strategies to set the vision, priorities and strategy for the delivery of LLS in each region. South East Local Land Services consulted with landholders, customers and the community to develop their local strategic plan. The plan was adopted in the June 2016 for the period from 2016 to 2021. Each LLS region is governed by a board of local community representatives. The statewide LLS Board is responsible for safeguarding the delivery of state-wide priorities under the direction of the Minister for Primary Industries. Involved in the delivery of the MEM Strategy particularly in regional areas (funding gone directly to LLS regions).
State	Marine Estate Management Authority	<ul style="list-style-type: none"> The NSW Government Marine Estate Management Authority assists in implementing the Marine Estate Management Strategy to ensure that policies and programs address priority issues, are efficient and evidence based and result in positive outcomes. Their vision is to have a healthy coast and sea managed for the greatest wellbeing of the community now and in the future. The <i>Marine Estate Management Act 2014</i> and <i>Marine Estate Management Regulation 2017</i> provides for the strategic and integrated management of the whole marine estate.
State	NSW Coastal Council	<ul style="list-style-type: none"> The NSW Coastal Council provides independent expert advice to the Minister administering the <i>Coastal Management Act 2016</i> on coastal planning and management issues. The NSW Coastal Council was appointed under the <i>Coastal Management Act 2016</i> and replaced the NSW Coastal Panel and the Coastal Expert Panel. The Minister can request the NSW Coastal Council to audit a local council's implementation of its coastal management program to determine if they are being effectively implemented.

Governance and Key Legislation

Govt Level	Agency / Organisation	Responsibility: Agency / Organisation
State	Transport for NSW (TfNSW)	<ul style="list-style-type: none"> Transport for NSW is the lead agency of the NSW Transport cluster. Tasked with leading the development of a safe, efficient, integrated transport system that connects communities and regions. Responsible for strategy, planning, policy, regulation, funding allocation and other non-service delivery functions for all modes of transport in NSW (including ferry, cycling and walking)
State	Transport for NSW	<ul style="list-style-type: none"> Transport for NSW (TfNSW) is responsible for delivering safe and efficient journeys throughout NSW and managing the operations and programs of waterways (and roads). TfNSW is responsible for administering the following Acts: <ul style="list-style-type: none"> - <i>City of Sydney Act 1988</i>, Part 4A and Schedule 2, jointly with the Minister for Transport (remainder, the Minister for Local Government) - <i>Driving Instructors Act 1992</i> - <i>Heavy Vehicle (Adoption of National Law) Act 2013</i> and the <i>Heavy Vehicle National Law (NSW)</i> - <i>Marine Pollution Act 2012</i> - <i>Marine Safety Act 1998</i> - <i>Marine Safety Legislation (Lakes Hume and Mulwala) Act 2001</i> - <i>Motor Vehicles Taxation Act 1988</i> - <i>Photo Card Act 2005</i> - <i>Ports and Maritime Administration Act 1995</i> - <i>Recreation Vehicles Act 1983</i>, Parts 4 and 6 (remainder, the Minister for the Environment) - <i>Road Transport Act 2013</i> - <i>Roads Act 1993</i> (except parts, jointly the Minister for Primary Industries and other Ministers, parts, the Minister for the Environment, and parts, the Minister for Local Government) - <i>Sydney Harbour Tunnel (Private Joint Venture) Act 1987</i> - <i>Transport Administration Act 1988</i>, Part 4A, Divisions 1 to 3, so far as it relates to Transport for NSW, Part 6, and so much of the Act as relates to Transport for NSW (remainder, the Minister for Transport).

Governance and Key Legislation

Govt Level	Agency / Organisation	Responsibility: Agency / Organisation
State	NSW Land Registry Services (LRS)	<ul style="list-style-type: none"> The NSW LRS maintains a secure, efficient and guaranteed system of land ownership for NSW, defines the legal ownership and boundaries of land parcels throughout the State, both private and public, and records changes as they occur. NSW LRS collects, collates and integrates property information in NSW and makes it readily available. The community, business and government rely on this information for a variety of purposes including land management, conveyancing, property development, investment, local planning, state economic and social development and historical research.
State	NSW Treasury	<ul style="list-style-type: none"> NSW Treasury manage the State's finances and assets, monitor the performance of its commercial agencies and develop its financial and industrial relations policies. They assist the NSW government in establishing, implementing and delivering the State Budget and provide funding to government agencies and programs.
State	Department of Infrastructure, Regional Development and Cities, Regional Development Australia – Illawarra	<ul style="list-style-type: none"> Regional Development Australia (RDA) is a joint partnership between the Australian, State, Territory and Local Government to support growth and development of Australia Region; RDA Illawarra is one of 14 committees in NSW and covers the local government areas of Wollongong, Shellharbour and Kiama. RDA Illawarra's current priorities include enabling infrastructure to improve connectivity and unlock investment opportunities, supporting development and capability of industry growth sectors and leveraging a collaborative regional culture and working together on innovative solutions.
State	Destination NSW	<ul style="list-style-type: none"> Destination NSW is the lead government agency responsible for the major events and tourism sectors. Their role is to devise and implement strategies to grow the State's visitor economy.
State	Independent Pricing and Regulatory Tribunal	<ul style="list-style-type: none"> IPART provides advice and independent regulatory decisions to protect and promote the interests of taxpayers, citizens and consumers of NSW. They are the independent pricing regulator for water, public transport and local government as well as the licence administrator of water, gas and electricity. IPART is responsible for reviewing Kiama Municipal Council special rate variation requests etc.
State	Infrastructure NSW	<ul style="list-style-type: none"> Infrastructure NSW is an independent statutory agency tasked with identifying and prioritising the delivery of critical public infrastructure for NSW.
State	Local Government NSW	<ul style="list-style-type: none"> Local Government NSW is the industry association that represents the interests of NSW general and special purpose councils.

Governance and Key Legislation

Govt Level	Agency / Organisation	Responsibility: Agency / Organisation
Local	Illawarra Local Aboriginal Land Council	<ul style="list-style-type: none"> LALCs are established following the <i>Aboriginal Land Rights Act 1983 (ALRA)</i> and are bound by key legislative requirements in the amended ALRA. The objects of each LALC are to "improve, protect and foster the best interests of all Aboriginal persons within the Council's area and other persons who are members of the Council". Functions include acquiring and managing land, and promoting/protecting culture and heritage, facilitating business enterprise, provide community benefits
Local	Kiama Municipal Council	<ul style="list-style-type: none"> Each local council is an independent entity responsible for administering the local government area over which it has jurisdiction as per the <i>Local Government Act 1993</i>. Council is responsible for administering various legislation and developing their own plans and policies for their LGA (i.e. LEPs, CMPs etc). Council has key responsibilities in relation to Coastal Zone Management in the LGA including: coastal management works, land use planning, development approval, water quality and pollution regulation, open space and stormwater management etc. Councils service provision is undertaken through its Integrated Planning and Reporting (IPR) Framework, which consists of a Community Strategic Plan, 4 year Delivery Program, 1 year Operational Plan and various 10 year financial plans for assets, staff resources etc. Actions of the CMP that are councils responsibility are expected to be implemented via the CMP.
Local	Illawarra Shoalhaven Joint Organisation (ISJO)	<ul style="list-style-type: none"> ISJO is a voluntary organisation comprised of four councils who represent over 400,000 residents. ISJO work together to address regional issues, work co-operatively for the benefit of the region and advocate on agreed regional positions and priorities. They aim to improve the wellbeing of our communities on the South Coast, through working with state and federal governments to bring services and funds into the region.

