

Kingscliff - Dreamtime Beach Coastal Zone Management Plan

PART A - Final Draft

May 2017

Acknowledgement:

Tweed Shire Council has prepared this document with financial assistance from the NSW Government through the Office of Environment and Heritage. This document does not necessarily represent the opinions of the NSW Government or the Office of Environment and Heritage.

The draft document was prepared for Tweed Shire Council by environmental consultants, BMT WBM. The BMT WBM project team and authors of this document include Ms Verity Rollason and Dr Philip Haines.

Changes to the draft document were made by Tweed Shire Council in response to public submissions and consultation with relevant NSW Government Authorities.

Executive Summary

Kingscliff Beach has been subject to substantial erosion over recent years, prompting Tweed Shire Council (Council) to prepare a Coastal Zone Management Plan (CZMP) for the Kingscliff - Dreamtime Beach embayment, ahead of the remainder of the Tweed coastline. Preparation of this CZMP for Kingscliff - Dreamtime Beach has been jointly funded by the NSW Office of Environment & Heritage (OEH) and Council.

To assist in managing Kingscliff-Dreamtime Beach through this CZMP, the embayment has been separated into management “precincts”. As outlined below, the precincts are defined in terms of the different risks and values within them that in turn support a different level of community usage and development, ecological habitats and function, and therefore require different management intent and actions.

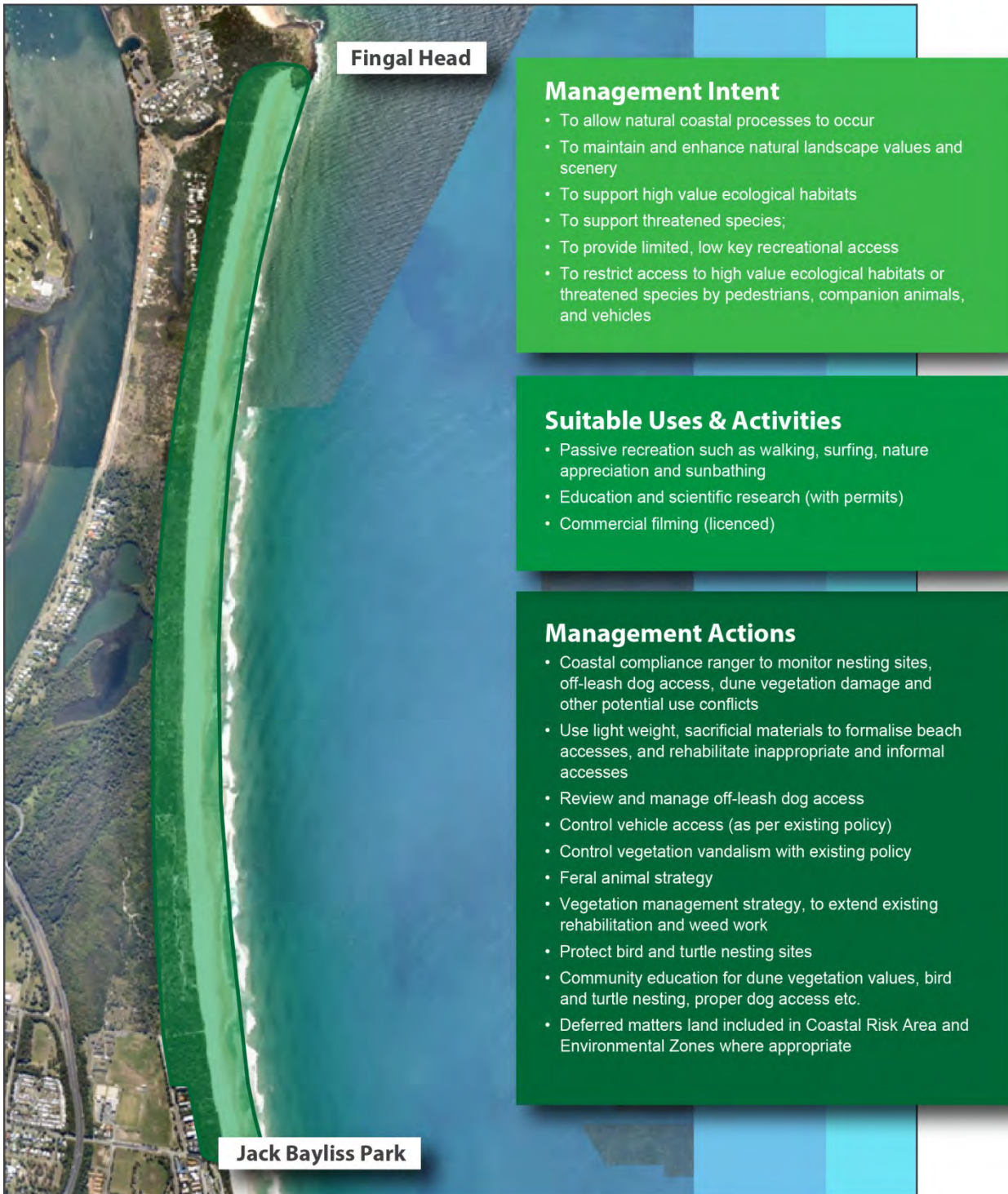
- *Natural Beach and Habitat Precinct.* covers Dreamtime Beach between Fingal Head and the northern boundary of Jack Bayliss Park. This precinct is defined by the high quality of natural habitat along the beach that in turn supports nesting shorebirds and turtles. It therefore needs a gentle approach to community access and use. Management intent and actions in this precinct focus on maintaining and rehabilitating the natural habitat and reducing anthropogenic impacts;
- *Passive Community Use Precinct.* covers two areas, namely Faulks Park and Lions Park, and Jack Bayliss Park. The precincts are already used extensively for passive community activities such as walking and picnicking within the parkland of the precinct, and swimming, surfing, sunbathing etc. at the beach. While some minor works to support dune vegetation are recommended, the management intent for the precinct is to continue to promote passive community recreation; and
- *Hazard Protection Precinct.* extends from the Cudgen Headland Surf Life Savings Club (SLSC) to the Kingscliff Beach Bowling Club, inclusive. This precinct was the subject of detailed analysis through the Kingscliff Coastal Risk Management Study (BMT WBM, 2015), as the area currently experiences severe risks from erosion and inundation. The precinct is already fortified by existing protection structures, with the land behind used for more intensive community activity through the Cudgen Headland SLSC, the Kingscliff Beach Holiday Park, and the Kingscliff Beach Bowling Club. The Kingscliff CRMS determined that over the medium term while the hazard protection remains in place and can be reasonably maintained and upgraded, the precinct can continue to support more intensive community and commercial activity.

