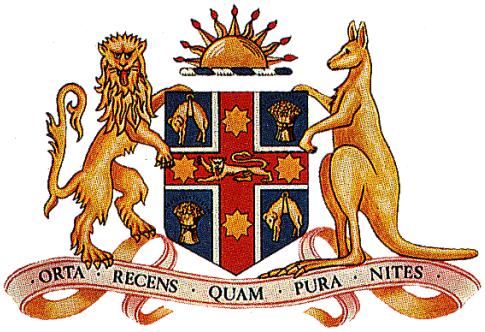

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COUNCIL NOTICES

COFFS HARBOUR CITY COUNCIL

Coastal Protection Act 1979, Section 55H

Gazettal and Commencement of a Coastal Zone Management Plan

COFFS HARBOUR CITY COUNCIL with the certification of the Minister for the Environment, have prepared and adopted the Coffs Creek Estuary Coastal Zone Management Plan in accordance with Section 55 of the *Coastal Protection Act 1979*.

The Plan is a strategic and long term plan developed to provide guidance for achieving a sustainable estuary in the future, giving balanced consideration to environmental, social and economic demands on the estuarine system and its catchment area.

The Plan will remain in force until such time as it is amended or repealed by a coastal management program that replaces it.

The Plan may be viewed on Coffs Harbour City Council's website at www.coffsharbour.nsw.gov.au For more information, call 02 6648 4000.

Steve McGrath
General Manager
Coffs Harbour City Council
Locked Bag 155, Coffs Harbour NSW 2450

COFFS CREEK ESTUARY

COASTAL ZONE MANAGEMENT PLAN

Helping to achieve the 2030 Community Vision

Coffs Creek Estuary
Coastal Zone Management Plan

Prepared for: Coffs Harbour City Council and
NSW Office of Environment and Heritage

Cover photo courtesy of Sawtell Framing & Beachscapes Gallery
Amended January 2018 for Certification

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AQUATIC SCIENCE AND MANAGEMENT

GECO Environmental

UPR	*Description*	*Date Issued*	*Issued By*
1988-1027	First issue – Preliminary Draft	20/06/2014	Tim Ruge
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1988-1041	Third issue	09/12/2014	Tim Ruge
1988-1056	Fourth issue	27/01/2015	Tim Ruge
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Executive Summary

The purpose of the Coffs Creek Estuary Coastal Zone Management Plan (CZMP) is to provide Council with a strategic direction for the sustainable management of the Coffs Creek estuary. The CZMP encompasses the Coffs Creek waterway, its tributaries and foreshores, and catchment processes and activities that impact on the condition of the estuary.

The estuary is a key recreational resource for the city and contains important natural ecosystems.

Estuary Issues

On a statewide basis the health of the estuary is under high pressure due to a highly urbanised and largely cleared catchment. Water quality is moderate to poor due to the pressures of cleared land.

The key management strategies of this CZMP to address estuary health pressures include:

- Rehabilitating the riparian bushland of the creeks tributaries west of the existing highway
- Reducing pollutant runoff from rural lands and urban areas
- Conserving the relatively healthy riparian bushland west of the existing highway.

The existing bushland associated with the tributaries of Coffs Creek provide significant benefits to the city area and West Coffs due to the network of green corridors that extend into the urban area providing an attractive green backdrop to the suburban environment.

Recreational use of the estuary varies considerably between the west and east side of the existing highway. East of the highway, the Coffs Creek Walk path network provides the main focus of access to the creek and recreational activity. This is due to the substantial size of the reserves, easy access, the scenic amenity of the natural environment and the variety of recreational opportunities provided by the setting. The lower estuary has also been subject to considerable capital investment for public access.

West of the highway the Coffs Creek tributaries are contained within narrow public reserves and are largely surrounded by private property with limited exposure to the public road system. There are considerable open space reserves associated with the creek system, however few offer significant recreational value largely due to their remoteness, inaccessibility and lack of integration with the surrounding urban setting.

The key management strategies of this CZMP to address community use of the estuary include:

- Maintaining and enhancing Coffs Creek Walk as the primary access and recreational corridor in the lower estuary
- Improving recreational opportunities and pathways associated with Coffs Creek reserves west of the highway for the benefit of West Coffs community
- Rehabilitating the riparian bushland of the creeks tributaries west of the existing highway to sustain the visual amenity provided to the adjoining suburban environment.

Estuary Management Actions

The table overleaf summarises the management actions for Coffs Creek estuary:

Action No. / Title	*Description*	
High Priority Actions		
H-1 - Rehabilitate Riparian Corridors in the Upper Catchment	1. Support vegetation rehabilitation and weed management measures for priority areas detailed in Council's *Natural Resource Management Plan for Coffs Harbour City Council Lands Adjoining Coffs Creek* (NRMP) (CHBRG, 2013) 2. Use Council incentives program to encourage rural landholders to restore riparian corridors 3. Encourage private conservation agreements with rural landholders for important habitat or key wildlife corridors 4. Redesign drain to natural stream form near King Street Park	1. $15,000 pa over 5 years 2. $20,000 pa 3. $5,000 pa over 5 years 4. $50,000
H-2 - Conserve Riparian Corridors in the Lower Catchment	▪ Undertake vegetation rehabilitation and weed management of Council managed land in the lower estuary based on Council's NRMP	▪ Costs are detailed in Council's NRMP
H-3 - Foreshore Management Plan for Lower Estuary Reserves	1. Replace the failing timber retaining wall and gabion works in Park Beach Reserve with a more gradual level change to improve the amenity 2. Simular works as above for foreshore path / esplanade near England's Park 3. Combine natural vegetation into existing shoreline erosion works to improve the visual appearance 4. Retain 'natural' bank amenity on southern bank near entrance	1. $250,000 2. $200,000 3. $50,000 4. Council budget
H-4 - Stormwater management	1. Develop a Stormwater Management Plan for Coffs Creek. 2. Regularly maintain the six major stormwater outlets in Coffs Creek 3. Investigate the need for a GPT next to Marcia Street Depot 4. Audit key industrial areas for better stormwater quality outcomes 5. Education of rural landholders for better soil / pesticide / fertiliser practices	1. $50,000 2. Council budget 3. Council budget 4. $50,000 5. $10,000
H-5 - Litter Control	▪ Undertake a litter prevention campaign ▪ Require litter management for events that hire the Coffs Creek walk ▪ Involve local schools in litter awareness and monitoring	▪ < $2000 in promotional materials and direct support
H-6 - Improve Pedestrian and Cycle Paths in Upper Catchment	▪ Carry out the relevant actions contained in Council's Open Space Strategy / Pedestrian Access and Mobility Plan / Bike Plan. ▪ Include new trails and paths identified in Council's NRMP ▪ Improve the safety and accessibility of existing pedestrian/cyclist crossings of the Pacific Highway	▪ Council budget
H-7 - Better Use of Coffs Creek Reserves in the Upper Catchment for Recreational Opportunities	▪ Carry out the relevant actions contained in Council's Open Space Strategy / Pedestrian Access and Mobility Plan / Bike Plan. ▪ Consider making better use of the Coffs Creek reserve system and drainage reserves for new recreation areas and pedestrian/cycle connections	▪ Council budget
H-8 - Sustain the High Visual Amenity provided by Riparian	▪ Implement actions in Council's NRMP that modify and improve grass mowing practices on public reserves ▪ Adopt a visually coordinated suite of materials, details, signage etc in all new infrastructure work.	▪ Council budget

Action No. / Title	*Description*	
Bushland		
H-9 - Implement Estuary Health Monitoring	▪ Develop and implement an estuary health monitoring program based on the plan outlined in **Appendix A** of this CZMP	▪ $20,000 every 3 years
Medium Priority Actions		
M-1 - Monitor Seagrass, Saltmarsh and Mangroves	1. Map mangroves, seagrass and saltmarsh in Coffs Creek every 6 years 2. Measure the condition of mangroves, seagrass and saltmarsh every 3 years	1. $10,000 every 6 years 2. $10,000 every 3 years
M-2 - Allow for Saltmarsh Migration in Response to Sea Level Rise	▪ Protect existing saltmarsh at Englands Park and Edgar Street foreshore ▪ Assess the above areas for suitability for potential saltmarsh migration path in response to sea level rise	▪ $50,000
M-3 - Protect and Enhance Estuary Bank Stability	▪ Monitor the estuary banks after significant flood events and remediate bank erosion sites where public infrastructure is at risk	▪ Council budget
M-4 - Enhance Heritage and Cultural Values	▪ Supporting the implementation of *Buluunggal – The Aboriginal Community Vision* for *the Coffs Creek Catchment and Estuary* ▪ Implement a program that identifies dual names, drawing on traditional Aboriginal names for key locations such as naming of Coffs Creek ▪ Involve the local Aboriginal community in relevant management decisions ▪ Support the *Coffs Creek Restoration & Interpretive Bush Tucker Trail* project	▪ Council budget
M-5 - Implement Entrance Management Policy	▪ Adopt and implement Entrance Management Policy based on policy contained in **Appendix B** of this CZMP	▪ Council budget
Low Priority Actions		
L-1 - Improve and Manage Water Access around the Lower Estuary	1. Upgrade the existing Melittas Street boat ramp and other smaller jetties 2. Prohibit large scale commercial recreation boating along the creek 3. Prohibit mooring in the estuary 4. Developing Council policies that prohibit mooring and use of large commercial recreation vessels in the estuary	1. $20,000 2. Council budget 3. Council budget 4. Council budget
L-2 - Strengthen Community Appreciation of the Upper Tributaries	1. Educate farmers and residents adjoining Coffs Creek tributaries and drainage lines about the value of the reserve system. 2. Implement interpretive signage to enhance awareness	1. Council budget $10,000pa for infrastructure work and revegetation 2. $10,000
L-3 - Monitor Fish Abundance and Diversity	1. Undertake monitoring of fish abundance and diversity on a regular basis as part of an overall estuary health monitoring package. 2. Undertake the sampling and analysis of common recreational fish and shellfish from Coffs Creek to assess their suitability for eating.	1. $5,000 per monitoring event 2. Council budget / $2,000 per round for laboratory fees

1 Introduction

The purpose of the Coffs Creek Estuary Coastal Zone Management Plan (CZMP) is to provide strategic direction and specific focus for the sustainable management of the Coffs Creek estuary. The scope of the plan encompasses the Coffs Creek waterway, its tributaries and foreshores, and the wider catchment insofar as catchment activities impact on the condition of the estuary. This CZMP details actions (the Implementation Schedule) to be executed by Coffs Harbour City Council (Council), other public authorities and the private sector to address priority management issues for the Coffs Creek estuary. These issues relate to:

- risks to public safety and built assets;
- pressures on estuary health; and
- community uses of the estuary.

The general area covered by the CZMP is defined by the hydrological catchment of Coffs Creek as shown in the top image in **Illustration 1.1**. The CZMP focuses on the estuary which is located downstream of the tidal limits of the tributary creeks between the Pacific Highway and Coffs Creek entrance (refer to lower image in **Illustration 1.1**). However, the broader catchment of Coffs Creek is considered with respect to influences on estuary health and the connection with community uses of the estuary.

1.1 How to use this CZMP

- Management strategies and associated tasks are prioritised in the Implementation Schedule (**Sections 3** to **5**) for implementation by the 'Responsible Agency'.
- An indicative timeframe is nominated for implementation of each management strategy in the schedule.
- The specific tasks listed for each strategy shall be 'ticked off' by the 'Responsible Agency' at both commencement and completion of the task.

1.2 Review and Reporting

This document will be reviewed every 5-10 years to ensure its effectiveness and consistency with State Government policy. A comprehensive review will be required prior to 31 December 2021 to transition this CZMP into a Coastal Management Plan in order to retain its certification status under the Coastal Management Act 2016. Implementation of the strategies and the associated tasks will be coordinated by Council staff and monitored by the Coast and Estuary Management Advisory Committee (CEMAC) throughout the duration of the CZMP. During the revision phase of this document, any substantial changes to the Plan and strategies will be reported to Council, CEMAC, and State government and appropriate agencies to ensure that all relevant stakeholders are informed.

Community reporting will be provided by way of disclosing all relevant information on the Council website throughout the process allowing the community a platform to comment and provide feedback.

1.3 Background to development of this CZMP

In 2004, Council's Coastal Zone Management Committee (CZMC) adopted the goal "to assist council in achieving an integrated, balanced, responsible and ecologically sustainable use of the Coffs Creek." In 2012 Council engaged GeoLINK in conjunction with Aquatic Science and Management (Mathew Birch), Redbelly Landscape Architects (Garry Murray), GECO Environmental (Damon Telfer) and Water Technology to develop a CZMP for Coffs Creek estuary, with funding and technical assistance provided by Office of Environment and Heritage (OEH).

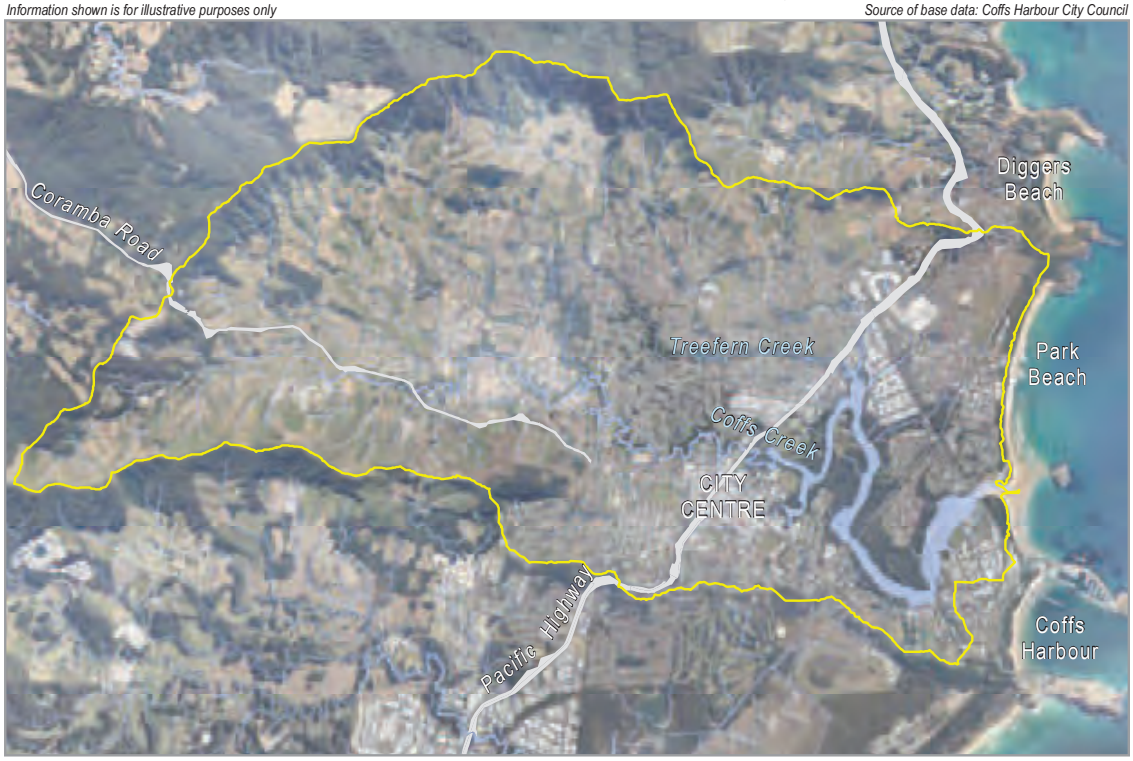
Preparation of this CZMP involved the following components which are detailed in separate reports:

- *Scoping Exercise* which defines the scope of the CZMP and the issues to be addressed
- *Literature and Information Review* which provides an understanding of the information base relevant to the estuary processes and health, and community uses of the estuary
- *Coffs Creek Infilling and Hydraulic Capacity Study* which provides an understanding of the hydraulic and sedimentation characteristics of the estuary and assesses the response of the system to changes linked to potential management options such as dredging and reducing mangrove density
- *Estuary Condition Study* which details the health of the estuary and the relationship between the estuary processes (including sedimentation and hydraulic characteristic)
- *Community Uses Assessment* which details issues, threats and considerations with respect to recreational uses, scenic and public amenity, and the cultural and heritage significance of the Coffs Creek estuary.

Drawn by: KHP Checked by: RE Reviewed by: TIM Date: July 2014

Information shown is for illustrative purposes only

Source of base data: Coffs Harbour City Council



0 1.25 km

Coffs Creek Total Catchment

0 500

Coffs Creek Lower Estuary

North

GeoLINK environmental management and design

Coffs Creek Estuary Coastal Zone Management Plan
1988-1032

Study Area

Illustration 1.1

1.4 Overview of the Coffs Creek estuary and catchment

Coffs Creek estuary is located within the land of the Gumbaynggirr nation. The Coffs Creek estuary is located centrally between the Coffs Harbour central business district and the jetty precinct. Coffs Creek estuary is recognised as one of the city's key recreational resources and contains important and significant ecosystems of forest, wetlands, saltmarsh, mangroves, and areas of koala habitat. Coffs Creek estuary is part of the Solitary Islands Marine Park and is designated as a Habitat Protection Zone.

The hydrological catchment area of Coffs Creek covers 24.5 km² and has an estimated population of 18,000 (Roper et. al., 2011). The catchment is characterised by steep hillsides with elevations of 490 m AHD falling down to the coastal floodplain. The catchment drains through three main creek lines – Coffs Creek and two northern tributaries: Treefern Creek which flows parallel to Argyll Street; and an unnamed creek which flows parallel to Bray Street.

Source: NSW Office of Environment and Heritage

Plate 1.1 Aerial Image of Coffs Creek Estuary

Coffs Creek estuary can be classified as a wave-dominated estuary at a mature evolutionary phase is characterised by a relatively high degree of sediment infilling. These types of estuaries are general constricted by wave-deposited beach sand and flood-tidal deltas (Roy et al., 2001). The entrance to Coffs Creek is predominantly open, however it can close under low creek flow conditions and during periods of beach accretion or after large ocean storm events.

The estuary is characterised by a well-defined wide meandering channel that creates broad expanses and long reaches of water. The estuarine portion of Coffs Creek is complemented by a substantial and continuous area of public reserve that protects a rich diversity of riparian vegetation including saltmarsh, mangroves and subtropical coastal floodplain.

The character of the creek environment transforms significantly west of the highway. From a relatively substantial water body the creek splits into two smaller tributaries and then into a series of minor watercourses and drainage lines that dissect the basin floor and the surrounding hillsides.

The catchment extending west from the Pacific Highway includes the highly urbanised area of West Coffs Harbour and the rural and bush hinterland of the urban fringe and surrounding slopes. 82% of the catchment is classified as disturbed which is higher than other estuaries in the Northern Rivers region and similar to metropolitan estuaries of Sydney.

The upper tributaries of Coffs Creek have influenced the way in which the West Coffs area has developed, however the creeks need to be better integrated into Councils open space reserves for multi-purpose uses including conservation, recreation and pedestrian/cycle access corridors.

1.4.1 **Land use**

Land uses in the catchment are shown in **Illustration 1.2** and generally comprise:

- 35% residential development and 9% community and business use
- 23% agricultural uses which are predominantly banana and blueberry farming (although not all of this area is being actively cultivated) and 10% grazing
- 12% under tree and shrub cover
- 11% associated with recreational uses.

1.4.1.1 Land Use History

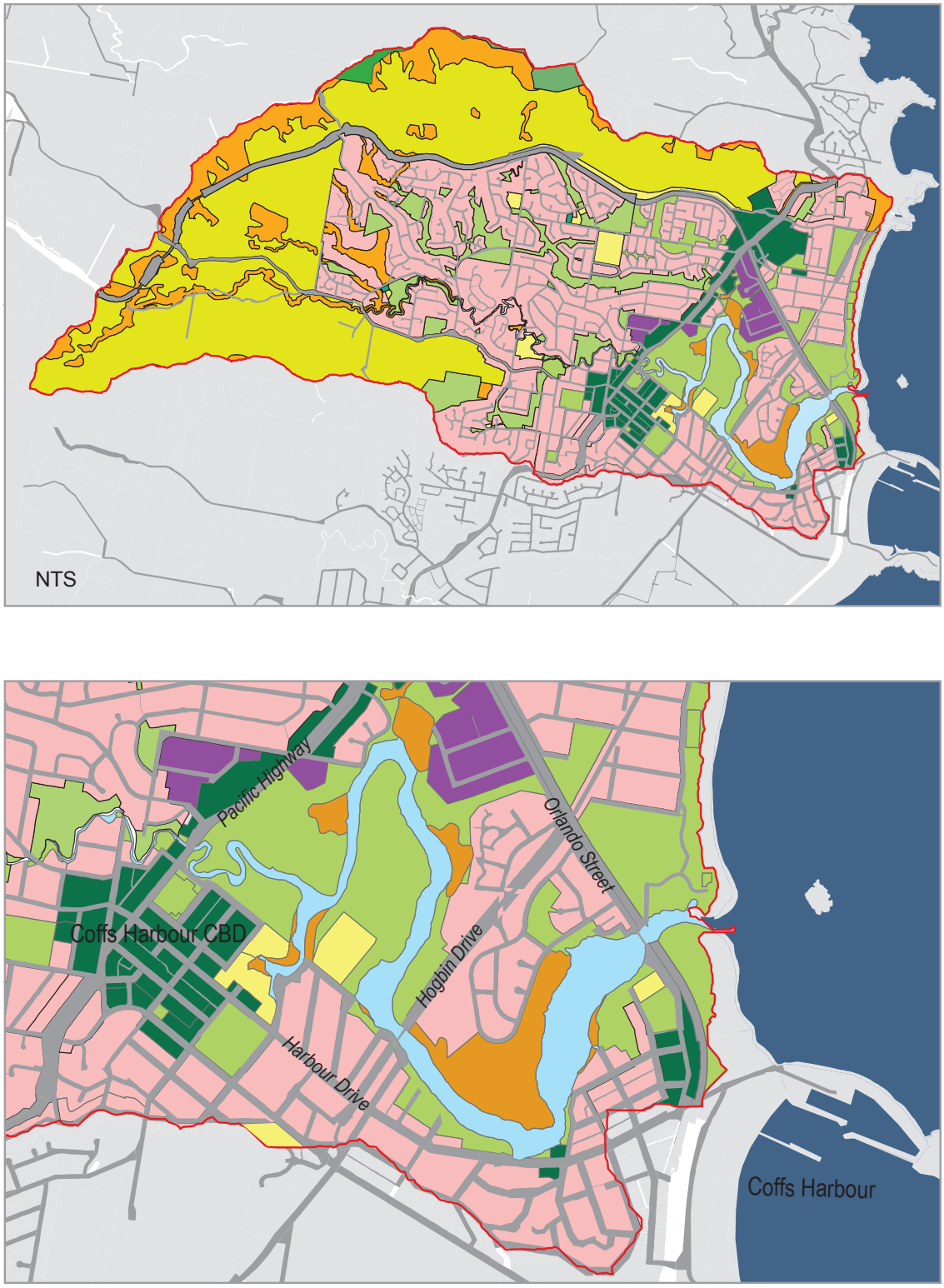
Aerial images indicated that in the 1950's, land use was predominately rural with minor urban development and residential subdivision occurring in and around the city centre. Over the past sixty years, particularly since the 1970s, urban development has intensified around Coffs Creek and spread outwards from the city centre transforming the lower rural lands to residential suburbs. The extent of clearing / remnant vegetation in the upper fringes of the catchment has remained relatively unchanged since 1954.

1.4.1.2 Future land use changes

Potential future land use changes significant to the estuary include construction of the Pacific Highway bypass of Coffs Harbour. The preferred highway route will effectively form the western extent of future urban development of the Coffs Creek catchment.

Information shown is for illustrative purposes only

Drawn by: KHP Checked by: RE Reviewed by: RE Date: July 2014
Source of base data: Coffs Harbour City Council



North

Land Use

GeoLINK environmental management and design

Coffs Creek Estuary Coastal Zone Management Plan
1988-1033

Illustration 1.2

2 Context and Priority of Actions

2.1 How this CZMP relates to the NSW Coastal Management Principles

The NSW Government has developed Coastal Management Principles to guide strategic considerations in coastal and estuary management, including the preparation of CZMPs. The relationship between the principles and this CZMP is detailed in **Appendix F**.

2.2 How this CZMP fits into Council's strategic context

The Coffs Creek estuary CZMP relates to the Coffs Harbour 2030 Plan (Council's overarching plan that integrates planning and reporting frameworks) and other Council plans and policies. The relationship between the CZMP and Council plans and policies is detailed in **Appendix F**.

The CZMP also directly supports and adopts relevant strategies from the following Council plans:

- Council's *Natural Resource Management Plan for Coffs Harbour City Council Lands Adjoining Coffs Creek* (CHBRG, 2013)
- Coffs Harbour City Council Open Space Strategy 2010
- Pedestrian Access and Mobility Plan Review (PAMP) (2011)
- Bike Plan 2014-2019 (Draft).

2.3 Community and stakeholder values and issues for Coffs Creek

A range of community and stakeholder values and issues have been developed through the consultation process of preparing this CZMP. The consultation process included the following:

- An initial community workshop on 26 June 2012 to gain input on community values, issues and objectives for the estuary.
- A community survey over a month from June to July 2012 to establish additional information on how the community uses the estuary and the level of concern for a range of issues (a summary is contained in **Appendix G** in regard what importance respondents placed on a range of concerns and management activities);
- A community workshop at Cavanbah Hall, Coffs Harbour on 26 October 2013.
- Stakeholder consultation including:
  - an initial project inception meeting between the consultant team, Council and NSW Office of Environment and Heritage to establish an initial set of key concerns and objectives largely based on input from Council's Coastal Zone Management Committee;
  - letters sent to over 30 stakeholder groups requesting for input on their role or activities associated with the estuary, their issues or concerns, objectives and potential strategies; and
  - presentations to Council's Coastal Zone Management Committee at various stages of the CZMP preparation.

The estuary management issues raised from the consultation process and addressed in the preparation of the CZMP are summarised in the following table. The issues presented in the table are a record of community / stakeholder opinions which may not necessarily agree with the issues and pressures developed from the community uses assessment and estuary condition study (GeoLINK *et al*, 2013a and 2013b).

Table 2.1 Community and stakeholder values and issues

Topic	*Issues / Goals*
Ecological health and water quality	▪ Poor water quality including impacts on Marine Park Authority sanctuary zone. ▪ Public health issues associated with eating fish from the creek. ▪ Runoff from residential, commercial, industrial and agricultural lands. ▪ Disturbance of acid sulfate soils. ▪ Herbicide and pesticide use in the catchment. ▪ Litter / rubbish (domestic and industrial). ▪ Discharges from Dolphin Marine Magic (DMM) and conversely, the impact of poor water quality in Coffs Creek on intake water for DMM. ▪ Sewage overflows in extreme wet weather. ▪ Pollution from septic tank systems.
Erosion	▪ Benthic habitat destruction and loss of visual amenity resulting from bank erosion and past erosion protection works. ▪ Impacts on bank erosion from uprooted trees along the banks. ▪ Bank erosion at the southern side of the creek mouth.
Sedimentation	▪ Sediment accretion and its effect on fisheries habitat and water quality. ▪ Effects of estuary entrance condition on sedimentation, tidal exchange, shoaling and flushing. ▪ Impact of the harbour construction on coastal sediment movement and consequent impacts to the creek.
Aquatic habitat	▪ Decline in seagrass beds, mangrove, saltmarsh and other estuarine communities. ▪ Effects (short and long term) of pollution incidents on estuarine habitat.
Riparian vegetation	▪ Loss and deterioration of riparian habitat and consequent impacts to fauna. ▪ Lack of riparian or wildlife corridors connecting the coast and hinterland. ▪ Edge effects on riparian zones from urban and rural lands.
Acid sulfate soils	▪ Impacts from disturbed acid sulfate soils from urban and rural lands.
Flooding / oceanic inundation	▪ Impacts of past flood protection works. ▪ Impact of sand shoals on flood levels. ▪ Management of floods and stormwater runoff from high rainfall events.
Impacts of climate change	▪ Changes in entrance dynamics due to climate change and sea level rise. ▪ Impact of coastal inundation and sea level rise.
Fishing	▪ Impact of recreational fishing on fish stocks and other estuarine fauna and habitat.
Blocking of natural flows	▪ Impact of sand shoals on flow capacity and flushing of poor water quality. ▪ Inappropriate bank protection works. ▪ Impacts of narrow railway / road bridges near creek mouth. ▪ Impact of fallen vegetation in waterways on flood carrying capacity.
Waterway usage	▪ Public access, boating access and boating-related facilities to the waterway. ▪ Conflicts between boating, swimming, fishing and passive recreation. ▪ Potential increased boating activity in the creek. ▪ Impact of sand shoals on canoeing and swimming. ▪ Need for a Council policy on estuary moorings to guide future mooring requests.