Appendix D Community Consultation Outcomes Summary

D.1 Community Online Survey

D.1.1 Demographics

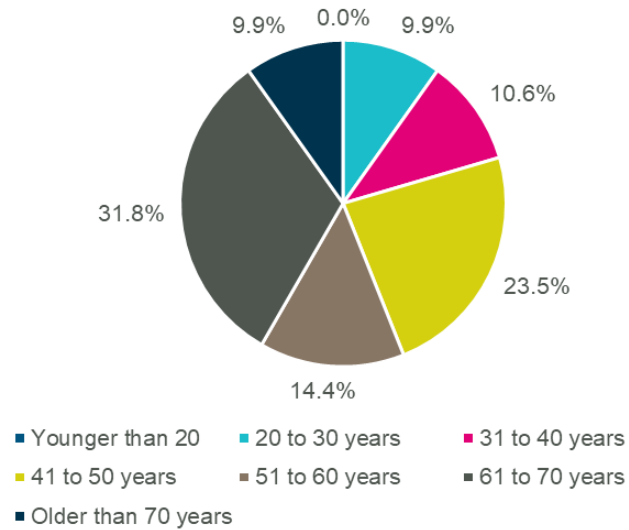


Figure D-1 Community Survey Responses: Age

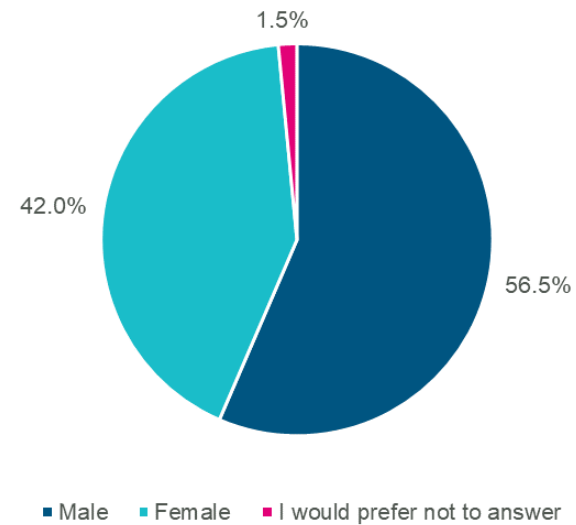


Figure D-2 Community Survey Responses: Gender

Community Consultation Outcomes Summary

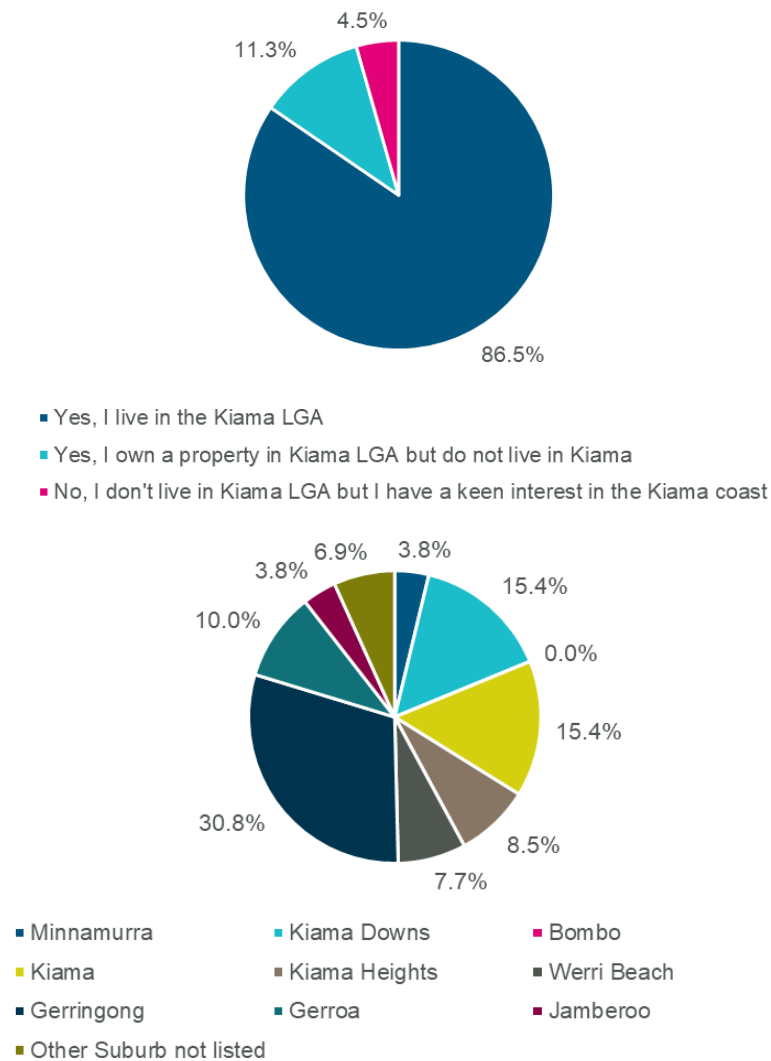
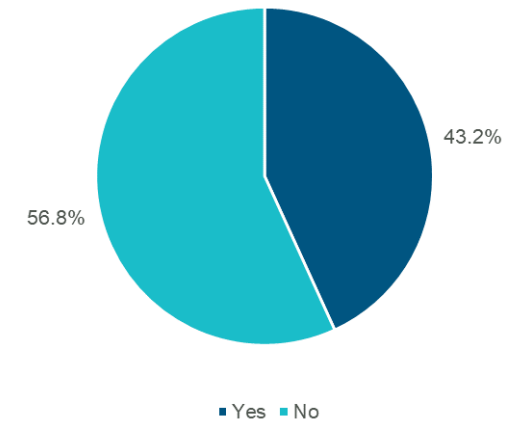


Figure D-3 Community Survey Responses: Study Area Connection

Other suburbs indicated by survey responses included: Foxground, Killalea, Toolijooa, Berry, Sydney and Saddleback Mountain.

D.1.2 Community Interest Groups



Of the 57 respondents that identified themselves as members of a community interest group, the following groups were indicated:

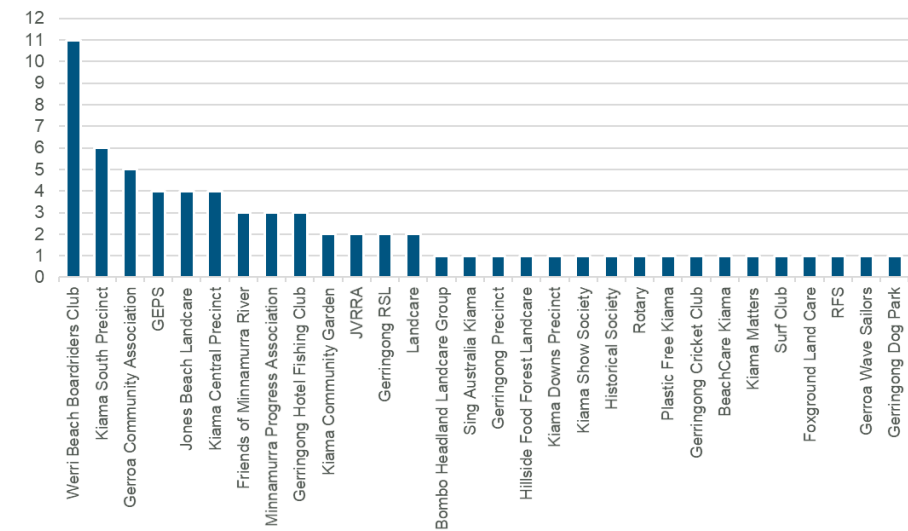


Figure D-4 Community Survey Responses: Community Interest Groups

Community Consultation Outcomes Summary

D.1.3 Community “Visions”



Figure D-5 Community Vision WordMap

Key “visions” include:

- Public spaces for all
- Less commercial activities and ‘privatisation’
- Dune management
- Maintained facilities and access
- Natural protected coastline
- Education programs
- Fact based, scientific decision making
- Safe, free and easily accessible

- Clean beaches
- Protected natural environment and wildlife habitats
- Natural beauty and scenic values
- Undeveloped nature
- Clean and clear waters
- Sustainability
- Risk management
- Places for all users
- Beach amenity and recreational values

Community Consultation Outcomes Summary

D.1.4 Community Values

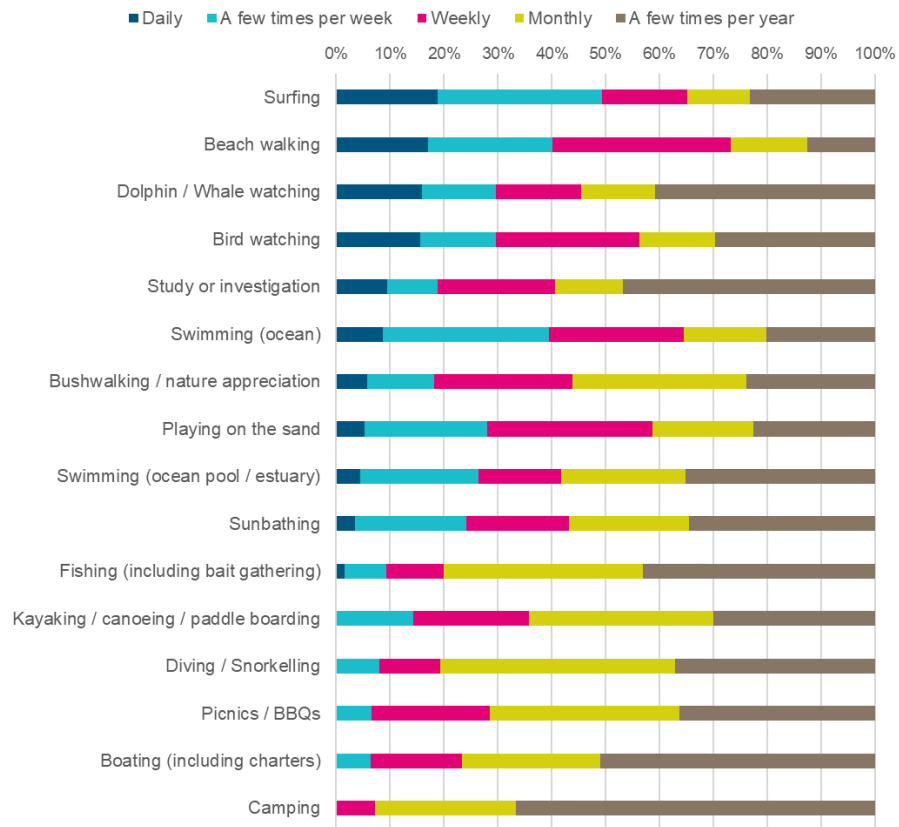


Figure D-6 Community Survey Responses: Recreational Activities Undertaken on Kiama Coast and Beaches

Other Recreational Activities the Community Undertake on the Kiama Coast and Beaches:

- Landcare and bush regeneration
- Wildlife watching

- Picking up rubbish on beaches
- Dog walking
- Native plant photography
- Cycling
- Walking, Running and Gym Activities
- Fishing
- Coastal sketching, drawing and photography
- Sight-seeing and visiting attractions
- Coastal drives
- Windsurfing
- Yoga, meditation and aerobic gym activity
- Using metal detectors
- Hermit crab racing
- Environmental and rural appreciation

Locations where the Community Regularly Undertakes these Activities:

- Werri Beach (and reserves) – swimming, boating, fishing, sand play, picnics, walking, surfing, bird watching, dolphin/whale watching, cycling, running, photography and snorkelling
- Seven Mile Beach – swimming, boating, fishing, surfing, paddle boarding, walking, sun bathing, sand play, study/investigation, dolphin/whale watching, bird watching, wind surfing, running and kayaking
- Jones Beach – swimming, boating, surfing, snorkelling, bird watching, nature appreciation, dog walking and fishing

