Cooks River Catchment CMP Scoping Study

Stage 1 Scoping Study – Final

January 2020

Document Control Sheet

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Document:	R.N20999.003.02.docx
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Synopsis: This report documents the Cooks River Catchment Coastal Management Program (CMP) Stage 1 Scoping Study prepared by BMT on request from the Cooks River Alliance (CRA).

REVISION/CHECKING HISTORY

Revision Number	Date	Checked by		Issued by	
0	10/12/2018	Geoff Withycombe		Daniel Machado	
1	5/07/2019	Geoff Withycombe		Daniel Machado	
2	18/12/2019	Geoff Withycombe		Daniel Machado	
3	24/01/2020	Geoff Withycombe		Daniel Machado	

DISTRIBUTION

Destination	Revision										
	0	1	2	3	4	5	6	7	8	9	10
Cooks River Alliance (Canterbury-Bankston Council)	PDF	PDF	PDF	PDF							
BMT File	PDF	PDF	PDF	PDF							
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This document has been prepared with financial assistance from the NSW Government through its Coastal Management Program. This document does not necessarily represent the opinions of the NSW Government.

The Cooks River Alliance respectfully acknowledges the Wangal, Cadigal and Gameygal, the Traditional Custodians of the Cooks River Catchment, and also acknowledges other Aboriginal people who have made the river their home. The Alliance pays respect to Elders past, present and future.

For over a thousand generations, the Cooks River catchment has been home to Aboriginal people who have fostered cultural and spiritual connections to the river as it evolved over many millennia.
The Cooks River Alliance recognised that it is vital to maintain strong partnerships with Aboriginal people and organisations across the catchment.

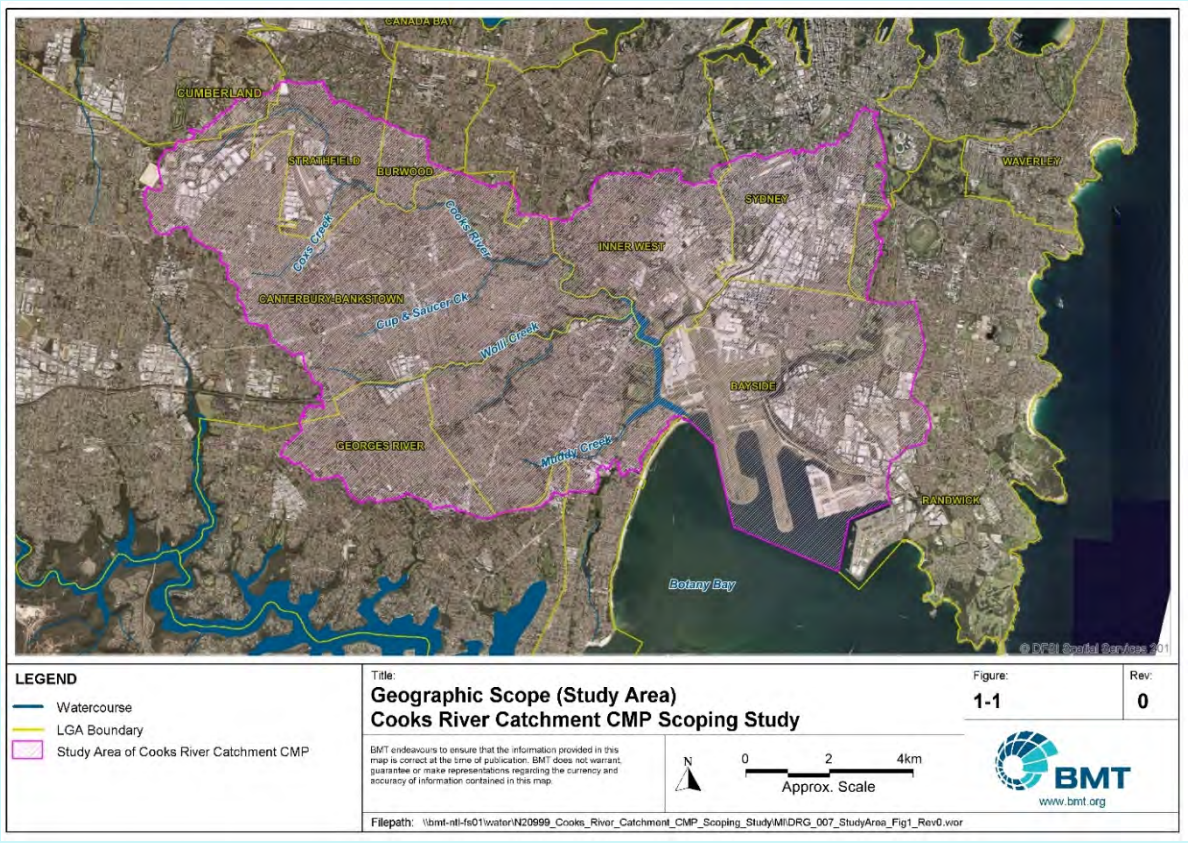
Executive Summary

Introduction

Integrated catchment and coastal management is a complex and challenging task, more so in highly developed and urbanised areas like the Cooks River catchment.

This Cooks River Catchment Coastal Management Program (CMP) Stage 1 Scoping Study has developed a shared understanding of the Cooks River catchment and coastal management issues and priorities, which builds on work by councils, the Cooks River Alliance (CRA), state agencies and other stakeholders over several decades. Based on this shared understanding, this study provides a forward plan for undertaking Stage 2 to Stage 5 of a CMP, consistent with the NSW Coastal Management Framework.

The Cooks River is a coastal river within the south metropolitan Sydney area. The geographic scope to be covered by the Cooks River Catchment CMP encompasses the complete coastal river, its catchment, tributaries, estuary and adjacent bay area within Botany Bay, as shown in Figure 1-1.



- **The catchment study area covers significant sections of seven local government areas (LGA)**, these are:
  - CRA members: Canterbury-Bankstown, Strathfield, Inner West, Bayside,
  - CRA non-members: Burwood, Georges River, and City of Sydney.
- As well as **small sections of other two LGAs**, these are:
  - Cumberland (at the top of the catchment), and Randwick (west end of Kensington suburb).

Vision

The long-term vision for the Cooks River catchment is:

"A loved and healthy river valley and its catchment enriching the heart of Sydney"

Objectives

Thirteen objectives are proposed for a Cooks River Catchment CMP that are consistent with the objects of the *Coastal Management Act 2016*. These are categorised via four focus themes:

- A biodiverse river valley supporting a clean river
- Every community accessing and enjoying the river
- Aboriginal ways of thinking are valued from Yana Badu to Kamay
- Holistic cooperative approaches are guiding river restoration

Context and Scope

The coastal management context for Cooks River has been characterised, based on consultation and literature review, in terms of its

- physical and environmental context
- legislative, planning, governance and management context
- social, cultural, economic and future context.

Values, and Key Catchment and Coastal Management Issues

Values and key management issues were identified for the Cooks River Catchment CMP study area through stakeholder consultation and a literature review:

Cooks River Catchment Values and Key Catchment and Coastal Management Issues

Values	Key Management Issues
V1. Biodiversity and ecosystem integrity V2. Accessible waterways and foreshores V3. Clean waters V4. Naturalness V5. Amenity and recreation V6. Aboriginal, heritage and cultural V7. Accessibility and safety V8. Socialisation and participation V9. Education and scientific V10. Trade, tourism and commerce V11. Stormwater drainage and flood resilience V12. Land value	I1. Biodiversity degradation and habitat disturbance I2. Land use intensification I3. Stormwater, flooding and sediment management I4. Water quality I5. Industrial activities I6. Climate change, sea level rise and coastal hazards I7. Aboriginal and cultural heritage degradation I8. Governance and compliance I9. Resource use conflict, access availability and public safety I10. Recreation and tourism I11.Shipping I12.Fishing

Benefits of Preparing the CMP

The potential benefits from preparing a Cooks River Catchment CMP are substantial and include:

- development and delivery of actions to mitigate the threats to the River's community values, ecological values and economic benefits
- development and delivery of a long-term, risk-based strategy to manage coastal hazards, climate change and other risks likely to manifest over the next 100 years
- provision of short- and long-term management actions to support ecological and social values of the coastal river underpinning the economic and social benefits to the catchment
- legislative weight and legitimacy for councils supported by funding from the NSW Government Coast and Estuary Grants Program
- provision of liability exemptions via S733 of the Local Government Act
- promotion of collaboration between councils in the catchment, particularly those within the Cooks River Alliance, as well as the various state agencies and public authorities
- promotion of consistency in management effort and approach between the councils, state agencies and other stakeholders
- provision of cost and resources savings compared with LGA-based individual CMPs
- a significant strategic opportunity to improve engagement with the various land owners, private interests, coastal managers, stakeholders and the community
- provision of an ability to build upon past studies, information and management initiatives.

Outcomes and Forward Plan

Summary of First-pass Risk Assessment Outcomes

Key Management Issue	Overall Risk / Priority
I1 – Biodiversity degradation and habitat disturbance	High
I2 – Land use intensification	High
I3 – Stormwater, flooding and sediment management	High
I4 – Water quality	High
I5 – Industrial activities	High
I6 – Climate change, sea level rise and coastal hazards	High
I7 – Aboriginal and cultural heritage degradation	High
I8 – Governance and compliance	High
I9 – Resource use conflict, access availability and public safety	High
I10 – Recreation and tourism	Medium
I11 – Shipping	Medium
I12 – Fishing	Low

Forward Plan

The preparation of the Cooks River Catchment CMP is contingent on identifying next stages in the process (i.e. Stage 2–4), reviewing and providing recommendations for CMP governance, roles and responsibilities and providing details of the associated recommended studies, investigations and assessments including their indicative costs and timelines for completion.

Cooks River Catchment CMP Forward Plan Summary

CMP Stage	Timing	Overview	Cost Estimate
Stages 2 to 4 CMP Project management and Implement of engagement strategy	Years 1-4	CMP project management (1.0 FTE) Implement engagement strategy	Low ~$300K High ~$600K
Stage 2 Determine risks, vulnerabilities and opportunities	Years 1-2	Technical studies: threats/hazards and values/assets Strategy, ownership and socioeconomic profiling studies	Low ~$700K High ~$1,200K
Stage 3 Identify and evaluate options	Years 2-3	Full-scale risk assessment Options development and assessment Multi-Criteria Analysis (MCA) Cost Benefit Analysis (CBA) Prepare Planning Proposal	Low ~$300K High ~$600K
Stage 4 Prepare, exhibit, finalise, certify and adopt a CMP	Years 3-4	Develop business plan Prepare and exhibit draft CMP Exhibit, review and finalise Planning Proposal(s) Review, finalise and certify CMP	Low ~$100K High ~$150K
Stage 5 Implement, monitor, evaluate and report	Years 4+	CRA and Councils implement through IP&R frameworks Other organisations implement through relevant work programs	*TBD*
		Total CMP Planning Costs	**Low ~$1.4M** **High ~$2.5M**

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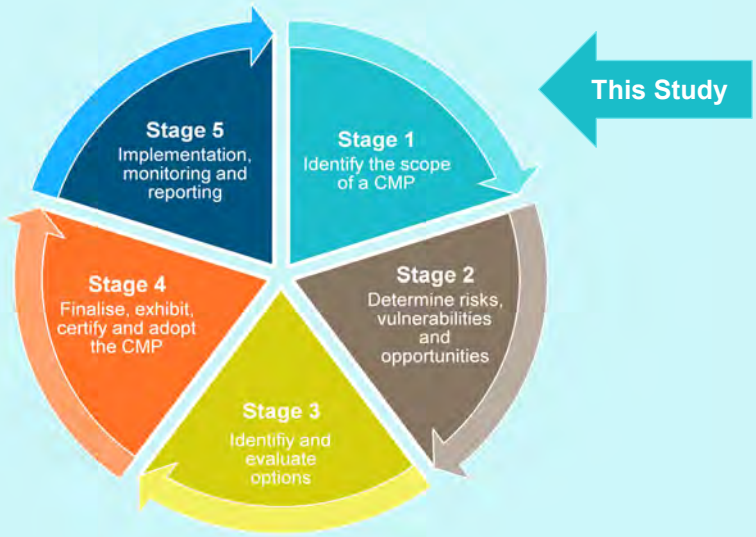
CHAPTER 1: INTRODUCTION – SUMMARY

This chapter introduces the Coastal Management Program (CMP) project, the catchment study area, and the key catchment and coastal management issues raised by stakeholders and the local community.

It outlines why a CMP is being prepared for the Cooks River Catchment, describes the recently updated NSW Coastal Framework and explains how this Stage 1 Scoping Study fits into the 5-stage process for preparing CMPs.



Staged Process for Preparing a Coastal Management Program

Purpose and Aim

The primary purposes of Stage 1 of a CMP are to determine the scope and define a path for progressing further stages of the CMP. The scoping study 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 catchment and coastal management 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; a preliminary business case and a forward plan to complete the CMP.

The Cooks River Catchment CMP Stage 1 Scoping Study aims to develop a shared understanding of the Cooks River and the management issues and priorities, building on work by councils, state agencies and other stakeholders over several decades. Based on this shared understanding the study provides a forward plan for undertaking Stage 2 to Stage 5 of a CMP, consistent with the NSW Coastal Management Framework.

1 Introduction

1.1 Purpose of this Report

Integrated catchment and coastal management is a complex and challenging task, more so in highly developed and urbanised areas as is the case of the Cooks River catchment. This Cooks River Catchment Coastal Management Program (CMP) Stage 1 Scoping Study aims to develop a shared understanding of the Cooks River coastal zone and the management issues and priorities, building up on work by Councils, state agencies and other stakeholders over several decades. Based on this shared understanding the study provides a forward plan for undertaking Stage 2 to Stage 5 of a CMP, consistent with the NSW Coastal Management Framework (CM Framework).

The final CMP will provide a strategic whole of system management approach with the overall goal of enhancing the health, ecological function and amenity of the Cooks River and broader catchment.

The expected outcomes of this study are:

- To support stakeholders to work together to plan for improved health and functioning of the Cooks River catchment, estuary and associated coast, to achieve safe community use and address current and future impacts of coastal hazards and development.
- To tackle significant issues which are contributing (in the short and medium term) to the physical degradation of the Cooks River including (but not restricted to) sewer overflows, banks instability and sedimentation, and high volumes of stormwater which adversely impact stream flow regimes and degrade aquatic habitats.
- To contribute towards coordination of stakeholders for the long-term management of Botany Bay, the receiving environment of the Cooks River, considering interactions, connectivity and bidirectional influence between the Bay and the River (e.g. water quality, ecological and inundation considerations).

This study has been prepared on behalf of the City of Canterbury-Bankstown as the host of the Cooks River Alliance (CRA), its four member Councils (i.e. Bayside, Canterbury-Bankstown, Inner West and Strathfield), the Cooks River Catchment Advisory Group, Department of Planning, Industry and Environment – Environment, Energy and Science (EES) (formerly Office of Environment and Heritage (OEH)), in consultation with the NSW Government agencies, the Council of the City of Sydney and Burwood Council. This report is consistent with the requirements outlined in the Coastal Management Manual *Part B: Stage 1 – Identify the scope of a coastal management program* (OEH, 2018).

The CMP will be developed under the CM Framework and will outline common objectives, targets and prioritised actions for the Cooks River catchment study area. For this, it is paramount that the CMP is developed collaboratively with the four member councils of the CRA, i.e. Bayside, Strathfield, Inner West and Canterbury-Bankstown; and including input, where appropriate, from non-member Councils (Burwood, Georges River, the City of Sydney), NSW Government agencies, other relevant public authorities, with the community.

1.2 Introduction to the Cooks River Catchment Study Area

The Cooks River catchment study area is within the south metropolitan Sydney area. The geographic scope (spatial extent) covered by the Cooks River Catchment CMP encompasses the complete coastal river, its catchment, tributaries, estuary, river mouth (present and historic) and adjacent bay area within Botany Bay, as shown in Figure 1-1 (referred to as the **catchment study area** throughout this report). Where specific mention is required the two areas will be referred to as Botany and the Cooks River catchment.

The Wangal, Cadigal and Gameygal are the traditional custodians of the land within the catchment study area, and have a rich history in this area that dates back thousands of years. Numerous registered Aboriginal sites, for example middens, fire places, a dugong skeleton and shelters can be found within the catchment. Today the Metropolitan Local Aboriginal Land Council are responsible for much of the Cooks River coastal areas and catchment with Gandangarra Local Aboriginal Land Council responsible for a small section of the top of the catchment. La Perouse Local Aboriginal Land Council have responsibility for the coastal land east of the airport.

The catchment study area is contained within the Botany Bay, Bate Bay and Port Hacking Sediment compartment (Coastal Management Act 2016). It was defined to reflect the original river's path prior to the airport development and to ensure that all parts of the Bay are included in a CMP. This discussion is further described in Appendix F.

Local Government

The catchment study area includes significant sections of seven local government areas (LGA). These are:

- Canterbury–Bankstown (CRA member),
- Strathfield (CRA member),
- Inner West (CRA member),
- Bayside (CRA member),
- Burwood (non-member of CRA),
- Georges River (non-member of CRA), and
- City of Sydney (non-member of CRA);

It also covers small sections of other LGAs, these are:

- Cumberland (at the top of the catchment), and
- Randwick (west end of Kensington suburb, which drains to Botany wetlands and Alexandra Canal).

Population

The catchment study area is highly urbanised and has an estimated resident population in 2018 of 544,130. This is an increase of 60,400 more people since the 2011 census (id, 2019 Profile.id.com.au 2019).

Cooks River and catchment

The Cooks River catchment section of the catchment study area is a highly urbanised catchment of around 100 km^2 including significant tributaries: Muddy Creek, Wolli Creek, Bardwell Creek, Cup and Saucer Creek, Coxs Creek, Greenacre Creek and Alexandra Canal. The estuary is a tide-dominated drowned river valley or "ria". It connects to Botany Bay at Kyeemagh with a constructed opening that enabled the expansion of Sydney's Kingsford Smith airport. The River's main course, of approximately 23 km in length, makes its way up from Kyeemagh to Graf Park between Yagoona and Potts Hill. From its opening to the Bay, the main channel meanders up to the northwest through urbanised and park areas. The main channel narrows down around Croydon Park and Campsie where the tidal influence decreases. Up from Belfield to the northwest, the River has been canalised into a relatively narrow concrete open canal. At Freshwater Park in Strathfield and on into Strathfield Golf Course for around 1.5 km's, the river is an open stream. The upper part of the River from the golf course passes below Rookwood Cemetery and into rail freight lands where it is a mix of open stream and closed channels. A series of tributaries in the upper reaches are open and closed canals passing through industrial and residential areas in Chullora to Yagoona.

Botany

The Botany section of the catchment study area consists of industrial lands, a constructed port and airport, and dense urban areas across approximately 25 km^2. It encapsulates all of the eastern side of Bayside LGA (former Botany Council area). The area includes the suburbs of Mascot, Botany and Banksmeadow as well as parts of Pagewood, Eastlakes and Daceyville and is in Bayside Council. The State Environmental Planning Policy (Three Ports) 2013 covers a significant section with land zoned as heavy industrial or general industrial to support the Port and Airport. The port itself is zoned Special Activities.

The eastern bank of the Cooks River estuary from the mouth to Alexandra Canal is dominated by the airport runways. Along the Bay there is a small beach between the river mouth and the runway. The runways extend into the Bay with the Mill Stream flowing alongside the northern runway.

The Mill Stream is the major tributary into the Bay and includes the Botany wetlands and constructed Mill Pond and Engine pond. These are part of the largest wetland system in Sydney and includes the Botany Sands Aquifer. This wetland system was historically used as a water supply and are now managed by Sydney Airport and Sydney Water.

At the mouth of the Mill Stream is Foreshore Beach. Originally part of an extensive wetland this is comprised of estuarine sands dredged from Botany Bay during the Port Botany construction activities in the 1970's / 1980's. Seagrass meadows are present in the shallow waters off Foreshore Beach. It is a popular recreation area.

Penrhyn Estuary was created as a result of the reclamation works associated with construction of the current Port Botany and Foreshore Road in the 1970s. The Estuary has formed in the protected

area between the port to the south and Foreshore Beach to the north (Port Authority NSW). It consists of an endangered saltmarsh community, mangroves and intertidal flats.

The coastal areas adjacent to the foreshore are occupied by the 2 km long Sir Joseph Banks Park and Botany Golf Club. Sir Joseph Banks Park is a listed on the State Heritage Inventory as a significant and complex cultural landscape. It was known as the Pleasure Grounds of the 1844 Sir Joseph Banks Hotel, and in 1988 a new parkland area of wetlands and lakes formed by the spoil of the reclamation works associated with the expansion of Port Botany.

The catchment study area then extends eastward to Bunnerong Creek to the northern boundary of Bayside Council and includes Port Botany north of Brotherson Dock.

History

Since European settlement in the catchment began in the late 18th Century, the Cooks River and surrounding environment has been dramatically altered and degraded. Land clearing, agricultural and industrial activity and urbanisation have affected the catchment's runoff patterns and polluted the waterways. Lime burning, sugar refineries, wool washes, tanneries, rendering works, slaughter houses, soap factories, sewage farms, and chemical manufacturing have discharged pollutants directly into the waterways of the Cooks River. In addition, stormwater pollution, sewer overflows, domestic waste, as well as dredging and channel modifications have degraded the river, its adjacent wetlands and receiving bay, adversely affecting water quality, flora, fauna and ecosystem functioning. Despite these historical impacts, significant management and restoration efforts have resulted in the rehabilitation and improvement of the Cooks River catchment study area, turning a once degraded system into an estuary that provides valuable ecological functions and is accessible to many users. However, many issues and opportunities for further improvement remain.

Recreational boating is popular near the estuary opening at Kyeemagh, with mooring sites at Muddy Creek Inlet and near the river entrance. Boat ramps are at Port Botany and Tempe enabling access to Kamay/Botany Bay. Kayaks and rowing are also popular with public access at the River Canoe Club at Tempe and club access at the Rowers Club at Wolli Creek. Recreational fishing is popular in the lower estuary and at the entrance. Swimming and dog walking is also popular at Foreshore Beach at Botany.

The catchment study area contains several regionally significant open spaces identified as priority Green Grid corridors in the Sydney District plans. These include the Cooks River, the Mill Stream, and Wolli Creek. This recognises the regional importance of the parks and sports grounds that were formed when the river was straightened or when low-lying areas were filled. In 2000 a 23 km pathway was built beside the river connecting Sydney Olympic Park with Kamay/Botany Bay.

Parklands from Sir Joseph Banks Park in Botany, in Wolli Creek and through to Strathfield are popular passive recreation destinations. Both public and private golf courses are within the coastal areas and catchment.

Within the coastal area there are a number of historic structures including Sydney's early water supply at Botany wetlands/ Mill Stream, Tempe House and the Sugar mill at Boat Harbour.

Around 9% of the original wetlands remain in the Botany Bay area. Most of the currently identified coastal wetlands are mangroves with smaller constructed saltmarsh areas. A small section of seagrass is present in Penryn Estuary.

Wolli Creek, a tributary of the lower Cooks River, is surrounded by the only bushland of considerable size left in inner south west Sydney and is predominantly managed by National Parks. Other 'jigsaw pieces' of bushland are present along the river in areas such as Campsie and Strathfield. Despite this there is still significant fauna existing within the catchment study area including a flying fox colony, many bird species and freshwater and saltwater aquatic species. There is strong community awareness and appreciation of flora and fauna with a number of community bushcare and bird watching groups.

The catchment study area has regionally and nationally significant infrastructure including

- One terminal of Port Botany
- Sydney Airport
- Enfield Intermodal and Chullora freight

Additionally, the main river corridor contains many services including high-voltage electricity lines, high-pressure fuel lines, and high- volume sewage pipes. Much of the main river channel and most of the tributaries are Sydney Water stormwater assets.

There are a number of older industrial areas within the catchment with variable impacts on the coastal areas. These include Botany, Sydenham, Lakemba and South Strathfield and more recent areas such as Chullora.

Despite its historical degradation, the Cooks River catchment study area is highly valued by the community for its aesthetics, its amenity and its environmental values.

LEGEND

- Watercourse
- LGA Boundary
- Study Area of Cooks River Catchment CMP

Title:

Geographic Scope (Study Area)
Cooks River Catchment CMP Scoping Study

Figure: 1-1

Rev: 0

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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0 2 4km

Approx. Scale

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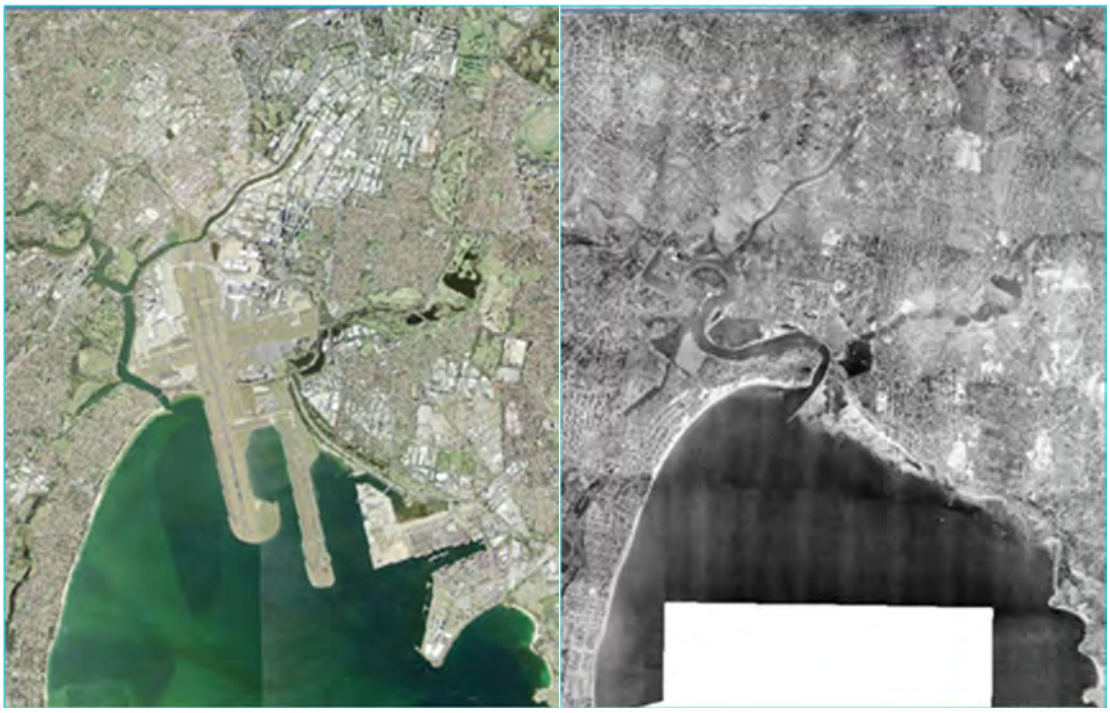


Figure 1-2 Aerial images showing the configuration of the Cooks River mouth at present (2019, left) and historically (1943, right) before construction of the Sydney Airport and Port Botany

1.2.1 Stakeholders and Key Issues

There is a diverse range of stakeholders in the catchment. Sydney Water Corporation (Sydney Water) holds ownership and management responsibility of large sections (around 80%) of the main river and tributary channels, stormwater and drainage infrastructure. This includes the Mill Stream with ownership shared with Sydney Airport Corporation. Local government manage or own much of the adjacent parklands along the main channel and tributaries, including the foreshore park in Botany. There are also a number of Council organisations, three Aboriginal Land Councils, such as the Cooks River Alliance, Southern Sydney Regional Organisation of councils.

Stakeholders and community member concerns associated with the Cooks River Catchment CMP study area relate to a wide array of coastal and catchment management issues including but not limited to:

- **Biodiversity degradation and habitat disturbance** of the riparian and coastal environments, with habitat fragmentation due to urbanisation, industrialisation and generally land development resulting in reduction of native flora and fauna diversity and communities. Remnant wetlands are particularly significant with only 9% of habitat remaining.
- **Land use intensification** involving urbanisation of the catchment with increased pressures from population growth. For example, habitat fragmentation, increasing the impervious nature of the catchment leading to increased stormwater flows, and pollutants generated in highly urbanised areas, and land development leading to increased sediment loads and associated challenges.

- **Stormwater, flooding and sediment management** including key concerns relating to stormwater volume, channel modification (straightening), nature of a low-lying river valley, potential increasing inundation risks due to ongoing sea-level rising, flows and velocities (flooding hazards), sediment transport, gross pollutants.
- **Water quality** issues due to historic contamination and groundwater management (which in lower reaches is a key concern, particularly in relation to wetlands). Also ad hoc monitoring programs, water quality target compliance issues.
- **Industrial activities** (historical and current) along the catchment potentially leading to pollution and concerns around impacts from increasing rail, heavy traffic on roads, pipelines and services to support industrial activities in the area with increasing demands around the Sydney Airport and Port Botany areas.
- **Climate change, sea level rise and coastal hazards** concerns relating to inundation and saltwater intrusion of groundwater, as well as uncertainty around the effects that climate change may have on the catchment and coastal environment.
- **Aboriginal and cultural heritage degradation** concerns regarding the general and specific loss of the nature of custodianship and value of tangible and intangible elements of indigenous and post-European settlement heritage.
- **Governance and compliance** – fragmented governance along and across the coastal river, concerns about environmental monitoring and regulation compliance; multiple ownership and uncertainty around management responsibility of river banks, e.g. Sydney Water historically managing the river and channels as stormwater infrastructure.
- **Resource use conflict, access availability and public safety** – concerns of conflicting uses and visions for the coastal river and coastal environment; interest in maintaining and improving availability and safe access to green space in a highly urbanised environment.
- **Recreation and tourism** – expectations and concerns around the development of public parks, with influence on lifestyle and well-being, while potentially conflicting with conservation objectives.
- **Shipping** – expected increase in vessel and overland traffic transport around Port Botany (part of Sydney's trade gateway), brings concerns of risks to the Cooks estuary and coast.
- **Fishing** – no commercial pressure in the catchment study area, yet recreational fishing is somewhat popular.

1.2.2 Management of the Catchment Study area

Management of the catchment is currently fragmented across nine councils, multiple NSW Government agencies, utility providers, private entities and corporations. Hence, the urgent need of a coordinated CMP. Further details of the complexity of governance, legislation, policy and planning instruments influencing management of the catchment study area are provided in Chapter 3.

Councils in the catchment have been working together since 1997 to drive improvement of the health of the Cooks River, with the CRA playing a key role on this since its inception. NSW Government agencies and public authorities have also contributed to these improvements. The CMP will provide

a strategic whole of system management approach with the overall goal of enhancing the health, ecological functioning and amenity of the catchment study area.

1.3 NSW Coastal Management Framework

The NSW Government recently completed a re-invigoration of the NSW CM Framework for managing the NSW coastal zone, inclusive of open coast, estuaries, coastal rivers and marine estate, and comprising four coastal management areas (CMAs) defined in the Coastal Management Act 2016 (CM Act). These are

- Coastal Wetlands and Littoral Rainforest Area (CWLRA),
- Coastal Vulnerability Area (CVA),
- Coastal Environment Area (CEA), and
- Coastal Use Area (CUA).

The new CM Framework came into force in April 2018 and now comprises the elements listed in Figure 1-3. A detailed description of the most relevant elements of the framework is included in Appendix B.

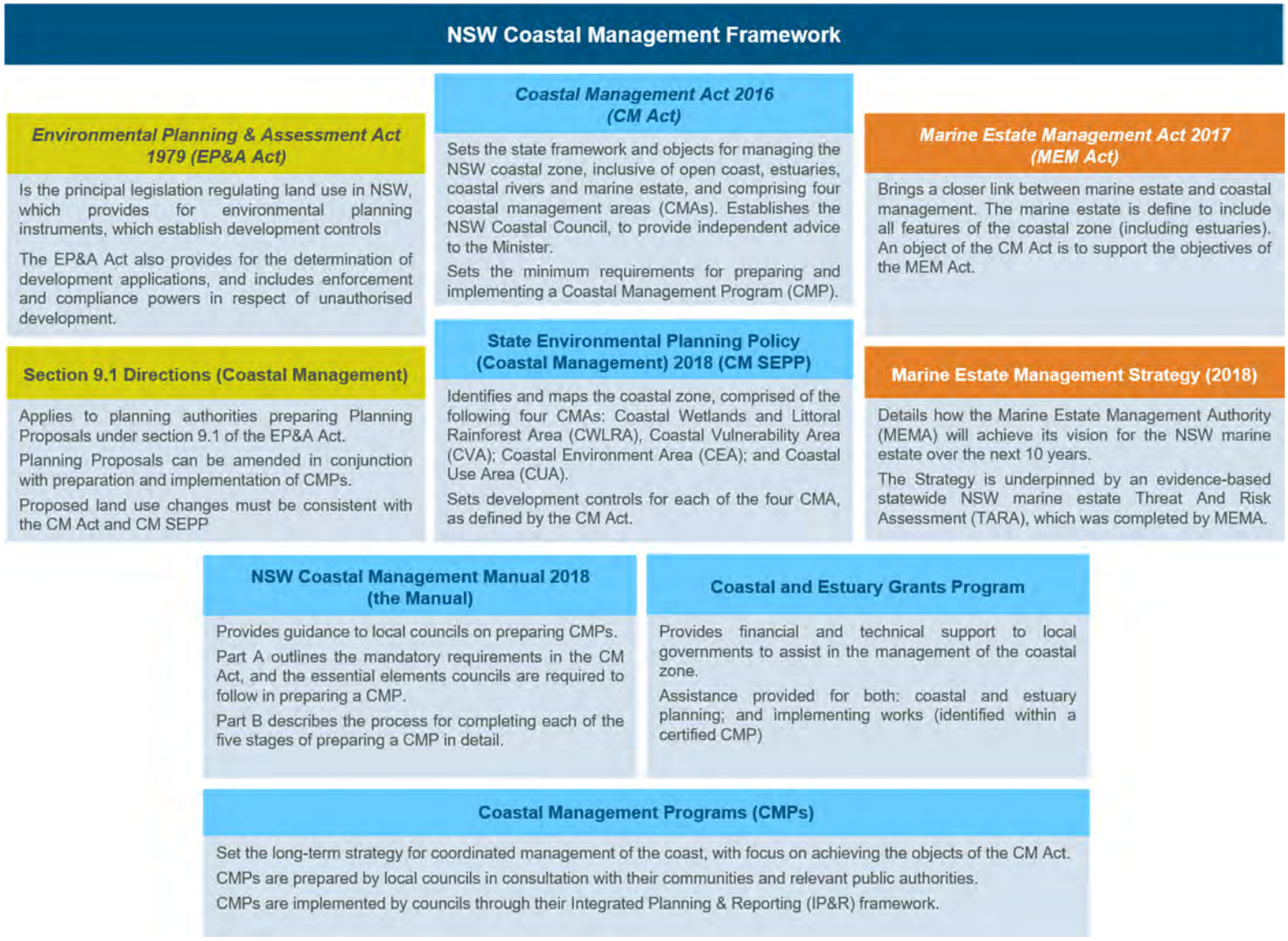


Figure 1-3 NSW Coastal Management Framework

1.3.1 What is a Coastal Management Program?

A Coastal Management Program (CMP) is a plan of management aimed at providing a long-term, coordinated strategy for managing and achieving a relevant local vision for the coastal zone, considering the local context and priorities as well as the state requirements in accordance with the NSW Coastal Management Framework and local objectives.

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.

The Manual outlines five stages of preparation of a CMP, as illustrated in Figure 1-4. It is 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 CMP 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 (certification of the CMP).

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.

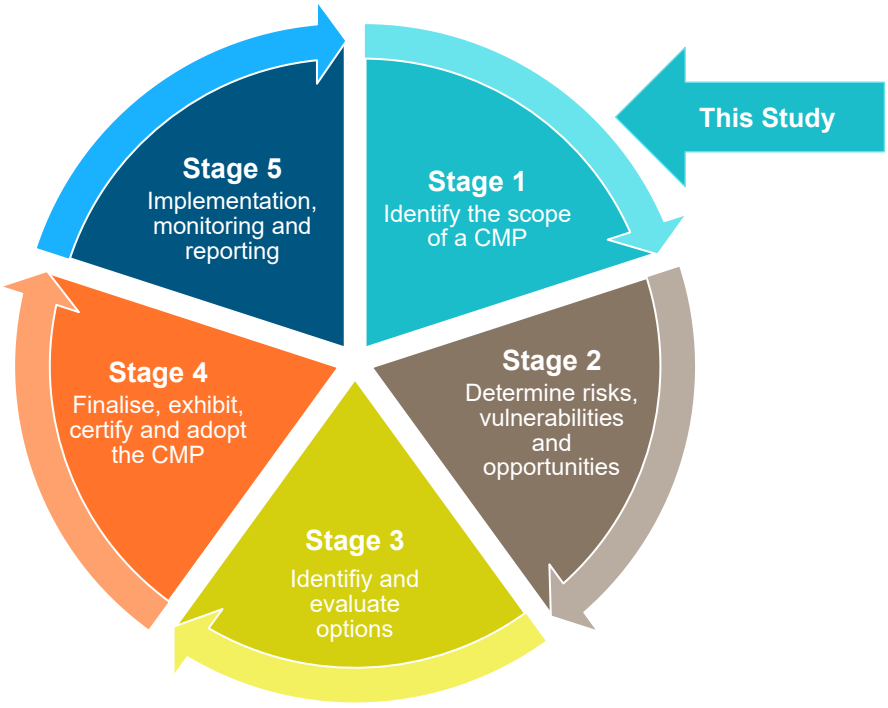


Figure 1-4 Staged Process for Preparing a Coastal Management Program (adapted from the Coastal Management Manual; OEH, 2018)

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 purposes of Stage 1 of a CMP are 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.

1.4 Report Structure

The required components of a Stage 1 Scoping Study, and the corresponding section in this report are outlined in Figure 1-5 below.

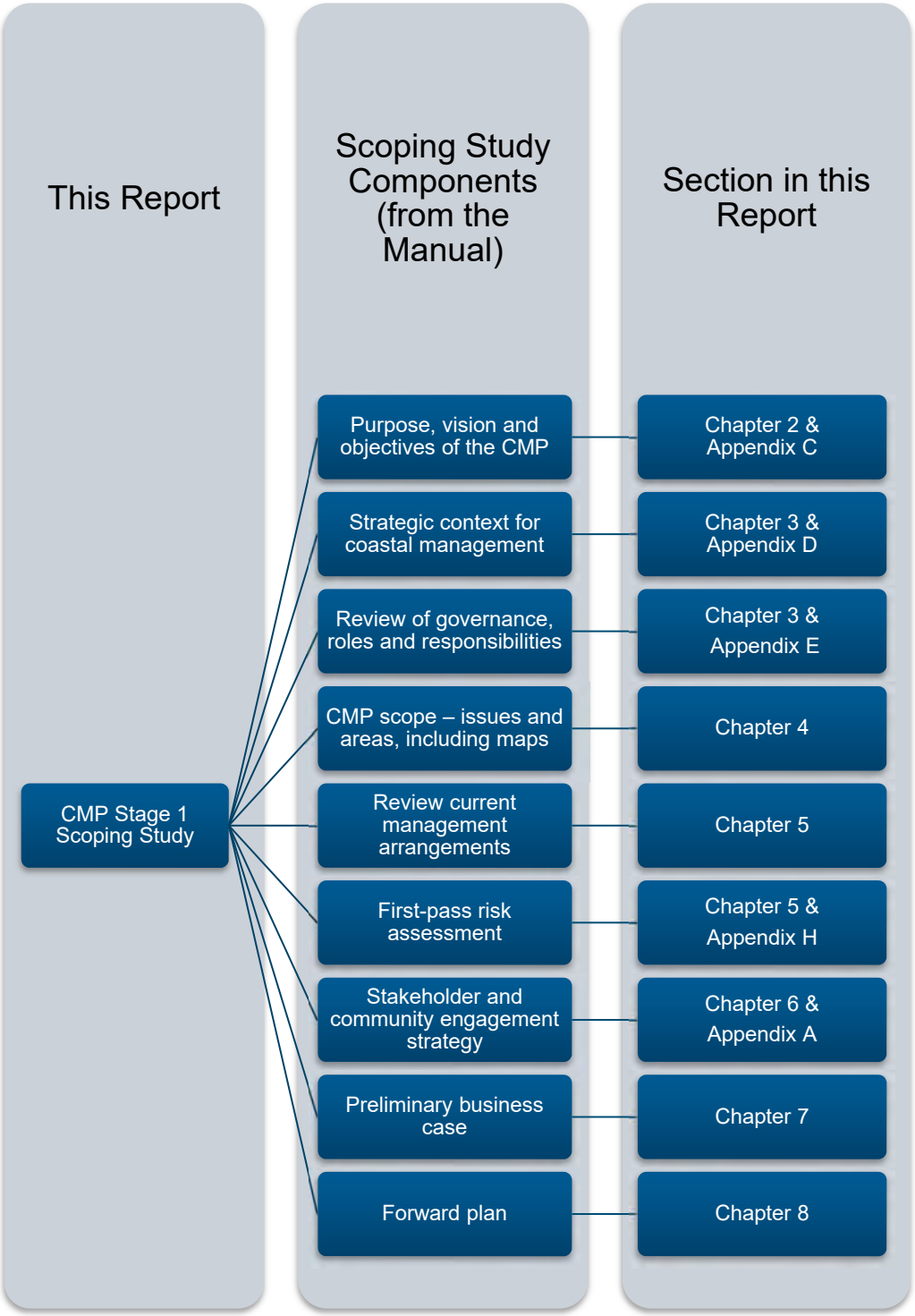


Figure 1-5 Components of CMP Scoping Study and Structure of this Report

CHAPTER 2: CMP VISIONING – SUMMARY

A key expected outcome of the Cooks River Catchment CMP Scoping Study is to direct and scope why the CRA and council(s) are preparing a CMP for the catchment study area. This is to be captured in the form of an overall purpose, a clear vision statement and accountable objectives for the CMP.

The vision statement for the Cooks River catchment CMP Scoping Study was developed after months of consultation with the Catchment Advisory Group, Aboriginal representatives, community members and river stakeholders, and the Cooks River Community Assembly.

The Alliance engaged with a wide range of community members and stakeholders through various workshops and meetings, catchment model demonstrations, council events, and an online Imagine 2030 survey. Consultation on the Vision also included direct stakeholder deliberations as part of the CMP Scoping Study First-Pass Risk Assessment Workshop.

The final community vision statement to be used to inform the Cooks River Catchment Coastal Management Program (CMP) is:

“A loved and healthy river valley and its catchment enriching the heart of Sydney”

Thirteen key objectives are proposed for a Cooks River Catchment CMP that are consistent with the objects of the *Coastal Management Act* 2016. These objectives are provided under four key themes identified by the community.

- A biodiverse river valley supporting a clean river
- Every community accessing and enjoying the river
- Aboriginal ways of thinking are valued from Yana Badu to Kamay
- Holistic cooperative approaches are guiding river restoration

2 Purpose, Vision and Objectives

2.1 Purpose

The general purpose of a CMP is to implement a long-term strategy for the coordinated management of the coastal zone which is a dynamic and evolving landscape, impacted by the broader Cooks River catchment study area.

The primary purpose of the Cooks River catchment CMP Scoping Study is to review progress made in managing issues in the catchment study area, with consideration of whole-of catchment processes. This is aims to develop a shared understanding of the historical and current situation, identify the focus of the CMP and develop recommendations for a forward plan with estimated costs to complete the CMP from Stage 2 to Stage 4.

Key expected outcomes of the Cooks River Catchment CMP are:

- to support stakeholders to plan for the improved health and functioning of the catchment study area, and to achieve safe community use as well as address current and future impacts of coastal hazards and development
- to tackle significant issues which are contributing (in the short and medium term) to the physical degradation of the catchment study area including (but not restricted to) sewer overflows, banks instability and sedimentation, dredging, and high volumes of stormwater which adversely impact stream flow regimes and degrade riparian and aquatic habitats
- to contribute towards coordination of stakeholders for the long-term management of the catchment study area and to consider interactions, connectivity and bidirectional influence between Botany Bay and the River (e.g. water quality, ecological and inundation considerations).

2.2 Vision Statement

"A loved and healthy river valley and its catchment enriching the heart of Sydney"

This 2030 community vision statement for the Cooks River catchment CMP Scoping Study was developed after months of consultation with Aboriginal representatives, community members and river stakeholders.

The Alliance engaged with a wide range of community members and stakeholders through various workshops and meetings, catchment model demonstrations, council events, and an online Imagine 2030 survey. Consultation on the vision also included stakeholder deliberations as part of the CMP Scoping Study First-Pass Risk Assessment Workshop (July 2018).

The development of the local vision statement was supported through a review of previous sub catchment statements, stakeholder engagement and community consultation. The resulting vision and objectives are consistent with the state's vision for the coast and encourages broad ownership of the CMP process by the community and stakeholders.

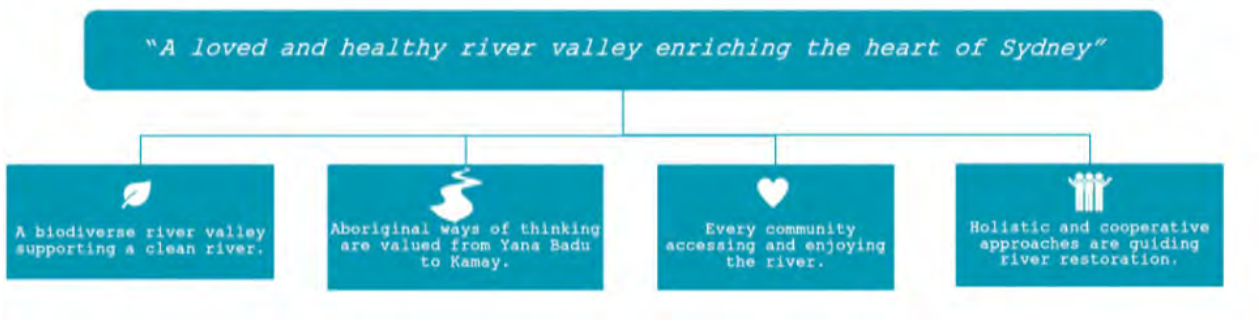


Figure 2-1 Cooks River Valley and Catchment CMP Vision and key Themes

2.3 Cooks River Catchment CMP Objectives

The following objectives for the Cooks River catchment CMP are grouped to respond to the vision statement.

The objectives for the Cooks River catchment CMP:

- are consistent with the CM Act objectives;
- give effect to the management objectives provided in the CM Act for the four coastal management areas that comprise the NSW coastal zone;
- support the objects of the Marine Estate Management Act 2014;
- are relevant for local catchment issues and conditions; and
- reflect community aspirations gathered from stakeholders and the community.

It is recognised that these objectives, grouped below within the four community-identified river themes, may be refined throughout the course of preparing the CMP via further consultations with stakeholders and the community.

A biodiverse river valley supporting a clean river

(1) To protect and enhance natural processes and environmental values of the Cooks River catchment study area;

(2) To provide for the management of the marine estate of NSW consistent with the principles of ecologically sustainable development in a manner that promotes a biologically diverse, healthy and productive marine estate and facilitates (*Marine Estate Management Act* 2014*)*:

- economic opportunities for the people of NSW, including opportunities for regional communities, and
- the cultural, social and recreational use of the marine estate, and
- the maintenance of ecosystem integrity, and
- the use of the marine estate for scientific research and education.

Every community accessing and enjoying the river

(3) To support the social and cultural values of the Cooks River catchment study area, maintaining and enhancing public access, amenity, use and safety;

(4) To recognise the Cooks River catchment study area as a vital economic zone and part of Sydney's trade gateway and to support sustainable coastal economies.

(5) To support public participation, awareness, education of catchment and coastal processes so that communities are enabled to participate in the management and planning of the Cooks River catchment study area;

Aboriginal ways of thinking are valued from Yana Badu to Kamay

(6) To be inclusive of Aboriginal peoples' spiritual, social, customary and economic use of the catchment study area;

Holistic cooperative approaches are guiding river restoration

(7) To facilitate ecologically sustainable development in the Cooks River catchment study area and promote strategic, sustainable and coordinated land use planning and decision-making;

(8) To mitigate and adapt to current and future risks from coastal hazards, and improve the resilience of coastal assets to the impacts of climate change and extreme storm events;

(9) To recognise that the local and regional scale effects of coastal and catchment processes, and shoreline dynamic effects of the shoreline, including the potential loss of land to the river and the sea and to manage coastal use and development accordingly;

(10) To promote the coordination and integration of policies, management and reporting activities of all tiers of government and public authorities relating to the Cooks River catchment study area, in partnership with the community;

(11) 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 within the catchment;

CHAPTER 3: STRATEGIC CONTEXT OF THE CMP – SUMMARY

Information Review

There is a wealth of information from a variety of sources relating to the functioning and management of the catchment study area. The review of information identified the values/benefits, hazards/threats and management issues, in addition to identifying critical information gaps.

Physical and Environmental Context

The catchment study area is located in a highly urbanised and industrialised area of Sydney and is within the 'Botany Bay, Bate Bay & Port Hacking' sediment compartment.

It includes the Cooks River that is an estuary in a tide-dominated drowned river valley with an open entrance. The river is approximately 23 km in length and has a catchment of around 100 km^2. This includes several primary and secondary tributaries joining the main course, which discharges downstream to Botany Bay at Kyeemagh where an artificial opening (trained entrance) was built to allow for the development of the Sydney Kingsford Smith International Airport. The tidally affected section of the Cooks River extends from the mouth to approximately 11 km upstream near Punchbowl Road at Belfield.

The catchment study area also includes all the eastern side of Bayside LGA (former Botany Council area). It extends across the historic river mouth and wetlands that was drained and realigned to create space for Sydney Airport. It includes Sir Joseph Banks Reserve developed because of Port Botany (Figure 1-2). It extends eastward from the river mouth to Bunnerong Creek, including the airport, Botany Wetlands (to the northern boundary of Bayside Council), Mill Stream, Foreshore Beach, Penrhyn Estuary, and Port Botany north of Brotherson Dock.

Flooding along the Cooks River and its tributaries can be influenced by both coastal and catchment conditions. The estuary has experienced coastal inundation during storm events and is subject to bank erosion from catchment and tidal currents, and locally induced waves. Coastal river foreshore and bank erosion hazards have been historically managed with stabilisation and lining of the main course and tributary channels using concrete, wood and steel piles.

The Cooks River catchment contains small pockets of remnant native vegetation scattered through the highly urban landscape containing key threatened fauna, flora and ecological communities. Wetland habitats (both freshwater and coastal) exist fragmented within the catchment study area.

Significant parts of the catchment study area have been the subject of past and current industrial activities, such as Sydney Airport and the chemicals manufacturing facility, Orica. The environmental risks such as groundwater pollution and site contamination are key concerns for the community, government, business and environmental groups.

Sea level variation, atmospheric, hydrologic and hydrodynamic processes are all predicted to shift under climate change, all of which influence coastal landforms and ecosystems. The threat of sea level rise, increasing temperatures and reduced or erratic rainfall patterns will place unprecedented stress on species, ecosystems and human settlements, infrastructure and industries. Consideration is needed as to how species, ecosystems and human communities can adapt to these anticipated stressors.

Legislative, Planning, Governance and Management Context

The legislation and policy governing the management of the catchment study area is complex and includes:

- 6 primary Commonwealth Acts;
- 25 state government Acts;
- 11 Local Environment Plans; and
- 11 State Environmental Planning Policies and Strategies.

The governance of the Cooks River catchment study area is complex and multi-layered and includes all tiers of government which are responsible for overseeing or delivering, legislation, policy and plans. This chapter summarises the legislation and policies that have a major influence in the coastal management of the catchment study area, which is further expanded in Appendix E.

The catchment study area waterways (tributaries and main channel) are primarily owned or managed by Sydney Water as critical stormwater and drainage infrastructure as per the Sydney Water (Stormwater Drainage Areas) Order 2011. The NSW Government owns the remaining waterways including the main Cooks River channel. Sydney Airport and Sydney Water manage parts of the Mill Stream and Mill Ponds. The Department of Planning, Infrastructure and Environment (DPIE) own the river below the boat harbour that is not Sydney Water's asset.

Land ownership and management within the catchment study area is mainly private with varying land use. Local government manages or owns much of the adjacent parklands along the main channel and tributaries, including the foreshore areas.

Social, Cultural and Economic Context

The Cooks River catchment study area is culturally diverse, with 47% of residents born overseas and 52% who speak a language other than English at home. The population of the area has grown in the past 10 years, increasing from 424,982 in 2007 to 531,506 in 2017.

The community values the Cooks River waterways and surroundings primarily for their natural and environmental values as well as for the recreation and wellbeing opportunities.

Sydney's continuing population growth will require significant changes to the built environment that will place additional pressure on the Cooks River catchment study area. The Greater Sydney Commission outlines the future for development in the catchment study area as documented in the Greater Sydney Regional Plan (GSC, 2018) and District Plans (GSC, 2018). The Eastern City and South District Plans cover the area of the proposed Cooks River catchment CMP. It is projected that the Eastern City and South Districts will continue to grow over the next 20 years with an anticipated population growth of 19% and 12% by 2036, respectively. This will require an additional 157,000 and 83,500 dwellings in the Eastern City and South Districts, respectively; which will be provided through urban renewal around new and existing infrastructure and infill development.

The Cooks River flows through the oldest industrial area in Australia. The area has been impacted by European settlement since 1788. The catchment study area contains significant industrial sites for the Greater Sydney region as well as for Sydney's global trade gateway. The overall Gross Regional Product for these LGAs is $151.92 billion, which accounts for 30.2% of Gross State Product (GSP). Seven LGAs contribute to this and it does include the whole of Council of the City of Sydney which is a key contributor at 21.7% of GSP.

3 Strategic Context of the CMP

3.1 Previous Work and Information Review

There is a wealth of information from a variety of sources relating to the functioning and management of the coastal river comprised within the catchment study area:

- technical studies and academic literature
- planning and management documents (e.g. strategic, operational and natural resource/coastal zone management plans)
- spatial mapping and data.

The review of information resulted in a better understanding of the strategic context for the catchment study area, which supported identifying the 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 Greater Sydney Region Plan (GSC, 2018) and associated Eastern City and South District Plans, Three Ports SEPP, and the Cooks Cove Sydney Regional Environmental Plan No 33
- Local Environment Plans (LEPs), Development Control Plans (DCPs) and Community Strategy Plans for each Council within the catchment study area
- catchment-wide information sources, including water quality improvements plans, estuarine vegetation management plans, Cooks River ecological health report cards and the Cooks River flood study.

The document review identified that there are many sources of information about the study area both historical and current and that these have generally been developed by different organisations with varying degrees of a whole catchment or coastal management approach or an approach across the catchment study area.

A summary of key documents and information sources are provided in Appendix D, with further details of governance, legislation and policy provided in Appendix E.

3.1.1 Catchment study area – Coastal Management Areas

The catchment study area of the Cooks River Catchment CMP is generally described in 1.2 and mapped in Figure 1-1. The catchment study area comprises contains several areas classified as either of the four coastal management areas defined in the CM Act, i.e.:

- Coastal Wetlands and Littoral Rainforest Area (CWLRA),
- Coastal Vulnerability Area (CVA),
- Coastal Environment Area (CEA), and
- Coastal Use Area (CUA); as well as,

A technical context and description of these four areas are presented in Section 4.2, in relation to the definitions and considerations of the CM Framework. Further details on the physical,

environmental, social, economic and governance context are provided in subsequent sections of this chapter.

3.2 Physical Context

There are two distinct areas in this Scoping Study that were at one time part of the same waterway.

3.2.1 The Cooks River and Catchment

The Cooks River is a coastal river, comprising an estuary in a tide dominated drowned river valley with an open entrance. The Cooks River catchment is approximately 100 km^2, including several primary and secondary tributaries joining the main course, which discharges downstream to Botany Bay at Kyeemagh where an artificial opening, that is, trained entrance, has been placed providing an area for the Sydney Kingsford Smith International Airport.

It is within the area of the Metropolitan Local Aboriginal Land Council with the very upper reaches within the area of Gandangara Local Aboriginal Land Council.

The river's main course is approximately 23 km in length and has several tributaries (Muddy Creek, Wolli Creek, Bardwell Creek, Cup and Saucer Creek, Coxs Creek, Greenacre Creek and Alexandra Canal), along with smaller tributaries and several unnamed stormwater channels that discharge into the river.

The upper part of the river, south west of Strathfield Golf Course, goes through sections of open and closed canals passing industrial and residential areas in Chullora to Yagoona. Many of the creeks were lined with concrete during the last century, particularly during and after the great depression (1929–1939) to alleviate flooding, flush out pollutants and facilitate urban development (MWH-PB, 2009). However, this practice of making the waterways into stormwater and flood drains degraded the ecological values of the waterways, and as the walls are now deteriorating and require renewal or replacement, alternatives such as naturalisation have been looked at (and implemented in sections of the main watercourse) as an opportunity to reintroduce natural waterway features and social values back into the area (Sydney Water, 2017).

3.2.2 Botany Area

The Botany area comprises around 21.6 square kilometres of catchment and includes most of the area known as the Botany Wetlands, the Millstream, Foreshore beach and Penryn Estuary. It is within the area of the La Perouse Local Aboriginal Land Council.

The Botany Wetlands are the largest coastal freshwater wetlands in the Sydney region. It is listed on the Directory of Important Wetlands in Australia and is a major recharge source for the Botany Sands Aquifer (Sydney Water, 2018). The wetlands are comprised of 13 interconnected ponds that span over a 4.5 km corridor in Sydney's eastern suburbs. The wetlands have significant ecological value, providing an extensive refuge to both migratory birds and other wetland flora and fauna, as well as providing important recreational, educational and scientific amenity to the community. The wetlands are listed on the State Heritage Register because the original Botany Swamps Water Supply Scheme (1858-1886) provided drinking water to early settlers of Sydney. The ponds and historic water supply weirs

are now a flood mitigation resource, receiving and treating stormwater run-off from a large urban catchment in Sydney's eastern suburbs. Sydney Water holds a 'water supply works approval licence' under the Water Management Act 2000 issued by the Department of Industries – Water (DoI – Water) for the wetlands. This licence requires Sydney Water to implement a Plan of Management (PoM) for the wetlands. (Sydney Water Botany Wetlands PoM 2018).

The Millstream is a 1.1 km estuary that flows into a coastal foreshore area at Foreshore Beach. Foreshore beach is a 500m managed coastline that was formed with the development of the airport and the port extension.

The Botany study area extends for a further 2.5 km incorporating the Penryn Estuary (managed by the Port Authority of NSW) and Brotherson Dock. The coastal areas along the foreshore includes the 2.7 km Sir Joseph Banks Park created because of port expansion works and managed by Bayside Council.

Sydney Airport has a significant impact on the physical context of the Botany area. The airport is located on a 907 hectares site, of which seven hectares is owned by Sydney Airport and the remaining 900 hectares is leased from the Commonwealth Government to Sydney Airport Corporation Limited (Sydney Airport).

Sydney Airport manages the downstream sections of the Botany Wetlands, known as Sydney Airport Wetlands comprising Engine Pond East, Engine Pond West, Mill Pond and Mill Stream. The Sydney Airport Wetlands are designated as an environmentally significant area (heritage and biodiversity) under the Airports Act 1996 (Sydney Airport Environment Strategy).

3.2.3 Tidal Regime

The tidally affected section of the Cooks River extends from the Rivers mouth to approximately 11 km upstream near Enfield. The tidal influence on the tributaries extends up to Huntly Street on Alexandra Canal, Bestic Street on Muddy Creek and to Nanny Goat Hill on Wolli Creek (NSW Environment Protection Authority 1997 in PPK & Webb McKeown 1999). The tidally affected area of Botany extends into the Millstream approximately one km upstream to the first weir.

The tidal regime in Botany Bay has a mean tidal period of 12.4 hours. Generally, the tidal regime in the area is semi-diurnal with two high tides and two low tides occurring each day (NSW Environment Protection Authority 1997 in PPK & Webb McKeown 1999). The tidally affected sections of the main river course and tributaries are expected to extend further upstream with ongoing and future sea level rise. A number of surrounding low-lying areas are currently subject to periodic nuisance flooding under tidal inundation, with the frequency, extent and duration also anticipated to increase with future sea level rise (Hanslow, 2019). The notable areas where properties are affected include:

- Booralee Street, Luland Street and Bay Street in Botany;
- Rockwell Avenue and Levey Street in Wolli Creek;
- Carrington Road, Renwick Street and Warren Road in Marrickville; and
- Old Street and Bay Street in Tempe.