Topic	*Issues / Goals*
Entrance management	▪ Need for a formal entrance opening policy.
Development and conservation	▪ Impacts of increased urbanisation. ▪ Stormwater management from urban areas. ▪ Loss of significant natural and cultural heritage areas. ▪ Adequacy of land status / management of reserve areas. ▪ Impacts of increased urban density in existing urban areas.
Recreational use	▪ Poor access for recreational use. ▪ Improve connection between the creek and the botanical. ▪ Reduce mowing of creek reserves and promote vegetation. ▪ Develop more creek-side walking / cycling tracks in upper catchment (west of highway) and link with wider context and wildlife corridors. ▪ Enable pedestrian access across creek in both upper and lower reaches. ▪ Promote more environmental, cultural and heritage interpretation and public art along creek walks and improved legibility of signage systems. ▪ Prevent inappropriate uses along walks such as motorised trail bikes. ▪ Consideration of crime prevention along walks through environmental design. ▪ Installation of accessible fishing platforms (for people with disabilities). ▪ Avoid over-development of tracks that threaten the values / amenity of the creek.
Fauna	▪ Maintain nesting sites in riparian vegetation. ▪ Create buffer zone around flying fox camps to protect flying foxes.

2.4 Committee objectives for Coffs Creek

Council's Coastal Zone Management Committee adopted aim for the Coffs Creek estuary CZMP is:

> *to assist council in achieving an integrated, balanced, responsible and ecologically sustainable use of Coffs Creek.*

The objectives for the CZMP for Coffs Creek estuary have been developed by Council's Coastal Zone Management Committee and include the following:

- Link the CZMP with other planning processes in the coastal zone to facilitate integrated management.
- Involve the community in the preparation of the CZMP including provision of relevant information.
- Consider and accommodate natural coastal processes and hazards.
- Maintain the condition of high value coastal ecosystems and rehabilitate priority degraded ecosystems.
- Address current and potential risks to estuary health.
- Maintain and improve public access arrangements to estuary foreshores, support recreational uses and protect the cultural and heritage environment.
- Consider the effects of climate change, including sea level rise, on coastal hazards, ecosystem health and community uses.
- Develop management actions based on best available information and reasonable practice, including adopting an adaptive management approach.
- Prioritise management actions based on public benefit including long-term cost-effectiveness.

2.5 Prioritisation of management actions

The aim of the prioritising the management actions is to identify proposed actions which address priority management issues, are reasonable and achieve optimal long-term outcomes for the expected available funding. Prioritising the management actions has taken into account:

- whether they are technically appropriate and effective or can be safely implemented and maintained
- whether a actions is reasonable with regard to:
  - the Coastal Management Principles
  - the social, environmental and economic impacts of the strategy, including its benefits and costs, and any impacts on cultural values
  - the views of the community and other stakeholders
- combinations of actions to achieve the best outcomes
- actions that achieve multiple objectives
- logical sequence of inter-dependent actions.

Consideration of the above has resulted in the prioritisation of management actions into 'high', 'medium' and 'low' priority categories as listed below. Details of the management actions are provided in the Implementation Schedule in **Section 3** (High Priority actions), **Section 4** (Medium Priority) and **Section 5** (Low Priority).

Table 2.2 Priority Management Actions

Action No. / Title	*Description*
High Priority	
H-1 Rehabilitate Riparian Corridors in the Upper Catchment	▪ Support vegetation rehabilitation and weed management measures for priority areas detailed in Council's *Natural Resource Management Plan for Coffs Harbour City Council Lands Adjoining Coffs Creek* (NRMP) (CHBRG, 2013) ▪ Use Council incentives program to encourage rural landholders to restore riparian corridors ▪ Encourage private conservation agreements with rural landholders for important habitat or key wildlife corridors
H-2 Conserve Riparian Corridors in the Lower Catchment	▪ Undertake vegetation rehabilitation and weed management of Council managed land in the lower estuary based on Council's NRMP
H-3 Foreshore Management Plan for Lower Estuary Reserves	▪ Replace the failing timber retaining wall and gabion works in Park Beach Reserve with a more gradual level change to improve the amenity ▪ Similar works as above for foreshore path / esplanade near England's Park ▪ Combine natural vegetation into existing shoreline erosion works to improve the visual appearance ▪ Retain 'natural' bank amenity on southern bank near entrance
H-4 Stormwater management	▪ Develop a Stormwater Management Plan for Coffs Creek. ▪ Regularly maintain the six major stormwater outlets in Coffs Creek ▪ Investigate the need for a GPT next to Marcia Street Depot ▪ Audit key industrial areas for better stormwater quality outcomes ▪ Education of rural landholders for better soil / pesticide / fertiliser practices

Action No. / Title	*Description*
H-5 Litter Control	▪ Undertake a litter prevention campaign ▪ Require litter management for events that hire the Coffs Creek walk ▪ Involve local schools in litter awareness and monitoring
H-6 Improve Pedestrian and Cycle Paths in Upper Catchment	▪ Carry out the relevant actions contained in Council's Open Space Strategy / Pedestrian Access and Mobility Plan / Bike Plan. ▪ Include new trails and paths identified in Council's NRMP ▪ Improve the safety and accessibility of existing pedestrian/cyclist crossings of the Pacific Highway
H-7 Better Use of the Coffs Creek Reserves in the Upper Catchment for Recreational Opportunities	▪ Carry out the relevant actions contained in Council's Open Space Strategy / Pedestrian Access and Mobility Plan / Bike Plan. ▪ Consider making better use of the Coffs Creek reserve system and drainage reserves for new recreation areas and pedestrian/cycle connections
H-8 Sustain the High Visual Amenity provided by Riparian Bushland	▪ Implement actions in Council's NRMP that modify and improve grass mowing practices on public reserves ▪ Adopt a visually coordinated suite of materials, details, signage etc in all new infrastructure work.
H-9 Implement Estuary Health Monitoring	▪ Develop and implement an estuary health monitoring program based on the plan outlined in **Appendix A** of this CZMP
Medium Priority	
M-1 Monitor Seagrass, Saltmarsh and Mangroves	▪ Map mangroves, seagrass and saltmarsh in Coffs Creek every 6 years ▪ Measure the condition of mangroves, seagrass and saltmarsh every 3 years
M-2 Allow for Saltmarsh Migration in Response to Sea Level Rise	▪ Protect existing saltmarsh at Englands Park and Edgar Street foreshore ▪ Assess the above areas for suitability for potential saltmarsh migration path in response to sea level rise
M-3 Protect and Enhance Estuary Bank Stability	▪ Monitor the estuary banks after significant flood events and remediate bank erosion sites where public infrastructure is at risk
M-4 Enhance Heritage and Cultural Values	▪ Supporting the implementation of *Buluunggal – The Aboriginal Community Vision for the Coffs Creek Catchment and Estuary* ▪ Implement a program that identifies dual names, drawing on traditional Aboriginal names for key locations such as naming of Coffs Creek ▪ Involve the local Aboriginal community in relevant management decisions ▪ Support the *Coffs Creek Restoration & Interpretive Bush Tucker Trail* project
M-5 Implement Entrance Management Policy	▪ Adopt and implement Entrance Management Policy based on policy contained in **Appendix B** of this CZMP

Action No. / Title	*Description*
Low Priority	
L-1 Improve and Manage Water Access around the Lower Estuary	▪ Upgrade the existing Melittas Street boat ramp and other smaller jetties ▪ Prohibit large scale commercial recreation boating along the creek ▪ Prohibit mooring in the estuary ▪ Developing Council policies that prohibit mooring and use of large commercial recreation vessels in the estuary
L-2 Strengthen Community Appreciation of the Upper Tributaries	▪ Educate farmers and residents adjoining Coffs Creek tributaries and drainage lines about the value of the reserve system. ▪ Implement interpretive signage to enhance awareness
L-3 Monitor Fish Abundance and Diversity	▪ Undertake monitoring of fish abundance and diversity on a regular basis as part of an overall estuary health monitoring package. ▪ Undertake the sampling and analysis of common recreational fish and shellfish from Coffs Creek to assess their suitability for eating.

3

Implementation Schedule – High-Priority Actions

H-1 Rehabilitate Riparian Corridors in the Upper Catchment

Strategy: Undertake a riparian rehabilitation works in the upper catchment to address degraded and modified water courses and to create wildlife corridors connecting the lower estuary to the upper ranges.

Responsible Agency: Coffs Harbour City Council

Timeframe: Years 1 – 10

Cost: Task H-1.1: $15,000 pa over 5 years
Task H-1.2: $20,000 pa for incentives funding
Task H-1.3: $5,000 pa over 5 years
Task H-1.4: $50,000

Potential Funding Sources: CHCC Environmental Levy
North Coast Local Land Services
Environmental Trust Restoration and Rehabilitation grants
Grants through NSW Government for weed control works

Monitoring: H-1.1: Update mapping of rehabilitation areas annually.
H-1.2 & 1.3: CHCC to report annually on uptake numbers & implemented measures.
H-1.4: Implementation of this task is an appropriate benchmark.

Task No.	*Description*	*Underway*	*Complete*
H-1.1	Undertake vegetation rehabilitation and weed management measures for the priority Council reserves on Coffs Creek tributaries as outlined in Council's *Natural Resource Management Plan for Coffs Harbour City Council Lands Adjoining Coffs Creek* (CHBRG, 2013) (referred to as the 'NRMP' in this CZMP). The three-tiered prioritisation system in the NRMP (priority weeds / priority corridors / priority reserves) should be adopted. The priority corridors and priority reserves are shown in **Illustration 3.1**. Coordinate work with measures to enhance recreation and access opportunities. Seek to establish new regeneration teams in the West Coffs area.	☑	☐

H-1.2	Utilise Council incentives program to educate and encourage rural landholders in upper catchment to rehabilitate and protect riparian corridors in priority areas. Undertake in coordination with Coffs Harbour regional Landcare. This task is to link with existing programs and include consideration of the following: ▪ Council / North Coast Local Land Services Environmental Impact Study that identifies high risk industries in Coffs Harbour local government area ▪ Durrunda-Wajaar Repair to Country High Priority Sites ▪ LLS Steep Lands Project co-ordinated through Coffs Harbour Regional Landcare which addresses rehabilitation of steep erodible lands ▪ High priority corridors shown in **Illustration 3.2**	☐	☐
H-1.3	Encourage private conservation agreements between rural landholders and NSW Office of Environment and Heritage through incentives for important habitat, existing vegetation, or key wildlife corridor lands. Utilise the outcomes of the *Landscape Corridors of the Coffs Harbour Local Government Area* project to prioritise areas (refer to priority corridors shown in **Illustration 3.2**)	☐	☐
H-1.4	Lot 4 DP 1084517 Coramba Road and Lot 2 DP 515903 (opposite Coffs Club), King Street Park and Lot 2 DP 533050 (refer to **Illustration 3.3**): ▪ Implement action from Open Space Strategy 2010 in respect to Lot 4 DP 1084517 and Lot 2 DP 515903 (Coffs West Precinct). The action states: "Create SFR [Social Family Recreation] space - including shelters, shared path, planting, footbridge etc. **Redesign drain to natural stream form**. Approach service clubs for interest in adopting the Park as a project." [emphasis added] ▪ Extend the above action to include King Street Park and Lot 2 DP 533050 with respect to redesigning the drain to natural stream form. ▪ The above works are to include consideration of: – establishing a riparian corridor that links with existing riparian vegetation in Lot 2 DP 533050 to south and existing riparian vegetation adjoining Coffs Club in north – incorporating relevant water sensitive urban design measures to restore natural values to degraded and highly modified watercourses and drainage lines including the concrete channel adjacent to Coffs Club – an expanded footprint for the tennis courts; passive surveillance of the tennis courts; and minimising fallen leaves / twigs on the tennis courts.	☐	☐

Information shown is for illustrative purposes only

Drawn by: RE Checked by: GJM Reviewed by: TIM Date: 5/12/2014
Source of base data: Coffs Harbour City Council

LEGEND

- Study area
- NRM Plan Priority Corridor (including some Priority Reserves)
- NRM Plan Priority Reserve

NOTE:
Priority corridors and priority reserves shown are based on Councils Draft Natural Resource Management (NRM) Plan for Coffs Harbour City Council Lands Adjoining Coffs Creek (2013)

0 400

North

Strategy H-1 - Priority Corridors and Council Reserves on Council Managed Lands

GeoLINK environmental management and design

Coffs Creek Estuary Coastal Zone Management Plan
1988-1042

Illustration 3.1

Information shown is for illustrative purposes only

Drawn by: RE Checked by: GJM Reviewed by: TIM Date: 5/12/2014
Source of base data: Coffs Harbour City Council and SIX Maps

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North

Strategy H-1 - Priority Riparian Corridors for works on Rural Lands

Information shown is for illustrative purposes only

Drawn by: RE Checked by: GJM Reviewed by: TIM Date: 10/04/2015
Source of base data: Coffs Harbour City Council

LEGEND

Study area

Existing landscape corridors

North

0 120

Strategy H-2 - Restore Riparian Corridor to Pitt Street Reserve

GeoLINK environmental management and design

Coffs Creek Estuary Coastal Zone Management Plan
1988-1043

Illustration 3.3

H-2 Conserve Riparian Corridors in the Lower Catchment

Strategy: Conserve existing riparian corridors in the lower catchment (east of existing highway) by supporting Council's Natural Resource Management Plan for Coffs Creek reserves and existing bushcare programs and community care group activities. Refer to Natural Resource Management Plan priorities in **Appendix A** of this CZMP.

Responsible Agency: Coffs Harbour City Council

Timeframe: Years 1 – 5

Cost: Costs of implementation on Council managed lands are detailed within the *Natural Resource Management Plan for Coffs Harbour City Council Lands Adjoining Coffs Creek* (CHBRG, 2013). Costs on non-Council managed lands should be determined once priorities have been set in consultation with existing care groups such as the Friends of Coffs Creek and the Coffs Harbour & District Local Aboriginal Land Council (CHALCL).

Potential Funding Sources:
North Coast Local Land Services funding
Environmental Trust Restoration and Rehabilitation grants
Grants through NSW Government for weed control works
CHCC Environmental Levy

Monitoring: Update mapping of rehabilitation areas annually.

Task No.	*Description*	*Underway*	*Complete*
H-2.1	Undertake vegetation rehabilitation and weed management of Council managed land in the lower estuary (refer to **Illustration 3.4**). It is recommended that the priorities for control of environmental weed species are consistent with the priorities contained within Council's *Natural Resource Management Plan for Coffs Harbour City Council Lands Adjoining Coffs Creek* (CHBRG, 2013).	☑	☐
H-2.2	Protect and rehabilitate riparian vegetation in priority areas by supporting existing bushcare programs and community care group activities.	☑	☐
H-2.3	Utilise specialist bush regeneration contractors to undertake primary weed control in priority areas.	☑	☐

Information shown is for illustrative purposes only

Drawn by: RE Checked by: GJM Reviewed by: TIM Date: 5/12/2014
Source of base data: Coffs Harbour City Council

LEGEND

Study area

Council managed land

North

0 400

Strategy H-2 - Council Managed Lands in Lower Estuary

GeoLINK environmental management and design

Coffs Creek Estuary Coastal Zone Management Plan
1988-1045

Illustration 3.4

H-3 Foreshore Management Works for Lower Estuary Reserves

Strategy: Implement a range of works for Park Beach Reserve and near Englands Park to address erosion issues and gain the most of the recreational opportunities and natural values of the location.

Note: Prior to undertaking this strategy, given complex nature of land ownership in the area, further investigation regarding infrastructure, land ownership and management arrangements / land status is required.
Where works are proposed on Crown lands, not under Council management, appropriate authorisation from DoI – Crown Lands & Water will be required prior to the works commencing.

Responsible Agency: Coffs Harbour City Council / Coffs Coast State Park Trust

Timeframe: Years 1 – 10

Cost: H-3.1 - Replace degraded retaining wall with improved foreshore access / erosion protection / revegetation works: $250,000

H-3.2 - Replace degraded retaining wall with improved foreshore access / erosion protection / revegetation works: $50,000

H-3.5: Foreshore management works near Englands Park: $200,000

Potential Funding Sources: CHCC Environmental Levy
North Coast Local Land Services funding
Environmental Trust Restoration and Rehabilitation grants
NSW Coast and Estuary Grants

Monitoring: Routinely check health of infrastructure and implement tasks when appropriate. An overall improvement in amenity and bank stability is an appropriate benchmark.

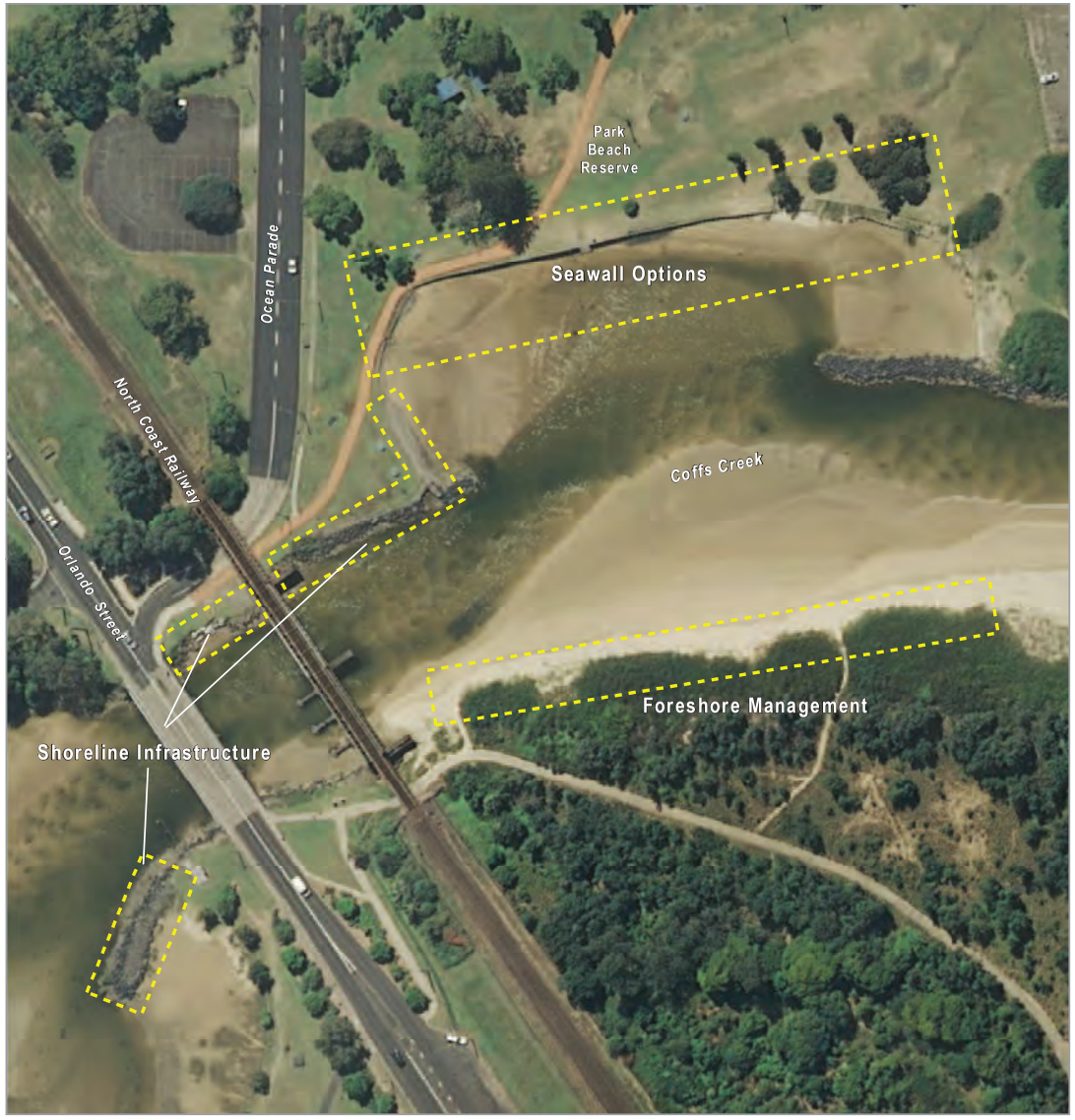
Task No.	*Description*	*Underway*	*Complete*
H-3.1	Replacement of existing timber retaining wall and gabion works in Park Beach Reserve (refer to **Illustration 3.5**): When the existing timber retaining wall on north shore of creek requires significant repair works, replace with a structure that provides a more gradual level change to improve the recreational and visual character of the setting. 1. Prepare concept designs to explore options for a more gradual level change. These should include features that improve the amenity of the park while maintaining stability of the embankment. Consider: ▪ extended terraces and steps along the embankment to increase pedestrian connectivity between park and beach; ▪ a primary path route that provides legible, universal beach access; ▪ wide terraces to create small usable spaces for informal seating, picnicking and sunbathing; ▪ future high-tide levels resulting from sea level rise;	☐	☐

	▪ engineering protection work that is integrated discretely into the profile design; ▪ protected soil pockets to encourage riparian vegetation. 2. Implement preferred concept works.		
H-3.2	Undertake landscape design works where indicated in **Illustration 3.5** to combine natural vegetation into existing shoreline erosion works to improve the visual appearance and fit in with the surrounding natural and recreation setting.	☐	☐
H-3.3	Training Walls on north bank: Monitor changes / erosion of north bank / beach in Park Beach Reserve following Task H-3.1 to determine if an assessment of training wall modifications is required. If required, prepare coastal engineering advice to provide recommended modifications / improvements to training walls.	☐	☐
H-3.4	Retain 'natural' bank amenity on southern bank near entrance: East of existing rock stabilisation works on south bank near railway and road bridge retain 'natural' bank amenity by allowing erosion and sacrificing back beach land / revegetation works.	☐	☐
H-3.5	Foreshore management works near Englands Park (refer to **Illustration 3.6**): When the foreshore path / esplanade (shown in **Illustration 3.6**) and associated retaining wall requires significant repair works, replace the existing structures with functional works that improve the recreational and visual character of the setting. 1. Prepare concept designs to explore options for foreshore esplanade. These should include features that enhance and complement the amenity of the foreshore while maintaining stability of the embankment. Consideration should be given to: ▪ extended terraces and steps along the foreshore to increase pedestrian connectivity between esplanade and beach / water; ▪ a primary path route that provides legible, universal beach access; ▪ engineering protection work that is integrated discretely into the profile design; ▪ future high-tide levels resulting from sea level rise; ▪ replacing existing 'swampy' turfed areas with estuarine vegetation such as saltmarsh. This includes the turfed area on the creek-side of the path in Englands Park – refer to Strategy M-2. 2. Implement preferred concept works.	☐	☐

Information shown is for illustrative purposes only

Drawn by: RE Checked by: DMT Reviewed by: TIM Date: 02/12/14
Source of base data: Coffs Harbour City Council

Shoreline Infrastructure:
Undertake landscape design works that incorporate natural vegetation to improve visual amenity of existing shoreline infrastructure



Seawall Options:
1. Prepare concept designs to explore options for seawall profiles.These should include features that enhance and complement the amenity of the reserve while maintaining stability of the embankment.

Consideration should be given to:
- extended terraces and steps along the embankment to increase pedestrian connectivity between park and beach;
- a primary path route that provides legible, universal \ beach access;
- wider terraces to create small usable spaces for informal seating, picnicking and sunbathing;
- engineering protection work that is integrated discretely into the profile design;
- protected soil pockets to encourage riparian vegetation.

2. Implement preferred concept works.

Foreshore Management:
Retain 'natural' bank amenity on southern bank near entrance: East of existing rock stabilisation works on south bank near railway and road bridge retain 'natural' bank amenity by allowing erosion and sacrificing back beach land / revegetation works.

0 NTS

North

GeoLINK environmental management and design

Coffs Creek Estuary Coastal Zone Management Plan
1988-1050

Strategy H-3 - Foreshore Management Works at Park Beach Reserve

Illustration 3.5

Information shown is for illustrative purposes only

Drawn by: RE Checked by: DMT Reviewed by: TIM Date: 10/04/2015
Source of base data: Coffs Harbour City Council

Revegetation Works
Revegetate existing turfed area with estuarine vegetation such as saltmarsh. Combine with educational / interpretive signage opportunities

Englands Park
Rehabilitate SEPP 14 wetland area that is currently turfed on creek-side of path through Englands Park. Investigate the suitability of this area for saltmarsh establishment and as a potential saltmarsh migration path in response to sea level rise. Ensure vegetation within approximately three metres of path (on creek-side) is low-level estuarine vegetation to ensure no negative impacts on personal security of walkers / cyclists on the pathway.

Foreshore Esplanade
1.Prepare concept designs to explore options for foreshore esplanade. These should include features that enhance and complement the amenity of the foreshore while maintaining stability of the embankment. Consideration should be given to:
- extended terraces and steps along the foreshore to increase pedestrian connectivity between esplanade and beach / water;
- a primary path route that provides legible, universal beach access;
- engineering protection work that is integrated discretely into the profile design;
- future high-tide levels resulting from sea level rise.

2. Implement preferred concept works.

North

0 NTS

GeoLINK environmental management and design

Coffs Creek Estuary Coastal Zone Management Plan
1988-1053

H-3 - Foreshore Management Works near Englands Park

Illustration 3.6

H-4 Stormwater Management

Strategy: Develop an urban stormwater management plan for Coffs Creek including strategies to improve the quality of runoff from industrial and commercial landuses.

Responsible Agency: Coffs Harbour City Council

Timeframe: Years 1 - 5

Cost: Develop a Stormwater Management Plan: $50,000
Awareness/auditing program for key industrial and commercial areas: $50,000
Educational strategies for rural landholders: $10,000

Potential Funding Sources: OEH – Estuary Management Grants
CHCC Environmental Levy

Monitoring: H-4.1-5: Implementation of this strategy and tasks is an appropriate benchmark. Review policy, guidelines and incentives every 5 years.
H-4.6: Delivery of workshops is an appropriate benchmark.