Community Consultation Outcomes Summary

- Kiama Coast Walk – Walking, running, exercise, bird watching, whale watching, nature appreciation and photography
- Minnamurra River and Estuary – swimming, bird watching, bush walking, picnics, sand play, paddle boarding, kayaking, fishing, canoeing and boating
- Surf Beach – swimming, sand play, walking, snorkelling and picnics
- Boneyard – swimming, sand play, kayaking, snorkelling, bush walking and picnics
- Gerroa – Windsurfing, paddle boarding, swimming, surfing, sand play, bird watching, bush walking, sun bathing and whale watching
- Kendalls Beach – swimming, sand play, walking, dog walking, nature appreciation, snorkelling, surfing and picnics
- Bombo Beach and Headland – surfing, swimming, whale watching, sand play, walking, fishing, snorkelling and dog walking
- Werri Headland and Lagoon – sand play, picnics, walking, bird watching, swimming and photography
- Black Head Gerroa – snorkelling, fishing, bird watching, whale watching and diving
- Kiama (including blowholes and seapools) – land care and cycling
- Boat Harbour – fishing, boating, snorkelling, diving, swimming
- Crooked River Mouth – picnics, kayaking, swimming, fishing, walking, bird watching, boating and sand play
- Ricketts Reserve – picnics
- Little Beach – picnics
- Redhead – snorkelling
- Campbell's Hole – snorkelling
- Gerringong – surfing, bush walking
- Minnamurra Beach – surfing, snorkelling, swimming and picnics
- Mystics Beach – swimming
- East Beach – swimming, sand play and walking
- Rockpools – swimming and sand play
- Black Beach

Community Consultation Outcomes Summary**Table D-1 Community Survey Responses: Most Important Values of Kiama Coast and Beaches**

Value	Count
Free and safe / easily accessible / provision of facilities i.e. toilets, walkways, parking	60
Pollution control / cleanliness	52
Wildlife habitat / natural environment protected / preserved	37
Fair and equitable usage of beaches / public usage / no overcrowding or commercial operations	36
Scenery / scenic values / aesthetics / natural beauty	32
Undeveloped nature (in terms of human structures) / no more development	22
Clean, clear waters / water quality / mangrove and floodplain health	14
Sustainability / risk management i.e. SLR, inundation, erosion etc.	10
Provision of off-leash dog areas / dog friendly on- and off-leash areas	7
Beach amenity / open space / recreational value	7
Waves / Surf quality	6
Transparency and education about coastal risks / warning signage	4
Reasonable planning outcomes / sustainable empathetic development	3
Weed management	3
Natural vegetation / ecological integrity / natural dunes	2
Coastal geology / geography	2
Get rid of vegetation / reduced vegetation height	2

Value	Count
Fishing access	1
Overnight free camping	1
Dog free / fishing free	1
Historical sites / Interaction of indigenous, colonial and settlement	1

**Figure D-7 Community Online Survey Responses: Coastal Values**

Community Consultation Outcomes Summary

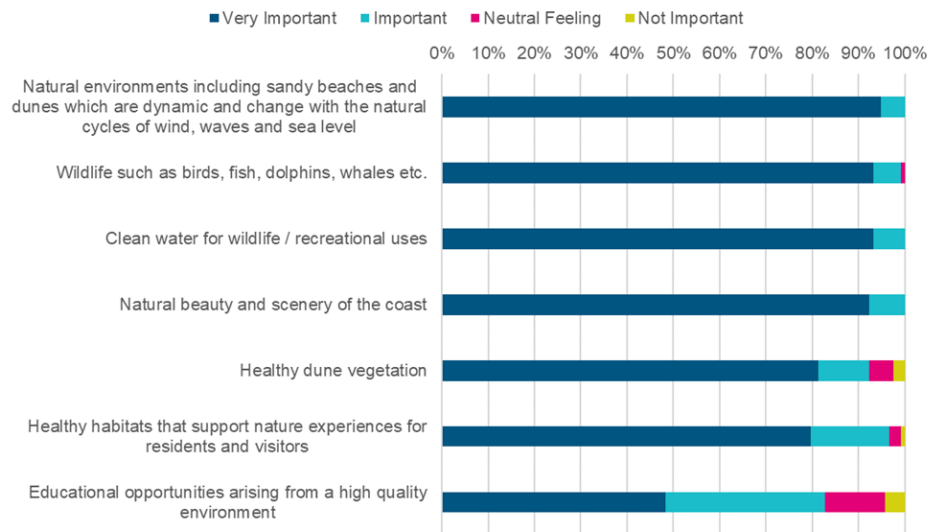


Figure D-8 Community Survey Responses: Importance of Natural Values

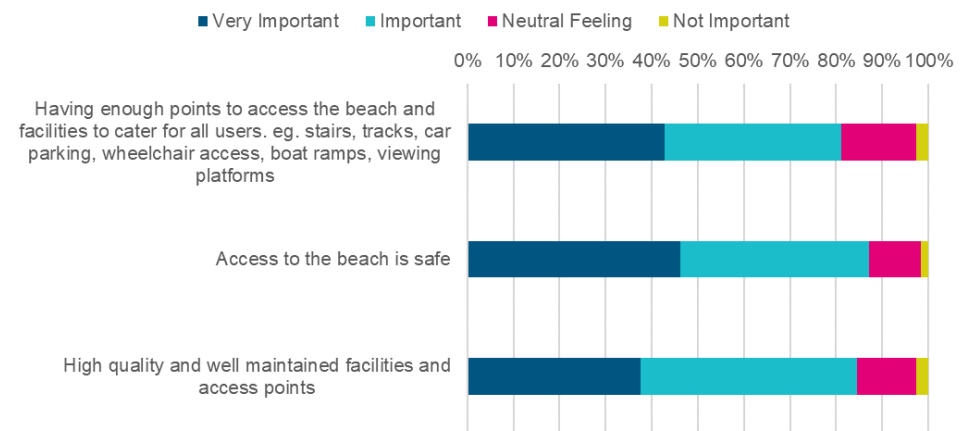


Figure D-9 Community Survey Responses: Importance of Access and Facilities

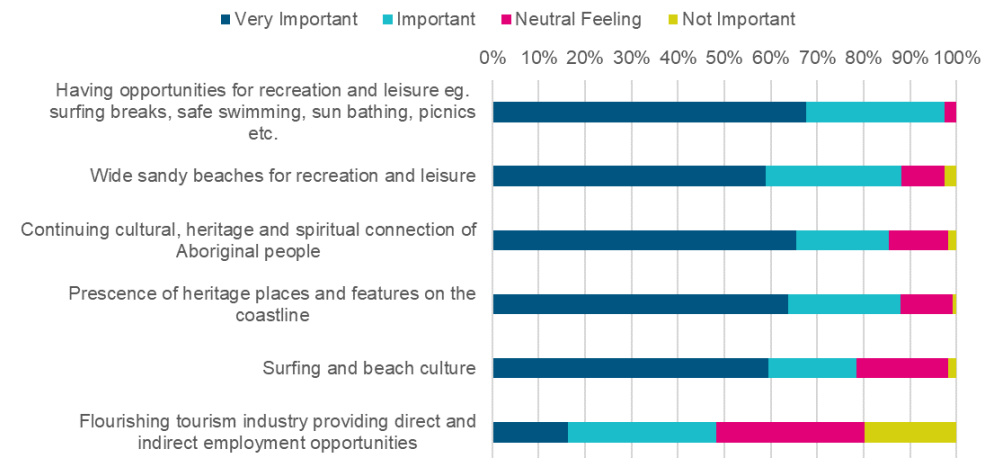


Figure D-10 Community Survey Responses: Importance of Recreation, Leisure and Culture

Community Consultation Outcomes Summary

D.1.5 Community Issues



Figure D-11 Community Survey Responses: Coastal Issues

Table D-2 Community Survey Responses: Key Threats to the Kiama Coast and Beaches

Threat	Count
Inappropriate development / over development	51
Commercialisation of public beaches i.e. the surf schools	33
Pollution (mainly plastics but also rubbish, fishlines, hooks etc.)	28
Climate change and associated issues (sea level rise etc.)	24
Overcrowding / population growth	22
Tourism / over-tourism	16
Replanting of inappropriate dune vegetation / lack of dune maintenance	14
Council – pro development, disinterested in preserving natural environment and amenity	12
Illegal vegetation poisoning and clearing by nearby residents	11
In appropriate commercial activities i.e. sand mining	7
Overfishing – by industrial trawlers and recreational fishers (non-compliance with bag limits)	7
Invasive vegetation species / weed control	7
Increased Motor crafts i.e. boats and jet skis	4
Stormwater and catchment runoff	4
Lack of community education	3
Coastal vegetation loss	3
Illegal campers	3
Siltation issues in creeks	2
Informal dune accessways	2
Management of estuary and lagoon outlets	2
Overregulation	2

Community Consultation Outcomes Summary

Threat	Count
Lack of resources i.e. funding	1
Pesticide / herbicide usage	1

D.1.6 Future Management and Improvements

Changes or improvements that the community would like to see in the way the Kiama coast is managed:

Table D-3 Community Survey Responses: Changes / Improvements in Kiama Coast Management

Future Management	Count
Stronger stance on protection of public open space from being 'privatised' / Less commercial activities / privatising of beaches (i.e. dominantly surf schools)	21
Focus on / Better dune management i.e. planting diversity, increase restoration sites etc.	17
Additional / better maintained accessways and facilities (toilets, walkways, bins etc.) to relieve overcrowding issues	12
More active compliance policing / management for inappropriate behaviour and pollution	11
Keep coastline as natural / protected as possible	9
Stronger stance / controls around overdevelopment and inappropriate development	9
Stronger policy protection/compliance around coastal vegetation and clearing of dune vegetation	8
Education programs (focus on dune vegetation value, pesticide usage, climate change)	6
Fact based, scientifically designed policy and decision making	5
Habitat restoration for wildlife	4
Improved vermin and weed control	4

Future Management	Count
Address coastal hazard issues and climate change i.e. erosion, climate impacts	4
Engage with and leverage community involvement	3
Increased monitoring and reporting on coastal zone health and environmental values	3
Better stormwater management i.e. GPTs etc.	3
Policing of carparks being used as illegal campgrounds	2
Artificial reefs	2
Construction of sea pools / natural rock pool (similar to that constructed at Avoca Beach)	2
Increased acknowledgement and identification of historical and cultural landmarks	2
Compliance action on unlawful works carried out in waterways	1
Improved traffic management	1
Stronger development controls i.e. building sites sediment control	1
Break wall at Boat Harbour	1
Commercial fishing ban	1
Better maintenance in areas outside of Kiama itself	1
Better communication to community on environmental strategies and what is being done	1
Increase RV and caravan friendly facilities in area	1
More dog friendly beach areas	1
Reduce tourism promotion of Kiama for summer	1

Community Consultation Outcomes Summary

D.2 Community Drop-In Sessions

The following summary documents the key feedback received at the community drop in session held during the Kiama CMP scoping study project.