The three different precincts provide for varied usage and values to be supported along the entire embayment. The proposed management intents, permissible uses and management actions for the precincts are illustrated in the figures below.

This Kingscliff - Dreamtime Beach CZMP incorporates actions from the previous Tweed Coastline Management Plan that covered the whole Tweed Coast (Umwelt, 2005), new actions for Kingscliff Beach arising from the recent Kingscliff Coastal Risk Management Study (BMT WBM, 2015) (which focused on the section of shoreline between the Cudgen Headland SLSC and Kingscliff Beach Bowls Club); and new actions for the remainder of the beach developed through the course of this CZMP. An implementation schedule for the proposed actions along Kingscliff – Dreamtime Beach is detailed within this document.

Kingscliff - Dreamtime Beach Coastal Zone Management Plan

Natural Beach and Habitat Precinct



Kingscliff - Dreamtime Beach Coastal Zone Management Plan

Passive Community Use Precinct



Management Intent

- To allow natural coastal processes to occur
- To support threatened species
- To support a range of passive recreational activities
- To improve beach access
- To provide a sandy beach for amenity purposes
- To maintain and enhance natural dune vegetation
- To provide low to medium scale recreational facilities
- To build the resilience of the community towards a highly variable beach width, which may be eroded or accreted at particular times
- To permit the storage and use of sand reserves, as a buffer to coastal erosion

Suitable Uses & Activities

- Passive and active recreation (swimming, surfing, walking, etc)
- Controlled dog access
- Formal beach access paths, walkways and cycleways
- Low key recreational facilities (picnic tables, beach showers, play equipment, viewing platforms)
- Landscaped parkland
- Dune vegetation and management
- Commercial filming (licenced)
- Commercial and tourism activities with permits (e.g. surf schools, fitness 'boot camps', festivals, events and markets as per existing policies)

Management Actions

- Periodic small-scale sand nourishment to repair erosion
- Beach monitoring program to track beach erosion and recovery
- Maintain a rolling vegetation easement to help dune vegetation migrate landward as needed, particularly in Jack Bayliss Park where erosion is enhanced next to protection structures
- Provide and maintain formal beach accesses, and repair after storms when safe
- Enhance recreational facilities, such as pathways, picnic tables, beach showers etc.
- Community education about beach erosion, nesting shorebirds, dune vegetation values etc.