Task No.	*Description*	*Underway*	*Complete*
H-4.1	Develop a Stormwater Management Plan for Coffs Creek building on previous work by Horne (2010 & 2011). This task should consider: ▪ Priority Options listed in the *Coffs Creek Infilling and Hydraulic Capacity Study* (Water Technology, 2013:43-44) which address: sediment build-up at stormwater outlets; and maintaining litter traps ▪ Council's WSUD policy and guidelines ▪ Action A-3 and A-7 in Council's *Climate Change Mitigation and Adaptation Action Plan* (BMT WBM, *et al*, 2010) in regard to assets at risk from sea level rise.	☐	☐
H-4.2	Implement a maintenance program for the six major stormwater outlets in Coffs Creek catchment - refer to **Illustration 3.7**.	☐	☐
H-4.3	Review the maintenance regime of existing GPT's. Implement any recommendations for improvements.	☐	☐
H-4.4	Investigate the need for a GPT next to Marcia Street Depot	☑	☐
H-4.5	Council to undertake stormwater awareness/auditing program for key industrial areas shown in **Illustration 3.8**. The program is to identify and improve yard management practices for better stormwater quality outcomes. Council to utilise POEO Act if necessary to undertake inspections and enforce any necessary works to address significant stormwater management issues	☐	☐
H-4.6	Educational strategies to address soil management and pesticide, herbicide and fertiliser use in agricultural activities. Link with Task H-1.2 (encourage rural landholders in upper catchment to rehabilitate and protect riparian corridors in priority areas). Workshops could be based upon existing NSW Primary Industry guidelines and utilise the expertise and guidelines of NSW Primary Industry.	☐	☐

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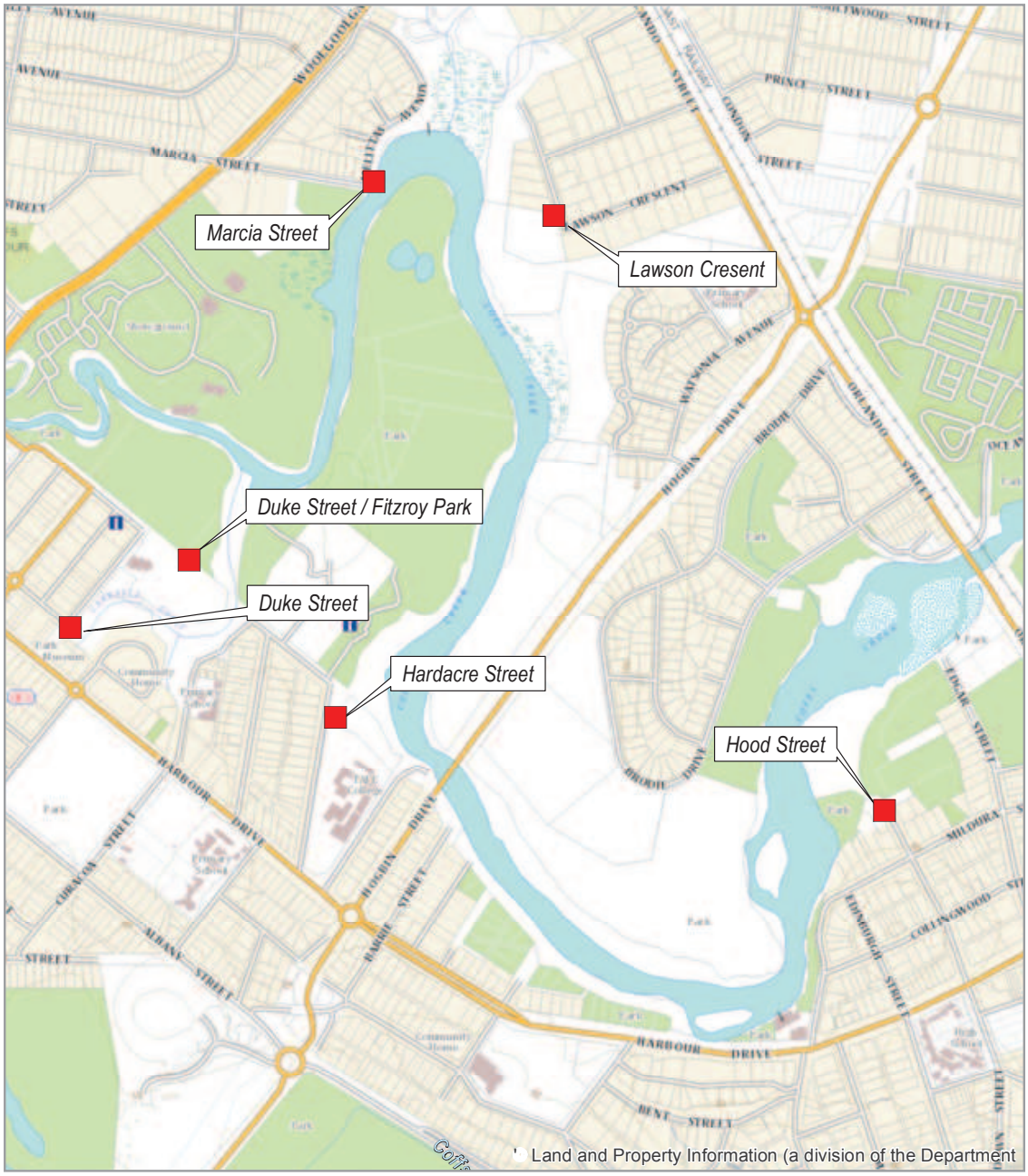
Source of base data: Coffs Harbour City Council and SIX Maps



LEGEND

Stormwater outlet

0 250

North

Strategy H-4 - Stormwater Major Outlets

GeoLINK environmental management and design

Coffs Creek Estuary Coastal Zone Management Plan
1988-1054

Illustration 3.7

Information shown is for illustrative purposes only

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Source of base data: Coffs Harbour City Council

LEGEND

Study area

General industrial

North

0 400

Strategy H-4 - Audit Key Industrial Areas

GeoLINK environmental management and design

Coffs Creek Estuary Coastal Zone Management Plan
1988-1046

Illustration 3.8

H-5 Litter Control

Strategy: Reduce litter in Coffs Creek by addressing the sources of litter and by removal of litter directly from the creek environment

Responsible Agency: Coffs Harbour City Council

Timeframe: Years 1 – 5

Cost: Staff Time
< $2000 in promotional materials and direct support

Potential Funding Sources: Keep Australia Beautiful Grants
Environmental Trust Grants
NSW Estuary Management Program
NSW Maritime Partnership Funding
CHCC Environmental Levy

Monitoring: Liaise annually with Clean Up Australia site coordinators following Clean Up Australia Day

Task No.	*Description*	*Underway*	*Complete*
H-5.1	Undertake a litter prevention campaign using a NSW EPA litter campaign resource kit as a base. The campaign is to include: ▪ targeting special events involving the creek / creek walk ▪ auditing for industry or at least a commitment to engage shopping precincts in the catchment for active support in litter management and education.	☐	☐
H-5.2	Require litter management and litter education for events involving the hire of the Coffs Creek walk. For special events where the hire of the Coffs Creek walk is required by Council (eg Coffs Running Festival/triathlons etc) Council is to consider including an arrangement in the lease/licence that requires the organisers to implement litter management and litter education of participants.	☑	☐
H-5.3	Council to arrange advertising and practical support to Coffs Harbour Regional Landcare / Friends of Coffs Creek, etc in tri-annual Coffs Creek litter removal efforts staged for Clean-up Australia Day, Clean-up the World Day and World Oceans Day. Seek to involve local schools. As well as general advertising target advertising at residential and commercial areas near clean-up sites.	☑	☐
H-5.4	Involve local schools in litter awareness and monitoring through programs such as Tangaroa Blue and Teach Wild.	☑	☐

H-6 Improve Pedestrian and Cycle Paths in the Upper Catchment

Strategy: Improve pedestrian and bicycle paths in the upper catchment to achieve a continuous and fully integrated path network that connects with and matches the paths around Coffs Creek in the lower estuary.

Responsible Agency: Coffs Harbour City Council

Timeframe: Years 1 – 10

Cost: Staff budget time

Potential Funding Sources: Undertaken through Council's Open Space Strategy / Pedestrian Access and Mobility Plan / Bike Plan. Potential funding source may include RMS.

Monitoring: Review every 5 years based on Council's updated mapping of cycleways and footpaths

Task No.	*Description*	*Underway*	*Complete*
H-6.1	Carry out the relevant actions contained in the following Council strategies to improve and expand the public pedestrian and bicycle path network in West Coffs: ▪ Coffs Harbour City Council Open Space Strategy 2010 ▪ Pedestrian Access and Mobility Plan Review (PAMP) (2011) ▪ Bike Plan 2014-2019 (Draft).	☑	☐
H-6.2	Prioritise works associated with Task H-6.1 for grant applications.	☑	☐
H-6.3	At the next review stage of each of the above documents (Open Space Strategy / PAMP / Bike Plan), consider the following objectives in the revised documents: ▪ Include new trails and paths identified in Council's *Natural Resource Management Plan for Coffs Harbour City Council Lands Adjoining Coffs Creek* (CHBRG, 2013) ▪ Improve the safety and accessibility of existing pedestrian/cyclist crossings of the Pacific Highway at or near estuary tributaries. The aim of this objective is to provide better links between the Coffs Creek path network on the east side of the highway, with path networks on the west side.	☐	☐

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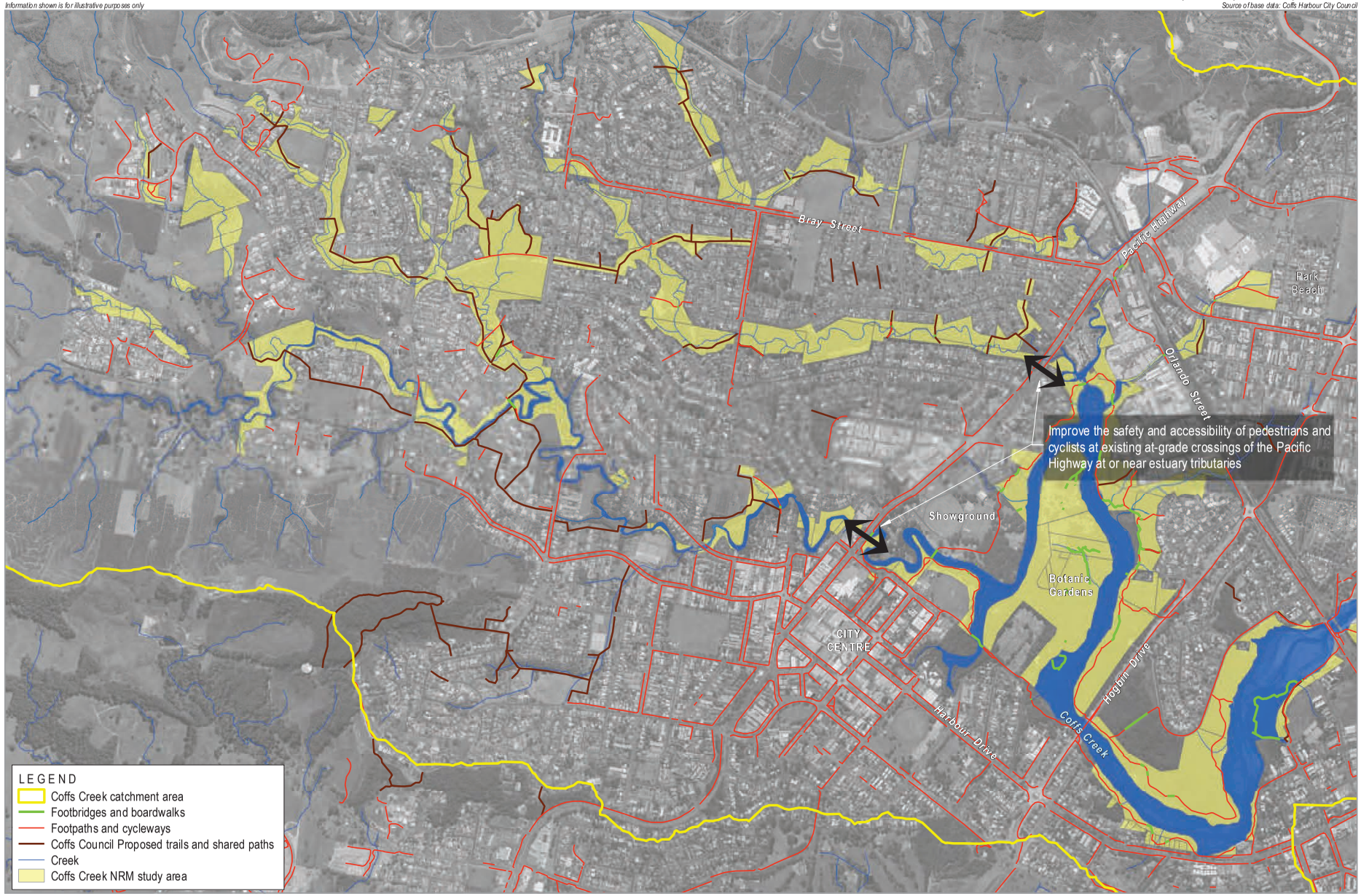
Source of base data: Coffs Harbour City Council



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North

GeoLINK environmental management and design

Coffs Creek Estuary Coastal Zone Management Plan
1988-1047

Strategy H-6 Path Systems in the Coffs Creek Estuary

Illustration 3.9

H-7 Better Use of the Coffs Creek Reserves in the Upper Catchment for Recreational Opportunities

Strategy: Make better use of the Coffs Creek reserve system and drainage reserves in the upper catchment to improve passive recreation opportunities (walking, picnicking, resting) and pedestrian and bicycle connections

Responsible Agency: Coffs Harbour City Council

Timeframe: Years 1 – 10

Cost: Staff budget time

Potential Funding Sources: Undertaken through Council's Open Space Strategy / Pedestrian Access and Mobility Plan / Bike Plan.

Monitoring: Review every 5 years based on Council's updated mapping of cycleways and footpaths

Task No.	*Description*	*Underway*	*Complete*
H-7.1	Carry out the relevant actions contained in the following Council strategies to improve and expand passive recreation opportunities along the Coffs Creek tributaries west of the existing highway: ▪ Coffs Harbour City Council Open Space Strategy 2010 ▪ Pedestrian Access and Mobility Plan Review (PAMP) (2011) ▪ Bike Plan 2014-2019 (Draft).	☑	☐
H-7.2	Prioritise works associated with Task H-7.1 for grant applications.	☑	☐
H-7.3	At the next review stage of each of the above documents (Open Space Strategy / PAMP / Bike Plan), consider the following objectives in the revised documents (in combination with Task H-6.3): ▪ make better use of the Coffs Creek reserve system and drainage reserves in the upper catchment for new recreation areas and pedestrian/cycle connections	☐	☐

H-8 Sustain the High Visual Amenity provided by Riparian Bushland

Strategy: Enhance the high visual amenity afforded by natural vegetation by conserving and expanding existing areas of riparian bushland.

Responsible Agency: Coffs Harbour City Council

Timeframe: Years 1 – 10

Cost: Staff budget time to update management plans

Potential Funding Sources: CHCC Environmental Levy

Monitoring: H-8.1: Review every 5 years based on Council's updated mapping of rehabilitation areas annually.
H-8.2: Routinely check mowing practices on public reserves.
H-8.3: Routinely monitor new infrastructure proposals to ensure works will complement existing amenities

Task No.	*Description*	*Underway*	*Complete*
H-8.1	Preserve, restore and manage natural vegetation of the riparian corridors of Coffs Creeks and its tributaries west of the existing highway. Aim to ensure the sustainability of visually significant vegetation such as large, forest scaled trees.	Addressed in Strategy H-1 and Strategy H-2	
H-8.2	Implement actions within Council's *Natural Resource Management Plan for Coffs Harbour City Council Lands Adjoining Coffs Creek* (CHBRG, 2013) that aim to modify and improve grass mowing practices on public reserves by preventing unnecessary and damaging incursions into remnant vegetation.	☑	☐
H-8.3	Create a strong visual image and sense of cohesion throughout the Coffs Creek reserve system by developing and adopting a visually coordinated suite of construction materials, design details, proprietary furniture, signage standards and graphics to be used consistently in all new infrastructure work.	☑	☐

H-9 Implement Estuary Health Monitoring

Strategy: Implement a consistent and adequate long term estuary health monitoring program for Coffs Creek building on the Ecohealth monitoring program.

Responsible Agency: Coffs Harbour City Council
NSW Primary Industries – Fisheries (for fish monitoring component of program – refer to Strategy L-3.1)

Timeframe: Years 1 – 2 for initial implementation. Ongoing thereafter

Cost: Task H-9.1: $20,000 every 3 years
Task H-9.2: Council staff time – every 5 years

Potential Funding Sources: Council operating budget
Marine Parks - Solitary Islands Marine Park - in kind assistance
NSW Primary Industries – Fisheries - in kind assistance

Monitoring: Implementation of the estuary health monitoring program and ongoing reviews every 5 years is an appropriate benchmark for this strategy.

Task No.	*Description*	*Underway*	*Complete*
H-9.1	Develop and implement an estuary health monitoring program based on the plan outlined in **Appendix A** of this CZMP. **Background**: The NSW Government *Guidelines for Preparing Coastal Zone Management Plans* (OEH, 2013) require the preparation of an estuary health monitoring program. The example Coffs Creek monitoring program outlined in **Appendix A** provides a list of monitoring indicators covering water quality, sediment and biological indicators. The program also includes frequency of sampling, sampling methods, and criteria for evaluating sampling results.	☑	☐
H-9.2	Use the outcomes of estuary health monitoring program to review the following aspects every 5 years: ▪ conclusions in Estuary Conditions Study (GeoLINK et. al., 2013b). ▪ Implementation Schedule strategies and priorities in this CZMP.	☐	☐

4

Implementation Schedule - Medium-Priority Actions

M-1 Monitor Seagrass, Saltmarsh and Mangroves

Strategy: Monitor the distribution and condition of seagrass, saltmarsh and mangroves in the estuary to shed light on changes in the extent of these species and to inform future management actions.

Responsible Agency: Coffs Harbour City Council

Timeframe: At 6 year intervals

Cost: $10,000 per mapping exercise (M-1.1)
$10,000 per condition study (M-1.2)

Potential Funding Sources: NSW Estuary Management Program

Monitoring: The benchmark for this strategy is an increased frequency of monitoring the distribution and condition of seagrass, saltmarsh and mangroves in Coffs Creek.

Task No.	*Description*	*Underway*	*Complete*
M-1.1	Map estuarine vegetative habitats in Coffs Creek at 6 year intervals according to the methods used by Williams *et al*. (2007). Compare results with prior surveys to gain an insight into trends and changes in distribution. An indication of species cover in previous surveys is shown in **Illustration 4.1**.	☐	☐
M-1.2	Measure the condition of mangroves, seagrass and saltmarsh in the Coffs Creek estuary at three year intervals using: ▪ seagrass density, blade length and epiphyte cover at three representative transects; ▪ mangrove density, canopy height, trunk diameter, pneumatophore density and crab-hole density at three representative transects; and ▪ saltmarsh species counts at three representative transects.	☐	☐

Information shown is for illustrative purposes only

Drawn by: KHP Checked by: TIM Reviewed by: TIM Date: December 2014
Source of base data: Coffs Harbour City Council

LEGEND

Williams et al. 2006	West et al. 2011
Mangrove	Mangrove
Saltmarsh	Saltmarsh
Seagrass	Seagrass

0 250

North

Strategy M-1 - Distribution of Mangroves, Seagrass and Saltmarsh

GeoLINK environmental management and design

Coffs Creek Estuary Coastal Zone Management Plan
1988-1052

Illustration 4.1

M-2 Allow for Saltmarsh Migration in Response to Sea Level Rise

Strategy: This strategy aims to include corridors for saltmarsh migration in response to sea level rise into foreshore works near Englands Park.

Responsible Agency: Coffs Harbour City Council

Timeframe: 5 – 10 years

Cost: Staff Time

Revegetation works associated with rehabilitating SEPP 14 wetland area and near Edgar Street: $50,000

Potential Funding Sources: General operating budgets

Monitoring: Implementation of this strategy and associated tasks is an appropriate benchmark.

Task No.	*Description*	*Underway*	*Complete*
M-2.1	Protect existing saltmarsh vegetation on the Englands Park foreshore and assess the suitability of the area as a potential saltmarsh migration path in response to sea level rise. Rehabilitate SEPP 14 wetland area that is currently turfed on creek-side of path through Englands Park. Investigate the suitability of this area for saltmarsh establishment and as a potential saltmarsh migration path in response to sea level rise. Ensure vegetation within approximately three metres of path (on creek-side) is low-level estuarine vegetation to ensure no negative impacts on personal security of walkers / cyclists on the pathway. Investigate similar opportunities near Edgar Street for rehabilitation of saltmarsh. Combine with educational / interpretive signage opportunities – refer to **Illustration 3.6** in association with Strategy H-3.	☐	☐

M-3 Protect and Enhance Estuary Bank Stability

Strategy: Assist long term bank stability by protecting existing bank remediation works, promoting natural recovery where minor bank erosion has occurred, and monitoring for erosion damage after flood events.

Responsible Agency: Coffs Harbour City Council (CHCC)

Timeframe: Years 1 – 5

Cost: Task M-3-3: Council staff time.

Potential Funding Sources: Task M-3-3 : Council operating budget

Monitoring: The benchmark for this strategy is that there should be no net increase in the area of estuary bank that is identifiable as having moderate or severe erosion occurring over the 5 year implementation phase of the CZMP.

Task No.	*Description*	*Underway*	*Complete*
M-3.1	Assist long term bank stability by protecting / enhancing existing bank remediation works, promoting natural recovery where minor bank erosion has occurred – refer to **Illustration 4.2**. This task is covered by Strategy H-1 and H-2.	Refer to Strategy H-1 and H-2	
M-3.2	Monitor the estuary banks after significant flood events and remediate bank erosion sites where public infrastructure is at risk	☐	☐
M-3.3	Undertake a program of modifying existing shoreline infrastructure such as retaining walls, bank stabilisation work and training walls particularly near the creek mouth to improve the visual appearance and fit in with the surrounding natural and recreation settings – this task is covered by Strategy H-3.	Refer to Task H-3.2 in Strategy H-3	
M-3.4	Encourage the retention of riparian vegetation on estuarine creek banks and where possible improve vegetation condition in reaches identified during the 2013 condition assessment as having minor bank erosion – refer to **Illustration 4.2**. This task is covered by Strategy H-1.	Refer to Strategy H-1	

Drawn by: KHP Checked by: RE Reviewed by: TIM Date: November 2014

Information shown is for illustrative purposes only

Source of base data: Coffs Harbour City Council

Note: Mapped November 2012 and January 2013

0 200

North

Strategy M-3- Bank Stability in the Coffs Creek Estuary

GeoLINK environmental management and design

Coffs Creek Estuary Coastal Zone Managment Plan
1988-1051

Illustration 4.2

M-4 Enhance Heritage and Cultural Values

Strategy: Preserve cultural and heritage values throughout the Coffs Creek estuary and develop a greater public appreciation of these values.

Responsible Agency: Coffs Harbour City Council

Timeframe: 2 – 5 years (and ongoing)

Cost: CHCC staff budget time for plan and program preparation

Potential Funding Sources: Caring for our Country
CHCC Environmental Levy

Monitoring: The benchmark for this strategy is increased community awareness and appreciation of the cultural and heritage values associated with the Creek.

Task No.	*Description*	*Underway*	*Complete*
M-4.1	Support the implementation of *Buluunggal – The Aboriginal Community Vision for the Coffs Creek Catchment and Estuary* (http://coffsharbourlandcare.org.au/projects/the-aboriginal-community-vision-for-the-coffs-creek-catchment-and-estuary)	☐	☐
M-4.2	Establish a strong symbol of reconciliation by developing and implementing a program that: ▪ identifies dual names for key locations associated with Coffs Creek ▪ incorporates English to Gumbaynggirr translations for features, and sites in signs and interpretive information. Refer to *Buluunggal – The Aboriginal Community Vision for the Coffs Creek Catchment and Estuary* which identifies a number of place names that the local aboriginal community would like to change to honour local identities and Gumbaynggirr culture. Some suggested name changes include: ▪ *Coffs Creek* to *Buluunggal* (Gumbaynggirr for mullet) ▪ *Coffs Creek Tributary* to *Snake Gully*	☐	☐
M-4.3	Continue to involve the participation of the local Aboriginal community in the preparation of design proposals and relevant management decisions throughout the reserve.	☑	☐
M-4.4	Support Council's *Coffs Creek Restoration and Interpretive Bush Tucker Trail* project. The project has multiple aims including: ▪ developing a bush tucker trail ▪ promoting visitation along parts of the Coffs Creek estuary ▪ developing an understanding of traditional Aboriginal use of local plants to the wider public ▪ rehabilitate 29.3 hectares of culturally significant land to the Gumbaynggirr nation in Coffs Harbour	☐	☐

M-5 Implement Entrance Management Policy

Strategy: Adopt and implement formal Entrance Management Policy based on a natural opening / closing regime which prohibits artificial opening of a closed entrance except under specified circumstances.

Responsible Agency: Coffs Harbour City Council

Timeframe: Year 1 for development and adoption of policy

Cost: Staff budget time

Potential Funding Sources: Coffs Harbour City Council operating budget

Monitoring: The adoption and implementation of the Entrance Management Policy and associated tasks is an appropriate benchmark.

Review policy and guidelines every 5 years

Task No.	*Description*	*Underway*	*Complete*
M-5.1	Adopt and implement Entrance Management Policy based on policy contained in **Appendix B** of this CZMP. **Background**: The NSW Government *Guidelines for Preparing Coastal Zone Management Plans* (OEH, 2013) require the preparation of an entrance management policy for intermittently closed and open lakes. Coffs Creek is an ICOLL that naturally alternates between being open or closed to the ocean. The entrance is predominantly open, however it can close under low creek flows and during periods of beach build-up or after large ocean storm events. The policy presently only recommends artificial opening of the Coffs Creek estuary entrance in the event of extreme water quality issues such as contaminant spills where it may be desirable to provide some 'draining' of the creek system.	☐	☑

5

Implementation Schedule - Low-Priority Actions

L-1 Improve and Manage Water Access around the Lower Estuary

Strategy: Retain and strengthen water access opportunities around the Lower Estuary to maintain existing recreational activities.

Responsible Agency: Coffs Harbour City Council

Timeframe: Years 1 - 5

Cost: CHCC staff budget time for grant application and implementation management
$20,000 for new infrastructure work

Potential Funding Sources: NSW Government Better Boating Program
CHCC Environmental Levy

Monitoring: Implementation of this strategy and associated tasks is an appropriate benchmark.
Review policy and guidelines every 5 years

Task No.	*Description*	*Underway*	*Complete*
L-1.1	Seek available NSW Government funding opportunities to upgrade the existing Melittas Street boat ramp and other smaller jetties and associated infrastructure elsewhere around Lower Estuary to increase capacity, accessibility, safety and comfort of users, and to enhance access for kayak and canoe launching.	☑	☐
L-1.2	Consider modifications and improvements to the Edgar Street ramp as part of the preparation of the revised foreshore management plan for the reserve.	☐	☐
L-1.3	Introduce restrictions to prohibit possible future large scale commercial recreation boating along the creek. **Background**: RMS envisage that continued use of Coffs Creek by small powered craft under the existing speed restriction, and greater encouragement of passive activities is likely to be the vision for future use of the estuary (*Scoping Exercise* report - GeoLINK *et. al.*, 2012a).	☐	☐
L-1.4	Develop and introduce Council policies that prohibit mooring in the estuary. **Background**: RMS consider the estuary is not typical of one that lends itself to moorings and a Council policy would RMS in determining future mooring requests (e.g. to moor BBQ pontoons).	☐	☐

Information shown is for illustrative purposes only

Drawn by: GAM Checked by: RE Reviewed by: TIM Date: November 2014
Source of base data: Red Belly Design

Legend

- Shared pedestrian / cycle paths
- Walking trails
- Boat ramp
- Water edge access
- Car park

North

0 NTS

Strategy L-1 Existing Water Access Locations

GeoLINK environmental management and design

Coffs Creek Estuary Coastal Zone Management Plan
1988-1048

Illustration 5.1

L-2 Strengthen Community Appreciation of the Upper Tributaries

Strategy: Increase local community appreciation of and engagement with the natural values of Coffs Creek particularly within the upper catchment (west of the existing highway)

Responsible Agency: Coffs Harbour City Council (Task L-2.1 and L-2.2)

Timeframe: Years 1 – 10

Cost: Council staff budget time for management of education programs
$10,000 for signage system preparation (if undertaken externally) plus Council staff budget time for management
$10,000pa for new infrastructure work and revegetation programs

Potential Funding Sources: CHCC Environmental Levy

Monitoring: The benchmark for this strategy is increased community appreciation of and engagement with the natural values of the Coffs Creek.