D.2.1 Bombo Beach

Threats:

- Runoff from spring creek – dogs in the area can get dirty
- Water quality
- Sewage spills, pollution, plastics from runoff
- Storm surges – increased intensity – quality of building materials so private property at increased risk
- Construction of ugly carpark is an impact on the iconic reserve
- Sea urchin “extraction” and recreational fishing threats to biodiversity and safety

Values:

- High value – maintain public access/ visits while protecting shore processes/ biodiversity

Room for Improvement:

- Pollution/ trash

D.2.2 Easts Beach, Kendalls Beach and Surf Beach

Threats:

- Concrete drain from urban area
- Poor water quality/ drainage from urban area

- Threatened communities around little blowhole that have been compromised
- Need for more sand on beach to retain sand
- Threatened endangered communities – littoral rainforest
- Too many new houses
- Storm surge – inundation
- Increased intensity of storms, quality of buildings, insurability, materials public/ private property at increased risk

Values:

- Kaleula headland Landcare group – TEC
- Themada grass on coastal headland TEC
- Little blowhole
- Visual amenity
- Public amenity
- Protection of shore processes/ biodiversity

Room for Improvement:

- Improved signage for coastal track
- Would be great if coastal track was a suspended path – so people can walk the reserve and not the streets

D.2.3 Jones Beach

Threats:

- Ocean storms

Community Consultation Outcomes Summary

- Loss of habitat for wildlife
- Degradation of visual amenity from vegetation loss
- Clearing of dune vegetation
- Vandalism/ poisoning o trees and destruction for firewood
- Invasive species – lantana, moth vine
- Poisoning of vegetation
- Fencing damaged
- Foot traffic
- Coastal inundation – risk if vegetation is removed
- Littoral rain forest (EEC) – complex weed infestation
- Minnamurra – coastal littoral rainforest has lantana and bitou bush
- Issue of dogs in the estuary – especially in summer
- Growth continues to encroach onto beach, diminishing usable sand
- Obstruction of line of site from surf club by vegetation
- Storm water pollution
- Dune vegetation
- Potential sea level rise impacts – storm surge – also referenced 1974 storm surge

Values:

- Habitat
- Dune storm protection
- Vegetation aesthetics

- Biodiversity
- A place that improves wellbeing of those that visit it due to natural values
- Dog off leash – great community building
- Habitat value
- Dunes helping to protect houses however many residents want vegetation chopped down
- Biodiversity
- Bombo headland Landcare group – successful group of 25 years but need help with maintenance
- Dune vegetation for beach stability and creating habitat for wildlife

Room for Improvement:

- Dune/ vegetation management
- Current weed management and replanting of native vegetation is carried out by Bombo headland Landcare but more assistance from council would be welcome (jones beach receives 12000 assistance but BHL care receive none)
- Current vegetation is currently being degraded/ removed and destroyed by individuals with no qualifications in native vegetation community management
- Funds for maintenance of fences and walkways
- Resident should be encouraged to be involved in management of jones beach
- Science dominated decision making should be general principle
- Need formalised access tracks across dunes

Community Consultation Outcomes Summary

- Need more infrastructure on beach as to not get sandy
- Need gross pollutant traps for storm water pollution
- No reason for plants to be any higher than 1-2 metres. Remove invasive species e.g. New Zealand tea-tree and plant low lying shrub that will satisfy dune stability requirements
- Remove all dead vegetation
- Return beach to “natural state” prior to the planting of trees

D.2.4 Werri Beach

Threats:

- Weed control – toxic to native plants and marine life
- Morning glory is out of control – removing for 12 years
- Possible runoff from possible abattoir
- Sea level rise
- Storm surge, wind driven tidal increase
- Lack of dune protection – Bruun Rule – loss of beach sand
- Retaining walls – filled with earth to extent properties flat areas
- Coastal erosion,
- Loss of biodiversity
- Loss of aesthetics
- Loss of EEC remnant
- Blue metal on rails
- Miseducation is rife regarding appropriate vegetation for dunes

Values:

- Historical plantings from Landcare/ dune care group
- Dune vegetation – dune care group has been working in this area across entire beach for number of years
- Previously the site of a grinding bowl – now lost but may be grinding grooves in areas
- Site of aboriginal midden
- Remnant littoral rainforest is a significant EEC and was originally much more extensive at this site

Room for Improvement:

- Improved management/ education / elimination of pesticide use from farmlands / residents/ local government
- No more round-up/ aerial spraying
- Frequent water analysis / Landcare management
- Improved regulations of fishing activities – excessive catch quotas and disposal activities require attention
- Rockpool/ rock shelf / marine life – excessive visitations to these locations during peak times
- Hazardous ingredient in sunscreen - need to review and educate on the effects of chemicals ins sunscreen
- Landcare management major room for improvement and compliance of removal of poisoning vegetation

Community Consultation Outcomes Summary

- Dune management is being managed to maintain views of relatively few residents so plants of any height are not being planted – littoral rainforest species are disappearing.
- Improved management of Werri lagoon
- Cattle have been removed from area so has improved. Could be a really good bird sanctuary area
- Some rainforest species degraded

D.2.5 Seven Mile Beach

Threats:

- 6 x EECs from hind dune to western wetland
- Increased visitation – impact to beach and amenity
- Boat launching facility is a value but potential conflicts between users
- Surf schools utilising reserve for equipment and taking up parking spots
- Swamp oak forest EEC, swamp sclerophyll EEC
- Sand resource
- Acid sulphate soil impacts due to proposed CB's sand mine "modification" 2008
- fish kills, vegetation poisoning
- Surf school using most popular section of beach (zone A) removing very popular section of the beach for general public. Also taking up area where boats launch, taking parking spaces and using reserve,
- Exposure to acid sulphate soils
- Increased visitation – threat to public amenity

- Board walk from entrance
- Increased runoff from development in Gerringong
- Noxious weeds
- Rabbits

Values:

- Littoral rainforest area
- Landcare group revegetating the area
- Pied oyster catcher nesting area and feeding and foraging area
- World famous wind surfing and kite surfing x 2
- Shallow sand bar immediately west of the river is ideal learn to surf zone because the waves break softly and gently, which is required by young children who need to learn to surf in non-threatening surf zone
- Complex littoral rainforest EEC
- Shallow sand bar immediately west of the river is ideal learn to surf zone
- Aboriginal burial site
- Four EEC communities
- Ensure minimal commercialisation of public land - Disabled surfing association utilise this area, Gerringong nippers run in these areas, surf schools who utilise the beach in general
- Varied use for general public – being accessible
- Boat launching facility
- Biodiversity/ threatened species/ wildlife corridor
- Highly value remnant

Community Consultation Outcomes Summary

- Great use of recycled water for Agriculture
- Landcare groups and dune care

Room for Improvement:

- Boardwalk from track 3 to track 1 needs improvement
- Establish off road cycleway from Gerroa to Berry Beach Road
- Area to the north of waste treatment plant had 20 000 trees planted by Gerroa community and GEPs around 2000. The area to west of WWTP needs to be planted out to reduce weed infestation and return to as much possible after 1986-89 clearing
- South west from track 6 – surf school numbers 240 pupils x 5 times day is too heavy traffic for beach and adjacent tracks
- Extend coastal walking track
- Coastal headlands restore native vegetation
- Walking track Gerringong – Gerroa

D.2.6 Additional Areas

Threats:

- Sand mining is a big issue
- Taking sea urchins by harbour and big continental pool – taking bucketful

Values:

- At least 8 Landcare groups in Kiama (Seven Mile, Werri, Little Blow Hole, Bombo Headland, Bombo, Bombo Outlook, Jones Beach, Kaleula Headland)

Room for Improvement:

- The coastal track between Kiama and Gerringong could be improved by “Levelling” the path with a grader a bit better. It is bad for walkers knees/hips/ ankles to walk on a slope – it will cost very little and will naturally grass over. Would be great if the walk was extended to Gerroa and then through the national park to Shoalhaven heads
- The coastal track between Kiama and Gerringong → Lots of small patches of littoral rainforest on properties along the coastline. Orchids in littoral rainforests
- Gerringong boat harbour to Gerroa park → concrete path to walkers beach, the green path around the headland could easily be graded to be level so people are not straining their ankles/ knees/ hips walking on a slope the grass cover will quickly be replaced, there are two areas below the pumping station near carpark on Headland Dr where the steep eroding and dangerous path needs grading and the nearby drainage creek needs proper piece of bridging placed over it to improve the track
- Black headland → needs some topsoil to allow the grass to cover the headland to improve the amenity, a whale watching platform would be nice, interpretive boards about whales/ seals / fossils. History Kingsford smith etc is needed
- Extend Kiama coastal walk from Boat Harbour to Black head, Gerroa
- Dune care/ Landcare – more funding required.