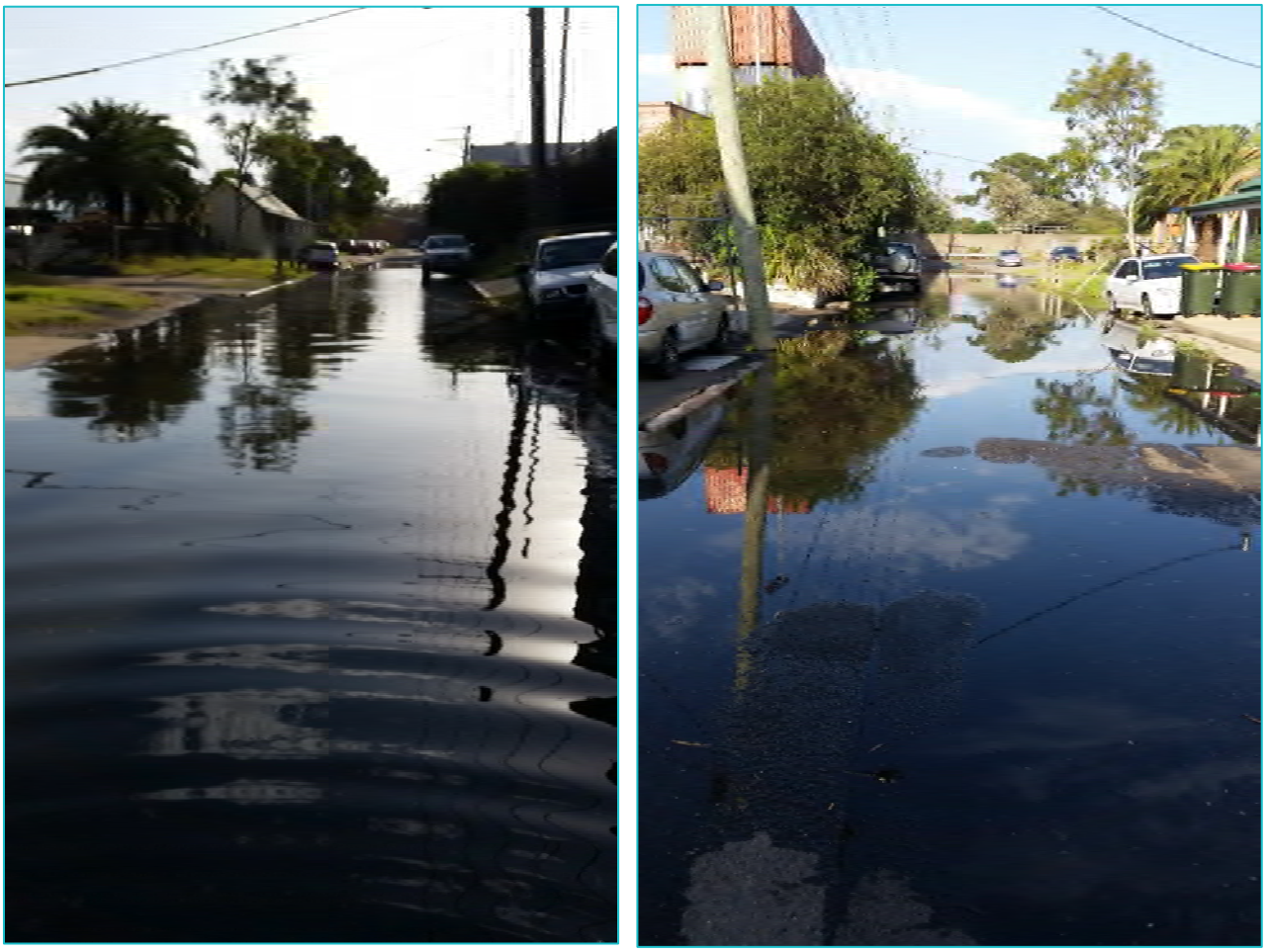
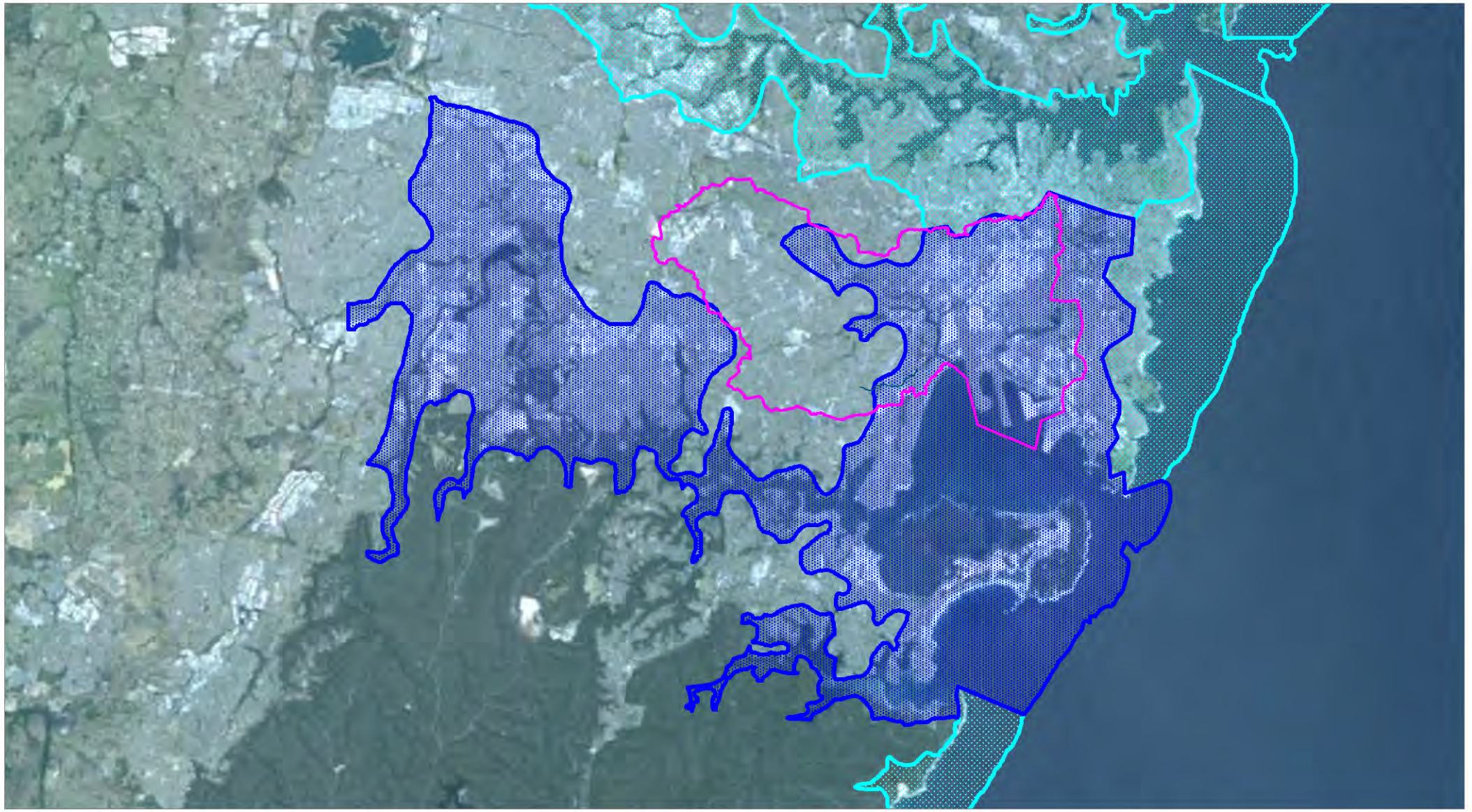


Figure 3-1 Nuisance flooding associated with tidal inundation at Booralee St, Botany 19/02/2019 (DPIE, 2019)

3.2.4 Sediment Compartments

The coastline of the catchment study area is comprised within the 'Botany Bay, Bate Bay & Port Hacking' sediment compartment as shown in Figure 3-2 (CM Act 2016; CoastAdapt, 2018). It is worth noting, in addition to the Cooks River, this sediment compartment also comprises the Georges River, Port Hacking estuaries and the semi enclosed Botany Bay area.



LEGEND

- Study Area of Cooks River Catchment CMP
- Botany Bay, Bate Bay & Port Hacking Sediment Compartment
- Neighbouring Sediment Compartments

Title:

Sediment Compartment "Botany Bay, Bate Bay & Port Hacking" (Source: CoastAdapt 2018)

Figure: 3-2

Rev: 0

N

0 3.75 7.5km

Approx. Scale

BMT

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3.2.5 Catchment Study Area Characteristics

The catchment study area has a highly urbanised and industrialised catchment of approximately 121 km^2 (12,100 ha). There is a variety of land uses ranging from:

- light to heavy industrial
- regionally significant transport corridors
- Sydney airport
- low, medium and high-density residential areas
- public and private (e.g. golf courses) open space.

A 2015 Study by Alluvium (2015) reported that most of the Cooks River catchment is comprised of low density residential areas, which together with medium and high-density housing amounted to 45% of the catchment. Approximately 14% of the catchment land use is considered commercial or industrial, 7% comprises public recreation areas and several other land uses amounted to the remaining catchment area. Refer to Figure 3-3 for a map of land zoning and use features.

The Botany area encompasses approximately 2,167 hectares (former Botany Bay LGA area) of which more than half is occupied by the Airport, Port, industrial areas and Botany Wetlands. A large section of Banksmeadow and parts of Botany are zoned as general industrial under State Environmental Planning Policy (Three Ports) 2013. Further land and waterways abutting the runway are also zoned under this SEPP for special activities. Residential development is limited as over 50% of the area is in the aircraft noise contour of ANEF25. The area contains a significant amount of open space with most of the population of Botany within 400 metres of open space. However, open space such as Botany Wetlands is not accessible to the community and other areas are golf courses or large regional sports field facilities. (Bayside Council, Botany Bay Planning Strategy 2031).

In general, the study area is highly urbanised and industrialised which has reduced significantly the catchment permeability. A considerable land surface comprises open green spaces or parklands, mostly along the main course and tributary banks, with only minor areas of remnant bushland, native vegetation (e.g. Wolli Creek) and wetlands (freshwater and coastal). These green spaces have been historically affected (and continue to do so today) by urbanisation and industrialisation, with littering and solid waste that is either dumped (nowadays illegally) on site or moved (generally downstream) by the river flows and tidal variations. Waste water overflows also have an ongoing impact on water quality.

3.2.6 Acid Sulfate Soils

Development, vegetation clearing and filling of the low-lying areas along the river has led to major changes in the soil condition. Acid sulphate soil conditions exist in bottom sediments of the tidally influenced areas of the catchment study area. This presents an environmental risk if disturbed as acid leachate can be washed to the estuary and Botany Bay because of drained soils or lowering of the water table (Ecological, 2010).

3.2.7 Flooding

Flood behaviour is influenced by runoff generated within the catchment study area and tide levels in Botany Bay (MWH-PB, 2009). In relation to catchment driven floods (i.e. due to rainfall and runoff), mainstream flooding occurs along sections of the Cooks River with flooding conditions exacerbated by modifications to the river channel and land use changes, i.e. urbanisation, residential and industrial development on the natural floodplain. The concrete drainage lines, relatively low infiltration and soil storage capacity of the catchment results in a quick response to rainfall events, and in general high flow velocities in the channels. This is particularly significant during small frequent storm events and results in high flows and flooding in parts of the catchment (NSW Environment Protection Authority 1997 in PPK & Webb McKeown 1999).

The MWH-PB Cooks River Flood Study (2009) outlines notable areas where properties are affected by the 100-year ARI (average return interval) catchment flood event include properties near:

- Bay Street in Tempe, Carrington Road, Thornley and Illawarra Road/ Wharf Street in Marrickville;
- Riverview Road to Flinders Road, Bankside Avenue to Bamboo Avenue and Waterside Crescent in Earlwood;
- Riverside Crescent, Tennent Parade and Hurlstone Avenue in Hurlstone Park;
- Charles Street and Phillips Avenue in Canterbury;
- Between Bellombi Street and Adam Street, Byron Street and Fifth Avenue in Campsie;
- Walsh Avenue in Croydon Park;
- Water Street in Belfield; and
- Cave Road to Morgan Place, Augusta Street and Ada Avenue in Strathfield.

Also, Mascot, Eastlakes, Rosebery and Botany Wetlands flood studies (Royal HaskoningDHV, 2019) outlines flooding issues in the Botany area. Botany Road separates the Mascot catchment in the west from the Rosebery and Eastlakes catchments to the east. Generally, the Mascot catchment drains in a westerly direction to the Alexandra Canal. To the east, the Rosebery and Eastlakes catchment drains in a south westerly direction, into the Ascot Drain which discharges directly to Botany Wetlands.

The Flood Study found that the Metropolitan Goods Railway Line forms a major hydraulic feature of the area, obstructing overland flow at Baxter Road. Further, drainage from Baxter Road can only occur via the piped drainage network. As such, this location is subject to frequent ponding of floodwaters resulting in inundation of properties in flood events as frequent as the 0.2 EY.

The study identified that flooding in Botany Wetlands will not spill over into the Bay St catchment up to the 1% AEP (annual exceedance probability) event, but overflow is likely to occur in more extreme events such as the PMF (probable maximum flood).

Local flooding occurs on the eastern side of Botany Road near the intersection with Forster Street. This appears to be an issue relating to local road grading and locations of stormwater inlets and pipe drainage, rather than a “flooding” issue, as the problem has occurred regularly and in relatively low-intensity storm events.

3.2.8 Coastal Hazards

Flooding along the Cooks River, Botany and tributaries can be influenced by both sea level and catchment conditions. The estuary has experienced coastal inundation during storm events and is subject to bank erosion from catchment and tidal currents, locally induced waves and bank degradation. In addition, sea driven inundation can be exacerbated influenced by stormwater runoff, degradation and ageing of drainage infrastructure as well as sea level rise.

Coastal inundation hazard mapping for the Sydney region produced a set of high-resolution hydrodynamic model simulations in order to obtain current climate, as well as storm tide return level estimates and sea level rise considerations, (SCCG & CSIRO, 2012). Six Inundation scenarios where developed include for the Cooks River that including the influence of tidal attenuation, Scenarios included:

- 1 in 1-year event;
- 1 in 1-year event with 40 cm Sea Level Rise;
- 1 in 1-year event with 90cm Sea Level Rise;
- 1 in 100-year event;
- 1 in 100-year event with 40 cm Sea Level Rise;
- 1 in 100-year event with 90cm Sea Level Rise.

BMT WBM (2013) conducted a study for Rockdale City Council presenting the results of hydrodynamic and coastal process modelling of Botany Bay, including a risk assessment of current and future permanent and episodic oceanic inundation levels within Botany Bay and Cooks River and its tributaries using a first-pass ‘bath tub’ analytical approach.

Coastal river foreshore and bank erosion hazards have been historically managed in the catchment study area with stabilisation and lining of the main course and tributary channels using concrete, wood and steel piles. As described in section 3.2.1, this has resulted in changes to water and sediment movement.

On the seaward side, the catchment study area includes only two relatively short man-made unconsolidated sandy shorelines, i.e. Foreshore Beach and a pocket beach located between the eastern breakwater of the Cooks River entrance and the Sydney Airport parallel runway.

A report by Lawson & Treloar (2003) for Sydney Ports Corporation provides extensive hydrodynamic and coastal process modelling and assessment of Botany Bay generally and of the catchment study area specifically, and alongshore sediment transport analyses of Foreshore Beach.

The development consent conditions issued in relation to the Port Botany Expansion Project in 2005 require ongoing erosion control of Foreshore Beach to mitigate adverse impacts on seagrasses. Accordingly, in 2016 the Port Authority of NSW installed three groyne structures to stabilise Foreshore Beach and reduce alongshore sediment transport into Mill Stream. The Port Authority is responsible for ongoing erosion management of Foreshore Beach in accordance with the consent obligations.

3.2.9 Groundwater

The Botany Aquifer is a large volume of underground water present in the sandy ground surrounding Botany Bay which runs from Centennial Park to the Botany Wetlands and into Botany Bay.

Historically, bore water was extracted for both domestic and industrial uses. Contamination from these activities is likely to have leached into the groundwater. The aquifer is particularly vulnerable to this kind of contamination because the sandy soil above it allows pollutants to pass through easily and the groundwater is often very close to the surface.

As a result, chemicals such as chlorinated hydrocarbons and other solvents, petroleum hydrocarbons (such as petrol and diesel), and some heavy metals such as chromium, nickel, lead and arsenic, have polluted groundwater in parts of the aquifer (DPIE online https://www.industry.nsw.gov.au/water/allocations-availability/temporary-water-restrictions/botany-sands-gw).

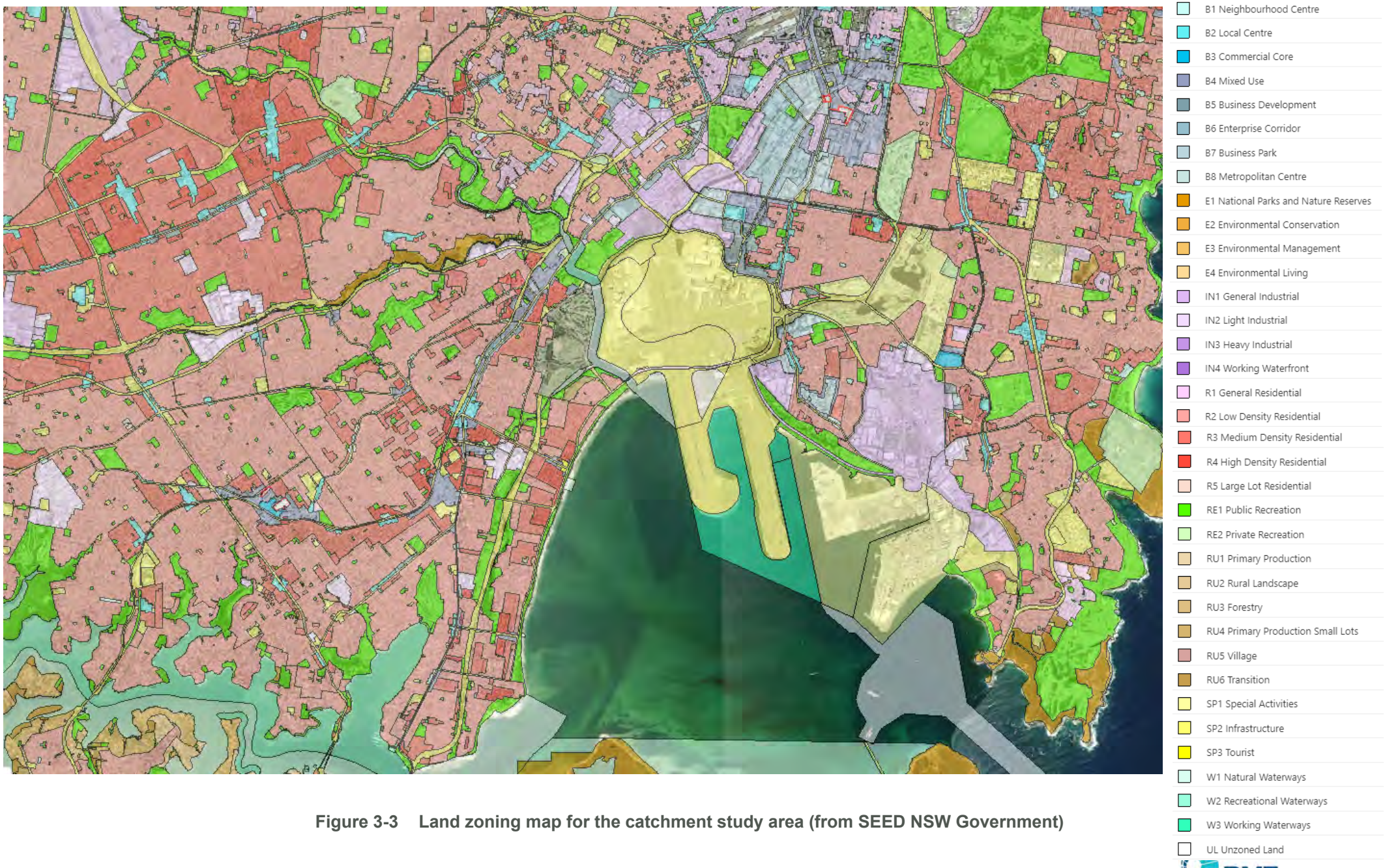


Figure 3-3 Land zoning map for the catchment study area (from SEED NSW Government)

3.3 Environmental Context

3.3.1 Ecological Attributes

The Cooks River catchment contains small pockets of remnant native vegetation scattered throughout the highly urban landscape of the inner south western suburbs of Sydney.

The Cooks River tributary Wolli Creek flows through Wolli Creek Regional Park which is the most significant region of remnant bushland in the area. This area conserves a diverse vegetation corridor providing habitat for an array of fauna, in particular the valued Grey-Headed Flying Foxes which is classified as vulnerable under the *Biodiversity Conservation Act* 2016. However, many of the other remnant vegetation areas within the catchment study area are small, degraded and contain noxious and environmental weeds.

Wetland habitats (both freshwater and coastal) exist fragmented within the catchment study area (as further discussed in section 4.2) with the dominant species being the grey mangrove (*Avicennia marina)*in the coastal intertidal zones *and* Samphire *(Sarcocornia sp*). Saltmarsh is considered an endangered ecological community under the *Biodiversity Conservation Act* 2016. Efforts to coordinate the management of these wetland areas was documented in the Cooks River Estuarine Vegetation Management Plan (EcoLogical Australia, 2010), which identified remnant vegetation, rehabilitated vegetation and degraded areas.

The Botany area has been the subject of past and current industrial activities, such as Sydney Airport and the chemicals manufacturing facility, Orica. The environmental risks such as groundwater pollution and site contamination from these activities are key concerns for the community, government, business and environmental groups (NSW EPA, 2018). Although these developments have altered the Pre-European habitats in this area, valued ecological areas have remained or have been created as a response to development. The ecological values of these areas are considered when new developments such as the Port Botany Expansion have been proposed.

- Penrhyn Estuary: formed in the 1970s during the construction of Port Botany and is bounded by Foreshore Road, Penrhyn Road and Patrick container terminal. The site is values for its bird life, seagrass habitats and saltmarsh environments. Port Authority has spent approximately $8 million to rehabilitate and expand Penrhyn Estuary in Botany Bay to provide habitat for migratory birds protected by State and Federal legislation (Port Authority NSW, 2019).
- Botany Wetlands: the wetlands are the largest coastal freshwater wetlands in the Sydney region and are a known habitat for migratory birds protected under international agreements and the area also contains Sydney Freshwater Wetlands and Eastern Suburbs Banksia Scrub- both threatened ecological communities.
- Mill Stream; is identified as Key Fish Habitat under the Fisheries Management Act 1994.
- Foreshore Beach: was formed during the 1970s Port Botany development from reclaimed land. The beach has shown signs of erosion since its formation which has impacted the adjacent seagrass beds.
- Key threatened fauna, flora and ecological communities that exist in the catchment study area are identified in Table 3-1, Table 3-2 and Table 3-3, respectively (as provided by DPIE, 2019).

Table 3-1 Threatened Species – Fauna

Threatened Fauna (Scientific Name)	
Anthochaera phrygia	*Limosa*
Artamus cyanopterus	*Litoria aurea*
Botaurus poiciloptilus	*Litoria brevipalmata*
Calidris alba	*Melithreptus gularis*
Calidris ferruginea	*Miniopterus schreibersii oceanensis*
Calidris tenuirostris	*Neophema pulchella*
Calyptorhynchus lathami	*Ninox strenua*
Charadrius leschenaultii	*Perameles nasuta*
Charadrius mongolus	*Petroica boodang*
Crinia tinnula	*Petroica phoenicea*
Dugong dugon	*Phascolarctos cinereus*
Eubalaena australis	*Pteropus poliocephalus*
Glossopsitta pusilla	*Ptilinopus superbus*
Haematopus fuliginosus	*Saccolaimus flaviventris*
Haematopus longirostris	*Stagonopleura guttata*
Haliaeetus leucogaster	*Sternula albifrons*
Hieraaetus morphnoides	*Stictonetta naevosa*
Ixobrychus flavicollis	*Tyto novaehollandiae*
Lathamus discolor	*Varanus rosenbergi*
Limicola falcinellus	*Xenus cinereus*

Table 3-2 Threatened Species – Flora

Threatened Flora (Scientific Name)	
Acacia prominens	*Pomaderris prunifolia*
Acacia pubescens	*Pultenaea pedunculata*
Acacia terminalis subsp. terminalis	*Senecio spathulatus*
Caladenia tessellata	*Syzygium paniculatum*
Epacris purpurascens var. purpurascens	*Wahlenbergia multicaulis*

Table 3-3 Threatened Ecological Communities

Threated Ecological Communities
Bangalay Sand Forest of the Sydney Basin and South East Corner bioregions
Cooks River/Castlereagh Ironbark Forest in the Sydney Basin Bioregion
Coastal Saltmarsh in the NSW North Coast, Sydney Basin and South East Corner bioregions
Eastern Suburbs Banksia Scrub in the Sydney Basin Bioregion
Freshwater wetlands on coastal floodplains of the NSW North Coast, Sydney Basin and South-East Corner bioregions
River-flat Eucalypt Forest on Coastal Floodplain of the NSW North Coast, Sydney Basin and South East Corner bioregions
Shale Gravel Transition Forest in the Sydney Basin Bioregion
Swamp Oak Floodplain Forest of the NSW North Coast, Sydney Basin and South East Corner bioregions
Swamp Sclerophyll Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions
Sydney Freshwater Wetlands in the Sydney Basin Bioregion
Sydney Turpentine-Ironbark Forest

3.3.2 Environmental Pressures

Ecological health and functioning in the catchment study area is influenced by the systems hydrodynamics, saline-freshwater interaction, water quality, sediment characteristics and human intervention. Past and present human activities within the waterways, the broader catchment and Botany Bay continue to threaten many of the catchment study area's environmental values.

Impacts include:

- Vegetation clearing
- Draining of wetlands
- Diversion of natural channels and drainage
- Concrete, steel sheet piling and masonry lining of channels and banks
- Dredging
- Industrial activities
- Road and transport routes
- Development of residential areas
- Dumping of commercial and domestic waste
- Land filling

- Sewage overflow contamination
- Groundwater extraction and contamination
- Biosecurity (ports).

3.3.3 Environmental Monitoring

Water quality is widely used as an indicator for the heath of an aquatic ecosystem and the local catchment. Water quality within the catchment study area is affected by all activities and management practices within the catchment as well as by exchange with seawater from Botany Bay. Councils have worked together and with Sydney Water to manage water quality issues through water sensitive urban design structures such as rain gardens, as well as gross pollutant traps and litter booms.

Monitoring of water quality within the catchment study area has been undertaken since the 1980s, however, many recordings were undertaken by different authorities for various purposes, and the location and level of monitoring, and the range of pollutants measured were not consistent (NSW Environment Protection Authority 1997 in PPK & Webb McKeown 1999).

Since 2011 the Cooks River Alliance has been monitoring the ecological health of the Cooks River using key indicators of overall ecosystem health and publishing these results as Cooks River Ecological Health Report Cards. From 2011 to 2017 monitoring was undertaken annually but will now be undertaken every 5 years. The key indicators monitored are:

- water quality
- aquatic macroinvertebrates
- benthic diatoms
- riparian vegetation and creek channel condition.

These above indicators are assessed against locally derived environmental and ecological guidelines. The most recent Cooks River Ecological Health Report Card (CRA, 2017) showed the ecological heath of the river was rated as poor. The water quality at all monitored freshwater sites was degraded compared to regional guideline limits, with non-compliant levels of nutrients, conductivity turbidity and dissolved oxygen. In addition, estuary reaches showed signs of degradation with excessive algae concentrations and turbidity. The riparian vegetation and creek channel condition across the catchment was degraded with frequent observations of litter, severe bank erosion, channelisation, exotic weed invasion and lack of complex riparian and instream habitats. The condition of the macroinvertebrates and benthic diatoms communities indicated the creeks were affected by excessive nutrient concentrations, lack of complex aquatic habitats and frequent high velocity stormwater flows (CRA, 2017).

There are various other projects and guidelines that assist in monitoring and regulating the health of the catchment study area. The Botany Bay Water Quality Improvement Plan – BBWQIP (Sydney Metropolitan Catchment Management Authority, 2011) sets out water quality objectives based on existing conditions and community preferences and proposes pollution reduction targets for new developments. The recreational water quality objective outlined in the Plan is to improve water

quality to allow secondary contact which includes activities such as rowing and boating. The key pollutants outlined by the BBWQIP are gross pollutants, -total suspended solids, total nitrogen and total phosphorus.

Orica undertakes groundwater and surface water testing as part of the Botany Groundwater Cleanup Project. They deliver quarterly Progress Reports that provide details of Orica's cleanup progress again their Voluntary Management Proposal as associated Groundwater Remediation and Management Plan (Orica Limited, 2019).

Beachwatch monitors recreational water quality at swimming sites across NSW to assess the level of faecal pollution. Two Beachwatch sites exist near the catchment study area: Kyeemagh Baths, Brighton Le Sands Baths and a further site is in the catchment study at Foreshore Beach (EES, 2019). Between 2014 and 2019 Beachwatch also conducted monitoring of three potential swim sites along the Cooks River. The data indicated that poor water quality can occur after rainfall with enterococci results exceeding the safe swimming limit and there were high levels of other hazards and risks associated with the sites.

3.4 Legislative and Policy Context

The legislation and policy governing the management of the catchment study area is complex and includes:

- 6 primary Commonwealth Acts
- 25 state government Acts
- 11 Local Environment Plans11 State Environmental Planning Policies and Strategies.

As outlined previously in Chapter 1, the *Coastal Management Act* establishes the framework and overarching objectives for coastal management in NSW which focus on strategic, integrated and ecologically sustainable management of the NSW coastal zone.

Table 3-4 provides a summarised list of the legislation and policy that have a major influence in the coastal management of the catchment study area, which is further expanded in Appendix E. It is worth noting that no one piece of legislation (i.e. Act) overwrites other Acts, however, Commonwealth legislation takes precedence over state legislation. Also, in the context of preparing a CMP, the relevant NSW state legislation (i.e. the CM Act and MEM Act, in that order) are the driving legislation for dealing with coastal and marine management matters, followed by the CM SEPP.

Table 3-4 Key legislation and policy governing coastal management in the catchment study area (see Appendix E for further details)

NSW Coastal Zone Legislation and Policy	Additional Key Legislation Supporting Coastal Management in the Cooks River catchment study area
• *Coastal Management Act* 2016 • *Coastal Management SEPP* 2018 • *Marine Estate Management Act* 2017 • Marine Estate Management Strategy (2018)	**Commonwealth** • *Environment Protection and Biodiversity Conservation Act* 1999 • *Biosecurity Act* 2015 **NSW** • *Environmental Planning & Assessment Act* 1979 • *Protection of the Environment Operations Act* 1997 • *Local Government Act* 1993 • *Crown Lands Act* 1989 • *Fisheries Management Act* 1994 • *Biodiversity Conservation Act* 2016 • *National Parks and Wildlife Act* 1974 • *Water Management Act* 2000 • *Catchment Management Authorities Act* 2003 • *Natural Resource Management Act* 2003 • *Greater Sydney Commission Act* 2015 • *Sydney Water Act* 1994

3.5 Regional and Local Planning Context

Several planning instruments are relevant to the governance of catchment study area. The key state, regional and local level planning instruments that guide management of the catchments coastal zone are reviewed below.

Under the NSW Environmental Planning and Assessment Act, state planning instruments generally take precedence over local plans, e.g. state environmental planning policies such as the Three Ports SEPP or the Infrastructure SEPP will take precedence over the Botany Council (Bayside) LEP and associated development control plans.

3.5.1 State Level Policies and Plans

3.5.1.1 *State Environmental Planning Policy (Coastal Management)* 2018 - The Coastal Management SEPP

The *State Environmental Planning Policy (Coastal Management)* 2018 (the 'CM SEPP') passed in Parliament in April 2018, and defines the strategic planning objectives and development controls applicable to the four coastal management areas 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 maps. It is anticipated that councils in the catchment study area will submit planning proposals to have existing or new coastal hazard mapping adopted as the coastal vulnerability area. There may also be updates to the coastal wetland and littoral rainforest management area maps. The preparation of a planning proposal, and associated engagement activities to be undertaken through this CMP are further outlined in Section 4.2.5.

3.5.1.2 *State Environmental Planning Policy (Infrastructure) 2007- 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 such as hospitals, roads, railways, emergency services, water supply and electricity delivery. The 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. The amendments 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 NSW 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.

3.5.1.3 *Draft State Environmental Planning Policy (Environment) - Environment SEPP*

The NSW Government is working towards developing a new State Environment Planning Policy (Environment)- the Environment SEPP. This is proposed to repeal and replace several existing 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. This SEPP is relevant in the catchment study area as it affects the current *State Environmental Planning Policy No. 19 – Bushland in Urban Areas*.

3.5.1.4 State Environmental Planning Policy (Three Ports) 2014

In 2014, the NSW Government finalised an amendment to the *State Environmental Planning Policy (Port Botany and Port Kembla)* 2013, to apply the same planning controls to the Port of Newcastle that already apply at Port Botany and Port Kembla. The *State Environmental Planning Policy (Port Botany and Port Kembla)* 2013 was then renamed to the *State Environmental Planning Policy (Three Ports)* 2014 (i.e. the 'Three Ports SEPP').

This SEPP includes areas identified within the catchment study area. However, Clause 7(2) of the Coastal Management SEPP excludes its application to the Lease Area as identified in the Three Ports SEPP (see Figure 3-4).

7) *Relationship with other environmental planning instruments*

(2) This Policy does not apply to land within the Lease Area within the meaning of State Environmental Planning Policy (Three Ports) 2013.

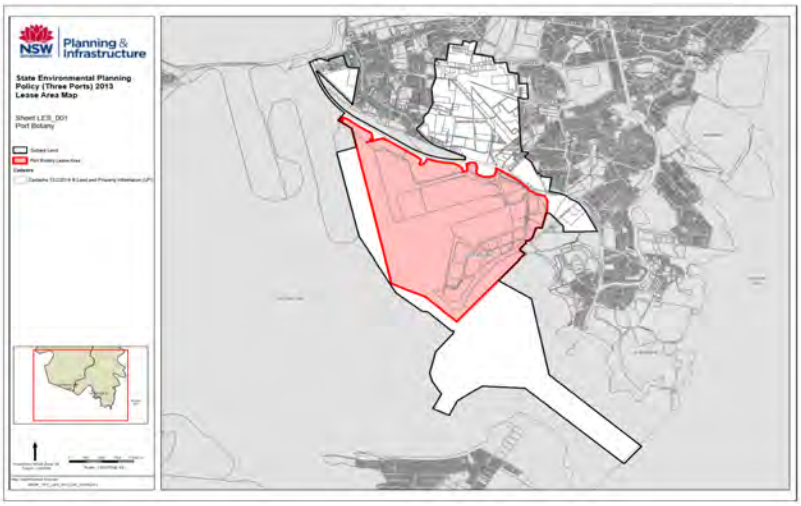


Figure 3-4 Three Ports SEPP 2013 – Ports Lease Area map for Port Botany (NSW DPI)

The Coastal Management SEPP does, however, apply to the land affected by the Three Ports SEPP excluding the Lease Area (i.e. the "Subject Land" other than the red "Lease Area")

The relevant consent authority for this area is defined in Clause 8 of the Three Ports SEPP, which states:

The consent authority for the purposes of this Policy is:

- The Minister, for development on land within the Lease Area or land that is unzoned, or
- The Council, for development on any other land to which this Policy applies.

3.5.1.5 *Sydney Regional Environment Plan No. 33 Cooks Cove*

The Sydney Regional Environment Plan no 33 was gazetted in 2004. The 100ha site encompasses the Kogarah Golf Course and Barton Park, along the foreshores of the Cooks River and Muddy Creek.

This plan aims:

(a) to establish planning principles for the development of land that promote the ecologically sustainable use of the Cooks Cove site, and

(b) to rezone land at Cooks Cove to encourage trade and technology uses, and to attract global-reach businesses which strengthen Sydney's international competitiveness, and

(c) to capitalise on the physical proximity of the Cooks Cove site to Sydney International Airport and Port Botany to create trade-focussed development, and

(d) to facilitate master planning strategies that will promote the orderly development of public open space and trade and technology land uses, and

(e) to identify appropriate development form and capacity for the Cooks Cove site, and

(f) to provide open space for a range of recreational uses, and

(g) to provide for good public access through the Cooks Cove site and along the Cooks River foreshores, and

(h) to enhance the Botany Bay to Homebush Bay regional cycleway and pedestrian/cycle network, and

(i) to protect environmentally significant wetlands and the habitat of the endangered Green and Golden Bell Frog, and

(j) to establish vegetated riparian areas along the Cooks River and Muddy Creek foreshores, and

(k) to provide vegetated riparian buffers around the Marsh Street, Eve Street, Spring Creek and Landing Lights wetlands.

3.5.2 Regional Level Plans

At a regional level, *'A Metropolis of Three Cities - Greater Sydney Regional Plan* (and associated District Plans) are the primary planning policies relating to Sydney and specifically to the Cooks River catchment study area. These plans are prepared by the Greater Sydney Commission - an independent organisation established under the *Greater Sydney Commission Act* 2015 who were tasked with preparing a plan for Greater Sydney over the next 40 years.

The *Greater Sydney Region Plan* (GSC, 2018) sets out an overarching vision and strategy for the Greater Sydney Region as a metropolis of three unique but connected cities. The Regional Plan identifies infrastructure and collaboration, liveability, productivity and sustainability as four key themes that underpin the plan with ten directions that guide the delivery of the key themes. It is noted that a Cooks River Catchment CMP would support several of the key directions of the Greater Sydney Region Plan.

Five District Plans sit below the Regional Plan, which provide the framework to implement the overarching vision and strategy for Greater Sydney. The plans for the Eastern City District, South District and Central City District cover the area of the Cooks River Catchment CMP (see Table 3-5). The key objectives of the District Plans that are relevant to the Cooks River Catchment CMP are outlined below in Table 3-6.

Table 3-5 Councils within the Cooks River Catchment CMP study area in relation to the Greater Sydney District Plan Areas

Eastern City District Plan	South District Plan	Central City District Plan
Bayside * Inner West * Strathfield * Burwood City of Sydney Randwick **	Canterbury–Bankstown * Georges River	Cumberland **
* CRA member ** Only small sections of the catchment study area are within Cumberland (at the top of the catchment) and Randwick (west end of Kensington suburb)		

Table 3-6 Key Objectives of the District Plans

Objective (Common to all District Plans)	Associated Planning Priority	Details of Objective	Relevance to Cooks Catchment
5	E2* S2**	Benefits of growth realised by collaboration of governments, community and business.	Primary
7	E4 S4	Communities are healthy, resilient and socially connected.	Primary
12	E6 S6	Great places that bring people together	Primary
13	E6 S6	Environmental heritage is identified, conserved and enhanced.	Primary
25	E14 S13	The coast and waterways are protected and healthier.	Primary
27	E15 S14	Biodiversity is protected, urban bushland and remnant vegetation is enhanced	Primary
28	E16 S14	Scenic and cultural landscapes are protected.	Primary
32	E17 S15	The Green Grid links parks, open spaces, bushland and walking and cycling paths.	Primary
31	E18 S16	Public open space is accessible, protected and enhanced.	Primary
36	E20 S18	People and places adapt to climate change and future shocks and stresses.	Primary
37	E20 S18	Exposure to natural and urban hazards is reduced	Primary
16	E9 S12	Freight and logistics network is competitive and efficient.	Secondary
23	E12 S10	Industrial and urban services land is planned, retained and managed.	Secondary
30	E17 S15	Urban tree canopy cover is increased.	Secondary
34	E19 S17	Energy and water flows are captured, used and re-used.	Secondary
39	E21 S19	A collaborative approach to city planning.	Secondary
*E = Eastern City District Planning Priority **S= Southern City District Planning Priority			

3.5.3 Local Level Plans

Seven key LGAs occur within the Cooks River Catchment CMP study area although very small areas of Cumberland and Randwick LGA are encompassed by the catchment study area. Under the direction of the state government, all NSW local governments are required to prepare a Local Environment Plan (LEP) that outlines the 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. There are currently 11relevant LEPs: Marrickville LEP (2011), Canterbury LEP (2012), Bankstown LEP (2015), Sydney LEP (2012), Rockdale LEP (2011), Botany Bay LEP (2013), Burwood LEP (2012), Strathfield LEP (2012), Ashfield LEP (2013), Hurstville LEP (2012), and Randwick LEP (2012).

A Development Control Plan (DCP) provides detailed planning and design guidelines to support the planning controls in each LEP.

All NSW councils are required to prepare a Local Strategic Planning Statement (LSPS) and for metropolitan councils this is to be completed by December 2019. The LSPS 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 to 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 (IP&R) Framework (as set out in the *Local Government Act* 1993).

- Community Strategic Plan (10+ years), which 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 the Community Strategic Plan.
- 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 management strategies in their CMPs and objectives and strategies in their Community Strategic Plan – with the aim to mainstream coastal management into councils' overall service delivery and asset management responsibilities.

3.5.3.1 Other Management Plans

In addition to the above, there is one Coastal Zone Management Plan (CZMP), the George River CZMP, in the vicinity of the catchment study area.

Key land areas of Sydney Airport and Port Botany are governed their own business plans and procedures and comply with federal legislation. Sydney Airport Corporation Limited (SACL) is the operating company that manages the airport's assets. The operator for Port Botany is NSW Ports which is a consortium of institutional investors: IFM Investors (including Cbus, HESTA and Hostplus, Australian Super, Tawreed Investments Limited and Q Super).

Several other site-specific plans exist within the catchment study area for parks, foreshores, sub-catchments (e.g. plans of management, master plans) as outlined below and further documented in the information review included in Appendix D.

- Cooks to Cove GreenWay Masterplan (2018)
- Cooks River Parklands Plan of Management and Master Plan (2016)
- Rockdale City Council Plan of Management for Community Land and Public Open Space (2016)
- Flockhart Park Sportsgrounds Plan of Management (2016)
- Gough Whitlam and Waterworth Park Masterplans (2016)
- Wolli Creek Regional Park Plan of Management (2015)
- Botany Bay Water Quality Improvement Plan (2011).

3.6 Governance Context

3.6.1 Waterway and Land Ownership and Management

The catchment waterways (tributaries and main channel) are primarily owned or managed by Sydney Water as critical stormwater and drainage infrastructure as per the Sydney Water (Stormwater Drainage Areas) Order 2011. The NSW state government owns the remaining waterways including the main Cooks River channel. Sydney Airport and Sydney Water manage parts of the Mill Stream and Mill Ponds (i.e. Sydney Airport west and Sydney Water east, of Southern Cross Drive). Sydney Water's stormwater drainage area encompasses the Cooks River and its catchment upstream of the boat harbour situated near Hutton street, Hurlstone Park. Downstream of the boat harbour Sydney Water has drainage areas that encompass: the upper portions of Wolli Creek, Bardwell Creek and Muddy Creek catchments, Alexandra Canal and its catchment and additional catchments in the Inner West LGA as shown in Figure 3-5 (Alluvium, 2015). The river asset downstream of the boat harbour is owned by the NSW Government - Department of Planning, Industry and Environment (DPIE).

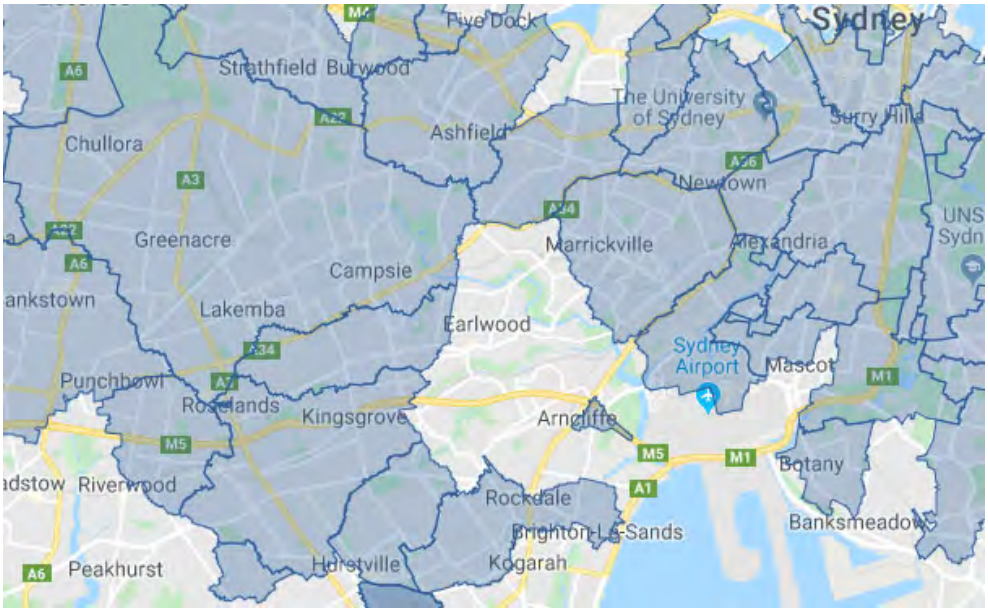


Figure 3-5 Sydney Water's stormwater drainage areas within and around the catchment study area (Alluvium, 2015)

Land ownership and management within the catchment land is mainly private with varying land use. Local government manages or owns much of the adjacent parklands along the main channel and tributaries, including the foreshore areas.

The governance of the Cooks River catchment and associated coastal area is complex and multi-layered and includes all levels of government, which are responsible for overseeing or delivering, legislation, policy and plans (see Appendix E). There are 9 LGAs within the catchment study area, 28 state government agencies and organisations and 9 Commonwealth government agencies. The councils work together regionally in several ways including catchment management with the Cooks River Alliance, Sydney Coastal Councils Group and the Southern Sydney Regional Organisation of Councils. Overall, there is considerable jurisdictional ambiguity and fragmented management responsibility throughout the catchment and receiving waterways.

The Cooks River Catchment CMP study area contains key industrial sites for the Greater Sydney region and for Sydney's global trade gateway, notably the Sydney Airport and Port Botany, which need to be considered in the context of governance of the catchment study area.

3.6.2 Roles and Responsibilities

In the Federal context, the Commonwealth government have management and regulatory responsibilities for key areas of the Kingsford Smith airport and Port Botany. The Environmental Protection and Biodiversity Conservation Act 1999 protects nationally significant heritage, including threatened species and communities (e.g. *Posidonia australis* seagrass beds) and there are additional international bird migratory treaties which apply within the broader Botany Bay areas, e.g. Towra Point Japan-Australia Migratory Bird Agreement (JAMBA) and the China- Australia Migratory Bird Agreement (CAMBA).

State and local governments share strategic and statutory planning responsibilities for land in the catchment and coastal area. Both the Department of Planning, Industry and Environment and local councils administer the *NSW Environmental Planning and Assessment Act* 1979, which is the key legislation for land use planning and development assessment in NSW. LEPs 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 CM Act 2016 provides the legislative framework for managing the coastal zone in a strategic and coordinated manner, including the Cooks River estuary and the Botany area. Under the CM Act, CMPs are developed and certified to specify actions to be implemented by local councils (generally through councils Integrated Planning and Reporting Framework, which is established in the Local Government Act 1993) and state agencies (through written agreement).

Transport for NSW is responsible for property administration and infrastructure management related to commercial and recreational boating. Within Port Botany, the Port Authority of NSW manages navigation, security and operational safety needs of commercial shipping. NSW Ports is the port operator for Port Botany (and Port Kembla) as well as the Enfield Intermodal terminals located in the upper Cooks River catchment. NSW Ports is a private company made up of a consortium of institutional investors.

The Greater Sydney Commission (GSC) is an independent organisation funded by the NSW Government that has a specific role in coordinating and aligning strategic planning for Greater Sydney, with responsibilities for leading and guiding the planning for development, transport and housing to ensure a productive and sustainable city. The GSC has also developed the Eastern City District and South District Plans which will guide the redevelopment of Council LEPs to achieve urban growth and management objectives.

There are many other legislation, plans and policies relating to the management of Cooks River Catchment CMP study area, which are reviewed in Appendix E, Table E-1 and Table E-2.

3.7 Social Context

3.7.1 Population and Demographics

The Cooks River catchment study area is home to diverse people and cultures, with approximately 47% of residents born overseas and 53% who speak a language other than English at home. The population of the area has grown in the past decade, increasing from 434,840 in 2008 to 544,130 in 2018 (Profile.id, 2019).

As of 2016 the median age in the catchment study area was 34, the unemployment rate was at 6.8% and 64% of residents lived in medium and high density housing (Profile.id, 2019).

Sydney's continuing population growth will require significant changes to the built environment that will place additional pressure on the Cooks River catchment study area. The following growth precincts within the study area have been identified in the District Plans: Sydenham to Bankstown Corridor and the Bayside West Precinct (GSC, 2018).

3.7.2 Community Values and Issues

The community values the Cooks River waterways and surroundings primarily for their natural and environmental diversity as well as for the recreational potential, wellbeing and amenity. Passive and active recreational opportunities are important throughout the catchment study area and the community considers that ecological conditions and biodiversity should be maintained and improved. The values associated with the catchment study area were identified following stakeholder engagement activities and a literature review, as further described in Chapter 4.

3.8 Cultural and Heritage Context

3.8.1 Aboriginal Culture and Heritage

The catchment study area has a rich Aboriginal history that extends from past to present. For over a thousand generations the study area has been home to Aboriginal people who have fostered culture and spiritual connections to the region. Within the catchment there exists numerous registered Aboriginal sites and evidence of Aboriginal people including middens, fire places, a dugong skeleton, shelters, engravings and artefacts. The study area is across three Local Aboriginal Land Councils (LALC) in Sydney- the Metropolitan, La Perouse and Gandangara LALC, which legally have responsibility for the land.

In 2016, people who identified as Aboriginal and Torres Strait Islander were 0.9% of the total population residing in the Cooks River catchment study area (Profile.id, 2019).There is a strong sense of custodianship of the river, its history and heritage, which is advocated by Council advisory committees and the Metropolitan LALC (Irish, 2017). This has resulted in several initiatives that have served to protect and preserve (partly) the heritage of the river and educate the public about its Aboriginal history and significance. Aboriginal culture and heritage are regarded as key values of the catchment study area, and thus Aboriginal communities will continue to be an important stakeholder in the development of the Cooks River Catchment CMP.

3.8.2 European and Industrial History

The Cooks River flows through the oldest industrial area in Australia. The area has been impacted by European settlement since 1788. During the early 19th century the industrial use of the area included fishing and lime burning, sugar refinery, wool washes, tanneries and rendering works. By the middle of the 19th century key industries included slaughter houses, soap factories, sewage farms, tanning factories and chemical manufacturing (PPK & Webb McKeown, 1999). The catchment study area's remnant industrial issues explain its character today and makes the case for tackling historic industrial pollutants in sediment and groundwater.

Today the catchment study area contains significant industrial sites for the Greater Sydney region. This includes Sydney's global trade gateway, airport, ports. fuel lines. Southern and Western Suburbs Ocean Outfall Sewer (SWOOS), Enfield Intermodal, rail yards at Chullora, and industrial areas such as Chullora, Sydenham, Botany and Alexandria.

3.9 Economic Context

As stated above, the Cooks River catchment hosted early industry activities in Sydney, with economic activity based around the abundance of food (fish, shellfish), middens and land (including hunting grounds). Seven LGAs contribute significant geographic areas to the study area: Bayside, Canterbury-Bankstown, Inner West, Strathfield, Georges River, Burwood and City of Sydney. The overall Gross Regional Product for these LGAs is $151.92 billion, which accounts for 30.2% of Gross State Product (GSP). It must be noted that these economic figures include the whole of the Council of the City of Sydney which is a key contributor at 21.7% of GSP (economy,id, 2019). The key employment sectors within the study area are diverse and include: transport, postal and warehousing, healthcare and social assistance, manufacturing and professional scientific and technical services.

Botany Bay, which includes Sydney Airport and Port Botany is Greater Sydney's main international passenger and trade gateway. The Cooks River (natural) entrance and the Botany foreshore has been heavily modified to create space for these assets that are key to the NSW economy. The port is a freight hub for Sydney and is a major focus of the NSW freight network. The airport and port play a major role in supporting the Southern and Eastern Economic Corridor as defined in the Southern District and Eastern City District Plans (GSC, 2018).

3.10 Future Context

CMPs are expected to be long-term plans over the next 100 years and reviewed at least every ten years to include adaptation planning. Therefore, it is important to make note of climate change and population pressures, and the need for a long-term future intent to be set for the region. Any actions undertaken in the final CMP need to be consistent with the defined long-term vision of the CMP. Key future aspects to consider in this regard include projections of climate change, population and economic growth, as described below.

3.10.1 Climate Change

Sea level variation, atmospheric, hydrologic and hydrodynamic processes are all predicted to shift under climate change, all of which influence coastal landforms and ecosystems. The threat of sea level rise, increasing temperatures and reduced or erratic rainfall patterns will place unprecedented stress on species, ecosystems and human settlements, infrastructure and industries. Consideration is needed as to how species, ecosystems and human communities can adapt to these anticipated stressors.

It is key to understand the vulnerability of existing assets, infrastructure and communities to climate change, and to plan accordingly to "reduce the exposure to natural and urban hazards and build resilience to shocks and stresses" (GSC, 2018).

Some key potential impacts of climate change and sea level rise on the Cooks River catchment study area include:

- increase in coastal and tidal inundation
- degradation of riparian vegetation

- changes to species migration and movement of flora and fauna
- reduced access to natural places and recreational opportunities
- increased flooding risks
- reduced liveability (e.g. cost of housing, temperature increases).

The Metropolitan Sydney Climate Change Snapshot (DPIE - AdaptNSW) provides regional information on climate change projections. The region is expected to experience an increase in all temperature variables (average, maximum and minimum) for the near future (2020–2039) and the far future (2060–2079). On average, maximum temperature increases are projected to raise by 0.7^0C in the near future and by 1.9^0C in the longer term. Hot days are projected to increase in frequency, with fewer cold nights. This warming trend for the region is large compared to natural variability in temperature and is of a similar order to other regions in NSW.

Rainfall is projected to decrease in spring while increasing in summer and autumn. Average fire weather is projected to increase in spring and severe fire weather days are projected to increase in summer and spring by 2070.

With respect to future sea level, regional projections under the very high greenhouse has (RCP 8.5) scenario indicate an increase in sea level between 0.5m and 1.0m by 2100, as presented in Figure 3-6 (CoastAdapt, 2018). These projections are in line with recommendations made by the CRA for councils to adopt sea level rise benchmark of 90cm increase by 2100 (CRA, 2014). It is expected that preparation of the CMP will review and establish, through agreement with Councils and relevant stakeholders, consistent sea level rise considerations for the purpose of hazard assessment and risk management, within the catchment study area. Further, assessing coastal hazards within a probabilistic framework will enable the future sea level uncertainty (and range of climate scenarios) to be considered.

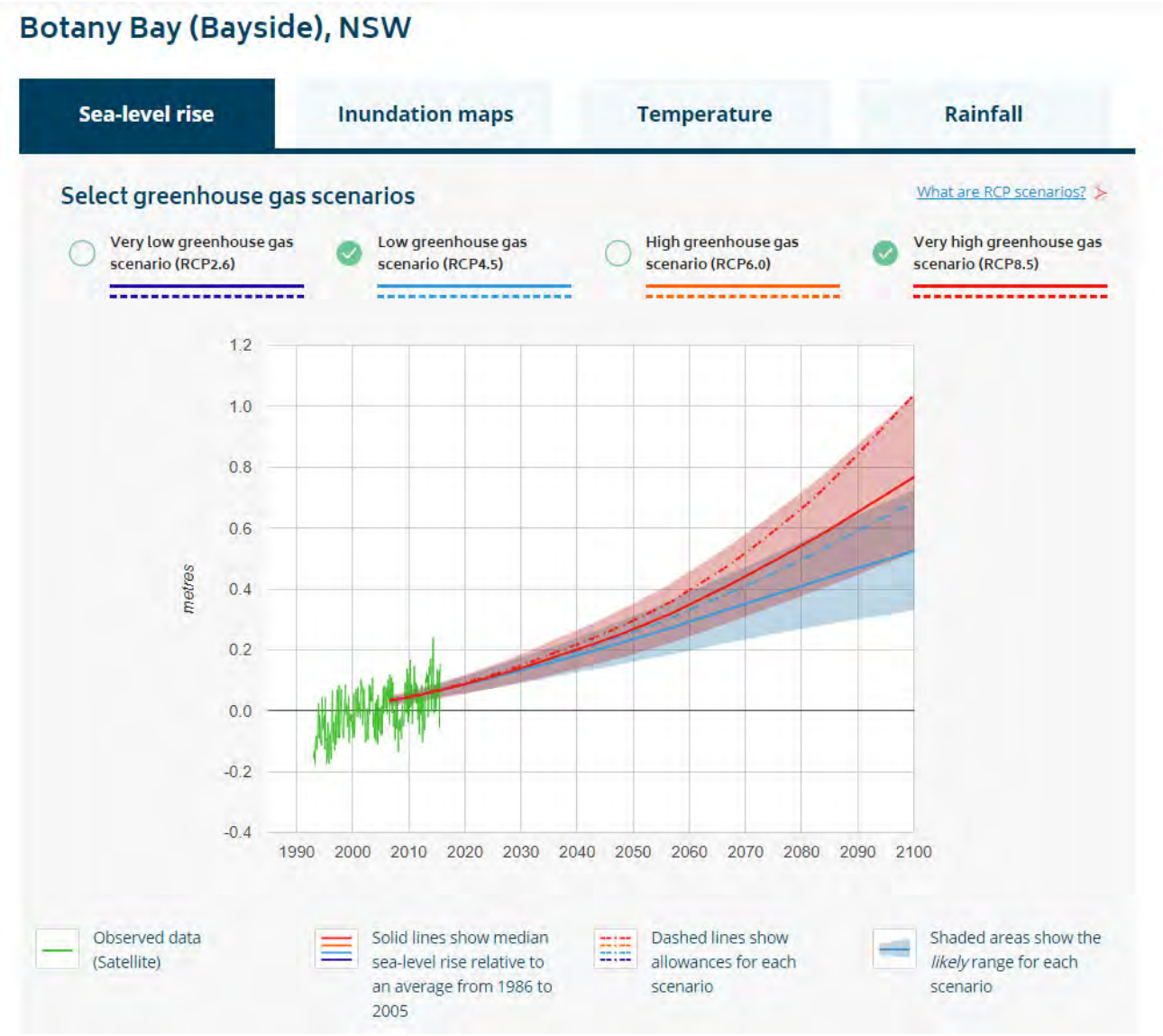


Figure 3-6 Indicative sea level rise projections for the study area (CoastAdapt, 2018)

3.10.2 Population and Economic Growth

The Greater Sydney Commission outlined the future for development in the study area in the Greater Sydney Regional Plan (GSC, 2018) and subordinate District Plans (GSC, 2018). The Eastern City and South District Plans cover the area of the proposed Cooks River Catchment CMP.

It is projected that the Eastern City District will continue to grow over the next 20 years with an anticipated population growth of 19% by 2036. This will demand for an additional 157,000 dwellings which will be provided through urban renewal around new and existing infrastructure and infill development. This development will be achieved by increasing innovation and creative industries and knowledge intensive jobs while retaining industrial and urban services and protecting international trade and freight routes. A key growth precinct in the catchment study area (within the Eastern City District) is the Bayside West Precinct, which will incorporate sustainability initiatives with

an integrated approach to green infrastructure (waterways, bushland, urban tree canopy and open spaces).

The population within the South District is anticipated to increase by 12% by 2036, demanding an additional 83,500 dwellings. The development of the South District is underpinned by the key growth precinct Sydenham to Bankstown Growth Corridor that is mainly within the catchment study area. The South District Plan anticipates that this will be provided through urban renewal, around new and existing infrastructure, and infill developments

Port Botany and Sydney Airport are projected to grow significantly, with the annual container traffic at Port Botany to grow from 2.4 million to 8.4 million containers by 2050 and passenger trips per year at Sydney Airport to grow from 39 million to 74 million passengers by 2033 (GSC, 2018). These economic gateways, their supporting industrial precincts and essential transport connections and corridors are regarded as essential to the Greater Sydney and broader NSW economy, and according to the District Plans must therefore be safeguarded and given the support required for growth (GSC, 2018).