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Hazard Protection Precinct

Management Intent

- To manage the impact of coastal hazards (erosion and wave inundation) progressively over time
- To accept a limited sandy beach amenity at times, and build community resilience for this
- To maintain and enhance the high value recreational opportunities, access and facilities behind the beach
- To sustain the existing high economic values from assets behind the beach (i.e. Kingscliff Beach Holiday Park, Cudgen Headland SLSC, Kingscliff Beach Bowling Club)
- To facilitate the staged upgrade of existing protection structures to suitable engineering standard for coastal protection
- To retain the option of retreat and relocation of assets in the long term

Suitable Uses & Activities

- Passive and active recreation (swimming, surfing, walking, cycling, etc)
- Re-development of commercial facilities, e.g. Kingscliff Beach Holiday Park, Cudgen Headland SLSC, Kingscliff Beach Bowling Club
- Commercial and tourism activities with permits (e.g. surf schools, fitness 'boot camps', festivals, events and markets as per existing policies)
- Structured road access and parking
- Surf life saving facilities and programs
- Controlled dog access
- Structured recreational facilities, including footpaths, cycleways, park furniture and picnic facilities
- Landscaped parkland and plantings
- Low growing dune vegetation and fencing



Management Actions

<p>Short Term (next 0-5 yrs)</p> <ul style="list-style-type: none"> • Replace protection structure along Holiday Park • Upgrade Holiday Park and create a Central Park including children's play areas, picnic areas, etc. • Upgrade SLSC vertical seawall • Small scale sand nourishment as sand reserves become available 	<p>Long Term (up to 2050)</p> <ul style="list-style-type: none"> • Consider a large-scale nourishment program by 2030 • Reconsider protection versus retreat and relocation options at 2050 	<p>Ongoing</p> <ul style="list-style-type: none"> • Maintenance of low-growing dune species in suitable locations • Planning controls for developments (refer existing LEP, DCP)
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1 Introduction

1.1 Purpose and Context of the Kingscliff - Dreamtime Beach Coastal Zone Management Plan

Kingscliff Beach has been subject to substantial erosion over recent years, prompting Tweed Shire Council (Council) to prepare a Coastal Zone Management Plan (CZMP) for the Kingscliff – Dreamtime Beach embayment, ahead of the remainder of the Tweed coastline. A Coastline Management Plan (CMP) for the entire Tweed Local Government Area coastline was previously completed in 2005, including coverage of Kingscliff - Dreamtime Beach.

This Kingscliff - Dreamtime Beach CZMP incorporates actions from the previous Tweed CMP (Umwelt, 2005), as well as new actions for the beach arising from the recent Kingscliff Coastal Risk Management Study (BMT WBM, 2015) (which focused on the section of shoreline between the Cudgen Headland SLSC and Kingscliff Beach Bowls Club); and for the remainder of the beach developed through the course of this CZMP. Preparation of this CZMP for Kingscliff - Dreamtime Beach has been jointly funded by the NSW Office of Environment & Heritage (OEH) and Council.

This CZMP has been prepared in accordance with the *Coastal Protection Act, 1979* and its associated *Guidelines for Preparing Coastal Zone Management Plans* (OEH, 2013), and other relevant NSW legislation. In accordance with the *Guidelines for Preparing Coastal Zone Management Plans* (OEH, 2013), this plan includes:

- practical actions to address the risks to assets and land from **coastal hazards** (erosion, recession and inundation) at the present, 2050 and 2100;
- practical actions to manage **community use and amenity** of the coastal zone; and
- practical actions to manage **ecological health** in the coastal zone, including rehabilitation and protective actions for ecological assets.

The main coastal hazards addressed by this CZMP are:

- **Erosion** of the beach and dunes during storms and medium term fluctuations in climate, particularly waves and water levels;
- **Recession** (or retreat) of the shoreline due to existing coastal processes, and in future due to projected sea level rise. Recession is evident as periodic erosion events that progressively reduce the beach and foredune width; and
- **Inundation** and overtopping of coastal barriers by ocean waves during storms, which will increase in frequency and depth with rising sea levels.

The Kingscliff - Dreamtime Beach embayment varies in terms of its exposure to risk from coastal processes, the scale of community facilities and associated community activity; and coverage and quality of natural habitat (including nesting areas for endangered species). The variations in usage, ecological value and risk exposure can be neatly segmented into separate “management precincts” along the beach, which allow for targeted management actions that are relevant for each precinct. The following management precincts have been defined:

- Natural Beach and Habitat Precinct
- Passive Community Use Precinct
- Hazard Protection Precinct

This CZMP has been designed around the above management precincts. Further description, mapping and management intent for these precincts are detailed in Section 2.

1.1.1 Objectives of the CZMP

Management objectives for the Tweed coastline, including the Kingscliff - Dreamtime Beach, given in the Tweed CMP (Umwelt, 2005) are listed in Table 1.1 . These objectives have been retained for this Kingscliff – Dreamtime Beach CZMP.