Stakeholder Workshop Outcomes – Visioning and First Pass Risk Assessment

Appendix E Stakeholder Workshop Outcomes – Visioning and First Pass Risk Assessment

Stakeholder Workshop Outcomes – Visioning and First Pass Risk Assessment**E.1 Activity 1: Visioning****One word to describe the Kiama Coastline (ranked by workshop votes):**

- Iconic - 5
- Beautiful - 5
- Diverse - 4
- Balanced - 4
- Accessible - 3
- Colourful - 3
- Rugged - 2
- Home - 1
- Oceanic - 1
- Natural value - 0
- Unique - 0
- Magical - 0
- Opportunity - 0
- Decimated - 0
- Impacted - 0
- Valued - 0
- Peaceful - 0
- Colourscape - 0
- Welcoming - 0

Unique Values / Local Characteristics and Future Management:

- “Fortress Kiama” (maintaining uniqueness, separation of townships, maintaining balanced development)
- Agricultural land use bordering the coast
- Accessible x 2
- Remoteness - Accessible but balanced can still find rugged remote areas
- Protect - Over-development concern
- Scenery - Headlands
- Character – maintaining it x 2
- Maintain diversity
- Sustainable landuse
- Landforms - Hills to the sea
- Undeveloped (in relative terms) – keep that
- Egalitarian
- Low Density - Maintain the low density / development controls
- Scenic vistas – dramatic x 2
- Visual landscape from north to south – need to maintain and protect those values against individual and owner expectations
- Being prepared - Keep up with services – add to unique values but also maintain essential values / prepared “future-proof”
- “Gateway” to the south coast
- Sustained

Stakeholder Workshop Outcomes – Visioning and First Pass Risk Assessment

- Colourscape – character, architecture, separation of towns and villages, vegetation and coastal landscape transition from forest and agriculture to coastline
- Maintained - Custodianship type role in protecting the gem of the region
- Massive influx in visitation – survey results: lots of external visitation from outside areas
- Bombo landscape – raised landforms, natural landscape with highway and infrastructure. Its dramatic, townships have a human scale but landscape is stunning and dramatic
- Uncrowded - Aim for uncrowded / maintain the above “feel” – no high-rises

E.2 Activity 2: Values

E.2.1 Environmental

Environmental values (ranked by workshop votes):

- (1) *Biodiversity and dune vegetation:* (Variety of natural areas i.e. wetlands, beach, river systems, biodiversity across diverse landforms i.e. escarpment, floodplain and coast, coastal dunal systems with natural vegetation for biodiversity and natural defences, diversity of vegetation communities on coastal plain and escarpment, green even in times of drought, maintenance and enhancement of biodiversity within the coastal zone, environmentally significant areas preserved) – 9
- (2) *Scenic landforms and natural beauty:* (Unique, protection, maintain scenic beauty, special geological formations i.e. fossils and volcanics, beautiful) – 6
- (3) *Cultural heritage:* (Aboriginal heritage) – 4

- (4) *Recreation and accessibility:* (Foreshore areas under public ownership for the enjoyment of all, not over development but under threat, accessibility, the importance of engaging with but not degrading the environment, recreational) – 3
- (5) *Threats:* (Strain on the beaches, threatened, sea level rise) – 1
- (6) *Diverse:* (Diversity, environmental diversity, nurturing, natural, feeling of wellbeing) – 0

E.2.2 Social

Social values (ranked by workshop votes):

- (1) *Small, connected communities:* (Small connected communities, small communities, sense of community) – 7
- (2) *Sustainable development:* (Keeping Kiama Kiama, sustainable development to maintain village feel and character) – 3
- (3) *Accessibility:* (Access, accessibilities – public access via reserves and coastal walk on private lands) – 1
- (4) *Aboriginal, heritage and culture:* (Aboriginal heritage, aboriginal cultural heritage, greater understanding and emphasis on Aboriginal heritage values) – 1
- (5) *Connection:* (well-connected communities within the Kiama LGA and close to Wollongong and Sydney, connected communities via coastal activities and shared values) – 1
- (6) *Socialisation, participation and interaction:* (Recreational boating, social interactions i.e. surfing groups, nippers) – 1

Stakeholder Workshop Outcomes – Visioning and First Pass Risk Assessment

- (7) *Respectful guardianship of coast*: (Understanding / respect of the beaches, understanding and respect, community ownership looking after coastline and its values) – 1
- (8) *Supportive*: (supportive, nurturing, feeling of wellbeing) – 0
- (9) *Healthy*: (Healthy) – 0
- (10) *Engaged community*: (Engaged, participative community) – 0
- (11) *Safety*: (minimal crime in the LGA) – 0

E.2.3 Economic

Economic values (ranked by workshop votes):

- (1) *Sustainable economic growth*: (sustainable economic growth, sustainable but preserved, not over developed but under threat, over development, relatively uncommercialized) – 13
- (2) *Sustainable tourism industry*: (opportunity for sustainable tourism, tourism, tourism and living, tourism opportunities and money brings to local economy, sustainable tourism industry that is balanced with capacity e.g. not overcrowded or overcommercialised, opportunities with Harbour) – 2
- (3) *Aboriginal heritage*: (Aboriginal heritage) – 1
- (4) *Balance*: (Balanced) – 1
- (5) *Industry, Trade and Commerce*: (there is still “dairies” in operation, maintenance of diverse economic contributes) – 0

E.3 Activity 3: Coastal Hazard FPRA

E.3.1 Coastal/Beach Erosion and Shoreline Recession

Table E-1 Coastal and Beach Erosion and Shoreline Recession First Pass Risk Assessment

Location	Broadly, what is the level of risk? High / Medium / Low or N/A		What management arrangements are in place to manage this risk? E.g. Policy (Local / Regional / State) - On ground works - Structure - Resources	Is it adequate? Why? E.g. \$ People Information Legislation / Policy Planning Controls Coordination Other	Is existing information about the risk Adequate / Moderate / Inadequate?	What are the key gaps in information / data / knowledge? (Please explain)	What is the level of threat likely to be in future? (H - M - L) Consider Sea Level Rise and Climate change, as well as population pressures, coastal development etc.		Are existing management arrangements adequate to manage the threat in future? (Yes / No)	What else is needed to manage this risk now or in the future?	Comments
	Beach Erosion: Present Day	Shoreline Recession: Present Day					Beach Erosion: Future	Shoreline Recession: Future			
Minnamurra Beach	Low – no development infrastructure, natural environment	Low	<ul style="list-style-type: none"> Generic Kiama Plan of Management for public reserves LEP Kiama 2011 - coastal building setback line (residential areas) CZMP / Estuary management plan Adapt Water 	Inadequate: \$ Legislation / Policy	Information not currently available to determine risk	<ul style="list-style-type: none"> Coastal hazards and processes information Cultural heritage Local planning provisions need to be reviewed Extent of sea-level rise and storm events 	Medium Low	Medium Low	No		Aboriginal midden has needed protection in the past
Jones / Boyd Beach	Medium / Low (with dune and vegetation is reasonably low currently)	Low	<ul style="list-style-type: none"> Dune restoration works Plan of management (needs more detail) Private / Local 	Inadequate: \$ Legislation / Policy Planning Controls Coordination	Plan of management has recently been watered down	<ul style="list-style-type: none"> Coastal hazards and processes information Cultural heritage Local planning provisions need to be reviewed Extent of sea-level rise and storm events 	High Medium	Medium Medium	No		Grass reserve behind need technical assessment
Bombo Beach	Medium – Spring Creek/Quarry water flows localised issue for current erosion Medium – Sydney Water infrastructure, road and rail etc. Longer beach, more exposed	Low – managed by rock walls/engineered works High	<ul style="list-style-type: none"> Managing Spring Creek /Quarry outlet flows State Assets Adapt water 	Inadequate: \$ Legislation / Policy Planning Controls Coordination	Information not currently available to determine risk More integrated incident planning	<ul style="list-style-type: none"> Coastal hazards and processes information Cultural heritage Local planning provisions need to be reviewed Extent of sea-level rise and storm events 	High Medium / High	Medium Medium / High	No		Dune is currently being eroded due to outlet from quarry works
Black Beach / Kiama Harbour	Medium / High – rock walls, rebuilding/ maintaining wall Low	Low	<ul style="list-style-type: none"> Rock wall State assets 	Inadequate: \$ Legislation / Policy Planning Controls Coordination	Information not currently available to determine risk	We don't have an intimate knowledge of existing information data / knowledge to answer fully. Based on anecdotal information and what people have seen	High Low	Medium / Low if rock wall may need replacing or increased Low	No		Rock wall may be damaged in future

Stakeholder Workshop Outcomes – Visioning and First Pass Risk Assessment

Location	Broadly, what is the level of risk? High / Medium / Low or N/A		What management arrangements are in place to manage this risk? E.g. Policy (Local / Regional / State) - On ground works - Structure - Resources	Is it adequate? Why? E.g. \$ People Information Legislation / Policy Planning Controls Coordination Other	Is existing information about the risk Adequate / Moderate / Inadequate?	What are the key gaps in information / data / knowledge? (Please explain)	What is the level of threat likely to be in future? (H - M - L) Consider Sea Level Rise and Climate change, as well as population pressures, coastal development etc.		Are existing management arrangements adequate to manage the threat in future? (Yes / No)	What else is needed to manage this risk now or in the future?	Comments
	Beach Erosion: Present Day	Shoreline Recession: Present Day					Beach Erosion: Future	Shoreline Recession: Future			
Surf Beach	Medium / High – works / boulders northern end. Low – protected by rock work	Low	<ul style="list-style-type: none"> Rock placement on northern headland Brick wall on back of beaches Local 	Inadequate: \$ Legislation / Policy Planning Controls Coordination		Extent of sea-level rise and storm events	High / Medium Low	Medium / Low Low	No		Not moving due to existing rock works.
Kendalls Beach	Medium – large sand expense, low dune vegetation/dune formation. Also Sydney Water assets	Low	<ul style="list-style-type: none"> Local 	Inadequate: \$ Legislation / Policy Planning Controls Coordination			High Medium	Medium Medium	No		Rock wall under sand?
East Beach	Medium – headland protection on south	Low	<ul style="list-style-type: none"> Private 	Inadequate: \$ Legislation / Policy Planning Controls Coordination			High Medium	Medium Medium	No		Have rock protection at moment
Werri Beach	Medium – houses close to beach Low – due to current dunes and vegetation	Medium Low (Beach currently reasonably stable)	<ul style="list-style-type: none"> Dune creation, Werri Lagoon opening, vegetation planting, beach access works Local 	Inadequate: \$ Legislation / Policy Planning Controls Coordination			High Medium	High Medium	No		
Gerringong Boat Harbour	Low – rocky Walkers Beach - Low	Low	<ul style="list-style-type: none"> Local 	Inadequate: \$ Legislation / Policy Planning Controls Coordination			Medium Low	Medium Low	No		
Seven Mile Beach	Low – undeveloped hind area	Low	<ul style="list-style-type: none"> Estuary management plant – Crooked River Seven Mile Beach National Park Management Plan Shoalhaven Coastal Management Plans State – National Park 	Inadequate: \$ Legislation / Policy Planning Controls Coordination			Medium Low	Medium Low	No		Impacts on bridge