CHAPTER 4: SCOPE OF THE CMP – SUMMARY

The Cooks River Catchment CMP encompasses the complete coastal river, its catchment, tributaries, estuary and adjacent bay area within Botany Bay and will focus on all four management areas, as listed in the CM Act 2016 and mapped in the CM SEPP 2018:

- Coastal Wetlands and Littoral Rainforest Area (CWA)
- Coastal Vulnerability Area (CVA) – *Note, mapping for this area not available at present*
- Coastal Environment Area (CEA)
- Coastal Use Area (CUA)

The values, threats and issues relevant to the CMP study area were identified through a review of previous work and information, stakeholder consultation and the first-risk pass assessment process.

A triple-bottom line approach was used to group the environmental, social and economic values. These were identified by the relevance to the Cooks River catchment study area and the local and broader community benefit. The key coastal and management issues to be addressed by the CMP were identified by establishing the main threats to these values. In this manner, a clear link was established from the values of the study area, to the processes occurring that may threaten these values, and the associated key management issues for controlling risks.

As part of the first-pass risk assessment process, linking the values to threats and priority management issues within the context of the catchment study area facilitated the review of current management arrangements and the development of recommendations for further studies and action in subsequent CMP stages (See Chapter 5) .

Cooks River Catchment Values and Key Catchment and Coastal Management Issues

Values	Key Management Issues
V1. Biodiversity and ecosystem integrity V2. Accessible waterways and foreshores V3. Clean waters V4. Naturalness V5. Amenity and recreation V6. Aboriginal, heritage and cultural V7. Accessibility and safety V8. Socialisation and participation V9. Education and scientific V10. Trade, tourism and commerce V11. Stormwater drainage and flood resilience V12. Land value	I1. Biodiversity degradation and habitat disturbance I2. Land use intensification I3. Stormwater, flooding and sediment management I4. Water quality I5. Industrial activities I6. Climate change, sea level rise and coastal hazards I7. Aboriginal and cultural heritage degradation I8. Governance and compliance I9. Resource use conflict, access availability and public safety I10. Recreation and tourism I11. Shipping I12. Fishing

4 Scope of the CMP

4.1 Catchment Study Area

The geographic scope or spatial extent to be covered by the Cooks River Catchment CMP encompasses the complete coastal river, its catchment, tributaries, estuary and adjacent bay area within Botany Bay, as shown in Figure 1-1. A more extensive description of the catchment study area is provided in section 1.2 with details of the strategic context of the CMP provided in Chapter 3.

4.2 Coastal Management Areas

The Cooks River Catchment CMP will focus on all four management areas, as listed in the CM Act 2016 and mapped in the CM SEPP 2018. This is presented in Figure 4-1, Figure 4-2 and Figure 4-3, and excludes the Coastal Vulnerability Area as mapping is not currently available.

4.2.1 Coastal Wetlands and Littoral Rainforest Area (CWLRA)

The CWLRA's have the hydrological and floristic characteristics of coastal wetlands or littoral rainforests and land adjoining. The CM SEPP maps include those areas that were previously protected by SEPP 14 and SEPP 26 as well as defined areas within the Greater Sydney Region. A 100m proximity area also applies to all land around coastal wetlands and littoral rainforests. Refer to Appendix I for key areas within the Cooks River Catchment CMP study area.

Coastal Wetlands and Littoral Rainforest Area

In relation to the *Coastal Wetlands and Littoral Rainforest Area* a series of gaps were identified during this scoping study in the current mapping. Therefore, an opportunity exists for amending the mapping and incorporating a series of wetlands through a Planning Proposal. A preliminary list of gaps has been collated by BMT and passed on to CRA for consideration, as documented in Appendix I.

The CM Act 2016 specifies that the management objectives for these areas are:

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

4.2.2 Coastal Vulnerability Area (CVA)

CVA's are subject to impact from the seven coastal hazards as defined in the CM Act 2016. The CM SEPP 2018 has not provided mapping for this area at present. Councils will be able to seek the inclusion of coastal vulnerability area mapping in the CM SEPP via a Planning Proposal.

Coastal Vulnerability Area (CVA)

In relation to the *Coastal Vulnerability Area*, the mapping of this area has been identified in this scoping study as a priority knowledge gap to be addressed in subsequent stages of the CMP.

Coastal hazards are:

- beach erosion
- shoreline recession
- coastal lake or watercourse entrance instability (limited applicability to the Cooks River system with the presence of training walls)
- coastal inundation
- coastal cliff or slope instability
- tidal inundation
- erosion and inundation of foreshores caused by tidal waters and the action of waves, including the interaction of those waters with catchment floodwaters.

The management objectives for this area are to:

- ensure public safety and prevent risk to human life
- mitigate current and future risks from coastal hazards, considering the effects of coastal processes and climate change
- maintain the presence of beaches, dunes and the natural features of foreshores, taking into account the beach system operating at the relevant place
- maintain public access, amenity and use of beaches and foreshores
- encourage land use that reduces exposure to risks from coastal hazards, including through siting, design, construction and operational decisions
- adopt coastal management strategies that reduce exposure to coastal hazards, in the first instance by restoring and enhancing natural defences such as coastal dunes, vegetation and wetlands; and, if that is not sufficient, by taking other action to:
    - avoid significant degradation of biological diversity and ecosystem integrity
    - avoid significant degradation or disruption of ecological, biophysical, geological and geomorphological coastal processes
    - avoid significant degradation of or disruption to beach and foreshore amenity and social and cultural values
    - avoid adverse impacts on adjoining land, resources or assets
    - provide for the restoration of the beach or adjacent land if any increased erosion is caused by actions to reduce exposure to coastal hazards
    - prioritise actions that support the continued functionality of essential infrastructure during and immediately after a coastal hazard emergency
    - improve the resilience of coastal development and communities by improving adaptive capacity and reducing reliance on emergency responses.

During the scoping study, information available on coastal hazards studies and data was obtained from councils and key stakeholders within the catchment study area as documented in Appendix G. This information, together with the with coastal inundation mapping available from Sydney Coastal Councils Group (SCCG) was reviewed at high-level. This review highlighted that data in the catchment study area is relatively patchy, with some gaps and inconsistencies in the assessment of the above listed coastal hazards. Therefore, more detailed review and a series of coastal hazard studies are recommended for Stage 2 of the CMP, as listed in the Forward Plan. These studies to identify and map relevant coastal hazard will then inform the full-risk assessment and development and evaluation of coastal hazard management alternatives in Stage 3.

4.2.3 Coastal Environment Area (CEA)

The coastal environment area identifies the environmental features of the coastal zone and includes land adjoining those features. In the catchment study area this includes the coastal estuaries, and foreshore.

Coastal Environment Area (CEA)

For the Cooks River catchment study area the *Coastal Environment Area* incapsulates the entire river, Wolli Creek, Alexandra Canal and waters of Botany Bay including those within Port Botany.

The objectives for this area under the Act are:

- to protect and enhance the coastal environmental values and natural processes of coastal waters, estuaries, coastal lakes and coastal lagoons
- enhance natural character, scenic value, biological diversity and ecosystem integrity to reduce threats to, and improve the resilience of, coastal waters, estuaries, coastal lakes and coastal lagoons, including in response to climate change
- to maintain and improve water quality and estuary health
- to support the social and cultural values of coastal waters, estuaries, coastal lakes and coastal lagoons
- to maintain the presence of beaches, dunes and the natural features of foreshores, taking into account the beach system
- to maintain and, where practicable, improve public access, amenity and use of beaches, foreshores, headlands and rock platforms.

4.2.4 Coastal Use Area (CUA)

The coastal use area is land adjacent to coastal waters, estuaries, coastal lakes and lagoons where development is or may be carried out resulting in impacts on the environmental, scenic and cultural values. The CUA includes areas subject to public use and enjoyment such as coastal foreshores and estuaries.

Coastal Use Area (CUA)

For the study area the *Coastal Use Area* it includes the immediate foreshores (100m) of the Cooks River, Wolli Creek and Alexandra Canal, the main river course (to the extent of tidal influence) and foreshores of Botany Bay (including within Port Botany) and Millstream.

The management objectives for this area within the Act are to accommodate both urbanised and natural stretches of coastline and 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 on cultural and built environment 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

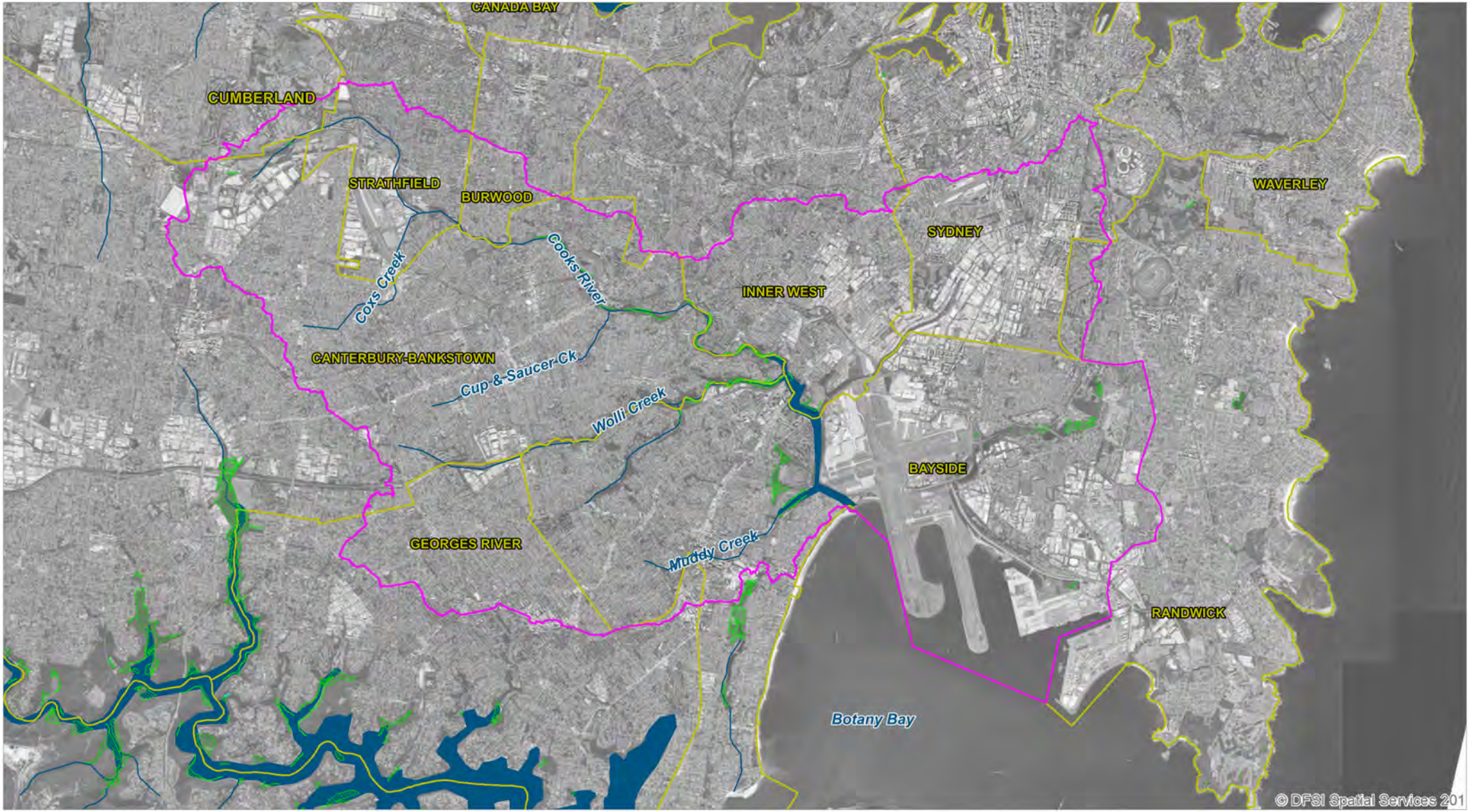
4.2.5 Planning Proposal Engagement Process / Requirements (CM SEPP Mapping Updates)

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, within their respective LGA. It is anticipated that councils may submit Planning Proposals to have existing and/or new coastal hazard mapping adopted as the *coastal vulnerability area* and updating the *coastal wetland and littoral rainforest area* maps where identified (such as, for example, amendments to the list outlined in Appendix I).

Planning Proposals are assessed by the Department of Planning, Industry and Environment (DPIE) through the Gateway process. There are important legislative requirements for preparing a Planning Proposal in relation to technical information and engagement processes, which each Council should consider. The preparation of a Planning Proposal, and associated engagement activities to be undertaken through this CMP are outlined in Table 4-1 below.

Table 4-1 Planning Proposal activities through the Gateway process

CM SEPP Planning Proposal Activities	
Step 1 in Gateway process: Planning Proposal *Undertake technical studies, determine mapping amendments, prepare the planning proposal.* Consult with internal CRA / catchment council stakeholders in the preparation of a planning proposal, through meetings and workshops (CMP Stage 1, 3). Planning proposal to be adopted internally at council meetings (CMP Stage 3). **Step 2 in Gateway process: Gateway** *Minister (or delegate) decides if planning proposal can proceed (merit assessment), and any conditions. Conditions are compiled, and changes made if necessary.* Seek advice from the Minister (or delegate) on conditions for planning proposal (technical, engagement) (CMP Stage 3).	**Step 3 in Gateway process: Community Consultation** *Planning proposal is publicly exhibited. Submissions may request a public hearing.* Consult with community during exhibition period, through media release, info sheets/webpage, community drop in session. Planning proposal and maps to be on exhibition for 28 days (CMP Stage 4). Any required amendments to the planning proposal (& associated maps) would then need to be adopted again internally, at council meetings (CMP Stage 4). **Step 5 in Gateway process: Making of the LEP** *Minister (or delegate) approves the local environmental plan, which is then published on the legislation website* No engagement requirements for CRA / catchment councils.



LEGEND

- Watercourse
- LGA Boundary
- Study Area of Cooks River Catchment CMP
- Coastal Wetlands

Title:

SEPP Coastal Management Areas
Littoral Rainforest and Coastal Wetlands

Figure: **4-1**

Rev: **0**

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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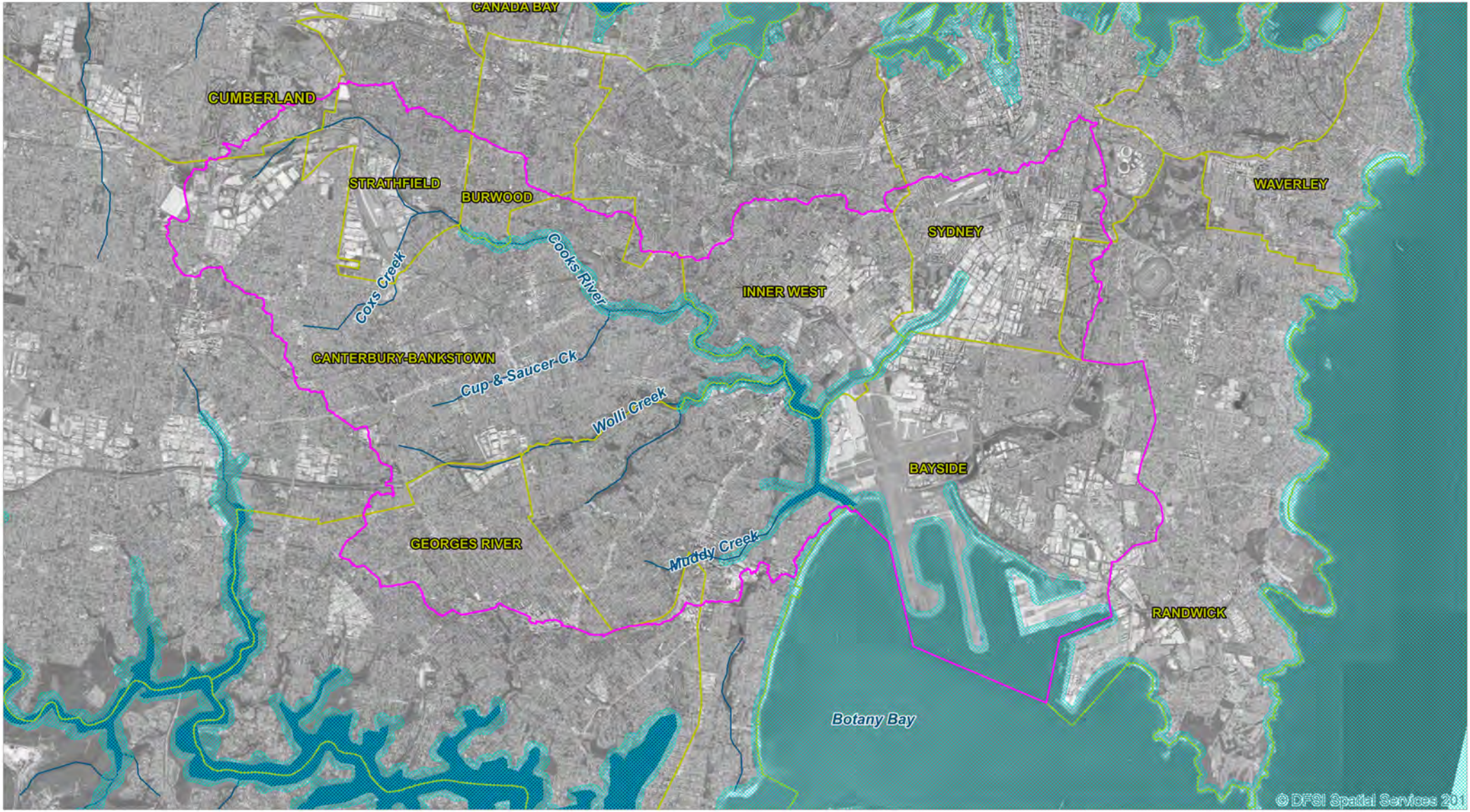

LEGEND

- Watercourse
- LGA Boundary
- Study Area of Cooks River Catchment CMP
- Coastal Environment Area

Title:

SEPP Coastal Management Areas
Coastal Environment Area

Figure: **4-2**

Rev: **0**

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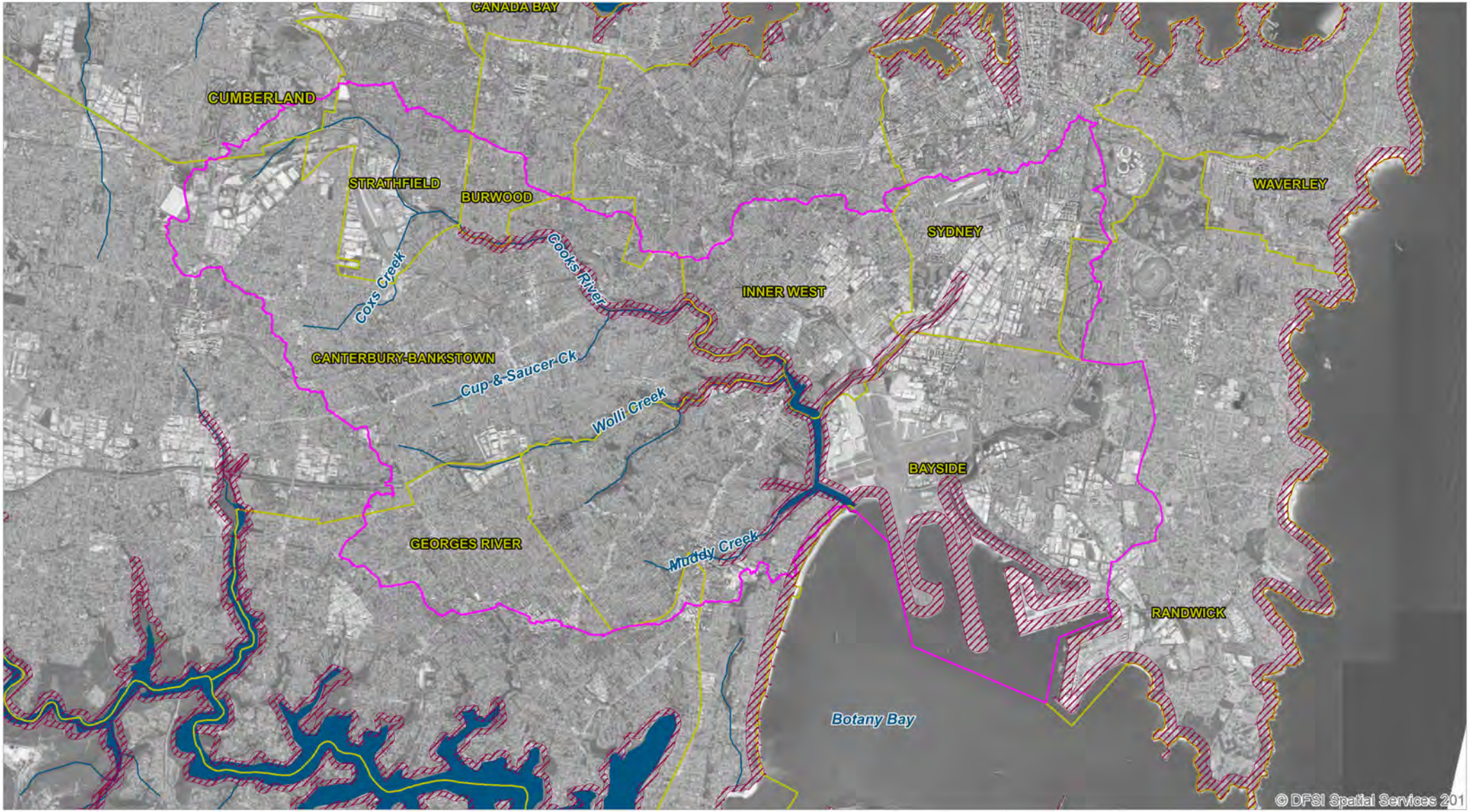

LEGEND

- Watercourse
- LGA Boundary
- Study Area of Cooks River Catchment CMP
- Coastal Use Area

Title:

SEPP Coastal Management Areas
Coastal Use Area

Figure: **4-3**

Rev: **0**

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4.3 Key Values and Management Issues

The Scoping Study process ensured that the key management issues identified for the Cooks River Catchment CMP were based on the community's identified values and the processes that threaten those values now and into the future.

The process included a review of previous work and information, stakeholder consultation and the first-risk pass assessment process. A triple-bottom line approach was used to group values into environmental, social and economic categories based on the local and broader Cooks River catchment communities identification of values and benefits.

4.3.1 Values and Benefits

The values of the Cooks River Catchment CMP study area are extensive and relate to physical assets (natural or built), resources, and activities and benefits that are highly valued by the community and stakeholders.

The 12 priority values for the Cooks River Catchment CMP are (this are presented in Table 4-2 grouped by triple bottom line categories, i.e. Environmental, Social-Cultural and Economic):

V1. Biodiversity and ecosystem integrity

V2. Accessible waterways and foreshores

V3. Clean waters

V4. Naturalness

V5. Amenity and recreation

V6. Aboriginal, heritage and cultural

V7. Accessibility and safety

V8. Socialisation and participation

V9. Education and scientific

V10. Trade, tourism and commerce

V11. Stormwater drainage and flood resilience

V12. Land value

4.3.2 Issues and Threats

In the context of coastal and catchment management, a threat can be defined as a hazard, activity, event and process that directly or indirectly affects or impacts values and benefits now and into the future. Considering this, an extensive list of potential threats was developed and then linked into themed priority issues.

The list of threats was developed in a similar way to the list of values; i.e. derived from the list of threats from the MEMA's TARA (BMT WBM, 2017), then refined and ranked for the Cooks River Catchment CMP study area based upon the data and information review, and input from relevant stakeholders during the first-pass risk assessment workshop and follow up consultation.

When listing the threats, consideration was given to the definition of risk (ISO 31000:2009), which is often characterised by a reference to potential events and consequences or impacts. For example, a sewer overflow event (threat) may result in a detrimental impact to clean waters (value).

A comprehensive list of threats was collated and further detail is available in Appendix H.

The 12 priority management issues for the Cooks River Catchment CMP are:

I1. Biodiversity degradation and habitat disturbance
I2. Land use intensification
I3. Stormwater, flooding and sediment management
I4. Water quality
I5. Industrial activities
I6. Climate change, sea level rise and coastal hazards
I7. Aboriginal and cultural heritage degradation
I8. Governance and compliance
I9. Resource use conflict, access availability and public safety
I10. Recreation and tourism
I11. Shipping
I12. Fishing

The priority values, threats and management issues are presented in Table 4-2 demonstrating the association between these and ensuring that there is a clear linkage with the forward plan recommendations.

Table 4-2 Priority Coastal and Catchment Values, Threats and Management Issues for the Cooks River Catchment CMP

Category	Catchment and Coastal Values			Catchment and Coastal Management Issues		
	Priority Values		What the local community praises	Main threats affecting values	Priority Management Issues	
	No.	Description			No.	Description
Environmental	V1	Biodiversity and ecosystem integrity	• Diversity of riverine and estuarine habitats, including: coastal and freshwater wetlands, saltmarshes, mangroves, mudflats, shallow soft sediments, riparian and terrestrial vegetation, woodlands and forest • Presence and health of wildlife including birds, fish, mammals, other animals, plants and iconic species (e.g. Grey headed flying fox colony) • Reserves for endangered ecological communities (EECs) and threatened and protected species (e.g. Wolli Creek Regional Park)	• Land development and urbanisation of the catchment • Pollution of waterways, sediment and riparian areas • Habitat fragmentation and interruption of wildlife corridors • Industrial activity impacts on land and water habitat • Trade gateway activities threatening native and migratory species (e.g. birds and Grey-Headed Flying Fox) • Lack of a riparian strategy across the study area • Protection of threatened species and communities is nor consistent neither well-coordinated across the study area • Introduction of species, animals, plants, pests and weeds	I1 I2 I5	Biodiversity degradation and habitat disturbance Land use intensification Industrial activities
Environmental	V2	Accessible waterways and foreshores	• Enjoying the naturalness, beauty and scenery of the river, river banks, estuary and coast • Continuous walkways, cycleways & paths, parklands, picnic grounds, playgrounds and other equipment, boat ramps, kayak landing, reserves	• Foreshore, riparian and catchment development • Clearing riparian habitats, including wetland drainage • Conflict over space and resource access and use, e.g. reserves, parklands, green corridors, easements and bicycle paths • Increased traffic and freight • Climate change sea-level-rise and coastal hazards	I2 I6 I8	Land use intensification Climate change, sea level rise and coastal hazards Governance and compliance
Environmental	V3	Clean waters	• Healthy river and estuary environment with clean water (good water quality), clean air and lots of greenery • Supporting recreation activities and contact with nature	• Historical surface, groundwater and sediment pollution • Ongoing industrial activity, including discharges • Runoff of organic and inorganic fertilisers from catchment • Sediment transport and turbidity increased by stormwater • Sewage effluent discharges • Increased gross and organic pollutants • Oil pipelines and other easements (and breakage risk) • Algae blooms, oxygen depletion (anoxia), fish-kills	I3 I4	Stormwater, flooding and sediment management Water quality
Environmental	V4	Naturalness	• The river valley and its tributaries provide a green corridor that brings benefits to locals and visitors in a highly urbanised setting that is predicted to densify further in coming decades	• Land use intensification and traffic congestion • Trade gateways and overland transport	I1 I5	Biodiversity degradation and habitat disturbance Industrial activities

Category	Catchment and Coastal Values			Catchment and Coastal Management Issues		
	Priority Values		What the local community praises	Main threats affecting values	Priority Management Issues	
	No.	Description			No.	Description
Social and Cultural	V5	Amenity and recreation	• A natural, green refuge in highly urbanised areas provides a place for regeneration of mind, general community wellbeing and a balance towards a healthy lifestyle • Abundance of recreational opportunities on the foreshore and in the water (i.e. bush walking, running, cycling, birdwatching, picnicking, golfing, kayaking, boating, fishing and ultimately swimming at e.g. Foreshore Beach)	• Boating and boating infrastructure • Passive recreational use (no direct water contact, scenic) • Active recreational use (e.g. kayaking, swimming) • Increasing tourism, enhanced by proximity to the airport • Littering	I9 I10	Resource use conflict, access availability and public safety Recreation and tourism
Social and Cultural	V6	Aboriginal, heritage and cultural	• Tangible and intangible Aboriginal cultural heritage, connection to country and ways of thinking (i.e. traditions, spiritual values, knowledge, places, items, and source of food) - Presence of post-European settlement heritage places and features along the foreshores and broader catchment	• Aboriginal culture not being recognised and preserved; including values and sites • Community not valuing culture and heritage generally	I7	Aboriginal and cultural heritage degradation
Social and Cultural	V7	Accessibility and safety	• Access and facilities support recreation, participation, safety, health, wellbeing, relaxation and sense of community	• Anti-social behaviour and unsafe practices • Limited or lack of access infrastructure (vulnerable) • Loss of public access (either by private development or Government area closures) • Inaccessibility and risk on river banks due to failing and ageing infrastructure (e.g. steel sheeting, concrete edge) • Public safety hazards from inundation, poor water quality, gross pollutants, seafood contamination, wildlife interactions • Multicultural communities not knowing risks of fishing in polluted waters	I2 I9 I12	Land use intensification Resource use conflict, access availability and public safety Fishing
Social and Cultural	V8	Socialisation and participation	• River and tributaries corridor (and their restoration) provides opportunities for community and visitors to socialise and participate • Multiple parklands and sport grounds surrounding the estuary allow for community interaction	• Conflict over space and resource access and use, e.g. reserves, parklands, green corridors, easements and bicycle paths • Loss of public access (either by private development or Government area closures) • Overcrowding and congestion	I8 I9	Governance and compliance Resource use conflict, access availability and public safety
Social and Cultural	V9	Education and scientific	• Naturalness and biodiversity richness provide many opportunities for education and first contact with nature in an otherwise highly urbanised area	• Land development and urbanisation of the catchment and study area • Habitat fragmentation and interruption of wildlife corridors • Industrial activity impacts on land and water habitat • Climate change sea-level-rise and coastal hazards	I1 I2 I6	Biodiversity degradation and habitat disturbance Land use intensification Climate change, sea level rise and coastal hazards

Category	Catchment and Coastal Values			Catchment and Coastal Management Issues		
	Priority Values		What the local community praises	Main threats affecting values	Priority Management Issues	
	No.	Description			No.	Description
Economic	V10	Trade, tourism and commerce	• The Sydney 'global' trade gateway (including Sydney Airport and Port Botany), which support economic, shipping and industrial activities essential to the Greater Sydney and broader NSW economy • 'Coastal dependent' businesses and commerce, 'Blue Economy' • Historically supporting industrial activities within the catchment and broader study area • Tourism economic benefit providing direct and indirect employment and business opportunities • Transit and holiday letting and other business and commercial activities by locals and visitors to the area and Greater Sydney (with proximity to the airport a key factor)	• Land development and urbanisation of the catchment and study area • Boating and boating infrastructure • Passive recreational use (no direct water contact, scenic) • Active recreational use (e.g. kayaking, swimming) • Increasing tourism, enhanced by proximity to the airport • Littering	I2 I10 I11	Land use intensification Recreation and tourism Shipping
Economic	V11	Stormwater drainage and flood resilience	• The river and tributaries, including stormwater infrastructure, provide improved safety to people and built assets during catchment flood and/or tidal inundation management, resulting in increased flood resilience (e.g. channels of the main river course and primary tributaries like Muddy Creek, Alexandra Canal and Wolli Creek) • Aquatic and riparian vegetation (e.g. mangroves) mitigate effects of climate change and sea level rise	• Modified catchment and stormwater courses and flows (e.g. general loss of catchment permeability and straightening and concreting of river and tributaries) • Barriers to riverine and estuarine flows (e.g. channelisation, weirs, etc.) • Sediment fluxes and contamination (toxicants) • Littering, solid waste, marine debris and microplastics transported along catchment, estuary and coastal waters • Instability of estuary and stream banks	I3 I6	Stormwater, flooding and sediment management Climate change, sea level rise and coastal hazards
Economic	V12	Land value	• Located in Sydney's inner suburbs and serviced by key transport hubs, land development provides economic benefit • Enhanced by green space along the course of the Cooks River and tributaries, in an otherwise highly urbanised area	• Land development and urbanisation of the catchment and study area • Habitat fragmentation and interruption of wildlife corridors • Industrial activity impacts on land and water habitat • Climate change sea-level-rise and coastal hazards	I2 I6 I8	Land use intensification Climate change, sea level rise and coastal hazards Governance and compliance

CHAPTER 5: IDENTIFYING WHERE ACTION IS REQUIRED – SUMMARY

A key component of a CMP scoping study is to review current coastal management arrangements and practices, identify knowledge gaps and information needs, and ultimately determine where action is required. This chapter documents the process and outcomes followed to complete those components for the catchment study area. The chapter includes:

- an overview of the methodology followed (data information review, first-pass risk assessment and stakeholder consultation)
- Tabulated outcomes of the first-pass risk assessment, summarising catchment and coastal management issues and threats occurring on the coastal management areas
- details of threats, risks, and management arrangements grouped by the key coastal management issues with recommendations of further studies for Stages 2 to 4 of the CMP process.

Summary of First-pass Risk Assessment Outcomes

Key Management Issue	Overall Risk / Priority
I1 – Biodiversity degradation and habitat disturbance	High
I2 – Land use intensification	High
I3 – Stormwater, flooding and sediment management	High
I4 – Water quality	High
I5 – Industrial activities	High
I6 – Climate change, sea level rise and coastal hazards	High
I7 – Aboriginal and cultural heritage degradation	High
I8 – Governance and compliance	High
I9 – Resource use conflict, access availability and public safety	High
I10 – Recreation and tourism	Medium
I11 – Shipping	Medium
I12 – Fishing	Low

5 Identifying Where Action is Required

5.1 Methodology

The data information review, first-pass risk assessment and stakeholder consultation were the key tools used to assess and determine the existing level of information about the catchment study area, including its values, issues and how these are being managed at present. Based upon the outcomes of these assessments, a gap analysis was conducted documenting the performance of current management arrangements and practice and the quality of existing technical information and baseline data. The outcomes of this analysis will be used to determine the future studies required in further stages of the of the CMP (Stages 2 to 4).

5.1.1 Data and Information Review

There is a great deal of information from a wide range of sources relating to the processes and management of the Cooks River and associated coastal area. A critical review of this information was conducted to determine content of the reports that is directly or indirectly relevant to:

- understanding the environmental processes occurring within the study area
- identifying key values (or benefits), and known issues or threatening processes that may be reducing or undermining these benefits
- determining existing management actions or strategies for managing the threats, and if possible, the effectiveness of these actions.

The data review focussed on environmental process information, threats and benefits, and existing management, as it is the quality of information available to define and assess these factors that determine what (if any) additional studies are required to prepare an effective CMP.

The data and information reviewed included

- technical studies and academic literature
- planning documents (e.g. strategic, operational and natural resource
- spatial mapping and data.

A full list of documents and a review of their adequacy or relevance is provided in Appendix D, Appendix E and Appendix G. Remaining sections of this chapter have utilised the outcomes of the data and information review to formulate the scope of the CMP.

5.1.2 Stakeholder Consultation

Various stakeholder consultation activities have been undertaken to capture information for use in this scoping study. These activities have the additional advantage of establishing the stakeholder and community consultation process that will be carried through the entire CMP preparation and implementation. Activities included

- regular contact with CRA and DPIE representatives that enabled a flow of information relevant to the CMP

- the first-pass risk assessment workshop that gathered feedback from the state agencies and other stakeholders involved in coastal river management
- post-workshop follow-up contact, facilitated by CRA, to collect input from relevant stakeholders and community representatives about the values, threats, issues and risk in the study area; and
- a data availability survey to gain an understanding of the datasets available and knowledge gaps.

5.1.3 First-pass Risk Assessment Process

The first-pass risk assessment provided the methodology for considering the severity of known threats in the study area, and the effectiveness of existing management actions to dealing with the threats.

A first-pass risk assessment is different to the full-scale risk assessment that will be conducted in Stage 2 or Stage 3 of the CMP preparation process. A full-scale risk assessment involves detailed investigation of the individual consequence of threats and likelihood of a risk event and combining these to derive the level of risk. In contrast, a first-pass risk assessment is a preliminary assessment that considers consequence and likelihood in combination, to determine risk as high, medium or low, see Figure 5-1.

Full Scale Risk Assessment

Likelihood	Consequence				
	Insignificant 1	Minor 2	Moderate 3	Major 4	Catastrophic 5
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 5-1 First-pass Risk Assessment vs Full Scale Risk Assessment

In this Stage 1 CMP Scoping Study, the first-pass risk approach aimed to use the risk level derived for each threat as a measure of its priority, and as a measure for the effectiveness of management at present. Therefore, the first-pass risk assessment process was to:

- Broadly prioritise the known threats, issues and risks;

- Assess the adequacy (i.e. effectiveness) of existing management arrangements (i.e. controls, actions and governance) by considering the level of risk remaining after a management action is accounted for (also known as the 'residual risk');
- Investigate why, in general, an action is considered adequate or inadequate;
- Consider the future trajectory of the risk considering future pressures such as population growth and climate change; and
- Consider the general suitability of existing data, determining knowledge gaps and other barriers to management of the risk now and into the future.

In assessing the above, the scales listed in Table 5-1 were applied.

Table 5-1 Scales used in the First-pass Risk Assessment

Assessment	Scale		
Overall Level of Risk *(considering threats and existing management arrangements)*	**High**	**Medium**	**Low**
Current Risk *(based on existing threats)*	**High**	**Medium**	**Low**
Future Risk *(based on projected threats)*	**High**	**Medium**	**Low**
Adequacy of Existing Management Arrangements *	**Inadequate**	**Moderate**	**Adequate**
Suitability of Existing Data **	**Inadequate**	**Moderate**	**Adequate**
Recommended CMP Studies *(for further CMP Stages)*	**High Priority**	**Medium Priority**	**Low Priority**

** Defined based on input to the first-pass risk assessment workshop and considering governance complexity for each management issue (single vs multi Council and stakeholder governance).*

*** Defined based on expert judgement, considering the temporal and spatial extent of existing information and data (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).*

The above process was conducted at a First-pass Risk Assessment Workshop with attendees from the Catchment Advisory Committee including the CRA, Councils, state agencies, local community groups, industry representatives and other stakeholders involved in the management of the Cooks River catchment and associated coastal area. 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 the Forward Plan. First-pass risk assessment worksheets with outcomes are provided in Appendix H.

5.2 First-pass Risk Assessment Outcomes

The first-pass risk assessment process was used to determine the adequacy of existing management arrangements for each key management issue, by broadly determining the likely level of risk (or

'residual risk') from the threats. The management issues are presented in Table 5-2, ordered from high to low overall risk.

Table 5-2 Summary of First-pass Risk Assessment Outcomes

Key Management Issue	Overall Risk / Priority
I1 – Biodiversity degradation and habitat disturbance	High
I2 – Land use intensification	High
I3 – Stormwater, flooding and sediment management	High
I4 – Water quality	High
I5 – Industrial activities	High
I6 – Climate change, sea level rise and coastal hazards	High
I7 – Aboriginal and cultural heritage degradation	High
I8 – Governance and compliance	High
I9 – Resource use conflict, access availability and public safety	High
I10 – Recreation and tourism	Medium
I11 – Shipping	Medium
I12 – Fishing	Low

5.3 Key Issues, Management Arrangements and Recommended Studies

This section provides a summary of the management issues the overall level of risk and recommended studies.

A list of recommended studies with indicative costs, a timeline and responsibilities is provided in Table 8-3 in the forward plan in Chapter 8.

5.3.1 Biodiversity degradation and habitat disturbance

I1. Biodiversity Degradation and Habitat Disturbance		
Risk Assessment and Review of Management Arrangements		
Overall Level of Risk *(considering existing management arrangements)*		**HIGH**
Current Risk *(and threats)*	The key threats associated with biodiversity degradation and habitat degradation across the catchment study area are • land development and urbanisation • pollution of waterways, sediment and riparian areas • habitat fragmentation and interruption of wildlife corridors • industrial activity impacts on land and water habitat • alteration of natural flow regimes across the catchment and study area • trade gateway activities threatening native and migratory species (e.g. birds and Grey-Headed Flying Fox) • lack of a riparian strategy • invasive species across the catchment and study area • urban stormwater discharge (quality, velocity and quantity) • protection of threatened species and communities is not consistent or well-coordinated Key areas of concern include (but are not limited to): remnant wetlands (both coastal and freshwater), riparian and estuary areas, pressure on Wolli Creek Regional Park, threatened communities and species (refer to Section 3.3 for details).	**High**
Future Risk *(and threats)*	The main future threats associated with biodiversity and habitats is increased pressure from population growth, land use intensification and climate change. Occurrences such as increased activity in the trade gateway have been pointed out as potentially leading to increased risk of invasive species due to ship ballast water.	**High**
Adequacy of Existing Management Arrangements	Biodiversity legislation, LGA regulations, local biodiversity-related management policies (e.g. a specific Flying Fox Camp Management Policy), support from community groups partly control threats to biodiversity. However, there are key issues associated with increasing urban development, limited consideration to conserve and enhance biodiversity corridors and a lack of community enthusiasm towards conservation.	**Inadequate**
Suitability of Existing Data	There is available information about biodiversity values within the study area. However, there is an opportunity to update biodiversity and habitat data to assess risks in more detail as well as to improve conservation of biodiversity and protection of threatened species, communities, and ecosystems (e.g. wetlands).	**Moderate**
Recommended Studies for CMP Stage 2		
Study No.	***Stage* / Description**	**Priority**
2.01	***Stage 2*** **Coastal river health monitoring, reporting and improvement Strategy** Develop a consistent strategy providing specific recommendations leading to a Waterways and Catchment Health Monitoring and Reporting Framework that incorporates opportunities for citizen science and make consistent water quality and ecological programs and reporting, ultimate aimed at improving the condition and health of the coastal river. This study should consider the Risk-based Framework for Considering Waterway Health Outcomes in Strategic Land-use Planning Decisions (OEH and EPA, 2017) and draft Critical State Significant Infrastructure. Standard Secretary's Environmental Assessment Requirements (SEARs) for Sydney gateway due in second half of 2019, also info from BBWQIP, LEPs, DCPs, and GSC to inform the water quality targets and tools and to achieve these.	**High**
2.02	***Stage 2*** **Site specific condition assessment, resilience and threat assessment for *coastal wetlands area* (CWA)** CWA assessments (site specific) to identify potential threats to and opportunities for improved management practices. Include consideration of climate change, sea level rise resilience in determining conservation priorities.	**High**
2.03	***Stage 2*** **Riparian and terrestrial ecology assessment and strategy development** Critical review, assessment of conditions and strategy development for riparian communities and associated terrestrial ecosystems over all coastal management areas. Consider: • informing a management plan for existing and new riparian edge. • catchment wide terrestrial species and communities mapped, and coastal area wide management plan put in place to manage known species and habitats. • assessment of tree canopy within the study area, considering climate change impact and planning for increase and/or replacement of canopy. • assessment and definition of catchment wide biodiversity governance and management arrangements.	**High**

I1. Biodiversity Degradation and Habitat Disturbance		
2.04	*Stage 2* **Determine (map) additional areas to be added to the *coastal wetlands and littoral rainforest area* (CWA)** Ground truthing activities to assess the current CWA management area mapping within the CM SEPP mapping. Consideration be given to areas of existing and future coastal hazards. This data will inform the preparation of a Planning Proposal.	**High**
2.05	*Stage 2* **Studies into biodiversity of intertidal and fringing habitats** A comprehensive review of habitat characteristics, ecological patterns and processes throughout the study area, with focus on the coastal environment area (CEA) and coastal use area (CUA), including: • mangrove, saltmarsh habitats • soft sediment habitats • rocky intertidal habitats • modified habitats (naturalised river banks) Identify current condition and to identify areas for remediation and protection. Investigate migration pathways, barriers and resilience to sea level rise. Consider the outcomes of coastal and tidal inundation modelling and erosion hazards. Consider aquatic species relationships between saltwater and freshwater and impacts. Leading to a management plan for known species e.g. eel and tortoise movement, mullet and bream.	**Medium**
2.06	*Stage 2* **Studies of non-indigenous species** • detailed review and gap analysis of existing catchment wide studies • catchment and study area wide genetic investigation of invasive species status and origin; to assist with identifying invasive species management strategies across jurisdictions and key land managers. • investigate exotic species considered likely to invade study area (from abroad and other Australian harbours). This information to assist with identifying invasive species management strategies. • identify opportunities for monitoring programme targeting high risk exotic species in key catchment locations. • undertake a review of catchment councils backyard habitat programs to identify opportunities for integration, operation efficiency gains and common catchment messaging and engagement activities. identify opportunities for improved controls on ballast water discharge, limiting hull fouling and measures to reduce likelihood of recreational vessels spreading marine pests.	**Medium**
2.07	*Stage 2* **Seagrass threat assessment** Seagrass mapping is intermittently updated by state government (NSW DPIE). These maps to be utilised to undertake a threat and risk assessment to identify key activities and their pressures for management response to achieve objectives as defined within the Fish Habitat Protection Plan No. 2 – Seagrasses.	**Low**

5.3.2 Land Use Intensification

I2. Land Use Intensification		
Risk Assessment and Review of Management Arrangements		
Overall Level of Risk *(considering existing management arrangements)*		**HIGH**
Current Risk *(and threats)*	The main threats associated with land use intensification within Cooks River catchment are: • urban stormwater discharge, flooding and sediment • foreshore, riparian and catchment development • clearing riparian habitats, including wetland drainage • introduction of species, animals, plants, pests and weeds • airport and ports trade gateway • oil pipelines and other easements (and breakage risk) • sewage effluent discharges • increased traffic and freight • increased gross and organic pollutants General trend of land use intensification increases the pressure of stormwater and sediment flows, and it threatens biodiversity within the study area, particularly around riparian, wetland and estuarine species and communities. Key areas of concern include (but are not limited to): Bray Ave Stormwater, Sydney-Bankstown corridor, Cooks Cove, market gardens (3) in the Bayside area, Muddy Creek (diffuse agricultural pollutants).	**High**
Future Risk *(and threats)*	Population growth and associated conflict on land use within the study area has potential to impact biodiversity, increase catchment and coastal pollution, stormwater and sewage overflows if these issues are not adequately managed. Future sea level rise will increase the pressure on riparian and estuarine habitats, which will tend to get squeezed between land development and rising waters.	**High**
Adequacy of Existing Management Arrangements	A number of management policies are implemented to control new developments, these include: LEPs, DCPs, building DA requirements, stormwater and water quality improvement plans, POEO Act, sub-catchment management plans, SEPP 55 contaminated land, Coastal Management Act, DPI Fisheries Policy, NSW Biodiversity Conservation Act, NSW Wetlands Policy, DPI habitat protection plans, biosecurity legislation, EPA licenses (with variations in regulations) between small and large businesses), Sydney Water operating licenses, OCP and environmental policy review. Sustainable infrastructure initiatives have included WSUD and gross pollutant traps. Despite these controls, there is variation in the management of land intensification measures for each Council, which limits the overall effectiveness of management initiatives.	**Inadequate**
Suitability of Existing Data	As part of the District Plans for Greater Sydney and from planning by councils, information and data about projected land use intensification. Opportunity for information to be further collated, analysed and used to assess cumulative impacts from land use and inform coordinated catchment and coastal management. Coastal vulnerability mapping required to inform full scale risk assessment and planning for future land use intensification.	**Inadequate**
Recommended Studies for CMP Stage 2		
Study No.	***Stage* / Description**	**Priority**
2.08	***Stage 2*** **Socioeconomic profiling study** Socioeconomic profiling study, to detail present and future change and projections to study area communities, population, economy, industrial activities, etc. Collating data from relevant Councils, analysing and presenting information in a way that it results useful for coordinated coastal and catchment management. Note, the Local Strategic Planning Statement (LSPS) draft will be finished by late 2019 and this should provide relevant information.	**Medium**

5.3.3 Stormwater, flooding and sediment management

I3. Stormwater, Flooding and Sediment Management		
Risk Assessment and Review of Management Arrangements		
Overall Level of Risk *(considering existing management arrangements)*		**HIGH**
Current Risk *(and threats)*	The main threats associated with hydrologic, hydraulic and sediment modifications and management are: • Modified catchment and stormwater courses and flows (e.g. steel sheet piling, general loss of catchment permeability and straightening and concreting of river and tributaries) • Barriers to riverine and estuarine flows (e.g. channelisation, weirs, etc.) • Sediment fluxes and contamination (toxicants) • Tidal inundation and backwater effects • Littering, solid waste, marine debris and microplastics transported along catchment, estuary and coastal waters • Instability of estuary and stream banks Key areas of concern include (but are not limited to): Cooks River main course and main tributaries, e.g. Muddy Creek, Wolli Creek, Bardwell Creek, Cup and Saucer Creek, Coxs Creek, Greenacre Creek and Alexandra Canal, as well as smaller channelised creeks and drains.	**High**
Future Risk *(and threats)*	Population growth may increase the pressure to modify freshwater, riverine and estuarine flows and formations, and increase pollution. Climate change is likely to change natural processes related to sediments and flows. Sea level rise potentially poses further risks of flood and inundation from stormwater.	**High**
Adequacy of Existing Management Arrangements	Much of the upper catchment is already channelised, however, additional modifications to natural formations in the catchment are managed with planning controls, guidance material and government legislation. It is understood that additional catchment intelligence is required when making alterations to flows. Pollution controls are a mixture of infrastructure such as litter booms and WSUD, educational campaigns, and policy. There are access controls in place for contaminated areas which are defined under Groundwater Extraction Exclusion Areas. However, in general, these controls are considered largely insufficient.	**Inadequate**
Suitability of Existing Data	The Cooks River Flood Study (2009) provides relevant hydrological information and numerical models. Opportunity for updating catchment information and assessment of scenarios, including climate change and sea level raising considerations.	**Moderate**
Recommended Studies for CMP Stage 2		
Study No.	***Stage* / Description**	**Priority**
2.09	***Stage 2* - Flood, coastal and tidal inundation assessment (joint probability analysis)** Review and update (as appropriate) flood, coastal and tidal inundation assessments and mapping for the catchment and all tidal waterways, including review of SCCG inundation mapping (2010), flood studies from Sydney Water (2009) and various relevant Councils. Give consideration to using a consistent and best practice approaches (e.g. following ARR 2016 guidelines) to specifically model, assess and map: - Tidal inundation, of land by tidal action under average meteorological conditions and the incursion of sea water onto low lying land that is not normally inundated, during a high sea level event such as a king tide or due to longer-term sea level rise. - Inundation of foreshores and estuary banks caused by tidal waters and the action of waves, including the interaction of those waters with catchment floodwaters (joint probability analysis), under average meteorological conditions and during a high sea level event such as a king tide, storm tide, or due to longer-term sea level rise.	**High**
2.10	***Stage 2* - Assessment (i.e. hydraulic modelling) of floodplains, river and estuary banks, and wetlands flows – including structures** To inform how management of drains and structures could impact and/or improve catchment and wetlands flows (“wetland hydrology”) Potential to include wetland ecological modelling to assess response of wetlands to flow and management scenarios.	**High**
2.11	***Stage 2* - Flood, coastal and tidal inundation damages and risk assessment** Review, update and develop a robust damages assessment framework to address both temporary inundation (e.g. storm surge and catchment flooding events) and permanent inundation impacts due to future sea level rise conditions. Risk (including damages) incurred from sea level rise impacts must consider permanent ground water impacts to soil chemistry, groundwater dependant ecosystems, underground services and building foundation etc, plus permanent tidal inundation to above ground built and environmental assets.	**High**
2.12	***Stage 2* - Sub-catchment assessment and high-level planning** Including a review of Council policies, plans, planning documents to understand the adequacy of these documents in flood, coastal hazards, coastal river health and water quality management. To determine hydrologic and hydraulic management and propose mitigation strategies and actions that can reduce the threats to the riparian, estuarine and coastal areas from high volumes and velocity of stormwater flow. Providing sub-catchment and cumulative impact analysis data and insight to inform cost benefit analysis at Stage 3 of CMP.	**High**

5.3.4 Water Quality

I4. Water Quality		
Risk Assessment and Review of Management Arrangements		
Overall Level of Risk *(considering existing management arrangements)*		**HIGH**
Current Risk *(and threats)*	The main threats associated with water quality in Cooks River catchment are: • historical surface, groundwater and sediment pollution • ongoing industrial activity, including discharges • runoff of organic and inorganic fertilisers from catchment • sediment transport and turbidity increased by stormwater • land use intensification and traffic congestion • trade gateways and overland transport (oil, pfas spills) • urban stormwater discharge (sewage, overflows, velocity and quantity) • lack of compliance and enforcement of regulations • algae blooms, oxygen depletion (anoxia), fish-kills Key areas of concern include (but are not limited to): mostly all waterways within the study area, with high risk areas in areas where active recreation activities take place like the lower reaches of the Cooks River estuary and Foreshore Beach.	**High**
Future Risk *(and threats)*	Population growth and land use intensification have the potential to increase pressures on water quality due to further water and sediment pollution, if not managed properly. Climate change and sea level rise may alter water quality dynamics, uncertainty on the effects of this on aquatic ecology.	**High**
Adequacy of Existing Management Arrangements	Water quality has been regularly monitored in the study area, with measurements recurrently finding degraded water quality, which generally indicates the existing management arrangements are not appropriate. Further details of the monitoring program by the CRA (Cooks River Ecological Health Report Cards), including water quality indicators are provided in Section 3.3.3). Legislation, policy and regulations related to water quality exist but enforcement and previous contamination (of water and sediments) make difficult improving the existing conditions.	**Inadequate**
Suitability of Existing Data	In general, there is good information and data availability related to water quality in both the Cooks River and Botany Bay, including historical and recent monitoring programs (and benchmarking by CRVFWG including consideration of WSUD treatment methods). Groundwater monitoring and research, e.g. Orica's program for over 15 years). However, there is opportunity for information to be further analysed and used to inform integrated catchment and coastal management.	**Moderate**
Recommended Studies for CMP Stage 2		
Study No.	***Stage* / Description**	**Priority**
2.13	***Stage 2*** **Integrated catchment-wide water quality modelling assessment** Reviewing and expanding from investigations completed for the Botany Bay Water Quality Improvement Plan (BBWQIP), following the principles and guidelines recommended in the Risk-based Framework for Considering Waterway Health Outcomes in Strategic Land-use Planning Decisions (NSW OEH and EPA, 2017), as well as the National Water Quality Management Strategy (NWQMS), based on the Australian and New Zealand Guidelines for Fresh and Marine Water Quality, towards achieving the NSW Water Quality and River Flow Objectives. Modelling could be used to assess catchment-wide as well as sub-catchment management scenarios and options, including: Water Sensitive Urban Design (WSUD), climate change, sea level rise, nutrient cycling, trophic networks, and others.	**High**
2.14	***Stage 2*** **Review of groundwater resources and impacts** Review existing information and data on groundwater to define investigations and modelling to assess future groundwater conditions under various sea level rise and development scenarios. Assessment outcomes should ensure management implications can adequately assessed for the following: • ecosystems functioning • built asset and infrastructure risks • contamination impacts.	**High**

5.3.5 Industrial Activities

I5. Industrial Activities		
Risk Assessment and Review of Management Arrangements		
Overall Level of Risk *(considering existing management arrangements)*		**HIGH**
Current Risk *(and threats)*	The main threats associated with industrial activities within Cooks River catchment are: • services: pipelines, cables, trenching, etc. • industrial discharges to surface • groundwater, soil and sediment contamination • industrial intensification around port botany • concrete batching plants in botany • heavy traffic and transport to/from industry • storage of PFAS and other chemicals, e.g. Orica Specific threats have been associated with the APA pipeline, Caltex pipeline, jet fuel pipelines, desalination pipeline and the new pipeline to the western airport. The rail and freight (Intermodal) terminals at Enfield and Chullora pose risks to the coastal areas, Key areas of concern include (but are not limited to): Port Botany, the Airport, Chullora, Alexandria, Enfield and Lakemba	**High**
Future Risk *(and threats)*	Population growth has the potential to increase the demand on infrastructure and industry. As demographics change there is potential for some industrial areas to be rezoned for alternative uses, potentially decreasing industrial activity and / or increase conflict with mixed land uses. Further expansion of Port Botany and the Airport should be considered. Uncertainty around future impact of heavy traffic and industry related transport through the study area, which may result in increased risk of accidents and spills. Uncertainty around the interaction between sea level rise, discharges, groundwater and contamination movement.	**High**
Adequacy of Existing Management Arrangements	Various controls are in place to manage the implementation and ongoing monitoring of industrial activities. These include the EPA's Protection of the Environment Operations Act 1997, DA consents, environmental assessments and approvals and trade waste licensing. However, there is currently no holistic approach to management of industrial impacts, which requires consideration of cumulative, associated and secondary impacts. Controls are somewhat effective in managing pollution, however, environmental penalties are not severe enough to reduce the risks of all pollution events and compliance and enforcement are patchy.	**Moderate**
Suitability of Existing Data	Information and data of industrial discharges and services: (pipelines, cables, trenching, etc.) exists but it is neither consolidated nor easy to access for informing coastal and catchment management. General acknowledgement of Orica providing a reasonable groundwater monitoring program.	**Moderate**
Recommended Studies for CMP Stage 2		
Study No.	***Stage* / Description**	**Priority**
2.15	***Stage 2*** **Contamination studies (land and groundwater)** Review, audit existing monitoring programs and update contamination studies (if deemed required in consultation with industries) to: (a) report on current contamination in sediments and groundwater (by emerging pollutants, dioxins, PFAS, heavy metals, hydrocarbons, etc), (b) investigate the potential for pollutant dispersal, and (c) propose options to manage contamination. Consider cumulative impacts as well as the impact of current and projected sea level rise on groundwater tables, with consideration of interactions between contaminant landfill and aquifers.	**High**
2.16	***Stage 2*** **Stormwater outlets, sewer overflow and industrial discharges audit** An audit of low-lying stormwater infrastructure, sewer overflows and industrial discharges to enable meaningful risk assessment under current sea level, as well as with consideration of tidal inundation under future sea level rise conditions. The audit should include assessment of infrastructure capacity, cumulative impacts and provide commentary on timeline for upgrades required. The audit may require an elevation survey of outlets and connecting pipes. Information should be documented in a georeferenced database.	**Medium**

5.3.6 Climate Change, Sea Level Rise and Coastal Hazards

I6. Climate Change, Sea Level Rise and Coastal Hazards		
Risk Assessment and Review of Management Arrangements		
Overall Level of Risk *(considering existing management arrangements)*		**HIGH**
Current Risk *(and threats)*	At present, the influences of climate change in the study area have been relatively limited; however, climate change and sea level rise are considered increasing threats to a variety of values, including environmental (e.g. biodiversity and ecosystem integrity), social (amenity and recreation) and economic (stormwater drainage and flood resilience) values. In accordance with the CM Act and as relevant to the study area, coastal hazards include the following: (a) beach erosion (includes estuary and river banks); (b) shoreline recession; (c) coastal lake or watercourse entrance instability; (d) coastal inundation; (e) Coastal cliff or slope instability; (f) tidal inundation; and (g) erosion and inundation of foreshores caused by tidal waters and the action of waves, including the interaction of those waters with catchment floodwaters. The coastal hazards highlighted above are considered high and moderate priority, respectively, within the CMP study area, as arising from the scoping study. These hazards are expected to be exacerbated by sea level rise. Key areas of concern include (but are not limited to): the lower reaches and low-lying land surrounding the Cooks River estuary, its tributaries, the Mill Stream and particularly: • Booralee Street, Luland Street and Bay Street in Botany • Rockwell Avenue and Levey Street in Wolli Creek • Carrington Road, Renwick Street and Warren Road in Marrickville • Old Street and Bay Street in Tempe	**Moderate**
Future Risk *(and threats)*	The main future risks associated with climate change within the study area are: • sea level rise along the estuary and Botany Bay area • altered storm patterns, potentially leading to increasing flooding and stormwater across the whole study area • temperature rise and heat island effects on liveability • loss and changes to biodiversity • increased frequency and severity of drought	**High**
Adequacy of Existing Management Arrangements	Government and academic research about climate change adaption have been undertaken; however, there is no consistent policy and limited long-term adaptation management planning for climate change issues and threats across the catchment study area.	**Inadequate**
Suitability of Existing Data	Information and data about climate change and tidal inundation data exist mostly at the regional level (e.g. by SCCG), with no consistent data about the potential impacts of climate change and sea level rise specific and across the catchment study area.	**Moderate**
Recommended Studies for CMP Stage 2		
Study No.	***Stage* / Description**	**Priority**
2.17	***Stage 2*** **Review of coastal hazard assessment parameters** Critically review (in detail) existing data, particularly historical tidal behaviour information, sediment compartment analysis, coastal quaternary geology, wave and ocean water level data, topography (lidar), bathymetry (riverine / marine lidar) etc. Identify key regional coastal physical processes, to develop a conceptual model especially regional sediment budget (supply, sinks etc). Determine coastal hazard model input parameters (starting with state-wide parameters set by EES) and assumptions to be applied in the study area. This shall include confirming the timeframes for outputs (e.g. 2020, 2050, 2100 etc) and the sea level rise scenarios to be applied. *(Consideration for Botany Bay / sediment compartment wide study)*	**High**