Table 1.1 Management Objectives for the Tweed Coastline (from Umwelt, 2005)

Objective	Secondary Objectives
1. To protect, rehabilitate and improve the natural environment	1.1 To identify coastline lands with conservation values and to devise strategies and controls to ensure those values are protected and rehabilitated where necessary. 1.2 To provide a framework for the Tweed Coast Reserve Plan of Management, and other relevant Management Plans such as the Vegetation Management Plans. 1.3 To maintain the cleanliness of Tweed Shire beaches and to improve it where it is currently unsatisfactory. 1.4 To manage the coastline in the public interest to ensure its health and vitality.
2. To recognise and accommodate natural processes and climate change.	2.1 To reduce the impact of coastline hazards on existing developed areas and to reduce private and public losses resulting from damage by coastal forces. 2.2 To ensure that future coastline development and land-use is compatible with coastline hazards, including the potential effects of climate change. 2.3 To ensure that local emergency action plans are in place that deal with the threat, onset and aftermath of large coastal storms.
3. To protect and enhance the aesthetic qualities of the coastal zone.	3.1 To identify and protect and enhance areas of high natural or built aesthetic quality. 3.2 To ensure that the location and design of coastal development complements the surrounding environment.
4. To protect and conserve cultural heritage.	4.1 To effectively manage all significant cultural heritage places, items and landscapes. 4.2 To involve local Aboriginal community in the coastline decision making process.
5. To promote ecologically sustainable development and use of resources	5.1 To ensure the principles of Ecologically Sustainable Development are applied to the development, use and management of the coastline. 5.2 To maintain and where necessary improve the recreational amenity of the Tweed Shire coastline.
6. To provide for ecologically sustainable human settlement.	6.1 To minimise the impacts of present and planned urban settlements.
7. To provide for appropriate public access and use.	7.1 To provide for appropriate and sustainable public access to the coastline including beaches. 7.2 To provide guidance for the management of commercial activities on Tweed Shire's beaches and adjoining coastline. 7.3 To minimise the risks to human safety from the use of and access to the coastline.
8. To provide information to	8.1 To ensure that coastline information relevant to the Tweed

Objective	Secondary Objectives
enable effective management.	Shire Coastline Management Plan is accessible to the community. 8.2 To identify and promote public education and awareness programs that target coastline management issues. 8.3 To monitor and review progress in implementation of the Coastline Management Plan and to report performance in State of Environment reports. 8.4 To facilitate comprehensive utilisation of available flora and fauna data and mapping
9. To provide for integrated planning and management.	9.1 To ensure that the Coastline Management Plan involves community participation throughout its development and effectively coordinates future community involvement. 9.2 To enable consistent and complementary decision making, linkages shall be made with other coastal planning instruments, strategies and plans including: 9.3 LEP and DCPs 9.4 Estuary Management Plans 9.5 Urban Stormwater Management Plans 9.6 To ensure consistency with regional, State and National coastal zone policies.

1.2 Area Covered by this CZMP

The area covered by this CZMP encompasses Kingscliff Beach and Dreamtime Beach, as shown in Figure 1.1. The two beaches form a 6km long embayment with continuous sandy shoreline, from Fingal Head in the north to Cudgen Headland and the Cudgen Creek training walls in the south.

Kingscliff Beach comprises the southern end of the embayment and has a number of high value recreation and tourism assets, namely Jack Bayliss Park, Kingscliff Beach Bowls Club, Kingscliff Beach Holiday Park, Cudgen Headland Surf Life Saving Club (SLSC), Faulks Park and Lions Park.

The Kingscliff foreshore has a history of severe coastal erosion events and active shoreline management to protect land and assets affected by coastal erosion. The shoreline between the Cudgen Headland SLSC and the Kingscliff Beach Bowls Club was the subject of a separate Kingscliff Coastal Risk Management Study (CRMS) by BMT WBM (2015) and forms a preceding reference document to this CZMP.



Figure 1.1.1 - Area Covered by the Kingscliff - Dreamtime Beach CZMP

A number of shoreline protection works have been established within this shoreline area, as shown on Figure 1.2, including:

- Two rock training walls at the Cudgen Creek river entrance (built in 1967) to alleviate flooding issues within Cudgen Lake and Cudgen Creek and to prevent meandering of the creek entrance along Kingscliff Beach;
- A rock seawall in front of the Kingscliff Bowls Club (initially built in 1967 and upgraded in 1995) to protect the club against erosion threats;
- A vertically piled concrete seawall in front of the Cudgen Headland SLSC (completed in August 2010);
- A low rock seawall along Faulks Park (completed in early 2011 as emergency protection works);
- A geotextile sand container wall to the immediate north and south of the piled concrete seawall (completed in October 2011 as emergency protection works); and
- A rock seawall along the Holiday Park, located immediately north of the geotextile sand container wall up to the Kingscliff Beach Bowls Club (built in December 2011 as emergency protection works).