Stakeholder Workshop Outcomes – Visioning and First Pass Risk Assessment

E.3.2 Coastal Inundation and Tidal Inundation

Table E-2 Coastal Inundation and Tidal Inundation First Pass Risk Assessment

Location	Broadly, what is the level of risk? High / Medium / Low or N/A			What management arrangements are in place to manage this risk? E.g. Policy (Local / Regional / State) - On ground works - Structure - Resources	Is it adequate? Why?	Is existing information about the risk Adequate / Moderate / Inadequate?	What are the key gaps in information / data / knowledge? (Please explain)	What is the level of threat likely to be in future? (H - M - L) Consider Sea Level Rise and Climate change, as well as population pressures, coastal development etc.			Are existing management arrangements adequate to manage the threat in future? (Yes / No)	What else is needed to manage this risk now or in the future?	Comments
	Coastal Inundation: Present Day	Wave Overtopping: Present Day	Tidal Inundation: Present Day					Coastal Inundation: Future	Wave Overtopping: Future	Tidal Inundation: Future			
Minnamurra Beach	Low – vegetation exposed to storm events	Low – some damage near boat ramp in ECLs to bank, signs etc.	Low – some bank erosion near boat ramp	<ul style="list-style-type: none"> Management plan for Killalea 	Adequate	We don't have any	<ul style="list-style-type: none"> No flood study No hazard study 	Low	Medium	Low High – sea level rise		Planning Controls	
Jones / Boyd Beach	Low / Medium – dunes provide an amount of inundation protection from storm surge	Low / Medium – dunes provide an elevated berm	Low	<ul style="list-style-type: none"> Plan of Management Asset management Dune vegetation 	Adequate	<ul style="list-style-type: none"> We know of storm damage from past events 	<ul style="list-style-type: none"> Technical study required to inform management 	Medium / High	Medium / High	Medium	No – management plan enhanced, possible other options		Need studies to help understand
Bombo Beach	Low – potential impact on sewer infrastructure at south Bombo	Low – access under highway may be exposed	Low	<ul style="list-style-type: none"> Plan of Management Sydney Water has management policies to respond to and / or mitigate, asset inundation Sydney Trains? TfNSW (Roads)? NSW Maritime? 	Adequate, but could be improved (POM)	<ul style="list-style-type: none"> Council does not have coastal hazard, Spring Creek flood study 		Medium	Medium / High	Low / Medium	Unsure – need to understand asset exposure/plans		Sydney Water and Sydney Trains have assets
Black Beach / Kiama Harbour	Medium – 2016 east coast low impacted much of black beach impacted by inundation	Medium – 2016 east coast low impaired stairs going down from Terralong Street, Harbour infrastructure	Low	<ul style="list-style-type: none"> Masterplan Plan of Management Harbour walls 	Adequate	<ul style="list-style-type: none"> Not sure, the current exposure from past storms has been relatively well dealt with 		High	High	Low / Medium	No – current infrastructure deals with most issues not large events	Information Planning Controls	Technical study Possible infrastructure
Surf Beach	Medium – Coronation Park likely exposed	Medium – waves in 2016 destroyed surf club doors. 1974 crossed Coronation Park	Low	<ul style="list-style-type: none"> Hazard study from 2009 Some rock walls Not much infrastructure except surf club 		<ul style="list-style-type: none"> Information from past historical events 		High	High	Low / Medium High – due to experience of past events	No		

Stakeholder Workshop Outcomes – Visioning and First Pass Risk Assessment

Location	Broadly, what is the level of risk? High / Medium / Low or N/A			What management arrangements are in place to manage this risk? E.g. Policy (Local / Regional / State) - On ground works - Structure - Resources	Is it adequate? Why?	Is existing information about the risk Adequate / Moderate / Inadequate?	What are the key gaps in information / data / knowledge? (Please explain)	What is the level of threat likely to be in future? (H - M - L) Consider Sea Level Rise and Climate change, as well as population pressures, coastal development etc.			Are existing management arrangements adequate to manage the threat in future? (Yes / No)	What else is needed to manage this risk now or in the future?	Comments
	Coastal Inundation: Present Day	Wave Overtopping: Present Day	Tidal Inundation: Present Day					Coastal Inundation: Future	Wave Overtopping: Future	Tidal Inundation: Future			
Kendalls Beach	High – lots of infrastructure right on the beach	High – Low elevation infrastructure right on beach. Needs directional swell	Low	<ul style="list-style-type: none"> Evacuation during storm events 				High	High	Low / Medium	No	Planning Controls	Seawalls, retreat look at other options – tidal gates, reuse
East Beach	High – same as Kendalls have had past exposure	High – same as above orientation of swell important	Low	<ul style="list-style-type: none"> Private owned / unsure 				High	High	Low / Medium	No		Look at alternative options, engineering, retreat, change in land use
Werri Beach	High risk south end Medium risk north end Carpark and road exposed	High risk south end Medium risk north end Was some overtopping in 2016 in caravan park	Low	<ul style="list-style-type: none"> Rock walls Dune vegetation 				High	High	Low / Medium (northern area)	No		
Gerringong Boat Harbour	Low – not much infrastructure	Low – some exposure for toilet block	Low	<ul style="list-style-type: none"> Rock walls 				Low	Low	Low	Yes		Not much impact
Seven Mile Beach	Low – not sure of historical exposure of private land e.g. 1974	Low – possible road impact but there are rock walls	Low	<ul style="list-style-type: none"> Plan of Management 				Medium	Medium	Low			

Stakeholder Workshop Outcomes – Visioning and First Pass Risk Assessment

E.3.3 Other Hazards

Table E-3 Other Hazards First Pass Risk Assessment

Coastal Hazard	Location	Broadly, what is the level of risk? High / Medium / Low or N/A	What management arrangements are in place to manage this risk? E.g. Policy (Local / Regional / State) - On ground works - Structure - Resources	Is it adequate? Why?	Is existing information about the risk Adequate / Moderate / Inadequate?	What are the key gaps in information / data / knowledge? (Please explain)	What is the level of threat likely to be in future? (H - M - L) Consider Sea Level Rise and Climate change, as well as population pressures, coastal development etc.	Are existing management arrangements adequate to manage the threat in future? (Yes / No)	What else is needed to manage this risk now or in the future?	Comments
c) coastal lake or watercourse entrance instability	Minnamurra Beach: Minnamurra River	Low Natural system, minimal infrastructure, consistent tidal movement, strong catchment flows. Risks increase as you move upstream. 'Human' improvements on southern side. Entrance instability, increases salinity and undermines 'human' improvements	<ul style="list-style-type: none"> Self-managed Revetment works 	People Coordination	Adequate as low risk, self-managed	Extent of sea-level rise / acceptable scenarios	Low – defined entrance	Yes	Information Legislation / Policy Coordination	Future modelling Relationship between CMPs – integration Interagency
	Bombo Beach	Low Less flow, adaptive to changes in flow, subject to catchment flood (clears quickly)	<ul style="list-style-type: none"> Adapt Water 	People Coordination			Low – defined entrance	Yes		
	Surf Beach	Low	<ul style="list-style-type: none"> Ongoing discussions with service providers regarding infrastructure outlets at watercourse entrances 	People Coordination		I and I surveys and studies	Low – defined entrance	Yes		
	East Beach	Low		People Coordination			Low – defined entrance	Yes		
	Werri Beach: Werri Lagoon	Low		People Coordination			Low – defined entrance	Yes		
	Seven Mile Beach: Crooked River	Low Natural system, National Park		People Coordination			Low – defined entrance	Yes		
	Other? Please Specify, e.g. Jones / Boyd Beach Black Beach / Kiama Harbour Kendalls Beach Gerringong Boat Harbour			People Coordination			Low – defined entrance	Yes		
e) coastal cliff or slope instability	Please note down the location, consider also the cliffs and headlands between the beaches: (Minnamurra Beach, Jones / Boyd Beach, Bombo Beach, Black Beach / Kiama Harbour, Surf Beach, Kendalls Beach, Easts Beach, Werri Beach, Gerringong Boat Harbour, Seven Mile Beach)	Low / Medium Dune management – debate regarding vegetating dunes and impact it is having on replenishing sand banks Development on cliff overlooking Jones/Boyd/Boneyard	<ul style="list-style-type: none"> Natural environment provides protection 	Planning controls i.e. foreshore building lines	Yes	Limited information regarding cliff stability	Low – hard rocks	Yes	People Legislation / Policy Planning Controls	No future expansion identified on coastal cliffs