Task No.	*Description*	*Underway*	*Complete*
L-2.1	Undertake a community education program with related agencies targeting farmers and residents adjoining Coffs Creek tributaries and drainage lines to generate a greater understanding of the existing or potential value and visual amenity of reserve system. Encourage residents to undertake sensitive landscape maintenance practices particularly at the interface of properties with remnant vegetation and to become engaged in local bushcare work.	☐	☐
L-2.2	Develop and implement a system of consistent, discrete interpretive signage to enhance awareness and the visual experience of the reserve to the community and visitors. Undertake in combination with Task H-8.3	☐	☐

L-3 Monitor Fish Abundance and Diversity

Strategy: Undertake monitoring of fish abundance and diversity on a regular basis as part of regular estuary health monitoring – refer to Strategy H-9

Responsible Agency: NSW Primary Industries – Fisheries (Task L-3.1)
Coffs Harbour City Council (Task L-3.2)

Timeframe: Task L-3.1: At 3 year intervals starting with the next EcoHealth monitoring program.
Task L-3.2: One monitoring event only – the need for further monitoring to be determined based on results

Cost: Task L-3.1: Approximately $5,000 per round of monitoring
Task L-3.2: Approximately $2,000 per round for laboratory analysis. Council staff time for sampling

Potential Funding Sources: North Coast Local Land Services
NSW Estuary Management Program

Monitoring: L-3.1: The benchmark for this strategy is to have monitoring of fish abundance and diversity undertaken at regular intervals.
L-3.2: Publicly disclosing sampling results of recreational fish and shellfish suitability for eating is an appropriate benchmark.

Task No.	*Description*	*Underway*	*Complete*
L-3.1	Undertake monitoring of fish abundance and diversity on a regular basis as part of an overall estuary health monitoring package.	☐	☐
L-3.2	Undertake the sampling and analysis of common recreational fish and shellfish from Coffs Creek to assess their suitability for eating. Make the results publicly available. **Background**: Coffs Creek has a history of pollution and pesticide spills that have been raised as a potential cause of previous fish kills. Agriculture is currently a major use of land in the Coffs Harbour catchment and there is some risk of agricultural chemicals entering the creek system. As a result there is some community concern that historical and, potentially, current pollution may affect the suitability (for human consumption) of fish and shellfish harvested recreationally from Coffs Creek. At present there is no information to confirm this.	☐	☐

References

Bewsher Consulting (2005a). *Coffs Creek Floodplain Risk Management Plan*. Draft Report, October 2005.

Bewsher Consulting (2005b). *Coffs Creek Floodplain Risk Management Study*. Final Report, October 2005.

BMT WBM *et al* (2010). *Coffs Harbour City Council Climate Change Mitigation and Adaptation Action Plan.* Report prepared for Coffs Harbour City Council in association with Eco Logical Australia and Coastal Zone Management.

BMT WBM *et al* (2010). *Coffs Harbour City Council Climate Change Mitigation and Adaptation Action Plan.* Report prepared for Coffs Harbour City Council in association with Eco Logical Australia and Coastal Zone Management.

CHBRG (2013a). *Natural Resource Management Plan for Coffs Harbour City Council Lands Adjoining Coffs Creek*. February 2013. Prepared by Coffs Harbour Bushland Regeneration Group Pty Ltd (CHBRG) for Coffs Harbour City Council as per North Coast Local Land Services (Formerly Northern Rivers Catchment Management Authority) Contract RFQ-519-Q1

Coffs Harbour City Council (2013b). *Coffs Harbour City Council Climate Change Policy*. Approved by Council 26 September 2013 CP 13/33 245. Available: http://www.coffsharbour.nsw.gov.au/Coffs-And-Council/Documents/Approved%20Policies/Climate%20Change%20Policy.pdf [Accessed 16 April, 2014].

GeoLINK *et. al.* (2012a) *Coffs Creek Coastal Zone Management Plan - Scoping Exercise*. Report prepared for Coffs Harbour City Council and NSW Office of Environment and Heritage by GeoLINK in association with Aquatic Science and Management and GECO Environmental, November 2012.

GeoLINK *et. al.* (2012b) *Coffs Creek Coastal Zone Management Plan - Literature and Information Review*. Report prepared for Coffs Harbour City Council and NSW Office of Environment and Heritage by GeoLINK in association with Aquatic Science and Management and GECO Environmental, December 2012

GeoLINK *et. al.* (2013a) *Coffs Creek Coastal Zone Management Plan – Community Uses Assessment*. Draft report prepared for Coffs Harbour City Council and NSW Office of Environment and Heritage by GeoLINK in association with Red Belly Design, March 2013.

GeoLINK *et. al.* (2013b) *Coffs Creek Coastal Zone Management Plan – Estuary Condition Study*. Draft report prepared for Coffs Harbour City Council and NSW Office of Environment and Heritage by GeoLINK in association with Red Belly Design, November 2013.

Horne, S., (2011). *Coffs Creek Urban Stormwater Management Plan*. February 2011. Report prepared for Coffs Harbour City Council.

Horne, S., (2010) *Urban Stormwater Pollution: Evaluation, Management, and Climate Change Implications for Coffs Creek, Coffs Harbour, Australia*. Report prepared for Coffs Harbour City Council Survey and Design Branch.

OEH (2013). *Guidelines for Preparing Coastal Zone Management Plans.* Published by NSW Office of Environment and Heritage (OEH). OEH 2013/0224, July 2013.

NSW Department of Planning (2010). *NSW Coastal Planning Guideline: Adapting to Sea Level Rise.* Pub no. DOP 10_022, August 2010.

Water Technology (2013). *Coffs Creek Infilling and Hydraulic Capacity Study*. Report prepared for Coffs Harbour City Council, April 2013.

Water Technology (2010). *Coffs Creek training Wall Realignment*. Report prepared for Coffs Harbour City Council, November 2010.

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Appendix A

Coffs Creek estuary health monitoring program

A.1 Introduction

The Coffs Creek estuary is located at Coffs Harbour NSW approximately equidistant between Sydney and Brisbane. The estuarine region of Coffs Creek is approximately 0.5 km^2. Coffs Creek can be classified as a wave dominated estuary or wave dominated delta and has features of both classes of estuary. Coffs Creek is best described as being in extensively modified condition.

Coffs Creek is an important centrepiece to the overall landscape of Coffs Harbour. It is highly valued by the local community and visitors as a place that provides good opportunities for swimming, boating, recreational fishing and observing wildlife (GeoLINK 2012). It is apparent form community consultation that a strong level of interest exists for the protection and enhancement of these values.

As part of the development of a Coastal Zone Management Plan (CZMP) for Coffs Creek estuary it is necessary to prepare a monitoring plan for key aspects of the environment. A consistent and adequate long term environmental monitoring program for the Coffs Creek estuary would provide a number of direct and indirect benefits for users and managers alike. Whilst a reasonable quantity of water quality data has been collected over the past 10 years it has been collected under a variety of water quality monitoring programs, each with individual goals, limiting its utility as a device for detecting trends or changes in the health of the estuary. This document is intended to provide an example environmental monitoring program for future application to the Coffs Creek estuary. Where possible it will be based upon previous monitoring such as the EcoHealth program (Ryder 2012), in the hope of conserving the utility of the existing dataset.

A.2 Objectives of a Water Quality Monitoring Program for Coffs Creek

Setting clear achievable objectives is an essential part of designing an effective water quality program and generating meaningful data (Maher *et al*. 1993). Objectives should be based upon a sound understanding of the values and the physical and biological processes of the waterway in question.

Community consultation throughout the development of the Coffs Creek Coastal Zone Management Plan has shown that Coffs Creek is widely valued for its recreational values and for its inherent environmental values (GeoLINK 2012). In addition, there is occasional recreational harvest of seafood in the form of fish and crustaceans.

Objective 1: Environmental monitoring in the Coffs Creek estuary should assist managers to protect and enhance the recreational and aquatic ecosystem values identified.

Objective 2: Water Quality data collected from the Coffs Creek estuary should facilitate comparison with relevant guidelines for the protection of aquatic ecosystems (ANZECC 2000) and recreational use (NHMRC 2008).

The data collected to date indicates that, in general, the water quality of the Coffs Creek estuary is variable with respect to the protection of aquatic ecosystems and for primary contact recreational uses. With this in mind it is desirable that any future trends and changes in water quality are detected. This is further emphasised by the requirement to monitor the effects, if any, of works associated with the Coffs Creek Coastal Zone Management Plan.

Objective 3: Water quality data should be collected and analysed in a way that facilitates the detection of significant trends and changes.

Objective 4: Water quality data should provide Coffs Harbour City Council and associated stakeholders with a sound platform to make management decisions in the interest of protecting and enhancing the recreational and ecological values of Coffs Creek.

Coffs Harbour City Council (CHCC) and the NSW Office of Environment and Heritage (OEH) have reporting requirements relating to estuaries. CHCC prepare a Comprehensive State of the Environment Report every four years and the OEH prepare a State of the Catchments report.

Objective 5: An environmental monitoring program for Coffs Creek should contribute to the reporting requirements of CHCC and OEH with respect to the water quality and environmental status of the Coffs Creek estuary.

A.3 Environmental Pressures and Concerns

An effective environmental monitoring program should address the current environmental pressures and issues of concern that have been identified (ANZECC 2000).

Previously collected information has revealed a number of water quality issues in Coffs Creek. A summary and analysis of all water quality data collected from Woolgoolga Lake revealed the following (GeoLINK 2012);

- Long term monitoring of faecal indicator organisms indicate that the middle to upper estuary (around Melitas Avenue) is generally not suitable for primary contact recreation when the ANZECC (2000) guidelines are applied. Results from the lower estuary are mixed, with the lower estuary generally complying with ANZECC (2000) guidelines for primary contact recreation with respect to faecal coliform concentrations but not with respect to enterococcus concentrations. Three years of beachwatch monitoring in the lower estuary indicated that the lower estuary is compliant with beachwatch requirements for approximately 2 out of 3 months in any swimming season;
- Short term measurements of nutrients did not comply with ANZECC (2000) guideline values in either the lower estuary or the middle estuary. Median values for TN, TP, ammonia and oxides of nitrogen were all above the relevant ANZECC (2000) guideline value.
- Short term measurements of chlorophyll-a indicated that the chlorophyll-a concentration in the middle to upper estuary complied with ANZECC (2000) and MER guideline values but that in the lower estuary it complied with neither. Only five samples contributed to this assessment. Other short-term programs showed that the chlorophyll-a concentration did not comply with the MER guideline value in any part of the estuary and that chlorophyll-a concentrations in the upper estuary were frequently elevated;
- Long term monitoring showed that dissolved oxygen concentrations are generally healthy in the lower estuarine reaches but in the middle to upper estuary the median value slightly exceeds the ANZECC (2000) value. EcoHealth sampling showed that DO concentrations are lowest at the bottom of the water column;
- Turbidity measurements in the middle and lower estuary are not compliant with ANZECC (2000) or OEH MER guideline values (Roper 2011);

Environmental pressures affecting or likely to affect the Coffs Creek estuary include the following;

- High temperatures and low dissolved oxygen concentrations;
- A heavily developed, largely cleared catchment;
- Very high concentrations of nutrients and sediment in diffuse runoff, particularly from horticultural landuses;
- High concentrations of metals in concentrated runoff such as stormwater; and
- Possible contamination from biocides exported from agricultural land uses in the catchment.

A.4 Indicators

The indicators are chosen for this study in a way that maximises the opportunities to fulfil the objectives. The choice of indicators also takes into account knowledge of environmental pressures and current water quality issues derived from previous monitoring of Coffs Creek.

For the particular range of issues, environmental stressors and constraints encountered at Coffs Creek the following list of indicators are suggested.

Indicator	*Sampling Method*	*Comments*
Physicochemical		
pH	Probe	Most aquatic organisms are not tolerant of pH extremes. Should be measured throughout the water column.
DO	Probe	All aquatic life requires oxygen. DO is an indicator of potential stress on aquatic organisms. DO should be measured throughout the water column.
Salinity/Conductivity	Probe	A useful indicator of the physical status of the waterway. Should be measured throughout the water column.
Temperature	Probe	Should be measured throughout the water column.
Turbidity	Probe	Considered an adequate measure of sediment concentration for Woolgoolga Lake.
Secchi Depth	Disk	An easily collected indicator of recreational and visual amenity.
Nutrients		
Total N and P	Bottle Collect – Laboratory Analysis	Stressors. Elevated nutrient concentrations can lead to eutrophic conditions.
Chemical		
Pesticides and Herbicides	Bottle Collect and Sediment Cores – Laboratory Analysis	A broad suite of herbicides and pesticides should be tested for, including all current widely used chemicals.
Metals	Bottle Collect – Laboratory Analysis	Metals analysis should follow the suite of metals tested for during the Coffs Creek Stormwater Monitoring Program.
Biological		
Chlorophyll-a	Bottle Collect – Laboratory Analysis	An indicator of the trophic status of the estuary and overall estuary health.
Enterococci	Bottle Collect – Laboratory Analysis	Enterococci are now considered the most reliable indicator of faecal contamination and therefore the best indicator of risk to recreational users.
Environmental		
Mangrove extent and condition	Aerial photography based mapping and a foot based survey	An important indicator of estuarine health and habitat availability. Measures of condition include recruitment, production, seedling regeneration, canopy cover, crab hole density and pneumatophore density.
Seagrass extent and condition	Aerial photography based mapping and a foot based survey	An important indicator of estuarine health and habitat availability. Measures of condition include density, blade length, precruitment, production, seedling regeneration, canopy cover, crab hole density and pneumatophore density.
Salt marsh extent	Aerial photography based mapping	An important indicator of estuarine health and habitat availability.
Fish community	Survey using scientific seine nets and fyke nets as needed	The abundance, diversity, biomass and species composition of benthic invertebrates can be used as indicators of changing environmental conditions. Methods should follow Hastie (2006).
Benthic invertebrate community	Analyse benthic grab samples under microscope.	

A.5 Timing

- It is proposed that sampling of all physico-chemical, nutrient, and biological indicators are undertaken monthly.
- Sampling for pesticides, herbicides and metals should be undertaken annually.
- An additional event based sample of all physico-chemical, nutrient, biological and chemical water quality indicators should be undertaken annually within 48 hours of a rainfall event > 50mm in 24 hours.

- A sanitary inspection (see NRMRC 2008) should be undertaken annually as part of the recreational water quality monitoring.
- Environmental indicators should be measured once every 3 years.

A.6 Sampling Methods

- Water quality sampling should be undertaken at or near to low tide to ensure consistency between samples and to eliminate the effects of marine water ingress at high tides. It should be noted that, in the case of Coffs Creek, sampling at low tides will provide a worst case scenario picture of water quality.
- All water quality samples should be collected from surface waters. Physicochemical parameters should also be measured at the bottom of the water column, within 0.3m of the benthos.
- Three sampling sites are proposed, corresponding with the 3 estuarine sites used in the Ecohealth trial undertaken in 2011/2012. These sites maximise data compatibility with the existing sites. In addition these sites provide excellent accessibility.
- Three methods have been outlined for WQ sampling, a hand held multiprobe for physicochemical parameters that can be measured in the field, bottle sampling of shallow waters for samples requiring a laboratory analysis and collection of sediment cores for laboratory analysis. All methods for sampling should follow those set out in section 4 of ANZECC (2000b). Methods for the analysis and storage of data should also be sourced from ANZECC (2000b).
- Mangrove and seagrass condition analysis should be undertaken at 3 sites for each habitat type using transect and quadrat based surveys.
- Fish surveys should be undertaken using replicate seine hauls at three sites loosely corresponding with WQ sampling sites.
- Benthic invertebrate surveys should be undertaken at the sites used by Hastie (2006). The data collected by Hastie (2006) forms a useful baseline.

A.7 Using Guideline Trigger Values

In the absence of biological response data from Coffs Creek or the local area it is considered adequate to adopt the ANZECC (2000) guideline default trigger values for estuarine waters in South East Australia, OEH MER guidelines (Roper 2011) and the NHMRC (2008) guidelines as interim guidelines for Coffs Creek.

The ANZECC (2000) guidelines are designed to be used as a trigger for further investigation. In the case of Coffs Creek this is most likely to be an investigation into the cause of poor water quality. ANZECC (2000) suggest that the median measured value is statistically the most robust for comparison against guideline values. They also suggest that control charts should be continuously updated as new data is generated so that any triggered action can be undertaken promptly.

Table A.1 ANZECC (2000) trigger values for environmental protection using commonly measured chemical and biological water quality parameters

Ecosystem Type	*ChI-a* μgL^{-1}	*TP* μgL^{-1}	*FRP* μgL^{-1}	*TN* μgL^{-1}	NO_3 μgL^{-1}	NH_4 μgL^{-1}
Lowland River	5	50	20	500	40	20
Estuary	4	30	5	300	15	15

Table A.2 ANZECC (2000) trigger values for environmental protection using commonly measured water physico-chemical water quality parameters

Ecosystem Type	*DO (%saturation)*		*pH*		*Salinity (µScm^{-1})*		*Turbidity (NTU)*	
	lower	*upper*	*Lower*	*upper*	*Lower*	*upper*	*lower*	*Upper*
Lowland River	8.5	110	6.5	8	125	2200	6	50
Estuary	80	110	7	8.5	7	N/A	0.5	10

The NHMRC (2008) guidelines are intended to be used in conjunction with an annual sanitary inspection. From the sanitary inspection a preliminary risk category is developed, dependent on the prevalence of potential sources of faecal contamination. A minimum of 20 enterococci samples are then required to generate a microbial water quality assessment category, using a constantly updated 95th percentile value. The advantage of this system is that a proactive approach can be taken to warning the public of any risks associated with the recreational use of waterways.

Table A.3 NHMRC (2008) trigger values for commonly measured water chemical water quality parameters

Sanitary Inspection Category (Basic susceptibility to human faecal influence)	*Microbial water quality assessment category (95th percentile value of intestinal enterococci/100mL)*			
	A	**B**	**C**	**D**
	≤40	**41-200**	**201-500**	**>500**
Very Low	Very Good	Very Good	Follow Up	Follow Up
Low	Very Good	Good	Follow Up	Follow Up
Moderate	Good	Good	Poor	Poor
High	Good	Fair	Poor	Very Poor
Very High	Follow Up	Fair	Poor	Very Poor

Note: Follow Up indicates, in some cases, that some event based sampling may be required or, in other cases, that some non – human source of bacteria may be present

The relevant OEH MER guideline values (Roper 2011) are as follows;

Table A.4 OEH MER guideline values for chlorophyll-a and turbidity.

Estuary Class	*Salinity Range (mg/L)*	*Chlorophyll (µg/L) 80th%ile of Reference*	*Turbidity (NTU) 80th%ile of Reference*
River – low	>25	2.3	5.0
River – mid	10-25	2.9	8.0
River – upper	<10	3.4	13.7

A.8 Data Storage

Data needs to be stored on a central database available to all relevant stakeholders. Data management must align with regional and State reporting systems.

References

ANZECC (2000) *Australia and New Zealand Guidelines for Fresh and Marine Water Quality.*

ANZECC (2000b*) Australian Guidelines for Water Quality Monitoring and Reporting.*

GeoLINK (2012) *Coffs Creek Estuary Coastal Zone Management Plan – Literature and Information Review.* Report prepared for Coffs Harbour City Council.

Hastie, B. F. (2006) *Spatial and Temporal Variation of Benthic Macrofaunal Communities in the Intermittently Closed Estuaries of the Solitary Islands Marine Park, Australia.* A thesis submitted for the degree of Doctor of Philosophy of the University of New England – September 2006.

Maher, W.A., Cullen, P.W. & Norris, R.H. (1993) Framework for Designing Sampling Programs. *Environmental Monitoring and Assessment*. **30** pp 139 - 162

NHMRC (2008) *Guidelines for Managing Risks in Recreational Water.*

Office of Environment & Heritage (2013) *Assessing estuary ecosystem health: Sampling, data analysis and reporting protocols, NSW Natural Resources Monitoring, Evaluation and Reporting Program.* 59 Goulburn Street, Sydney. Available: http://www.environment.nsw.gov.au/resources/soc/130125esthlthprot.pdf

Roper, T. Creese, B. Scanes, P. Stephens, K. Williams, R. Dela-Cruz, J. Coade, G. & Coates, B. (2011). *Assessing the condition of estuaries and coastal lake ecosystems in NSW. Technical Report - NSW State of the Catchments 2010*. NSW Office of Environment and Heritage, Sydney.

Ryder, D. (2012*). Ecohealth: A healthcheck for our waterways. Design, methods and reporting of waterway health in coastal northern NSW, Australia.* Report to the Northern Rivers CMA. University of New England, Armidale.

Appendix B

Entrance Management Policy

Introduction

B.1.1 Reason for this Policy

The entrance to the Coffs Creek estuary naturally alternates between being open or closed to the ocean. These types of estuaries are known as an ICOLL's - Intermittently Closed and Open Lakes and Lagoons.

Many ICOLL's are manually or artificially opened to the ocean by authorities to 'drain' the estuary for a range of reasons, often to reduce the impacts of flooding around the estuary foreshores. However, artificially opening ICOLL's can impact on estuary health. Therefore a Policy is required to outline to Council if and when the entrance to Coffs Creek estuary should be artificially opened.

B.1.2 The Purpose of this Policy

The purpose of this Policy is to provide Council with criteria and a procedure for initiating an artificial opening event of the Coffs Creek entrance.

B.1.3 Policy Statement

The Coffs Creek Entrance Management Policy aims to:

- minimise interference with the natural opening and closing regime for Coffs Creek estuary;
- provide a procedure to address extreme water quality issues in the estuary;
- detail procedures and responsibilities for artificial opening of the estuary entrance; and
- detail procedures for monitoring following an artificial opening event.

This Policy will be implemented by Coffs Harbour City Council in consultation with the appropriate NSW Government agencies.

B.1.4 Area to Which this Policy Applies

The area covered by this Policy is shown in **Illustration B.1.1**. This Policy applies to the catchment of the estuary which comprises the waterway, foreshores and land adjacent to the estuary up to the tidal limit of the tributary creeks and the extent of the drainage catchment directly contributing to the estuary waterways.

B.1.5 Policy Context

This Policy has been prepared as part of the Coastal Zone Management Plan (CZMP) for Coffs Creek estuary. CZMP's for estuaries are prepared in accordance with Part 4A of the *Coastal Protection Act 1979* and the *Guidelines for Preparing Coastal Zone Management Plans* (DECCW, 2010). These guidelines require CZMP's for ICOLL's to include an entrance management Policy.

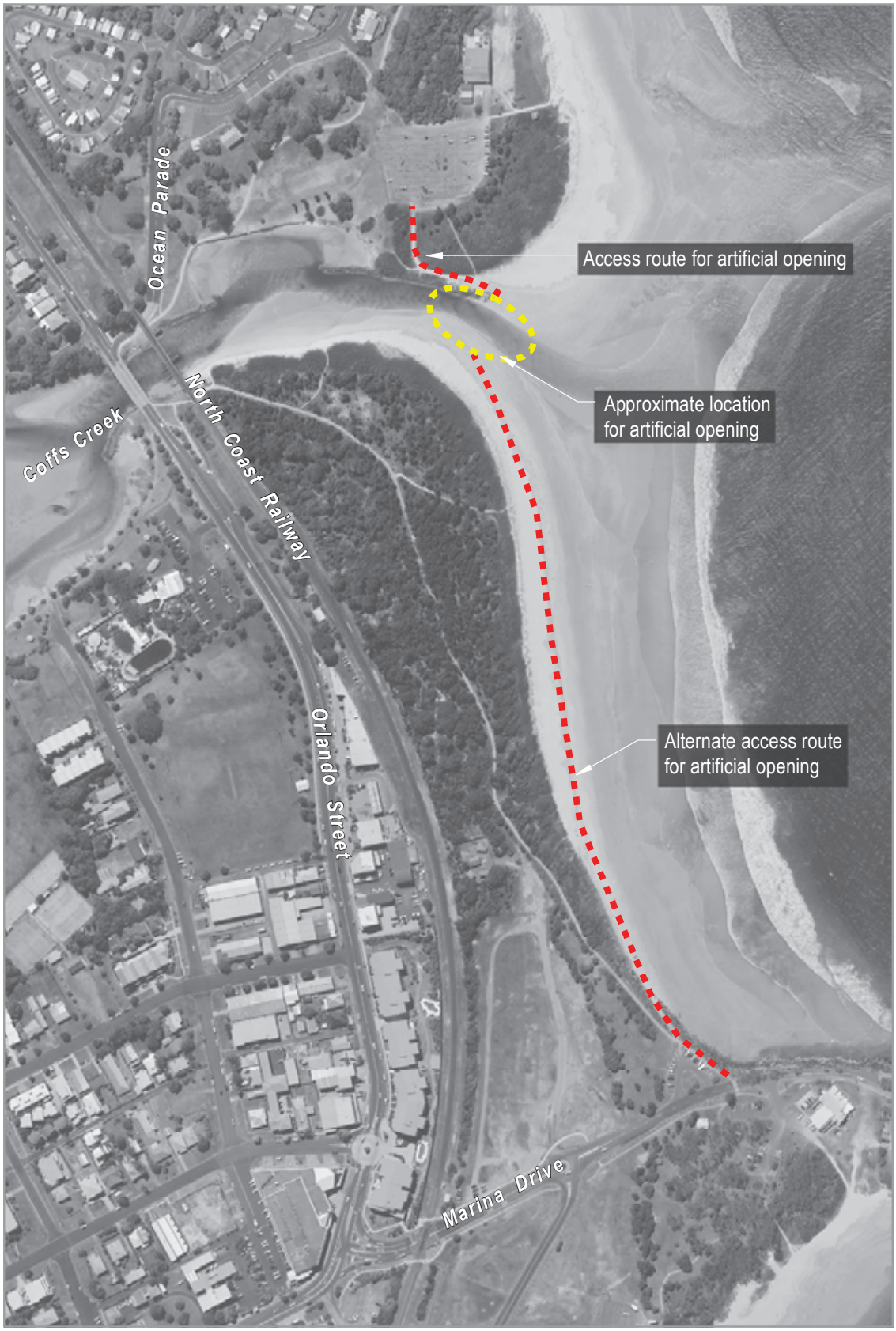
A range of NSW legislation and policies are relevant to estuary management and the establishment of any Entrance Management Policy and subsequent artificial opening procedures.

There may be a range of statutory approvals / licensing requirements that need to be sought in order to undertake entrance management activities, for example artificial opening. A range of approvals may be required due to potentially different land tenures, zonings and statutory provisions. These provisions may include Crown Lands licence under the NSW Crown Lands Act 1989, concurrence from NSW Fisheries for dredge and reclamation work on defined water land under the NSW Fisheries Management Act 1994, or other approvals and licences under the National Parks and Wildlife Act 1974 or the Marine Parks Act 1997.

In addition, the Environmental Planning and Assessment Act 1979 established the framework for development control and assessment in NSW. Certain activities may require approval under this Act and associated State Environmental Planning Policies (SEPP) (e.g. SEPP (Infrastructure) 2007). Certain works or activities may either require development consent or be exempt from requiring consent. In the case where works or activities may be exempt from requiring consent, a Review of Environmental Factors (along with all other relevant approvals / licences) would be required under Part 5 of the EP&A Act before works / activities can be carried out. This is addressed more fully in **Section B 3** of this Policy.

Information shown is for illustrative purposes only

Drawn by: RE Checked by: GJM Reviewed by: TIM Date: 5/12/2014
Source of base data: Coffs Harbour City Council



North

0 90

GeoLINK environmental management and design

Area to Which Policy Applies

Coffs Creek Estuary Coastal Zone Management Plan
1988-1047

Illustration B.1

Background

B.2.1 Entrance Management Issues

Coffs Creek is an ICOLL system that naturally alternates between being open or closed to the ocean. In 1969 the entrance was nearly 'choked off' with sand and so mechanical excavators were used to artificially open the estuary. The entrance was artificially opened again in 2007 after heavy seas forced sediments into the estuary and blocked tidal inflows. Community consultation has not indicated any desire for artificial opening of the creek entrance. Nor is there currently any significant present need for artificial opening for the purpose of flood mitigation.