I6. Climate Change, Sea Level Rise and Coastal Hazards		
2.18	*Stage 2* **Condition assessment of riverine and coastal protection structures** Review exiting information, identify gaps and accordingly undertake a comprehensive assessment of foreshore protection structures across study area and its tidal waterways, to clarify ownership, condition, and future management needs. Rock revetments, concrete walls/structures, cantilevered walls, steel sheet pilling, estuary/river bank stabilisation structures, weirs, etc. Include watercourse entrance instability assessment; i.e. estuary, river mouth training walls, structures. Include identify ownership and management responsivity of structures and built assets.	**High**
2.19	*Stage 2* **River bank and beach erosion assessment** Review existing information and update (as appropriate) beach and bank erosion hazard assessment considering the impact of tidal waters and the action of waves, including the interaction of those waters with catchment floodwaters. First and second pass erosion assessment focusing on non-protected (natural) / susceptible bank and beach areas. The assessment should include mapping areas of riparian degradation. Where possible, the field survey should identify likely causes of the erosion (e.g. tidal currents, wind waves, stormwater flows, floodwaters, lack of vegetation, or a combination of these). Depending on the severity of the erosion (or level of risk), undertake modelling of bank erosion mechanisms, which may include: • hydrodynamic modelling, to determine current velocities (tidal, floodwaters) adjacent to critical areas of bank erosion • wave modelling, to determine height and erosion potential of locally generated waves within the estuary / riverine system	**Low**
2.20	*Stage 2* **Slope instability assessment** Review existing information and update (as appropriate) by conducting first-pass, site-specific geomorphic assessment of slope stability to be undertaken based upon a review of literature, lidar and site inspection relating to the geology; coastal and catchment slopes types and failure mechanisms, and assets. Detailed assessments to be undertaken on areas where risk to life and property are identified. Reference to AGS 2007: • AGS 2007a - Guideline for Landslide Susceptibility, Hazard and Risk Zoning for Land Use Planning • AGS 2007c - Practice Note Guidelines for Landslide Risk Management 2007 • GeoGuide LR10 Coastal Landslides.	**Low**
2.21	*Stage 2* **Prepare *coastal vulnerability area* (CVA) mapping** Determine hazard assessment and mapping outputs needed to inform coastal management going forward. This may include: • hazard mapping suitable for preparing a planning proposal to update the coastal vulnerability area maps in the CM SEPP; • hazard mapping outputs enabling assessment of immediate and future coastal vulnerabilities; • hazard modelling frameworks that can support option evaluation through application of a Cost Benefit Assessment (CBA), e.g. probabilistic outputs for inundation and erosion. This data will inform the preparation of a Planning Proposal.	**High**
2.22	*Stage 2* **Climate change adaptation strategy** High-level review and strategy development study to further identify key potential impacts from ongoing and future climate change and sea level rise, to inform definition of adaptation options and responsibilities – to be then further considered in Stage 3 of CMP. With particular attention on influence on biodiversity loss. Explore benefits and capacities for carbon sinks and markets.	**Medium**
2.23	*Stage 2* **Beach and shoreline recession assessment (probabilistic)** Indicated for specific areas identified to be susceptible to substantial beach or bank erosion (to be determined as part of the *beach and bank erosion assessment*). Further modelling simulations could 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, which may require site-specific geomorphological and/or geotechnical surveys.	**Low**

5.3.7 Aboriginal and cultural heritage degradation

I7. Aboriginal and Cultural Heritage Degradation		
Risk Assessment and Review of Management Arrangements		
Overall Level of Risk *(considering existing management arrangements)*		**HIGH**
Current Risk *(and threats)*	The key threats associated with Aboriginal, heritage and cultural values are: • Aboriginal culture not being recognised and preserved; including values and sites • community not valuing culture and heritage generally It is important to recognise Local Aboriginal Land Councils (LALC) as representatives of custodians within the study area, as well as consider tangible and intangible cultural heritage (refer to Section 3.8.1 for further details). Critical within the study area is to: • continue to build relationships between people and country (both indigenous and non-indigenous) • develop tangible and intangible evidence and values of Aboriginal uses and culture	**High**
Future Risk *(and threats)*	Increasing population, urban development pressure and climate change are viewed as key threats to Aboriginal and cultural values and sites.	**High**
Adequacy of Existing Management Arrangements	Various elements of the management system include involvement from LALCs, RAPS, Metropolitan LALC legislation in regard to site analysis requirements, National Parks and Wildlife Service legislation, heritage legislation and local heritage plans.	**Inadequate**
Suitability of Existing Data	The data and information available for Aboriginal and heritage sites is available on the Aboriginal Heritage Information Management System and via EES directly. Other resources to consider include: • *Cooks River Interpretation Strategy* • *Cooks River oral histories* • *Paul Irish – Hidden in plain view* • *Heather Goodal – Rivers of resilience* • *Ian Tyrell – River of dreams* • *Steven Gapps – Sydney Wars*	**Moderate**
Recommended Studies for CMP Stage 2		
Study No.	***Stage* / Description**	**Priority**
2.24	***Stage 2*** **Review of Aboriginal and heritage values and sites register and documentation** Review existing management techniques, values and preservation and recommendations, as well as databases of sites of cultural significance, including location, description and other relevant attributes of: • Aboriginal significant sites • heritage significant sites Consider naming of significant sites and places. Consider the use of the Burra Charter to capture all values.	**High**
2.25	***Stage 2*** **Aboriginal heritage sites vulnerability assessment** Undertake a heritage sites vulnerability assessment with key responsible agencies and LALCs. Assessment to utilise outcomes of key hazards assessments. Study to identify key issues and locations of concern for risk treatment.	**Moderate**

5.3.8 Governance and Compliance

I8. Governance and Compliance		
Risk Assessment and Review of Management Arrangements		
Overall Level of Risk *(considering existing management arrangements)*		**HIGH**
Current Risk *(and threats)*	The main threats associated to poor governance and compliance management are: • inadequate, inefficient, over or under regulation • lack of compliance with regulations or lack of enforcement • uncertainty of ownership and management responsibility of the coastal river and catchment leading to lack of action • lack of intergovernmental coordination • lack of community and stakeholder engagement Key areas of concern include (but are not limited to): Trade gateway, Coastal hazards including natural areas impacted by physical threats, Botany Bay, river banks, government assets such as sheet piling.	**High**
Future Risk *(and threats)*	Future risk to the coastal management areas is these not being prioritised in governance arrangements. Cooperation among different layers of government, agencies and private parties is required to protect the riverine and coastal areas. Population growth may result in additional visitation and pressure on the catchment and estuary which may result in increased conflict of use. An aging volunteer network creates uncertainty around community engagement within the study area.	**High**
Adequacy of Existing Management Arrangements	Inadequate integrated governance has been a key issue in the Cooks River historically and has resulted in the cumulative degradation of the coastal river. Organisations and strategies involved in the management of the study area include: Cooks River Alliance, Georges River combined catchments, GSC District plans, Sydney transport strategy, SSROC, and SCCG. Government agencies include: Federal, State, and local government (see Appendix E). Stakeholder and community engagement is carried out regularly as part of large projects occurring in the catchment or as part of studies that are setting the future direction for the area or community. Information availability, improved compliance of legislation, policy and coordination between organisations are identified as key areas for improvement.	**Inadequate**
Suitability of Existing Data	There is good and available information about governance, policy and legislation. Opportunity is for improved coordination and governance outcomes from the CMP development and implementation process.	**Adequate**
Recommended Studies for CMP Stage 2		
Study No.	***Stage* / Description**	**Priority**
2.26	***Stage 2*** **Detailed mapping of ownership and management responsibility of riverine and coastal areas** Including definition and collation of key land and waterway attributes. Involve active stakeholder engagement to facilitate the full-scale risk assessment (with consideration of the potential impact of un-integrated management) and thus to inform the development of management options in further stages of the CMP process.	**High**

5.3.9 Resource Use Conflict, Access Availability and Public Safety

I9. Resource Use Conflict, Access Availability and Public Safety		
Risk Assessment and Review of Management Arrangements		
Overall Level of Risk *(considering existing management arrangements)*		**HIGH**
Current Risk *(and threats)*	The main threats associated with resource use conflict, access availability and public safety are: • conflict over space and resource access and use, e.g. reserves, parklands, green corridors, easements and bicycle paths • anti-social behaviour and unsafe practices • overcrowding and congestion • loss or decline of biodiversity and natural habitats • limited or lack of access infrastructure (vulnerable) • loss of public access (either by private development or government managed area closures) • excessive stormwater discharge, sediment, litter • lack of access to wetlands due to private development • inaccessibility and risk on river banks due to failing and ageing infrastructure (e.g. steel sheeting, concrete edge) • public safety hazards from inundation, poor water quality, gross pollutants, seafood contamination, wildlife interactions (e.g. shark bite, jellyfish) • other surface, groundwater and sediment pollution affecting ecosystem and human health and safety (toxic algal blooms, bacteria, etc.) • communities not knowing risks of fishing in polluted waters Key areas of concern include (but are not limited to): key growth precincts (e.g. Bayside West and Bankstown Growth Corridor), access areas managed by Sydney Water and Sydney Airport. Limited river bank access where steel sheeting is located on Crown Land; Foreshore Beach, Muddy Creek, Alexandria Canal, Wolli Creek regional park, Sydney Water assets.	**High**
Future Risk *(and threats)*	Population growth and pressure on land development, increase in residents and visitors may intensify the current threats on resource use, conflict, access availability and public safety. Climate change, and varying water quality and floodplain parameters may require adaptive management initiatives. Sea level rise may exacerbate the threats and issues.	**High**
Adequacy of Existing Management Arrangements	A range of management options exist to manage the resource use conflict. 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 and DCPs. However, these policies are not necessarily enforced. Various access restrictions are in place, for example, Sydney Water restricts access to all sites, and stormwater assets are fenced off. There are specific event management policies and regulations and parking policies in place to manage overcrowding. Management initiatives implemented to ensure public safety is maintained within the catchment region. Education campaigns using signage, websites/apps and workshops are used to inform the public about risks to human life from flooding, water pollution and seafood contamination. In conjunction, physical controls are enforced to restrict access to the River. In addition, infrastructure such as WSUD is utilised to manage these issues. Monitoring and reporting of pollution incidents occurs and the public is informed when necessary, similarly flood risk management programs and flood intelligence warning systems are in place to inform the public of flood risks. Sydney Water's property is fenced and managed to reduce risks, but the steel sheeting and other areas is not.	**Moderate**
Suitability of Existing Data	Limited available information on resource use conflict. Suitable information is available regarding reported pollution incidents. Limited available information on diffuse pollution. The cumulative impact on the catchment and coastal management areas (of the four different types) of threats is not quantified. Public safety encompasses many aspects; hence, the type of information involved is very diverse, notably including water quality, groundwater, contamination and flooding data.	**Inadequate**
Recommended Studies for CMP Stage 2		
Study No.	***Stage* / Description**	**Priority**
2.27	***Stage 2*** **Review, survey and develop register of river bank and foreshore access assets and uses** Develop a database of waterway access and other vulnerable infrastructure, identifying the following attributes: access infrastructure type; spatial location; elevation (or elevations); user groups / competition; accessibility for the disabled; ownership / management responsibility; asset design life; and systems interdependencies. This study should also identify access opportunities and barriers, noting unapproved/illegal private structures (e.g. fencing) may be limiting access. Opportunities for improved/future access may extend to: public land; and easements not currently utilised for access. A single repository in the form of a spatial database that contains the information to guide detailed assessment of risks arising from coastal hazards and development of management options to improve access.	**Medium**

5.3.10 Recreation and Tourism

I10. Recreation and Tourism		
Risk Assessment and Review of Management Arrangements		
Overall Level of Risk *(considering existing management arrangements)*		**MEDIUM**
Current Risk *(and threats)*	The main threats associated with recreation and tourism within Cooks River catchment are: • boating and boating infrastructure • passive recreational use (no direct water contact, scenic) • active recreational use and associated access (e.g. cycle routes, social trails) • increasing tourism, enhanced by proximity to the airport • Littering Key areas of concern include (but are not limited to): foreshore beach, Wolli Creek, Muddy Creek, Tempe, Botany Bay, river banks, and sensitive ecological communities. Assets of concern are bridges, jetties and boat ramps.	**Low**
Future Risk *(and threats)*	Population growth and land use intensification may result in increased demand for recreational facilities and overall human interaction with water and remnant natural habitats. Sea level rise potentially poses further risks of inundation and thus constraining natural and green recreational space along the river banks.	**Medium**
Adequacy of Existing Management Arrangements	Various control measures are in place to manage recreational activities and facilities in the Cooks River catchment. • swimming and related activities are limited by water quality; however, netted designated swimming areas along Lady Robinson beach exist (in the vicinity of the study area). • boat access is controlled by limited boat ramps, weirs and bridges. boat operations are controlled by environmental assessments, rms policies and speed limits. • policies such as plans of management and review of environmental factors are implemented for the management of passive recreational spaces to reduce overall impact of these spaces. • various NSW Government grants are available to help facilitate the management of passive recreational areas, often referred to as “green spaces” (Green Space, Saving Our Species, and NSW Environmental Trust grants).	**Moderate**
Suitability of Existing Data	In general, there is good information and data availability about recreation and tourism activities within the study area, including master plans and plans of management of various parklands and trails. Recreational boating information exists, including a recent survey. Opportunity for information to be further analysed and used to inform coordinated coastal management.	**Moderate**
Recommended Studies for CMP Stage 2		
Study No.	***Stage* / Description**	**Priority**
2.28	***Stage 2*** **Recreation and swimming policy study** High-level review study, considering objectives and actions within the District Plans collating information and data from various park master plans, plans of management, community plans and associated policies and strategies. Aimed at informing the development of a study area wide policy to manage risks and impacts of recreation practices, comprising both passive (i.e. scenic) and active (e.g. boating, kayaking, swimming) activities.	**Low**

5.3.11 Shipping

I11. Shipping		
Risk Assessment and Review of Management Arrangements		
Overall Level of Risk *(considering existing management arrangements)*		**MEDIUM**
Current Risk *(and threats)*	The main threats associated shipping in Cooks River Catchment are: • large commercial vessels • small commercial vessels • dredging and harbour maintenance Important to note these threats occur mostly within a relatively small section of the study area, i.e. Botany Bay, especially Port Botany and the trade gateways. Key activities of concern related to shipping include ongoing shipping channel maintenance (dredging), port expansions, the desalination pipe line, and extended oil pipeline.	**Low**
Future Risk *(and threats)*	Population growth has the potential to increase shipping pressures due to increases in the size and frequency of vessels entering Port Botany.	**High**
Adequacy of Existing Management Arrangements	A number of key initiatives restrict shipping operations, development, and biosecurity measures. Key authorities involved in management of shipping are the Port Authority of NSW, NSW Ports and Transport for NSW (Roads and Maritime) and the Australian Quarantine and Inspection Service.	**Moderate**
Suitability of Existing Data	Commercial vessels information and data is gathered and managed by Ports and RMS. Opportunity for better analysis of existing data to inform detailed risk assessment.	**Adequate**
Recommended Studies for CMP Stage 2		
Study No.	***Stage* / Description**	**Priority**
2.29	***Stage 2*** **Review commercial vessels information** Detailed review of existing boating and commercial vessel activity data, future plans and trends. This information will help to assess: • opportunity for improved boating infrastructure and management • threat of shipping to coastal and estuarine habitats	**Low**
2.30	***Stage 2*** **Oil spill risk assessment and review emergency plans** Detailed oil spill risk assessment and review of relevant emergency plans to identify potential impacts and management requirements.	**Low**

5.3.12 Fishing

I12. Fishing		
Risk Assessment and Review of Management Arrangements		
Overall Level of Risk *(considering existing management arrangements)*		**LOW**
Current Risk *(and threats)*	The main threats associated with fishing within the Cooks River catchment are: • Recreational fishing • Illegal fishing Aboriginal cultural fishing Although these are all relatively small-scale fishing operations, collectively could be posing pressure on the environment and there is associated public safety risk due to potentially contaminated seafood. Botany Bay is a popular and productive urban fishing location, additional key areas of concern include (but are not limited to): Muddy Creek and Wolli Creek.	**Low**
Future Risk *(and threats)*	Population growth plus the increase in visitation to the Cooks River catchment has the potential to increase fishing pressures if these issues are not managed adequately. Uncertainty around the effects that climate change on fish stocks and breeding habitats.	**Medium**
Adequacy of Existing Management Arrangements	A number of key initiatives have or are being implemented to control fishing activities as to protect fisheries for the future. Controls placed on fishing allows fish stocks to be managed in a sustainable manner. Botany Bay is designated as a recreational fishing haven as no commercial has been permitted since 2001. Commercial fishing is not allowed in the Cooks River. Fishing is controlled using policy, license requirements and existing facilities: • Limited charter boat facilities and DPI charter fishing boat license required • Research licences are required • Limited boat ramps (in the River and Foreshore Beach) • No aquaculture leases within the Cooks River • NSW DPI bag and size limitations • Dietary advices issued recommends to avoid eating fish or shellfish from the Cooks River and its tributaries, due to high levels of industrial pollutants, as well as from Botany Bay due to PFAS. The release of catches is recommended. Fishing restrictions apply around runways and at Port Botany. Botany Bay restricted areas include: • Waters between Sydney Airport runways • Alexandra Canal includes no disturbance of bed sediments due to high levels of pollutants • Penrhyn Estuary, from its source to its junction with the Sydney International Container Terminal (SICTL) bridge leading from Foreshore Road • Towra Point Aquatic Reserve Sanctuary Zone (outside of study area), also no disturbing, destroying or collecting marine animals or plants, whether dead or alive. Council and DPI rangers and environmental officers undertake some enforcement of the controls placed on fishing.	**Adequate**
Suitability of Existing Data	Information and data about recreational fishing activities exist; however, coverage around the CMP study area is not uniform nor consistent.	**Moderate**
Recommended Studies for CMP Stage 2		
Study No.	***Stage* / Description**	**Priority**
2.31	***Stage 2*** **Recreational fishing surveys and investigations** Investigate recreational fishers and non-compliance fishers in the, looking at: • patterns of recreational fishing • potential human health risks from fish consumption • threats to the fishery • reasons for non-compliance • improved design and delivery of education programs, including educational packages for culturally and linguistically diverse communities • recommendations for ongoing management (e.g. regular 5-year assessments)	**Low**

CHAPTER 6: STAKEHOLDER AND COMMUNITY – SUMMARY

It is vital to establish links with key stakeholders and the community at the outset of the CMP to build interest and trust in the process and outcomes. Early and ongoing engagement in the process has the advantage of eliciting stakeholder issues and concerns that can help shape the decision making. This Chapter outlines the CMP Stage 1 engagement activities and outcomes from this project.

Engagement with stakeholders and the community has formed a central component of this scoping study, which has helped shape the current study document. Engagement activities undertaken through this project and their corresponding outcomes. Engagement activities to build interest and elicit knowledge have included:

- introductory presentation / session on the new NSW coastal management framework, CMP process and CMP scoping study requirements;
- stakeholder data availability survey;
- stakeholder risk assessment and vision workshop;
- one-on-one follow up emails, phone calls and meetings;
- Aboriginal stakeholders engagement workshop, ran by the CRA;
- community survey by the CRA; and
- presentation of the final Scoping Study.

In addition to the engagement activities undertaken, this project has prepared a Cooks River Catchment CMP stakeholder and community engagement strategy. This has been designed to help facilitate ongoing community engagement through subsequent CMP stages. The engagement strategy has been prepared as a standalone document and can be found in (Appendix A).

Cooks River Catchment CMP - Catchment Advisory Group

Cooks River Catchment CMP - Catchment Advisory Group	
Councils	**State agencies / stakeholders**
Inner West Council Strathfield Council Canterbury-Bankstown Council Bayside Council The Council of the City of Sydney Burwood Council	Sydney Airport Port Authority of NSW NSW Ports Sydney Water Transport for NSW DPIE – EES DPI Fisheries Local Aboriginal Land Councils Greater Sydney Local Land Services National Parks and Wildlife Service Caltex Wolli Creek Preservation Society Cooks River Valley Association Botany Bay Alliance

6 Stakeholder and Community Engagement Strategy

6.1 Engagement Activities Conducted in this Scoping Study

Establishment of a coastal management advisory committee or panel can be an effective way of facilitating stakeholder and community involvement and oversight of the CMP planning process. Fortunately, the Cooks River system benefits from the existence of such a group already.

The CRA established a Catchment Advisory Group in 2018 to assist with the direction, review and subsequent implementation of the Cooks River Catchment CMP. The Catchment Advisory Group includes representatives from catchment councils, state government authorities and key stakeholder representatives from within the study area.

Table 6-1 Cooks River Catchment CMP - Catchment Advisory Group

Cooks River Catchment CMP - Catchment Advisory Group	
Councils	**State agencies / stakeholders**
Inner West Council Strathfield Council Canterbury-Bankstown Council Bayside Council The Council of the City of Sydney Burwood Council	Sydney Airport Port Authority of NSW NSW Ports Sydney Water Transport for NSW DPIE – EES DPI Fisheries Local Aboriginal Land Councils Greater Sydney Local Land Services National Parks and Wildlife Service Caltex Wolli Creek Preservation Society Cooks River Valley Association Botany Bay Alliance

A range of Stage 1 Scoping Study engagement activities have been completed to build interest and elicit knowledge. These initiatives have included the following:

- introductory presentation / session on the new NSW Coastal Management Framework, CMP process and CMP Scoping Study requirements;
- stakeholder data availability survey;
- stakeholder risk assessment and vision workshop;
- one-on-one follow up emails, phone calls and meetings – to gather further inputs;
- Aboriginal stakeholder workshop ran by the CRA;
- community survey by the CRA; and
- CRA Presentation of the final Scoping Study (TBC).

Information gained from these activities has provided direct guidance to a range of components in this study, including:

- CMP vision (Chapter 2);
- establishment of context for management (Chapter 3);
- setting the scope (Chapter 4);
- identification of values and issues (Chapter 5); and
- the CMP forward plan (Chapter 8).

6.2 Stakeholder and Community Engagement Strategy going forward

An engagement strategy for the Cooks River Catchment CMP has been prepared as part of this project, which is documented in Appendix A. The engagement strategy establishes a framework and sets the strategic direction for how communication and engagement will be undertaken with internal and external stakeholders (including community) throughout the development of the Cooks River Catchment CMP.

The engagement strategy is focussed on the development of the CMP (i.e. CMP Stages 1 to 4). An effective engagement strategy is dynamic in nature and can respond to changing community needs. Therefore, it should be considered as a 'living document', which is monitored, evaluated and updated as required during the CMP development, and once the CMP is implemented. Without effective and ongoing engagement with stakeholders, it is unlikely that the CMP will be successful.

The overarching objectives of the engagement strategy include:

- highlight the purpose of the CMP, how it adds value to what has been done previously and what will be done by Councils and relevant public authorities/state agencies in the future;
- de-risk the CMP process by bring stakeholders and community on board;
- provide an overarching engagement approach that is adaptive and flexible, and can be modified/refined throughout the remaining CMP stages; and
- facilitate meaningful exchange of information.

In addition, the specific aims of this engagement strategy are to:

- outline which individuals and organisations should be involved in the CMP process;
- support involvement of community and stakeholders over the life of the plan, highlighting when there will be opportunities for input and what the nature of these opportunities maybe; and
- outline how community and stakeholder input will be incorporated into the CMP.

The engagement strategy includes:

- identified key stakeholder and communities;
- outlines a range of engagement tools and key messages;
- provides a breakdown of the "who", "how", "what" and "when" of engagement for each CMP stage;
- details engagement process and requirement for submitting a planning proposal; and

- provides guidance on celebrating achievements and successes.

The engagement strategy is provided in Appendix A.

CHAPTER 7: PRELIMINARY BUSINESS CASE – SUMMARY

The benefits of preparing a CMP for the Cooks River catchment:

- develop and deliver action to mitigate the threats to the river's community values, ecological values and economic benefits.
- develop and deliver a long-term, risk based strategy to manage coastal hazards, climate change and other risks likely to manifest over the next 100 years.
- provides short- and long-term management actions to support ecological and social values of the coastal river underpinning the economic and social benefits to the catchment.
- provides legislative weight and legitimacy for Councils supported by funding the NSW Coastal Management Program.
- provision of liability exemptions via S733 of the Local Government Act.
- promotes collaboration between Councils in the catchment, particularly those within the Cooks River Alliance, as well as the various state agencies and public authorities to assist with consistency in management effort and approach.
- provides cost and resources savings compared with LGA-based individual CMPs.
- represents a significant strategic opportunity to improve engagement with the various land owners, private interests, coastal managers, stakeholders and the community.
- an ability to build upon past studies, information and management initiatives.

By not pursing a CMP, Councils and state agencies in the catchment 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.

The cost of not preparing a CMP to assist manage the threats to the coastal river's ecological and community values is likely to be significant, especially given the substantial population growth pressures within the catchment and adjoining Sydney metropolitan areas. There will also be longer term costs from "doing nothing", as population growth and urban development pressures combine with climate change related risks.

The total cost of preparing the CMPs is estimated at:

- $1.4 million to $2.5 million

The NSW government is committed to managing the coastal environment and marine estate of NSW and have allocated funding packages for coastal management ($83.6M package) and for managing the marine estate (an initial $46M package). These funding packages are available to support preparation of CMPs, and further studies that support the CMP and management of the marine estate.

Responsibilities, collaboration and cost sharing arrangements will need to be further considered by all project partners, in order to commence Stages 2 to 4 of the CMP.

7 Preliminary Business Case

7.1 Overview

This section outlines the preliminary business case for developing a CMP for the Cooks River catchment. The benefits of preparing a CMP for the Cooks River catchment, including the four member Councils of the CRA Bayside, Canterbury-Bankstown, Inner West, and Strathfield, are clear:

- a CMP provides a mechanism to develop and deliver action to mitigate the threats to the River's community values, ecological values and economic benefits.
- a CMP provides a mechanism to develop and deliver a long-term, risk based strategy to manage coastal hazards, climate change and other risks likely to manifest over the next 100 years.
- by providing these short- and long-term management actions, the CMP intrinsically supports the ecological and social values of the catchment study area, which in turn underpin its economic and social benefits to the catchment.
- NSW legislation, particularly the CM Act, the MEM Act provide legislative weight and legitimacy for Councils to prepare CMPs. The legislation backed by the NSW Coastal and Estuary Grants Program and the MEM Strategy which are both well-funded, providing further incentive to develop a CMP.
- further legal weight for preparing a CMP is given through S733 of the Local Government Act, where public authorities are exempted from liability where decisions are made substantially in accordance with the specified Manual.
- a whole-of-Cooks-River catchment CMP promotes collaboration between Councils in the catchment, particularly those within the Cooks River Alliance, as well as the various state agencies and public authorities with jurisdiction in the catchment and waterway.
- a whole-of-catchment CMP promotes consistency in management effort and approach between the councils, state agencies and other stakeholders.
- a gazetted CMP provides enhanced opportunities for collaboration and partnership with state agencies and public authorities. Via the CM Act, 2016 (s23) the preparation and implementation of the CMP will be able to drive and facilitate commitments to contribute towards the necessary studies and implementation of management actions as agreed within the final CMP to be fairly proportioned depending on land ownership and management responsibility.
- a whole-of-Cooks-River catchment CMP provides cost and resources savings compared with LGA-based individual CMPs. For example, the design and feasibility assessments for actions can be shared across the responsible parties in the catchment. Certain actions are also more economic when applied at a catchment scale.
- the preparation of the CMP represents a significant strategic opportunity to improve engagement with the various land owners, private interests, coastal managers, stakeholders and the community.

- developing the CMP will build upon past studies, information and management initiatives, rather than replace them.

Herein, this business case supports the forward program for developing the CMP, providing cost estimates and cost breakdowns for the various catchment and CRA councils, and public authorities. The business case also outlines the available funding mechanisms to support CMP preparation, the greatest of which are the NSW Coastal and Estuary Grants Program ($83.6 million over 4 years to 2021) and potentially components the MEM Strategy implementation program ($46 million over the next 2 years), such as providing capacity building in applying the risk-based framework.

7.2 Why Prepare a CMP?

7.2.1 Economic, Ecosystem and Social Basis

A CMP aims to provide for the coordinated and strategic management of the Cooks River over the short and long term (i.e. 10 years plan, considering hazards to 2100). By providing a consolidated and coordinated management strategy, a CMP provides the action plan for maintaining and improving health of the coastal river, and the social and economic values underpinned by this.

The foreshores of the Cooks River are earmarked as a key feature of the green corridors detailed in the Greater Sydney Commission reports. The Cooks River supports a wealth of habitat remnants.

The catchment supports a densely populated region of greater Sydney. The catchment is also expected to house a population growth of more than 15% by 2036 through further density increases and key new development precincts.

Such intensive urban development poses obvious threats to the water quality of the estuary. A CMP provides a suitable and government supported process for managing these threats to the Cooks River.

A catchment-wide approach is recommended (i.e. to consider issues beyond the mapped “coastal zone” tidal limit), as catchment influences are key to the water quality and ecological health of the system, which in turn supports the social and economic values associated with the river. As demonstrated through the risk assessment outcomes (Section 3.5), many of the highest threats to the coastal river arise from management issues within the catchment, e.g. bank stabilisation and loss of habitat, contamination, stormwater inputs, expansive catchment development, impacts from historical land uses and so on.

Key ecological values within the catchment will be supported by CMP preparation. Including but not limited to key wetland and foreshore habitat areas, riverine and marine habitats, urban bushland and rare, threatened and international recognised species.

7.2.2 Scientific Understanding to Support Coastal Management

The preparation of a CMP provides an excellent mechanism for filling data gaps that currently impede effective integrated management. A CMP requires a detailed risk assessment and cost benefit analysis be undertaken to guide the selection of management options. Thus, the CMP process provides a mechanism for developing effective management of short(er) term risks; and for developing adaptation pathways for long term risks, such as tidal inundation from sea level rise, or

effective planning schemes to manage the expected Cooks River catchment population pressures and changes to community structure and economic activity in the catchment that may threaten the coastal river health (refer to Section 3).

Existing high quality scientific or management information is not lost through the CMP process, but rather, is carried forward for use in the CMP preparation. Thus, the CMP process builds on past knowledge and experience, so that key learnings are retained and built upon in managing the estuary (Refer to Chapter 5 and Appendix D).

7.2.3 Existing Governance and Management Arrangements

Development of a CMP does not mean starting from scratch. The Scoping Study has reviewed in detail previous and current actions, to test their effectiveness for treating known risks, and then recommending existing suitable actions or arrangements be taken directly to Stage 3 or 4, for inclusion in the CMP.

For known risks where existing actions are no longer suitable or sufficient (e.g. because the action has been implemented, is no longer practical or affordable, was found to be ineffective, and so on), the CMP process provides for new actions to be formulated. It also enables actions to be identified for new risks and risks that may become apparent in the future, for example as a result of climate change, population grown and shifts in demographics.

Presently there is no single regulatory body or framework to oversee the management of the Cooks River catchment, its tidal waterways and associated coastal areas. As a result, coastal management initiatives undertaken to date have been primarily in response to localised plans and initiatives, as opposed to a coordinated whole-of-system approach.

Further collaboration between Councils and public authorities in the catchment 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.

The Cooks River has a significant advantage in the governance context, in that the CRA is already established, providing an excellent governance arrangement to pursue, coordinate and implement a CMP. The CRA already has strong links with Councils in the catchment (although membership could be expanded) as well as the many and varied state agencies and other stakeholders that have management responsibility in the waterway and catchment. The CRA's strong history of action on catchment and coastal river issues provides an excellent platform for pursuing a successful whole-of-system CMP. The legal status of CMPs given under section 23 of the CM Act, that states "other public authorities to have regard to coastal management program and coastal management manual".

S23 serves as a key driver to improve collaboration between and ownership by local and state agencies for coastal management.

The NSW Government has given a significant funding boost to both coastal management and marine estate management, by committing $87 million to the NSW Coastal Management Program, and some moneys via the to the implementation of the MEM Strategy over the next 2-5 years for such activities including capacity building in applying the risk-based framework. These funds are available to councils and organisations such as the CRA to prepare a CMP, and furthermore, to implement actions within a certified CMP.

7.3 Risks Arising from Not Preparing or Preparing a CMP

7.3.1 Key Risks of Not Preparing a CMP

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 pursing a CMP, Councils and state agencies in the catchment 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.

The cost of not preparing a CMP to assist manage the threats to the coastal river's ecological and community values is likely to be significant, especially given the substantial population growth pressures within the catchment and adjoining Sydney metropolitan area. In addition to the water quality and ecological health risks arising from intensive urban development, there are also significant risks from competing recreational uses threatening ecological habitats within the limited foreshore area available along the Cooks River. Without a considered management plan for these foreshore areas, such as within a CMP, estuarine and riparian habitats on the foreshores will be under substantial pressures (with a high potential for loss), squeezed between the increasing recreational usage and opportunities demanded from an increasing population, and the decreasing land area with sea level rise.

There will also be longer term costs from "doing nothing", as population growth and urban development pressures combine with climate change related risks. By "doing nothing", there is an opportunity cost, where the opportunity to reduce future risks and associated financial costs through planning for future development (in this case, infill and re-development) is lost. Preparation of a CMP provides an excellent mechanism for assessing these risks, and developing actions relating to strategic land use planning and development controls.

Similarly, the costs of not effectively preparing existing development for coastal and climate related risks are also substantial. According to the Australian Business Roundtable for Disaster Resilience and Safer Communities (November 2017) current costs of natural disasters in terms of insurance and damages is $9 billion year in Australia, while in NSW over the past decade averaged $3.2 billion per year, with storm accounted for 49% of this cost and 23% due to flood events. Costs of natural disasters in the Cooks River catchment have not been quantified.

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 is $33 Billion by 2050 with the total economic cost of natural disasters in NSW will reach $10.6 billion a 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 then to develop suitable, practical and affordable actions to manage these and pathways for when and how such actions to be implemented over the short to long term. Stage 3 of preparing a CMP enables actions to be subject to detailed analysis, such that the economic cost savings from avoided damages can be estimated.

7.3.2 Key Risks of Preparing a CMP

Risks include:

- expectations of the local community and stakeholders – 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's accountability and obligations for implementing the CMP – As the leading entity preparing and driving the CMP process, once gazetted Councils' have 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:

(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.

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 regard to implementing a CMP; in that

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

(a) 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

(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 Councils' and agencies – Preparing a CMP may result in conflict within Councils 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 potential conflicts are identified, and controls are implemented to mitigate associated risks.

7.4 Costs and Funding Options for CMP Preparation

7.4.1 Estimated Cost of Preparing the CMP(s)

The total cost of preparing the CMPs is estimated at:

- $1.4 million to $2.5 million

The upper and lower ranges are based upon the exclusion (lower limit) or inclusion (upper limit) of medium and low priority studies, as recommended in the forward program. The cost advantages of conducting the CMP are very evident, as discussed further below. Funding opportunities, responsibilities and cost sharing arrangements are also detailed below.

7.4.2 Cost and Other Savings Associated with Separate Versus Combined Studies

The development of a CMP provides opportunity to enhance a coordinated and sustained approach to effective coastal and catchment management within the Cooks River area. A whole-of-system CMP that encompasses the coastal zone and the adjoining catchment area provides the ideal opportunity to: clarify the jurisdictional ambiguity; develop a truly strategic and integrated management plan; and significantly assist with governance, management and implementation of actions.

Benefits of a whole-of-system CMP include:

- the ability to work collaboratively to attract funding and investment;
- efficiency savings for costs and resources where economies of scale are achieved and duplication between many councils and agencies are reduced;
- improved capacity to strategically and consistently address system-wide issues and interests (but still opportunities for local councils to build in local specifics); and
- improves communication, collaboration, advocacy and promotion of the estuary across the councils and state agencies throughout the catchment.

7.4.3 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 ($84M package) and managing the marine estate (an initial $46M package).

These funding packages are available to support preparation of CMPs, and further studies that support the CMP and management of the marine estate.

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, are also available to fund actions specified in a CMP, at Stage 5 when the CMP is being implemented. Supporting in-kind resources may also be available via community participation and input from other interests particularly research institutions. Funding contributions may also be available through partnerships with private enterprises who obtain a direct financial benefit from the sustainable management of the coastal river.

7.4.4 Cost Sharing Arrangements

Responsibilities, collaboration and cost sharing arrangements will need to be determined with all project partners, in order to commence Stages 2 to 4 of the CMP. The CRA Executive Committee recommend funding options as:

- that the NSW Government fully funds the CMP planning process as of the next funding round in February 2020.
- if the funding ratio remains the same, then the future studies are limited to current CRA funding of $100,000 per year for 2 years and; Councils look to fund studies through existing dedicated funds and through working groups.
- further funding is sought from other organisations and agencies in the catchment study area.

A gazetted CMP provides enhanced opportunities for collaboration and partnership with Councils, state agencies and public authorities. Via the CM Act, 2016 the preparation and implementation of the CMP will be able to assist drive and facilitate commitments to contribute towards the necessary studies and implementation of management actions as agreed within the final CMP via fairly proportioned contributions depending on land ownership and management.

Under current arrangements, CRA Member Councils will be eligible to apply for ‘dollar for dollar’ funding to prepare the CMP under the NSW Coastal and Estuary Grants Program competitive grant program and should budget for this accordingly. The CRA may also be eligible to apply for marine estate management funding to undertake studies recommended for preparing the CMP, where the study aligns with or supports capacity building in applying the risk-based framework achieving objectives and actions of the NSW MEMA Strategy (e.g. implementing the risk-based framework for waterway health by OEH and EPA, 2018).

Much of the MEMA funding is expected to flow to DPIE – EES in urban areas and LLS and DPI Fisheries in rural areas to implement the strategies. There are some studies specified in the forward program (Table 8-3) that Council may seek joint responsibility and funding assistance from DPIE – EES through MEMA to implement. For example, the MEMA Strategy lists Water Quality improvement as the #1 priority, and so water quality studies in Stages 2 and 3 (and presumably CMP actions in future) may be eligible for funding assistance or technical support, especially where they are based upon the waterway health framework (OEH and EPA, 2018).

CHAPTER 8: FORWARD PLAN – SUMMARY

This section provides a summary of next stages (Stage 2-4) in the development of the Cooks River Catchment CMP. These include:

- 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 (to feedback to the cycle).

This Chapter:

- informs the governance arrangements for the preparation and delivery of the CMP by providing recommendations for CMP governance, roles and responsibilities.
- demonstrates clear benefits to developing a Cooks River Catchment CMP that can address whole-of-catchment issues and capitalise on opportunities through enhanced collaboration and partnerships.
- provides details of the associated recommended studies, investigations and assessments including their indicative costs and timelines for the completion.

Cooks River Catchment CMP Forward Plan Summary

CMP Stage	Timing	Overview	Cost Estimate
Stages 2 to 4 CMP Project management and Implement of engagement strategy	Years 1-4	CMP project management (1.0 FTE) Implement engagement strategy	Low ~$300K High ~$600K
Stage 2 Determine risks, vulnerabilities and opportunities	Years 1-2	Technical studies: threats/hazards and values/assets Strategy, ownership and socioeconomic profiling studies	Low ~$700K High ~$1,200K
Stage 3 Identify and evaluate options	Years 2-3	Full-scale risk assessment Options development and assessment Multi-Criteria Analysis (MCA) Cost Benefit Analysis (CBA) Prepare Planning Proposal	Low ~$300K High ~$600K
Stage 4 Prepare, exhibit, finalise, certify and adopt a CMP	Years 3-4	Develop business plan Prepare and exhibit draft CMP Exhibit, review and finalise Planning Proposal(s) Review, finalise and certify CMP	Low ~$100K High ~$150K
Stage 5 Implement, monitor, evaluate and report	Years 4+	CRA and Councils implement through IP&R frameworks Other organisations implement through relevant work programs	*TBD*
		Total CMP Planning Costs	**Low ~$1.4M** **High ~$2.5M**

8 Forward Plan

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

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

Stage 2 of the CMP process involves undertaking detailed studies that will assist Councils 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); and
- identifying scenarios for social and economic change and related opportunities for coastal communities.

8.1.2 Stage 3 – Identify and evaluate options

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; and
- identifying pathways and timing of actions.

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

Stage 4 of the CMP process involves a draft CMP being prepared (including a business plan for implementation), 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. The preparation of planning proposal(s) to amend maps of coastal management areas, to commence the Gateway process will also be included in Stage 4 where feasible.

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).

8.2 CMP Project Governance Considerations

This section informs the governance arrangements for the preparation and delivery of the CMP. It reviews and provides recommendations for CMP Governance, Roles and Responsibilities.

Presently there is no single regulatory body or framework to oversee the management of the Cooks River catchment, its tidal waterways and associated coastal areas. As a result, coastal management initiatives undertaken to date have been primarily in response to localised plans and initiatives, as opposed to a coordinated whole-of-system approach.

The Cooks River Alliance have done an admirable job in coordinating actions of member councils and other stakeholders to improve the health and quality of the catchment (see Section 3.6 – Governance Context). The CRA have also recently released *"The Cooks River People's Plan - A strategic plan for united action on the Cooks River and its catchment" 2018–2021"*.

The Cooks River People's Plan - 2018–2021

The Cooks River People's Plan is a three-year plan that commits the Cooks River Alliance to united action for a healthy Cooks River and catchment that improves the liveability of places and communities. It also outlines actions that meet the Alliance's long-term outcomes. It acknowledges that there are multiple organisations managing the river and catchment and invites all to continue to combine efforts to create positive change.

The development of a CMP now provides opportunity to enhance a coordinated and sustained approach to effective coastal and catchment management within the Cooks River area. A whole-of-system CMP that encompasses the coastal zone and the adjoining catchment area provides the ideal opportunity to:

(1) Clarify the jurisdictional ambiguity that exists;

(2) Develop a truly strategic and integrated management plan; and

(3) Significantly assist with governance, management and implementation of actions.

8.2.1 CMP Structure and Project Governance Options

The NSW Coastal Management Framework provides flexibility around the scope, structure and governance arrangements of a CMP. For large and complex coastal system such as the Cooks River catchment flexibility is needed.

A CMP provides a unique opportunity for state government agencies, councils and their communities to achieve a strategic and coordinated approach to manage coastal risks and improve coastal habitats and environments, for both environmental and social (community) benefit.

Given the substantial number of state and local authorities who have some responsibility within study area, there needs to be careful consideration and decisiveness regarding governance scope and structure for a Cooks River Catchment CMP. Two structural options are presented for the Cooks River Catchment CMP(s).

- a Cooks River CMP study area as defined in this Scoping study (see Section 4.2) where the CMP encompasses the catchment, estuary and the associated coastal area extending eastward from the Cooks River mouth to Bunnerong Creek, including Sydney Airport, Botany Wetlands (to the northern boundary of Bayside Council), Mill Stream, Foreshore Beach, Penrhyn estuary, and Port Botany north of Brotherson Dock; i.e. encapsulating all of the eastern side Bayside LGA.
- LGA specific CMPs, which would see each fringing Council developing their own CMP. This approach would provide localised control of the content and issues addressed in the CMP and to some degree reduce the need for specific collaboration with neighbouring Councils. Engagement and collaboration are still required (and encouraged) for CMP development and implementation within and adjoining sediments compartments (*Section 16 Consultation - CM Act, 2016)*.

Whole of Botany Bay CMP

It is further recognised that a whole of Botany Bay CMP has merit, however this will not be addressed at this time. There are three CMPs currently being considered within the Botany Bay embayment area. The Cooks River Catchment CMP Scoping Study (here) and Georges River and Eastern Beaches CMP Scoping studies (being initiated). (NB The Bate Bay CMP Scoping Study is also underway however it is understood that this applies to the Bate Bay open coastal areas only).

It is recommended that close collaboration across the three Scoping studies be undertaken with then consideration given to the development of a whole of Botany Bay CMP.

8.2.1.1 A Cooks River Catchment CMP

There are numerous advantages from developing a Cooks River Catchment Coastal Management Plan with the area as defined within this scoping study (Section 4.2).

The key benefit being that a Cooks River Catchment CMP will underpin the development and implementation of a strategic and integrated plan that addresses system-wide opportunities and vulnerabilities. The CMP will provide opportunity to set key objectives, management and action priorities to support the implementation of the Cooks River People's Plan, 2018-2021 , the GSC Eastern City and South District Plans and the NSW Marine Estate Management Strategy 2018-2028.

The CMP should be structured to support local scale issues in the context of catchment wide application, while ensuring integration with the other CMPs being development within the Botany Bay embayment and the 'Botany Bay, Bate Bay & Port Hacking' sediment compartment.

The catchment wide CMP encompassing the defined study will also ensure:

- that Bayside will not need to involve in 3 separate CMPs;
- there is a clear jurisdictional separation in coastal management for the north side of Botany Bay i.e. between Bayside and Randwick Councils;
- integration of areas managed by Port Botany with similar environmental values to Cooks River, e.g. Penrhyn estuary, Foreshore Beach;
- minimisation of open coast processes, areas and issues to deal with enhancing the focus on estuarine and catchment processes and issues; and
- ensuring involvement of Sydney Airport and NSW Ports into the preparation and delivery of the Cooks River Catchment CMP.

Table 8-1 Pros and Cons (Single CMP for whole of study area)

Opportunities and Advantages	Challenges and Limitations	Governance Considerations
CMP establishes a system-wide direction, establishing priorities under a defined governance structure to support integrated and strategic management for the Cooks River catchment	History has shown the difficulties in achieving a coordinated whole of catchment approach. Agreement on financing and funding models. The need for further CRA funding to resource management, coordination and reporting of the CMP.	Utilising the existing governance structure of the CRA. Continuing the Catchment Advisory Committee including CRA member and non-member councils, related state agencies and key private and community (NGO) sector representatives Links with regional planning processes are established (e.g. GSC Regional and District Plans and the Marine Estate Management Strategy
Enhanced opportunity to access funds to tackle larger whole-of-system issues that could not be addressed by one or a small collective of councils/agencies alone	Requirements for additional operational funding for CRA to adequately support the implementation of the CMP. Not all Councils within the study area are members of the CRA	Oversight and ownership of the outputs, ensuring that the needs of the whole of catchment are put ahead of those of a local area.
Increased collaboration between councils and agencies; moving away from ad hoc locally based activity with; jurisdictional uncertainty clarified	Clarification of who will lead grant funding applications for whole of estuary issues and definition of contributions of participating Councils. Determination of cost sharing arrangements and beneficiary pays principles.	Need for dedicated implementation resources to ensure ongoing coordination and management.
A consistent approach across all Councils to manage issues that are common to all areas (but local in nature).	Ensuring attention to local issues addressed at the right temporal and spatial scale while encompassing a whole of catchment approach	Defining protocols and processes for the existing Catchment Advisory Committee to adequately and appropriately report to the CRA Executive and Management Committees
Opportunity to develop Local Implementation Schedules	Local implementation schedules subordinate however complimentary to the overall CMP providing locally specific (LGA based) issues and needs which may not be implemented in a timely nor consistent fashion	Implementation and reporting of actions schedule of CMP partners and links to the IP&R framework

8.2.1.2 LGA Specific CMPs

LGA specific CMPs may be considered as an option (e.g. Bayside, Inner West, Strathfield, Canterbury Bankstown etc) however it is unclear if this CMP model would be acceptable from a state government perspective with the CM Act promoting an integrated and systems approach to coastal zone management.

This option might reduce the consultation needed upfront when developing the CMP, but there will still be a need for collaboration where issues occur across LGA boundaries. This approach would importantly miss the significant opportunity for economies of scale in managing issues that are common across all LGAs. This approach would also lack a binding tool or alliance under which to make negotiations and agreements effectively between councils and with State agencies.

State agencies and authorities have shown in principal support for a systems approach to management and may become frustrated at the need to consult with individual councils on matters covered within LGA based CMPs.

Table 8-2 Pros and Cons (LGA specific CMPs)

Opportunities and Advantages	Considerations and Limitations
Enable locality specific issues to be targeted and addressed. This would be seen by Councils as directly relevant to their own area.	The CMPs may be repetitious where issues span the entire catchment, and particularly where the CMP for each local council must still cover each of the four coastal management areas.
Consultation would be required to provide some consistency between the approaches taken by Council.	There is a high likelihood of duplication of resources to tackle issues that are common to all councils.
Less complicated to manage and potentially quicker results in targeted areas as no need to work with so many other stakeholders and no need to attend meetings outside each LGA.	The ability to address significant whole of estuary issues is reduced because different approaches may be applied across different CMPs.
LGA based CMPs would encompass local issues while still having an opportunity to capture catchment wide and larger whole of system issues.	The ability to fund actions to address whole of estuary issues may be impeded without a single CMP that compares, costs and selects actions at an appropriate scale.

8.2.2 CMP Project Governance Recommendations

There are clear benefits to developing a Cooks River Catchment CMP that can address whole-of-catchment issues and capitalise on opportunities available through enhanced collaboration and new partnerships.

Cooks River Catchment CMP
It is recommended that a single Cooks River Catchment CMP be developed lead by the existing CRA utilising the established CRA catchment advisory committee consulting and engagement with other stakeholders where needed.

The advantages of developing a Cooks River Catchment CMP in summary are:

- utilising existing governance structures available within the catchment (CRA and the catchment advisory committee);
- the CMP would be the vehicle for co-ordinated and strategic management of the Cooks River catchment and providing an opportunity to set the key objectives and management and action priorities to support the implementation of the Cooks River People's Plan, 2018-2021 as well as the GSC Eastern City and South District Plans;
- significant savings due to economies of scale particularly via;
- Stage 2 investigations that cover all areas (e.g. tidal inundation, wetland hydrology and the water quality models likely use the same underlying model framework;
- Stage 3 and risk assessment and options studies to manage common threats;
- Stage 5 implementation where consistent actions can be rolled out across the catchment or an LGA scale;
- enhanced opportunity to access funds to tackle larger whole-of-system issues that could not be addressed by one or a small collective of councils/agencies alone;
- enhanced collaboration between councils, agencies key land managers and the broader catchment community;
- promotion of a consistent approach across all Councils to manage issues that are common to all areas (but local in nature); and
- provision of an opportunity for continuous catchment-based action reporting via the IP&R Framework.

8.3 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 8-3, as derived from the first-pass risk assessment, review of current management arrangements and data and information review. Readers are referred to sections 4.2 and 5.3 for detailed descriptions of the studies.

Table 8-3 also provides indicative costs for the studies, and a combined cost for undertaking the CMP stages. The table provides a timeline for completion of the studies, with a view to completing the CMP by the end of 2021 in accordance with the CM Act. It further includes an indication of who may be responsible for those actions in the context of responsibility and investment.

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

More detailed cost assessments would be required prior to progression of specific study contracts when specific management questions are defined, and refined definition of study deliverables is determined through a more detailed understating of knowledge state from past investigation.

The table further includes a recommendation that a 1.0 EFT CRA Project Manager be engaged to facilitate development of the CMP. Activities to include management and engagement of the Catchment Advisory Group, consultants and undertaken necessary project promotion and community consultation. A cost estimate including on-cost of $80,000 to $120,000 is suggested (NB this cost is included in the overall CMP development costing as final determination of CMP facilitation will need to be resolved by the CRA in consultation with their members).

Table 8-3 Forward Plan, Indicative Costs, Timeline and Responsibility for Preparation of the CMP

Item	Recommended Studies / Components	Priority	Timing*	Cost (Low)	Cost (High)	Responsible
	Stages 2 to 4: CMP Project management and implementation of engagement strategy					
	CMP project management					
1.01	1.0 EFT for CRA Project Manager to facilitate development of CMP including management and engagement of consultant, Catchment Advisory Group, project promotion and community consultation	High	*Per annum*	$80,000	$120,000	CRA / ESS
	Community and stakeholder engagement strategy					
1.02	Ongoing internal and external engagement activities including surveys, fact sheets, information sessions, workshops, presentations, meetings and so on.	High	*Per annum*	$15,000	$25,000	Councils
	CMP Project management and engagement strategy implementation	***Sub-total***	***Years 1-4***	***$285,000***	***$580,000***	
	Stage 2: Risks, Vulnerabilities and Opportunities					
I1	**Biodiversity degradation and habitat disturbance**					
2.01	Strategy development study for coastal river health monitoring, reporting and improvement	High	Immediate	$25,000	$35,000	Councils, ESS, Sydney Water
2.02	Site specific condition assessment, resilience and threat assessment for coastal wetlands area (CWA)	High	Immediate	$15,000	$25,000	Councils, State Agencies, DPIE
2.03	Riparian and terrestrial ecology assessment and strategy development	High	Immediate	$40,000	$50,000	Councils, ESS
2.04	Determine (map) additional areas to be added to the coastal wetlands area (CWA)	High	Medium	$10,000	$20,000	Councils, DPIE
2.05	Studies into biodiversity of intertidal and fringing habitats	Medium	Medium	$15,000	$25,000	Councils, State Agencies, DPIE, Sydney Water, Crown Lands
2.06	Studies of non-indigenous species	Medium	Medium	$20,000	$30,000	Councils
2.07	Seagrass threat assessment	Low	Future	$15,000	$25,000	Councils, DPIE, State Agencies
I2	**Land use intensification**					
2.08	Socioeconomic profiling study	Medium	Medium	$20,000	$30,000	Councils, DPIE, GSC
I3	**Stormwater, flooding and sediment management**					
2.09	Flood, coastal and tidal inundation assessment (joint probability analysis)	High	Immediate	$70,000	$100,000	Councils, State Agencies, , Sydney Water, DPIE,
2.10	Assessment (i.e. hydraulic modelling) of floodplains, river and estuary banks, and wetlands flows – including structures	High	Immediate	$20,000	$40,000	Councils, ESS, Crown Lands, DPIE, Sydney Water
2.11	Flood, coastal and tidal inundation damages and risk assessment	High	Medium	$20,000	$40,000	Councils, State Agencies, Sydney Water, DPIE,
2.12	Sub-catchment assessment and high-level planning	High	Medium	$30,000	$40,000	Councils, ESS, Sydney Water
I4	**Water quality**					
2.13	Integrated catchment-wide water quality modelling assessment	High	Immediate	$80,000	$150,000	Councils, Sydney Water, State Agencies
2.14	Review of groundwater resources and impacts	High	Immediate	$60,000	$80,000	State Agencies, DPIE, Sydney Water
I5	**Industrial activities**					
2.15	Contamination studies	High	Immediate	$40,000	$60,000	Councils, EPA
2.16	Stormwater outlets, sewer overflow and industrial discharges audit	Medium	Medium	$10,000	$20,000	Councils, Sydney Water, NSW Ports
I6	**Climate change, sea level rise and coastal hazards**					
2.17	Review of coastal hazard assessment parameters	High	Immediate	$5,000	$10,000	Councils, State Agencies DPIE, Sydney Water, State Agencies
2.18	Condition assessment of riverine and coastal protection structures (including steel sheet piling)	High	Immediate	$20,000	$40,000	Councils, State Agencies, Sydney Water
2.19	River bank and beach erosion assessment	Low	Medium	$20,000	$30,000	Councils, State Agencies, Sydney Water, DPI
2.20	Slope instability assessment	Low	Medium	$20,000	$30,000	Councils, State Agencies, Sydney Water
2.21	Prepare coastal vulnerability area mapping	High	Medium	$5,000	$10,000	Councils, ESS, DPE
2.22	Climate change adaptation strategy	Medium	Medium	$30,000	$40,000	Councils, State Agencies, Sydney Water, DPIE,

Item	Recommended Studies / Components	Priority	Timing*	Cost (Low)	Cost (High)	Responsible
2.23	Bank and beach shoreline recession assessment (probabilistic)	Low	Future	$30,000	$40,000	Councils, State Agencies, Sydney Water, DPIE
I7	**Aboriginal and cultural heritage degradation**					
2.24	Review of Aboriginal and heritage sites register and documentation	High	Immediate	$5,000	$15,000	NPWS, State Agencies, Councils, LALCs
2.25	Aboriginal and heritage sites vulnerability assessment	Medium	Medium	$5,000	$15,000	NPWS, State Agencies, Councils, LALCs
I8	**Governance and compliance**					
2.26	Detailed mapping of ownership and management responsibility of riverine and coastal areas	High	Immediate	$20,000	$30,000	Councils, State Agencies, Sydney Water
I9	**Resource use conflict, access availability and public safety**					
2.27	Review, survey and develop register of river bank and foreshore access assets and uses	Medium	Medium	$20,000	$40,000	Councils, Crown Lands, Sydney Water, State Agencies
I10	**Recreation and tourism**					
2.28	Recreation and swimming policy study	Low	Future	$10,000	$15,000	Councils, State Agencies, Sydney Water
I11	**Shipping**					
2.29	Review commercial vessels information	Low	Future	$5,000	$10,000	Ports Authority, State Agencies
2.30	Oil spill risk assessment and review emergency plans	Low	Future	$10,000	$20,000	Ports Authority, State Agencies, EPA
I12	**Fishing**					
2.31	Recreational fishing surveys and investigations	Low	Future	$5,000	$10,000	DPIE, Councils
	Stage 2	***Sub-total***	***Years 1-2***	***$700,000***	***$1,125,000***	
	Stage 3: Identify and Evaluate Options					
3.01	Full-Scale Risk Assessment (*optionally to be completed in Stage 2*)	High	Medium	$35,000	$60,000	Councils, State Agencies, Utilities, Community and User Groups
3.02	Identify and Evaluate Potential Management Options: • tier 1 – identify potential management options • tier 2 – multi-criteria analysis (mca) of options • tier 3 – cost benefit analysis (cba) of options	High	Medium	$250,000	$500,000	Councils, State Agencies, Utilities, Community and User Groups
3.03	Prepare Planning Proposal (*optionally to be completed in Stage 4*)	High	Medium	$15,000	$25,000	Councils and Key Stakeholders
	Stage 3	***Sub-total***	***Years 2-3***	***$300,000***	***$585,000***	
	Stage 4: Prepare, Exhibit, Finalise, Certify and Adopt the Coastal Management Program					
4.01	Prepare CMP 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 • supporting documentation	High	Future	$40,000	$60,000	Councils, State Agencies
4.02	Business Plan for CMP Implementation	High	Medium	$30,000	$50,000	Councils and Key Stakeholders
4.03	Community and Stakeholder Engagement and input to Draft CMP	High	Future	$10,000	$15,000	Councils
4.04	Public Exhibition of CMP	High	Future	$5,000	$10,000	Councils, State Agencies
4.05	Planning Proposal Exhibition and Amendment *(optionally to be completed in Stage 5)*	High	Medium	$5,000	$10,000	Councils, DPIE
4.06	Finalising the CMP	High	Future	$5,000	$10,000	Councils, State Agencies
	Stage 4	***Sub-total***	***Years 3-4***	***$95,000***	***$155,000***	
	CMP Planning and Preparation Cost	**Total**	**3-4 years**	**$1,400,000**	**$2,500,000**	

**Indicative Timing: Immediate = years 1-2; Medium = years 2-3; and Future = years 3-4+*

References List

.id (2019). Cooks River Catchment. Australia: Prepared for Cooks River Alliance. https://profile.id.com.au/canterbury-bankstown/signin

Alluvium (2015). Cooks River Improvement Plan: Physical Profile Final. Prepared by Alluvium Consulting Australia for Sydney Water, September 2015.

Australian Business Roundtable for Disaster Resilience and Safer Communities (November 2017).

BMT (2013) Botany Bay Western Foreshore Coastal Hazard Risk Assessment & Management Options Study. Prepared for Rockdale City Council.

Cooks River Alliance (2017). Cooks River Ecological Health Report Card 2016-2017.