Stakeholder Workshop Outcomes – Visioning and First Pass Risk Assessment

E.4 Activity 4: Other Issues FPRA

Table E-4 Other Issues First Pass Risk Assessment

Issue	Theme	Level of Risk derived from Community Feedback (High / Medium / Low)	Broadly, what is the level of risk? High / Medium / Low or N/A	What locations are affected? (geographical area / sector / assets / ecosystems)	What management arrangements are in place to manage this risk? E.g. Policy (Local / Regional / State) - On ground works - Structure - Resources	Is it adequate? Why?	Is existing information about the risk Adequate / Moderate / Inadequate?	What are the key gaps in information / data / knowledge? (Please explain)	Will the threat get worse in the future? How? Consider population pressures, climate change etc.	Are existing management arrangements adequate to manage the threat in future? (Yes / No)	What else is needed to manage this risk now or in the future?	Comments
Coastal Development	Adverse social, economic or environmental outcomes (including biodiversity loss) due to coastal development	High	Medium High – based on social fabric and environmental. Overcrowding and commercialisation of public areas. Less economic	<ul style="list-style-type: none"> North Warri Headland house that community doesn't like Permissible development in town centre Caravan park redevelopment Urban zoned Spring Creek and Bombo areas 	<ul style="list-style-type: none"> LEP DCP Coastal SEPP Kiama Town Centre Study Traffic and carparking study Community Groups: Precinct groups (South, Gerroa, Central etc.), Board riders 	Adequate – Could be better Planning Controls – DCP could be improved	Coastal SEPP doesn't do much – no current vulnerability layers Adequate – planning controls and coordination	No hazard study Community knowledge	Yes – greater pressure, higher population both residents and tourists	Yes – enough other mechanisms. SEPP – will benefit from vulnerability layer	Greater understanding of hazards Education on policies	Relies on governance. DCP will be enhanced by Kiama Town Study / car park and traffic study.
Coastal Development	Hazard impacts resulting from poorly sited coastal developments	High	High Low	<ul style="list-style-type: none"> Bombo asset infrastructure Low lying – Jones Beach, Warri Beach, Surf Club, Easts / Kendall Urban areas Spring Creek Bombo 	<ul style="list-style-type: none"> LEP zonings DCP controls Urban strategy Regional Plan State Planning Political 	Adequate	Yes Adequate	No hazard study Updated stormwater management policies Review foreshore building line CMP	Shouldn't get worse due to current controls. Depends on change in climate / sea level rise. Yes – climate change and population increase	No Adequate for asset management	People Information Legislation / Policy	CMP Stormwater management policy
Biodiversity / Habitat Disturbance	Habitat disturbance / impacts due to recreation activities (e.g. boating, surf schools, fishing, camping, bush / beach walking, dog walking etc.)	High (surf schools)	High Low	<ul style="list-style-type: none"> Nesting areas Fragile coastal organisms Seven Mile Beach Coastal Walk Off leash beaches 	<ul style="list-style-type: none"> Council Rangers for regulation (e.g. dogs, illegal camping) Dune Care / Land Care Groups DA consents Maritime Boating Safety Officers 	Adequate	Adequate	Jetty / boating policy	Yes – Higher with greater population. Harder to manage	Yes	Legislation / Policy Planning Controls	Jetty / boating policy Education piece on surf schools
Biodiversity / Habitat Disturbance	Invasive vegetation species, pests and feral animals impacting on habitat and biodiversity (e.g. foxes, dogs, cats, bitou bush)	Medium	High Medium	<ul style="list-style-type: none"> Already stressed community Dune vegetation is weed infested / rabbits Littoral rainforest areas LGA wide 	<ul style="list-style-type: none"> Feral animal management plan ISJO – Invasive weed management LLS – pest control National Parks – pest control 	Adequate	Adequate Enacting is the difficult part	Co-ordinated and resourced \$\$ Management approach	Yes, consistent / worse	Yes	\$ Coordination Other:	Additional financial resources Management by other public authorities i.e. TfNSW

Stakeholder Workshop Outcomes – Visioning and First Pass Risk Assessment

Issue	Theme	Level of Risk derived from Community Feedback (High / Medium / Low)	Broadly, what is the level of risk? High / Medium / Low or N/A	What locations are affected? (geographical area / sector / assets / ecosystems)	What management arrangements are in place to manage this risk? E.g. Policy (Local / Regional / State) - On ground works - Structure - Resources	Is it adequate? Why?	Is existing information about the risk Adequate / Moderate / Inadequate?	What are the key gaps in information / data / knowledge? (Please explain)	Will the threat get worse in the future? How? Consider population pressures, climate change etc.	Are existing management arrangements adequate to manage the threat in future? (Yes / No)	What else is needed to manage this risk now or in the future?	Comments
Biodiversity / Habitat Disturbance	Illegal removal of dune vegetation by residents	Medium	High – complex drivers, completing interests i.e. ecology, surfers, develop Medium	<ul style="list-style-type: none"> Jones Beach Werri Beach 	<ul style="list-style-type: none"> Plan of Management e.g. Jones Beach Compliance by Council Actions by Landcare Group Dune Care and Land Care groups Signage Landowner – compliance 	Inadequate Legislation / policy	Inadequate - \$, information and legislation / policy POM – has been watered down to what it was. Allows for only low growing vegetation.	CMP policy position – ongoing management plans, management groups, financial contributions Difficult to prosecute if people aren't caught in the act	Consistent Possibly worse depending on management and community engagement	-	\$ People Information Legislation / Policy Planning Controls Coordination	CMP
Recreation Use and Amenity	Overuse and overcrowding at the beach and associated facilities / insufficient facilities and accessways to meet demand	High	Low to Medium Seasonal and relative to season use. Balance pros and cons.	<ul style="list-style-type: none"> James Oates Reserve – Minnamurra River Entrance Surf Beach Northern Gerroa Beach – Boat Launching facility Gerroa, Kiama township, Minnamurra River, North Bombo, Blow Hole 	<ul style="list-style-type: none"> Capital works programs → car parks, toilets, lifeguards Section 94 Maintain / upgrade facilities → difficult to maintain for peak periods 	Adequate \$ People Planning Controls Coordination	Yes Moderate, can always have more data	Demand analysis Popular beaches i.e. visitation numbers. Data / info → current and live use / trends	Yes, Increase Population increase both local and tourists. Increased pollution and use.	Yes / Getting there	\$ Information People Legislation / Policy Planning Controls Coordination	Information and money to put towards capital works. People compete for space during recreation. Thresholds for action.
Recreation Use and Amenity	Expansion of surf schools resulting in crowding and lack of space on beach and in the surf for other users	High	Low – managed by licence conditions. Low to Medium – seasonal → shore birds, waterside land infrastructure, resource allocation	<ul style="list-style-type: none"> 7 Mile Beach Gerroa Minnamurra (Surf Skis) 	<ul style="list-style-type: none"> DA consent LG Act licence → Rangers and enforcement Licence Policy Zoning 	Adequate Legislation / Policy Planning Controls Coordination	Yes Adequate	Nil Inform community acceptance of use	No DA / licence condition and use of public land policy. Increase	Yes Increase	\$ People Legislation / Policy Planning Controls Coordination	Community understanding and love. Increase, localised issue.
Recreation Use and Amenity	Conflicts between other user groups on / in the beaches (e.g. boat launching in swimming areas)	High	Low to Medium Low – seasonal use, conflict values / shared public space	<ul style="list-style-type: none"> Boat ramp at Northern Gerroa Beach Minnamurra River 	<ul style="list-style-type: none"> Risk management assessment → Gerroa Increase compliance / Regulation Education 	Adequate Increase	Yes Moderate	Numbers i.e. adequacy of facilities Scale of issues difficult to understand. A few parties constituents	Yes / Increase. Population increase	Maybe Yes	Education, Signage	CMP Increase education and regulation

Stakeholder Workshop Outcomes – Visioning and First Pass Risk Assessment

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								can over play the issues.				
Recreation Use and Amenity	Poorly maintained or located recreational facilities and beach access points	Medium	Low Low – Key point that attracts visitors	<ul style="list-style-type: none"> Disagree that facilities are poor. Expectations need to be managed. All – risk is cost and delivery continue current service level 	<ul style="list-style-type: none"> Capital works program Dune care groups Policy – local and state ownership of facilities 	Adequate \$ People Coordination Other	Yes Moderate	Limited budget. Respond to Health and Safety Issues Data on use and ability to react to change in use of an area.	No / Neutral Ongoing Management Yes – but can be managed and controlled easier than above.	Yes	\$ Legislation / Policy Coordination Other	CMP Funding related and allocation of funds
Water Quality	Poor water quality in the ocean due to runoff from coastal / urban development (stormwater)	Medium / Low	Medium to High Low – no major rivers effected during rain events	<ul style="list-style-type: none"> Occurrence of wet weather overflows (Sydney Water's) at Bombo, Kendalls and Surf Beaches Kiama Harbour 	<ul style="list-style-type: none"> EPA licence → ongoing reporting, Sydney Water Monitoring Policy – local and state ownership of facilities 	Inadequate Policy Both inadequate and adequate as land ownership varies (\$, Planning controls, coordination)	Moderate	Additional resources (money). Update WSUDP. Broad scale water testing void → lack of information	Potentially Yes. Yes – all of the above	No	\$ Legislation / Policy Planning Controls Coordination	Revised WSUD Policy Compliance with EPA Licence Capital Works Strategic Plans and designs
Water Quality	Sewage effluent and septic runoff	Medium / Low	Low – currently good W/C readings. Low – Medium After incidents water quality is generally acceptable in a few days. Impacts on estuaries probably more exposed and may be higher	<ul style="list-style-type: none"> Kiama Downs <-> Bombo Seven Mile Beach Bombo for ocean outfall Pump station overflows happen in Kendalls Beach, Spring Creek after 60+ mm rain Septic runoff, Minnamurra River, Crooked River, Werri Lagoon 	<ul style="list-style-type: none"> Water testing Sydney Water licence requirements for Bombo WRP outfall discharge Environmental licence and EPA regulation Council does OSSM Program 	Adequate – depending on storms At this point it is, aging infrastructure and population growth may bring this to a higher risk level	Don't know Assumed through past studies and licences	Data Exposure to hazards and future pressures	Get worse until there is an event that needs to be fixed. Population pressure Yes, due to population growth / intensification	Yes, it is in the budget No, \$ and infrastructure	\$ People Coordination Other: Technology	Higher levels of treatment using technology, upgrading infrastructure
Water Quality	Poor water quality in ocean and waterways due to agricultural runoff	Medium	Medium Low – Medium, depending on rainfall	<ul style="list-style-type: none"> River / estuary mouths Minnamurra River Crooked River Werri Lagoon Spring Creek 	<ul style="list-style-type: none"> Don't know Guidelines and controls through new development but onus is generally on individual 	Inadequate Need more resources for landholders	Yes, well understood risk and management options	Data Capacity to engage with landholders and money to fund these works	No Probably not, dependent on ability of agricultural enterprises to afford improved	Yes No, there is no requirement for better management	\$ People Legislation / Policy	Dairies unable to afford required upgrades to infrastructure