Options for long term protection of Kingscliff Beach particularly between the SLSC and the Bowls Club have been the subject of a number of previous investigations, most recently the Kingscliff Coastal Risk Management Study (CRMS) (BMT WBM, 2015). During the preparation of this CZMP, Council received approval for grant funding from the Australian Government's National Stronger Regions Fund to upgrade the seawall section along the Kingscliff Beach Holiday Park, as part of the renewal project for the Park. Further details are provided in the Implementation Schedule of actions in this CZMP (Section 3.4).

Dreamtime Beach comprises the northern half of the embayment and is substantially backed by natural dunes and habitat. The land is variously under the care and control of Council, Department of Industry - Lands and the Tweed Byron Local Aboriginal Land Council (TBLALC). Dreamtime Beach's natural habitat supports nesting shorebirds and turtles, and other important ecological communities.

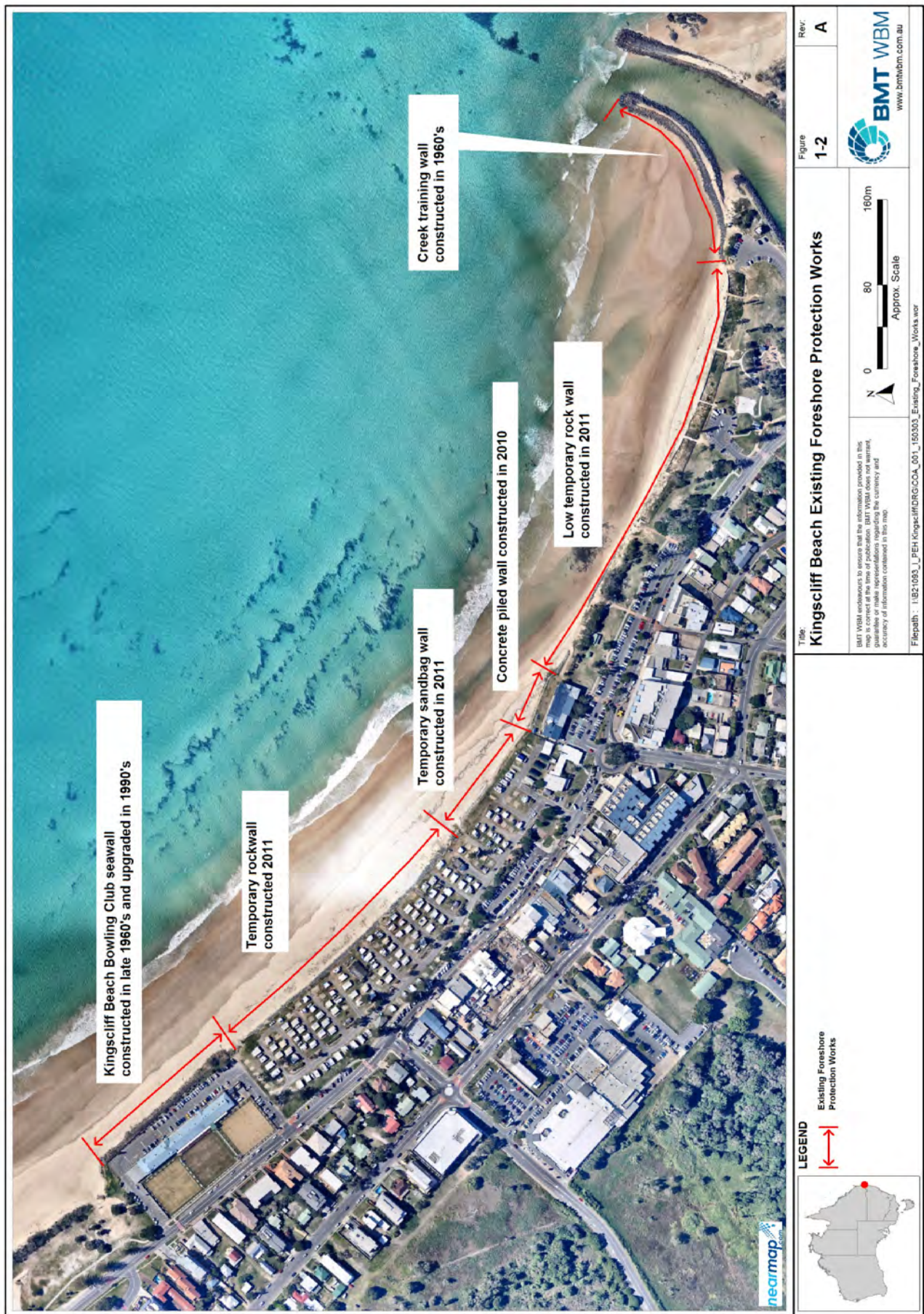


Figure 1.2 - Kingscliff Beach existing foreshore protection works

1.3 The Coastal Management Process in NSW

The *Guidelines for Preparing Coastal Zone Management Plans* (OEH, 2013) ('CZMP Guidelines') specify the requirements for preparing a coastal zone management plan in accordance with the *Coastal Protection Act 1979*, including requirements additional to those specified in the Act. The CZMP Guidelines dictate the process to be followed when preparing a CZMP including the hazards to be investigated and the timeframes for the hazard assessments and management actions (typically being the immediate, 2050 and 2100 timeframes). The stages for preparing the Kingscliff Dreamtime Beach CZMP are illustrated in Figure 1.3.