Cooks River Alliance (2014). Cooks River Annual Report 2014.

Ecological Australia (2010) Cooks River estuarine vegetation management plan. Prepared for City of Canterbury, Marrickville and Rockdale Councils on behalf of the Cooks River Foreshores Working Group.

Hanslow et al (2019). *Rising Tides: Tidal Inundation in South East Australian Estuaries*, NSW Coastal Conference 2019.

Irish, P (2017) Aboriginal History Along the Cooks River.

Lawson & Treloar (2003) Proposed Expansion of Container Port Facilities in Botany Bay, NSW – Coastal Processes and Water Resources Issues: Volume 3 Waves, Currents and Coastal Process Investigations. Prepared for Sydney Ports Corporation.

MWH-PB (2009) Cooks River Flood Study. Prepared for Sydney Water Corporation.

National Parks and Wildlife Service (2004) Endangered Ecological Community Information: Cooks River/Castlereagh Ironbark Forest.

OEH (2019) Sydney Beaches Water Sampling Sites. Accessed from [https://www.environment.nsw.gov.au/topics/water/beaches/sydney-beaches/sampling-sites]

Orica Limited (2019) Environmental Monitoring. Accessed from: [https://www.orica.com/Locations/Asia-Pacific/Australia/Botany/Botany-Transformation-Projects/Groundwater-Cleanup/environmental-monitoring]

PPK Environment & Infrastructure Pty Ltd and Webb, McKeown & Associates Pty Ltd (1999). Cooks River Stormwater Management Plan. Prepared for Cooks River Catchment Association of Councils.

Preston, B.L., et al (2008) Mapping Climate Change Vulnerability in the Sydney Coastal Councils Group. Prepared for the Sydney Coastal Councils Group.

SCCG & CSIRO (2012) Mapping & Responding to Coastal Inundation.

Sydney Metropolitan Catchment Management Authority (2011), Botany Bay & Catchment Water Quality Improvement Plan.

Sydney Water (2017) Case Study: Cooks River Naturalisation.

Sydney Water (2018) Plan of Management: Botany Wetlands 2018 - 2028.

List of Appendices

Appendix A Cooks River Catchment CMP Community and Stakeholder Engagement Strategy

- this appendix provides the Community and Stakeholder Engagement Strategy for the CMP, prepared as part of the Scoping Study in consultation with the CRA.

Appendix B Overarching NSW Coastal Management Framework

- this appendix provides details of the CMP Visioning process undertaken as part of the workshop held, including background and guidance materials utilised and the raw data
- collected at the workshop session.
- the above informed the preparation of a purpose, vison and objectives statement for the Cooks River Catchment CMP (in consultation with CRA).

Appendix C CMP Visioning – Stakeholder Workshop

- this appendix provides details of the CMP Visioning process undertaken as part of the workshop held on 31 July 2018 including background and guidance materials utilised and the workshop raw data collected.
- the above informed the preparation of a purpose, vison and objectives statement for the Cooks River Catchment CMP (in consultation with CRA).

Appendix D Background Information Review

- this appendix summarises background information review completed in this study, in a table format.
- responses to the data availability survey are also collated in this appendix.

Appendix E Governance, Policy and Legislation Additional Information

- this appendix provides additional information relevant to Governance, Policy and Legislation, including:
- a tabled review of governance, roles and responsibilities around the Cooks River catchment;
- a review of Legislation relevant to CMP preparation in NSW; and
- a tabled review of relevant Legislation and Policy.

Appendix F Identifying the Geographic Scope to be Covered

- this appendix details the process and options considered when defining the area to be covered by the Cooks River Catchment CMP.

Appendix G Coastal Hazards Data Availability Review

- this appendix provides details of the Coastal Hazards as defined within the NSW Coastal Management Framework and the data sheets used as part of the First-Pass Risk Assessment workshop to collate known available information in relation to these hazards by stakeholders.

- stakeholders not present at the workshop were also requested to complete this information.

Appendix H First-Pass Risk Assessment Input

- this appendix introduces the First-Pass Risk Assessment process and the raw workshop data sheets.
- this work includes some additional BMT input to fill gaps and provide additional information.

Appendix I Areas for Potential Amendment to Coastal Wetlands and Littoral Rainforest Area CM SEPP Mapping

- this appendix provides a list of areas identified for potential amendment to the CM SEPP mapping.

Appendix A Cooks River Catchment CMP Community and Stakeholder Engagement Strategy

Introduction

Project context

A Coastal Management Programs (CMP) that encompasses Cooks River catchment is being prepared to provide a whole-of-system, integrated and strategic planning approach that addresses current needs (both local, regional and system-wide scale) and plan for future challenges (including population growth and climate change). The CMP will be completed over five-stages, as outlined in Figure A-1.

This Community and Stakeholder Engagement Strategy ('Engagement Strategy') has been prepared in accordance with the Manual and in parallel with the CMP Stage 1 Scoping Study completed for the Cooks River catchment.

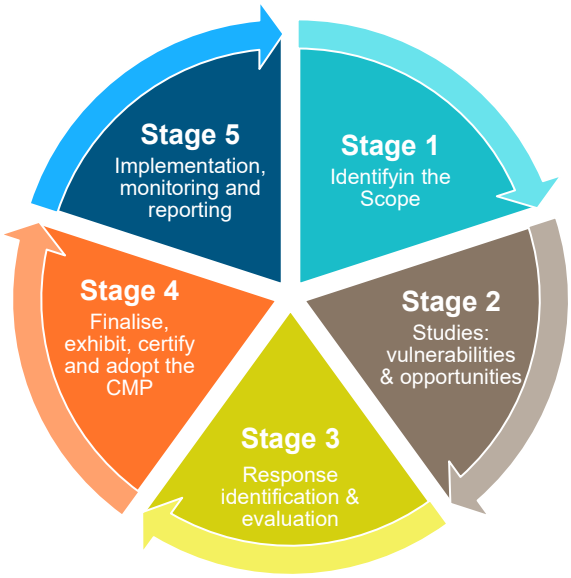


Figure A-1 Five Stage Process for Preparing a Coastal Management Program

This engagement strategy

This document 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 a Cooks River Catchment CMP. This Engagement Strategy is focussed on the development of the CMP (Stage 1 to 4) and will need to be revised once the CMP is certified and implemented. Effective, ongoing and meaningfully resources engagement is needed to ensure the success of the CMP.

Engagement purpose, objectives and requirements

The **overarching purposes of this Engagement Strategy** is to:

- highlight the need for a Cooks River Catchment CMP, how it adds value to what has been done and what will be done by individual councils and state agencies within the catchment;
- assist Cooks River Alliance (CRA) and council staff to gain internal buy-in for undertaking a CMP;
- de-risk the CMP process by bringing stakeholders and community on board;
- provide an overarching engagement approach that is adaptive and flexible, and can be modified/refined throughout the remaining CMP stages; and
- facilitate meaningful exchange of information.

In addition, the **specific aim of this Engagement Strategy** is to:

- outline who, how, what and when of engagement within the CMP planning and implementation process, underpinned by the International Association for Public Participation (IAP2) engagement spectrum.

Project Stakeholders and Communities

Key stakeholder and community groups that should be engagement with and afforded the opportunity to provide input into the development of the Cooks River Catchment CMP include the following:

- cooks River catchment councils, including Cooks River Alliance council partners;
- regional councils (including relevant Georges River and Sydney Harbour catchment councils, and those within the Botany Bay – Port Hacking sediment compartment);
- NSW government agencies / authorities;
- business and industry;
- research and education;
- Aboriginal organisations;
- community organisations, interest and user groups; and
- catchment communities.

A breakdown of the stakeholder and community groups are provided in Table A-1, with suggested level of engagement as outlined in IAP2 for each outlined in Table A-5.

Table A-1 Key Stakeholders

Interested Sectors	Key Stakeholder / Organisation	
Catchment Councils (including Cooks River Alliance partner councils*)	• Bayside* • Burwood • City of Sydney • Canterbury–Bankstown* • Cumberland (minor only)	• Georges River • Inner West* • Randwick (minor only) • Strathfield* **CRA members*
Internal Council Stakeholders (Catchment Councils)	• Councillors • Executive management team • Council departments: - Governance and Finance - Planning and development - Assets and infrastructure - Natural resource management and Heritage - Community services	
Regional Councils (i.e. Botany Bay catchment councils, not listed prior)	• Blacktown • Campbelltown • Fairfield	• Liverpool • Parramatta • Sutherland Shire
State government agencies / Organisations	• Department of Planning, Industry and Environment (DPIE) • Department of Primary Industries (DPI) • Greater Sydney Commission	• Sydney Water • Greater Sydney Local Land Services • DPIE - National Parks and Wildlife Service • Environment Protection Authority • Port Authority NSW • Transport for NSW
Federal agencies	• Australian Maritime and Safety Authority • Department of Environment and Energy	• Department of Agriculture • Department of Infrastructure, Regional Development and Cities
Business and Industry	• NSW Ports • Sydney Airport • Sydney Trains • Caltex	• ARTC • Pacific Freight • Business Chambers • Local Businesses
Research and Education	• Universities (e.g. University of NSW, University of Sydney, University of Technology	• Western Sydney University, CRC for WSC • Other research organisations (e.g. SIMS)

Interested Sectors	Key Stakeholder / Organisation	
Aboriginal Organisations	• Metropolitan LALC • La Perouse LALC	• Gandangara LALC • ATSI Reference Groups
Community Organisations **CRA Listed Groups:** http://cooksriver.org.au/community-groups/	• Bankstown Bushland Society • Bushcare Groups • Cooks River Mudcrabs Community Eco Group • Cooks River to Iron Cove Greenway • Cooks River Valley Association	• Inner West Council Environmental Services Residential and community • Sporting and special interest groups • Wolli Creek Preservations Society
Individuals	• Landowners • Volunteers	• Community members • Visitors

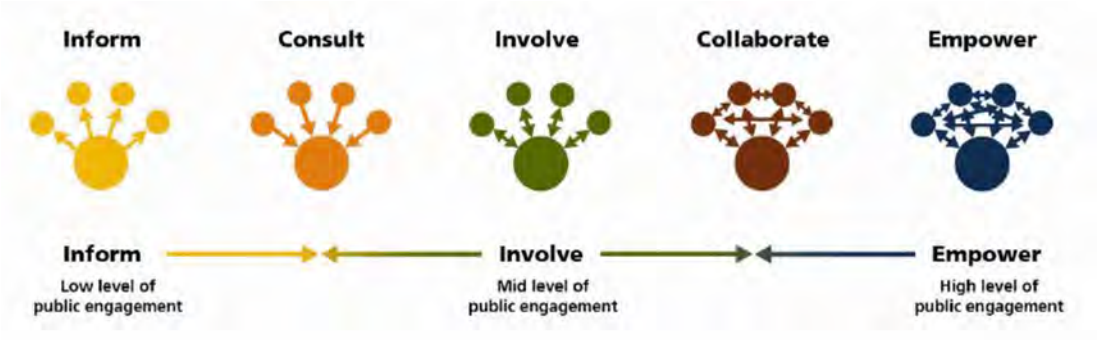


Figure A-2 IAP2's Public Participation Spectrum

Table A-2 Stakeholder Analysis

Sector	Stakeholder / Organisation	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5
Councils	Catchment Council	Empower	Empower	Empower	Empower	Empower
	Regional Councils	Inform	Inform	Consult	Consult	Consult / Collaborate
Stage Agencies	ESS	Involve / Collaborate	Involve / Collaborate	Involve / Collaborate	Involve / Collaborate	Involve / Collaborate
	DPIE	Involve	Consult / Involve	Consult / Involve	Consult / Empower	Involve / Collaborate
	LLS	Involve	Involve	Involve	Involve	Involve
	NPWS	Involve	Inform	Involve	Involve	Involve
	EPA	Consult	Inform	Involve	Involve	Involve
	Port Authority NSW	Consult	Involve / Collaborate	Involve	Involve / Collaborate	Involve / Collaborate

Sector	Stakeholder / Organisation	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5
	Sydney Water	Consult	Involve / Collaborate	Involve / Collaborate	Involve / Collaborate	Involve / Collaborate
	Transport NSW	Consult	Involve / Collaborate	Involve / Collaborate	Involve / Collaborate	Involve / Collaborate
	GSC	Consult	Consult / Involve	Consult / Involve	Consult / Involve	Consult / Involve
Federal Agencies	See table A-1	Inform	Inform	Consult	Consult	Consult / Involve
Business and Industry	NSW Ports	Inform / consult	Consult / Involve / Collaborate	Consult / Involve / Collaborate	Consult / Involve	Consult / Involve
	Sydney Airport	Inform / consult	Consult / Involve / Collaborate	Consult / Involve / Collaborate	Consult / Involve	Consult / Involve
	Sydney Trains	Inform	Consult / Involve	Consult / Involve / Collaborate	Consult / Involve	Consult / Involve
	Business Chambers	Inform	Consult / Involve	Consult / Involve / Collaborate	Consult / Involve	Consult / Involve
	Local Businesses	Inform	Consult / Involve	Consult / Involve / Collaborate	Consult / Involve	Consult / Involve
Research	UNSW / UoW / SIMS	Involve / Consult	Involve / Consult	Involve / Consult	Consult	-
Aboriginal Organisations	LALCs, ATSI reference group(s)	Involve	Involve / Consult	Involve / Consult	Involve / Consult	Involve / Empower
Community Organisations	Various	Inform	Consult	Involve	Involve / Consult	Inform / Involve / collaborate
Individuals	Various	Inform	Consult	Involve	Involve / consult	Inform / Involve / collaborate

Engagement Tools

A wide range of tools could be used to ensure people are aware of opportunities to be informed of, and have input to, the CMP as it progresses. These include:

- CMP project webpage on Cooks River Alliance website;
- social media (e.g. Facebook);
- media release(s);

- fact sheets;
- meetings and briefings;
- targeted workshops;
- working groups;
- information drop-in sessions;
- online surveys;
- letters to community / CMP collaborators; and
- speaking engagements and presentations.

Key Messages

General Messages

Key messages (benefits) of the Cooks River Catchment CMP that apply to most target groups are:

- the NSW government supports the development of Coastal Management Plans (CMPs) for coastal and estuarine systems by local councils to achieve the objectives of the Coastal Management Act (2016).
- CMPs provide a framework for integrated coastal and catchment management. The Cooks River Catchment CMP is being developed by the Cooks River Alliance, which has representation from catchment Councils.
- Development of the Cooks River Catchment CMP will help ensure the Cooks River waterways and catchment environment is managed in a strategic and ecologically sustainable manner.
- the Cooks River Catchment CMP will ensure its social, cultural, economic and environmental values are maintained or enhanced.
- the CMP will establish clear objectives and direction for managing the Cooks River coastal zone.
- the CMP will provide the basis for securing state government funding to implement strategy that is being developed in consultation with the community.

Key Messages by CMP Stage

Key messages that may be outlined when explaining the five stage CMP process are provided in Table A-3.

Table A-3 Key Messages: CMP Process

CMP Stage	Key Messages
Stage 1 - Scoping Study	• Stage 1 of a CMP involves identifying the scope of a CMP and outlining the forward plan for its development • The goal of this stage is to determine the context, purpose and scope of a CMP, and initiate engagement and buy-in
Stage 2 - Studies of Opportunities and Vulnerabilities	• Stage 2 of a CMP involves determining the risk, vulnerabilities and opportunities associated with the CMP study area coastal zone • the goal of this stage is to undertake studies to provide information to support evidenced based decision-making in later stages of the CMP planning process
Stage 3 – Response Identification and Evaluation	• Stage 3 of a CMP involves identifying and evaluating the coastal management options, to improve environmental, social and economic benefit of the coastal zone and marine estate • the goal of this stage is to identify preferred coastal management actions in consultation with stakeholders and the community, that addresses issues in an integrated and strategic manner
Stage 4 – Finalise, Exhibit, Certify, Adopt the CMP	• Stage 4 of a CMP involves preparing, exhibiting, finalising, certifying and adopting the CMP • The goal of this stage is to finalise a CMP that achieved certification from the Minister
Stage 5 – Implementation, Monitor, Reporting	• Stage 5 of a CMP involves implementation of the CMP and monitoring and reporting on its outcomes • the goal of this stage is to implement actions within the CMP and monitor the effectiveness of the plan

CMP Engagement Strategy

The strategy for engagement with Cooks River catchment stakeholders and the community is provided herein. Direction in relation to the 'who', 'how', 'what' and 'when' of engagement at each stage of the CMP is outlined in Table A-4 to Table A-8.

A description of engagement requirements for submitting a planning proposal to amend the CM SEPP coastal management area mapping is also provided, along with guidance on celebrating achievements and successes with internal/external stakeholders.

Stage 1 – Identify the scope of a CMP

Table A-4 Stage 1 Engagement Strategy

CMP STAGE 1 – IDENTIFY THE SCOPE		
Community/stakeholders Bring all interested parties on board early to share information and ideas (before decisions are made).	**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.	**Timing** 2018 – 2019
Level of Engagement		
Inform, consult, involve		
Level of Influence		
Council retains decision-making about the scope of subsequent stages and will incorporate community input.		
Outcomes sought		
• stakeholders / community understand how to be involved • establish working relationships built on trust / respect • understand community goals, aspirations, values & priorities • understand community motivations to participate in planning and implementation	• help community understand dynamic nature of coastal processes & the need to set long-term objectives • increase community understanding of the new legislative and planning framework • determine the engagement activities for next CMP stages	
Target Audience		
• Cooks River Alliance • internal council stakeholders	• NSW government agencies / authorities • community and interest groups • relevant federal agencies	
CMP Engagement Tools / Activities		
• project webpage (CRA website) • internal CRA meetings • community drop-in sessions • risk screening workshop	• visioning workshop • prepare this Engagement Strategy • Stage 1 presentation to CRA	
Planning Proposal Engagement Activities / Considerations		
• internal (CRA / council) stakeholders to discuss & determine need for coastal management area amendment(s) to CM SEPP		

Stage 2 – Determine risks, vulnerabilities and opportunities

Table A-5 Stage 2 Engagement Strategy

CMP STAGE 2 – RISKS, VULNERBILITIES, OPPORTUNTIES		
Community/stakeholders Empower community and stakeholders with knowledge to contribute to decisions in subsequent stages. Share information equitably among stakeholders.	**CMP content** Explore risks, vulnerabilities and opportunities of coastal management. Explore different perspectives on coastal risk management.	**Timing** 2020
Level of Engagement		
Inform, consult, involve		
Level of Influence		
Council retains decision-making. Community and stakeholders may contribute to detailed studies on issues of concern and participate in risk assessment and evaluation.		
Outcomes sought		
• 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	
target audience		
• Cooks River Alliance • internal council stakeholders • NSW government agencies / authorities • business and industry stakeholders	• research and education organisations • community organisations, interest and user groups • catchment communities • relevant Federal agencies	
CMP Engagement Tools / Activities		
• update project webpage (CRA website) • internal CRA meetings • community drop-in sessions • online surveys • working group meetings / workshop (if established)	• expert panel workshop (processes, hazards, estuary health) • detailed risk assessment workshops • working group(s) for sub-catchment engagement using for example the *Risk-based Framework for Considering Waterway Health Outcomes in Strategic Land-use Planning Decisions* (NSW OEH and EPA, 2017) • Stage 2 presentation to CRA • update Engagement Strategy	
Planning Proposal Engagement Activities / Considerations		
• no engagement requirement at this CMP stage	• good to highlight technical background for coastal management areas update need to council and community, based on outcomes of Stage 2 studies (e.g. Stage 2 presentation, CRA webpage)	

Stage 3 – Identify and evaluate options

Table A-6 Stage 3 Engagement Strategy

CMP STAGE 3 – IDENTIFY, EVALUATE OPTIONS		
Community/stakeholders Share the decision-making dilemma. Establish a process that will be used to choose between options, incorporating community preferences and criteria.	**CMP content** Identify and evaluate opportunities to address coastal risks for relevant coastal management areas, consistent with management objectives.	**Timing** 2020 – 2021
Level of Engagement		
Inform, involve, collaborate		
Level of Influence		
Council, stakeholders and community collaborate to identify the full range of potential responses to manage coastal vulnerabilities and to evaluate options.		
Outcomes sought		
• 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	
Target Audience		
• Cooks River Alliance • internal council stakeholders • regional councils • NSW government agencies / authorities	• business and industry • Aboriginal organisations • community organisation and interest groups • catchment communities • relevant Federal agencies	
CMP Engagement Tools / Activities		
• update project webpage (CRA website) • internal CRA meetings • working group meetings / workshop (if established) • management options workshop • community drop-in sessions • brochure	• online survey (management options) • external project partner meetings (e.g. state authorities, businesses) • Stage 3 presentation to CRA • update Engagement Strategy	
Planning Proposal Activities / Considerations		
• prepare planning proposal in consultation with councils (Gateway Stage 1) • seek advice from Minister / DPIE (Gateway Stage 2)	*see Table A-9 for details*	

Stage 4 – Prepare, exhibit, finalise, certify and adopt the CMP

Table A-7 Stage 4 Engagement Strategy

CMP STAGE 4 – EXHIBIT, FINALISE, CERTIFY CMP		
Community/stakeholders Gain community confidence and support for decisions that are in the documented CMP.	**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.	**Timing** 2021 – 2022
Level of Engagement		
Inform, consult, involve		
Level of Influence		
Council retains decision-making about the CMP. Community involvement and feedback refine actions in the CMP to address risks considered unacceptable by the community		
Outcomes sought		
• 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	
Target Audience		
• all project partners (internal council stakeholders, public authorities, businesses)	• all external stakeholder groups and catchment communities	
CMP Engagement Tools / Activities		
• update project webpage (CRA website) • internal CRA meetings • implementation and operations workshop • external project partner meetings (e.g. state authorities, businesses) • public exhibition of CMP (min. 28 days) • community drop-in sessions	• brochure • online surveys / maps • Stage 4 presentation to CRA • Council adoption of CMP (council meetings) • CMP submission to the Minister for Certification • media release (CMP certification notification) • update Engagement Strategy	
Planning Proposal Activities / Considerations		
• consult with community during exhibition period (Gateway Stage 4) • consult internally with council, where updated required (Gateway Stage 4)	• submit to DPIE / Minister for approval (Gateway Stage 5) • *see Table A-9 for details*	

Stage 5 – Implement, monitor, evaluate and report

Table A-8 Stage 5 Engagement Strategy

CMP STAGE 5 – IMPLEMENT, MONITOR, EVALUATE CMP		
Community/stakeholders Maintain community support for a commitment to the CMP, especially among those directly involved in, or impacted by the implementation.	**CMP content** Active community participation in implementation of CMP actions, and in monitoring and review of CMP implementation.	**Timing** 2022 ongoing (5 – 10 year timeframe)
Level of Engagement		
Inform, involve, collaborate		
Level of Influence		
Council retains decision-making but will look to the community for advice, innovation and resources to improve implementation of the CMP actions.		
Outcomes sought		
• 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	
Target Audience		
• all project partners (internal council stakeholders, public authorities, businesses)	• all external stakeholder groups and catchment communities	
CMP Engagement Tools / Activities		
• update project webpage (CRA website) • internal CRA meetings • action implementation and monitoring activities (TBC)	• IP&R evaluation and reporting engagement activities (TBC) • CMP review engagement activities (TBC) • update Engagement Strategy	
Planning Proposal Engagement Activities / Considerations		
• *no engagement required*		

Planning Proposal Engagement Process / Requirements (CM SEPP Mapping Updates)

Cooks River Alliance and member councils may seek to amend / create maps of coastal management areas (such as amendments to the Coastal Wetlands Area (CWA) and creating the Coastal Vulnerability Area (CVA) under the CM SEPP through the preparation of a planning proposal(s). Planning proposals are assessed by the Department of Planning, Industry and Environment through the 'Gateway' process. There are some 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 this CMP are outlined in the Table A-9 below.

Table A-9 Coastal Management Area Mapping

CM SEPP Planning Proposal Activities	
Step 1 in Gateway process: Planning Proposal *Undertake technical studies, determine mapping amendments, prepare the planning proposal.* Consult with internal CRA / catchment council stakeholders in the preparation of a planning proposal, through meetings and workshops (CMP Stage 1, 3). Planning proposal to be adopted internally at council meetings (CMP Stage 3). **Step 2 in Gateway process: Gateway** *Minister (or delegate) decides if planning proposal can proceed (merit assessment), and any conditions. Conditions are compiled, and changes made if necessary.* Seek advice from the Minister (or delegate) on conditions for planning proposal (technical, engagement) (CMP Stage 3).	**Step 3 in Gateway process: Community Consultation** *Planning proposal is publicly exhibited. Submissions may request a public hearing.* Consult with community during exhibition period, through media release, info sheets/webpage, community drop in session. Planning proposal and maps to be on exhibition for 28 days (CMP Stage 4). Any required amendments to the planning proposal (& associated maps) would then need to be adopted again internally, at council meetings (CMP Stage 4). **Step 5 in Gateway process: Making of the LEP** *Minister (or delegate) approves the local environmental plan, which is then published on the legislation website* No engagement requirements for CRA / catchment councils.

Celebrating CMP Achievements / Success

Effective management of coastal and waterway environments can be challenging when competing stakeholder priorities need to be balanced and big issues such as climate change must be addressed. For this reason, it is important to celebrate successes achieved through the CMP planning and implementation process. Recognising achievements of individuals, groups/organisations and the CMP itself can also be an effective communication and engagement tool, which helps to bring community together and encourage stakeholder buy-in to the CMP.

Successes / achievements of a range of stakeholders may be celebrated, including the:

- CRA and their member councils (internal stakeholders)
- Catchment Advisory Group (external stakeholders)
- broader community (external stakeholders)

Success means different things to different stakeholders. Success may be defined in relation CMP planning, CMP implementation and CMP engagement. For example, success may be defined by:

- successful progression through CMP planning stages.
- completion of CMP background studies / initiatives (e.g. Stage 2 studies).
- achieving community engagement outcomes sought through this Engagement Strategy.
- in terms of CMP implementation, the annual review process should provide an opportunity to identify and celebrate CMP success. This may include the successful implementation of an action, or the demonstrated progress towards achieving the CMP vision and objectives.

Achievements may be recognised through various platforms / initiatives. As a starting point, the following are suggested for the development stage of the CMP (Stage 2 to 4):

- CMP planning and implementation achievements promoted on the CRA website
- annual certificates of recognition awarded to internal and external stakeholders for contributions
- promoting the commencement and / or completion of key studies and stages, through media releases and “launching” the document at a community information session, event or similar
- issuing brochures, FAQs and surveys at the start and completion of key studies and stages.

As the CMP progresses, the above listed opportunities to recognise achievement should be updated and refined, as new ideas come to light by the CRA and member councils.

Appendix B Overarching NSW Coastal Management Framework

The New NSW Coastal Management Framework

Since 2012, the state government has embarked upon a re-invigoration of the NSW Coastal Management (CM) Framework, including the open coast, estuaries, and the marine estate.

The Cooks River Catchment CMP Stage 1 Scoping Study is the first step for the CRA and Councils along this new coastal management framework. Therefore, it is worth describing recent changes to the framework.

The most important changes to the NSW coastal management process have been the:

- *Coastal Management Act 2016;*
- *State Environmental Planning Policy (Coastal Management) 2018;*
- *NSW Coastal Management Manual* (OEH, 2018), and
- *Marine Estate Management Act 2014*.

These are further outlined below.

Coastal Management Act 2016

The *Coastal Management Act 2016* was passed in the NSW Parliament in April 2016, and came into force in April 2018 once the CM SEPP was passed. The CM Act replaced the *Coastal Protection Act, 1979*. Under the CM Act, the coastal zone is now defined as comprising four coastal management areas, each with its own objectives under the Act:

- Coastal wetlands and littoral rainforests area;
- Coastal vulnerability area;
- Coastal environment area; and
- Coastal use area.

Mapping of all coastal management areas is gazetted under the CM SEPP, although no maps are currently available for the *coastal vulnerability area*. The SEPP mapping can be updated or in the case of the CVA, included via a Planning Proposal under the EPA Act. Further definition of the coastal management areas is provided below.

Under the CM Act, a coastal zone management plan will now take the form of a Coastal Management Program (CMP). The CM Act sets the minimum requirements for preparing and certifying CMPs.

Councils may seek to amend the mapping of any of these four coastal management areas via a Planning Proposal where they hold better or more up to date mapping, as part of preparing a CMP (and indeed this should be flagged at the Scoping Study stage). That is, it is not only the *coastal vulnerability area* for which amendments can be made by councils for their coastal zone.

Coastal Wetlands 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' (DPE, 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,
- promote the objectives of State policies and programs for wetlands or littoral rainforest management.

Coastal Vulnerability Area

The CM Act recognises seven coastal hazards within the NSW coastal zone. The coastal vulnerability area focusses on identifying land subject to current and future coastal hazards and ensure land use management undertaken in these areas recognise 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 thereafter 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,
  - 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.

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.

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.

State Environmental Planning Policy (Coastal Management) 2018

The *State Environmental Planning Policy (Coastal Management) 2018* (the 'CM SEPP') passed in Parliament in April 2018, which brought the CM Act into force. 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 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 is supported by maps of the coastal management areas, except the coastal vulnerability area. Under the new process for the preparation of CMPs, Council may submit a Planning Proposal (in accordance with the EPA Act) to update any of the coastal management area 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.

NSW Coastal Management Manual (2018)

The NSW Coastal Management Manual ('the Manual') was released by the EES in 2018 to guide the preparation of Coastal Management Programs (CMPs) in accordance with the CM Act. A CMP sets out the long-term strategy for co-ordinated management of land within the coastal zone, that addresses local circumstances while also meeting the state objectives. The Manual comprises three parts:

- Part A: outlines the mandatory requirements in the CM Act, and the essential elements councils are required to follow in preparing a CMP.
- Part B: describes in detail the process for preparing a CMP.
- Part C: provides a technical toolkit with advice on a range of topics.

Part B of the draft Manual outlines five stages of a CMP. The present study relates to Stage 1 (Scoping Study) of preparing a CMP for the Cooks River catchment.

Marine Estate Management Act 2014

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 is defined in the *Marine Estate Management Act 2014* (s6), as:

"(a) the coastal waters of the State within the meaning of Part 10 of the Interpretation Act 1987,

(b) estuaries (being any part of a river whose level is periodically or intermittently affected by coastal tides) up to the highest astronomical tide,

(c) lakes, lagoons and other partially enclosed bodies of water that are permanently, periodically or intermittently open to the sea,

(d) coastal wetlands (including saltmarsh, mangroves and seagrass),

(e) lands immediately adjacent to, or in the immediate proximity of, the coastal waters of the State that are subject to oceanic processes (including beaches, dunes, headlands and rock platforms),

(f) any other place or thing declared by the regulations to be the marine estate,

but does not include any place or thing declared by the regulations not to be the marine estate".

It is an object of the CM Act (s3) "to support the objectives of the *Marine Estate Management Act 2014*". In this case, and as reciprocated in the *Coastal Management Act 2016*, CMPs need to align with the *Marine Estate Management Act 2014*.

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.

Marine protected areas are part of the NSW marine estate managed to conserve marine biodiversity and support marine science, recreation and education. The NSW marine protected area system includes: six marine parks; 12 aquatic reserves; and marine and estuarine habitats within national parks and nature reserves.

Appendix C CMP Visioning – Stakeholder Workshop

Visioning Fact Sheet

Fact Sheet - Vision for the Cooks River Coastal Management Program

The direction for setting the vision for the Cooks River Coastal Management Program (CMP) is defined by **the *Coastal Management Act, 2016*:**

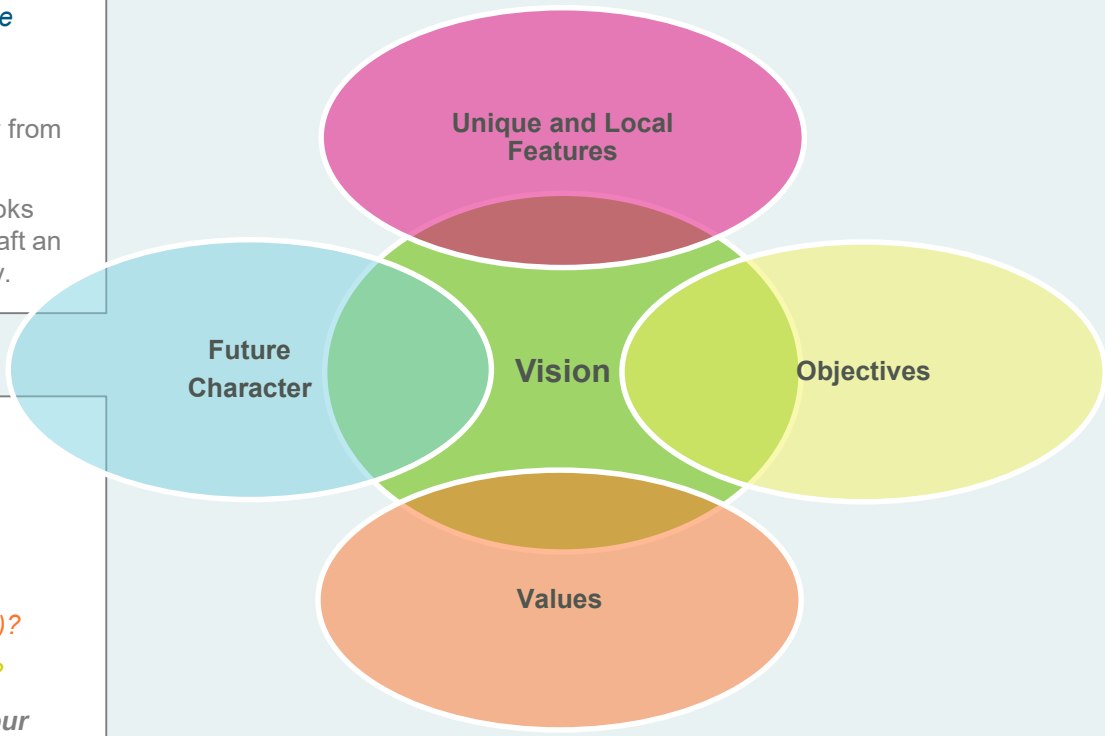
"to manage the coastal environment of [the Cooks River] in a manner consistent with the principles of ecologically sustainable development for the social, cultural and economic well-being of the people of the [River Catchment, Estuary and Coast]."

This vision statement could be updated to better reflect the unique features, local character, and future aspirations for the Cooks River from its community and land managers.

Previous community consultation, goals and objectives (via the Cooks River Alliance), plus feedback from the workshop will be used to draft an updated vision statement for the CMP, as part of the Scoping Study.

Mission Statement for the Cooks River Alliance:

"United action for a healthy Cooks River and catchment."



Points to consider in preparation for the workshop activity:

- *What is unique about the Cooks River? What are its local characteristics?*
- *What is the future you want to see for the Cooks River?*
- *What things do you value about the River (tangible or intangible)?*
- *What other objectives or ideas do you have for the CMP Vision?*

In preparing for the workshop please consult with others in your organisation about the Cooks River.

…existing Visions for the Cooks River

Previous Vision Statements for the Cooks River include:

Cooks River Catchment Management Strategy (1999)

"The Cooks River catchment will comprise a community which values and respects its natural resources and heritage, and which is guided by the principles of ecologically sustainable development in a catchment where biodiversity of both terrestrial and aquatic ecosystems is enhanced and protected."

Cooks River Stormwater Management Plan (1999)

"…a healthy natural waterway within a sustainable urban landscape that can be enjoyed for its recreational, visual and ecological values."

Cooks River Valley Association

"Safe to swim by 2020."

"Working to restore our river and connect our community." (web)

Inner West Council Community Strategy (2018)

"…We are water sensitive and rich with biodiversity. Our waterways are clean, swimmable and brimming with wildlife."

Cooks River Sustainability Initiative – Subcatchment 2050 Community Water Visions (2007-08):

Residents, council staff and other stakeholders from the six OurRiver subcatchments developed visions of what they wanted for their areas in 20 to 30 years time.

Excerpts from Vision Statements:

Ashbury Subcatchment (Ashfield and Canterbury)

"The naturally flowing Cooks River supports a thriving ecosystem..."

Eastern Channel East Subcatchment (Marrickville)

"We are leaders in sustainable practice and innovative design."

Munni Street Subcatchment (City of Sydney)

"Our community understands how water works and plays an active role in its management..."

Rookwood Road Subcatchment (Bankstown)

"Our parks and streets are safe, accessible and sustainable living spaces that connect the community and the environment."

Strathfield South Subcatchment (Strathfield)

"Industry and residents are sustainable water users who live in harmony with the environment..."

Upper Wolli Creek Subcatchment (Canterbury, Hurstville and Rockdale)

"Our catchment is planted with native vegetation and there are roadside gardens that clean stormwater..."

Further Visioning Elements

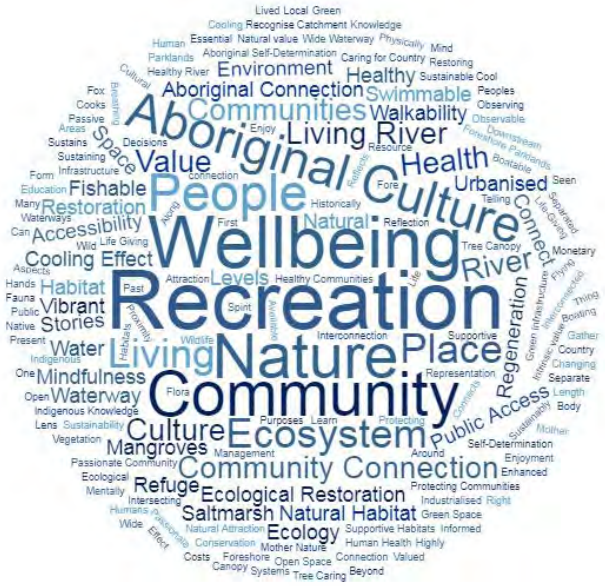
As noted above, BMT prepared, facilitated and delivered an activity to engage stakeholders on Visioning of the CMP during the First-Pass Risk Assessment Workshop (31 July 2018). The activity provided summary of previous and existing visions for the Cooks River and sought for input on:

- Unique and Local Features:
  - What is unique about the Cooks River? What are its local characteristics?
- Future Character:
  - What is the future you want to see for the Cooks River?
- Values:
  - What things do you value about the River (tangible or intangible)?
- Objectives:
  - What other objectives or ideas do you have for the CMP Vision?
- Vision:
  - Draft Vision statements for the CMP.

Further input from stakeholders that were not present at the workshop was then sought through targeted consultation. The various inputs have been collated and used to inform the development of vision and objective statements. Summaries and visual representations, in the form of word clouds are presented in the following sections.

The Visioning Fact Sheet compiled in preparation of the visioning consultation, together with a full list of input collected during the workshop and follow up contact with stakeholders and representatives is presented in Appendix C.

Values



Key Themes

- Community Wellbeing;
- Aboriginal Culture and Heritage;
- Living River Ecosystem;
- Accessibility; and
- Passive and Active Recreation.

Stakeholder Testimonials

Community Wellbeing

"A place where people can connect with nature and each other".

Aboriginal Culture and Heritage

"A living breathing river that cannot be seen as separate from Aboriginal people – one and the same thing".

Living River Ecosystem

"A living and vibrant ecosystem that sustains and connects all levels of life form".

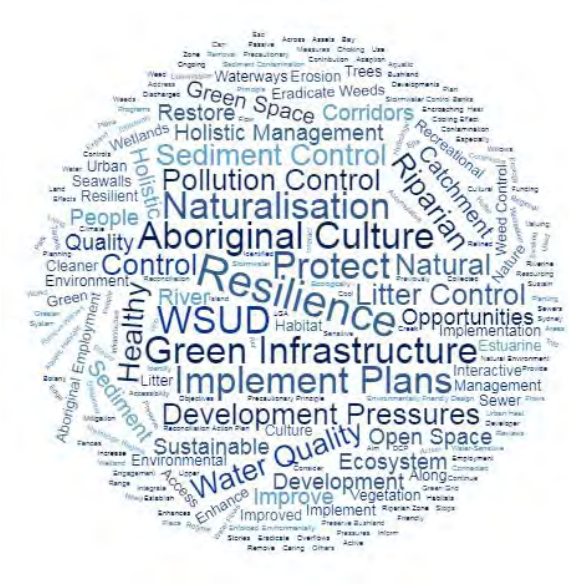
Accessibility

"Proximity and accessibility to communities along the length of the river".

Recreation

"A natural attraction for recreation purposes to a highly urbanised community".

Objectives



Key Themes

- Aboriginal Culture and Heritage;
- Pollution Control;
- Environmental Restoration;
- Sustainable Urban Development; and
- Recreational Opportunities.

Stakeholder Testimonials

Aboriginal Culture and Heritage

"The cultural stories of the river need to be told by Aboriginal people".

Pollution Control

"Protect, improve, and enhance estuarine and riparian vegetation".

Environmental Restoration

"To restore the river to a healthy and sustainable riverine ecosystem".

Sustainable Urban Development

"Water Sensitive Urban Design enforced across catchment for all developments".

Recreational Opportunities

"To provide a range of passive and active recreational uses".

Unique and Local Features

Key Themes

- Green Space;
- Green Infrastructure;
- Aboriginal Culture and Heritage; and
- Biodiversity.

Stakeholder Testimonials

Green Space

"Living example of nature surviving human interference".

Green Infrastructure

"Innovation demonstrated e.g. environmentally friendly seawalls, WSUD treatments, and wetland rehabilitation".

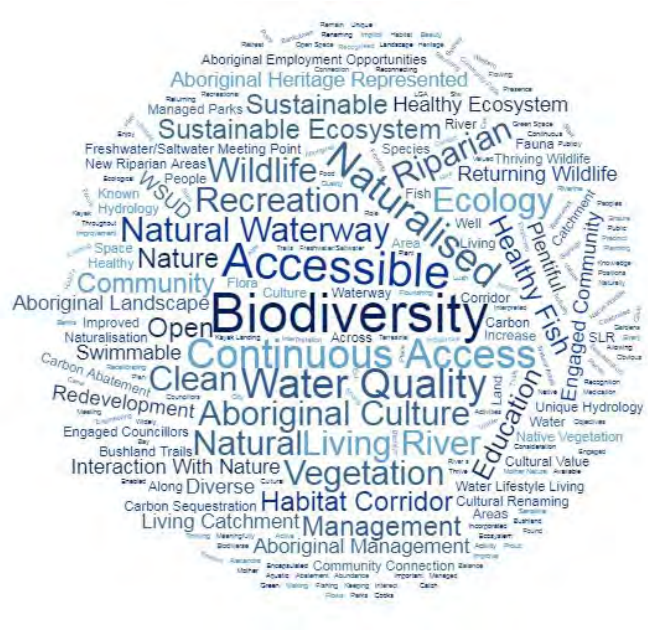
Aboriginal Culture and Heritage

"The Cooks River is a meeting place and pathway, boundaries for trade and ceremonies for the Cadigal in the North, the Bidigal in the south, the Cameragal on the Bay, and the Wangal in the west therefore all the Cooks River catchment is one Aboriginal site".

Biodiversity

"Wildlife corridor and biodiversity in urban environment".

Future Character



Key Themes

- Aboriginal Culture and Heritage;
- Naturalisation;
- Integrated Management; and
- Biodiversity.

Stakeholder Testimonials

Aboriginal Culture and Heritage

"Aboriginal culture and knowledge is more widely known and celebrated across river".

Naturalisation

"More naturalised and improved public contact to waterway for Alexandra Canal and Airport precinct".

Integrated Management

"Recreation and ecology in balance – both are important".

Biodiversity

"Biodiverse flora and fauna found throughout catchment".

Vision

Key Themes

- Connection to Natural Environment and Community;
- Resilient catchment; and
- Aboriginal Culture and Heritage.

Stakeholder Testimonials

"The river and its tributaries have Aboriginal names; the water is accessible and clean; space has been created for Aboriginal people and they are recognised; there is rich biodiversity along the river".

"To live, work and play along the Cooks River now and into the future".

"To acknowledge Aboriginal peoples' spiritual, social, customary and economic use of the coastal zone".

"The River is respected and protected by all communities".

Visioning Input

Category	Theme / Group	Key Phrase
Values	Group similar items under a few theme	One per post-it
Available to the public	Community	Accessability, Public access
Value the community connection to the river	Community	community connection, intrinsic value,
Community wellbeing: recreation, culture, nature	Community	Community wellbeing: recreation, culture, nature
Connect the community through water	Community	Community connection
Wellbeing	Community	Wellbeing
A very passionate local community	Community	community connection; passionate community
A place where people can connect with nature and each other	Community	community connection, nature
A living vibrant river that reflects caring for country	Cultural Heritage	Living River Caring for Country
Aboriginal self-determination	Cultural Heritage	Aboriginal~self-determination
Management decisions informed by Indigenous knowledge	Cultural Heritage	Indigenous~knowledge
A living and vibrant ecosystem that sustains and connects all levels of life form	Ecology	Living~River ecosystem
Supportive habitats GH flying Fox	Ecology	Natural habbitat, Supportive habitats
All levels of natural aspects of the river are enhanced	Ecology	conservation, restoration
A wild place with native vegetation and wildlife	Ecology	natural habitat
Habitat	Ecology	Habitat
Ecology	Ecology	Ecology
Ecological restoration – restoring and protecting communities	Ecology	Ecological restoration restoring and protecting communities
Mangroves, saltmarsh, tree canopy	Ecology	Mangroves, saltmarsh, tree canopy
Sustainable resource	Ecology	sustainability
Green infrastructure	Green Infrastructure	Green infrastureture
Cooling effect of the river (both mentally and physically)	Livability	Cooling~Effect
A cool space in a very urbanised and industrialised catchment	Livability	Cooling~Effect
Open space fore recreation	Recreation	open space, recreation
Cooks River foreshore parklands	Recreation	forehsore parklands
Health, walkability	Recreation	Health, walkability
Swimmable, fishable, boatable (in the right areas)	Recreation	Swimmable, fishable, boatable
Recreation	Water Flow	Recreation
Proximity and accesibility to communities along the length of the river	Public access	public access
An observbale and 'hands on' represenataion of a living river ecosystem	Healthy River	living river, ecosystem
A natural attraction for recreation purposes to a highly urbanised community	Recreational opprrtunities	Recreation, green spaces , natural~attraction
Value our waterways		waterway
A place for regeneration of mind, nature and spirit		regeneration wellbeing, mindfullness
A refuge for all - flora, fauna and humans		refuge wellbeing
A passive place of reflection		Wellbeing, mindfullness
A place to gather and enjoy		recreation, enjoyment
A place to learn		Education
a living breathing river that cannot be seen as separate from Aboriginal people- one and the same thing.		Aboriginal~connection
the environment and Aboriginal people and culture cannot be separated- it is interconnected		Aboriginal~connection
a healthy river is essential for human health and wellbeing and healthy communities		healthy~river Healthy communities, human health

recognise that historically Aboriginal people lived sustainably observing nature telling stories		Aboriginal culture
that it has many stories of Aboriginal people past and present		Aboriginal culture
interconnection of cultural peoples all intersecting in and around this life-giving, all sustaining body of water		life~giving
Mother Nature and her systems valued in first place (changing the lens to value environment above and beyond monetary costs)		Mother Nature , Natural~value
Wide waterway downstream	Water Quality	wide~waterway
Objectives		
Sewers are relined, and sewer stops being discharged to river	Controls	Pollution~Control
Engagement with Aboriginal culture	Cultural Heritage	Aboriginal ~Culture
Water flows enhances natural environment	Ecology	Water~Flows Natural~Environment
Sediment control	Ecology	Sediment~Control
More wetlands	Ecology	Wetland
Improved aquatic habitats	Ecology	Aquatic~Habitats
Protect, improve, and enhance estuarine and riparian vegetation	Ecology	Protect improve enhance Esuarine Riparian Vegetation
Eradicate weeds encroaching/ choking flow	Ecology	Eradicate~Weeds
A continuous riparian zone	Ecology	Riparian~Zone
Remove willows in catchment	Ecology	Remove~Willows
Environmentally friendly seawalls and bank works (fences disappear)	Ecology	Environmentally~Friendly~Design seawalls, naturalisation
Sediment control	Ecology	Sediment~Control
Resilient ecosystem	Ecology	Resilient Ecosystem
Improved hydrologic regime	Environmental Flows	Hydrologic~regime
A water sensitive catchment	Green Infrastructure	water-sensitive
WSUD enforced across catchment for all developments	Green Infrastructure	WSUD
Holistic management of River and Botany Bay	Integrated Management	Holistic~Management
Valuing and resourcing green infrastructure as assets: trees, habitat, corridors, waterways	Integrated Management	Green~Infrastructure, trees, habitat, corridors, waterways
To establish healthy river system for its ecosystem and peoples recreational use	Integrated Management	Healthy, ecosystem
To improve environmental resilience/ i.e urban heat island/ ecology/ improve water quality	Livability	Environmental Resillience , Urban~Heat
A cool place in an environment that's getting hotter	Livability	Cooling~Effect
Reviews and implement existing plans (funding!)	Planning Controls	Implement~Plans
To integrate objectives and implementation plans effectively into the EPA act through LEPs, DCPs, Plans of Management	Planning Controls	Implement~Plans
Implement the green grid identified by the Greater Sydney commission	Planning Controls	Green~Grid
Precautionary Principle of Ecologically Sustainable Development – to identify and improve climate adaption and mitigation measures	Planning Controls	ESD, Precautionary~Principle
Ensure the implementation programs interact with LGA Developer contribution plans (7.11 or previously 94)	Planning Controls	Implement~Plans
Aim to address ongoing accumulative development pressures to inform planning controls	Planning Controls	Development~Pressures
Litter control	Pollution	Litter~Control
Litter control	Pollution	Litter~Control
Consider sediment contamination	Pollution	Sediment~Contamination
Open interactive space in nature	Recreation	Green~Space
Connected open space corridors	Recreation	Green~Space

Stormwater is collected in the upper catchment and used to sustain it	Water Conservation/ Reuse	Stormwater~Control
Cleaner water	Water Quality	Water~Quality
Improve water quality	Water Quality	Water~Quality
Water quality targets in BBCCI	Water Quality	Water~Quality
To restore the river to a healthy and sustainable riverine ecosystem	Healthy River	Sustainable, Healthy, Ecosystem
To provide a range of passive and active recreational uses	Recreational Oppurtunities	Recreation
Preserve the natural bushland of Wolli Creek Regional Park	Natural Areas	Preserve~Bushland
Restore and and expand the natural areas		Restore
Protect from urban development and edge effects		Development~Pressures
Increase riparian planting and continue weed removal		Weed~Control
Protect the GHFF camp		
Protect from sewer overflows and erosion		Erosion, Pollution~Control
increase the naturalisation of the banks and access so that Aboriginal people (and others) living along this can have access to water.		Naturalisation, Acceessability
increase Aboriginal employment opportunities along the river and catchment by caring for land, especially for young people		Aboriginal~Employment, Oppurtunities
the cultural stories of the river need to be told by Aboriginal people		Aboriginal~Culture
Reconcilitation Action Plan		Reconcilitation~Action~Plan
Cleaner water, more wetlands, open interactive space with nature	Water Quality	Green~Space
Unique and Local Features		
Highly urbanised with dense population	Community	Dense population, urbanised
Diverse community	Community	Diverse
A river with a riparian zone that is publicly accessible	Community	Accessible, Riparian Zone
Aboriginal sites and current custodians	Cultural Heritage	Aboriginal~Culture
Classic example of ignoring concepts of caring for country	Cultural Heritage	
Indigenous heritage	Cultural Heritage	Indigenous heritage
Major and varied cultural and historical significance	Cultural Heritage	Cultural Significance, Historical Significance
A river with a riparian zone that is publicly accessible in urban environment: community, story, celebration	Cultural Heritage	Riparian Zone
Wildlife corridor in an urban environment	Ecology	Wildlife Corridor
Biodiversity in urban environment	Ecology	
Botany ponds	Ecology	Botany~Ponds
River/ eco hub / nature / wildlife in a very urban area	Ecology	
Living example of nature surviving human interference	Ecology	Human Interference
Flying fox camp	Ecology	
Wetlands particularly saline wetland	Ecology	
Large tracts of natural vegetation across the catchment	Ecology	
Tidal flow saltmarsh	Ecology	
Grey-headed flying fox and camps	Ecology	
The reach into the catchment through tributaries	Environmental Flows	
Freshwater saltwater linkage	Environmental Flows	
Link between Sydney harbour and Botany Bay	Environmental Flows	
Innovation demonstrated e.g environmentally friendly seawalls, WSUD treatments, wetland rehabilitation	Green Infrastructure	Innovation
Limited natural areas	Green Space	

It could be the leading catchment for " naturalisation" across Sydney/NSW/Australia??	Green Space	Green~Space
Green natural open space in highly urbanised environment	Green Space	Green~Space
Wolli Creek, Regional Park	Green Space	Wolli~Creek, Regional~Park
Waterway through an urban area	Livability	
Unnatural history – high level of interaction and engineering	Livability	
Much of the riparian zones of the upper catchment have been replaced by pipes and concrete channels	Livability	Urbanisation
Natural oasis in dense urban area	Livability	Natural~Oasis
PFAS contamination	Pollutrion	
Ability to walk/ride in natural areas	Recreation	
Sydney Park, boardwalk, walking	Recreation	Sydney~Park
Recognise the recreational functions around the Cooks River	Recreation	
Recreational and tourism functionality	Recreation	
Economic and tourist, airport, port	Trade Gateway	
Cup and saucer creek was named after the divots in the rock banks which are now covered by concrete		Concrete
A range of recreational facilities for different communities along the length of the river	Recreational opportunities	Recreation
A wide range of river characteristics such as natural foreshores and wetlands	Healthy river	Natural~Foreshores
Native vegetation		Native~Vegetation
Passive recreation and bush trail		
Grey-headed Flying Fox camp		
Heritage gardens and homes		Heritage~Gardens and Heritage~Homes
Saltmarsh		
Weir with Fish ladder at Turrella Reserve		Fish~Ladder, Sustainability
the Cooks river and catchment has tangible and intangible features- captured by listed sites and by stories and historical figures		Tangible~Features, Intangible~Features
The Cooks River is a meeting place and pathway, boundaries for trade and ceremonies for the Cadigal in the North, the Bidigal in the south, the Cameragal on the Bay, and the Wangal in the west therefore all the Cooks River catchment is one Aboriginal site		Meeting~Place
Scarbourough ponds has been identifed by elders as draining into Cooks River and has scar trees next to it that have not been listed		Scarbourough~Ponds
rock art at Earlwood - 1 site listed 1 not. Both on private land		Rock~Art
Sites are listed on the Aboriginal Heritage Information Management System although as site analysis has only been around since 1983 much of the area was built over prior. Sites are currnetly only found through development activity and pre site assessment.		Aboriginal~Heritage
Fatima/Pelican Island, midden sites in Kendrick park and on the other bank the firepit at Discovery point.		Aboriginal Heritage
the majority of Aboriginal people in the MLALC area live along the concreted canals of the Cooks River		Concreted~Canals
the freshwater/saltwater meeting point is an important place		Meeting~Point
due diligence standard is that within 200 metres of a riverbank it is highly likely to find evidence of Aboriginal people . Therefore the potential for future sites where the river hasn't been disturbed		

the dugong site in Alexandra canal		
The Cooks is part of Permulwuy's story (killed the gamekeeper somewhere around Marrickville golf course - significantly, first known retribution act against the invaders): Bennelong's story (he was a Wangal man) and Maroot (a Cameragal man who was the first recorded Aboriginal entrepreneur)		Permulwuy's~Story, Bennelong's~Story
No sites are insignificant - there is a footprint of Aboriginal culture, heritage		Aboriginal~Culture
It is of value even though degraded – need to set the value of the river itself in an urban context – to set development that is sensitive to this – not provide the " its degraded" so "it will be fine" justification		
Future Character		
Diverse, accessible, plentiful open space	Community	Diverse, accessible, plentiful, open space
A river the community is proud of	Community	Community~Pride
Engaged councillors and community	Community	Engaged~Community, Engaged~Councillors
Community	Community	
History and heritage (indigenous) well interpreted/ presence	Cultural Heritage	Aboriginal~Heritage~Represented
An aboriginal landscape is visible and meaningfully incorporated in planning	Cultural Heritage	Aboriginal~Landscape
Aboriginal culture – food, plant species, recognition	Cultural Heritage	Aboriginal~Culture
Aboriginal culture and knowledge is more widely known and celebrated across river	Cultural Heritage	Aboriginal~Culture
More Obvious/ implicit Aboriginal management of catchment - nature over Western engineering focus	Cultural Heritage	Aboriginal~Management,Naturalisation
Allowing space for vegetation to retreat of SLR	Ecology	Vegetation
Flourishing ecological community	Ecology	Biodiversity
Biodiverse flora and fauna found throughout catchment	Ecology	Biodiversity
Increase native vegetation and wildlife in riparian area	Ecology	Native~Vegetation, Native~Wildlife
A recognised habitat corridor	Ecology	Habitat~Corridor
Lush riparian and new riparian areas with wildlife	Ecology	New~Riparian~Areas
Wildlife is returning to the river catchment	Ecology	Returning~Wildlife
Wildlife is thriving	Ecology	Thriving~Wildlife
Biodiversity	Ecology	Biodiversity
Sustainable living catchment for its biodiversity and peoples recreational activity	Ecology/ Recreation	Recreation, Biodiversity, Living~Catchment
Naturally flowing	Environmental Flows	Natural~Waterway
A natural waterway	Environmental Flows	Natural~Waterway
Hydrology	Environmental Flows	
Unique hydrology – re: stw flows	Environmental Flows	Unique~Hydrology
Water sensitive	Green Infrastructure	WSUD
A green healthy space where people can interact with nature in the city – clean water improvement	Green Space	Green~Space, Interaction~with~Nature
Well managed parks and natural areas	Green Space	Managed~Parks, Natural~Areas
Open space	Green Space	Open~Space
Recreation and ecology in balance – both are important	Integrated Management	
Ensure the objectives of the plan are encapsulated in the redevelopment of the Sydney and Bankstown corridor	Integrated Management	Redevelopment
More naturalised and improved public contact to waterway for Alexandra Canal and Airport precinct	Recreation	Naturalised, Continuous~Access
Continuous bushland trials from start of waterway to the bay	Recreation	Bushland~Trails

Publicly accessible land fronting all waterways	Recreation	Continuous~Access
Available for active and passive recreation	Recreation	Recreation
Water lifestyle living – the area is known for the Cooks River's beauty and activities	Recreation	Water~Lifestyle~Living
To be able to fish and actually eat catch from the river	Water Quality	Fishing, Healthy~Fish
Improve water quality	Water Quality	Water~Quality
Water quality / clean water	Water Quality	Water~Quality
Clear and clean water	Water Quality	Water~Quality
Improved ecology and water quality – consideration of SLR	Water Quality	Water~Quality, Ecology, Biodiversity
Healthy and sustainable riverine ecosystem	Healthy River	Healthy~Ecosystem, Sustainable~Ecosystem
Remain a natural place		Natural
Increase biodiversity of aquatice and terrestrial species - flora and fauna		Biodiversity
A kayak landing to enjoy the waterway		Kayak~Landing
A place where fish thrive		Healthy~Fish
the freshwater/saltwater meeting point is a place of abundance		Freshwater/Saltwater~Meeting~Point
the river and catchment has living cultural values		Living~River, Cultural~Values
the community have a strong connection to the river		Community~Connection
Aboriginal people are employed in decision making positions, and in land management across the catchment		Aboriginal~Employment~Oppurtunities
there are cultural keeping places in every LGA		Cultural~Value
more cultural renaming of sites along the river		Cultural~Renaming
there is an education along the river		Education
The river is swimmable and living		Swimmable Living~River
the banks are accessible and naturalised		Accessible Naturalised
Mother Nature enabled to play her role in reuniting, reconnecting, recalibrating		Mother~Nature
Aboriginal signage and trails, interpretation, medication gardens		Aboriginal~Culture
An valued place for carbon abatement carbon sequestration		Carbon~Abatement Carbon~Sequestration
Vision		
To live, work and play along the Cooks River now and into the future		Live, Work, Play, Current, Future
Capable of supporting biodiversity and social values		Social~Values, Support
Return of the river system to pre-European settlement state	Healthy river	River~Restoration
Respect and protect the river by all communities	Community protection of river	Community Involvement
A place to come and experience the natural environment		Connection~To~Natural~Environment
A place to learn and reflect		Education Reflection
the river and its tributaries have Aboriginal names, the water is accessible and clean: space has been created for Aboriginal people and they are recognised ; there is a rich biodiveristy along the river;		Accessible Water~Quality, Aboriginal~Culture~Recognition Biodiversity
to acknowledge Aboriginal peoples' spiritual, social, customary and economic use of the coastal zone'		Aboriginal~Heritage
The Cooks River is a beautiful, prosperous and resilient catchment with thriving communities, healthy ecosystems and cherished urban landscapes supported by active water stewardship – adapted from vision and transition strategy for water sensitive greater Sydney 2018.		Resilient~Catchment Thriving~Communities Healthy~Ecosystems Cherished~Urban~Landscapes Water~Stewardship