A number of entrance management issues have been raised concerning: the effects of estuary entrance condition on sedimentation, tidal exchange shoaling and flushing; and the impacts of climate change on entrance management. The CZMP for Coffs Creek estuary will include development of a formal entrance management policy. It is recommended that a natural opening / closing regime is adopted in the policy which prohibits artificial opening of a closed entrance except under an exceptional circumstance whereby this is a significant and scientifically validated risk to human health or the environment that can be effectively abated through temporary entrance modification.

However, sea level rise caused by climate change will result in higher flood inundation levels within the estuary in the future. Current inundation levels are likely to increase by a similar amount as sea level rise increases. Council adopted sea level rise estimates for NSW are a 0.4 m increase in sea level by 2050 (relative to 1990 levels) and a 0.9 m increase by 2100. Climate change also has the potential to result in an increased frequency of high rainfall events leading to more frequent flooding events.

B.2.2 Entrance Behaviour

Theory suggests that the predominant hydrodynamic state of Coffs Creek is an open entrance. However it can close under low creek flow conditions and during periods of beach accretion or after large storm events. Between 1930 and 1934 the creek was reportedly closed during low tides. In November 1960 the Council decided to warn persons swimming in Coffs Creek that they did so at their own risk. This precaution, taken on health grounds, was a consequence of the creek mouth having been blocked by a sand bar for two months, thereby preventing tidal flushing.

Historic aerial photography indicates there has been significant change to both Park Beach and South Park Beach shorelines and within the estuary channel including:

- change in estuary path which is evident by May 1973, due to training walls on entrance banks which were constructed during early 1973;
- south of the entrance channel there is considerable build-up of sediment on the South Park Beach when compared with the 1964 image;
- the vegetation line east of the Orlando Street bridges on both the Park Beach and South Park Beach shoreline has increased substantially following construction of the training walls. However, since 2007 the vegetation on Park Beach east of the surf lifesaving club car park has receded by up to 30m and by approximately 20m on the banks at South Park Beach;
- vegetation begins to establish on the southern bank by 1984, and by 2000 the area is heavily vegetated;
- similarly, there is some sparse vegetation evident in the 1977 and 1984 images on Park Beach around the car park; however by 2000 there is a thick wedge of vegetation on the seaward side of the car park.
-

B.2.2.1 Entrance Location

The catchment is characterised by steep hillsides with elevations of 490m AHD falling down to the coastal floodplain. The lower reaches of the creek, east of the Pacific Highway, are broad and flat, with an average gradient of 0.02%. The catchment drains through three main creek lines – Coffs Creek and two northern tributaries which run parallel to Argyll Street (Treefern Creek) and Bray Street respectively.

The estuary is characterised by a well-defined creek system that forms one wide meandering channel that creates broad expanses and long reaches of water. The estuarine portion of Coffs Creek is complemented by a substantial and continuous area of public reserve that protects a rich diversity of riparian vegetation along the foreshores including saltmarsh, mangroves and subtropical coastal floodplain.

B.2.3 Flood Mitigation

B.2.3.1 Mitigation for Major Flood Events

A flood mitigation study on the Coffs Creek indicated that flood levels upstream of Orlando St water levels were virtually independent on entrance conditions (Public Works Department 1979). The study produced floodplain mapping of 20, 50 and 100 year ARI flood events and modelled the Creek entrance with a channel set to 0 m AHD and a bermed entrance set to 1.2 m AHD which scoured after overtopping.

B.2.4 Water Quality

Artificially opening estuary entrances is often carried out as a 'quick fix' to redress water quality problems stemming from other causes such as inadequate stormwater treatment from urban areas or inadequate erosion control measures in the catchment. Best practice for estuary management is based on addressing the source of the water quality issues rather than treating the symptoms by artificially opening entrances to 'flush' an estuary. The CZMP for Coffs Creek estuary includes strategies to address the source of current water quality issues.

Water quality of Coffs Creek estuary is moderate to poor despite the lower estuary being well-mixed with good tidal flushing of the lower estuary water body. The pressures of cleared land, sediment and nutrient input from the surrounding and upper catchment are revealed in the poor to moderate water quality of the creek. The poor rating relates to high turbidity, occasional high concentrations of chlorophyll-a and low concentrations of dissolved oxygen in the upper estuary and in deeper sections of the central basin of the estuary. Water quality in the lower estuary is not suitable for primary contact recreation after rain and primary contact recreation in the upper estuary should be avoided generally. This indicates that there is an overgrowth of microalgae and also has negative consequences for flora and fauna. Light penetration into the water column is poor, particularly in the upper reaches. The factors contributing to poor light penetration are probably sediment delivery from the catchment and the overabundance of microalgae in the water column. Restricted light availability reduces the potential for beneficial benthic processes and growth of seagrasses and other aquatic flora. In addition, the availability of dissolved oxygen is sometimes restricted, mostly in the middle to upper estuary. This issue might be resulting partially from poor light penetration in combination with high levels of oxygen consumption.

Nevertheless, there may be instances where artificial opening is justified to address extreme water quality issues such as contaminant spills where it may be desirable to provide some 'draining' of the creek system. However, it is not considered practical to include triggers to address a broad range of potential water quality scenarios. A range of factors would need to be considered during a water quality crisis, such as:

- environmental and public health risks posed by the water quality issue;
- the extent to which artificial opening will mitigate the water quality issue; and
- consequent environmental and public health risks along the adjoining coastline following artificial opening of the creek.

This Policy does not include triggers for water quality issues due to the broad range of potential water quality scenarios and the associated uncertainties. It is recommended that any water quality crisis is assessed on an individual basis.

Approvals

B.3.1 Statutory Provisions

The area of Coffs Creek and any proposed entrance management works would be located within the Coffs Harbour LGA. The body of Coffs Creek is zoned as W2 Recreational Waterway under the Coffs Harbour Local Environmental Plan (CHLEP) 2013. Land immediately adjacent to and surrounding the defined water body of Coffs Creek is predominantly zoned as RE1 Public Recreation and E2 Environmental Conservation CHLEP 2013.

Clause 50 of the State Environmental Planning Policy (Infrastructure), 2007 (ISEPP) applies, allowing such works to be carried out by or on behalf of a public authority on any land and precludes them from requiring development consent. Clause 50 of ISEPP 2007 states the following:

Development permitted without consent

(1) Development for the purpose of flood mitigation work may be carried out by or on behalf of a public authority without consent on any land.

(2) A reference in this clause to development for the purpose of flood mitigation work includes a reference to development for any of the following purposes if the development is in connection with flood mitigation work:

- *(a) construction works,*
- *(b) routine maintenance works,*
- *(c) environmental management works.*

Specifically, for the purpose of waterway or foreshore management activities, Clause 129 of the State Environmental Planning Policy (Infrastructure), 2007 (ISEPP) applies, allowing such works to be carried out by or on behalf of a public authority on any land and precludes them from requiring development consent.

Waterway or foreshore management activities means:

- *(a) riparian corridor and bank management, including erosion control, bank stabilisation, re-snagging, weed management, revegetation and the creation of foreshore access ways, and*
- *(b) instream management or dredging to rehabilitate aquatic habitat or to maintain or restore environmental flows or tidal flows for ecological purposes, and*
- *(c) coastal management and beach nourishment, including erosion control, dune or foreshore stabilisation works, headland management, weed management, revegetation activities and foreshore access ways, and*
- *(d) coastal protection works, and*
- *(e) salt interception schemes to improve water quality in surface freshwater systems, and*
- *(f) installation or upgrade of waterway gauging stations for water accounting purposes*

Clause 129 of ISEPP 2007 states the following:

Development permitted without consent

(1) Despite clause 129A, development for the purpose of waterway or foreshore management activities may be carried out by or on behalf of a public authority without consent on any land.

(1a) To avoid doubt, subclause (1) does not permit the subdivision of any land.

(2) In this clause, a reference to development for the purpose of waterway or foreshore management activities includes a reference to development for any of the following purposes if the development is in connection with waterway or foreshore management activities:

- *(a) construction works,*
- *(b) routine maintenance works,*
- *(c) emergency works, including works required as a result of flooding, storms or coastal erosion,*

Note. Emergency coastal protection works within the meaning of the Coastal Protection Act 1979 are excluded from the operation of the EP&A Act and therefore are not development to which this clause applies.

(d) environmental management works.

(2a) The following provisions apply in relation to the carrying out of new coastal protection works by or on behalf of a public authority on the open coast or entrance to a coastal lake:

(a) if a coastal zone management plan is in force in relation to the land on which the development is to be carried out—the public authority (or person carrying out the works on behalf of the public authority) must consider the provisions of that plan before carrying out the development,

(b) if a coastal zone management plan is not in force in relation to the land on which the development is to be carried out—the public authority (or person carrying out the works on behalf of the public authority) must:

i. notify the Coastal Panel before carrying out the development, and

ii. take into consideration any response received from the Coastal Panel within 21 days of the notification.

(2b) For the purposes of subclause (2a):

New coastal protection works means coastal protection works other than:

(a) the placement of sand (including for beach nourishment) or sandbags, or

(b) the replacement, repair or maintenance of any such works.

Although flood mitigation works and waterway and foreshore management activities would be permitted without consent on any land, the requirements of Part 5 of the EP&A Act 1979 must be fulfilled and Council would be required to prepare a REF for any proposed relevant works or activities, e.g. artificial opening of Coffs Creek. The REF would outline the nature and extent of the proposal, what would be the trigger and determining factors for proceeding with relevant works / activities such as artificial opening and identify and address any potential environmental effects which may result from such works. Hence the REF would also include mitigation measures and safeguards for the protection of the environment during relevant works / activities. The REF would need to be consistent with the adopted CZMP and entrance management Policy for Coffs Creek.

In conjunction with preparation of the REF, Council would be required to consult with and seek any relevant licences and or concurrence from other state government agencies. These would include:

- DoI – Crown Lands & Water under the Crown Lands Act 1989;
- Department of Primary Industries - Fisheries under the Fisheries Management Act 1994;
- Marine Parks Authority under the Marine Parks Act 1997;
- Department of Primary Industries - Water under the Water Management Act 2000;
- Office of Environment and Heritage (National Parks and Wildlife) under the National Parks and Wildlife Act 1974.

B.3.1.1 Crown Lands Act 1989

Due to the artificial opening works affecting the waterway of Coffs Creek and the coastline, it is likely that such works would affect Crown Land. Artificial opening of the entrance will require authority by way of licences from the Crown under Part 4, Division1 of the Crown Lands Act 1989.

Note: The Crown Land Management Act 2016 is expected to commence in early 2018. This may have implications that will need to be considered when the CZMP actions are implemented.

B.3.1.2 Fisheries Management Act 1994

The objectives of the Fisheries Management Act 1994 *are to conserve, develop and share the fishery resources of the State for the benefit of present and future generations.* The provisions of Division 3, Part 7 of the Act are likely to be relevant to any works associated with the artificial opening of Coffs Creek. The provisions relate to the protection of aquatic habitat. Although flood mitigation works and waterway or foreshore management activities would be precluded from requiring consent under ISEPP, the provisions of the Fisheries Management Act 1994 are still applicable and as part of the REF process concurrence from the Department of Primary Industries (Fisheries) would be required for certain activities. **Table B.3.1** outlines the relevant provisions of the Act that would apply to the artificial opening of Coffs Creek.

Table B.3.1 Activities requiring concurrence under the Fisheries Management Act 1994

Fisheries Management Act 1994	Sections 198-202	Concurrence is required from the Minister, Department of Primary Industries (Fisheries) for dredge and reclamation works on defined water land. The nature of artificial opening would constitute dredge works and also potentially reclamation works in watered land. Hence a permit and concurrence form is required prior to commencement of any works.
	Sections 219-220	Concurrence is required when barriers to the movement of fish including water course crossings are to be constructed or modified. Any proposed artificial opening is unlikely to create a barrier to the movement of fish. However such specifics would need to be confirmed within the REF.
	Sections 204-205	Any artificial opening works would likely be restricted to the sand berm. Any works must not affect mangroves or other protected marine vegetation. If marine vegetation would be harmed by relevant works / activities, a permit must be sought from the Minister before works commence. Clause 205 (2) states that *A person must not harm any such marine vegetation in a protected area, except under the authority of a permit issued by the Minister under this Part.* The REF would need to determine if artificial opening works are likely to affect mangroves or other protected marine vegetation.
	Schedules 4, 4A, 5 and 6	The REF prepared for works associated with artificial opening would need to consider any presence of local threatened aquatic habitat for flora or fauna. Thus Key Threatening Processes (KTPs) would need to be considered in preparation of the REF. The following KTPs may be relevant and required consideration: ▪ *Degradation of native riparian vegetation along NSW water courses*. ▪ *Installation and operation of instream structures and other mechanisms that alter natural flow regimes of rivers and streams.*

B.3.1.3 Marine Parks Act 1997

As Coffs Creek forms park of the Solitary Islands Marine Park, Council would be required to obtain a permit / concurrence from the Marine Park Authority / the Minister under the Marine Parks Act 1997 in order to undertake any works on land affected by the Marine Park and any associated zoning. Preparation of the REF would need to consider these factors and seek the relevant concurrence / permit.

B.3.1.4 Water Management Act 2000

A controlled activity approval under the Water Management Act 2000 (WM Act) is required for certain types of developments and activities that are carried out in or near a river, lake or estuary (water land). Under the WM Act, a controlled activity means:

- the erection of a building or the carrying out of a work (within the meaning of the Environmental Planning and Assessment Act 1979), or
- the removal of material (whether or not extractive material) or vegetation from land, whether by way of excavation or otherwise, or
- the deposition of material (whether or not extractive material) on land, whether by way of landfill operations or otherwise, or
- the carrying out of any other activity that affects the quantity or flow of water in a water source.

Artificial opening of Coffs Creek would constitute a controlled activity under the WM Act. However under the Water Management (General) Regulation 2011, Clause 38 Controlled activities—public authorities, states: *A public authority is exempt from section 91E (1) of the Act in relation to all controlled activities that it carries out in, on or under waterfront land.*

Although Coffs Harbour City Council would be exempt from requiring a Controlled Activity Approval, Clause *37, Condition applying to all exemptions under this Subdivision,* of the Regulations states:
An exemption conferred under this Subdivision is subject to the condition that the person by whom the relevant controlled activity is carried out must comply with applicable requirements (if any) of the Minister that are published in the Gazette, or notified in writing to the person, for the purposes of this clause and that are for the protection of:
(a) the waterfront land on which the activity is carried out, or
(b) any river, lake or estuary to which that land has frontage.

B.3.1.5 National Parks and Wildlife Act 1974

The Coffs Creek system falls within the Coffs Coast Regional Park. The park was created through a partnership of Council and the National Parks and Wildlife Service (now within OEH). The National Parks and Wildlife Act 1974 applies if the park is a reserve made under the Act. The Park's management is guided by a Trust Board. Preparation of an REF for artificial opening works would need to determine whether or not the park is a reserve under the Act and hence consultation / concurrence are required with OEH / National Parks and Wildlife Service. Consultation with the Trust Board would be required whether or not the park is affected by the Act. The REF would also need to consider any management plan that has been prepared for the park.

B.3.2 Summary of Potential Approvals

Works / activities for the purpose of flood mitigation or waterway / foreshore management (to address an extreme water quality issue) would be permitted without consent under Clause 50 of the State Environmental Planning Policy (Infrastructure), 2007. However the requirements of Part 5 of the EP&A Act 1979 must be fulfilled and Council is required to prepare a REF for proposed works / activities (e.g. artificial opening of the entrance to Coffs Creek estuary). The REF needs to be consistent with the adopted CZMP and Entrance Management Policy for Coffs Creek estuary.

Preparation of the REF will involve consultation with relevant state government agencies. This will confirm the necessary approvals and licences required for artificial opening of the entrance. Preliminary assessment indicates the following approvals and licences may be necessary:

- a license from the DoI – Crown Lands & Water under the Crown Lands Act 1989;
- a permit and concurrence from the Minister, Department of Primary Industries (Fisheries) under the Fisheries Management Act 1994 pursuant to Sections 198-202 for dredge and reclamation works on defined water land (the nature of artificial opening would constitute dredge works and also potentially reclamation works); and
- a permit / concurrence from the Marine Park Authority / the Minister under the Marine Parks Act 1997 as Coffs Creek forms park of the Solitary Islands Marine Park.

The Coffs Creek system falls within the Coffs Coast Regional Park, which was created through a partnership of Council and the National Parks and Wildlife Service. Consultation with the National Parks and Wildlife

Service and Trust Board is required to determine if any approvals are required under the National Parks and Wildlife Act 1974.

It is noted that a Controlled Activity Approval under the Water Management Act 2000 is not required due to the Water Management (General) Regulation 2011, Clause 38 Controlled activities - public authorities, which states: *A public authority is exempt from section 91E (1) of the Act in relation to all controlled activities that it carries out in, on or under waterfront land.* However, Council is still required to follow any applicable guidelines of NSW Office of Water under the Water Management Act 2000.

Artificial Opening Procedure

B.4.1 Decision Making Process

This Policy presently only recommends artificial opening of the Coffs Creek estuary entrance in the event of extreme water quality issues such as contaminant spills where it may be desirable to provide some 'draining' of the creek system. However, the decision to initiate an artificial opening event will be based on assessment of each individual circumstance of an extreme water quality issue with consideration of:

- environmental and public health risks posed by the water quality issue;
- the extent to which artificial opening will mitigate the water quality issue; and
- consequent environmental and public health risks along the adjoining coastline following artificial opening of the creek.

As noted in **Section B.2.3**, this Policy does not include triggers for water quality issues due to the broad range of potential water quality scenarios and the associated uncertainties. Determining what constitutes an extreme water quality issue would include reference to water quality monitoring results for Coffs Creek to determine if the issue is 'outside' normal water quality variations for the creek system.

The general decision making process / procedure for determining if artificial opening is to be employed to address an extreme water quality issue is shown in the flow chart in **Illustration B.4.1** and involves:

- following warning of potential extreme water quality issues Council's designated officer will alert relevant state government agencies of the issues and potential for an artificial opening event;
- Council's designated officer will then conduct a site assessment and/or review of water quality monitoring data to determine in consultation with relevant state government agencies if artificial opening is an appropriate response;
- if artificial opening is considered an appropriate response Council's designated officer will initiate deployment of Council's personnel and machinery to the entrance and direct when and where artificial opening is to be initiated. Ideally, the artificial opening should be initiated during a falling tide and shortly after the tide turns from high to low (if possible around a spring tide when tidal fluctuations are larger).

B.4.2 Responsibilities for Artificial Opening

Coffs Harbour City Council is responsible for artificial opening of the entrance.

B.4.3 Monitoring

When artificial openings have been carried out, monitoring of the entrance should be undertaken to determine the efficiency of the opening. For each artificial opening event, the following data will be tested / recorded:

- prior to opening:
  - testing of water quality parameters relevant to the specific water quality issue;
  - survey existing berm crest height shape and profile, and water level of creek;
- date and time of opening;
- survey water levels of creek over 24 hours following opening;
- testing of water quality parameters relevant to the specific water quality issue over 24 hours and at appropriate intervals following 24 hours after the opening;
- location and length of excavation;
- approximate width and depth of initial channel;

- ocean swell conditions (wave height and direction);
- preceding rainfall;
- date of closure; and
- digital photographs.

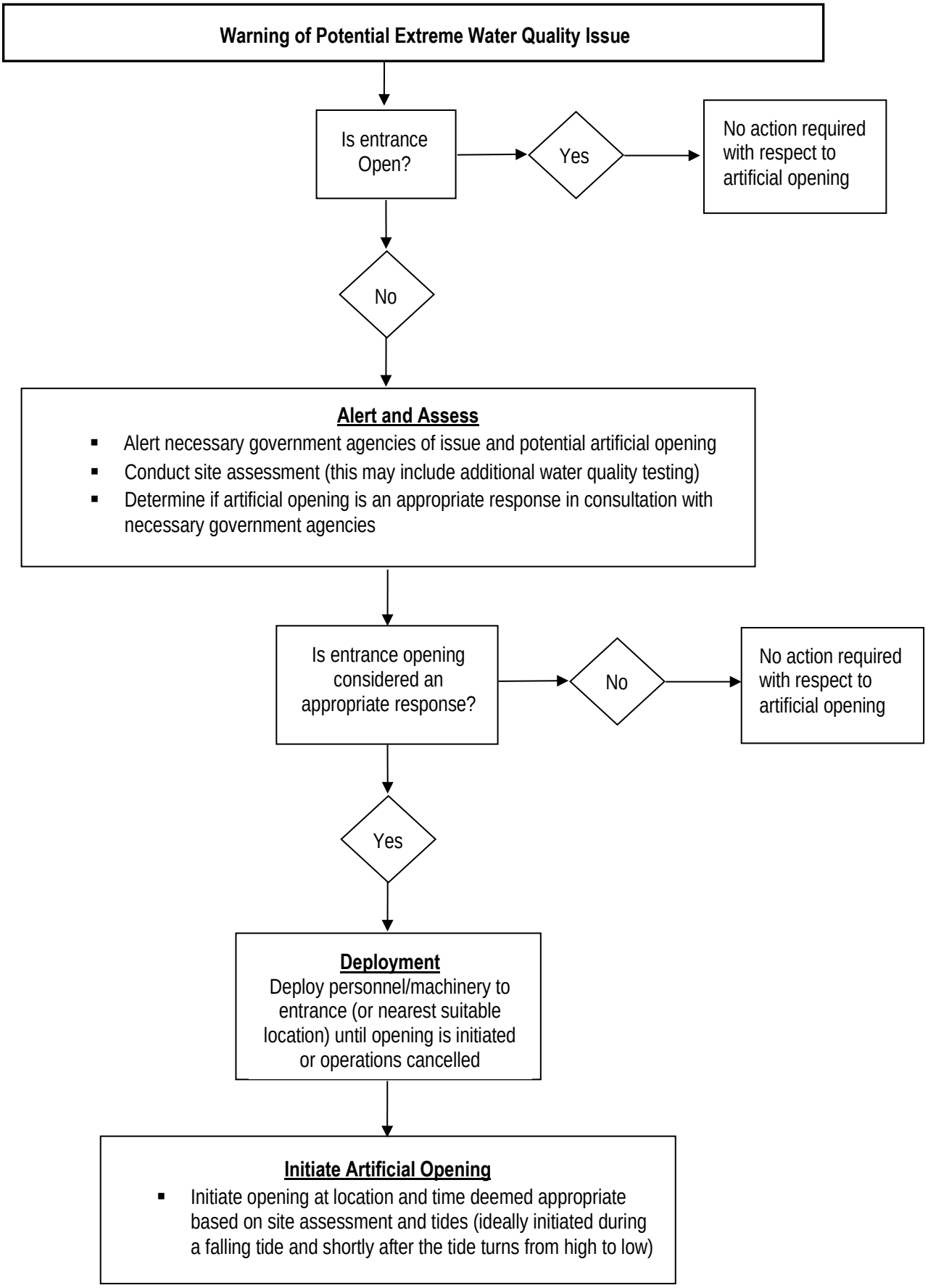


Illustration B.4.1 Artificial Opening Decision Making Flowchart

Policy Updates

B.5.1 Review and Update of this Policy

This Policy and the associated REF should be reviewed every five years or in response to:

- legislation changes; and
- any other significant factors relevant to artificial opening of the entrance of Coffs Creek estuary.

Review of the Policy will include analysis of all monitoring data collected over that period to assess if the assumptions and procedures outlined in the current Policy and REF are correct or appropriate. This will include a review of changes to climate change and sea level rise predictions and consequent impacts to this Policy.

References

BMT WBM (2011). *Coffs Harbour Coastal Processes and hazards definition Study. Volume 1: Final Report.* Prepared for Coffs harbour City Council. Date of Issue 15/02/11.

BMT WBM (2010). *Climate Change Projections for the Coffs Harbour Local Government Area.* Draft Report, February 2010.

BMT WBM *et al* (2010). *Coffs Harbour City Council Climate Change Mitigation and Adaptation Action Plan*. Report prepared for Coffs Harbour City Council in association with Eco Logical Australia and Coastal Zone Management.

Department of Primary Industries (n.d.), *Management of Coastal Lakes and Lagoons in NSW* [online], NSW Government, available: http://www.dpi.nsw.gov.au/fisheries/habitat/aquatic-habitats/wetland/coastal-wetlands/management-of-coastal-lakes-and-lagoons-in-nsw#Who-is-responsible-for-managing-ICOLL-entrances-and-artificially-opening-them

GeoLINK *et al*. (2011a). *Data Compilation and Estuary Processes Study - Darkum Creek, Woolgoolga Lake and Willis Creek*. Prepared for Coffs Harbour City Council and NSW Office of Environment and Heritage in association with **Aquatic Science and Management** and **GECO Environmental**, July 2011.

GeoLINK *et al*. (2011b). *Estuary Management Study - Willis Creek*. Prepared for Coffs Harbour City Council and NSW Office of Environment and Heritage in association with **Aquatic Science and Management** and **GECO Environmental**.

GeoLINK *et al*. (2012). *Draft Coastal Zone Management Plan - Willis Creek Estuary*. Prepared for Coffs Harbour City Council and NSW Office of Environment and Heritage in association with **Aquatic Science and Management** and **GECO Environmental**.

Haines, P. E. (2006). *Physical and chemical behaviour and management of Intermittently Closed and Open lakes and Lagoons (ICOLLs) in NSW* [Online]. Griffith centre for Coastal Management, School of Environmental and Applied Sciences, Griffith University Available: http://www4.gu.edu.au:8080/adt-root/public/adt-QGU20070221.132729/index.html Australian Digital Theses Program [Accessed 15/12/2010].

Haines, P. (2008) *ICOLL Management – Strategies for a Sustainable Future.* BMT WBM Pty Ltd, Broadmeadow NSW. [Online]. . BMT Group Ltd, Available:http://www.bmtwbm.com.au/Documents%20&%20Resources/?/1906/3269/3269 [Accessed 28/02/2011].

Jelliffe, PA (1997a). *Report on the Impact of the Disposal of Reclaimed Water into Willis Creek*

Jelliffe P. (1997b) *'Willis Creek, Woolgoolga: Coastal Processes and Effluent Release Preliminary Investigation*.' Manly Hydraulics Laboratory, Coffs Harbour.

MHL (1997). *Willis Creek, Woolgoolga. Coastal Processes and Effluent Release. Preliminary Investigation* (Draft). Prepared by NSW Department of Public Works and Services, Manly Hydraulics Laboratory. Report No. MHL 854. Draft 18 March 1997.

MHL (2004). *DIPNR Woolgoolga Lake and Darkum Creek, Tidal Data Collection February – May 2004.* Prepared by NSW Department of Commerce, Manly Hydraulics Laboratory. Report No.MHL1342.

Appendix C

Estuary Health Status and Pressures

C1 Pressures impacting on the health of Coffs Creek estuary

Estuary health pressures generally relate to human activities and associated modifications to catchment processes and coastal processes influencing the estuarine ecosystem. Impacts associated with climate change also present estuary health pressures.

A statewide assessment of estuaries in NSW (Roper *et. al.*, 2011) indicates Coffs Creek estuary has an overall 'high' pressure index rating. The 'high' rating generally relates to catchment pressures associated with the highly urbanised and significantly cleared catchment. The assessment indicates that 82% of the Coffs Creek catchment is disturbed, which is the highest proportion compared to other estuaries in the NSW Northern Rivers area. Of the 46 estuaries in the NSW Northern Rivers region, only three other estuaries (Tweed River, Cudgen Creek and Richmond River) had an overall 'high' pressure index rating.

To frame the development of management strategies, a summary of the pressures is provided below.

C1.1 Clearing of native vegetation and increased fragmentation of remnant vegetation

Illustration C.1 provides an indication of remnant vegetation cover in the catchment. Clearing and fragmentation is the principal factor threatening species and ecosystems in the Coffs Harbour LGA. The dominant pressures for riparian areas and other habitat areas in the upper catchment of Coffs Creek estuary relate to: clearing for urban development; rural-based clearing; introduced weeds; and secondary clearing associated with development such as maintenance of asset protection zones for bushfire control. Pressures on the riparian vegetation in the lower estuary are relatively low and the riparian condition is generally in good condition due to a large proportion being protected within Council reserves and ongoing weed management by landcare/ bush regeneration teams – refer to **Illustration C2**.