Under Section 733 of the *Local Government Act 1993*, councils are taken to have acted in 'good faith' and thus receive an exemption from liability for land affected by coastal hazards where their actions substantially accord with the principles contained in the specified manual, in this case being the CZMP Guidelines.

A summary of legislation relevant to managing the coastal zone in NSW is provided in the Kingscliff CRMS (see PART B Appendix A). How this CZMP addresses the Principles for Coastal Management and the minimum requirements for preparing CZMPs outlined in the Guidelines are provided in PART B Appendix B.

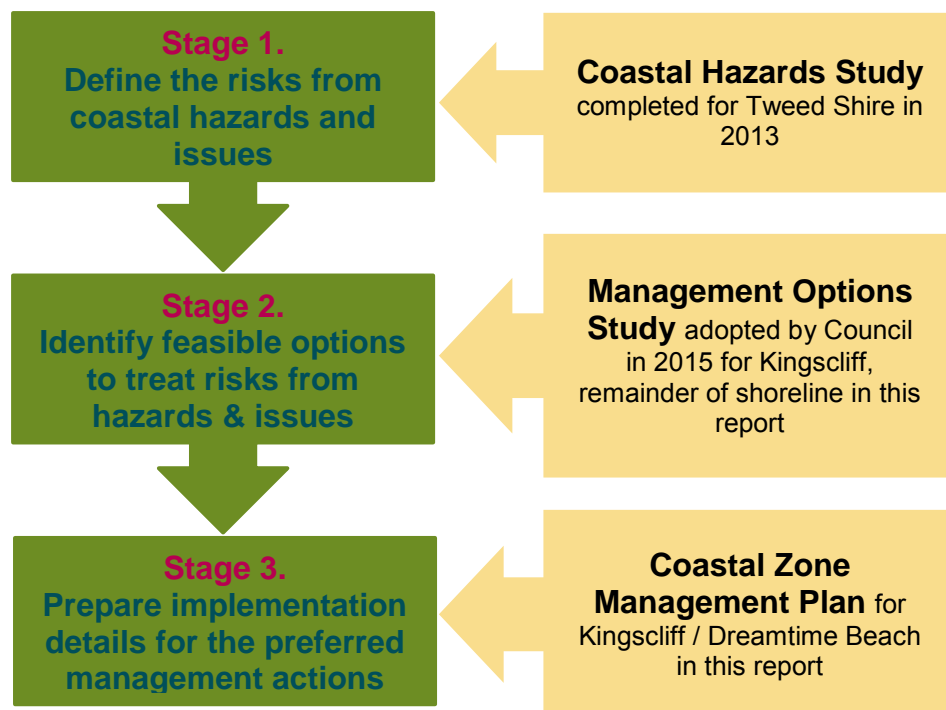


Figure 1.3 - Stages for preparing the CZMP

Subsequent steps to complete this CZMP:

- The preliminary draft CZMP was exhibited for public comment during March and April 2016. See Section 1.5 and PART B Appendix F Draft Plan Submissions.
- The preliminary draft CZMP was updated to final draft status by Council incorporating, where applicable, internal stakeholders, community and state agency comments;
- Council adopted the final draft CZMP in May 2017;
- Submission of the final draft CZMP to the Minister for Environment for certification, and if certified, Council to finalise and gazette the plan; and
- Council to review and transition the CZMP to a Coastal Management Program under the *Coastal Management Act 2016* by December 2021.

1.3.1 Reforms to the Coastal Management Process

The NSW Government is carrying out extensive reforms to the coastal management process. The *Coastal Management Act 2016* was passed in June 2016 but was yet to commence as of April 2017.