Appendix D Background Information Review

Document and Reports Review Register

Project: N20999_Cooks_River_Catchment_CMP_Scoping_Study
Doc Register: Information collation and high-level review
Comment: *Review of relevant documents to be used to inform: Strategic Context of the CMP, Scope of the CMP, Existing Governance Arrangements, etc.*

Doc No.	Document Loc.	Full Title	Date	Author/Agency	Format	Relevance / Importance	Description	Highlights / Findings / Outcomes	Data / GIS available	Models created / utilised
001	\\bmt-ntl-fs01\wate	Marrickville Local Environmental Plan 2011	2011	Marrickville Council (now Inner West)	Planning Instrument	Review in Further Detail	The purpose of a Local Environmental Plan (LEP) is to define what purpose land may be used for and make local environmental planning provisions for land in a Local Government Area (LGA). The LEP is the primary planning instrument for a LGA.			
002	\\bmt-ntl-fs01\wate	Canterbury Local Environmental Plan 2012	2012	Canterbury Council (now Canterbury-Bankstown)	Planning Instrument	Review in Further Detail	The purpose of a Local Environmental Plan (LEP) is to define what purpose land may be used for and make local environmental planning provisions for land in a Local Government Area (LGA). The LEP is the primary planning instrument for a LGA.			
003	\\bmt-ntl-fs01\wate	Bankstown Local Environmental Plan 2015	2015	Bankstown Council (now Canterbury-Bankstown)	Planning Instrument	Review in Further Detail	The purpose of a Local Environmental Plan (LEP) is to define what purpose land may be used for and make local environmental planning provisions for land in a Local Government Area (LGA). The LEP is the primary planning instrument for a LGA.			
004	\\bmt-ntl-fs01\wate	Sydney Local Environmental Plan 2012	2012	City of Sydney	Planning Instrument	Potentially worth reviewing for specific details	The purpose of a Local Environmental Plan (LEP) is to define what purpose land may be used for and make local environmental planning provisions for land in a Local Government Area (LGA). The LEP is the primary planning instrument for a LGA.			
005	\\bmt-ntl-fs01\wate	Rockdale Local Environmental Plan 2011	2011	Rockdale Council (now Bayside)	Planning Instrument	Review in Further Detail	The purpose of a Local Environmental Plan (LEP) is to define what purpose land may be used for and make local environmental planning provisions for land in a Local Government Area (LGA). The LEP is the primary planning instrument for a LGA.			
006 (1 & 2)	\\bmt-ntl-fs01\wate	Botany Bay Local Environmental Plan 2013	2013 (and 1995)	Botany Bay Council (now Bayside)	Planning Instrument	Review in Further Detail	The purpose of a Local Environmental Plan (LEP) is to define what purpose land may be used for and make local environmental planning provisions for land in a Local Government Area (LGA). The LEP is the primary planning instrument for a LGA.			
007	\\bmt-ntl-fs01\wate	Burwood Local Environmental Plan 2012	2012	Burwood Council	Planning Instrument	Potentially worth reviewing for specific details	The purpose of a Local Environmental Plan (LEP) is to define what purpose land may be used for and make local environmental planning provisions for land in a Local Government Area (LGA). The LEP is the primary planning instrument for a LGA.			
008	\\bmt-ntl-fs01\wate	Strathfield Local Environmental Plan 2012	2012	Strathfield Council	Planning Instrument	Review in Further Detail	The purpose of a Local Environmental Plan (LEP) is to define what purpose land may be used for and make local environmental planning provisions for land in a Local Government Area (LGA). The LEP is the primary planning instrument for a LGA.			
009	\\bmt-ntl-fs01\wate	Ashfield Local Environmental Plan 2013	2013	Ashfield Council (now Inner West)	Planning Instrument	Review in Further Detail	The purpose of a Local Environmental Plan (LEP) is to define what purpose land may be used for and make local environmental planning provisions for land in a Local Government Area (LGA). The LEP is the primary planning instrument for a LGA.			
010 (1 & 2)	\\bmt-ntl-fs01\wate	Hurstville Local Environmental Plan 2012	2012 (and 1994)	Hurstville Council (now Georges River)	Planning Instrument	Review in Further Detail	The purpose of a Local Environmental Plan (LEP) is to define what purpose land may be used for and make local environmental planning provisions for land in a Local Government Area (LGA). The LEP is the primary planning instrument for a LGA.			
011	\\bmt-ntl-fs01\wate	Randwick Local Environmental Plan 2012	2012	Randwick Council	Planning Instrument	Potentially worth reviewing for specific details	The purpose of a Local Environmental Plan (LEP) is to define what purpose land may be used for and make local environmental planning provisions for land in a Local Government Area (LGA). The LEP is the primary planning instrument for a LGA.			
012	\\bmt-ntl-fs01\wate	Botany Bay & Catchment Water Quality Improvement Plan	2011	Sydney Metropolitan Catchment Management Authority	Publication, Plan of Management	Potentially worth reviewing for specific details	The main objective of the Botany Bay & Catchment Water Quality Improvement Plan (WQIP) is to set targets for pollutant load reductions (in terms of total nitrogen [TN], total phosphorus [TP] and suspended sediment [TSS]) required to protect the condition of Botany Bay, its estuaries and waterways. In addition, it is expected that the Plan will be a tool for raising awareness and promoting behaviour changes amongst individuals and organisations. It is expected that the Plan will find an audience with Local, State and Federal Government agencies as well as with interested individuals, community groups and organisations. It has been developed with considerable input from the local community and other key stakeholders in the Catchment.	To reduce the stormwater pollution loads coming from urban development to the waterways in the Botany Bay Catchment, it is recommended that all new development and/or redevelopment meet the stormwater pollution reduction targets shown below. These reduction targets can be achieved by incorporating WSUD into urban development and renewal. These stormwater reduction targets will need to be included in local and state government planning policies such as development control plans (DCPs)... The Plan explores 'best' and 'worst' case scenario options for the Catchment, in line with expected population growth (as described in the Sydney Metropolitan Strategy)... The Plan explores 31 different WSUD "treatment train" options that could feasibly meet the pollutant reductions implied by the 'best' case or preferred Plan scenario. These treatment trains are combinations of 7 basic WSUD devices: bioretention; next generation bioretention; buffers; gross pollutant traps; vegetated swales; rainwater tanks; and wetlands. The 31 WSUD options were run through the Botany Bay CAPER Decision Support System (DSS) that was developed specifically to test a range of scenarios for the development of this WQIP. The Botany Bay CAPER DSS was used to provide an estimate of the impacts of the various WSUD options on nutrient and sediment delivery as well as the costs of their implementation throughout the Botany Bay Catchment... To be effective, the Plan needs to be owned and implemented by all levels of government as well as by individuals and organisations within the Catchment. The Plan provides direction on how each of these groups could act to implement its recommendations.		WATERCAST, Source & MUSIC, ELCOM/CAEDYM - CASPER DSS
013	\\bmt-ntl-fs01\wate	Wolli Creek Regional Park Plan of Management	2004	Clouston (for NSW National Parks and Wildlife Service)	Publication, Plan of Management	Review in Further Detail	The National Parks and Wildlife Service (NPWS) co-ordinated the consolidation of land in a variety of ownerships to create a reserve for the establishment of the proposed Regional Park.	The Plan of Management for the Wolli Creek Regional Park examines and resolves many issues facing the Park to enhance and promote its recreational opportunities, cultural and natural resources for the regional community... The process of this study has included site appraisal and analysis, consultation with community groups and various stakeholders, identification of issues and the establishment of an inspiring vision and concept and strategies for the planning and management of the Park... The Plan of Management identifies a range of long and short term strategies detailed under eight headings of consideration to meet the needs raised in the issues evaluation... The Plan sets out a range of details on the proposed implementation of the proposals...		
014	\\bmt-ntl-fs01\wate	Cooks River Improvement Plan: Physical Profile	2015	Alluvium (for Sydney Water)	Report	Review in Further Detail	Prepared by Alluvium, for Sydney Water, as part of the Cooks River Improvement Plan (the Plan). Two reports prepared for this project benchmark the catchment's history, conditions, as well as the roles, responsibilities and activities of stakeholders. These two parts have been developed as two stand-alone reports, namely: 1. A Stakeholder Engagement Strategy – identifying the key stakeholders in the Cooks River catchment, clarifying the roles and relationships of stakeholders, identify current and proposed activities within the catchment, identify Sydney Water's existing role. 2. A Physical Profile (this report) – describes the catchment's history, context, conditions through an assessment of the physical attributes of the catchment, analysis of the water cycle (potable water, wastewater and stormwater), as well as the ongoing actions of relevant organisations.	To meet the interests of stakeholders and improve the quality of the Cooks River direct, this project recommends a series of actions. The recommendations will inform future stages of the project and feed into the Cooks River Improvement Plan...		
015	\\bmt-ntl-fs01\wate	Cooks River Estuarine Vegetation Management Plan	2010	Eco Logical Australia (Cooks River Foreshores Working Group)	Report	Potentially worth reviewing for specific details	The Cooks River Estuarine Vegetation Management Plan (VMP) builds on best practice guidelines for management of salt marsh and mangrove vegetation communities, including the Saltwater Wetlands Rehabilitation Manual (DECC 2008). Current activities and proposals for management of foreshore vegetation along the Cooks River are identified, such as Sydney Water's bank naturalisation program and the proposed Cooks Cove redevelopment (which is now under voluntary administration)... The CRFWG requires a VMP that defines and delineates the intertidal zone of the Cooks River and provides an overall vision of the future management of these areas. The VMP provides guidelines to manage threats and opportunities within the study area. It builds on the Cooks River Foreshores Strategic Plan by Clouston (1997) and applies the principles of best practice restoration ecology to manage the intertidal zone of the Cooks River estuary. This plan is also consistent with the draft Catchment Action Plan for the Sydney Metropolitan Area, and in particular Catchment Target ECM1: 'By 2016 there is an improvement in the condition of estuaries and coastal lakes'.	Mangrove and salt marsh vegetation along the Cooks River foreshore has been mapped based on aerial photography interpretation and field investigation... Linkages or potential corridors between remnant patches of vegetation are identified. Areas where there is scope for foreshore vegetation to expand into higher elevations of open space in response to predicted sea level rise are indicated... Guidelines for preparing detailed site-specific plans are provided. Detailed plans should build on the site profiles provided in this VMP... A more integrated approach is recommended for the management of the Cooks River foreshore, facilitated through the Cooks River Foreshores Working Group. This would improve coordination of on ground rehabilitation works, information sharing, and may lead to cost savings and efficiencies. Other relevant parties should also be engaged (e.g. community groups, planning sections of Rockdale Council for Cooks Cove development, and parks and reserves sections of Marrickville Council for Tempe Reserve)...	Maps of current foreshore vegetation using existing data	
016	\\bmt-ntl-fs01\wate	Cooks River Catchment Management Strategy	1999	Cooks River Catchment Management Committee	Report	Potentially worth reviewing for specific details	The aim of this Strategic Plan is to enhance, conserve and protect the natural resources of the Cooks River Catchment (CRC) while considering the social and economic requirements of the community. The purpose of the Plan is to provide a tool for all members of the CRC, as well as government bodies and other organisations which have control over aspects of the CRC. The Plan describes goals for water, land and vegetation, biodiversity, cultural heritage and community education. It also identifies specific actions required to achieve sustainable management as well as details on how to implement these actions... The decision to develop a new strategic plan was taken by the Cooks River Catchment Management Committee (CRCMC) early in 1997, following the release of the 1996 Annual Report to the Community. Many of the goals of the 1993 Plan (CRCMC, 1993) had been achieved and a new plan was required, building on earlier processes but with a longer view forward, into the next century. This is a 6 year plan for the period 1999–2005. The development of the Strategic Plan was a staged process. The CRCMC developed an initial draft and used it as a basis for consultation with all key stakeholders. The CRCMC also held broad-based community consultations as well as discussions with relevant government agencies, local government and business and industry groups. Importantly, the consultation processes also specifically involved representatives of the Darug people. The results of the consultations and discussions are reflected here. In addition, this Strategic Plan takes into account other key local planning documents...	The Strategic Plan includes: a long term vision for the future; goals that have been established to strive for that vision; objectives for reaching the goals; actions for achieving the objectives; and indicators (or outcomes) to measure the extent to which the goals have been achieved... The Cooks River CMC's vision for the Cooks River and its catchment is that the Cooks River catchment will comprise: a community which values and respects its natural resources and heritage, and which is guided by the principles of ecologically sustainable development in a catchment where biodiversity of both terrestrial and aquatic ecosystems is enhanced and protected. What Does the Vision Mean? The vision provides links and a common focus. It paints a picture of the ultimate goals of the strategy which then determine the outcomes to be achieved. It directs management strategies proposed to resolve issues and deal with problems. Parts of the vision relate to areas of environment, culture and heritage, resource use, lifestyles and waterways administration and coordination... To implement the Strategic Plan, specific actions are required. Suggested actions are given under each of the objectives along with who is responsible and how the action can be implemented. Actions are also prioritised according to urgency of implementation, as shown by the time-frame given...		

017 (1 & 2)	\\bmt-ntl-fs01\wate	Cooks River Bank Naturalisation Project	2008	Sydney Water	Drawings	Potentially worth reviewing for specific details	Overall conceptual designs	Two drawing sheets: 1. Overall concept design upstream of Foord Ave Footbridge 2. Overall concept design downstream of Foord Ave Footbridge
018 (0 to 8)	\\bmt-ntl-fs01\wate	Cooks River Sustainability Initiative	2007-2011	Cooks River Sustainability Initiative	Subcatchment Plans	Potentially worth reviewing for specific details	The Our River project is an initiative of the Cooks River Foreshore Working Group and is funded by the NSW Environmental Trust's Urban Sustainability Program from 2007 to 2011. It is a partnership between Ashfield, Bankstown, City of Canterbury, City of Sydney, Hurstville, Marrickville, Rockdale and Strathfield councils, and Monash University. The project is focusing on six local areas (known as subcatchments) and is working with councils and communities to develop subcatchment management plans that reflect local conditions, ideas and needs. The aim of the subcatchment management plan is to improve the health of the Cooks River and to involve local communities in planning and implementing more sustainable water management solutions.	Strategic Sub-Catchment Management Plans: 1. Ashbury (Ashfield and Canterbury Councils) 2. Eastern Channel East (Marrickville Council) 3. Upper Wolli Creek (Canterbury Council) 4. Upper Wolli Creek (Hurstville Council) 5. Upper Wolli Creek (Rockdale Council) 6. Munni Street (Citi of Sydney) 7. Strathfield South (Strathfield Council) 8. Rookwood Rd
019	\\bmt-ntl-fs01\wate	Cooks River Stormwater Management Plan	1999	Cooks River Association of Councils (by PPK Env and Infstruct; and Webb McKeown and Assocs)	Report	Potentially worth reviewing for specific details	The 13 Local Councils of the Cooks River catchment, working together with State Authorities and the community, have prepared a Stormwater Management Plan for the Cooks River. The Plan aims to improve water quality and the health of the Cooks River by identifying practical and long term solutions to stormwater problems. The preparation of the Plan is a response to a Direction issued by the Environment Protection Authority under Section 12 of the Protection of the Environment Administration Act, 1991. Through the Stormwater Trust, the State Government has provided funding for the preparation of Stormwater Management Plans for all catchments within NSW. PPK Environment and Infrastructure Pty Ltd, in association with Webb McKeown and Associates Pty Ltd were appointed by the Cooks River Association of Councils to prepare the Stormwater Management Plan.	The approach to developing a Stormwater Management Plan closely follows the methodology and principles set out in the Environment Protection Authority's Draft Council Handbook for Managing Urban Stormwater (1997). The Plan has the following key components: - clear definition of catchment values and objectives for stormwater management; - identification of issues which prevent the objectives from being satisfied; - evaluation of options to address identified stormwater management issues; - a detailed Action Plan which identifies and prioritises cost-effective actions specific to the management of stormwater within the Cooks River; - an Implementation Strategy which defines the management framework, details costs and outlines a timeframe for implementation; and - an Evaluation, Monitoring and Reporting Program which provides performance indicators for the actions and identifies appropriate monitoring to measure and report on the success of the Stormwater Management Plan.
020	\\bmt-ntl-fs01\wate	Cooks River Foreshores Strategic Plan	1997	Cooks River Working Party (by Clouston)	Report	Potentially worth reviewing for specific details	The Cooks River Foreshores Strategic Plan focuses on strategies to ensure the River foreshores are managed in a coordinated manner. The "foreshores" for the purpose of this Plan are considered to be the extent of a zoning designation of "open space" on either side of the River, although adjacent land use zonings and the wider influences of the total catchment on the foreshore's integrity are also an essential consideration of the Plan. The Plan was commissioned by several Councils along the Cooks River and the Department of Land and Water Conservation, each of which recognised the need to develop a document which could serve as a management tool for all the Councils along the River foreshores, and to meet the aspirations of state government bodies and community groups.	Initiatives have taken place in recent years, particularly to prevent water pollution at the source and to improve open space. Through a process of site investigation, extensive consultation and review of the numerous existing documents, a range of issues arose which were addressed by the Plan.
021	\\bmt-ntl-fs01\wate	Cooks River Integrated Interpretation Strategy	2008	Cooks River Foreshores Working Group	Report	Potentially worth reviewing for specific details	This report is the culmination of a wider project commissioned by the Cooks River Foreshores Working Group (CRFWG) to develop an interpretation strategy for the Cooks River Foreshore. It is one of a number of long term initiatives to develop and improve facilities on the river foreshore for the residents of Strathfield, Burwood, Rockdale, Marrickville and Canterbury local government areas and others.	The Cooks River Integrated Interpretation Strategy aims to provide direction for effective and engaging on- and off-site interpretation of the values of the Cooks River. It includes the relevant resources available for interpreting the river and identifies relevant themes, audiences and gaps in the resources. It also provides interpretive objectives, key messages, techniques and recommendations to apply the interpretive strategies. This Strategy is likely to be followed by site-specific interpretation planning involving the collaboration of community members and others with management responsibilities—particularly council's cultural and amenity planners, architects and landscape architects. Site-specific interpretation planning and content development will continue into the future (for recommendations see page 27)... This Strategy identifies audiences, locations, themes and messages, techniques and strategies for interpreting the river, and contains the relevant resources available to inform and support interpretive projects. A number of resources contained in this strategy will be useful and of interest to a wide range of people, from parks managers to students, teachers, researchers, consultants, artists, etc, including: List of existing interpretive resources List of organizations, community groups and individuals associated with the Cooks River Annotated Bibliography of Known Documentary Resources on the Cooks River Cooks River Valley Thematic History, by local historian, Lesley Muir Statement of Significance for the Cooks River Creative ideas conceived at a creative community workshop for
022	\\bmt-ntl-fs01\wate	Cooks River Parklands Plan of Management + Master Plan	2016	Marrickville Council (now Inner West)	Plan	Potentially worth reviewing for specific details	Extensive research in 2012 resulted in the Recreation Needs Research - Strategic Directions for Marrickville, which identified the Cooks River Parklands as being in need of improved recreation and environmental outcomes for the community. Marrickville Council initiated the planning process to develop Plans of Management and Master Plans for 2.5 kilometres of the Cooks River Foreshore in July 2014. The scope of the project includes the following parks and recreation reserves: > HJ Mahoney Reserve; > Steel Park; > Warren Park; > Richardson's Lookout; > Cooks River Foreshore; > Kendrick Park; and > Fatima Island.	The report outlines all the legislative requirements for a Plan of Management. The report is divided into eight sections, within which, each of the parks are described separately. The sections include: Project context, existing site description and site analysis, park categorisation, leases and licences, engagement overview and common themes, designs including proposed strategies and the implementation plan. The report provides information on the Cooks River Parklands as a connected series of open space areas that form the northern riparian corridor of the lower Cooks River. The report balances interests of passive and organised recreation, biodiversity, stormwater treatment, heritage, pedestrian and cyclist circulation. It aims to deliver balanced outcomes that facilitate multipurpose infrastructure and use outcomes that provide for all park users and the environment. The design outcomes are a direct representation of requests from the community engagement process.
023	\\bmt-ntl-fs01\wate	Flockhart Park Sportsgrounds Plan of Management	2016	Burwood Council	Plan	Potentially worth reviewing for specific details	Flockhart Park is categorised as both Park and Sportsground. This PoM refers to the part of Flockhart Park that is categorised as a Sportsground (refer section 2). The remaining part of Flockhart Park is addressed in the Generic Plan of Management – Parks. The adoption of this PoM will supersede the Cook's River Foreshore Area Plan of Management, June1996.	The general process for the implementation of the Draft Flockhart Park Sportsgrounds Plan of Management PoM is as follows: - Preparation of the document - Draft PoM presented to Council for approval for public exhibition. - In accordance with the NSW Local Government Act 1993, a public hearing must be held if Community Land is proposed to be categorised or re-categorised - Draft PoM is placed on public exhibition for at least 28 days, with written submissions taken for at least 42 days from the first day of public exhibition. - Council staff review comments received, and make changes to the Draft PoM accordingly. - Revised Draft PoM presented to Council for adoption. - Final Flockhart Park Sportsgrounds PoM is adopted, implemented and made available for public view on Council's website, in the Burwood Library and Community Hub, and at Council's Administration Centre.
024	\\bmt-ntl-fs01\wate	Rockdale City Council Plan of Management for Community Land and Public Open Space	2016	Rockdale Council (now Bayside)	Report	Potentially worth reviewing for specific details	A Plan of Management is a document required by legislation, Local Government Act 1993, for all Council owned Community Land. The Plan describes and identifies each of the various categories of community land: natural; sportsgrounds; general community use and culturally significant, and what is and is not a permissible use for this land. The Rockdale City Council Plan of Management for Community Land and Public Open Space 2015, is an updated and consolidated document that supersedes over twenty five previous plans on various parks that were developed for or by the Council. It is intended that this plan will provide the necessary information for Council staff to carry out their work, the community to understand their local open spaces and guide the future of the city's public open space. Many of the plans of management for Rockdale City Council's parks that this Plan supersedes, included master plans, this Plan does not include master plans. While this new Plan supersedes the previous plans, the master plans that were developed as part of those plans will be referred to when any capital development or upgrades are planned for a park.	The Cook Park Plan of Management (2010) and the Muddy Creek Plan (2011) remain current plans of management for the parks covered by those plans. These Plans relate to both Crown Land and Community Land, and were established under Part 5, Division 6 of the Crown Lands Act 1989 and Chapter 6, Part 2 of the Local Government Act 1993. The Minister has authority to alter or cancel a Plan of Management adopted in accordance with the Crown Lands Act 1989. The Plan was developed by Council staff in consultation with both internal and external stakeholders and should be reviewed every 5-7 years to ensure that it is current with all legislative updates, changes in community needs and uses for public open spaces. The Plan is a strategic document providing direction to enable the Council's Vision. Much of the information within this Plan is intended to provide a high level planning controls and opportunities framework as required by the legislation. However, in developing the Plan the need for other strategy and policy documents has become evident and the objectives, actions and performance targets within each of the community land categories have identified the development of specific strategy documents where necessary...
025	\\bmt-ntl-fs01\wate	Wolli Creek Flood Study	2014	Sydney Water (by HydroStorm)	Report	Potentially worth reviewing for specific details	Floodplain risk management in NSW is the responsibility of Local Government. The flood risk management process is guided by the NSW State Government's Flood Policy through the Floodplain Development Manual (2005). Sydney Water Corporation owns and maintains a large number of stormwater assets in the Wolli Creek catchment. A flood study has been undertaken to assess the risk associated with the open channel and the pipe drainage assets in this catchment. Wolli Creek catchment lies in the Hurstville Council, Rockdale Council and Canterbury Council local government areas. This study can assist these Councils in discharging their duties related to flood risk management in the Wolli Creek catchment.	Wolli Creek is prone to flash flooding due to urban nature of the catchment. A significant rainfall event generates enough discharge to cause overtopping of the Bexley Road Bridge, which has been closed to traffic on several occasions in the past few years... This report presents the methodology adopted for the study and defines the flood risk by providing detailed flood maps. The provisional flood hazard in the study area is also presented in this report. The study has been undertaken as per the guidelines provided in the New South Wales Government' Floodplain Development Manual (2005). The data presented in this report can be utilized by the local Councils for flood risk management in their respective jurisdictions.	RAFTS (Hydrology) TUFLOW (Hydraulic)

026	\\bmt-ntl-fs01\wate	Recreation Needs Study - A Healthier Inner West	2018	Inner West Council (by Cred Consulting)	Report	Potentially worth reviewing for specific details	The Recreation Needs Study – A Healthier Inner West, provides an analysis of the current and projected recreation needs of the Inner West community. For the purposes of this needs study, recreation is defined across a broad spectrum ranging from unstructured activities like picnics, walking the dog and playing in parks, streets and laneways; to organised sport and everything in between. Participation in, and access to, recreational opportunities brings significant physical and mental health and social benefits to individuals, and improved development outcomes for children and young people.	Current situation In total (including non-Council owned land), there is 323.4ha of open space within the Inner West, making up 9.2% of the total land area or 16.8m2 per person. There are 276 Council owned or controlled parks and sporting grounds totalling 256ha, making up 7.3% of the total land area of the Inner West and 13.3m2 per person. Inner West has 28 sporting grounds, 9 outdoor gyms, 116 play spaces, 18 community gardens, 16 creek corridor parks, 2 indoor recreation facilities, 5 aquatic centres (including 3 with warm water pools). Future gaps If no new open space is provided as the population increases, the amount of open space per person will decline from 13.3m2 to 11.8m2 per person in 2026, and 10.6 to 11.1m2 per person in 2036... In urban areas like the Inner West, where there is limited land, but residential growth and density are increasing, there are a number of key design and planning trends: • Multipurpose and flexible design (making what we have work harder) • Networked and connected recreation places and programs (connecting parks, sporting grounds, and users within a network) • Sharing the city for recreation (learning to share space for competing needs) • Inclusion and universality (inclusive and universal design and programming from 8 to 80 years of age) • Connecting to nature and healthy built environments (biophilic design, nature and adventure play for children, supporting bio-diversity, reducing climate impacts), and • Co-designing places and programs (working with communities, sporting groups and agencies to co-design future recreational	
027	\\bmt-ntl-fs01\wate	Cooks to Cove GreenWay Masterplan	2018	Inner West, CBC & NSW State Gov	Report and Plans	Potentially worth reviewing for specific details	This Master Plan represents a significant step forward for the Cooks to Cove GreenWay. For the first time in its history, there is significant funding available to build the physical infrastructure of the GreenWay. At this point in time, the Master Plan has a key role to play in setting out how this funding should be allocated, what should be delivered and how it should be implemented. The Master Plan has been informed by existing documents that have previously established the vision and articulated strategic plans for the GreenWay, including the 2009 "GreenWay Master Plan and Co-ordination Strategy", and 2012 Biodiversity and Active Transport Strategies. These existing documents have provided the basis for the objectives and planning strategies that have shaped the Master Plan.	The Master Plan includes capital works plans organised into six precincts along the GreenWay. Proposed works aim to achieve four main outcomes: - A connected ecological corridor, supporting diverse locally native species and links to the surrounding neighbourhoods - A connected active transport corridor, with a main spine between the Cooks River and Iron Cove, and links into the surrounding neighbourhood - Diverse recreation opportunities, including the opportunity to connect with nature - An engaging cultural experience, which integrates public art and facilitates education and engagement with local stories This Master Plan seeks to integrate these four outcomes through design for multifunctional infrastructure and places. The Master Plan proposes approximately $57 million in capital works along the GreenWay. The highest priority works have current funding available...	
028	\\bmt-ntl-fs01\wate	Gough Whitlam Park Masterplan	2016	CBC	Report and Plans	Potentially worth reviewing for specific details	A concept master plan has been created for Gough Whitlam Park and Waterworth Park in Earlwood, for the purpose of gaining community feedback on the plans through a public exhibition process. The final master plan will then guide the formation of a Plan of Management for the parks which is required due to the number of competing uses and proposals the parks are facing.	Recommendations 1. Council endorses and places on public exhibition the Master Plan options as outlined in the report for Gough Whitlam Park and Waterworth Park. 2. A further report be submitted to Council at the conclusion of the exhibition period to consider any submissions.	
029	\\bmt-ntl-fs01\wate	Aboriginal history along the Cooks River	2017	Dr Paul Irish of MDCA (on behalf of the Cooks River Alliance)	History Report	Potentially worth reviewing for specific details	This history has been written as part of the Cooks River Catchment Aboriginal History Project that has been undertaken by MDCA on behalf of the Cooks River Alliance. It was completed between May 2016 and May 2017 and aimed to: - Conduct comprehensive research into the long history of Aboriginal associations with the Cooks River catchment from the archaeological past and the oral and documentary history of more recent times and up to the present. - Distil project research into a detailed, readable Aboriginal history of the Cooks River catchment. - Assemble source materials and research in a manner that allows the development of resources targeted to a diverse range of users across different media.	In addition to this history, the outcomes of this research were: - compilation of a source list, providing an overview of all relevant material examined. Where possible some form of copy was taken of records e.g. photographs or photocopies or electronic copies of documents for research purposes. It is possible that this material could serve as a rudimentary research archive for those wishing to conduct further research in future; and -preparation of a list of places including pre-contact Aboriginal archaeological sites and places used historically by Aboriginal people. These places were divided into the approximate periods used in this history, and have formed the basis for the maps used at the tart of each section... - oral histories were examined and where they contained information of relevance to the current project, were transcribed (where this had not already been done). - For the current study, an additional 12 oral histories were undertaken by Asher Milgate...Each video interview was edited to a 10-15 minute clip featuring the most relevant portions of the interview to the Cooks River. These were then provided to each interviewee for approval, along with a release form specifying the permissible uses of the edited video and photos.	
030	\\bmt-ntl-fs01\wate	Cooks River Ecological Health Report Card	2014-2015 2015-2016 2016-2017	CRA	Report Card	Review in Further Detail	Our monitoring program We benchmark, monitor and evaluate the ecological health of the Cooks River catchment to increase knowledge and understanding, and to support member councils' individual higher-resolution monitoring programs. How we monitor Our program undertakes routine scientifically robust monitoring of the following ecological indicators: - Freshwater Benthic Macroinvertebrates - Water Quality - Riparian Vegetation and Creek Channel Condition - Benthic Diatoms	The ecological indicators monitored by the Alliance are commonly used in waterway assessments and together are reliable indicators of the ecological condition or 'health' of a catchment. Results provide valuable information to the Alliance and allow strategic and targeted on-ground activities to improve the condition of the Cooks River catchment. River Health indicators are assessed against locally derived environmental and ecological guidelines which enable the calculation of River Health grades which range from A+ and F-. The approach applied by the Alliance is consistent with other River Health assessments undertaken across the Sydney metropolitan area.	CRA and C Tippler for raw data
031	\\bmt-ntl-fs01\wate	Our Greater Sydney 2056 South District Plan Eastern District Plan	2018	Greater Sydney Commission	Report Plans	Review in Further Detail	The Greater Sydney Commission's five District Plans are a guide for implementing A Metropolis of Three Cities - the Greater Sydney Region Plan at a District level. These 20-year plans are a bridge between regional and local planning. They inform local environmental plans, community strategic plans and the assessment of planning proposals. The District Plans also help councils to plan and deliver for growth and change, and to align their local planning strategies to place-based outcomes. The Commission's District Plans were finalised in March 2018 after extensive stakeholder and community consultation, including two public exhibition periods.	The vision for Greater Sydney as a metropolis of three cities – the Western Parkland City, the Central River City and the Eastern Harbour City and a 30 minute city – will: ...see the Eastern City District become more innovative and globally competitive, carving out a greater portion of knowledge intensive jobs from the Asia Pacific Region. The vision will improve the District's lifestyle and environmental assets. ...mean residents in the South District will have quicker and easier access to a wider range of jobs, housing types and activities. The vision will improve the District's lifestyle and environmental assets.	
032	\\bmt-ntl-fs01\wate	Sydney Regional Environmental Plan No 33 - Cooks Cove	2004	NSW Gov	Planning Instrument	Review in Further Detail	This plan applies to land at Cooks Cove within the suburb of Arncliffe shown edged heavy black on the Zoning Map, which is referred to in this plan as the Cooks Cove site.		
033	\\bmt-ntl-fs01\wate	Uncovering the Hidden History of the Wolli Creek Valley – Archaeological Investigations in the Wolli Creek Valley (Updated and Revised Survey)	2015	Graham Craig Wilson	Archaeology Report	Potentially worth reviewing for specific details	This report is an update of an archaeological survey undertaken in 1991-1992 by the Wolli Creek Preservation Society at a time when the Wolli Creek Valley was threatened by the construction of the M5E. The information gathered was used in the preparation of environmental impact assessments for the proposed motorway.	The study identifies 17 sites of significance and 8 supplementary sites. It documents evidence of non-Indigenous occupation from the 1840s including structural remains such as walls and garden borders as well as larger landscape elements and it recommends actions to protect identified sites of significance.	
034	\\bmt-ntl-fs01\wate	Our Inner West 2036 - A Community Strategic Plan for Inner West Community	2018	Inner West Council	Plan	Potentially worth reviewing for specific details	The Inner West Community Strategic Plan (CSP), Our Inner West 2036, identifies the community's vision for the future, long-term goals, strategies to get there and how to measure progress towards that vision. Under pressure from increasing population density and looming environmental and economic challenges, it is essential to plan for Inner West's future. The development of Our Inner West 2036 has involved thousands of people who participated through a series of engagement activities in 2016 and 2017. Our Inner West 2036 has been designed to: • Inform the strategic decision-making that will shape our future community and environment • Protect and enhance the community's values and everything that makes Inner West unique • Pave the way for the future by anticipating change and the impacts of that change on the community, economy and environment • Achieve inclusivity, sustainability, accountability and innovation in service delivery	For Council, the CSP is the leading component of an Integrated Planning and Reporting Framework. The framework is mandated for all NSW councils by the State Government. This requires councils to demonstrate how they will deliver aspects of the CSP through a detailed four year Delivery Program and annual Operational Plan. Reviewed annually, these documents show the activities Council will undertake during its term of office to help achieve the long-term objectives set out in Our Inner West 2036. To support this plan effectively, Council is required to develop a 10-year Resourcing Strategy. The strategy ensures Council has the right people, budget, technology and infrastructure in place to deliver against its commitments. There are four components: • Workforce planning • A long-term financial plan • Assets management • Information and communications technology	

035	\\bmt-ntl-fs01\wate	Determining the Environmental Values of Botany Bay and its Catchments - "A Descriptive Analysis of the Botany Bay Catchment Environmental Values Questionnaire"	2018	Sydney Metropolitan Catchment Management Authority	Report	Potentially worth reviewing for specific details	This report presents the results of the Botany Bay Coastal Catchments Initiative (BBCCI) environmental values survey questionnaire. The report is identifies the distribution of survey responses according to sector and origin (indigenous or non-indigenous), and consecutively summarises the results for each question. The readership of the report is targeted toward the survey participants, local, state and federal governments and all other catchment stakeholders. The questions are as follows: Q1: What activities have you done in our waterways in the past 5 year period? Q2: What aspect or activities are you concerned about losing from our waterways? Q3: What do you appreciate most about the waterways? Q4: What do you see are the key threats to water quality in our waterways? Q5: How would you like to be able to use the waterways in the future? Q6: What are your ideas to better manage our waterways?	Provision of an ecological vision for the Botany Bay Catchment.	
036	\\bmt-ntl-fs01\wate	Modelling the Catchments of Botany Bay - Council Pollutant Loads E2 Modelling Results	2008	BMT WBM Pty Ltd	Report	Potentially worth reviewing for specific details	Updated modelling of the Botany Bay Catchments using the E2 modelling framework to quantify the predicted pollutant loads as derived from specific Council regions. The results of this assessment will allow for the development of targeted awareness activities and the prioritisation of council specific management actions.	The study describes : 1. Council specific total pollutant loads 2. Council specific individual land use loads and 3. Council specific loading rates. The findings detail that the councils associated with high pollutant load exports were not necessarily the highest load per unit area contributors. Inner city suburbs generally were associated with higher loading rates but only moderate to low overall pollutant export	Botany Bay E2 model
037	\\bmt-ntl-fs01\wate	Environmental Assessment of Botany Bay: Sediments, Sediment Geochemistry & Foraminifera	2008	Alberto Albani (University of New South Wales)	Report	Potentially worth reviewing for specific details	The study aims to determine the distribution of the unconsolidated sediments, to assess their geochemical characteristics and to identify and define the ecology of the benthic foraminifera (protozoa) within the Bay	The results detail information related to: sediments, total sediment geochemistry and benthic foraminifera. The potential use of foraminifera assemblages as biological indicators will assist the decision making process and the monitoring programs of the Australian estuaries. As the benthic foraminifera offer an integrated view of all the physical-chemical parameters they are well suited to long term environmental monitoring.	
038	\\bmt-ntl-fs01\wate	The Botany Bay Program	2002	Jim Colman	Fact Sheet	Potentially worth reviewing for specific details	Fact sheet detailing information about "The Botany Bay Program" What is it, what are the objectives of the program; The Bay - who, what, where; What has gone wrong with the bay?; The global context; The results of the program to date; What's next?	The fact sheet outlines the results to date of the Botany Bay Program: The establishment of a Botany Bay Management Committee; increasing involvement from the non-government sector; the establishment of a special Botany Bay Studies Unit at the University of NSW	
039	\\bmt-ntl-fs01\wate	The Tide is Turning - Final Report of the Botany Bay Program	2001	Southern Sydney Regional Organisation of Councils	Report	Potentially worth reviewing for specific details	This report outlines the result of an 18 month Botany Bay Program which had the aim to develop a framework for the integrated planning of the Botany Bay Catchment. The report presents an outline of an integrated and whole of government environmental strategy for the Bay in response to the recorded expectations of the community. It offers a provisional definition of such a strategy; discusses the geographical limits for a strategic plan; explains the need for community input; presents a rationale for a strategic approach; identifies key strategic planning elements; discusses ownership and implementation of the plan; explains the roles of science and scientists; examines funding issues and argues for an immediate commitment from State Government to move towards implementation of the strategy in concert with other current official initiatives and projects.	The strategy developed a degree of legitimacy to the extent that it brings together in a single document a number of priority concerns and actions which have been on the public record for some time. The document presents evidence that the Bay deserves to be assigned a new participative framework guided by ESD principles, science and community input to manage process.	
040	\\bmt-ntl-fs01\wate	Canterbury City Library resources			List of Resources	Potentially worth reviewing for specific details	List of resources from Canterbury City Library: 1986 Pollution Control Supplement to the Report of the Cooks River Advisory Committee (1978) submitted to the Section 521 Committee, Cooks River Co-ordinating Committee; Canterbury Urban Runoff Taskforce : Catchment Management Study Orissa Street Stormwater Channel; Canterbury Urban Runoff Taskforce : final report; Cooks River : 1996 Annual Report to the Community; Cooks River : a Profile; Cooks River Catchment Management Strategy ; Cooks River Catchment Management Strategy : Draft; Cooks River Campsie Masterplan Report; Cooks River : coming clean? [videorecording]; Cooks River : draft total catchment management action plan; Project; Cooks River Floodplain Management Study; Cooks River Foreshores Strategic Plan; Cooks River Road Air and Noise Pollution Study : final report ; Cooks River Stormwater Management Plan; Environmental Condition of the Cooks River and Community Vision Strategy Initial Report; Environmental Condition of the Cooks River and Community Vision Strategy Final Report; A History of the Cooks River; Our ocean to ocean opportunity : an account of Cooks River past and present, it's unbounded future possibilities for commerce, industry and recreation; A Report completed in part fulfilment of studies conducted during the work year at Canterbury Municipal Council : aesthetics and management of the Upper Cooks River and it's tributaries within the Canterbury Municipality; Report of the Cooks River Advisory Committee; Sydney's Vale of Tempe Cooks River : man and his environment; Upper Cooks River SWC No. 38 Catchment Management Study 1991;		
041	\\bmt-ntl-fs01\wate	Barney's Boating Survey			Survey Results	Potentially worth reviewing for specific details	Survey results about boating activities on the Cooks River. Questions included: In your opinion is boating on the Cooks River an appropriate activity?; If you answered NO to question 1 , why don't you think boating on the river is appropriate?; What kind of boating do you think is appropriate on the Cooks River?; Have you ever been boating on the Cooks River?; If you answered YES to question 4, how often do you go boating on the Cooks River?; If you answered YES to question 4, what kind of boating activities do you participate in on the river? Check multiple boxes if applicable; What obstacles do you think might prevent more boating on the Cooks River? Check multiple boxes if applicable; If you had the opportunity to go boating on the Cooks River, would you?; Are you a regular visitor to the river? Check multiple boxes if applicable; What is your age?	86% respondents said boating was an appropriate activity	
042	\\bmt-ntl-fs01\wate	Cooks River Catchment Coastal Management Program - Stage One Scoping Study Communications Strategy			Report	Review in Further Detail	Outline of the Cooks River Catchment Coastal Management Program - Stage 1 scoping study communication strategy: Purpose, objectives, target audience, audience insights, key messages, background information, budget, resources and actions, evaluation		
043 (1 & 2)	\\bmt-ntl-fs01\wate	A comprehensive reference list of scientific and technical literature regarding the Cooks River	2005	George Kollias	Report	Potentially worth reviewing for specific details	A comprehensive reference list of scientific and technical literature regarding the Cooks River. List of resources and aerial photographs. The literature search found 170 references regarding the Cooks River. These references included literature of various forms, namely reports, journal articles, conference papers, theses, and management plans and strategies. Most of the references were from the last 3 decades. 43 articles were relevant to the indicators of the ecological monitoring program	In relation to estuarine macrophyte flora, there was conflicting arguments as to their distribution. Many of the articles provided data of heavy metal contamination in the river. This document is ay useful tool that can be used in further research and work on the Cooks River. Similarly it is also invaluable as a source of background information for every-day management of the river by council.	
044	\\bmt-ntl-fs01\wate	Climate-ready biodiversity management: Cooks River case study	2017	Michael Dunlop, Paul Ryan and Rachel Williams	Report	Review in Further Detail	Results from the CSIROs "Climate ready process" analysis that explores future challenges and opportunities for managing open space and coastal biodiversity with urban development and increased inundation from rising sea levels and more intense flooding events. The case study provides new insights about the long term management of biodiversity vulnerable to "coastal squeeze" in the Cooks River, introduce staff in the CRA to climate-ready concepts and give them the opportunity to use them and implement climate ready tool in their own work.	The climate ready analyses highlighted the multiple ways in which open space is used and valued by the community, the current pressures on it, and extent to which it is increasingly vulnerable to 'coastal squeeze' from future development and climate change . The climate ready objective was to: "Maintain areas of open space, including organised sport, passive recreation and native vegetation, as sea level rise and increased flood risk lead to frequent inundation of the current parks and nearby buildings"	
045	\\bmt-ntl-fs01\wate	Cooks River Flood Study	2009	MWH&PB Engineering & Planning Services	Report	Review in Further Detail	An investigation of the feasibility of naturalising concrete canals in the Cooks River to improve aesthetic and environmental values. The assessment of bank neutralisation options include an assessment of impacts of flooding within the cooks river catchment. Information from this study is to be used by councils as the basis for implementing the NSW Floodplain Risk Management process.	Detailed flood extent maps were produced (2,20 and 100 year ARI design events and the PMF), and also an impact of climate change in the 100 ARI was mapped. The results show that there were numerous properties affected by flooding during the 100 year ARI flood along the Cooks River. The hydraulic assessments of the bank naturalisation options are reported separately.	WBNM, TUFLOW
046	\\bmt-ntl-fs01\wate	Cooks River Bank Protection Maintenance		Director of City Works	Report	Potentially worth reviewing for specific details	Report about the poor condition of sheet piling in a number of locations along cooks river and the replacement strategy.	Investigation into options available to replace sections of failed sheet piling along the river foreshores was completed, prepared designs to replace the sheet piling with a more natural treatment and called tenders for the work. Council's City Plan and Budget, provide for active and passive recreation along the river. This includes a proposed bike path that will extend to Riverview Road following the river bank restoration works.	

047 (1& 2)	\\bmt-ntl-fs01\wate	River Health Georges and Cooks Rivers	2011 - 2013	Georges River	Report Card	Potentially worth reviewing for specific details	Report Card outlining the results of the River Health Monitoring Program. Key ecological indicators are used to gain a greater understanding of the Georges and Cooks Rivers with a special focus on investigating the pressures and impacts of an increasingly urbanised catchment.	Results indicate that the ecological condition of the Georges River was rated as "Fair" and of the Cooks, "Poor". Degraded water quality and macroinvertebrate communities dominated by pollution tolerant species were recorded in the highly urbanised areas of the Georges and Cooks River catchments. This result highlights the severity of impacts to urban streams caused by runoff, stormwater influx, erosion and degraded riparian zones.	
048 (1& 2)	\\bmt-ntl-fs01\wate	Campsie Remnant and Nanny Goat Hill - Bushland Management Report	2008-2011	National Trust of Australia (NSW)	Report Card	Potentially worth reviewing for specific details	Outlines the conservation value of the Campsie bushland remnant which contains Cooks River/ Castlereagh Ironbark Forest , an endangered ecological community. It is the only remnant of this type still existing on the Cooks River. The report outlines: The Initial Work Program for 3 Zones in the area, and the outcomes of the work program for the 3 Zones. It follows with recommendations for future work.		
049 (1 & 2)	\\bmt-ntl-fs01\wate	Cooks River Survey	2005	University of New South Wales	Report	Potentially worth reviewing for specific details	A survey of Cooks River to determine the nature of the river sediments, their geochemical characters and the distribution of benthic fauna if present. 2: The objective of the report is to provide information for managers about the upper 2 - 3 metres of the Cooks River Sediments and the associated geochemistry of the estuarine section of the channel, in the 5 kilometres between Canterbury and the river mouth at Botany Bay. This will enable remediation programs to be specifically tailored to the site and hence facilitate more effective environmental outcomes.	The present study offers an overall assessment of the present status of Cooks River, thus the data here presented can be used as base line for further monitoring. Several of the anomalous occurrences of sediment types and heavy metals require further investigation to establish their source, to eliminate or minimise any further inputs and to establish the remedial work necessary to restore the optimal natural conditions 2. The results of the current research support this earlier work by revealing that levels of heavy metals in surface muds exceed ANZECC sediment quality guidelines. The source of the contamination has been the various industrial, commercial and residential land uses in the catchment. It is also clear that the surface muds and their contaminants are being exported into Botany Bay	
050 (1-4)	\\bmt-ntl-fs01\wate	Cooks River Alliance Action Plan	2014-2017	Cooks River Alliance	Report	Review in Further Detail	The Action Plan (developed by 8 founding councils) 2014-2017 is a companion document to the Cooks River Alliance Management Plan 2014, which provides important context and strategic direction.	The Action Plan details objectives, performance measures, resources and responsibilities for the Seven programs of the Action Plan: 1. Capacity Building, 2. Catchment ecological health monitoring, 3. Information and website, 4. On-ground works, 5. Collaboration and community engagement, 6. Communications, 7. Catchment Resilience.	
051 (1 & 2)	\\bmt-ntl-fs01\wate	Overall Concept Design upstream of Floord Ave Footbridge - Cooks River Bank Naturalisation Project	2008	CMA	Map Fact sheet	Potentially worth reviewing for specific details	Overall Concept Design upstream of Floord Ave Footbridge - Cooks River Bank Naturalisation Project- technical drawing		
052	\\bmt-ntl-fs01\wate	Fish and oysters from the Cooks River Report	1997		Report	Potentially worth reviewing for specific details	Environmental health assessment of fish and oysters from the Cooks River - This study, conducted between August 1993 and February 1994, compared the levels of heavy metals and organochlorine pesticides found in fish and oysters obtained from the Cooks River with published levels permitted in purchased food.	The findings of this study confirm previous reports regarding pollution contamination in the Cooks River. The study found that fish contaminated with organochlorine pesticides from the Cooks River did exist in 1993 to early 1994 and could be purchased. The levels of heavy metals in the fish were generally below the Maximum Permitted Concentration in food. While, it is acknowledged that the Maximum Permitted Concentration (MPC) and Maximum Residue Limit (MRL) values are conservative standards and assumes that fish from the river would be eaten on a daily basis, consumption of fish caught from this river theoretically has the potential to cause adverse health effects.	
053	\\bmt-ntl-fs01\wate	Seasonal Dynamics of Fish Assemblages on Breakwaters and Natural Rocky Reefs in a Temperate Estuary: Consistent Assemblage Differences Driven by Sub-Adults	2013	Fish Ecology Laboratory, School of the Environment, University of Technology, Sydney	Academic Article	Potentially worth reviewing for specific details	The study investigated whether well-established (> 30 years old) breakwaters could consistently approximate fish assemblages on interspersed rocky reefs in a temperate estuary over 6 consecutive seasons using regular visual surveys between June 2009 (winter) and November 2010 (spring). We examined whether assemblage differences between reef types were driven by differences in juvenile recruitment, or were related to differences in older life-stages.	The results indicated that breakwaters in temperate estuaries are capable of supporting abundant and diverse fish assemblages with similar recruitment process to natural reefs. However, breakwaters may not approximate all aspects of natural assemblage structure, with differences maintained by a single-life stage in some cases	
054	\\bmt-ntl-fs01\wate	Mangrove and Saltmarsh Threat Analysis in a Large City: Opportunities and Challenges for Management		Kerrylee Rogers, Laura Mogensen, Peter Davies, Jeffrey Kelleway, Neil Saintilan, Geoff Withycombe	Report	Review in Further Detail	The report outlines the modelling of the vulnerability of estuarine vegetation (mangroves, saltmarshes and Casuarina forest) to SLR (SLR) in Australia's most populous city, Sydney, and conduct a detailed assessment of impacts and adaptation options for a densely urbanised estuary, the Cooks River	Modelling demonstrated that saltmarsh is particularly vulnerable in the Sydney region, with previous research also identifying links between changes in relative sea level and the expansion of mangrove into saltmarshes. This assessment has identified two overarching adaptation priorities: management strategies which accommodate wetland vegetation migration under SLR and; strategies which specifically preserve and accommodate saltmarsh.	
055	\\bmt-ntl-fs01\wate	Modelling the Catchments of Botany Bay	2007	BMT WBM Pty Ltd	Report	Potentially worth reviewing for specific details	Development of the E2 modelling framework for the Botany Bay catchments which simulate a range of catchment land uses, rural lands, urban residential areas and other zones.	This study was the first application of a detailed catchment model in the region. The results indicated that significant pollutant loads are predicted to enter into the Bay from the urbanised catchments of the region, however further assessments were required to quantify the predicted loads from future land use and climate change scenarios.	E2 modelling framework
056	\\bmt-ntl-fs01\wate	Modelling the Catchments of Botany Bay - Predicted Future Landuse Changes (2030 & 2070) E2 Modelling Results	2008	BMT WBM Pty Ltd	Report	Potentially worth reviewing for specific details	Revision of the Botany Bay E2 model (BMT WBM, 2007) to incorporate projected future land use and all hydrologic and constituent parameters are completely consistent with the original catchment model.	The future model scenarios show increases in pollutant exports of between 11% and 22% for 2030 scenarios and 24% - 46% for 2070 scenarios above current conditions. The majority of new pollutant export is derived from predicted increases in urban density rather than new land releases.	
057	\\bmt-ntl-fs01\wate	State Environmental Planning Policy (Three Ports)	2013		Planning Instrument	Review in Further Detail	The aim of the SEPP is to provide a consistent planning regime for the development and delivery of infrastructure on land in Port Botany, Port Kembla and the Port of Newcastle.		
058	\\bmt-ntl-fs01\wate	Port Botany Expansion Penrhyn Estuary Habitat Enhancement Plan		Sydney Ports	Report	Potentially worth reviewing for specific details	This document is the Habitat Enhancement Plan required under the conditions of approval by the NSW and Commonwealth Governments. The Plan documents the habitat enhancement works to be undertaken within Penrhyn Estuary and the Penrhyn Estuary flushing channel. The key objectives are to: expand the existing shorebird habitat , create seagrass habitat, expand the area of saltmarsh habitat and provide controlled public access and minimise disturbances within the Estuary.		
059	\\bmt-ntl-fs01\wate	Capacity Building and training needs analysis: Stage 1 Report: "Are new developments cleaning up the Cooks River or creating more problems?" Final	2016	Cobalt 59	Report	Review in Further Detail	The report provides a baseline evaluation of the capacity of the Cooks River Councils within a critical systems area (planning assessment in relation to water management) and provides a training assessment that will assist in developing this capacity.	Makes recommendations for adaptions to SEPP< LEP, DCP, and training recommendations.	
060 - 0	\\bmt-ntl-fs01\wate	Riverscience Ecological Monitoring Program (Cooks River) Comparison of Hard Substrate Organism Photographs (2005/06-2007)	2008	Ecological Australia	Report	Potentially worth reviewing for specific details	The results from the Hard Substrate monitoring component of the River Science Monitoring program after two round of monitoring. Hard substrate organisms are monitored using photographic analyses.	Overall the hard substrate communities of the Cooks River have not changed dramatically between 2005-06 and 2007. Hard substrates continue to be dominated by green filamentous ("turf") algae, Sydney Rock Oysters, Barnacles and Gastropods (snails).	
060 -1	\\bmt-ntl-fs01\wate	Cooks River Ecological Monitoring Program RiverScience Interpretation Project	2007	AHA Ecology	Report	Review in Further Detail	The report outlines what the RiverScience Project is and provides an explanation of indicator species. It also identifies the ecological importance of habitats and trends along the river.	The results indicate that greater flushing of the lower estuary sites does not relate to the health of the ecological variables within these sites as many of these areas are heavily polluted and highly modified, instead scores of the ecological variables are increased at sites with lower levels of pollution and at sites which have available habitat.	
060 - 2	\\bmt-ntl-fs01\wate	Cooks River Ecological Monitoring Program - Phase 1, Pilot Study and Monitoring Program Design	2006	ACU National	Report	Potentially worth reviewing for specific details	Through a review of the literature, an assessment of standard ecology methods and a pilot study, a comprehensive monitoring program was developed for the Cooks River.	The adaptive monitoring design incorporates the latest ecological knowledge and techniques	

060 - 3	\\bmt-ntl-fs01\wate	RiverScience Ecological Monitoring Program (Cooks River) Round 3 Monitoring December 2008	2009	Ecological Australia	Report	Potentially worth reviewing for specific details	The third round of annual RiverScience monitoring. Key indicators were measured, including benthic invertebrate diversity and abundance, crab abundance and colonisation of hard substrates. Mangrove and saltmarsh communities were also monitored.	The results indicated that Overall the Cooks River is in poor ecological health. It has low diversity and abundance of organisms compared to other estuarine systems in the Sydney region. However, diversity and abundance of benthic invertebrates was higher in 2008 than in the previous years. Some sites have no organisms living in the benthos or very limited colonisation of hard substrates. Despite the overall degraded nature of the Cooks River, the system has some positive attributes that are noteworthy. These include stable crab populations, healthy saltmarshes and mangrove forests and several species of shorebirds using the site.
060 - 4	\\bmt-ntl-fs01\wate	RiverScience Ecological Monitoring Program (Cooks River) Round 2 Monitoring December 2007	2008	Ecological Australia	Report	Potentially worth reviewing for specific details	Results from the second year of monitoring under RiverScience protocol.	Overall the Cooks River is in poor ecological health. It has very low diversity and abundance of organisms compared to other estuarine systems in the Sydney region. Furthermore, diversity and abundance of benthic invertebrates was lower in 2007 than in the previous year. Some sites have no organisms living in the benthos or very limited colonisation of hard substrates. Despite the overall degraded nature of the Cooks River, the system has some positive attributes that are noteworthy. These include increasing crab populations, healthy saltmarshes and mangrove forests and several species of shorebirds using the site.
060 - 5	\\bmt-ntl-fs01\wate	A comprehensive reference list of scientific and technical literature regarding the Cooks River	2005	George Kollias	Resource List	Potentially worth reviewing for specific details	A comprehensive reference list of scientific and technical literature regarding the Cooks River	This literature search found a total of 170 references regarding the Cooks River. Forty three (43) of the articles found were relevant to the indicators of the ecological monitoring program.
060 - 6	\\bmt-ntl-fs01\wate	Riverscience cooks river ecological monitoring program, report card 2007	2007		Report Card	Potentially worth reviewing for specific details	Report Card summarising the 2007 RiverScience Monitoring Program results for the 8 sites across a full range of river habitats: General river health, mangrove and saltmarsh health.	The Cooks River is in poor ecological health. There is very low diversity and abundance of organisms compared to other estuarine systems in the Sydney region. Due to the fragile nature of saltmarsh and the slow rate of change in the mangroves, monitoring of these habitats is scheduled every 4 years.
060 - 7	\\bmt-ntl-fs01\wate	Riverscience cooks river ecological monitoring program, report card 2008	2008		Report Card	Potentially worth reviewing for specific details	Report Card summarising the 2008 RiverScience Monitoring Program results for the 20 sites across a full range of river habitats: General river health, mangrove and saltmarsh health.	The Cooks River is in poor ecological health. There is very low diversity and abundance of organisms compared to other estuarine systems in the Sydney region. Sediment quality is poor at many of the upstream monitoring sites.
061	\\bmt-ntl-fs01\wate	Sydney Water Clean Waterways Project Reports	1992		Report	Potentially worth reviewing for specific details	List of reports as part of Sydney Water Clean Waterway Projects.	
062	\\bmt-ntl-fs01\wate	Sydney Water Reference Collection		Annette Williams - Sydney Water	Resource List	Potentially worth reviewing for specific details	List of references related to the Cooks River from the Sydney Water Library and information service	
063 - 0	\\bmt-ntl-fs01\wate	Sydney Airport Environment Strategy 2019-2024 Preliminary Draft	2018	Sydney Airport	Planning Instrument	Potentially worth reviewing for specific details	This strategy document sets the strategic direction for environmental management at the airport over a five year period and replaces the Environment Strategy 2013-2018. The strategy covers all ground-based environmental aspects associated with the operation of the airport. The management of these specific environmental aspects is outlined in separate environmental action plans.	
063 - 1	\\bmt-ntl-fs01\wate	Sydney Airport Master Plan 2039		Geoff Culbert	Planning Instrument	Potentially worth reviewing for specific details	Master Plan 2039 provides a strong planning framework for Sydney Airport consistent with regional economic conditions and major infrastructure delivery strategies in and around the airport. It delivers a flexible plan for Sydney Airport that can adapt to changing conditions in the economy and aviation industry more broadly. In addition to being a plan that positions Sydney Airport for growth, Master Plan 2039 is a statutory document prepared in accordance with the requirements of the Commonwealth Airports Act 1996.	
063 - 2	\\bmt-ntl-fs01\wate	Master Plan 2039 Frequently Asked Questions			Planning Instrument	Potentially worth reviewing for specific details	Master Plan 2039 Frequently Asked Questions	
063 - 3	\\bmt-ntl-fs01\wate	Sydney Airport Master Plan 2039 Future Development of the Airport			Planning Instrument	Potentially worth reviewing for specific details	Summary Document about the future development at the airport as per the Master Plan 2039 which focuses on addressing the challenge of demand through sensible and responsible growth	
063 - 4	\\bmt-ntl-fs01\wate	Sydney Airport Master Plan 2039 Environment Strategy			Planning Instrument	Potentially worth reviewing for specific details	Summary of the Environment component of the Master Plan 2039. Master Plan 2039 sets out what Sydney Airport is intending to achieve to manage and minimise environmental impacts. It includes a separate Environment Strategy 2019-2024 setting out detailed action plans for the next five years.	
063 - 5	\\bmt-ntl-fs01\wate	Sydney Airport Wildlife Management Plan	2010		Planning Instrument	Potentially worth reviewing for specific details	PowerPoint presentation about the Sydney Airport Wildlife management plan.	
064	\\bmt-ntl-fs01\wate	Environmental Science: Water Research & Technology	2016		Report	Potentially worth reviewing for specific details	This report the first study describing the geographic distribution of four parabens in the urban waterways of Sydney. Sydney has separated stormwater and wastewater systems giving it international relevance.	Differences in paraben concentrations were identified between stormwater, rivers, and in relation to land uses that have implications for urban water management and highlight areas for further investigation.
065	\\bmt-ntl-fs01\wate	Botany Bay Western Foreshore Coastal Hazard Risk Assessment & Management Options Study	2013	BMT WBM	Report	Potentially worth reviewing for specific details	The report presents the results of hydrodynamic and coastal process modelling of Botany Bay and includes a risk assessment of current and future permanent and episodic oceanic inundation levels within Botany Bay and Cooks River and its tributaries using a first pass 'bath tub' analytical approach.	