C1.2 Increases in catchment runoff volumes and flow rates

This pressure is a result of clearing of vegetation and urban development which exacerbates erosion and pollutant runoff. Urban stormwater management and water management on rural lands is considered an effective approach to mitigate this pressure.

C1.3 Sediment and nutrient loads from rural lands

The major contribution of nitrogen, phosphorus and sediment to Coffs Creek comes from dry horticulture in the catchment. Modelling indicates the upper slopes of the catchment to the south of Coramba Road contribute a greater total quantity of nitrogen, phosphorus and sediment than any other sub-catchment area due to the higher concentration of dry horticulture in this part of the catchment.

C1.4 Sediment and nutrient loads from urban areas

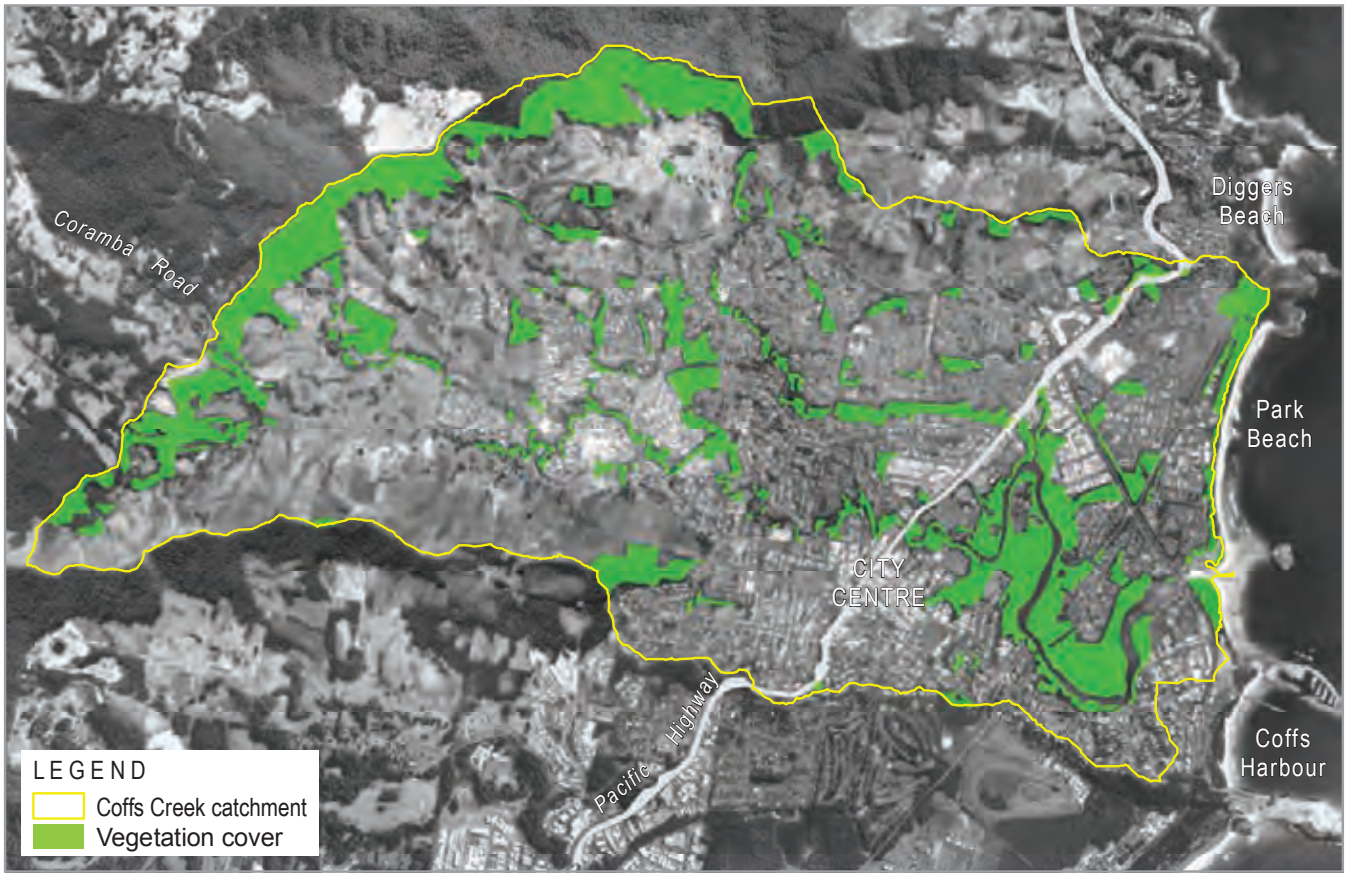
Stormwater management for new development during the construction and post-construction phases is addressed with current policies and procedures however development of a stormwater management plan is considered beneficial to address current deficiencies in the existing urban stormwater system.

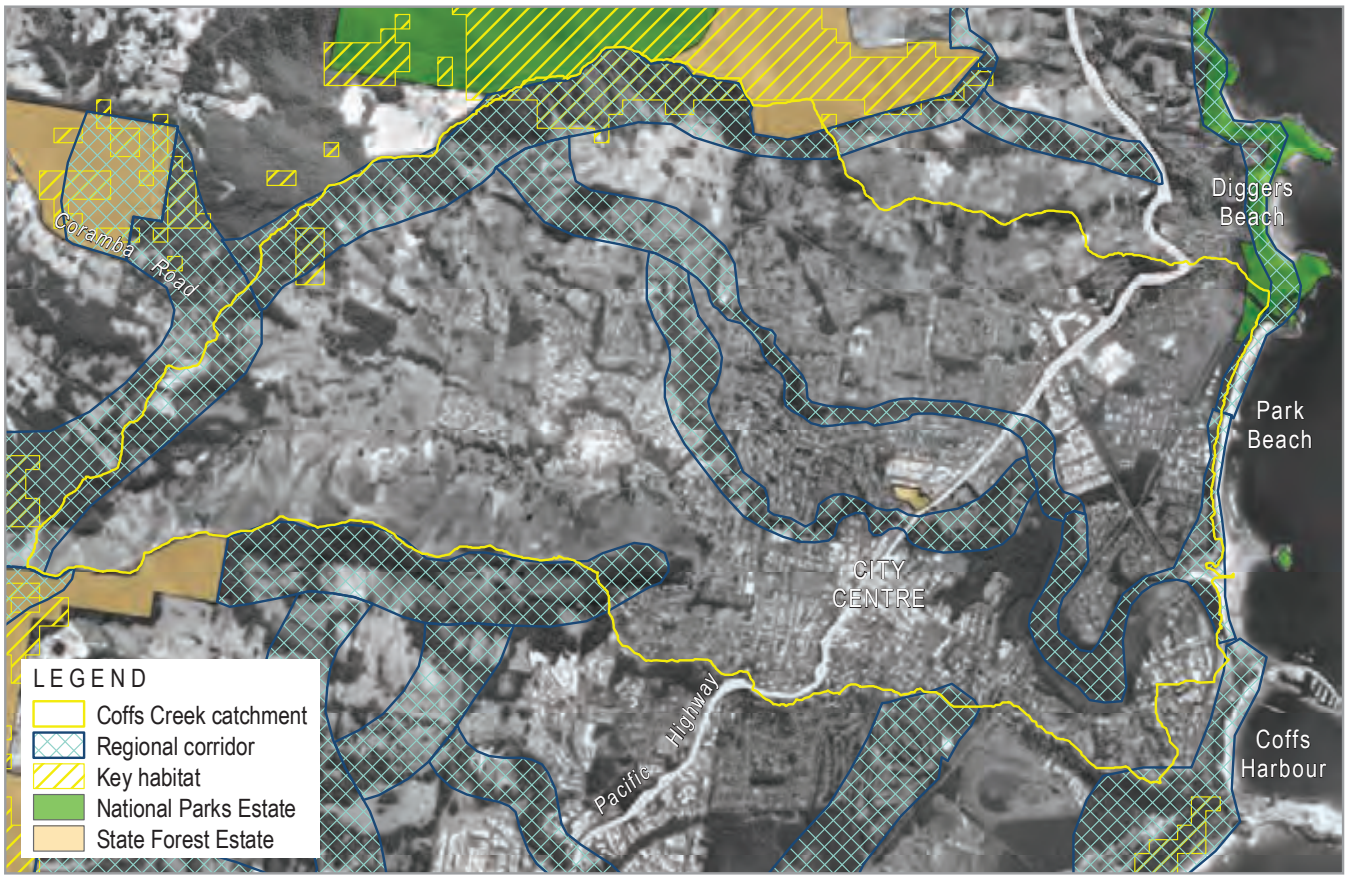
C1.5 Leakages or overflows from Council's sewerage system

Council's current asset management program for the sewerage systems addresses the issue of overflows. Council's Climate Change Mitigation and Adaptation Action Plan also addresses risks associated with climate change and sea level rise.

Information shown is for illustrative purposes only

Drawn by: RE Checked by: DMT Reviewed by: TiM Date: July 2014
Source of base data: Coffs Harbour City Council and Office of Environment and Heritage





North

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Vegetation Cover and Wildlife Corridors

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Coffs Creek Estuary Coastal Zone Management Plan
1988-1037

Illustration C1.1

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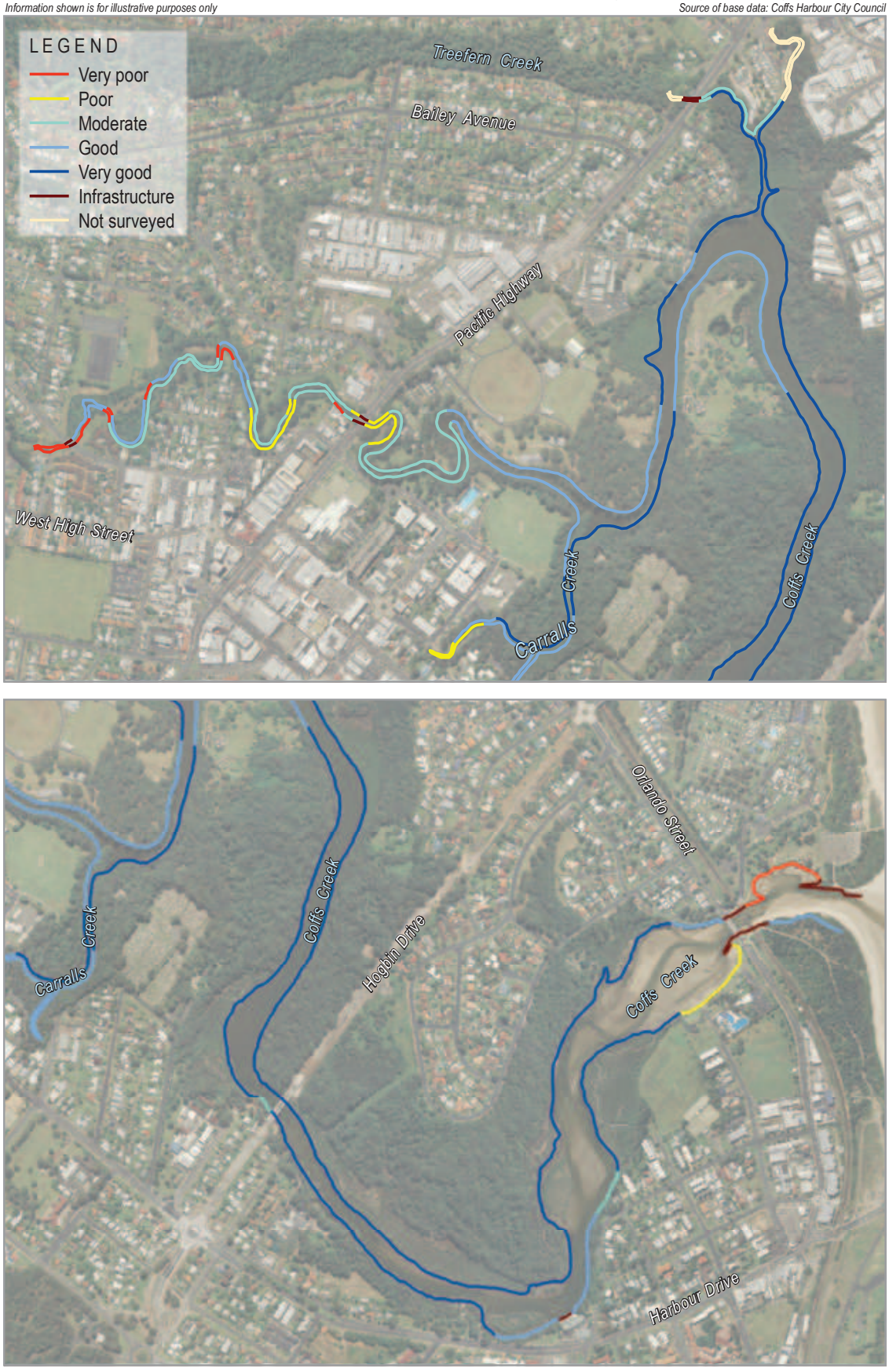
Source of base data: Coffs Harbour City Council



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North

Riparian Vegetation Condition in the Coffs Creek Estuary (Mapped November 2012 and January 2013)

GeoLINK environmental management and design

Coffs Creek Estuary Coastal Zone Management Plan
1988-1034

Illustration C1.2

C.1.6 Impacts associated with the proposed Pacific Highway bypass of Coffs Harbour

This pressure will be addressed in the design and construction of the highway with adoption of contemporary water quality and sediment and erosion control measures and incorporation of fauna underpasses and longer span bridges at the major watercourses to allow for wildlife linkages. The initial environmental assessment for the bypass indicates the potential provision of tunnels to maintain current fauna ridge passages.

C1.7 On-site sewage management systems

This pressure is adequately managed with Council's program of monitoring and inspection of on-site systems and enforcement of upgrades to failed or inadequate systems.

C1.8 Contaminated land from previous banana cultivation practices

This pressure is addressed by existing policies requiring contamination investigations and remediation for development of these lands. In respect to existing pesticide use, education and incentives for improved management of pesticide/herbicide/fertiliser use on farms is considered an effective strategy to address this pressure.

C1.9 High water temperatures which can impact on water quality in the estuary

This pressure arises from loss of riparian vegetation and therefore reduced shading of waterways and also from higher temperatures arising from climate change. Restoration of riparian corridors in the upper catchment is considered an effective approach to mitigate this pressure.

C1.10 Bank erosion

The majority of the estuary banks are considered stable and any bank erosion sites in the lower estuary were considered minor or have been treated with protection works. A proactive approach of restoration / maintaining riparian vegetation is recommended.

C1.11 Flood levels

A range of concerns in respect to alleviating flood levels have been previously investigated in flood study assessments for Coffs Creek:

- Fallen trees in the creek were not found to significantly impact on flood levels. It is noted that Council's flood detention basins are regularly maintained following floods to ensure the outlets are not blocked.
- Dredging sand shoals, reducing mangrove density and silt build-up along the banks, were found to have insufficient value in reducing flood levels.
- Widening the Orlando Street and railway bridges were found to have insufficient value in reducing flood levels.

C1.12 Beach erosion near Coffs Creek entrance

Predicted beach recession at South Park Beach and Park Beach is addressed by the Coffs Harbour coastline CZMP which proposes a range of strategies including investigation of erosion protection measures and dune management. The general strategy for South Park Beach is to allow erosion to the existing seawall and investigating potential extension of seawall to the mouth of Coffs Creek.

C1.13 Closing of the Coffs Creek entrance

No significant change in the natural opening and closing of the creek entrance is predicted, however development of an entrance management policy is considered prudent to formalise Council's approach to potential entrance related issues.

C1.14 Sedimentation in the lower estuary

Sedimentation associated with sand shoals does not significantly influence or affect flushing of the creek or blocking of natural flows based on recent technical studies. Therefore dredging is not recommended to improve flushing of the estuary or alleviate flood levels.

C1.15 Flooding of foreshores due to high ocean water levels and sea level rise

Inundation of low-lying areas around the lower estuary during high ocean water levels and as a result of sea level rise is addressed in a coastal inundation risk register in the Coffs Harbour coastline CZMP.

C1.16 Impacts of sea level rise on estuarine vegetation

Sea level rise is likely to cause mangroves and saltmarshes to migrate to higher areas where topography allows, however where barriers exist, current mangrove and saltmarsh distribution will be lost.

C1.17 Climate change impacts on rainfall patterns

Changes to rainfall patterns could lead to an increase in pollutants delivered from the catchment particularly under increased storm frequency and severity. Catchment based strategies addressing runoff and pollutants are the most suitable means of addressing these impacts.

C1.18 Climate changes impacts on flora and fauna

Climate changes in temperature, rainfall or evaporation will have long-term consequences for the regional ecology. Conservation connectivity and building resilience will be key strategies to ensure that natural systems have the capacity to adapt to shifting climatic zones. Restoring habitat connectivity for the Coffs Creek catchment is best facilitated by focussing on revegetation and restoration of the riparian zones.

C2 Status of Coffs Creek estuary health

C2.1 Water quality status

Water quality of Coffs Creek estuary is moderate to poor despite the lower estuary being well-mixed with good tidal flushing of the lower estuary water body. The pressures of cleared land, sediment and nutrient input from the surrounding and upper catchment are revealed in the poor to moderate water quality of the creek. The poor rating relates to high turbidity, occasional high concentrations of chlorophyll-a and low concentrations of dissolved oxygen in the upper estuary and in deeper sections of the central basin of the estuary. Water quality in the lower estuary is not suitable for primary contact recreation after rain and primary contact recreation in the upper estuary should be avoided generally.

C2.2 Ecological status

The estuarine habitats represented in Coffs Creek conform reasonably well to the expected habitats for this type of estuary. Mangroves are the dominant vegetative habitat type and are increasing in extent. Seagrasses have reduced in extent over the past three decades while the extent of saltmarsh is considered to have remained relatively constant.

Riparian vegetation is predominately in good condition east of the highway largely due to the presence of foreshore Council reserves and targeted efforts by landcare groups and bush regeneration teams. However, in the upper catchment, riparian vegetation is in poor condition, impacted by clearing or weed infestation.

Benthic macroinvertebrate populations (visible organisms living on / under rocks and sediments on the creek bed), which are important bio-indicators and also contribute to estuarine health, are considered relatively healthy in terms of species richness in Coffs Creek.

The current status of fish communities in Coffs Creek is uncertain.

A significant flying-fox camp occurs at Coffs Creek, providing habitat for the threatened Grey-headed Flying-fox on a year round basis.

C2.3 Sediments and bank condition

Whilst it is commonly thought the estuary has "silted up" in recent years, previous studies indicate the patterns of infilling and scouring are cyclical and there has been no discernible long-term trend in sand infilling of the downstream reaches over the last 50 – 60 years. Analysis of historical aerial photography also shows there has been very little change in the estuary channel location over the last 50 – 60 years.

Bank erosion mapping (2012/2013) reveals that:

- 97% of the estuary banks east of the Pacific Highway are considered stable
- in the vicinity of the Showgrounds and in the upper catchment, the major factors influencing erosion are clearing of riparian vegetation, scour of the bank toe during floods and associated slumping and tree fall.

C3 Strategies to address estuary health pressures

A number of broad management strategies arise from consideration of the key pressures impacting on the health of the Coffs Creek estuary. The key strategies address multiple objectives in regard to improving the health of Coffs Creek estuary.

C3.1 Improving the vegetated riparian zones in the upper catchment

This is considered a key strategy to address basic water quality and ecological issues. The objective of this strategy is to establish a viable vegetated riparian width along the length of all main tributaries. This will involve: increasing the width of existing vegetated riparian zones in areas; establishing riparian corridors along cleared tributary sections; improving the structural diversity of existing vegetated riparian zones via weed management and restoration.

A draft plan has been prepared for regeneration of riparian areas within Council managed reserves on Coffs Creek and its tributaries. The *Natural Resource Management Plan for Coffs Harbour City Council Lands Adjoining Coffs Creek* (CHBRG, 2013) (termed the 'NRMP') is being prepared by Coffs Harbour Bushland Regeneration Group Pty Ltd (CHBRG) for Coffs Harbour City Council. The NRMP includes priorities to rehabilitate the riparian zones of the managed reserve system with revegetation and weed control. This document would form a foundation for other strategies aimed at improving the vegetated riparian zones in the upper catchment. Other strategies should target riparian land parcels outside the Council managed reserve system to complement the aims and objectives of the NRMP.

C3.2 Reducing runoff, sediment and nutrient loads, and pesticides from rural lands

This is a key strategy aimed at addressing one of the main sources of water quality issues for the estuary. Methods used to reduce these source issues involve encouragement and incentives for improved soil and water management on farms, improved management of pesticide/herbicide/fertiliser use on farms; and establishment of vegetated riparian zones or riparian buffers on farms.

C3.3 Improvements to stormwater management in urban areas

This key strategy addresses one of the main sources of water quality issues for the estuary. Council currently has in place adequate policies and procedures for managing soil and erosion during construction of new development areas and for permanent stormwater management measures for new development areas. Therefore, potential strategies for improvements to stormwater management in urban areas should address deficiencies in existing stormwater infrastructure; and education programs and other non-structural measures to address issues such as litter control.

C3.4 Other specific or lower priority strategies

C3.4.1 Bank erosion

In respect to existing bank erosion assessed in this study, potential management actions include:

- Ongoing monitoring for areas identified with minor erosion but remedial action is not advised unless erosion processes worsen;
- Maintenance and enhancement works for some areas of past erosion that have been remediated using rock revetment or mixed timber walls/rock revetment (eg. northern bank downstream of Orlando Street bridge and south bank upstream of Orlando Street bridge), or gabions.

Previously mentioned management actions are also recommended to address the broader source of changes to flood dynamics. These actions include: revegetation and restoration of riparian areas in the upper catchment; urban stormwater management and water management on rural lands.

C3.4.2 Riparian zones in the lower estuary

Pressures on the riparian vegetation in the lower estuary area are relatively low and the riparian condition is generally good. Nevertheless, ongoing maintenance for weed control and riparian regeneration is required in the lower estuary to keep these areas relatively weed free and promote regeneration. The friends of Coffs Creek, the Coffs Harbour Repair to Country team (Darrunda-Wajaar), and more recently the Coffs Council bush regeneration teams have been very successful in addressing weeds issues in the estuary riparian zones and along the Coffs Creek walk/cycleway. Ongoing maintenance of treated areas is required. Support of proactive community bush regeneration groups is a cost effective way of maintaining the natural values of the estuary riparian zone.

C3.4.3 A policy for managing opening and closing of the Coffs Creek entrance

Consultation has not indicated any desire to change the existing 'natural' opening / closing regime. However, a number of issues related to entrance management have been raised with respect to the effects of estuary entrance condition on: sedimentation in the creek; tidal exchange shoaling and flushing; and the impacts of climate change on the opening / closing regime. Therefore, an entrance management policy is considered necessary to formalise Council's approach to potential entrance related issues. Additionally, OEH guidelines for the preparation of CZMP's (OEH, 2013) require development of an entrance management policy for estuaries with intermittently closed / open entrances.

It is recommended that a natural opening / closing regime is adopted in the policy which prohibits artificial opening of a closed entrance except under an exceptional circumstance whereby there is a significant and scientifically validated risk to human health or the environment that can be effectively abated through temporary entrance modification.

C3.4.4 Accommodating mangrove and saltmarsh migration in response to sea level rise

It is recommended that the mapped areas of mangroves and saltmarshes undertaken as part of this study are utilised in the proposed actions of Council's Climate Change Mitigation and Adaptation Action Plan (BMT WBM, 2010) which address migration of habitats at foreshore fringes (**Action A-8** and **A-10** of the climate change action plan).

C4 Health monitoring program for Coffs Creek estuary

Development of this CZMP included preparation of a monitoring plan for key aspects of the estuary environment. A consistent and adequate long term environmental monitoring program for the Coffs Creek estuary will provide a number of direct and indirect benefits for users and managers alike. Whilst a reasonable quantity of water quality data has been collected over the past 10 years it has been collected under a variety of water quality monitoring programs, each with individual goals, limiting its utility as a device for detecting trends or changes in the health of the estuary.

Therefore, an estuary health monitoring program has been developed for future application to the Coffs Creek estuary. Where possible the program has been based upon previous monitoring such as the EcoHealth program (Ryder 2012), in the hope of conserving the utility of the existing dataset.

Appendix D

Community Uses and Heritage

D1 Cultural and heritage environment

Coffs Creek estuary is located within the land of the Gumbaynggirr nation. The creek has been known as 'Buulunggal' (which relates to the local aboriginal name for mullet) and 'Bangalor' Creek.

The 1860s was the start of white settlement in the Coffs Harbour region. The earliest recorded contact made between local Aboriginal people and settlers in the Coffs Harbour area was with Walter Harvie – a cedar-getter who was led to Coffs Creek around 1865 by local Aboriginal people. Harvie set up camp in the vicinity of the present-day Showgrounds. Harvie floated the logs down Coffs Creek and hauled them across the beach to ships lying at anchor in the lee of North Coff Island. .

The main white settlement in Coffs Harbour occurred in the 1870s to early 1880s. Between the 1880s and the turn of the century, the Coffs Harbour area had developed and the effects would have substantially transformed the landscape. In the early 1900s agriculture and horticulture began to establish in the catchment and the town developed around the jetty and rail. At the height of the depression in the 1930s, shanty towns housing Aboriginal people and the white working class started to spring up around Coffs Harbour. The whole of Coffs Creek was used as a camp during the mid-twentieth century, and became one of the main Aboriginal camps in Coffs Harbour.

Coffs Creek continues to play an important role in the local aboriginal culture. Important places where people lived and still enjoy visiting include: The Old Camp (Fitzroy Oval); the Showground; the Cemetery; the Botanic Gardens; the Ranch, Happy Valley; Ferguson Cottage and Muttonbird Island. An important ceremonial site exists in the vicinity of the Showground.

The following list provides an historical account of specific places and features near Coffs Creek:

- **North Coast Regional Botanic Garden**: The site was gazetted in 1907 for disposal of night soil and used for garbage disposal from 1938 until 1964. In 1975 the site was gazetted for the "purposes of a Botanic Garden".
- **Coffs Harbour cemetery** contains the graves of local aboriginal people and many of the regions early settlers.
- **Coffs Harbour Showground** opened in 1912 run by the Agricultural Society.
- The **North Coast railway line** linking Coffs Harbour to Glenreagh was constructed between 1915-1922. This bridge has been replaced but the piers still exist in the creek and support a concrete platform.
- **Park Beach reserve** was dedicated in 1916.

Source: http://libraries.coffsharbour.nsw.gov.au/Local-Heritage/pictures/Pages/default.aspx

Plate D1.1 Holiday Scene – Park Beach Reserve/ Coffs Creek Entrance 1950

- **Fitzroy Park** was used for sporting activities since circa 1923;
- **The Northern Breakwater** was constructed to Muttonbird Island in 1924;

- **Coffs Creek Swimming baths** also known as the James Smith Memorial Pool was constructed circa 1924 near The Promenade buildings.
- **The Butter Factory** was constructed in 1926 (now **The Promenade**).
- **James Smith Park** was notified as a reserve in 1935, named after one of the swimming club's coaches;
- **Orlando Street bridge** was opened in 1936. The existing road bridge was constructed in 1966 to replace the original bridge.
- The **Grafton Street bridge** (also known as the Pacific Highway bridge) was constructed in 1947.
- **Dolphin Marine Magic** was constructed circa 1960.

D1.1 Aboriginal community vision for Coffs Creek

Coffs Harbour Regional Landcare Inc. (CHRL) conducted a project in 2013 to develop an Aboriginal community vision for the Coffs Creek catchment and estuary. The project involved a planning workshop with the Coffs Harbour Aboriginal community. The Coffs Harbour Regional Landcare website lists the outcomes.