The intention is to submit this CZMP for certification under the existing legislation. The NSW Government has indicated that existing certified CZMPs will be able to be fast-tracked into the new framework, to capitalise on existing valid work completed to date, and to retain momentum that has been gained in preparing existing CZMPs. Under the savings provisions of the *Coastal Management Act 2016*, the CZMP will have effect until replaced by a Coastal Management Program to be completed by December 2021.

1.4 Previous Studies Supporting this CZMP

1.4.1 Tweed Coastline Management Plan, 2005

Council commenced development of a coastline management plan in 1999, in accordance with the then NSW Government Coastline Management Manual (1990). The Tweed Coastline Management Plan (TCMP) 2005 was the culmination of supporting studies including:

- The Tweed Coastline Hazard Definition Study (WBM, 2001), which identified the coastline hazards affecting the entire Tweed coast, such as short and long term erosion, shoreline recession oceanic inundation and coastal entrance instability. The Immediate, 2050 and 2100 coastal erosion hazard areas identified for the Tweed coast highlighted various community assets at risk, including the Cudgen Headland Surf Life Saving Club (SLSC), Kingscliff Amenities Hall and Kingscliff Beach Holiday Park; and
- The Tweed Shire Coastline Management Study Stage 1 and Stage 2 (Umwelt, 2005a) were undertaken, to identify the issues and values along various elements of the Tweed coast, and determine objectives for management, and suitable options to address the risks to the coast.

The TCMP (Umwelt, 2005b) captured the preferred actions to treat the risks from coastal hazards, and to improve recreational amenity, landscape character and ecological values along the coast.

A review of the actions in the TCMP that were proposed for Kingscliff-Dreamtime Beach has been completed as part of preparing this CZMP, and is provided in PART B Appendix C. The review considered the status of implementation of actions, their success or barriers to the implementation of actions, and if actions should be continued in this CZMP, with or without amendments.

It is noted that the actions proposed in the TCMP (and other documents) to manage the erosion risks between the Cudgen Headland SLSC and Kingscliff Beach Bowls Club were the subject of further studies and analysis, as summarised in the Kingscliff CRMS (BMT WBM, 2015), see PART B Appendix A.

1.4.2 Tweed Shire Coastal Hazards Assessment, 2013

The Tweed Shire Coastal Hazards Assessment report (BMT WBM 2013) provides an updated and detailed assessment of the key coastal processes at Kingscliff, including the geological context and their influence on coastal hazards. The study was undertaken to support the preparation of this CZMP, and the more detailed management options being considered for the Cudgen Headland SLSC to Kingscliff Beach Bowls Club area of Kingscliff Beach. A detailed summary of the coastal processes and hazards operating along Kingscliff - Dreamtime Beach is documented in the Kingscliff CRMS, in PART B Appendix A, while a brief overview is presented below.

1.4.2.1 Summary of Coastal Processes and Hazards

Regionally, the Kingscliff - Dreamtime Beach embayment is part of a long coastal unit that experiences a continuous alongshore transport of sand extending from around the Clarence River in the south to Moreton Bay in the north.

Cudgen Headland has a significant effect on sand transport and shoreline responses at Kingscliff, particularly in controlling the nature and rates of headland bypassing supply of sand into the embayment. There is a 'sand slug' effect around the headland in which the southern end of the beach is supplied through periodic sand pulses. These pulses manifest themselves as sand waves that eventually attach to the beach. Often a topographically controlled rip migrates in advance of these sand waves, which can cause localised beach erosion (Short, 1999).

The shoreline processes along the Kingscliff - Dreamtime Beach embayment, and movement of sand pulses, are uniquely dependent on how the headland interacts with the prevailing deep water wave conditions, at short (days to weeks) and longer term (months; years; decades) time-scales. Furthermore, sand from South Kingscliff Beach will only travel around the headland when significant quantities of sand accumulate in a deposition area around the southern Cudgen Creek training wall and then favourable wave conditions occur.

Annual and medium term (decadal) variability is observed in the wave climate at least in part associated with the El Niño Southern Oscillation (ENSO). Variability in wave height and direction that persists for years to decades may result in alternate cycles of erosion and accretion and potential rotation of the shoreline, such as described in Figure 1.4 - Conceptual response to ENSO wave climate at Kingscliff (from BMT WBM, 2013). This is related to variability in the alongshore sediment movement and the direction of intense storm waves. The data suggests an extended La Niña pattern prior to 1977 followed by predominantly El Niño period through to about 2009. There have been several La Niña years since 2009, and strongly so during 2010-12.