Data Availability Surveys

BMT

Cooks River CMP Scoping Study
Data availability survey

Organisation	Cooks River Alliance		Port Authority of New South Wales		Randwick City Council		Inner West Council	
Datasets	Do you own / collect this data?	Can you provide details? (e.g. dates, data coverage, locations…)	Do you own / collect this data?	Can you provide details? (e.g. dates, data coverage, locations…)	Do you own / collect this data?	Can you provide details? (e.g. dates, data coverage, locations…)	Do you own / collect this data?	Can you provide details? (e.g. dates, data coverage, locations…)
Topography (Lidar, ALS)	No-SWC &MWH+PB	Cooks River Flood study 2009 GIS data-100yrARI velocity and depth, Asset data, Catchment delineation, DEM, Flood surfaces	Yes	Beach profile surveys of Foreshore Beach	Yes	Last run was 2014 for all of LGA	Yes (some)	Topography (Lidar, ALS) Yes (some) LIDAR for some parts of Marrickville and Leichhardt, Contours 2m and 10m (IWC) LIDAR data was collected in the recently completed catchment management studies (2015-16) for Marrickville LGA, I assumed the data is also available for other two LGAs captured for catchment studies. The data covered the upper catchments with some limited coverage along the Cooks River and along the Parramatta River. Sydney Water did a flood study in the Cooks River Catchment in 2009, possibly has LIDAR data along the mainstream of the river system.
Bathymetry / hydrosurvey	Yes	CRA River Health technical report 2013-14 Cooks River health report 2014-15 CRA Health report card 2016 2016-17 River health Grades and Report Card Summaries	Yes	Hydrographic survey data collected by Port Authority for Foreshore Beach and many other areas of Botany Bay	No		No, Council may have some limited data, possibly obtained from Sydney Water and RMS and other sources.	May be available through Sydney Water flood study of Cooks River
Water quality monitoring data	No-SWC Yes	Water quality No SWC Wet weather overflows Risk assessment process overview INVESTIGATION INTO SUITABLE SWIMMING SITES ON THE COOKS RIVER BMT - River Health and RiverScience Monitoring Programs Review Reference: R.S20056.001.02.docx Date: June 2014	Yes	pH; TSS; Conductivity; Biological oxygen demand; dissolved oxygen; temperature; photosynthetically active radiation; total nitrogen; total phosphorous; chlorophyll a in 2012, 2013, 2014 and 2015 at sample locations off Foreshore Beach, in Penrhyn Estuary and off of Port Botany	No	Most sites covered by EPA Beachwatch, Sydney Water or Commonwealth monitoring programs	No	
Habitat mapping or data, e.g. EECs, macrophytes, riparian coverage, wetlands, threatened species, etc.	No - DPI Fisheries	Habitat mapping or data, e.g. EECs, macrophytes, riparian coverage, wetlands, threatened species, etc. No – DPI Fisheries DOCUMENTS, PHOTOGRAPHS, MAPS REVIEWING AND RESTORING FISH PASSAGE IN URBANISED WATERWAYS, SYDNEY CATCHMENTS Final Maps, Report, Site Photographs Date 2005	Yes	In Penrhyn Estuary, focussed mainly on saltmarsh	Yes	For Acacia terminalis ssp. terminalis; all other EEC data is from OEH.	Yes	Some habitat mapping, Bandicoot Protection Area, Marrickville Wildlife Corridor, Marrickville Priority Biodiversity Sites, Marrickville Vegetation Mapping (large trees, small trees, shrubs, grass areas), GreenWay Corridor, WSUD-Raingardens.
Erosion mapping or data (including nourishment / erosion control actions)			No	But we have data on beach profile surveys as above	No		No	
Flood mapping	No-SWC &MWH+PB	Cooks River Flood study 2009	No		Yes	Green Square and west Kensington 2011;	Yes	Flood mapping Yes Cooks River Flood Risk Management Plan 2013, Cooks River Flood Study 2009, DCP Flooding (IWC) The flooding mapping data is available only within the completed catchment studies (covering the upper parts of the catchment and its outlets with the receiving waters). The flood study report completed for the Cooks River Catchment (2009) has mapped flooding conditions.
Storm surge / ocean inundation mapping			No		Kensington		No	
Sea level rise inundation mapping			No		Yes	Included in flood studies	Yes	The flooding maps produced in catchment management studies have some details on SLR.
Wave data measurements			Yes	Wind, wave and tide data for Botany Bay	Yes	Included in flood studies	No	Manly Hydraulic Laboratory has the data
Water level data (tides, etc)			Yes	See above	No		No	Manly Hydraulic Laboratory has the data
Other?	Yes	Climate change Yes Climate Change Adaptation Solutions for the Cooks River Alliance 2016 - Macquarie University			No		Yes	Acid Sulfate Soils
Assets	Do you own / manage these assets?	Are the assets mapped (e.g. a GIS database)?	Do you own / manage these assets?	Are the assets mapped (e.g. a GIS database)?	Do you own / manage these assets?	Are the assets mapped (e.g. a GIS database)?	Do you own / manage these assets?	Are the assets mapped (e.g. a GIS database)?
Stormwater (Pipe, outlets, culverts etc)	No		No	Sydney Water stormwater outlets along Foreshore Beach incorporated into the new groynes; two stormwater outlets into Penrhyn Estuary	Yes	Yes	Yes	GIS
Wastewater (pipes, pump stations, etc)	No		No		No	We have some GIS mapping of pipes.	No	Sydney Water
Water (pipes, reservoirs, etc)	No		No	Other than reticulation of water at the public boat ramp by Port Botany	No	We have some GIS mapping of pipes.	No	
Coastal structures e.g. revetments, groynes, seawalls, etc	No		Yes	Three groynes recently installed at Foreshore Beach and an older groyne at the mouth of the Mill Stream between Foreshore Beach and the airport	No	Not mapped as below mean high water line.	No	
Airport (land area)	No		N/A		No	No	No	
Council buildings, e.g. community halls, libraries, scout halls, surf clubs, etc	No		No		Yes	Yes	Yes	
Railways, railway stations, etc	No		No		No	None in LGA	Yes	
Hospitals, schools, nursing homes	No		No		No	Yes	Yes	
Waterway infrastructure such as wharves, jetties, boat ramps, etc	No		Yes	Public boat ramp by Port Botany	Yes	Yes	No	
Roads: major, arterial	No		No		No	Yes	Yes	
Roads: minor, local	No		No		Yes	Yes	Yes	
Shared paths / cycleways	No		Yes	Pedestrian / cycle path along Foreshore Beach and into Penrhyn Estuary	Yes	Yes	Yes	
Walking trails / tracks	DIPNR	Recreational trails framework/southern Sydney Region map DIPNR 2005	No		Most except for NPWS land	Yes	No	
Parks, playgrounds, sportsgrounds	No		No		Most except for some Crown Land	Yes	Yes	
National parks, nature reserves	No		No		No	Can get access to data through NPWS	Nil	
Council natural areas / reserves	No		No		Yes	Flora and fauna species lists, weed lists updated annually.	Yes	Bushcare Sites
Heritage assets	No		Yes	Port Botany Old Government Wharf Remains SHI 4560021; Henry Head Lighthouse SHI 4560009	Yes	Details of al heritage items local and state and of conservation areas.	Yes	

Canterbury Bankstown Coucnil		City Of Sydney Council		Bayside Council		DPI Fisheries	
Do you own / collect this data?	Can you provide details? (e.g. dates, data coverage, locations…)	Do you own / collect this data?	Can you provide details? (e.g. dates, data coverage, locations…)	Do you own / collect this data?	Can you provide details? (e.g. dates, data coverage, locations…)	Do you own / collect this data?	Can you provide details? (e.g. dates, data coverage, locations…)
Yes	Topography (Lidar, ALS) Yes Two sets of LIDAR are currently sitting in the ftp BMTWBM folder – under Northern Offices Flood Study RVA. Both are dated 2009.	Have access to data	3D model with 1m contours	Partial	Lidar is available		
No		Unsure	16 GB for flood model. Will require signing of form to request data and will need a 500 GB hard drive. Usually a cost.	No			
	Water quality monitoring data River health report cards and supporting reports. Looks like there are reports for 2011-12, 2013, 2016. In 2013, a Beach watch report prepared.	Unsure	* need to ask Urban Ecologist at City of Sydney	Yes	Sir Joseph Banks Pond https://www.rockdale.nsw.gov.au/environment/Pages/Environment_WaterQuality.aspx		
	Habitat mapping or data, e.g. EECs, macrophytes, riparian coverage, wetlands, threatened species, etc. A lot of habitat mapping was undertaking for the biodiversity strategy and is available in GIS format. Gough Whitlam Salt Marsh monitoring 2012-2016 Cup and Saucer Creek Plan of Management	Unsure	*need to ask Urban Ecologist at City of Sydney	Yes		yes	Estuarine macrophyte mapping: last mapped 2008, available on Fisheries spatial data portal https://www.dpi.nsw.gov.au/content/research/areas/aquatic-ecosystems/estuarine-habitats-maps/IINSW_EstMac_map40.pdf
No	Erosion mapping or data (including nourishment / erosion control actions) No erosion mapping. However there have been a lot of bank works: • Bank restoration c2007/2008 at Gough Whitlam park (proposed designs available) • Bank protection works around Bankside Avenue Earlwood • Bank protection works at Undercliff Road near Illawarra Road Earlwood • Sheet pile semi removal and bank naturalisation works at Permanent Ave Earlwood , and Tennent Pde Hurstone Park • Concrete bank removal and bank naturalisation at Berna St Canterbury and Gornall Ave Earlwood	Unsure	* need to ask Urban Ecologist at City of Sydney	No			
Yes	Flood mapping Yes • Greenacre Park, BMT WBM, December 2009 (prepared for BCC) • Rookwood Road, BMT WBM, July 2010 (prepared for BCC) • Cooks River, BMT WBM, November 2012 (prepared for BCC) • Punchbowl, November 2012 (prepared for BCC) • Overland Flow Study Cooks River Catchment, Cardno 2016 (prepared for CCC) • Wolli Creek Flood Study, HydroStorm Consulting, 2014 (prepared for CCC) • Cooks River Flood Study, PB MWH Joint Venture, February 2009 (prepared for Sydney Water). BMT WBM Northern offices have been engaged to do a Cooks River Flood Studies Review Verification and Alignment. Contact: Zita Dore / Anne Kolega to access these studies or for information on the review verification and alignment project.	Yes	16 GB for flood model. Will require signing of form to request data and will need a 500 GB hard drive. Usually a cost.	Yes			
No		Yes	16 GB for flood model. Will require signing of form to request data and	Partial	Bayside East - for more info check http://www.botanybay.nsw.gov.au/Env		
No		Yes	16 GB for flood model. Will require signing of form to request data and will need a 500 GB hard drive. Usually a cost.	As Above	As Above		
No		Unsure		No			
Yes	Water level data (tides, etc) Yes Data is collected and managed by Manly Hydraulics Laboratory (MHL)	Unsure	Perhaps in flood model	No			
Do you own / manage these assets?	Are the assets mapped (e.g. a GIS database)?	Do you own / manage these assets?	Are the assets mapped (e.g. a GIS database)?	Do you own / manage these assets?	Are the assets mapped (e.g. a GIS database)?	Do you own / manage these assets?	Are the assets mapped (e.g. a GIS database)?
Yes	Yes	Yes		Partial			
No		Yes		No			
No		Yes		No			
No		Unsure	Refer to RMS	Yes			
No	Nil Airports in catchment	N/A		No			
Yes	yes	Yes	List, not mapped. Incomplete.	Yes			
No		No	Refer to Transport for NSW	Yes			
No		No	Refer to NSW Health	Yes			
yes	Boat harbour Viewing platforms at Hurlstone Park and Earlwood possibly owned by Sydney Water	No	Refer to RMS	No			
yes	Regional roads	Yes	* need to contact Transport Data & GIS Analyst	Partial			
Yes	Yes	Yes	* need to contact Transport Data & GIS Analyst	Partial			
Yes	Yes	Yes	* need to contact Transport Data & GIS Analyst	Yes			
yes	Possible maps but not in asset register	Yes	* need to contact Transport Data & GIS Analyst	Yes			
Yes	yes	Existing Future and Planned	Existing – Asset Mgt System Administrator Future & Planned – Strategic Planning & Urban Design	Partial			
yes	Wolli creek NP	N/A		No			
Yes	yews	N/A		Yes			
Yes	possibly	Yes	LEP heritage list	No			

Cooks River Valley Association		Roads & Maritime Services – Maritime		Sydney Water		Strathfield Council		Wolli Creek Preservation Society	
Do you own / collect this data?	Can you provide details? (e.g. dates, data coverage, locations…)	Do you own / collect this data?	Can you provide details? (e.g. dates, data coverage, locations…)	Do you own / collect this data?	Can you provide details? (e.g. dates, data coverage, locations…)	Do you own / collect this data?	Can you provide details? (e.g. dates, data coverage, locations…)	Do you own / collect this data?	Can you provide details? (e.g. dates, data coverage, locations…)
		No		[Unsure]		Yes	Contour Map	no	
		No		[Unsure]		No		No	
Yes	Provided copy of data file on 31st July 2018 workshop	No		[Unsure]		Yes	Powells Creek, Saleyards Creek & Cox's Creek. Measurements taken once per month with records going back a few years.	some	Streamwatch data on their website
		No		Yes	[Unsure]	Yes	Two fauna reports: Bird Communities and Habitats in Strathfield Local Government Area 2007-2008 & The Fauna of Strathfield Council Local Government Area 2016. Mason Park plan of management & Cox's Creek plan of management for Mason Park and Cox's Creek respectively.	Council in consultatio n	Wolli Creek Riparian Managemen Plan Bayside and Canterbury – Bankstown Wolli Creek Grey-headed Flying-fox management plan
		No		No		No		no	Waterworth Park bank stabilisation and salt marsh, Ripparian planting at Turrella Reserve,
		No		Yes	Cooks River Flood Study, 2009 (completed by MWH+PB). Mainstream flooding for Cooks River and tributaries.	Yes	Cooks River & Coxs Creek Flood Study completed 2010	no	Council
		No		No		No		no	Council
		No		No		No		no	?
		No		No		No		no	
		No		No		No		no	
						No			
Do you own / manage these assets?	Are the assets mapped (e.g. a GIS database)?	Do you own / manage these assets?	Are the assets mapped (e.g. a GIS database)?	Do you own / manage these assets?	Are the assets mapped (e.g. a GIS database)?	Do you own / manage these assets?	Are the assets mapped (e.g. a GIS database)?	Do you own / manage these assets?	Are the assets mapped (e.g. a GIS database)?
		No		Yes	Yes	Yes	Yes (pits and pipes)	no	Bray Ave Wetland area, Johnstone Creek Raingarden Highcliff Rd Raingarden and GPT, S.J Harrison Reserve GPT and swale.
		No		Yes	Yes	No		no	Couple of sewer outlets in the park that poo with heavy rain
		No		Yes	Yes	No		no	
		Yes	Under the RMS Property Division in Botany Bay Only	No				no	Waterworth Park bank stabilisation and salt marsh
		No		No				no	
		No		No		Yes	Yes	no	
		No		No		Yes	Yes	no	
		No		No		Yes	Yes	no	
		Yes	Under the RMS Property Division in Botany Bay Only	No				no	Need one – kayak landing at Turrella Reserve
		No		No		Yes	Yes	no	
		No		No		Yes	Yes	no	
		No		No		Yes	Yes	no	
		No		No		Yes	Yes	no	
		No		No		Yes	Yes	no	
		No		No		Yes	Yes	no	
		No		No		Yes	Yes	no	
		No		Yes	Yes	Mostly private	Yes built heritage. No aboriginal heritage.	no	

Greater Sydney Local Land Services		National Parks and Wildlife Service / OEH		Burwood Council					
Do you own / collect this data?	Can you provide details? (e.g. dates, data coverage, locations…)	Do you own / collect this data?	Can you provide details? (e.g. dates, data coverage, locations…)	Do you own / collect this data?	Can you provide details? (e.g. dates, data coverage, locations…)	Do you own / collect this data?	Can you provide details? (e.g. dates, data coverage, locations…)	Do you own / collect this data?	Can you provide details? (e.g. dates, data coverage, locations…)
		No		No					
		No		No					
		No		No					
		Yes	Flora and Fauna records (not all mapped - ArcMap) Grey-headed Flying Fox numbers are collected by Wolli Creek Preservation Society	No					
		No		No					
No	Cooks River Flood Study, Sydney Water (Parsons Brinckerhoff Australia Pty Ltd) – November 2008 Sydney Water Corporation, Sydney Water (PB MWH Joint Venture) – February 2009	No		Yes	Draft Flood studies for LGA are currently on exhibition and available online.				
		No		No					
		No		No					
		N/A		No					
		No		No					
Yes	Cooks River Waterway Index Report - June 2014 - prepared by Alluvium								
Do you own / manage these assets?	Are the assets mapped (e.g. a GIS database)?	Do you own / manage these assets?	Are the assets mapped (e.g. a GIS database)?	Do you own / manage these assets?	Are the assets mapped (e.g. a GIS database)?	Do you own / manage these assets?	Are the assets mapped (e.g. a GIS database)?	Do you own / manage these assets?	Are the assets mapped (e.g. a GIS database)?
		No		Yes	GIS Database				
		No		No	No				
		No		No	No				
		No		No	No				
		No		No	No				
		No		Yes	GIS Database				
		No		No	Yes – GIS database – data from LPI				
		No		No	Yes – GIS database				
		No		No	No				
		No		No	GIS Database				
		Yes	La Perouse (Henry Head Lane) local crown road / Laperouse and Malabar Fire Management trails	Yes	GIS Database				
		No		Yes	GIS Database				
		Yes	Yes - AMS	Yes	GIS Database				
		No data	Turrella Reserve playground	Yes	GIS Database				
		Yes	Kamay Botany Bay NP – La Perouse / Wolli Creek Regional Park	No	No				
		No		No					
		Yes	La Perouse Museum (Leased) / Bare Island / Cape Banks / Malabar / Coast Hospital Cemetery / Fortifications– HHIMS / AHIMS	Yes	GIS database – LEP Heritage items and conservation areas				

Appendix E Governance, Policy and Legislation Additional Information

Tabled Review of Governance, Roles and Responsibilities

Table E-1 Cooks River Catchment Governance: Organisations and Responsibilities

Govt Level	Agency / Organisation	Responsibility: Agency / Organisation
Federal	Australian Defence Force	• The military organisation responsible for defence in Australia, and forms the Maritime Border Command in partnership with the Department of Immigration and Border Protection. • In partnership with the Department of Defence, makes up the Australian Defence Organisation.
Federal	Australian Maritime Safety Authority (AMSA)	• Established by the *Australian Maritime Safety Authority Act 1990* • Administers the *Protection of the Sea Act 1983* • Co-ordinates maritime safety, including environmental management and pollution prevention
Federal	Department of Agriculture	• Designs and implements Australian Government policy, programs and services improve the productivity, competitiveness and sustainability of the food and agriculture industry. • Administers all biosecurity threats and associated quarantine services. It is responsible for the monitoring of all vessels scheduled to enter and leave Australian waters, including Botany Bay.
Federal	Department of Immigration and Border Protection Command	• Department staff work with the Australian Defence Force to form the Maritime Border Command.
Federal	Department of Infrastructure and Regional Development	• Responsible for administration of the *Protection of the Sea (Prevention of Pollution from Ships) Act 1983*
Federal	Civil Aviation Safety Authority	Government body that regulates Australian aviation safety and the operation of Australian aircraft overseas. Licencing pilots, registering aircraft, oversee aviation safety and promote safety awareness. Roles described in Civil Aviation Act 1988
Federal	Department of the Environment and Energy	• 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 *Environmental Protection and Biodiversity Conservation Act 1999* • Projects listed Threatened species occurring in and around Cooks River catchment • No Heritage items of national environmental significance within the Cooks River Catchment

Govt Level	Agency / Organisation	Responsibility: Agency / Organisation
Federal	Maritime Border Command	• Australia's lead civil maritime security authority that operates primarily offshore to safeguard Australia's maritime jurisdiction.• Comprises staff from the Department of Immigration and Border Protection, and the Australian Defence Force.• Has various roles and responsibilities, including to counter civil maritime security threats such as illegal activity in protected areas, illegal exploitation of natural resources, marine pollution and compromises to bio-security.• Liaises with a range or partner agencies including the Australian Fisheries Management Authority and the Australian Maritime Safety Authority.
Federal	National Health and Medical Research Council	• 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 Health	• Department of Health has a diverse set of responsibilities centred around improving the health and wellbeing of all Australians both now and in the future. They provide evidence-based policy advice, program management, research and regulation.
State	Department of Industry	• Supports the growth and advancement of globally competitive and sustainable NSW industries to attract investment increase trade and create new jobs.
State	Department of Industry, Crown Lands and Water	• Agency within the Department of Industry. • 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 *Crown Land Management Act 2016 (as at 2 July 2018),* which provides for ownership and management of NSW Crown land.• Administrator for Crown land within the catchment area out to 3 nautical mile limit off Botany Bay. • Many Crown reserves are managed by Local Government either through appointment as trust managers or by devolvement under the *Local Government Act 1993*.• Approves jetties and other domestic waterfront structures on estuaries not covered by other agencies.• Investigates and assesses Aboriginal land claims across the state under the *NSW Aboriginal Land Rights Act 1983*. 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 *Water Management Act, 2000*.

Govt Level	Agency / Organisation	Responsibility: Agency / Organisation
State	Department of Industry, Regional Development Advisory Council - Sydney	• 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 Sydney is one of 14 committees in NSW and covers the Greater Sydney region • RDA Sydney's purpose is to build partnerships between governments, key regional organisations, local businesses, community groups and key regional stakeholders to provide strategic and targeted responses to economic, environmental and social issues affecting Sydney. • RDA Sydney believes ongoing, economic analysis for the "Whole of Sydney" Metropolitan Region is critical for current and future planning and decision making.
State	Department of Planning, Industry and Environment (DPIE)	• State government department tasked at making NSW a great place to live and work, by providing homes and services, building communities, creating jobs and protecting the environment • Is affiliated with multiple agencies that have various roles and responsibilities in managing Cooks River catchment, including: • Environment, Energy and Science (EES) • Office of Local Government • Urban Growth NSW • Environment Protection Agency
State	Department of Planning, Industry and Environment, Environment, Energy and Science (EES)	• Agency within the Department of Planning, Industry and Environment portfolio.• 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 *Biodiversity Conservation Act 2016,* which establishes a balanced approach to land management and biodiversity conservation in NSW• Administers the *Coastal Management Act 2016*, 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
State	Department of Planning, Industry and Environment, Office of Local Government	• Agency within the Department of Planning, Industry and Environment portfolio • 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 *Local Government Act 1993*, which provides the legal framework for the system of local government for New South Wales.

Govt Level	Agency / Organisation	Responsibility: Agency / Organisation
State	Department of Primary Industries, Biosecurity and Food Safety	• Agency within the Department of Primary Industries. • Responsible for the protection of the NSW economy, environment and community from biosecurity and food safety risks. • Administers the *Biosecurity Act 2015*, which provides flexible and responsive statutory framework to manage biosecurity risks from animal and plant pests and diseases, weeds and contaminants, for the benefit of the NSW economy, environment and community.
State	Department of Primary Industries, Fisheries	• Agency within the Department of Primary Industries • Administers the *Fisheries Management Act 1994*, 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. No marine protected areas within Cooks Catchment study area. • In Botany Bay / Cooks River, undertakes compliance of recreational fishing and assessing development applications within waterway (e.g. jetties).
State	Destination NSW	• 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	Greater Sydney Commission	• The Greater Sydney Commission is an independent organisation funded by the NSW Government that has a specific role in coordinating and aligning planning for Greater Sydney. • They are responsible for leading and guiding the planning for development, transport and housing to ensure a productive and sustainable city. • Developed the Eastern City and South District Plans • Leading Collaboration Areas within the Cooks Catchment in 2018 – 2019 including: Bankstown-Lidcombe an emerging health and education precinct, the Bankstown Airport – Milperra Industrial Collaboration Area and the Kogarah health and education precinct

Govt Level	Agency / Organisation	Responsibility: Agency / Organisation
State	Independent Pricing and Regulatory Tribunal (IPART)	• 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 Sydney Waters operating licence every 5 years.
State	Infrastructure NSW	• Infrastructure NSW is an independent statutory agency tasked with identifying and prioritising the delivery of critical public infrastructure for NSW. • Infrastructure NSW is involved in implementation of the Port Botany-Sydney Airport precinct strategy.
State	Local Government NSW	• Local Government NSW is the industry association that represents the interests of NSW general and special purpose councils.
State	Local Land Services (LLS)	• 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 Greater Sydney. • The *Local Land Service Act 2013* requires the development of regional strategies to set the vision, priorities and strategy for the delivery of LLS in each region. Greater Sydney Local Land Services consulted with landholders, customers and the community to develop their local strategic plan. The plan was adopted in the first half of 2016 for the period from 2016 to 2020. • 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.
State	Marine Estate Management Authority	• The NSW Government Marine Estate Management Authority assist in ensuring 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 Marine Estate Management Act 2014 and Marine Estate Management Regulation 2017 provides for the strategic and integrated management of the whole marine estate.
State	National Parks and Wildlife Service (NPWS)	• 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 of Wolli Creek Regional Park within Cooks River catchment.

Govt Level	Agency / Organisation	Responsibility: Agency / Organisation
State	NSW Coastal Council	• The NSW Coastal Council provides independent expert advice to the Minister administering the *Coastal Management Act 2016* on coastal planning and management issues. • The NSW Coastal Council was appointed under the *Coastal Management Act 2016 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.
State	NSW Environment Protection Authority	• 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 Protection of the Environment Operations Act 1997.
State	NSW Land Registry Services (LRS)	• The NSW LRS is 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	Port Authority of NSW	• Port Authority of New South Wales is a state-owned corporation that manages and develops port facilities and services to cater for the existing and future commercial shipping needs of the State of NSW. Operating under the Ports and Maritime Administration Act 1995 they manage the navigation, security and operational safety needs of commercial shipping including Port Botany including the role of Harbour Master in all NSW ports NB - NSW Ports is a consortium of leading institutional investors and is the Port Operator for Port Botany (and Port Kembla) as well as Cooks River / Enfield Intermodal terminals. NSW Ports
State	Sydney Water	• Sydney Water supplies water, wastewater, recycled water and some stormwater services to the people in Sydney, the Illawarra and the Blue Mountains. Their operating licence sets out standards and requirements they must meet as a water utility. • Sydney Water operates wastewater treatment plants and deep-water outfalls at North Head, Bondi and Malabar.

Govt Level	Agency / Organisation	Responsibility: Agency / Organisation
State	Transport for NSW	• 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 driving, maritime activities, cycling and walking)
State	Treasury	• 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	UrbanGrowth NSW Development Corporation (previously part of Urban Growth NSW)	• UrbanGrowth NSW Development Corporation is responsible for promoting, co-ordinating, managing and securing the economic development of five growth centres across metropolitan Sydney, including within the catchment the Redfern- Waterloo and Cooks Cove
Local	Local Aboriginal Land Councils (LALC) • Metropolitan LALC • La Perouse LALC • Gandangara LALC	• LALCs established following the *Aboriginal Land Rights Act 1983 (ALRA)* • LALCs 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	Local Government Areas administering lands within the Cooks River Catchment	• 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.* • Councils are responsible for administering various legislation and developing their own plans and policies for their LGA (i.e. LEPs, CMPs etc). • Councils have key responsibilities in relation to Coastal Zone Management in Sydney including: land use planning, development approval, water quality and pollution regulation, open space and stormwater management etc.
Local	Cooks River Alliance (Bayside, Canterbury-Bankstown, Inner West, and Strathfield)	• The Cooks River Alliance is a partnership of four councils – Bayside, Canterbury-Bankstown, Inner West, and Strathfield –The Alliance is working together with communities for a healthy Cooks River Catchment. • The Alliance operates at the elected and staff levels via three key governance committees: the Board, the Executive Committee, and the Steering Committee.

Govt Level	Agency / Organisation	Responsibility: Agency / Organisation
		• The Alliance has established Catchment Advisory Group made up of Council, state agencies, key asset owners and community groups to advise the development of the Cooks River Coastal Management Program.
Local	Georges River Keeper (Georges River Combined Council's Committee Incorporated (GRCCC) *(Bayside Council, Campbelltown City Council, City of Canterbury Bankstown, Fairfield City Council, Georges River Council, Liverpool City Council, Sutherland Shire Council and Wollondilly Shire Councils)*	Georges Riverkeeper's role is to work with member councils to look after the Georges River by undertaking activities within five main Programs to guide best practice management to protect natural resources and improve liveability along the Georges River.
Local	Southern Sydney Regional Organisation of Councils (SSROC) *(Bayside, Burwood, Canterbury Bankstown, City of Canada Bay, City of Sydney, Georges River, Inner West, Randwick City, Sutherland Shire, Waverley and Woollahra Municipal Councils).*	• SSROC is an association of 11 councils aiming to serve large and diverse communities and work together to address the challenges and utilise the opportunities of a metropolitan city. This includes waterways and land fronting Sydney Harbour.
Local	Sydney Coastal Councils Group (SCCG) *(Bayside, Inner West, Northern Beaches, North Sydney, Randwick City, Sutherland Shire, Waverley, Willoughby City and Woollahra Municipal)*	• The Sydney Costal Councils Group is a co-operative organisation responsible for leading sustainable management of the coastal and estuarine environment across Sydney. • They provide advocacy, facilitate and promote collaboration and capacity building between member Councils and identify and adders current and emerging regional coastal issues.

Key Commonwealth Legislation Supporting Coastal Management

Environment Protection and Biodiversity Conservation Act 1999

The *Environment Protection and Biodiversity Conservation Act 1999* (the EPBC Act) is Australia's key piece of environmental legislation focusing on the protection of matters of national environmental significance (MNES). It provides the legal framework for the protection and management of nationally and internationally important flora, fauna, ecological communities and heritage places.

The nine MNES to which the EPBC Act applies are:

- world heritage properties
- national heritage places
- wetlands of international importance (often called 'Ramsar' wetlands)
- nationally threatened species and ecological communities
- migratory species
- Commonwealth marine areas
- the Great Barrier Reef Marine Park
- nuclear actions (including uranium mining)
- a water resource, in relation to coal seam gas development and large coal mining development

Additionally, the EPBC Act confers jurisdiction over actions that have a significant environmental impact where the actions affect or are taken on Commonwealth land or are carried out by a Commonwealth agency (even if the significant impact is not on a MNES).

The EPBC Act is administered by the Australian Government Department of the Environment and Energy.

Key NSW Legislation Supporting Coastal Management

Environmental Planning & Assessment Act 1979

The *Environmental Planning and Assessment Act 1979* (EPA Act) is the key NSW legislation for planning and land use. The Act provides a system of environmental planning and assessment for NSW, and involves developing plans to regulate competing land uses, through 'environmental planning instruments. The EPA Act establishes three types of environment planning instruments (EPI):

- Local Environmental Plans;
- Regional Environmental Plans; and
- State Environmental Planning Policies.

The objectives of the EPA Act are to encourage:

- proper management, development and conservation of natural and artificial resources, including agricultural land, natural areas, forests, minerals, water, cities, towns and villages for the purpose of promoting the social and economic welfare of the community and a better environment;

- promotion and co-ordination of the orderly and economic use and development of land;
- protection, provision and co-ordination of communication and utility services;
- provision of land for public purposes;
- provision and co-ordination of community services and facilities;
- protection of the environment, including the protection and conservation of native animals and plants, including threatened species, populations and ecological communities, and their habitats;
- ecologically sustainable development;
- the provision and maintenance of affordable housing;
- promotion of the sharing of the responsibility for environmental planning between the different levels of government in the State; and
- provision of increased opportunity for public involvement and participation in environmental planning and assessment.

Approval processes for "development" and "works" in NSW are provided for in Part 3A, Part 4, Part 5 and Part 5A of the EPA Act. Key provisions are outlined briefly below.

Part 3A – Major Infrastructure and Other Projects

Part 3A came into operation in August 2005 and applies to development that is declared to be a project to which the part applies. A project can be declared by:

- A State Environmental Planning Policy (SEPP), with SEPP No. 71 – Coastal Protection of relevance to the coastal zone, or
- By order of the Minister for Planning published in the Government Gazette.

There are two types of development that may be declared for Part 3A approval (i.e. in addition to those directed to the Minister via a SEPP):

- Major infrastructure or other development that in the opinion of the Minister is of state or regional environmental significance, or
- Old Part 5 activity approvals where the proponent is the determining authority and an EIS would have been required.

Guidelines regarding Part 3A projects have been provided by DPIE. Part 3A of the AP&A Act has now been repealed, with the provisions largely incorporated into other planning instruments, such as *SEPP Infrastructure*.

Part 4 – Development Assessment

Part 4 of the EPA Act lays out the legislative regime for the standard process for lodgement and consideration of development applications. Part 4 processes essentially apply where the local authority (Council) is the consent authority.

The controls and permissibility for development of particular sites and / or uses are found in the Local Environment Plan (LEP) and Development Control Plan (DCP) (see following sections).

Part 5 – Environmental Assessment

Part 5 outlines the requirements for determining authorities to consider the environmental impact of activities, through an environmental assessment for the proposed activity. The environmental assessment shall outline the effect of the activity on critical habitat, endangered fauna, vulnerable species, conservation agreements (under the *National Parks and Wildlife Act 1974*), plans of management, wilderness areas (under the *Wilderness Act 1987*) and joint management agreements and bio-banking agreements under the *Threatened Species Act, 1995*, and any other legislation pertaining to the proposed activity.

Part 5 of the Act applies to proposed activities that are permissible without development consent under Part 4 of the EPA Act but require approval from a Minister or Public Authority, or is proposed to be carried out by a Minister or Public Authority (and Council is classified as a Public Authority).

Part 5 obliges the "determining authority" for the proposal to consider the environmental impact of any activity. A determining authority is the public authority which is required to approve an activity and can also be the public authority proposing to carry out the activity. For example, Council is permitted to undertake certain environmental management activities under SEPP (Infrastructure) 2007 without development consent, however may need to complete and environmental assessment under Part 5 of the EPA Act.

Part 5A (Development by the Crown) essentially provides a legislative regime for consideration of Development Applications made by, or for and on behalf of, the Crown.

The remaining parts of the EPA Act relate to: Part 6 – Implementation and Enforcement; Part 7 – Finance and Part 8 – Miscellaneous.

Draft Environment SEPP

The NSW Government is in the process of developing a new SEPP which will ensure the protection and management of the natural environment. The new Environment SEPP combine, repeal and replace the following:

- State Environmental Planning Policy No. 19—Bushland in Urban Areas
- State Environmental Planning Policy (Sydney Drinking Water Catchment) 2011
- State Environmental Planning Policy No. 50—Canal Estate Development
- Greater Metropolitan Regional Environmental Plan No. 2—Georges River Catchment
- Sydney Regional Environmental Plan No. 20—Hawkesbury-Nepean River (No.2-1997)
- Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005
- Willandra Lakes Regional Environmental Plan No. 1—World Heritage Property.

The purpose of the proposed SEPP Environment is to promote the protection and improvement of key environmental assets for their intrinsic value and the social and economic benefits they provide.

The SEPP (Environment) will have provisions set out under four parts, being:

(1) Catchments

(2) Waterways

(3) Bushland

(4) Protected Areas

It will incorporate revisions to current SEPPs to remove unnecessary or outdated policy, address emerging issues and locate provisions in the most appropriate level of the planning system. The proposed Environment SEPP will provide a consistent level of environmental protection to that which is currently delivered under the existing SEPPs.

Local Government Act 1993

The *Local Government Act 1993* (the LG Act) creates local governments and grants them the power to perform their functions, which involve management, development, protection, restoration, enhancement and conservation of the environment for the local government area. The functions of the local government are to be performed in a manner that are consistent with and promote the principles of ecologically sustainable development.

The service functions of local councils (defined in Chapter 6 of the LG Act) includes the classification, use and management of public land, including the objectives for management of the Community Land owned by Council (i.e. that is not Crown Land).

Plans of Management for Community Land need also to be prepared under Section 35 of the Act. Section 35 of the act provides that community land only be used in accordance with the plan of management applying to the parcel of community land; any law permitting the use of the land for a specified purpose or otherwise regulating the use of the land; and the provisions of Division 2 Chapter 6 of the Act.

Community land can be categorised into a range of categories under Section 36 of the Act, and each of these categories have their own core objectives specified under the Act. The categorisation of community lands is important as the Act requires Council to only grant a lease, licence or another estate (other than in respect of public utilities) for a purpose consistent with the core objectives of the category of that community land.

Crown Land Management Act 2016

The *Crown Land Management Act 2016* (the CLM Act) which commenced on 1 July 2018 implements reforms identified through a comprehensive review of Crown land management and follows almost six years of community engagement.

The objects of the CLM Act are to:

- *"provide for the ownership, use and management of the Crown land of New South Wales,*
- *provide clarity concerning the law applicable to Crown land,*
- *require environmental, social, cultural heritage and economic considerations to be considered in decision-making about Crown land,*
- *provide for the consistent, efficient, fair and transparent management of Crown land for the benefit of the people of New South Wales,*
- *facilitate the use of Crown land by the Aboriginal people of New South Wales because of the spiritual, social, cultural and economic importance of land to Aboriginal people and, where appropriate, to enable the co-management of dedicated or reserved Crown land,*

- *provide for the management of Crown land having regard to the principles of Crown land management".*

A key feature of the new CLM Act is the appointment of a Crown Land Commissioner with broad advisory and inquiry functions who will play a key role in maintaining transparency regarding Crown land management.

Fisheries Management Act 1994

The *Fisheries Management Act 1994* outlines legislation relating to the management of fishery resources in NSW. The aim of the *Fisheries Management Act 1994* is to conserve, develop and share the fishery resources of the State for the benefit of present and future generations.

The Act is divided into 10 parts and covers: fishery management strategies, general fisheries management, commercial share management fisheries, licensing and other commercial fisheries management, charter fishing management, co-operation with Commonwealth and other States in fisheries management, aquaculture management, protection of aquatic habitats, threatened species conservation, administration and enforcement.

The *Fisheries Management Act 1994* is administered by the Minister for Primary Industries.

Biodiversity Conservation Act 2016

The *Biodiversity Conservation Act 2016* (the BC Act) commenced on 25 August 2017 with the intent to maintain a healthy, productive and resilient environment for the greatest well-being of the community, now and into the future, consistent with the principles of ecologically sustainable development. The BC Act established a modern and integrated legislative framework for biodiversity conservation and repealed the previous *Threatened Species Conservation Act 1995*, the *Nature Conservation Trust Act 2001*, and the animal and plant provisions of the *National Parks and Wildlife Act 1974*. It is comprised of 14 parts including:

- Part 1: Preliminary
- Part 2: Protection of animals and plants
- Part 3: Areas of outstanding biodiversity value
- Part 4: Threatened species and threatened ecological communities
- Part 5: Investment Strategy and private land conservation agreements
- Part 6: Biodiversity offsets scheme
- Part 7: Biodiversity assessment and approvals under Planning Act
- Part 8: Biodiversity certification of land
- Part 9: Public consultation and public registers
- Part 10: Biodiversity Conservation Trust
- Part 11: Regulatory compliance mechanisms
- Part 12: Investigation powers
- Part 13: Criminal and civil proceedings
- Part 14: Miscellaneous

National Parks and Wildlife Act 1974

The *National Parks and Wildlife Act 1974* (NPW Act) is the NSW legislation in place to conserve the State's natural and cultural heritage, foster public appreciation, understanding and enjoyment of NSW's natural and cultural heritage and manage any lands reserved for those purposes.

The NPW Act is the main piece of legislation for managing and protecting Aboriginal cultural heritage with Part 6 of the Act providing protection for Aboriginal objects and places. All Aboriginal sites in NSW are protected under the NPW and it is an offence to damage or destroy them (this includes collecting artefacts) without prior permission.

Water Management Act 2000

The *Water Management Act 2000* (WM Act) establishes the principles and legislative framework governing water management in NSW. The WM Act aims to provide for the sustainable and integrated management of NSW water sources for the benefit of both present and future generations.

It includes requirements on water management planning, sharing, allocation and the use and the granting of access licences. The WM Act also defines what constitutes an offence. Examples of offences include taking water without an access licence, taking water for which there is no water allocation or contravening the terms and conditions of an access licence.

Local Land Services Act 2013

The *Local Land Services Act* (LLS Act) commenced on 1 January 2014, establishing Local Land Services and paving the way for the 11 regional Local Land Services organisations to begin operating. The LLS Act repealed the *Rural Lands Protection Act 1998*, the *Rural Lands Protection Amendment Act 2008* and the *Catchment Management Authorities Act 2003*.

The LLS Act identifies Local Land Services *"programs and advisory services associated with agricultural production, biosecurity, natural resource management and emergency management, including programs and advisory services associated with the following:*

(a) agricultural production,

(b) biosecurity, including animal pest and disease and plant pest and disease prevention, management, control and eradication,

(c) preparedness, response and recovery for animal pest and disease and plant pest and disease emergencies and other emergencies impacting on primary production or animal health and safety,

(d) animal welfare,

(e) chemical residue prevention, management and control,

(f) natural resource management and planning,

(g) travelling stock reserves and stock watering places,

(h) control and movement of stock,

(i) related services and programs".

The LLS Act designates local decision making and priority setting to Local Land Services.

Protection of the Environment Operations Act 1997

The *Protection of the Environment Operations Act 1997* (POEO Act) is the primary piece of legislation concerned with environmental protection in NSW and is administered by the NSW Environment Protection Authority (EPA). The POEO Act deals with the regulation and licensing of certain activities, issuing of environmental protection notices and conducting environmental audits and investigations.

Councils have the power under the act to regulate non-scheduled activities through notices and enforcement. Specifically, the Council can issue a clean-up notice if a pollution incident has occurred. This can include water pollution, littering and dumping of waste.

Mining Act 1992

The *Mining Act 1992* makes provisions with respect to prospecting for and mining minerals. The objects of the Mining Act 1992 are to *"encourage and facilitate the discovery and development of mineral resources in New South Wales, having regard to the need to encourage ecologically sustainable development, and in particular*:

to recognise and foster the significant social and economic benefits to New South Wales that result from the efficient development of mineral resources, and

to provide an integrated framework for the effective regulation of authorisations for prospecting and mining operations, and

to provide a framework for compensation to landholders for loss or damage resulting from such operations, and

to ensure an appropriate return to the State from mineral resources, and

to require the payment of security to provide for the rehabilitation of mine sites, and

to ensure effective rehabilitation of disturbed land and water, and

to ensure mineral resources are identified and developed in ways that minimise impacts on the environment."

Tabled Review of Relevant Legislation and Policy

Table E-2 Cooks River Catchment Governance: Relevant Legislation and Policy

Govt Level	Type	Legislation / Policy
Federal	Legislation	Australian Maritime Safety Authority Act 1990
Federal	Legislation	Environment Protection and Biodiversity Conservation Act 1999
Federal	Legislation	Protection of the Sea (Prevention of Pollution from Ships) Act 1983
Federal	Legislation	Water Act 2007
Federal	Legislation	Various Acts in relation to operations of Airport including: Curfews, Demand Management, Noise Leaves, CASA, biosecurity https://www.legislation.gov.au. For example: • Aircraft Noise Regulations • Air Navigation Act 1920 • Air Navigation Regulations 2016 • International Air Services Commission Act 1992 • Aviation Transport Security Act 2004 • Aviation Transport Security Regulations 2005 • Air Accidents (Commonwealth Government Liability) Act 1963 • Civil Aviation (Carrier's Liability) Act 1959 • Civil Aviation (Carrier's Liability) Regulations 1991 • Damage by Aircraft Act 1999
Federal	Legislation	Maritime Transport and Offshore Facilities Security Act 2003 Maritime Transport and Offshore Facilities Security Regulations 2003
Federal	Legislation	Biosecurity Act 2015
State	Legislation	Biodiversity Conservation Act 2016
State	Legislation	Catchment Management Authorities Act, 2003;
State	Legislation	Contaminated Land Management Act 1997
State	Legislation	Coastal Management Act 2016
State	Legislation	Crown Land Management Act 2016
State	Legislation	Greater Sydney Commission Act 2015
State	Legislation	Environmental Planning and Assessment Act 1979
State	Legislation	Fisheries Management Act 1994
State	Legislation	Heritage Act 1977
State	Legislation	Independent Pricing and Regulatory Tribunal Act 1992
State	Legislation	Local Government Act 1993
State	Legislation	Local Land Services Act 2013
State	Legislation	Marine Pollution Act 2012

Govt Level	Type	Legislation / Policy
State	Legislation	Maritime Services Act 1935
State	Legislation	National Parks and Wildlife Act 1974
State	Legislation	Natural Resources Commission Act 2003
State	Legislation	Ports and Maritime Administration Act 1995
State	Legislation	Protection of the Environment Administration Act 1991
State	Legislation	Protection of the Environment Operations Act 1997
State	Legislation	Public Health Act 2010
State	Legislation	Sydney Water Act 1994
State	Legislation	Transport Administration Act 1988
State	Legislation	Water Act 1912
State	Legislation	Water Industry Competition Act 2006
State	Legislation	Water Management Act 2000
State	Planning Instrument	Coastal Management SEPP
State	Planning Instrument	State and Regional Development SEPP
State	Planning Instrument	Sydney Regional Growth Centres SEPP
State	Planning Instrument	Urban Renewal SEPP
State	Planning Instrument	Infrastructure SEPP
State	Planning Instrument	State Significant Precinct SEPP
State	Planning Instrument	SEPP 33 – Hazardous and Offensive Development
State	Planning Instrument	SEPP 62 - Sustainable Aquaculture
State	Planning Instrument	SEPP (Infrastructure) 2007
State	Planning Instrument	Three Ports SEPP
State	Planning Instrument	Draft Environment SEPP
Regional	Planning strategy	A Metropolis of Three Cities
Regional	Planning strategy	Eastern City District Plan
Regional	Planning Strategy	South District Plan
Local	Planning Instrument	Cooks Cove Sydney Regional Environmental Plan No 33.
Local	Planning Instrument	Greater Metropolitan Regional Environmental Plan No 2 - Georges River Catchment *NB This plan applies to the Catchment, which is part of the region declared under the Act and known as the Greater Metropolitan Region. The Catchment consists of parts of Bankstown City, Blacktown City, Campbelltown City, Camden, Canterbury City, Fairfield City, Holroyd City, Hurstville City, Kogarah, Liverpool City, Rockdale City, Sutherland, Wollondilly and Wollongong City local government areas that are within the Georges River Catchment. The catchment map indicates the boundary of the Catchment.*

Govt Level	Type	Legislation / Policy
Local	Planning Instrument	Local Environment Plans - all local council managing land within the Cooks River catchment
Local	Planning Instrument	Development Control Plans - made by all local council under their LEPs

Appendix F Identifying the Geographic Scope to be Covered

Identifying the Geographic Scope to be Covered

The project brief for this Scoping Study provided by the CRA identified the Cooks River Catchment CMP would include:

> *"…the coastal zones within the whole catchment and extends into Botany Bay and adjacent Botany Wetlands."*

However, since project inception with the CRA and from initial discussions with the Cooks River Catchment Advisory Group, it was raised that the geographic scope of the CMP (area to be covered by) required further refinement. The main point of discussion was the coastal (downstream) extent to be included, in consideration of and in the context of interaction with other potential CMP to be developed around the study area, i.e. for Georges River, Eastern Beaches and Botany Bay.

Being the geographic scope a critical element of defining the Scope of the CMP, further discussions were held before and during the First-Pass Risk Assessment Workshop on 31st July 2018; event at which BMT was tasked with summarising and comparing the options for further consideration by the CRA Board.

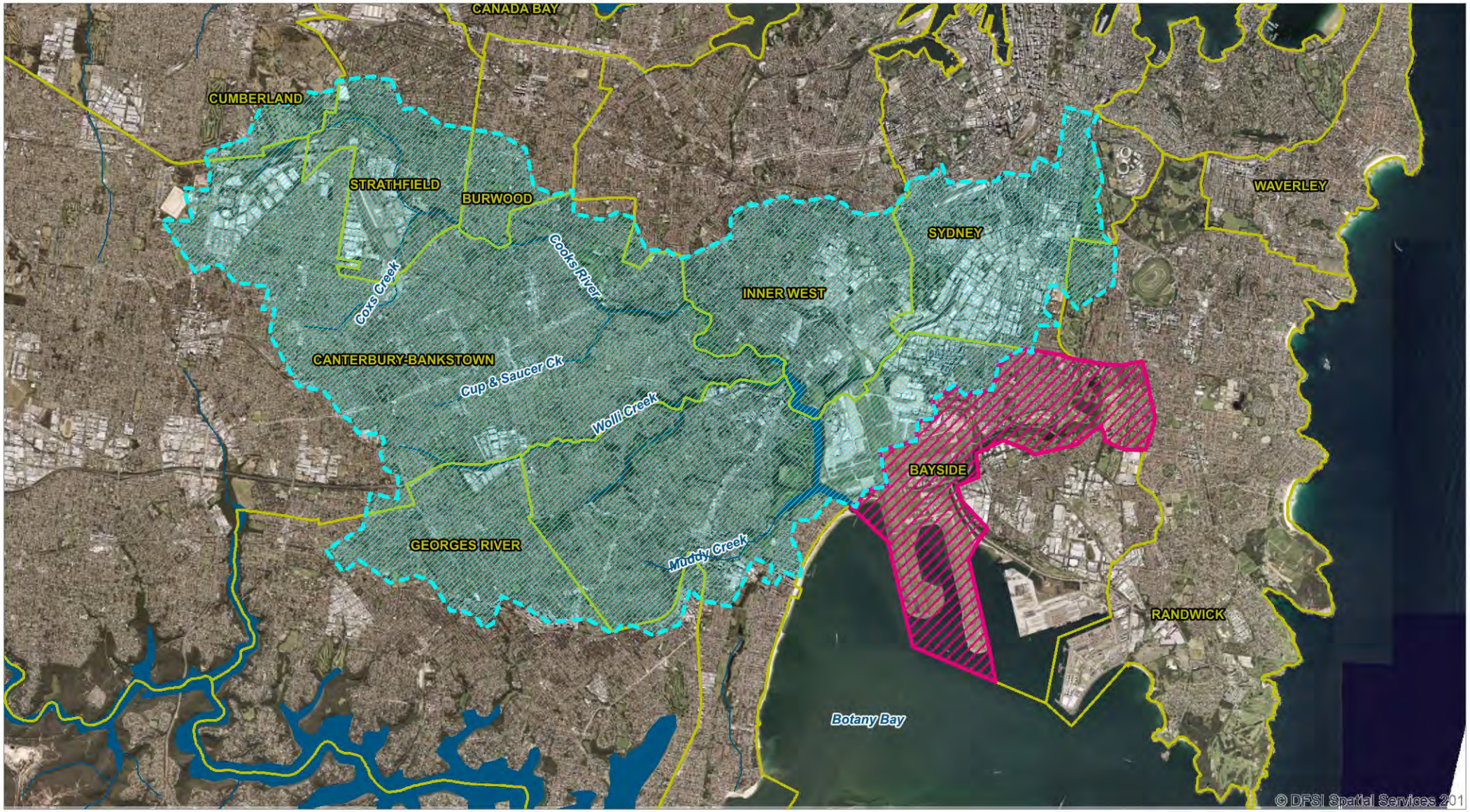
BMT identified three (3) potential options regarding the geographic scope of Cooks River Catchment CMP and presented this to the CRA Executive on a technical memorandum. The three options were tabled, summarising and comparing pros and cons, as shown in Table F-1. Indicative maps for the coverage of each options were also prepared by BMT for Option A, B, and C respectively.

At the meeting of the CRA Board on 9th August 2018 these three options were tabled and presented by the CRA Executive for consideration. The CRA Board determined, at this meeting, the Cooks River Catchment CMP Scoping Study will pursue Option B. This will cover the coastal extent from the mouth of the Cooks River to Bunnerong Creek, including Sydney Airport, Botany Wetlands (to the northern boundary of Bayside Council), Mill Stream, Foreshore Beach, Penrhyn estuary, and Port Botany north of Brotherson Dock; i.e. encapsulating all of the eastern side Bayside LGA.

Table F-1 Options for geographic scope of Cooks River Catchment CMP Scoping Study, Pros and Cons

Option A – Figure F-1 **Cooks River mouth to Mill Stream (including Sydney Airport, Botany Wetlands to the northern boundary of Bayside Council, and Mill Stream; excluding Foreshore Beach and Port Botany)**	**Option B – Figure F-2** **Cooks River mouth to Bunnerong Creek (including Option A, plus Foreshore Beach, Penrhyn estuary, and Port Botany north of Brotherson Dock; i.e. encapsulating all of the eastern side of Bayside LGA)**	**Option C – Figure F-3** **Cooks River mouth to Cape Banks (including Option B, plus Port Botany south of Brotherson Dock, Yarra Bay, La Perouse and Henry Head to Cape Banks; i.e. Randwick LGA southern end)**
Pros • Current area of application as defined in the Brief (Section 1.2) no modification to existing Scopes of Work • Focus of CMP kept within Cooks River estuary and catchment • Minimisation of open coast processes, areas and issues to deal with; focus on estuarine and catchment processes and issues • Reduced number of stakeholders involved, simplifying CMP governance, engagement strategy and forward plan	***Pros*** • Bayside LGA eastern end covered, i.e. Bayside Council would not need to be involved in 3 separate CMP Scoping Studies • Clear jurisdictional separation in coastal management for the north side of Botany Bay, i.e. between Bayside and Randwick Councils • Integration of areas managed by Port Botany with similar environmental values to Cooks River, e.g. Penrhyn estuary, Foreshore Beach • Minimisation of open coast processes, areas and issues to deal with; focus on estuarine and catchment processes and issues • Ensuring involvement of Ports into the preparation and delivery of the Cooks River Catchment CMP *(i.e. Section 23 Coastal Management Act)* • Minimal additional investment for area extension	***Pros*** • Reduced number of CMPs needing to be integrated for whole of Botany Bay management • Bayside LGA eastern end covered, i.e. Bayside Council would not need to be involved in 3 separate CMP Scoping studies • Port Botany covered, i.e. Ports would not need to be involved in 2 separate CMP Scoping studies, plus any future whole of Botany Bay management. • Coastal management of the sediment compartment gets fragmented in less CMPs • Engagement and participation of Randwick Council and Kamay Botany Bay National Park
Cons • Bayside LGA eastern end not fully covered • Bayside Council therefore required to be involved in 3 separate CMP Scoping Studies	***Cons*** • Port Botany not fully covered, i.e. Ports would need to be involved in 2 separate CMP Scoping Studies, plus any future whole of Botany Bay management planning processes	***Cons*** • Larger proportion of open coast processes, areas and issues to deal with; in parallel to estuarine and catchment processes and issues

Option A – Figure F-1 Cooks River mouth to Mill Stream (including Sydney Airport, Botany Wetlands to the northern boundary of Bayside Council, and Mill Stream; excluding Foreshore Beach and Port Botany)	Option B – Figure F-2 Cooks River mouth to Bunnerong Creek (including Option A, plus Foreshore Beach, Penrhyn estuary, and Port Botany north of Brotherson Dock; i.e. encapsulating all of the eastern side of Bayside LGA)	Option C – Figure F-3 Cooks River mouth to Cape Banks (including Option B, plus Port Botany south of Brotherson Dock, Yarra Bay, La Perouse and Henry Head to Cape Banks; i.e. Randwick LGA southern end)
plus any future whole of Botany Bay management planning processes • No integration of areas managed by Port Botany, e.g. Foreshore Beach, Penrhyn estuary • Coastal management of the sediment compartment fragmented across several CMP Scoping Studies • Larger number of CMPs needing to be integrated for future whole of Botany Bay management planning and implementation processes • Parts of northern Botany Bay not covered in either Cooks River or (pending) Eastern Beaches CMP scoping studies	• Moderate number of stakeholders involved, adds some additional complexity to CMP governance, engagement strategy and forward plan • Larger number of CMPs needing to be integrated for whole of Botany Bay management • Coastal management of the sediment compartment gets fragmented in several CMPs • Moderate modification of existing Scopes of Work • Parts of northern Botany Bay not covered in either Cooks River or eastern beaches CMP scoping studies	• Larger number of stakeholders involved, adds complexity to CMP governance, engagement strategy and forward plan • Further modification of existing Scopes of Work • Potentially some duplication with pending Eastern Beaches CMP scoping study • Potential focus diversion from the Cooks River catchment needs • Port Botany not required to be involved in pending Eastern beaches CMP Scoping Study



LEGEND

- Watercourse
- LGA Boundary
- Indicative Catchment Extent
- Further CPM Extent - Option A

Title:

Indicative Geographic Scope - Option A
Cooks River Catchment CMP

Figure: F-1

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.