The Aboriginal community vision for the Coffs Creek catchment and estuary is:

- For a healthy and productive ecosystem where plants and animals provide an abundance of food, medicine and fibre to the whole community.
- That our community re-develop and strengthen our cultural connections and Gumbaynggirr tradition and knowledge about this part of our world.
- That this creek system provides economic opportunities for our people.
- That this area continues to nurture our spirits and provide enjoyment and serenity.
- That the impacts of agriculture and urbanisation are minimised and the creek system is buffered from those impacts.
- That the aboriginal community is supported in their contribution to and participation in the management of the area in partnership with other management agencies.

A range of actions arose from the Aboriginal community vision workshop:

- the desire for a number of place name changes to acknowledge local Aboriginal identities and Gumbaynggirr culture
- improve amenities around the creek, in particular on the northern side of Coffs Creek, and to improve access for water-based recreation
- the community wishes to develop eco-tourism opportunities. The community noted other ideas to promote awareness and appreciation of Aboriginal cultural connections with the creek
- sustainable catchment management, riparian restoration and enhancement of wildlife corridors including the desire to integrate traditional aboriginal values and uses into these broader objectives.

D1.2 Native Title Act 1993 (Commonwealth) and Aboriginal land Rights Act 1983 (NSW) Considerations / Obligations

Where actions proposed on Crown Land consideration of Aboriginal Land Claims lodged under NSW *Aboriginal Land Rights Act 1983* will need to be undertaken. Any works will need to be compliant with the Commonwealth *Native Title Act 1993*

D2 Public access

Public access to the creek and its foreshores is largely contingent on the availability of public open space and the provision of suitable infrastructure. Accordingly:

- the **lower estuary** offers considerable access opportunity as it is contained within a broad corridor of public land that is within easy reach of the surrounding road system. The area has also been subject to considerable capital investment for public access.

- The **upper catchment** west of the highway comprises a series of tributaries and drainage lines that are contained within narrow public reserves and are largely surrounded by private property. These areas have limited exposure to the public road system and therefore offer very limited opportunity for public access.

D2.1 Issues and considerations

The following issues or constraints relating to public access to Coffs Creek estuary have been identified:

- important sections of the estuary path system do not comply with access standards. Key recreation areas in particular incorporate facilities such as car parking and path connections to key recreation facilities and foreshore destinations that are non-compliant. Some of the popular lower estuary destinations incorporating jetties, boardwalks and viewing platforms are also connected by paths and steps with limited accessibility
- the northern section of the Coffs Creek Walk includes narrow boardwalks and sections of path that are unsealed. These limit the use of the paths for shared bicycle access
- remote areas along walking trails in urban areas are vulnerable to anti-social behaviour
- the Pacific Highway forms a major barrier between the lower estuary and West Coffs areas and significantly impacts on east-west movement of pedestrians and cyclists. Safe access across the highway can only be made where there are traffic lights and these do not necessarily correspond with optimal east-west pedestrian/cycle movement. In particular, there are limited convenient opportunities to cross the highway at the western end of the lower estuary which diminishes the value of the estuary setting and associated recreational facilities as an easily accessible resource to this large, nearby residential community
- there is a lack of continuous access trails in the creek reserves in the West Coffs area which significantly diminishes their value for community use. Where provided, access routes from adjoining streets or the end of cul-de-sacs only provide short distance connections into or through reserves or lead to areas that have no facilities or recreational value
- retrofitting new access routes into and along the reserves adjoining the upper catchment tributaries will be difficult and expensive. They may also raise concern from adjoining property owners for loss of existing visual amenity, loss of privacy and increased security risk
- new residential areas on the fringe of West Coffs continue to exclude the opportunity of utilising drainage reserves for dual community open space and to utilise them as part of a larger public trail network.

Plate D2.2 Paths through reserves provide direct pedestrian connection between West Coffs neighbourhoods but offer only limited short distance experience of the reserve environment

Plate D2.3 Path to nowhere. This pedestrian corridor leads into a hidden area of drainage reserve that offers minimal recreational value and poor passive surveillance

Plate D2.4 Narrow passageways and lack of a welcoming public interface significantly limits the community value of drainage reserves hidden behind private properties

Plate D2.5 Creek crossings provide the primary visual connection into creek reserves within the West Coffs area

The Coffs Harbour Open Space Strategy 2010 identifies a range of opportunities for improved public access including the following that are relevant within the Coffs Creek reserves:

- upgrade Coffs Creek Walk (long term surfaced to cycleway) with improved connectivity to surrounding areas, rest and activity nodes, and high quality interpretive signage
- develop a network of shared pathways/walking trails utilising the numerous drainage corridors dissecting the West Coffs precinct.

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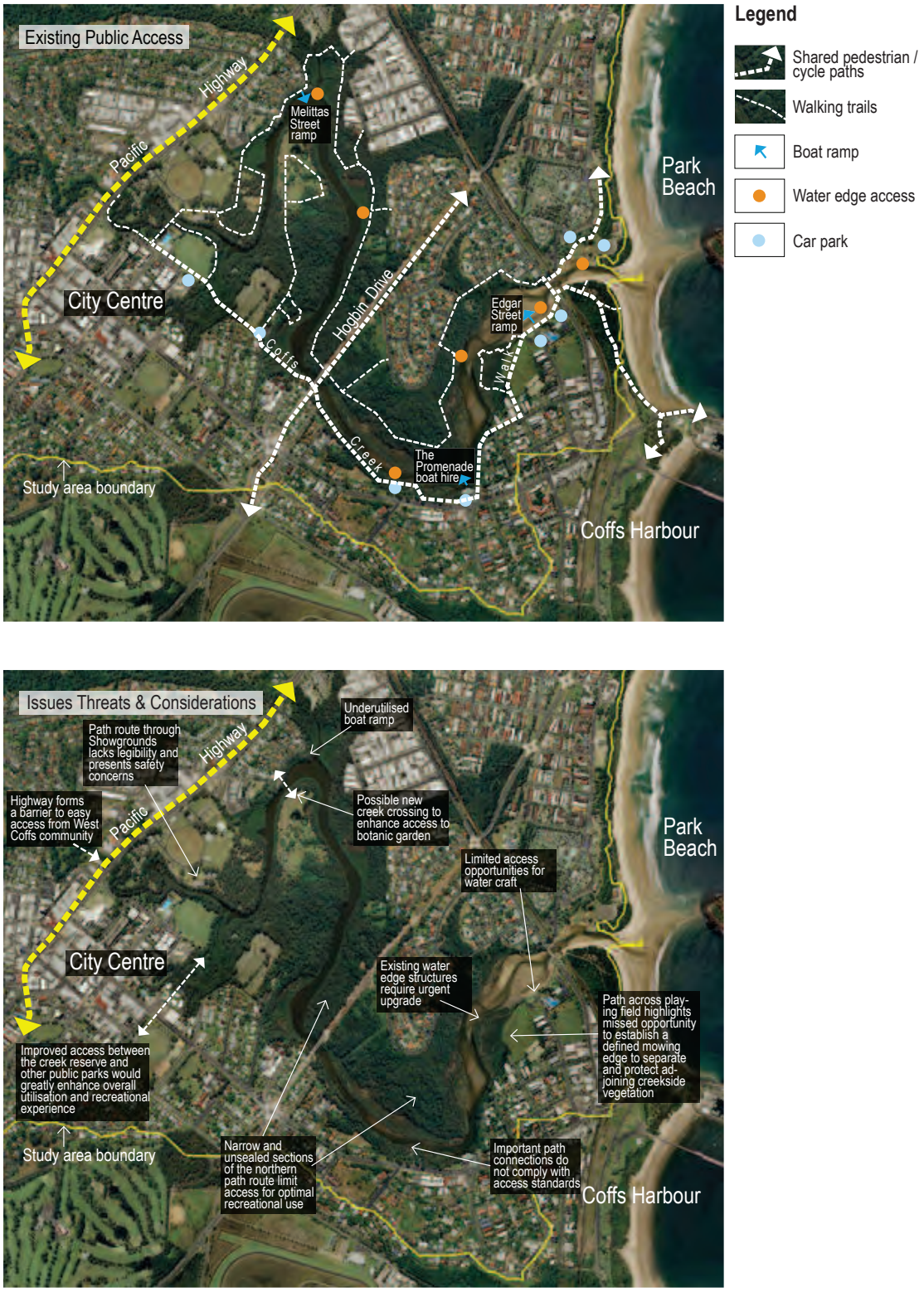
Source of base data: Red Belly Design



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Public Access Issues

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Coffs Creek Estuary Coastal Zone Management Plan
1988-1035

Illustration D2.1

D3 Recreational uses

Coffs Creek and its surrounding reserves have long provided an attractive natural setting for a range of outdoor recreation activities to the Coffs Harbour community. Many of the activities are supported with infrastructure and facilities in designated recreation areas that aim to enhance user enjoyment, sustain an optimal carrying capacity and minimise potential impacts between activities and the resource itself.

The value, extent and type of recreational use vary considerably between the upper catchment and lower estuary of Coffs Creek. The lower Coffs Creek estuary provides the main focus of recreational activity within the entire Coffs Creek catchment. This is due to the substantial size of the reserve, its easy access, the scenic amenity of the natural environment and the variety of recreational opportunities provided by the setting.

In the upper catchment there are considerable open space reserves associated with the creek system, however few offer significant recreational value. This is largely due to their remoteness, inaccessibility and lack of integration as valued components of the urban fabric.

D3.1 Issues and considerations

The following issues relating to recreational use have been identified:

- Existing facilities in key recreation areas in the lower estuary are becoming inadequate and out-dated. Facilities lack visual cohesion and do not fully optimise the natural and scenic values of the sites. This is impacting on the overall visual image and recreational experience of the creek environment.
- Higher density residential development is planned in and around the CBD. As one of the city's key recreation destinations, the Coffs Creek estuary is therefore likely to experience a significant increase in user activity, particularly along the southern foreshores between the CBD and the Jetty. This is likely to require increased parking and a greater level of infrastructure to ensure that the increased carrying capacities do not compromise existing recreation and natural values.
- Recreational use of the estuary, particularly for water access is currently limited by the availability and quality of existing access points, facilities and associated infrastructure.
- There is considerable community perception of the loss of amenity for swimming from increased sand shoals and loss of water quality due to inadequate flushing and exchange of creek water with the sea.
- An on-going concern for erosion of the shoreline at the creek mouth has raised the need to extend the existing training wall at the Ocean Parade Park / Park Beach Reserve. This will potentially increase the visual impact of the structure and further reduce the overall scenic quality of the setting.

D3.2 Strategies identified in the Coffs Harbour Open Space Strategy 2010

The Coffs Harbour Open Space Strategy 2010 identifies a range of opportunities for improved public recreation including the following that are relevant within the Coffs Creek reserves:

- upgrade Coffs Creek Walk (long term to surfaced cycleway) with improved connectivity to surrounding areas, rest and activity nodes, and high quality interpretive signage
- upgrade Coffs Creek Reserve adjacent to the Dolphin Marine Magic as district social/family recreation space with improved playground and picnic facilities
- develop Englands Park as an adjunct to the Coffs Creek Reserve. This can form a social/family recreation space incorporating a local sport space for junior training and/or school use. Investigate improved car parking of Edgar Street, fitness trails and tree planting. Potential site to investigate for a community garden

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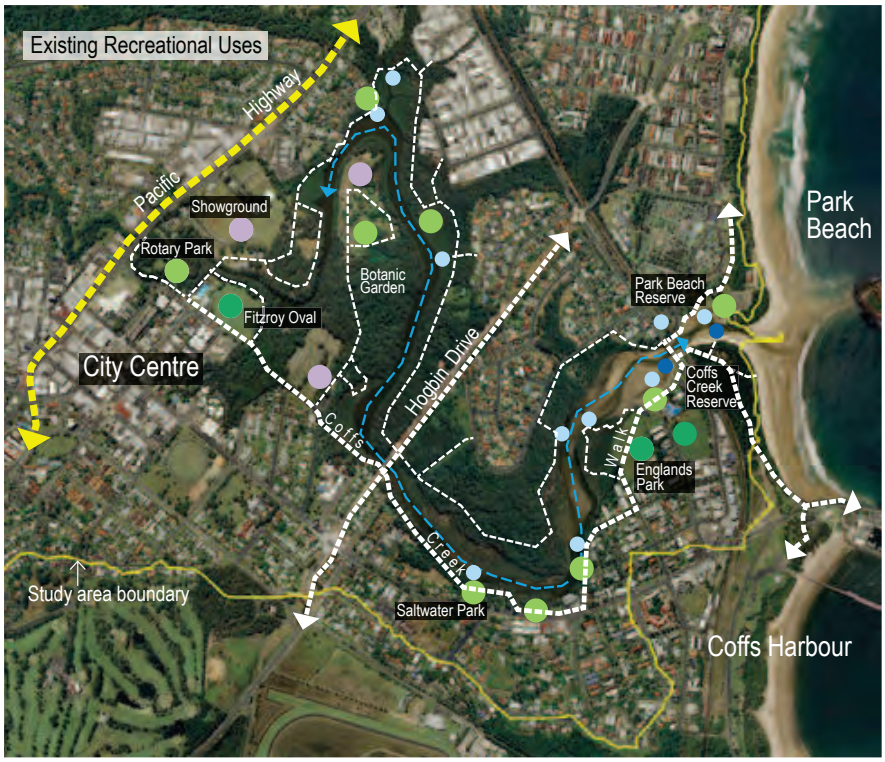
Source of base data: Red Belly Design



North

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Coffs Creek Estuary Coastal Zone Management Plan
1988-1035

Recreational Use Issues

Illustration D3.1

- develop fitness circuit incorporating Brelsford Park, Fitzroy Oval and Coffs Creek
- upgrade Rotary Park with improved picnic facilities catering for disabled assuming disabled parking can be provided. Revegetate creek area leaving viewing opportunities
- investigate relocation of amenity block at Fitzroy Oval to a more appropriate location in terms of retaining an open street frontage
- create local social/family recreation space at Red Cedar Drive
- create local social/family recreation space opposite Catholic Club. Redesign drain to a natural stream form
- develop a network of shared pathways/walking trails utilising the numerous drainage corridors dissecting the precinct
- improve relaxation opportunities including additional landscaping/tree planting at Baden Powell Park, Vera Drive and Heron Reserve
- develop seating and rest stops in conjunction with walkways along creek side open space
- open space for play outside the foreshore setting in the Coffs Harbour East neighbourhood is limited. There may be opportunity within the Coffs Creek area to upgrade existing spaces that are under capacity with improved recreation facilities to increase opportunities for local social and family recreation in the Coffs Harbour East area. Investigation is also recommended into the removal of playgrounds containing only basic play equipment with limited opportunity for improvement in areas that can be better served by social family parks.

D3.2 Strategies identified in the Coffs Harbour Sports Facility Plan 2010

- Englands Park – Recommendations for Cricket: Limit cricket competition to young junior teams only due to the reduced oval size (i.e. unsuitable for U13s and above)
- Englands Park – Recommendations for Cricket: Install shade/shelter on northeast side.

D4 Visual amenity

Coffs Creek is a highly important natural asset that influences the visual amenity of the whole catchment area. This is largely due to the scenic water views that are available within the lower estuary and the extent of remnant natural vegetation that follows the creek and tributary corridors through suburban areas in the upper catchment.

D4.1 Lower estuary

The lower estuary of Coffs Creek together with its substantial reserves of riparian vegetation are a highly attractive and important visual resource that provide Coffs Harbour with one of its defining natural assets.

The Coffs Creek reserve and adjoining sporting and open spaces form a green outlook and major natural asset across the northern fringe of the town centre. The visual experience of the Coffs Creek estuary has been enhanced by the provision of public infrastructure for recreation and access. Key to this has been the creation of a highly developed path system that enables easy access around the creek and to a wide range of natural settings and vantage points.

The southern foreshores in particular enable a variety of visual experiences due to the higher level of developed recreational areas and easy access from surrounding streets. The broader area of natural vegetation along the northern foreshores on the other hand offers a more remote recreational setting and intimate visual experience. Here, the dominance of natural features and the lack of visible urban development create a unique visual experience that is highly valued for its close proximity to the town centre.

D4.2 Upper catchment

The character of the creek changes significantly west of the Pacific Highway where the main creek channel branches into a series of small-scaled tributaries in stark contrast to the wide, open watercourse that defines the estuary east of the highway. The tributaries follow narrow, sometimes steeply sided channels that are engulfed and overshadowed by vegetation, further reducing visibility of the watercourse and its significance on the surrounding environment.

Visibility of the creek environment in West Coffs is made more difficult by a lack of easy or continuous public access along the public reserves of the creek system. The street layout offers only limited public interface with the creek, which is generally hidden behind urban development. For much of the West Coffs area the creek system is a highly underutilised visual resource. Opportunities to gain closer visual appreciation of the creek are generally limited to locations where streets or pedestrian routes cross the creek system.

Plate D4.1 Street crossings offer some of the few opportunities to gain direct visual access into the creek environment

Plate D4.2 Large trees within the tributary reserves offer a highly significant visual resource for the surrounding residential communities

While close range visibility of the creek is difficult, the creek environment at a broader scale has a profound influence on the overall visual amenity of the west Coffs Harbour setting. This is largely due to the remnant vegetation including tall forest scale trees that flank the creek foreshores and form a continuous tree canopy and network of green corridors deep into the urban area. The vegetation dominates the skyline and establishes an attractive green backdrop that mitigates the expanse of built form and provides a visual connection with the natural environment for the surrounding urban area. This effect greatly enriches the visual image of the West Coffs area in a way that would not be achieved by smaller vegetation typically planted within private gardens and public parks.

The visual significance of the creek system progressively diminishes as it branches out into smaller drainage gullies and swales through the urban fringe of West Coffs and the farmland beyond. The drainage lines have generally been modified over a long history of farming activity and comprise little natural vegetation. Environmental weed and some erosion are evident along poorly managed gullies. Flood management infrastructure also dominates some locations.

D4.3 Issues and considerations

The following issues relating to visual amenity have been identified:

- long sections of the path system around Coffs Creek lack appropriate signage and fail to provide adequate interpretation or direction. The signs lack visual cohesion and a consistent graphic or design theme or selection of construction materials
- visual amenity within recreation areas of the lower estuary is suffering from aging infrastructure or lacks visual cohesion

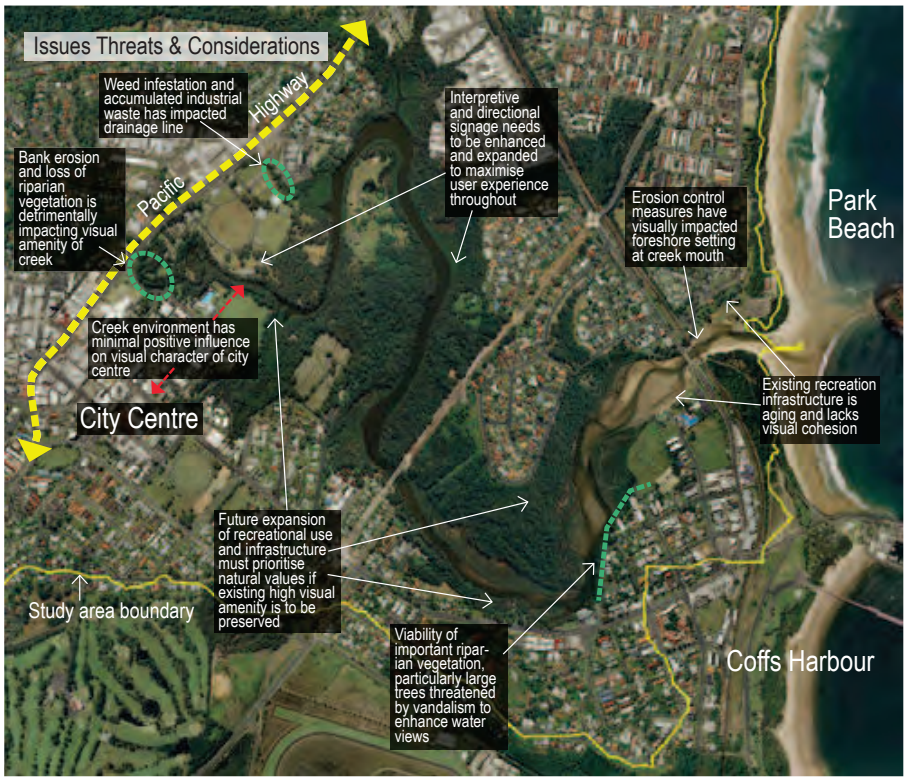
- the installation and possible extension of training and retaining walls to manage bank erosion near the creek mouth has a detrimental visual impact on the nearby recreation areas
- litter accumulation along the creek foreshores, particularly around mangroves, stormwater outlets and on beaches near popular recreation areas significantly impacts on the visual amenity of the reserve
- preservation of view corridors from public and private vantage points will be an on-going issue in the management of vegetation growth around the foreshores
- preservation and on-going recruitment of tall remnant native trees within narrow reserves of the upper catchment will be crucial to sustain the natural values and high visual amenity afforded by the trees
- environmental weeds in reserves in the upper catchment generate a poor visual image
- the lack of integration of drainage reserves into new residential areas has failed to optimise their potential visual amenity and recreational value to surrounding communities.

Information shown is for illustrative purposes only

Drawn by: GAM Checked by: RE Reviewed by: TIM Date: July 2014
Source of base data: Red Belly Design

Legend

- Key views and vantage points
- Scenic green outlook



North

0 NTS

Visual Amenity Issues

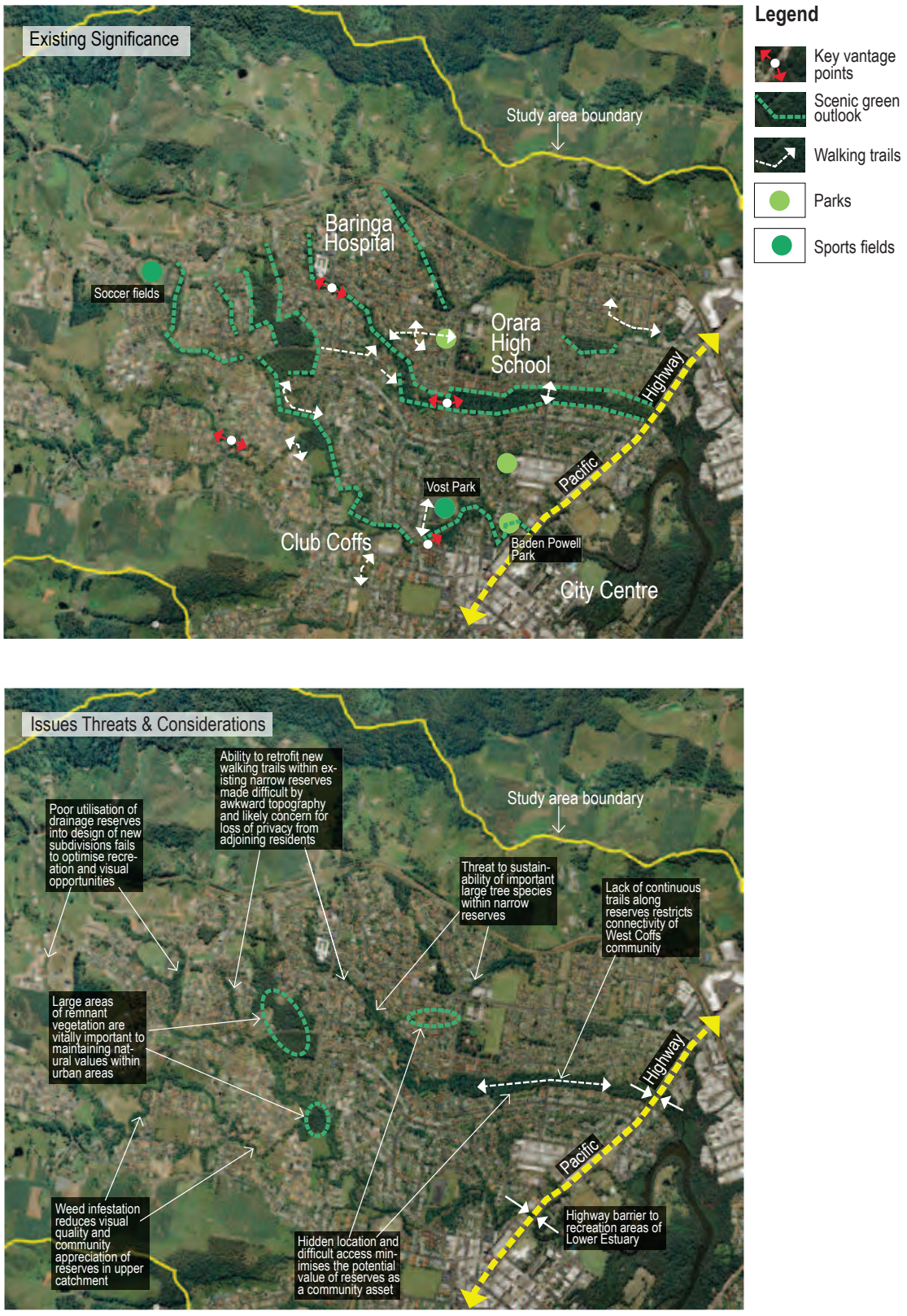
GeoLINK environmental management and design

Coffs Creek Estuary Coastal Zone Management Plan
1988-1035

Illustration D4.1

Information shown is for illustrative purposes only

Drawn by: GAM Checked by: RE Reviewed by: TIM Date: July 2014
Source of base data: Red Belly Design



North

0 NTS

GeoLINK environmental management and design

Upper Catchment Public Access, Recreational Use and Visual Amenity

Coffs Creek Estuary Coastal Zone Management Plan
1988-1035

Illustration D4.2

D5 Management strategies to address community use issues

The following broad management strategies arise from consideration of the key issues impacting on community uses of the Coffs Creek estuary.

D5.1 Cultural and heritage environment

- Generate a greater level of understanding of cultural and heritage values.
- Identify meaningful ways of achieving reconciliation with the local Aboriginal community such as dual-naming of key locations associated with Coffs Creek.
- Maintain involvement of the local Aboriginal community in decision-making associated with the estuary reserves.

D5.2 Public access

- Maintain and enhance Coffs Creek Walk as the primary access corridor.
- Maintain and support the existing use level of boating activity.
- Enhance pedestrian and cycle connectivity throughout West Coffs.

D5.3 Recreational uses

- Ensure that primary recreational activities are supported and continue without significant change while responsive to increased carrying capacities associated with higher density residential development in and around the CBD without compromising existing recreation and natural values.
- NSW RMS currently has a grant program available to local councils to undertake identified works that benefit boating related activities. Accordingly, an opportunity exists to attract funding support to address the limited availability and quality of existing water access points, facilities and associated infrastructure.
- Ensure existing designated recreation areas and facilities meet contemporary needs and design standards.
- Expand recreational opportunities within reserves for the benefit of West Coffs community.
- Prepare an integrated Foreshore Management Plan for Park Beach Reserve, Coffs Creek Reserve and Englands Park to facilitate their upgrade and redevelopment. The Plan should aim to review and optimise the recreational opportunities and natural values of the location to meet contemporary community demands and expectations. The Plan should address concern for erosion of the shoreline at the creek mouth and the need for dredging for improving water-based recreation in front of Coffs Creek Reserve.

D5.5 Visual amenity

- Strengthen the visual image of Coffs Creek in the lower estuary.
- Optimise the scenic values of the creek in the lower estuary.
- Improve visitor appreciation and orientation through improved signage in the lower estuary.
- Improve the visual image of reserves and water courses within existing established urban areas throughout West Coffs.
- Improve community appreciation of and engagement with the reserve system.
- Enhance the visual environment of farms and urban hinterland.