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					operators and capacity				land use/infrastructure Assuming gradual decline of agricultural			
Pollution and Waste	Reduced amenity and environmental impacts from litter and plastics waste, pesticides and herbicides and other recreational user litter e.g. fishing lines/hooks	High	Medium – big stuff is well controlled, little study unknown. We live in a pretty clean area, well maintained	<ul style="list-style-type: none"> Black Beach Gerringong Surf Beach River and estuary mouths Rocky headlands, fishing locations, beaches with easy access, blowhole points 	<ul style="list-style-type: none"> Waste minimisation education Litter and waste management Maintenance of GPTs etc Awareness programs Infrastructure is provided to capture litter / pollutants Education programs Compliance activities 	Adequate People Information Legislation / Policy	Adequate, for most pollutants listed Pesticides / herbicides not really well understood	Impacts of pesticides and herbicides	Get worse with increasing population / population pressures	No	\$ People Information Legislation / Policy Planning Controls Coordination Other: Regulation / Compliance	Plastics and micro plastics big problem
Engagement, Governance and Compliance	A lack of community awareness and engagement with the coastal environment and its management	High	Medium Medium – High	<ul style="list-style-type: none"> All Jones Beach, Warri Beach – places where private interest and public use meet Conflict between values 	<ul style="list-style-type: none"> Byron's programs Illawarra Landcare Communication strategies Agency and community consultation and collaboration 	Adequate Information Legislation / Policy Coordination	Moderate Adequate		No Hopefully better	Yes Increasing community awareness	?	
Engagement, Governance and Compliance	Insufficient or inappropriate governance and management of the coastal environment	High	Medium Medium – High	<ul style="list-style-type: none"> All If there is no trust or confidence in the process of CMP development, community wont respect it 	<ul style="list-style-type: none"> MEMA Coastal Management Program process Local government roles and responsibilities Current legislation Government governance Community committees 	Adequate Knowledge and awareness is improving. Opportunity for smarter decisions Information Legislation / Policy Planning Controls Coordination	Moderate, resource limitations Adequate	Resources to tackle certain problems and issues	Yes Climate change, population pressure and political agenda	No	\$ People Information Legislation / Policy Planning Controls Coordination	

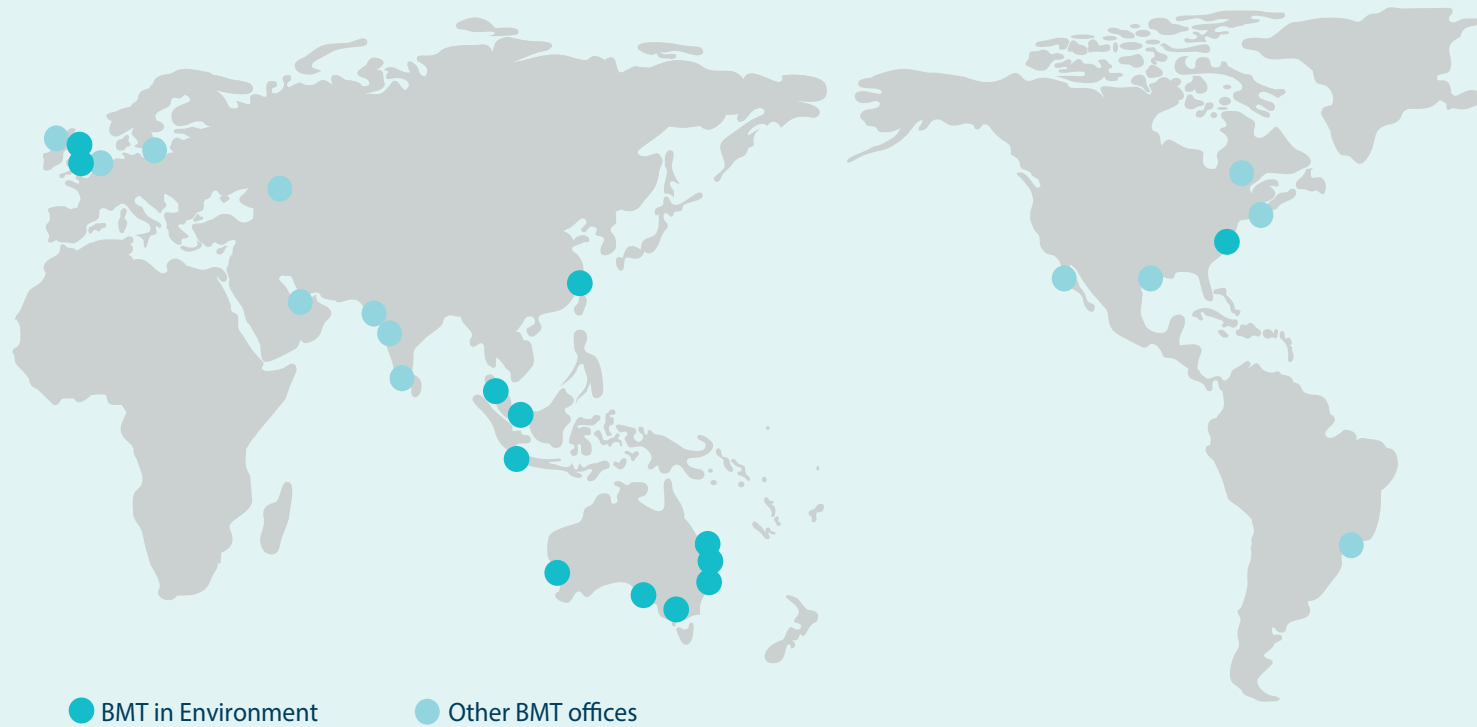
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Engagement, Governance and Compliance	Impacts resulting from lack of compliance with regulations and compliance effort / success from authorities	High / Medium	Low High	<ul style="list-style-type: none"> Jones Beach dune vegetation Over fishing Loss habitat Commercial operators in public foreshore Illegal dumping Cutting vegetation for views 	<ul style="list-style-type: none"> Local government – some compliance Land and Environment Court? State legislation Education e.g. RID officer Local enforcement Lease arrangements 	? \$ People Information Legislation / Policy Planning Controls Coordination Other: Photographic evidence required for compliance. Inadequate policing due to lack of compliance / ranger staff by Council	Moderate Adequate	Inadequate policing due to lack of compliance / ranger staff by Council	Yes, Population increases and everything that flows from this. Greater tourist pressures also.	No Arrangements yes but enforcement is not adequate	People	Greater resources for compliance Public education to prevent illegal activities in the first place
Cultural Heritage	Aboriginal culture not being recognised and preserved; including values and sites	Medium / Low	Aboriginal: High – we don't know where everything of importance is Medium – unmapped sites, loss of culture and history	<ul style="list-style-type: none"> Whole coastal area Foreshore areas and waterways Could be anywhere 	<ul style="list-style-type: none"> Aboriginal heritage assessment Toolkit – not very effective OEH – due diligence assessment Lack of knowledge / register of sites Protected by legislation Listings of aboriginal sites/artefacts 	Inadequate: Information – Council doesn't have much Legislation / Policy Planning Controls Coordination Adequate: Legislation / Policy Planning Controls	Inadequate May not know it is there before works begin leading to damage	Consulting with appropriate groups Listings aren't necessarily complete of aboriginal sites Overall cultural knowledge and loss is not necessarily capture or common knowledge	Yes – but hopefully not Hopefully will improve – Council is doing more e.g. raise profile of Aboriginal culture e.g. artworks planned in town	No Difficult as many unknown. Broader community needs to be involved. Needs Aboriginal involvement.	People Information	Greater understanding of Aboriginal culture and value Sharing of stories Need to understand Aboriginal
Cultural Heritage	Community not valuing culture and heritage generally	Medium / Low	Non-Aboriginal: Low – Medium, there is some appreciation for this area Low – Medium	<ul style="list-style-type: none"> Kiama town centre Pheasants Point and Manning Street – heritage conservation areas 	<ul style="list-style-type: none"> Heritage legislation and policies – State and Local DCP / LEP 	Adequate Legislation / Policy Planning Controls	Adequate	Rock pools should maybe have heritage status but doesn't	Yes Maybe with development pressure will get worse	Possibly Never static	Other: Education, Marketing	If vacant falls into disrepair Need buildings with uses that pay for their upkeep

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				<ul style="list-style-type: none"> Stories around historical events on beaches 	<ul style="list-style-type: none"> Undertaking a Review of Heritage currently Manning St Heritage Conservation Area 							Need to ensure education to ensure continued protection of heritage items
Fishing (Commercial and Recreational)	Overfishing by recreational or commercial fishers	Medium	High	<ul style="list-style-type: none"> Whole coastal area People not respecting bag and size limits Overfishing of resources Lack of policing 	<ul style="list-style-type: none"> State government responsibility Fisheries legislation Aboriginal people have different rules? 	Inadequate People – Fisheries Enforcement officers Legislation / Policy – Marine Park protections?	Inadequate Unsure? Anecdotal evidence from locals, unsure of data from Fisheries, black market info	? Fisheries enforcement officers lacking Understanding of black market?	Yes Threat will increase with population growth and tourist pressure	No Legislation maybe sufficient – issue is education and compliance	\$ People Information Legislation / Policy Planning Controls Coordination Other: education and compliance	Some controls area available – efficacy unknown. Lack of knowledge of the biosystem. Further education and compliance of this issue.

**BMT has a proven record in addressing today's engineering and environmental issues.
Our dedication to developing innovative approaches and solutions enhances our ability to meet our client's most challenging needs.**



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