N

0 2 4km

Approx. Scale

BMT
www.bmt.org

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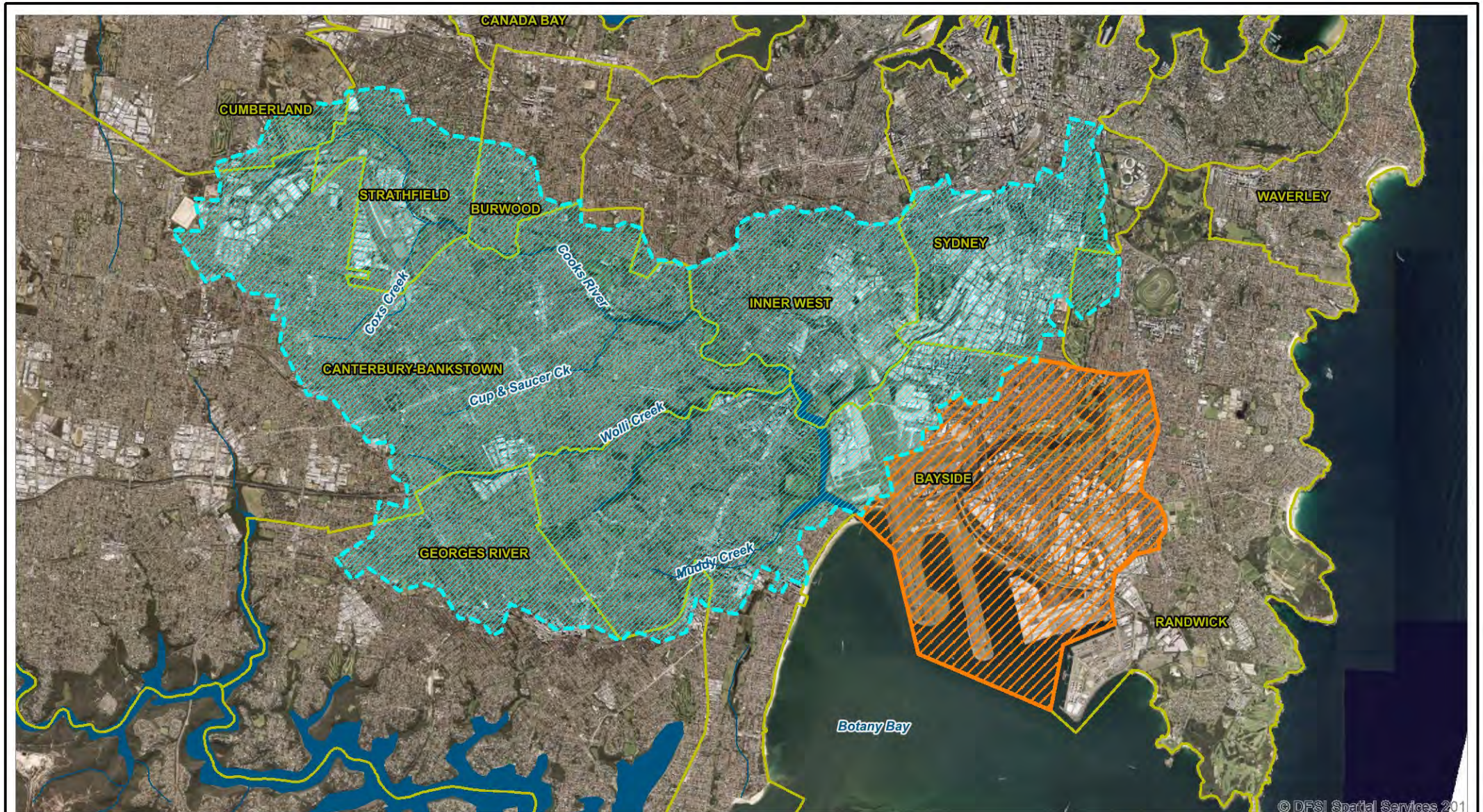

LEGEND

- Watercourse
- LGA Boundary
- Indicative Catchment Extent
- Further CPM Extent - Option B

Title:

Indicative Geographic Scope - Option B
Cooks River Catchment CMP

Figure: **F-2**

Rev: **A**

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Approx. Scale

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www.bmt.org

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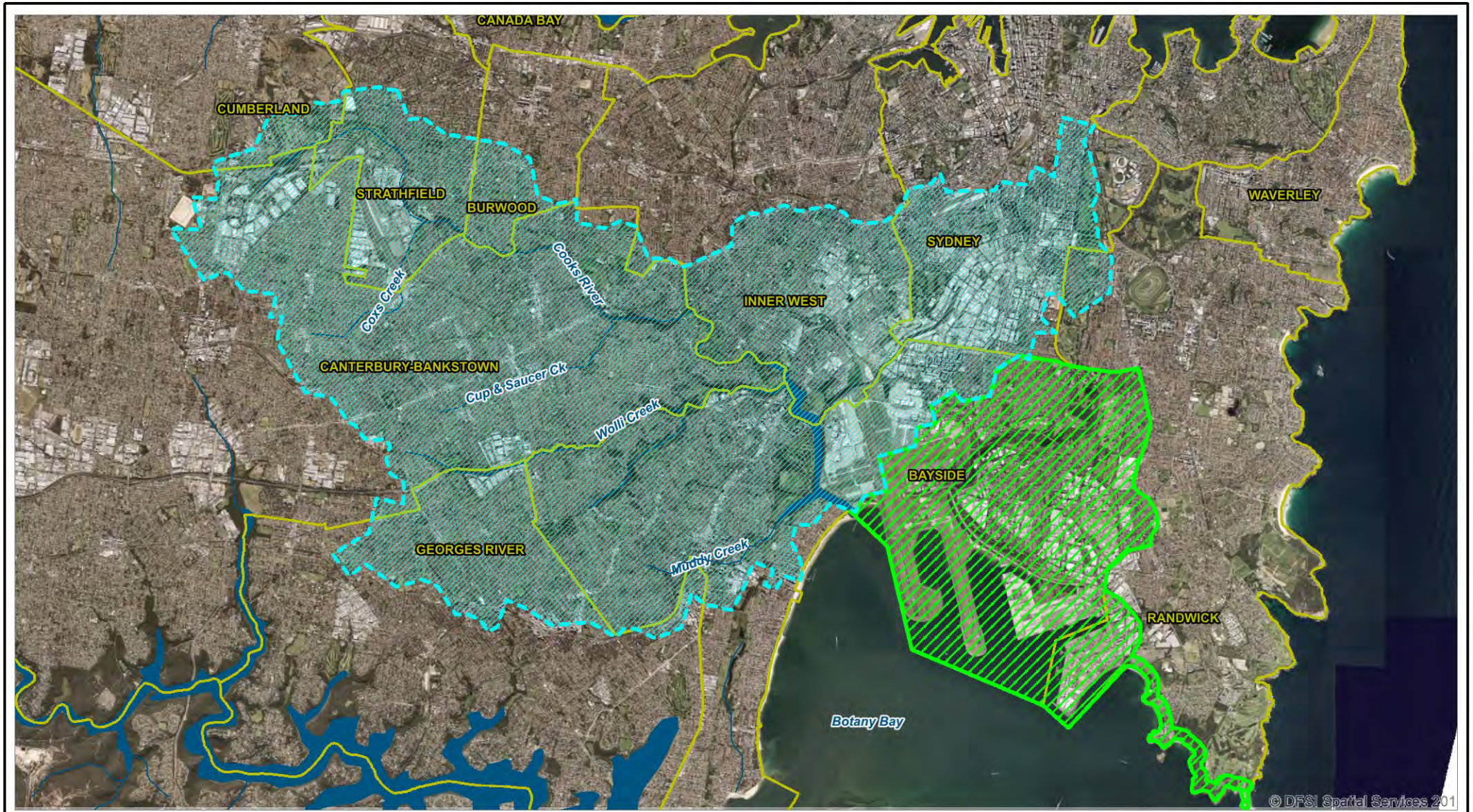

LEGEND

- Watercourse
- LGA Boundary
- Indicative Catchment Extent
- Further CPM Extent - Option C

Title:

Indicative Geographic Scope - Option C
Cooks River Catchment CMP

Figure: F-3

Rev: A

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Approx. Scale

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Appendix G Coastal Hazards Data Availability Review

Coastal Hazard Definitions

Organisation:	
Representative:	

Gathering Information About Coastal Vulnerability Areas - Coastal Hazards defined in the *Coastal Management Act 2016*

Coastal Hazard	Definition
a) beach erosion	refers to landward movement of the shoreline and/or a reduction in beach volume, usually associated with storm events or a series of events, which occurs within the beach fluctuation zone. Beach erosion occurs due to one or more process drivers; wind, waves, tides, currents, ocean water level, and downslope movement of material due to gravity.
b) shoreline recession	refers to continuing landward movement of the shoreline, that is, a net landward movement of the shoreline, generally assessed over a period of several years. As shoreline recession occurs the beach fluctuation zone is translated landward.
c) coastal lake or watercourse entrance instability	refers to the variety of potential hazards and risks associated with the dynamic nature of both natural and trained entrances. Coastal lake and watercourse entrances are highly active environments with their shape constantly changing in response to processes such as alongshore sediment transport, tidal flows, storms and catchment flooding.
d) coastal inundation	coastal inundation occurs when a combination of marine and atmospheric processes raises the water level at the coast above normal elevations, causing land that is usually ‘dry’ to become inundated by sea water. Alternatively, the elevated water level may result in wave run-up and overtopping of natural or built shoreline structures (e.g. dunes, seawalls).
e) coastal cliff or slope instability	refers to the variety of potential hazards and risks associated with the dynamic nature of both natural and trained cliffs (steep face of rock) or coastal slope (the area landward of an escarpment cut by storm bite, which may be affected by slumping to the angle of repose of the sand as it dries).
f) tidal inundation	the inundation of land by tidal action under average meteorological conditions and the incursion of sea water onto low lying land that is not normally inundated, during a high sea level event such as a king tide or due to longer-term sea level rise.
g) erosion and inundation of foreshores caused by tidal waters and the action of waves, including the interaction of those waters with catchment floodwaters	erosion and inundation of foreshores caused by tidal waters and the action of waves, including the interaction of those waters with catchment floodwaters.

Coastal Hazard Data Availability Review

Gathering Information About Coastal Vulnerability Areas - Coastal Hazards defined in the *Coastal Management Act 2016*

Coastal Hazard	a) beach erosion				
Question number	**Q1**	**Q2**	**Q3**	**Q4**	**Q5**
Question text	**Is this a hazard in your area? Yes / No**	**What management & planning arrangements are in place to manage this hazard? Are these effective? Why?**	**What works (on the grounds) are in place? Are these effective now and in the future?**	**What information and data are available? Technical studies / Inundation mapping, etc.**	**Data gaps requiring attention, now / future? Technical studies / Inundation mapping, etc.**
Questions Coded	**Q1 a) beach erosion - Is this a hazard in your**	**Q2 a) beach erosion - What management & planning arrangements are in place to manage this hazard? Are these effective? Why?**	**Q3 a) beach erosion - What works (on the grounds) are in place? Are these effective now and in the future?**	**Q4 a) beach erosion - What information and data are available? Technical studies / Inundation mapping, etc.**	**Q5 a) beach erosion - Data gaps requiring attention, now / future? Technical studies / Inundation mapping, etc.**
Code	**Q1 a)**	**Q2 a)**	**Q3 a)**	**Q4 a)**	**Q5 a)**
Randwick Council	Y		Vegetation management erosion control works – coir logs, jute matting	Crownland, NPWS	Tbd
Bayside Council	Y	Coastal Framework for NSW (Act, SEPP, Manual and CMPs / CZMPs Lobbying, beach nourishment Park PoMs (see recession Q3) Emergency response (SES and Councils)	seawall restoration Dune works Option studies and assessments Seeking support and engagement from OEH and various agencies land owners and operators (Ports, Airport etc) to pursue longer term solution incl beach nourishment	Hazard studies (BMT) Risk Assessments (BMT) Models and assessments from previous ongoing works (groyne field along Lady Robinson beach) SCCG inundation study (2010)	Detailed and contemporary assessments Existing Seawall design and integrity assessments (for now and in future - SLR) Hydrodynamic modelling Control options assessments including CBA and financing arrangements Erosion modelling within the river (bank stability / erodibility ('Beaches' in the river
Canterbury Bankstown	N				
DPI Fisheries	Y	Rockdale Council may have done a coastal inundation/ erosion study/ management plan			
Sydney Water (CRVA)	Y	(beach deposition not erosion) Foreshore Beach only	Stormwater outlet extusion	Sediment study outlet designs	
CRVA (Peter Munro)					
WCRP (Wolli Creek Regional Park)	N				
La Perosue	Y	POM - Botany Bay POM and Kamay Botany Bay Draft	Dune control/ weed control/ rehabilitation		None
Bayside Council	Y	Lobbying, Closures, Seawalls, beach nourishment	Lobbying, Closures, Seawalls, beach nourishment	Flood studies- Lady Robinson Beach	Relevant mapping insufficient information for beach studies
City of Sydney	N				
Inner West Council	N				
BB.RA	Y	Sydney ports	sand replace		
Burwood Council	N				
Wolli Creek Preservation Society	N	Not in Wolli	N/A		

Gathering Informati

Coastal Hazard	b) shoreline recession				
Question number	Q1	Q2	Q3	Q4	Q5
Question text	Is this a hazard in your area? Yes / No	What management & planning arrangements are in place to manage this hazard? Are these effective? Why?	What works (on the grounds) are in place? Are these effective now and in the future?	What information and data are available? Technical studies / Inundation mapping, etc.	Data gaps requiring attention, now / future? Technical studies / Inundation mapping, etc.
Questions Coded	Q1 b) shoreline recession - Is this a hazard in your	Q2 b) shoreline recession - What management & planning arrangements are in place to manage this hazard? Are these effective? Why?	Q3 b) shoreline recession - What works (on the grounds) are in place? Are these effective now and in the future?	Q4 b) shoreline recession - What information and data are available? Technical studies / Inundation mapping, etc.	Q5 b) shoreline recession - Data gaps requiring attention, now / future? Technical studies / Inundation mapping, etc.
Code	Q1 b)	Q2 b)	Q3 b)	Q4 b)	Q5 b)
Randwick Council	Y		Vegetation management to stabilise dunes	Crownland, NPWS	Tbd
Bayside Council	Y	Seawalls Dune management and maintenance Technical studies Advocacy activities (beach nourishment / partnership approaches Seeking grant funding	Seawalls and Groynes Access controls Community lands PoMs (adjacent park lands) Dune management and maintenance Technical studies Advocacy activities (beach nourishment / partnership approaches Seeking grant funding (studies and works (dune, seawall, nourishment) Community education	See beach erosion	See Beach erosion
Canterbury Bankstown	N				
DPI Fisheries	Y	Seawalls			
Sydney Water (CRVA)	Y		Alexandria Canal Bank Stabilisation (Tempe)	Designs; sediment studies	
CRVA (Peter Munro)					
WCRP (Wolli Creek Regional Park)	N				
La Perosue	N				
Bayside Council	Y	Seawalls, vegetation restoration, relocation of recreational facilities	Seawalls, vegetation restoration, relocation of recreational facilities	Flood studies- Lady Robinson Beach	Relevant mapping insufficient information for beach studies
City of Sydney	N				
Inner West Council	N				
BB.RA	Y				
Burwood Council	N				
Wolli Creek Preservation Society	Y	Wolli Creek Ripparian Management Plan, Cooks River Alliance working together across councils	Bank stabilisation with rock work and rip rap, salt marsh creation. Bayside side of Wolli Creek has too much development too close to the edge.	Councils may have	

Gathering Informati

Coastal Hazard	c) coastal lake or watercourse entrance instability				
Question number	Q1	Q2	Q3	Q4	Q5
Question text	Is this a hazard in your area? Yes / No	What management & planning arrangements are in place to manage this hazard? Are these effective? Why?	What works (on the grounds) are in place? Are these effective now and in the future?	What information and data are available? Technical studies / Inundation mapping, etc.	Data gaps requiring attention, now / future? Technical studies / Inundation mapping, etc.
Questions Coded	Q1 c) coastal lake or watercourse entrance	Q2 c) coastal lake or watercourse entrance instability - What management & planning arrangements are in place to manage this hazard? Are these effective? Why?	Q3 c) coastal lake or watercourse entrance instability - What works (on the grounds) are in place? Are these effective now and in the future?	Q4 c) coastal lake or watercourse entrance instability - What information and data are available? Technical studies /	Q5 c) coastal lake or watercourse entrance instability - Data gaps requiring attention, now / future? Technical studies /
Code	**Q1 c)**	**Q2 c)**	**Q3 c)**	**Q4 c)**	**Q5 c)**
Randwick Council	Y	Drainage line foes through Cown Land leased land Chinese market gardens	Crown Land managed by crown land; soil conservation services	Crownland, NPWS	Tbd
Bayside Council	N	NA for this study area			
Canterbury Bankstown	N				
DPI Fisheries	N				
Sydney Water (CRVA)	N				
CRVA (Peter Munro)					
WCRP (Wolli Creek Regional Park)	N				
La Perosue	N				
Bayside Council	N				
City of Sydney	N				
Inner West Council	N				
BB.RA	N				
Burwood Council	N				
Wolli Creek Preservation Society	N				

Gathering Informati

Coastal Hazard	d) coastal inundation				
Question number	Q1	Q2	Q3	Q4	Q5
Question text	Is this a hazard in your area? Yes / No	What management & planning arrangements are in place to manage this hazard? Are these effective? Why?	What works (on the grounds) are in place? Are these effective now and in the future?	What information and data are available? Technical studies / Inundation mapping, etc.	Data gaps requiring attention, now / future? Technical studies / Inundation mapping, etc.
Questions Coded	Q1 d) coastal inundation - Is this a hazard in your	Q2 d) coastal inundation - What management & planning arrangements are in place to manage this hazard? Are these effective? Why?	Q3 d) coastal inundation - What works (on the grounds) are in place? Are these effective now and in the future?	Q4 d) coastal inundation - What information and data are available? Technical studies / Inundation mapping, etc.	Q5 d) coastal inundation - Data gaps requiring attention, now / future? Technical studies / Inundation mapping, etc.
Code	Q1 d)	Q2 d)	Q3 d)	Q4 d)	Q5 d)
Randwick Council	Y	Flood prone land; flood studies		Flood studies modelling underway	
Bayside Council	Y	Flood studies (most will not include coastal inundation) Hazard areas mapped in LEP and with design conditions as detailed in relevant DCPs New Coastal Management Act and SEPP (even though "vulnerability area" is yet to be mapped) other areas are and have corresponding related issues to deal with Emergency response (SES / Council)	drainage works river revetments some weirs and levies	Detailed local DEMs including all drainage structures Council flood mapping SCCG Inundations mapping Some broad scale OEH mapping(David Hanslow) Australia Govt (2009) First pass assessment mapping CoastAdapt Mapping (NCCARF by the Cooperative Research Centre for Spatial Information (CRCSI) (see:	Up to date DEM(s) Infrastructire exposure assessment (buildong flood height etc / Locaitons of 'critical' infrastructure, Impact profiles / assessments Detailed instream and bay bathymetry detailed tidal models for estuary Detailed local studies Coincidence mapping (coastal / terrestrial flooding)
Canterbury Bankstown	N				
DPI Fisheries	N				
Sydney Water (CRVA)	?				
CRVA (Peter Munro)					
WCRP (Wolli Creek Regional Park)	Y	pom Kamay Botany Bay Draft	Volunteer groups- regeneration of plant communities and bank stabilisation, willow removal, catchment stabilisation		None
La Perosue	N	pom Kamay Botany Bay Draft	Rehabilitation/ replanting		marine mapping/ reefs and wave mapping
Bayside Council	Y	Planning controls, improvement of overall strategies, flood mitigation measures	Planning controls, improvement of overall strategies, flood mitigation measures	Flood studies- Lady Robinson Beach	Relevant mapping insufficient information for beach studies
City of Sydney	N				
Inner West Council	N				
BB.RA	N				
Burwood Council	N				
Wolli Creek Preservation Society	Y	In stormsurge	Not aware of any	Councils may have?	

Gathering Informati

Coastal Hazard	e) coastal cliff or slope instability				
Question number	Q1	Q2	Q3	Q4	Q5
Question text	Is this a hazard in your area? Yes / No	What management & planning arrangements are in place to manage this hazard? Are these effective? Why?	What works (on the grounds) are in place? Are these effective now and in the future?	What information and data are available? Technical studies / Inundation mapping, etc.	Data gaps requiring attention, now / future? Technical studies / Inundation mapping, etc.
Questions Coded	Q1 e) coastal cliff or slope instability - Is this	Q2 e) coastal cliff or slope instability - What management & planning arrangements are in place to manage this hazard? Are these effective? Why?	Q3 e) coastal cliff or slope instability - What works (on the grounds) are in place? Are these effective now and in the future?	Q4 e) coastal cliff or slope instability - What information and data are available? Technical studies / Inundation mapping, etc.	Q5 e) coastal cliff or slope instability - Data gaps requiring attention, now / future? Technical studies / Inundation mapping, etc.
Code	Q1 e)	Q2 e)	Q3 e)	Q4 e)	Q5 e)
Randwick Council	Y	Yarra Bay Foreshore Crown Land – no formal arrangement for council to manage this land	Vegetation management to stabilise slope / soils	Geotech studies with planning proposal, botany cemetery	
Bayside Council	N	Assume very little Standard conditions of consent (land stability assessments) (retaining walls etc) (above) associated drainage / water mgt controls to avoid ground saturation and slippage	Limited retaining walls and slope stability works in areas where needed (assume not proactive more reactive based on slip / collapse) standard river / creek bank and road works stability controls	Limited UoW have done Sydney wide slope slip susceptibility assessment via modelling (Dr Phil Flentje) (ask OEH ?)	Catchment wide land slip susceptibility mapping (to id hot spots for further detail investigation) Detailed studies in problem areas Potentially 149(5) notifications on properties in potential problem areas (for proponents to investigate further through DA processes
Canterbury Bankstown	N				
DPI Fisheries	N				
Sydney Water (CRVA)	N				
CRVA (Peter Munro)					
WCRP (Wolli Creek Regional Park)	N				
La Perosue	Y	POM	Engineer reports/ Ravines washing away during storms		Wave mapping + engineer reports/ projections/ storm effects
Bayside Council	N				
City of Sydney	N				
Inner West Council	N	Maybe (Dibble Ave Waterhole) - study of works under wat t address slope instability			
BB.RA	N				
Burwood Council	N				
Wolli Creek Preservation Society	N	Wolli has great sandstone cliffs			

Gathering Informati

Coastal Hazard	f) tidal inundation				
Question number	Q1	Q2	Q3	Q4	Q5
Question text	Is this a hazard in your area? Yes / No	What management & planning arrangements are in place to manage this hazard? Are these effective? Why?	What works (on the grounds) are in place? Are these effective now and in the future?	What information and data are available? Technical studies / Inundation mapping, etc.	Data gaps requiring attention, now / future? Technical studies / Inundation mapping, etc.
Questions Coded	Q1 f) tidal inundation - Is this a hazard in your	Q2 f) tidal inundation - What management & planning arrangements are in place to manage this hazard? Are these effective? Why?	Q3 f) tidal inundation - What works (on the grounds) are in place? Are these effective now and in the future?	Q4 f) tidal inundation - What information and data are available? Technical studies / Inundation mapping, etc.	Q5 f) tidal inundation - Data gaps requiring attention, now / future? Technical studies / Inundation mapping, etc.
Code	**Q1 f)**	**Q2 f)**	**Q3 f)**	**Q4 f)**	**Q5 f)**
Randwick Council	?	Tidal or wave/ storm surge		La Perouse Ferry Wharf feasibility study	
Bayside Council	Y	See (d) inundation Stormwater drainage design (one way valves etc) Mapping of some problem areas (eg parts of Bayside) Road / access closures during major high tide events (grab some photos of this hazard from here : https://climatechange.environment.nsw.gov.au/-/media/NARCLim/Files/PDF-resources/09722KingTide.pdf?la=en&hash=0C2F93EFD064206197C1AD873E624E6522F0A53A (Front cover image)	see inundation (road closures etc	see inundation (BMT) Georges river study King tide photos eg Q2f and also from this web site : http://www.witnesskingtides.org/participate/who's-involved/national/nsw-office-of-environment-and-heritage.aspx	see Inundations section Yes - an existing hazard to get worse (frequency and extent) why - road closures and access restrictions generally hydraulic performance issues on drainage, sewage and water supply infrastructure Issues in relation to increase inundation of salt water (infrastructure integrity, performance and operations), ground
Canterbury Bankstown	Y	Not really, some flood studies to understand impacts	Concreated channels	Flood studies; ozcoasts mapping?	Flood studies need updating to include climate change impacts; tidal inundation mapping under
DPI Fisheries	Y	Mapping of SLR? Planning around that? Floodplain management?	Changes to pedestrian pathway around tempe bridge		
Sydney Water (CRVA)	Y				
CRVA (Peter Munro)	Y	River bank regularly breached in king tides			
WCRP (Wolli Creek Regional Park)	Y	POM KiBB Draft	Willow Removal and bank stabilisation		Tidal - sediment mapping
La Perosue	N				
Bayside Council	Y	Planning controls, improvement of overall strategies, flood mitigation measures		Flood studies- Lady Robinson Beach	Relevant mapping insufficient information for beach studies
City of Sydney	Y	Munni Sub catchment plan	Green Square Trunk drain (will move water to Alexandria canal) -- both joint projects between City of Sydney and Sydney water	Flood modelling	Effects of tidal inundation with increased water flows from Green Square Trunk Drain; future Ashmore
Inner West Council	Y	Council's engineers recently completed review of flood planning and estuaries in Marrickville + Leichhardt -- planning controls in place, flood planning maps, DCP	Sea Walls - not clear who is responsible - only designed to current SL (i.e not accounting for SLR), some specific works to protect areas from inundation e.g. Tempe/ Kendrick park	Yes - see councils website of flood planning i.e flood studies	Urban renewal areas, major infrastructure activities subject to further studies and assessment
BB.RA	Y	storm events inflow high tides			
Burwood Council	N				
Wolli Creek Preservation Society	Y	in storm surge and King tides			

Gathering Informati

Coastal Hazard	g) erosion and inundation of foreshores caused by tidal waters and the action of waves, including the interaction of those waters with catchment floodwaters				
Question number	Q1	Q2	Q3	Q4	Q5
Question text	Is this a hazard in your area? Yes / No	What management & planning arrangements are in place to manage this hazard? Are these effective? Why?	What works (on the grounds) are in place? Are these effective now and in the future?	What information and data are available? Technical studies / Inundation mapping, etc.	Data gaps requiring attention, now / future? Technical studies / Inundation mapping, etc.
Questions Coded	Q1 g) erosion and inundation of foreshor	Q2 g) erosion and inundation of foreshores caused by tidal waters and the action of waves, including the interaction of those waters with catchment floodwaters - What management & planning arrangements are in place to manage this hazard?	Q3 g) erosion and inundation of foreshores caused by tidal waters and the action of waves, including the interaction of those waters with catchment floodwaters - What works (on the grounds) are in place? Are these effective now and in the future?	Q4 g) erosion and inundation of foreshores caused by tidal waters and the action of waves, including the interaction of those waters with	Q5 g) erosion and inundation of foreshores caused by tidal waters and the action of waves, including the interaction of those waters with
Code	**Q1 g)**	**Q2 g)**	**Q3 g)**	**Q4 g)**	**Q5 g)**
Randwick Council	Y	Kamay Botany Bay Plan of management La Perouse; NPWS; crownland managed land; headland leased to Randwick in September 2017	Crown Land lease to private land manager – conditions in lease?		
Bayside Council	Y	All covered in previous hazards except of coastal / catchment coincident issues Some work underway at a state level in this regard (details ?)			
Canterbury Bankstown	Y	Not really, some flood studies to understand impacts	Concreated channels	Flood studies; ozcoasts mapping?	Flood studies need updating to include climate change impacts; tidal inundation mapping under
DPI Fisheries	Y	Seawalls, floodplain management		floodplain management plans	
Sydney Water (CRVA)	Y	Flood Risk Management process		Cooks River - flood study 2009	
CRVA (Peter Munro)	Y	Fatima Island is being eroded by regular flood actions			
WCRP (Wolli Creek Regional Park)	Y	POM KBB Draft			
La Perosue					
Bayside Council	Y	Lobbying, Closures, Seawalls, beach nourishment , Seawalls, vegetation restoration, relocation of recreational facilities, Planning controls, improvement of overall strategies,	Lobbying, Closures, Seawalls, beach nourishment , Seawalls, vegetation restoration, relocation of recreational facilities, Planning controls, improvement of overall	Flood studies- Lady Robinson Beach	Relevant mapping insufficient information for beach studies
City of Sydney					
Inner West Council	Y	Council asset management plans reviewed annually and identify risks and mitigation. Fatima Island management study (affected by erosion)	There are mandated Flood Planning in LEP clauses, likewise the associated flood planning sections in the 3 inner west DCPs (Marrickville, Ashfield, Leichhardt	Yes - see councils website of flood planning i.e flood studies, sub catchment plans	Modelling of local impacts of sea level rise t guide e.g. public land improvements/ protection
BB.RA	Y	storm events inflow high tides			
Burwood Council	N				
Wolli Creek Preservation Society	Y	Wolli Creek Ripparian Management Plan, Cooks River Ripparian Vegetation Management Plan, UNSW Benthic Study, Riverscience Monitoring Porgram	Happens at - Turrella Reserve, Bray Ave wetalnd, Waterworth Park, Gough Whitlam Park aound the Cricket Ground and on the road through the stormwater drain - hence a		

Appendix H First-Pass Risk Assessment Input

Issue (Theme)	Threat	Broadly, what is the level of risk? (Assuming no management controls in place) Low / Med / High	What controls are in place to manage this risk? (Policy / Action) (Local / Regional / State)	Is it adequate? (Yes / No)	Why? (Please explain) (for adequate or inadequate)	What is the remaining level of risk after management controls in place? Low / Med / High	Will the threat get worse in future? How? (Population pressure, climate change, trade gateway, etc)	Will the existing management controls be adequate to manage the threat in future? (Yes / No)	What needs to improve to manage risk to the threat in the future? How? (Please explain)	List "hot-spots" that may be impacted by this threat (geographical area/sector/assets/ ecosystems)	Comments
Fishing (I)	**Commercial Fishing**	Low	Commercial fishing licences Commercial fishing effort in Botany Bay bought out in 2002 Commercial fishing is not permitted in Cooks River or Botany Bay	yes	Adequate ☐ Inadequate ☐ $ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _____	NA	NA	NA	$ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _____	NA	What is 'fishing' being viewed as a threat to in this situation? What is the context of the risk assessment? Recreational fishers will view issues like the ongoing development around Botany Bay, and poor water quality as a threat to recreational fishing. --> referring to the entire issue "fishing"
	Charter Fishing	Low	3-4 charter boat facilities in the Bay Associated licence requirements limits for load due to limited marinas (access) Local: Spatial and seasonal closures; statewide bag and size limits. See: https://www.dpi.nsw.gov.au/fishing/recreational/resources/info/local-fishing-guides/sydney-south and https://www.dpi.nsw.gov.au/fishing/recreational/fishing-rules-and-regs/saltwater-recreational-fishing-guide	No Yes (DPI Fisheries)	Adequate ☐ Inadequate ☐ $ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _____	Low	No	NA	$ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _____	**NA**	
	Recreational Fishing	High	BB describe by DPI as a "recreational fishing haven" (due to buy out commercial activities) "Fishing licence requirements and bag limits Access restriction in some part of the Bay (eg airport (runways), Port and other inaccessibility areas) (From DPI): http://www.dpi.nsw.gov.au/__data/assets/pdf_file/0003/329331/Sydney-South-Recreational-Fishing-Guide.pdf Botany Bay prohibited areas - • Waters between Sydney Airport runways (Figure 1). • Alexandra Canal (Figure 1), includes no disturbance of bed sediments due to high levels of pollutants. • Penrhyn Estuary (Figure 1), from its source to its junction with the Sydney International Container Terminal (SICTL) bridge leading from Foreshore Road. • Towra Point Aquatic Reserve Sanctuary Zone (Figure 7), also no disturbing, destroying or collecting marine animals or plants, whether dead or alive. Designated fishing areas and cleaning tables and and fishing platforms, There are limited boat ramps (foreshore beach, and inside Cooks and Georges rivers) " also see: https://www.dpi.nsw.gov.au/fishing/recreational/resource	No Yes- DPI fisheries	Adequate ☐ Inadequate ☐ $ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _____	High	Yes- population pressure; climate change to cause flooding; reduction in fishing sports	No	$ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _____ Water quality shing is managed for sustainability at a statewide level - justifiably so as fish move. … Legacy contamination issues have resulted in dietary advice and spatial closures on fishing activities. Recent PFAS dietary advice was printed in numerous languages.	Kyeemagh	
	Aboriginal Cultural Fishing	High	https://www.sbs.com.au/nitv/nitv-news/article/2016/03/28/fishermen-regain-cultural-fishing-rights-botany-bay Am unsure of the level of activity of this and where it occurs.	NA	Adequate ☐ Inadequate ☐ $ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _____	High	No	NA	$ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _____ Water quality	**NA**	

Issue (Theme)	Threat	Broadly, what is the level of risk? (Assuming no management controls in place) Low / Med / High	What controls are in place to manage this risk? (Policy / Action) (Local / Regional / State)	Is it adequate? (Yes / No)	Why? (Please explain) (for adequate or inadequate)	What is the remaining level of risk after management controls in place? Low / Med / High	Will the threat get worse in future? How? (Population pressure, climate change, trade gateway, etc)	Will the existing management controls be adequate to manage the threat in future? (Yes / No)	What needs to improve to manage risk to the threat in the future? How? (Please explain)	List "hot-spots" that may be impacted by this threat (geographical area/sector/assets/ ecosystems)	Comments
Fishing (II)	**Bait and Aquarium Trade**	Med	DPI Rangers do some inforcement of: bag limits, size, types (associated legislation); Council rangers/ environmental officers undertak some enfrocement and undertake conservation . management actvites including (e.g. red ear slider turtles); electrofishing (to remove carp from waterways) Commercial fishing (even for bait purposes not permitted in Botany Bay and Cooks River). Am unsure if aquarium trade permits are issued in this area and whether this activity occurs here or not.	No	Adequate ☐ Inadequate ☐ $ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _____	Lack of DPI staff/rangers; council could modify their policies to allow rangers to enforce	Yes, population pressure, trade gateway (ballast water); species in external hulls surviving trip from N to S hemisphere)	No	$ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _____	**Wolli Creek Weir; wiley park**	
	Aquaculture	Low	NA Historical fish farms: http://www.ssec.org.au/our_environment/our_bioregion/kurnell/history/enterprises/fishfarm.htm also see: https://www.dpi.nsw.gov.au/fishing/aquaculture/publications/species-saltwater/marine-fish Oyster farming banned in 1995-96 There are no aquaculture leases in the Cooks River	YES	Adequate ☐ Inadequate ☐ $ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _____				$ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _____		
	Research fishing (sampling specimens, etc.)	Low/ med	NA Research Licences are required (DPI, Lands) Lots of present and past activities (eg Cape Banks - (eg Prof AJ Underwood Et al Started with James Banks (Capt Cook) Lots of research / assessments undertaken for EIS of major developments, Cape Banks one of (if not tthe) oldest longest rocky shore monitoring sites (Underwood and Chapman - UNi of Sydney) Am unsure of the level of activity of this and where it occurs. Perhaps around Bare Island the most?	yes	Adequate ☐ Inadequate ☐ $ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _____				$ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _____ Water quality		
	Shark control measures	Low	Nets in place (eg Brighton Baths) Historic and recent shark attacks DPI Education (eg sharksmart web site and App) Am not sure of many in the Cooks River. Netted swimming enclosures along Lady Robinsons Beach. Offshore shark meshing program None in place but sharks have beenr reported	No Perhaps. Based on Current level of swimming in the Cooks. Other new shark contral measures being implemented (e.g. Shark Apps)	Adequate ☐ Inadequate ☐ $ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _____	low			$ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _____ Something to ask the shark control team within DPI Fisheries.	shark attack data base : http://www.sharkattackdata.com/attack/australia/new_south_wales/1949.11.20	
Shipping	**Large Commercial Vessels**	Cooks- Low; Botany - High	Customs Act; Biosecurity Act NSW Ports AQIS Restrictions on operation area; marine pest management measures;	No	Adequate ☐ Inadequate ☐ $ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _____	Med-High	Yes- larger commercial vessels entering Port Botany Syd (potential for 2nd terminal)	No	$ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _____	Port Botany (Yarra Bay) from Botany Bay entrance to the Port	
	Small Commercial Vessels	Low Medium - if botany included	Roads and Maritime Service NSW Ports	Yes	Adequate ☐ Inadequate ☐ $ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _____	Low	Yes, population pressure	yes	$ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _____		

Issue (Theme)	Threat	Broadly, what is the level of risk? (Assuming no management controls in place) Low / Med / High	What controls are in place to manage this risk? (Policy / Action) (Local / Regional / State)	Is it adequate? (Yes / No)	Why? (Please explain) (for adequate or inadequate)	What is the remaining level of risk after management controls in place? Low / Med / High	Will the threat get worse in future? How? (Population pressure, climate change, trade gateway, etc)	Will the existing management controls be adequate to manage the threat in future? (Yes / No)	What needs to improve to manage risk to the threat in the future? How? (Please explain)	List "hot-spots" that may be impacted by this threat (geographical area/sector/assets/ ecosystems)	Comments
	Dredging and harbour maintenance	Medium High - if botany is included	NSW Ports 'Port Authority of NSW (regulator) NSW Ports (Port opertor for Port Botany Key dregding activites Shipping channel maintenance (ongoing) Port expansion / construction Desalination pipe line Oil pipeline https://www.fishraider.com.au/topic/67818-botany-bay-oil-wharf-extension-dredging/ potentially some small scale dredging in marinas ?? A legacy issue. Approvals are likely to be sought for any future activities	No	Adequate ☐ Inadequate ☐ $ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _Absolute Authority	Med-High	Yes- trade gateways	No	$ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _____ Understanding of greater geomorphic changes over time in Botany Bay as a resultof entrance widening and sea level rise Heavy metals in the river bed	**Port Botany**	
					Adequate ☐ Inadequate ☐ $ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _____				$ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _____		
Industrial Activities	**Mining and Extraction: oil, gas, sand, coal, etc.**	Low	Low Well controlled via NSW Resources and Energy and Dept of Mineral resources Oil, gas and desalination pipelines and facilities (eg Kurnell / Port Botany)	NA	Adequate ☐ Inadequate ☐ $ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _____				$ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _____		
	Services: pipelines, cables, trenching, etc.	High	EPA Act; safe legislation for infrastructure (ISEPP) POEO Act Conditions of consent (eg from DPE) environmental assessment and approvals procedures NPW Act and Regulations	Yes (other group says no)	Adequate ☐ Inadequate ☐ $ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _____	Need money to improve and remove risks - high risk	Yes- more people = increasing need/ demand on infrastructure; minor industry moving west however Port and Airport likely to expand	yes for infrastructure, but no for rec and natural uses	$ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _____	APA gas line; Caltex line; airport and botany bay port; Jet fuel pipeline; new pipeline to western airport Desalination pipeline Caltext Pipeline to airport - threat to people and trees	
	Industrial discharges	High	EPA Act; DA consents; ongoing monitoring of DAs and POEO Act licenses; EPA hotline (App- send, swap, resolve); trade waste licenses	Yes- but environmental penalties are not high (not severe enough to reduce risks of pollution event); other group says NO FOR ALL REASONS	Adequate ☐ Inadequate ☐ $ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other __pending major pollution event it is inadequate_____	more officers to follow up pollution events	likely to get worse for airport and port; note that some industrial areas may be rezoned for other uses	Yes - technology changes to industry	$ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _____ Water quality	Airport + port ; Chullora area; Alexandria	
					Adequate ☐ Inadequate ☐ $ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _____				$ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _____		
Recreation and Tourism	**Boating and boating infrastructure**	Low, Med	Key boat access areas via boat ramps 'Limited boat access areas; bridges limit access; RMS policies, speed limits; weirs; environmental assessment	Y	Adequate ☐ Inadequate ☐ $ ☐ People ☐ Information ☐ Legislation / Policy (could be improved but CR is limited) ☐ Coordination ☐ Other _____	low	Potentially, if increase in boating w/increase people; climate change will raise bridge heights and more areas navigable; increased ports/ cruise ships	N - cruise ships unknown	$ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other ___Designated zones, education and compliance, water qulaity _____	Bridges; jetties; Muddy Creek; Botany Bay; river bank; seagrass; mangroves; wetland vegetation	

Issue (Theme)	Threat	Broadly, what is the level of risk? (Assuming no management controls in place) Low / Med / High	What controls are in place to manage this risk? (Policy / Action) (Local / Regional / State)	Is it adequate? (Yes / No)	Why? (Please explain) (for adequate or inadequate)	What is the remaining level of risk after management controls in place? Low / Med / High	Will the threat get worse in future? How? (Population pressure, climate change, trade gateway, etc)	Will the existing management controls be adequate to manage the threat in future? (Yes / No)	What needs to improve to manage risk to the threat in the future? How? (Please explain)	List "hot-spots" that may be impacted by this threat (geographical area/sector/assets/ ecosystems)	Comments
	Four-wheel driving	Low	Not permissible - Access also prevented by bollards	Y	Adequate ☐ Inadequate ☐ $ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _____	Low	maybe with increased population	Y	$ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _____	Designated under used parks	
	Swimming, snorkelling and diving	Low - wishful objective	Limited access; "perceived" water quality; water quality decreases access Provision of netted swimming area(s) along Lady Robinson Beach (x3)	Y	Adequate ☐ Inadequate ☐ $ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _____	Low	Too low to impact to be a threat	Y	$ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _____	all waterways	If the solution for the desire to swim in the river is a concrete pool adjacent to the river -- High impact threat to ecology/ wildlife
	Passive recreational use (no direct water contact, scenic)	Medium/ High Low risk - Burwood Council	Green grid; N.P Rangers; plans of management with limited control; ACTIVE Corridors (pathways/ jet ski bay --> high risk governed by fisheries legislation Green Space grants Saving our species grants NSW Environmental Trust grants River is fenced for length it passes through Burwood Council area to prevent access PoM - REF - if land has potential to be affected	N	Adequate ☐ Inadequate ☐ $ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other __more space more weighting towards green space/ not enough rangers_____	Med- high	increased population; limited access to parks; loss of estuarine riparian vegetation	No	$ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _Better planning controls that require private lands to be given back to councils for riparian zones, need to allow greater/ larger riparian zones to accommodate sea level rises, water quality and green spaces access_____	Open space	Passive recreation is enabled by access through, ontop of natural areas e.g cemented/ impervious pathways/ cycleways
Land use Intensify-cation (I)	**Urban stormwater discharge**	High	WSUD; stormwater management plans; POEO Act; LGA Act; LEPs; DCPs; building DA requirements; infrastructure (GPTs) Burwood council stormwater management plan to control urban stormwater discharge council Botany bay water quality improvement plan. Regional and District Plan; OEH Risk-based approach to water quality treatment. Some Council's have implemented wsud measures. Canterbury Bankstown Council responsible	no Not really. Unsure if all Council's are on the same page with the targets and impmenenting and maintaining wsud measures.	Adequate ☐ Inadequate ☐ $ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other __more infrastructure (upgrade)_____	High	yes, climate change, inundation, increased development/ impervious surfaces	no	$ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _____ water quality Could improve silt and high flow run off into park area	Bray Ave Stormwater	
	Foreshore development	High	Coastal management SEPP (coastal vulnerability areas currently undefined); Coastal use area requires consideration of various design documents / policy) foreshore building line; flood mapping; LEPs; Coastal Management Act New foreshore development not allowed under Burwood LEP Riparian buffer zone protections. DPI Fisheries policy and guideleines for fish habitat conservation and management. Council foreshore management plans?	no Needs mor given increasing urbanisation of ctachment and pressure on foreshore	Adequate ☐ Inadequate ☐ $ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _____	High	Yes, population; SLR; population pressure require more demand on developments	no	$ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _____	Syd-Bankstown corridor to impact cooks river	
	Beach nourishment and grooming	NA	Groyne field nourishment mid 2000s see: http://www.wardgroup.com.au/portfolio/lady-robinsons-beach/ $1M program for Towra beach n 2000 Investigations and lobbying by Bayside council		Adequate ☐ Inadequate ☐ $ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _____				$ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _____		

Issue (Theme)	Threat	Broadly, what is the level of risk? (Assuming no management controls in place) Low / Med / High	What controls are in place to manage this risk? (Policy / Action) (Local / Regional / State)	Is it adequate? (Yes / No)	Why? (Please explain) (for adequate or inadequate)	What is the remaining level of risk after management controls in place? Low / Med / High	Will the threat get worse in future? How? (Population pressure, climate change, trade gateway, etc)	Will the existing management controls be adequate to manage the threat in future? (Yes / No)	What needs to improve to manage risk to the threat in the future? How? (Please explain)	List "hot-spots" that may be impacted by this threat (geographical area/sector/assets/ ecosystems)	Comments
	Clearing riparian and adjacent habitat including wetland drainage	High	coastal SEPPs; coastal management Act; Water Management Act. NSW Biodiversity Conservation Act, NSW Wetlands Policy, DPI habitat protection plans see: https://www.dpi.nsw.gov.au/fishing/habitat/protecting-habitats/toolkit This is a legacy issue REF requires	Y	Adequate ☐ Inadequate ☐ $ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _____	Medium	SLR; population/ urban density; Syd-Bankstown priority; climate change to drive moore intense weather events		$ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _____		**The Cooks River CMP needs to clearly identify the inherent, environmental and social value of the rivers riparain lands. The protection of such lands needs to be emphasised in the CMP - that way future development will need to consider maintaining these values of riparian lands (and not shade them or turn them into overly landscaped environments) ... The CMP should idenift area to improve the riparian and wetland values of riparian lands (ie. further areas where saltmarsh can be introduced)**
Land use Intensify-cation (II)	**Agricultural diffuse source runoff**	low	POEO Act		Adequate ☐ Inadequate ☐ $ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _____				$ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _____		
	Stock grazing of riparian and marine vegetation	NA			Adequate ☐ Inadequate ☐ $ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _____				$ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _____		
	Introduction of species, animals, plants, pests and weeds	High	biosecurity legislation; management plans open space; community and other bushcare; council regulators CMA biosecurity activities, AQIS - Biosecurity Act DPI invasive species plan https://www.dpi.nsw.gov.au/biosecurity/weeds/strategy/strategies/nsw-invasive-species-plan-2018-2021	no	Adequate ☐ Inadequate ☐ $ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _____	HIGH - Non protection of nature flora and fauna; inadequate protection against noxious weeds	all of the above will continue to impact Flying Fox colony and airport	yes	$ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _____	**Weed invasion of open space. Introduced species/ Indian minor, noxious weeds Caulerpa see" https://www.dpi.nsw.gov.au/fishing/pests-diseases/marine-pests/found-in-nsw/caulerpa-taxifolia**	**biodiversity threat by urbanisation**
	airport/ ports trade gateway / Caltex oil lines easement and breakage	high	EPA licences	no							
	Sewage effluent discharges and septic runoff (and aging infrastructure)	high	POEO; Sydney water operating licences; planning controls new buildings Beachwatch monitoring: see https://www.environment.nsw.gov.au/beachapp/BotanyBulletin.aspx?NoMobile No septic runoff in Burwood council, unsure of sydney wtaer sewer overflows. Council, sydney water, EPA	no	Adequate ☐ Inadequate ☐ $ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _____	need to enforce policies about illegal connections	replacement of ageing infrastructure; if testing of illegal connections continues		$ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _____ Water quality		**Wolli Creek/ Barolmell valley has had testing amd new infrastructure - a major sewer pollutant source- needs this at key areas - use cooks river 2015 physical profile**

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Hydrologic and Sediment Modifications	**Estuary entrance modifications and breakwaters**	High	planning controls; guidance materials; water management act	NO	Adequate ☐ Inadequate ☐ $ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _____	High	Yes, climate change (SLR)	no	$ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _SW, councils, RMS working together_____	**Alexandria canal; steel street piling; SW concrete canals**	**Cooks River historic reconfiguration: https://en.wikipedia.org/wiki/Cooks_River**
	Modified freshwater flows; barriers to riverine and estuarine flows (e.g. weirs, etc.)	Med	Need more expertise; fishway Much of the upper catchment has been chanelised No Clearning of vegetation	no	Adequate ☐ Inadequate ☐ $ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _____	med - heritage listing of weir (need control that prevents renewal of weir)	No- climate change and SLR might increase natural flows		$ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _____	**Wolli Creek Weir**	
	Sediment contamination (toxicants)	High	general acceptance that councils won't remove contaminated sediments; Pollution of Waterways Act Access controls (restricted areas in Bayside development control of below ground structures (in contaminated areas) Contaminated aresas have been defined via 'Groundwater Extraction Exclusion Areas) Schedule 1 and Sch. 2 contaminated sites registers Council, Sydney Water, EPA River bank in Burwood has been naturalised - unsure of sediment quality Mostly a legacy issue that has ongoing impacts on existing users	NO ?? Controlson industrial discharges. Dietary advice issued to fishers. Wsud measures might assist in reducing contamination load from stormwater runofff?	Adequate ☐ Inadequate ☐ $ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _____	High	Yes, climate change, increase intensity of rainfall disturbing sediment	no	$ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _____ Water quality ??? Not sure. Are there any clean up notices within the Catchment? ORICA are working towards cleaning up grondwater contamination in the Botany Sands. Clean up of wider conamination levels would be too costly. The issue can be accepted and worked around.	**Alexandria canal; cooks river - Canterbury DIS eg historic tannery**	
	Littering, solid waste, marine debris and microplastics	High	Educational ; 6 PTS/ litter booms; WSUD; waste management plans; planning controls; EPA - littering reporting/ pollution line; bag bans; container deposit scheme; plastic free campaigns; App - snap, send resolve; councils - single use plastic bags at community events; groups - mud cr Council, Sydney Water, EPAabs Litter traps GPTs. Trash booms. Some measures within the Marine Estate managemetn Strategy to be implemented around this. The 'Tosser' campaign. Litter clean up activities.	No No. These measures do assist. But the litter keeps coming.	Adequate ☐ Inadequate ☐ $ ☐ People -culturak shift ☐ Information ☐ Legislation / Policy -source control ☐ Coordination ☐ Other _____	High	Yes, population pressure, trade gateway	No	$ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _____ Water Quality Look at te measures in the MEM strategy	**EPA / Council listed sites**	
Resource use conflict and access availability (I)	**Conflict over resource access and use**	Med	Plans of Management; Local government Act; NPWS Act	(yes); Enforceme	Adequate ☐ Inadequate ☐ $ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _____	Low- med	Yes- population pressure as result of increase in tourists and visitors	No	$ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _Manage access and cost of entry_____	**Foreshore Beach; Kyemagh; Muddy Creek**	
	Anti-social behaviour and unsafe practices	Med (all other); high (litter)	Local Government Act; NPWS Act; Engagement of Police	Policy (yes); Enforcement (no)	Adequate ☐ Inadequate ☐ $ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _____	Med	Yes- population pressure as result of increase in tourists and visitors	No	$ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _More regulatory officers_____	**Various places along the river**	**This is an outcome of a lack of liveability**
	Overcrowding / congestion	High	Parking Policies; Licencing requirements; Plans of management, Event management policies and regulations)	except during ev	Adequate ☐ Inadequate ☐ $ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other __Events_____	Med	Yes- population pressure as result of increase in tourists and visitors	No	$ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other ___more efficient parking policies_____	**Any boat ramps on the weekends**	

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	Loss or decline of marine industries	Low		No	Adequate ☐ Inadequate ☐ $ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _____	Low	NA	NA	$ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _____	**NA**	
Resource use conflict and access availability (II)	**Excessive or illegal extraction**	High- Bayside; low-elsewhere	NSW Water regulatory role (license)	No	**Adequate** ☐ Inadequate ☐ $ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _don't know who is coordinating_____	High in Bayside	increase in bore water demand	Yes - pending contamination events e.g. Orica	$ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _information not known, need more research_____	Bayside (Botany - Orica)	
	Limited or lack of access infrastructure to the marine estate	High - stormwater asset	Sydney Water restricts access to all sites (liability); steel sheeting bamer Council, Crown lands	NO	Adequate ☐ Inadequate ☐ $ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _____	High	Depends on whether the recreational and natural potential of areas are realised (political will and money) i.e GSC green and blue grid initiatives	NO	$ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _Political will_____ Water quality	**Alexandria Canal, All Sydney Water Assets, Steel Sheeting Access**	
	Loss of public access (either by private development or Government area closures)	High	Prioritisation of infrastructure in policies; Rep 30 Cook Cove; airport trade gate way area; metro line Tempe	No	Adequate ☐ Inadequate ☐ $ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _____	High	Cook Cove; Canterbury Racecourse		$ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _____		
	Excessive stormwater - discharge, sediment, litter, chemical	High	Fencing off of stormwater assets; golf courses; DCPs; POE Act; GPTs and SWM activities	No	Adequate ☐ Inadequate ☐ $ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other ___WSUD Policy_____	High	population increase; aging infrastructure		$ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _____	**S to bank; all precinct development**	**Need LEP's and DCPs; GSC leadership on SWM; policy shift**

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Governance	**Inadequate, inefficient, over- or under-regulation**	High	MoUS; alliances; acts; plans of management; LEPs/ DCPs; fed/state/ local planning/ Syd Water legislation	no	Adequate ☐ Inadequate ☐ $ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _____ Lack of Aboriginal people employed in senior water and land management positions Inequitable and incorrect perception that Aboriginal ranger programs not considered relevant for urban areas	high	Reforms underway; some improvement (coastal SEPP), some make it worse (biodiversity reforms	No	$ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination (between 3 tiers) ☐ Other _____	**All catchment - especially trade gateway**	**Bad regulation is high risk for Cooks River catchment**
	Lack of community/stakeholder engagement and awareness	High	MoUs; alliances; acts; plans of management; partnerships; CMP; community participation planning; comm strategy plans from all councils Office of Local Government guidelines: https://www.olg.nsw.gov.au/councils/integrated-planning-and-reporting/development-and-support/community-engagement In some ways, this catchment has a very enganged and active community. Lots of new people will be 'moving into' the catchment with proposed urban growth development	no Yes, though it needs to be ongoing and target new arrivals to the catchment and developers (so that they align with the vision for the river)	Adequate ☐ Inadequate ☐ $ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _____	high - needs more of whats happening	increased population may make it harder; social media is an important tool; technical change; different generations need different techniques	no other group = yes	$ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _technology and technique_____	**community; council**	**Aging volunteer netowrk and sucession planning**
	Lack of compliance with regulations (by users) or lack of enforcement (by agencies)	High	Resources; coordination; workplace structures; EPA act; fines; training of managers; not enough staff and a broad understanding of the environment Fisheries compliance officers patrol region	no	Adequate ☐ Inadequate ☐ $ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _____	high	; increased in population means more people doing the wrong thing; political will not going towards protection of the environment	no	$ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _____	**natural areas being impacted by physical threats**	
	ownership and responsibility of the river catchment	medium	lack of knowledge about who owns/manages state govt assets Multiple jurisdictions GSC District plan(s) (Eastern City and South) Sydney Transport strategy	no	Adequate ☐ Inadequate ☐ $ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _____		expect technology will make it easier	yes		**sheet piles; river bank; botany bay**	
	lack of intergovernmental coordination	high	subject to political mill GSC District plans Cooks River Alliance George River Combined Councils SSROC SCCG	no	Adequate ☐ Inadequate ☐ $ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _____		Depend on mergers and restructures	unsure	$ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _____	**Planning - land use zones**	
Public Safety	**Wildlife interactions (e.g. shark bite, jellyfish, boat striking a whale)**	Low - Med	signage; educational campaigns; open space maintenance River is fenced to prevent public access for its full length in Burwood LGA	yes	Adequate ☐ Inadequate ☐ $ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _____	Low	No, as the wildlife will be impacted by population pressure and climate change	NA	$ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _____	**Cooks five foreshore; Tempe Reserve; Wolli Creek National Park; Alexandrai's Canal**	
	Seafood contamination	High	Fines for wet catch and release; signage Fishing areas controls / strictions (see rec fishing) Legacy contamination issues EPA provide advice on eating fish in Botany Bay	no	Adequate ☐ Inadequate ☐ $ - not enough for cleaning up ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _____	Med - High	Yes, population increase = increase in population	no	$ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _____ Water quality	**Cooks River footbridges/ bridges in estuarine areas; kendrick park; boat harbour; muddy creek; cooks on Rowers**	
	Other water pollution affecting human health and safety (toxic algal blooms, bacteria, etc.)	High	Signage, education, WSUD (raingardens); water quality testing (health authority); reporting; rangers monitoring discharges These blooms can happen from time to time. Notifications are put out as required. Health and Food Authority Involved.	no	Adequate ☐ Inadequate ☐ $ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other ___remaining risk still high after controls_____	High - toxic sediments still exist	Yes- increase in population and increase in pollution and climate change; hotter = more algal blooms	no	$ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _ infrastructure e.g. sewer mining, WSUD_____ Water quality	**everywhere; sewer overflows; where canal doesn't have a concrete base**	**Pathogens and bacteria, Bird life botulism**

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	Flooding	High	Fences; WSUD, signage, infrastructure (new); planning controls; fire rescue services; ses; education programs - app; flood intelligence warning; flood risk management studies; flood modelling NSW Flood Management program	No	Adequate ☐ Inadequate ☐ $ - lack of flood infrastructure funding ☐ People ☐ Information ☐ Legislation / Policy - still lots of new impervious surfaces in development ☐ Coordination ☐ Other _____	High	yes- climate change,; increase in urban density	No	$ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _infrastructure e.g green roofs, WSUD, increase in pervious surfaces, stormwater harvests, recycled water networks_____	**Wolli Creek development; Carrington Rd; Riverside Cr; Cooks River; Gumborwarra swamp**	
Climate Change	**Sea level rise, altered storm/cyclone activity, air and sea temperature rise, altered ocean currents and waves, altered nutrient inputs, ocean acidification**		Government and academic research Too little, too late	No	Adequate ☐ Inadequate ☐ $ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _____				$ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _____		**Measures to control climate change are pretty much outside the scope of this CMP. Measures to address the impacts of climate change on coastal enviornments should be addressed in this CMP. I.e. changed coastal hazard impacts, inundation impacts, identify area for retreat of saltmarsh and wetlands**
					Adequate ☐ Inadequate ☐ $ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _____				$ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _____		
Biodiversity	**habitat degradation**	high	biodiversity legislation; LGA regulation	no	Adequate ☐ Inadequate ☐ $ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination - lack of enthusiasm to hold the ground ☐ Other _____	high	yes- loss of natural areas as opposed to recreation areas	no	$ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _____		
Cultural heritage	**community not valuing Aboriginal culture and heritage generally**	high	inner west broadscale Aboriginal study; MLALC legislation re site analysis requirement; NPWS legislation; heritage legislation/ local heritage plans see: https://www.environment.nsw.gov.au/licences/ACHregulation.htm Local Aboriginal lands councils	no	Adequate ☐ Inadequate ☐ $ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination - lack of enthusiasm to hold the ground ☐ Other _____	high	RAPS for each council and to organistions along the river		$ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _____	all the Scarborough Park wetlands runs via groundwater into the Cooks River. This area was included as part of the Georges River CZMP. I am not sure if there are adequate groundwater studies in this area to support this. If it is contributing to water quality in the Cooks then it is possibly needing further investigation - Sites are tangible and intangible. Nathan told of the need to include stories and history as part of the Aboriginal history not just sites.	need to consider tangible and intangible cultural heritage The data available for Aboriginal sites is on AIHMS (https://www.environment.nsw.gov.au/licences/AboriginalHeritageInformationManagementSystem.htm) . The sites listed are considered as minimal and there was discussion that there are many more sites but that site inspections were only required after 1983 and much of the soil was covered by then. Yvonne pointed out that due diligence is that within 200 metres of a river bed is highly likely to contain Aboriginal sites. The straightening of the river may influence this… -Climate change and sea level rise was seen as a key
Others?	**Ageing infrastructure - i.e. sheet pile seawalls**	high	Cooks River Alliance are trying to find out who is the owner of this infrastru		Adequate ☐ Inadequate ☐ $ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _____				$ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _____		The walls are nearing the end of their life and need replacing. Difficult to do when no-one is owning up to owning them. Environmentally friendly designs should be used.
	Grey headed flying fox colony	Medium	PoM and Flying Fox Camp Management Policy								

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	Rock art may be affected	Low	Awareness and PoM		Adequate ☐ Inadequate ☐ $ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _____				$ ☐ People ☐ Information ☐ Legislation / Policy ☐ Coordination ☐ Other _____		

Appendix I Areas for Potential Amendment to Coastal Wetlands and Littoral Rainforest Area CM SEPP Mapping

Project No. N20999
Project Name: Cooks River Catchment CMP Scoping Study

Appendix I Areas for Potential Amendment to Coastal Wetlands and Littoral Rainforest Area CM SEPP Mapping

Council	Coastal Viewer Link	Amendment Recommendation	Reason for Amendment
CRA	http://webmap.environment.nsw	Sir Joseph Banks Park wetlands, missing in draft maps	Area has a good assemblage of native species and is a biodiversity/wetland corridor
CRA	http://webmap.environment.nsw	Mill Stream and Engine Pond (Botany Wetlands), review extent of wetlands, patches missing in draft maps	Wetlands habitat is a continuous in this area, as opposed to the discrete patches currently shown in the draft maps
CRA	http://webmap.environment.nsw	Tempe Wetlands parallel to South St, missing in draft maps	Known change of use
CRA	http://webmap.environment.nsw	Sydney Airport wetlands, missing in draft maps	Wetlands draining to Alexandra Canal, tributary of Cooks River, potentially affecting estuary ecosystem
CRA	http://webmap.environment.nsw	Sydney Park wetlands, to be mapped, missing in draft maps	Known change of use
CRA	http://webmap.environment.nsw	Muddy Creek littoral forest/mangrove corridor, upstream patches missing in draft maps	Part of biodiversity/wetland corridor
CRA	http://webmap.environment.nsw	Bicentennial Park Wetlands/Colson Crescent/Scarborough Park wetlands, patches missing in draft maps	Part of biodiversity/wetland corridor
CRA	http://webmap.environment.nsw	Wolli Creek littoral forest corridor, review of wetlands/littoral forest and proximity areas, patches missing in draft maps	Corridor of significant closed forest remnants and Turpentine forest in otherwise urbanised area
CRA	http://webmap.environment.nsw	Gough Whitlam Park wetlands and salt marsh, missing in draft maps	Known change of use
CRA	http://webmap.environment.nsw	Cup and Saucer Creek wetlands, missing in draft maps	Known change of use
CRA	http://webmap.environment.nsw	Canterbury Racecourse wetland, missing in draft maps	Part of biodiversity/wetland corridor
CRA	http://webmap.environment.nsw	Patches of littoral forest/mangrove and wetlands along Cooks River's banks, missing in draft maps	Known change of use
CRA	http://webmap.environment.nsw	Yarrowee wetlands, missing in draft maps	Known change of use
CRA	http://webmap.environment.nsw	Chullora (Yana Badu) wetlands and river forest remnants, missing in draft maps	Part of biodiversity/wetland corridor

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