Appendix E

How this CZMP relates to the NSW Coastal Management Principles

Table E.1 How this CZMP relates to the NSW Coastal Management Principles

Coastal Management Principle	*Consideration in the CZMP*
Principle 1: *The Plan will consider the objects of the Coastal Protection Act 1979 and the goals, objectives and principles of the NSW Coastal Policy 1997.*	▪ The NSW Coastal Policy and NSW Coastal Protection Act 1979 deal with population and economic growth whilst protecting the natural, cultural, heritage and spiritual values of the coastal environment. These principles form the basis of development and prioritisation of management strategies for Coffs Creek estuary. ▪ The benchmarks and guidelines in the *NSW Coastal Planning Guideline: Adapting to Sea Level Rise* and in Council's Climate Change Policy and related documents have been considered in development of the entrance management policy, and in relation to climate change impacts on estuary ecology, hydrodynamics and community infrastructure.
Principles relating to the preparation of this CZMP	
Principle 2: *Optimise links between plans relating to the management of the coastal zone.*	▪ Development of this CZMP has considered Council's Coastal Processes and Hazard Definition Study and Coastal Zone Management Study for the coastline, and other studies and management plans related to Coffs Creek estuary. Refer to the literature review component (GeoLINK et al, 2012b).
Principle 3: *Involve the community in decision-making and make coastal information publicly available.*	▪ Community consultation was undertaken in the preparation of this CZMP to gain input to the development of management actions for Coffs Creek estuary. Consultation has included the following: – a workshop in 2012 to gain input on community values, issues and objectives for the estuary – a community survey in 2012 in respect to community uses of the estuary and values, issues and objectives – a workshop in 2013 to gain input on the development of management strategies – public exhibition of the draft CZMP for community comment.
Principle 4: *Base decisions on the best available information and reasonable practice; acknowledge the interrelationship between catchment, estuarine and coastal processes; adopt a continuous improvement management approach.*	▪ The *Estuary Condition Study* (GeoLINK *et al*, 2013b) and the *Coffs Creek Infilling and Hydraulic Capacity Study* (Water Technology, 2013) considered the above issues. ▪ The Implementation Schedule will be reviewed every 5 to 10 years to enable continuous improvement management approach.
Principles relating to coastal risk management	
Principle 6 and 7 relate more to coastal hazard risks and are generally not directly applicable to the issues for the Coffs Creek estuary. However, some coastal risk management strategies in the CZMP for the Coffs Harbour coastline have been incorporated into this CZMP where it relates to issues specific to Coffs Creek estuary eg. the coastal inundation risk register which includes assets and infrastructure in Coffs Creek catchment.	

Coastal Management Principle	*Consideration in the CZMP*
Principles relating to coastal ecosystem health	
Principle 8: *Maintain the condition of high value coastal ecosystems; rehabilitate priority degraded coastal ecosystems.*	▪ Development and prioritisation of strategies has considered the above approach such as improving the riparian zones in the estuary catchment and strategies for mangrove and saltmarsh migration in response to sea level rise.
Principles relating to coastal ecosystem health	
Principle 9: *Maintain and improve safe public access to beaches and headlands consistent with the goals of the NSW Coastal Policy.*	▪ Maintaining and improving safe public access to the Coffs Creek estuary has been a major component of the CZMP and is reflected in Strategy H-3 (improving foreshore infrastructure), Strategy H-6 (improving pedestrian and cycle paths) and Strategy L-1 (improving water access).
Principle 10: *Support recreational activities consistent with the goals of the NSW Coastal Policy.*	▪ Improving the recreational amenity of Coffs Creek estuary is another major component of the CZMP and is reflected in Strategy H-3 (improving foreshore recreational infrastructure), Strategy H-6 (improving pedestrian and cycle paths), Strategy H-7 (improving recreational opportunities in the upper catchment) and Strategy L-1 (improving water access to help facilitate boating).

Appendix F

How this CZMP fits into Council's strategic context

Table F.1 How this CZMP fits into Council's strategic context

Council Plans and Policies	*Relationship to Coffs Creek Estuary CZMP*
Coffs Harbour City Council Operational Plan	
Council must have an operational plan that is adopted before the beginning of each year and details Council's activities during the year as part of the delivery program covering that year	▪ Actions will be included into Council's Operational Plan when funds become available
Coffs Harbour 2030 Plan	
The 2030 Plan covers five themes including 'Looking After Our Environment', 'Moving Around' and 'Places for Living' which are more directly applicable to this CZMP. The 2030 Plan outlines objectives and strategies for each theme.	▪ This CZMP is consistent with the aspirations of the Coffs Harbour community as articulated in the 2030 Plan. The relevant 2030 Plan strategies and corresponding CZMP strategies are listed in **Table F.2**.
Coastal Hazard Zone Policy (2013) and Coffs Harbour Coastal Zone Management Plan (2013)	
Council's Coastal Hazard Zone Policy aims to minimise risk, both physical and economic, due to coastal processes and minimise the effects of development on land subject to coastal processes. The Coastal Zone Management Plan for the Coffs Harbour coastline, defines the level of risk from coastal hazards and provide a co-ordinated approach to management of coastal hazards for the coastline	▪ Development of this CZMP has considered Council's Coastal Processes and Hazard Definition Study and Coastal Zone Management Study for the coastline, and other studies and management plans related to Coffs Creek estuary. Refer to the literature review component (GeoLINK et al, 2012b). ▪ The Coffs Creek estuary CZMP has incorporated the relevant coastal CZMP management strategies in development of the estuary strategies.
Natural Resource Management Plan for Coffs Harbour City Council Lands Adjoining Coffs Creek (2013)	
The draft plan (NRMP) outlines regeneration of riparian areas within Council managed reserves on Coffs Creek and its tributaries. The NRMP adopts a three-tiered priority system involving: 1. Priority Weeds (1. Madeira Vine; 2. Camphor Laurel; 3. Broadleaf Paspalum; 4. Chinese Celtis) 2. Priority Corridors (Treefern Creek riparian corridor, Botanical Gardens, and major Council reserves located along Coffs Creek west of the highway) 3. Priority Reserves (located along Coffs Creek west of the highway and another upper tributary adjacent to Apollo Drive).	▪ The Coffs Creek estuary CZMP supports the NRMP. CZMP strategies have has been developed with consideration of the NRMP strategies and with the objective of incorporating complimentary strategies aimed at riparian restoration. ▪ The key relevant CZMP strategies are Strategy H-1 and H-2.
Climate Change Policy (2013) and Coffs Harbour City Council Climate Change Mitigation and Adaptation Action Plan (2010)	
The policy acknowledges the reality of climate change and adopts a sea level rise benchmark of 91cm increase by 2100. The policy includes: adapting existing activities and practices to be more	The impacts of the adopted sea level rise benchmarks have been included in the considerations of: ▪ designing foreshore works in Strategy H-3

Council Plans and Policies	*Relationship to Coffs Creek Estuary CZMP*
resilient to climate change impacts; and building the resilience of local ecosystems to respond to the effects of climate change. The action plan describes climate change projections at the local scale for the Coffs Harbour area with specific management actions such as relocation / modification of essential services/assets (stormwater, sewage pump stations, etc) vulnerable to sea level rise.	▪ developing a Stormwater Management Plan for Coffs Creek in Strategy H-4 ▪ planning for saltmarsh migration in response to sea level rise in Strategy M-2. The policy of building resilience of local ecosystems has been adopted in Strategy H-1 and H-2 in respect to restoring riparian / wildlife corridors in the upper catchment.
Coffs Harbour Biodiversity Action Strategy	
Council's Biodiversity Action integrates and consolidates the directions set out in various national, state and regional biodiversity plans. One of the key objectives is to improve biodiversity and ecological processes by protecting, rehabilitating and managing native vegetation across the area.	▪ Key priorities of the CZMP relate to restoring riparian corridors / wildlife corridors – refer to Strategy H-1 and H-2
Landscape Corridors of the Coffs Harbour Local Government Area (Consultation Draft – 2014)	
This project maps a network of landscape corridors within the Coffs Harbour LGA. Mapping categorises the riparian zone of the lower Coffs Creek estuary as a 'sub-regional corridor', and the riparian zones of the tributaries west of the existing highway as 'urban links' connecting with 'regional corridors' and 'sub-regional corridors' along the ridgeline on the Coffs Creek catchment.	▪ Key priorities of the CZMP relate to restoring riparian corridors / wildlife corridors – refer to Strategy H-1 and H-2
Water Sensitive Urban Design Policy and Guidelines (2013)	
This policy aims to apply the principles of Water Sensitive Urban Design (WSUD) to the development of land. The policy contains water quality targets for stormwater management for new urban development.	▪ Strategy H-4 (stormwater management) supports the policy and task H-4.1 will refer to the WSUD Guidelines.
Floodplain Development & Management Policy (2013) and Coffs Creek Floodplain Risk Management Plan (2005)	
The policy provides a range of clauses / guidelines for developments on flood liable land. The Coffs Creek Floodplain Risk Management Plan sets out flood planning controls and flood management measures specific to Coffs Creek.	▪ The Coffs Creek Floodplain Risk Management Plan has been used extensively in the development of the CZMP to inform strategies relating to flood issues such as: entrance management policy; consideration of the need for dredging the lower estuary. ▪ This CZMP is considered a complimentary document to the Coffs Creek Floodplain Risk Management Plan. It is noted that no CZMP strategy directly addresses flooding issues.
Creek Bank Erosion in Urban Streams Policy (2009)	
This policy recognises creek bank erosion is part of	▪ Strategy M-3 (Task M-3.2) is consistent with

Council Plans and Policies	*Relationship to Coffs Creek Estuary CZMP*
a natural process and will occur at various times. Where the erosion causes damage or endangers private infrastructure Council may choose to investigate the requirement for remedial works.	the policy. The task involves monitoring estuary banks after significant flood events and remediating erosion sites where public infrastructure is at risk ▪ Strategy H-1 and H-2 assist in preventing bank erosion by enhancing creekside vegetation.
Coffs Harbour Open Space Strategy 2010	
The Open Space Strategy 2010 guides the planning, management and development of the council's open space network. The strategy identifies a range of opportunities and actions for improved public access and recreation.	▪ Strategy H-6 and H-7 (improving path systems and recreational opportunities in the upper catchment) recommend carrying out actions contained in the Open Space Strategy which relate to the Coffs Creek estuary. ▪ Strategy H-6 and H-7 include suggestions for consideration at the next review stage of the Open Space Strategy.
Coffs Harbour Pedestrian Access and Mobility Plan Review (PAMP) (2011)	
The plan aims to improve pedestrian facilities and prioritise funding to provide a network of safe, convenient and connected pedestrian routes throughout the area.	▪ Strategy H-6 and H-7 (improving path systems and recreational opportunities in the upper catchment) recommend carrying out actions contained in the PAMP which relate to the Coffs Creek estuary. ▪ Strategy H-6 and H-7 include suggestions for consideration at the next review stage of the PAMP.
Coffs Harbour Bike Plan	
The bike plan is part of the process to achieve the objectives for cycling in the Vision 2030 community plan covering infrastructure, safety, promotion and awareness of cycling. Council has developed a draft plan for the five year period from 2014 – 2019 which was on exhibit from November to December 2014.	▪ Strategy H-6 and H-7 (improving path systems and recreational opportunities in the upper catchment) recommend carrying out actions contained in the Bike Plan which relate to the Coffs Creek estuary. ▪ Strategy H-6 and H-7 include suggestions for consideration at the next review stage of the Bike Plan.
Buluunggal – The Aboriginal Community Vision for the Coffs Creek Catchment and Estuary (2013)	
Coffs Harbour Regional Landcare Inc. (CHRL) conducted a project in 2013 to develop an Aboriginal community vision for the Coffs Creek catchment and estuary. The project involved a planning workshop with the Coffs Harbour Aboriginal community. The Coffs Harbour Regional Landcare website lists the outcomes of the project.	▪ The aims and objectives of this CZMP are consistent with the Aboriginal community vision for the Coffs Creek estuary. ▪ Strategy M-4 supports the implementation of *Buluunggal – The Aboriginal Community Vision for the Coffs Creek Catchment and Estuary* and includes some specific outcomes of the vision.

Table F.2 How this CZMP relates to the Coffs Harbour 2030 Plan

2030 Plan Strategies	*Related CZMP Strategy*
2030 Plan Theme: Looking After Our Environment	
Objective - LE 1 We share our skills and knowledge to care for our environment	
Strategy LE 1.2 Develop programs to actively engage communities on environmental issues and solutions	Strategy M-4 is aimed at enhancing public appreciation of cultural and heritage values throughout the estuary catchment including: ▪ establishing a strong symbol of reconciliation by implementing a program that identifies dual names, drawing on traditional Aboriginal names for key locations associated with Coffs Creek ▪ Continue to involve the participation of the local Aboriginal community in design proposals and relevant management decisions throughout the creek reserves Strategy L-2 proposes an education program to increase local community appreciation of and engagement with the creek's natural values particularly within the residential and farming communities of the upper catchment.
LE 1.3 Promote connections to the environment through learning in the environment	L-2 proposes an education program to increase local community appreciation / engagement with the creek's natural values particularly within the residential and farming communities of the upper catchment.
Objective - LE 2 We reduce our greenhouse gas emissions and adapt to climate change	
LE 2.1 Maintain biodiversity in a changing climate	H-1 is aimed at rehabilitating riparian corridors in the upper catchment for multiple objectives including restoring habitat connectivity which the Coffs Harbour Biodiversity Action Strategy considers an important adaptation strategy for conserving Coffs Harbour's biodiversity. H-2 complements H-1 with the objective of rehabilitating riparian corridors in the lower catchment (east of existing highway). M-2 is aimed at protecting available corridors for migration of Saltmarsh in response to sea level rise.
Objective - LE 3 Our natural environment and wildlife are conserved for future generations	
LE 3.1 Manage land use to conserve the region's unique environmental and biodiversity values	H-1 and H-2 described above assist in conserving the region's unique environmental and biodiversity values. H-4 addresses stormwater management in urban areas to improve water quality in Coffs Creek.
LE 3.2 Enhance protection of our catchments, waterways and marine areas	H-1 and H-2 address rehabilitating riparian corridors in the upper and lower catchment which is considered a key strategy in protecting the waterway and its foreshore areas.
LE 3.3 Recognise Aboriginal land and sea management practices in the development of environmental programs	M-4 addresses involvement of the local Aboriginal community in design proposals and relevant management decisions throughout the creek reserves
LE 3.4 Create environmental management and restoration programs through partnerships with the community	H-1 and H-2 include involvement of rural landholders, landcare groups and bush regeneration teams in rehabilitating riparian corridors in the upper and lower catchment. L-2 proposes an education program to increase local community appreciation of and engagement with the creek's natural values particularly within the residential and farming communities of the upper catchment.

2030 Plan Strategies	*Related CZMP Strategy*
LE 3.5 Develop and improve infrastructure to provide appropriate access to environmental experiences	H-6 involves enhancing and expanding the public pedestrian and bicycle path network in West Coffs by to achieve an integrated and continuous system that connects with riparian zones and optimises the existing network of paths around the lower estuary L-1 aims at improving water access in the lower estuary.
Objective - LE 4 We reduce our impact on the environment	
LE 4.2 Implement programs which aim to make the Coffs Harbour Local Government Area pollution free	H-1 and H-2 assist in reducing the pollutant runoff to the waterways H-4 addresses stormwater management in urban areas to improve water quality in Coffs Creek. H-6 addresses litter control in the estuary
2030 Plan Theme: Moving Around	
Objective - MA 1 We have an integrated, accessible and environmentally - friendly mixed mode transport system servicing the region	
MA 1.3 Promote increased public transport, pedestrian and cycle usage and reduced car usage	H-6 promotes increased pedestrian and cycle usage by enhancing and expanding the public pedestrian and bicycle path network in West Coffs to achieve an integrated and continuous system that connects with the existing network of paths around the lower estuary
MA 1.4 Integrate cycle way and footpath networks including linking schools, shops and public transport	Refer to H-6 above
Objective - MA 2 We have a system of well-maintained and safe roads for all users	
MA 2.1 Ensure adequate maintenance and renewal of roads, footpaths and cycleways	Refer to H-6 above
MA 2.2 Facilitate safe traffic, bicycle and pedestrian movement	Refer to H-6 above
2030 Plan Theme: Places for Living	
Objective - PL 1 Our infrastructure and urban development is designed for sustainable living	
PL 1.3 Create balanced pedestrian friendly communities with a mix of residential, business and services	Refer to H-6 above
Objective - PL 2 Our public spaces are enjoyed by all our people	
PL 2.1 Develop the harbour and foreshores as the focal point for our Local Government Area	H-3 involves development of a Foreshore Management Plan for Park Beach Reserve, Coffs Creek Reserve and Englands Park to achieve a range of objectives including improving the beach amenity of the creek foreshore at Park Beach Reserve, general improvements to the recreational areas / facilities of these reserves, and replacing degraded infrastructure with a visually coordinated suite of infrastructure, furniture, materials and signage H-7 is aimed at retaining and expanding passive recreation and leisure opportunities in the Coffs Creek reserve system. H-8 is aimed at preserving, restoring and managing the natural values of Coffs Creek which is contribute to a high visual amenity of the foreshores.

2030 Plan Strategies	*Related CZMP Strategy*
PL 2.2 Provide public spaces and facilities that are accessible and safe for all	H-6 and H-7 involves enhancing public access and recreation opportunities including consideration of disability access
PL 2.3 Provide safe and accessible play spaces for our children within each community	H-7 is aimed at retaining and expanding passive recreation and leisure opportunities in the Coffs Creek reserve system.

Appendix G

Summary of Community Survey Results

Table G.1 Ranking of issues based on a community survey

Issue	*Response Count*	*Percentage of Respondents indicating Concern for Upper and/or Lower Creek*	
		Upper Creek (west of highway)	*Lower Creek (east of highway)*
Rubbish dumping and litter	99	**88%**	71%
Weed invasion	106	**94%**	46%
Loss of water quality from urban and agricultural runoff	89	**91%**	64%
Sedimentation and sand build-up	97	60%	**75%**
Inadequate drainage system	89	**89%**	51%
Poor maintenance (environmental management, weed clearing, mowing, planting)	90	**83%**	54%
Bank erosion and sedimentation	88	**82%**	58%
Degradation of native vegetation and wildlife habitat	75	**88%**	63%
Decline in fish numbers	58	66%	**76%**
Vandalism and graffiti	56	64%	**80%**
Antisocial behaviour	52	67%	**77%**
Loss of visual amenity from inappropriate or incompatible development	54	**76%**	61%
Sea level rise	46	50%	**76%**
Security concerns from remoteness, lack of lighting or poor legibility	37	**78%**	70%
Insufficient access to creek corridor and/or water edge from adjoining areas	40	**80%**	43%
Dogs running off leash	36	**75%**	61%
Insufficient walking tracks	34	**82%**	35%
Inadequate water views / visual access	33	52%	**64%**
Excessive grass mowing and clearing	26	**92%**	54%
Inadequate interpretation/appreciation of cultural heritage	22	55%	**91%**
lack of picnic facilities	25	**72%**	48%
Insufficient signage	24	54%	**71%**
Conflicts with other uses (inadequate space, noise, incompatible activities)	17	**65%**	53%
Lack of children's playgrounds	16	**81%**	44%

Table G.2 Ranking of management activities based on a community survey

Management Activity	*Very Important*	*Important*	*Not Important*	*Unsure*	*Response Count*	*Score*
Control of rubbish dumping and litter	**72%**	26%	2%	1%	125	168
Weed control	**64%**	33%	2%	1%	129	166
Erosion control	**53%**	40%	5%	2%	114	136
Improved fish habitat	**52%**	39%	9%	1%	116	136
Improved wildlife habitat	**54%**	37%	8%	2%	115	136
Native planting	**48%**	40%	11%	1%	119	133
Improved trails and signage	18%	**55%**	23%	5%	108	89
Dedicated water viewing areas	19%	**49%**	28%	4%	108	84
Control of off-leash dog-walking	25%	**35%**	32%	8%	112	81
Improved picnic facilities	15%	**51%**	28%	7%	108	79
Improved protection of cultural heritage	14%	**41%**	34%	11%	107	66
Improved playgrounds	12%	**42%**	39%	7%	107	64
Reduced mown areas	10%	29%	**50%**	11%	114	50

Appendix H

Agency Letters of Support for Relevant Actions

NSW GOVERNMENT | Department of Industry

DOC18/000676

Steve McGrath
General Manager
Coffs Harbour City Council
Locked Bag 155
Coffs Harbour NSW 2450

Attn: Marten Bouma

By email: council@chcc.nsw.gov.au
CC: marten.bouma@chcc.nsw.gov.au

Dear Mr McGrath

Re: Draft Woolgoolga Lake, Boambee / Newports Creek and Coffs Creek Coastal Zone Management Plans as amended 14 December 2017 (draft CZMPs)

The Department of Industry – Lands & Water (DoI Crown Lands) has reviewed the draft Woolgoolga Lake, Boambee / Newports Creek and Coffs Creek Coastal Zone Management Plans (as amended 14 December 2017) where relevant to the NSW *Crown Lands Act 1989.*

The review has considered technical, planning and financial aspects of the draft CZMPs as relevant to Crown land management. The review has not considered the adequacy of the draft CZMPs in relation to other legislation or the 'Guidelines for Preparing a Coastal Zone Management Plans', produced by the NSW Office of Environment & Heritage (2013).

DoI Crown Lands agrees 'in principle' to the amended draft CZMPs under section 55C(2)(b) of the *Coastal Protection Act*. This agreement does not exclude or replace the need for authorities to undertake the various planning, regulatory and approval processes that may be required as per the *Crown Lands Act 1989* and as part of implementing the CZMPs.

Should you wish to discuss this matter further, please do not hesitate to contact Ms Catherine Knight, Coastal Management Specialist, on 0428 967 997 or by email at catherine.knight@crownland.nsw.gov.au.

Yours sincerely

Glenn Bunny
Director Infrastructure and Land Management
10 January 2018

437 Hunter Street Newcastle NSW 2300
PO Box 2185 Dangar NSW 2309
Tel: 1300 886 235 www.crownland.nsw.gov.au ABN: 72 189 919 072

From: David Greenhalgh [mailto:david.greenhalgh@dpi.nsw.gov.au]
Sent: Friday, 31 March 2017 10:07 AM
To: Marten Bouma
Subject: Re: Support for actions required to be undertaken by DoI Fisheries under Council's adopted Estuary Management Plans

Hello Martin

DPI Fisheries - Solitary Islands Marine Park is happy to provide in kind assistance for action H-9. The assistance we are able to provide is provision of vessels and staff to assist with the sampling as we have on other occasions. In the past we have also supplied monitoring equipment but we no longer have that equipment.

With regards to action L-3, I cannot confirm assistance will be provided. You will need to contact the Port Stephens Fisheries office on 4982 1232. I am not sure of a contact name but the main switch should be able to help you.

Regards
David

6/9

NSW GOVERNMENT | Department of Primary Industries

OUT17/31772

The General Manager
Coffs Harbour City Council
Locked Bag 155
COFFS HARBOUR NSW 2450

Attention: Mr Marten Bouma

Dear Mr Bouma

Coffs Creek Estuary Coastal Zone Management Plan

Thank you for providing the Coffs Creek Estuary Coastal Zone Management Plan (CCECZMP) to the NSW Department of Primary Industries (DPI Fisheries) for comment. DPI Fisheries has an ongoing involvement with issues affecting the Coffs Creek estuary and I am pleased to advise that Department supports the plan and appreciates the opportunity to contribute to its development.

DPI Fisheries has been identified, with Coffs Harbour City Council, as having joint responsibility for Action L-3: *Monitor fish abundance and diversity*. While identified as a standalone action this action is described in the plan as a component of H-9 *Implement Estuary Health Monitoring*. DPI Fisheries agrees that this is a desirable action, but stresses that implementation of these actions is reliant upon the Department having sufficient resources or receiving specific funding to support the subject actions.

The Department wishes to emphasise that support for the CCECZMP does not constitute approval for specified works. Plans and proposals for works which may require permits under Part 7 of the *Fisheries Management Act 1994* or authorisations under the *Marine Estate Management Act 2014*, including activities undertaken in or adjacent to the Solitary Islands Marine Park, will need to be submitted to the Department for review and assessment.

A threat and risk assessment for the NSW marine estate is presently being finalised by the Marine Estate Management Authority (see www.marine.nsw.gov.au). Priority threats to the marine estate include foreshore development, urban stormwater discharge, boating infrastructure, and activities that damage wetland habitats such as mangroves and saltmarsh. The CZMP should be strategically aligned to these key threats and the DPI Fisheries endorse actions within the CCECZMP that seek to address these threats as matters of priority for funding.

DPI Fisheries – Port Stephens Fisheries Institute
Locked Bag 1, NELSON BAY NSW 2315
Tel: 02 4916 3909 Fax: 02 4982 1107 www.dpi.nsw.gov.au ABN: 72 189 919 072

DPI Fisheries looks forward to working with all estuary management partners in implementing the CCECZMP into the future.

If you require any further information please contact either Mr Patrick Dwyer, Senior Fisheries Manager – Aquatic Ecosystems (North Coast) on 0407 264 391 or Mr David Greenhalgh, Solitary Islands Marine Park Officer on 6691 0604.

Yours sincerely

Dr Geoff Allan
Deputy Director General DPI Fisheries
Date: 31 August 2017

From: Jason Bailey
To: Sally Whitelaw
Cc: Jackson Pfister
Subject: RE: ccspt draft email
Date: Wednesday, 3 January 2018 11:50:40 AM
Attachments: image002.png
image003.jpg

Hi Jackson

The Coffs Coast State Park Trust supports the amended actions proposed for Woolgoolga Lake and Coffs Creek as detailed in the email below.
Please contact me if you have any further questions.

Kind Regards
Jason

Jason Bailey
Manager Holiday Parks & Reserves | Coffs Harbour City Council
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From: Sally Whitelaw
Sent: Friday, 15 December 2017 11:06 AM
To: Jason Bailey
Cc: Jackson Pfister
Subject: FW: ccspt draft email

Hi Jason,

Support for actions required to be undertaken by Coffs Coast State Park Trust under Council's Woolgoolga Lake, and Coffs Creek Coastal Zone Management Plans (CZMPs).

I refer to Council's adopted Coastal Zone Management Plans (CZMPs) undertaken for Woolgoolga Lake and Coffs Creek. Council has recently submitted all CZMPs to the Minister of Environment for Certification under Section 55G of the Coastal Protection Act 1979. Prior to finalizing certification, the Minister requires confirmation of written support from various agencies for nominated actions that they are responsible for under those plans.

Following consultation with DoI – Crown Lands and Water, Council has identified that Coffs Coast State Park Trust is in control and management of a number Reserves pertaining to Strategies within the Woolgoolga Lake and Coffs Creek CZMPs. The strategies pertaining to CCSPT for each respective CZMP have been detailed in the table attached.

The updated CZMPs (showing changes via highlights for additions and ~~strikethrough~~ for deletions) can be found in Q:\Common\SALLY WHITELAW\CZMPs with the original plans available on the Council website at http://www.coffsharbour.nsw.gov.au/environment/our-coast/Pages/Estuary-Management-Plans.aspx

Accordingly, Council is seeking written support from CCSPT for the listed Strategies for each CZMP. Currently, Council has received written support from CCSPT for Strategy 11.3 in the Woolgoolga Lake CZMP (received 18 April 2017).

It should also be noted that the CZMP was endorsed for adoption by the Coffs Harbour Coastal Estuary Management Advisory Committee. This committee included members from various State Government and community agencies, including - NSW OEH (Coasts and Catchments), Marine Parks Authority, OEH (National Parks and Wildlife Authority), Roads and Maritime Services, Local land Services, Marine Park Authority, State Emergency Service, Coffs Harbour Regional Landcare and DoI – Crown Lands & Water.

In order to help expedite the Ministerial certification process for the CZMPs can you now provide a written response as soon as possible ie. within 30 days, that you are in support, or have no objection, to the certification of the Woolgoolga Lake and Coffs Creek CZMPs.

Should you require any further information please contact Jackson Pfister on 6648 4662, or email jackson.pfister@chcc.nsw.gov.au

Regards,

Sally Whitelaw
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