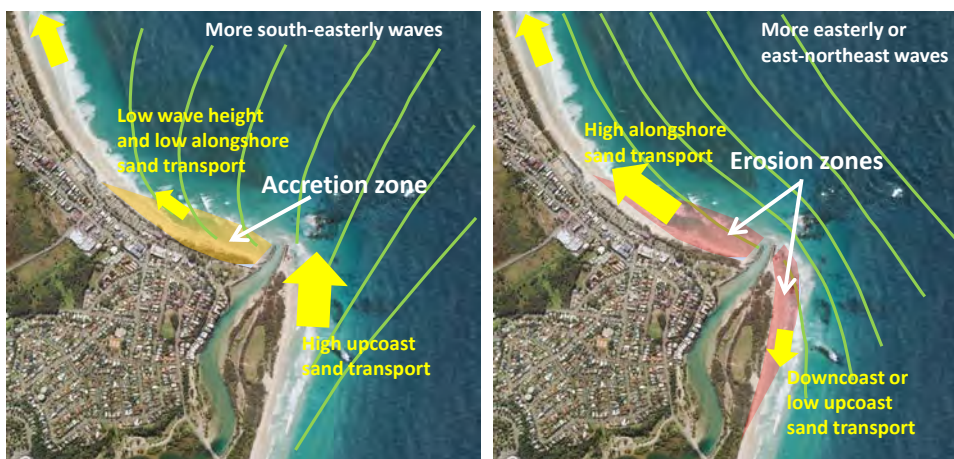


Figure 1.4 - Conceptual response to ENSO wave climate at Kingscliff (from BMT WBM, 2013)

During severe storms or a series of storms in succession, increased wave heights and elevated water levels results in wave attack of the beach berm and foredune region. Short term storm related cross shore sand transport and longshore drift occur simultaneously, the latter commonly leading to a significant shoreline erosion component immediately downdrift of headlands in cases where the sand supply into the beach compartment is less than the transport away to the north. Storm bite volumes up to 250m³/m have been identified at Kingscliff, but are more typically around 150-200m³/m. The larger volume losses may occur during multiple storm events or where there is significant alongshore net sand loss in addition to the removal of sand to nearshore (BMT WBM, 2013).

Superimposed on these short to medium term beach fluctuations, the shoreline is subject to ongoing recession. The long term shoreline recession rate within the Kingscliff - Dreamtime Beach embayment has been assessed in the coastal hazard assessment at about 0.15m/year at the southern end (Kingscliff) reducing to about 0.05m/year towards the northern end, with an uncertainty provision of about $\pm 20\%$ incorporated in the recession hazard distances.

The erosion hazards comprising short term storm erosion, ongoing recession and future recession relating to future sea level rise were assessed and mapped as part of the Tweed Shire Coastal Hazards Study (BMT WBM, 2013). The approach adopted was to provide a band of feasible erosion extents, defined on hazard maps by lines representing the 'best estimate', 'minimum' and 'maximum' likely limits for the immediate, 2050 and 2100 planning periods.

Coastal inundation associated with wave run-up and overtopping of the dune barrier was also assessed as part of the study. The design run-up level for natural beaches/dunes was found to vary from approximately 4.1m AHD at the Cudgen Headland Surf Club to approximately 4.5m AHD, based on the assumption that the shoreline comprises a natural beach/dune system. At the present time, there is a notable potential for overtopping adjacent to Faulks Park where dune levels are generally at 3.5m AHD; as well as some limited potential for minor overtopping at Kingscliff Holiday Park as the dune crest levels are typically 4.0 to 4.5m AHD, which is approximately the run-up limit for design wave conditions.

Where waves impact on shoreline protection structures (e.g. vertical or steeply sloping seawalls), substantially higher wave run-up levels can be experienced. Therefore, wave overtopping is a key consideration in the design of protection structures. Furthermore, it is likely that Kingscliff will experience enhanced wave run-up and overtopping in the future as sea levels rise.

1.4.3 Kingscliff Coastal Risk Management Study, 2015

The approach to the short and long term management of Kingscliff Beach between the Cudgen Headland SLSC and Kingscliff Beach Bowls Club was assessed in the Kingscliff CRMS (BMT WBM, 2015). The Kingscliff CRMS is attached as PART B Appendix A. The study found there to be no single management option that provides a clear benefit over other alternatives for addressing coastal management at Kingscliff in the near term. Given sufficient funding to support any option, either Planned Retreat without retention; or Terminal Protection with nourishment, would likely provide an acceptable outcome in the short to medium term (up to 50 years say) if certain limitations are overcome.

The CRMS determined a short to medium term management solution for Kingscliff for the next 30 years, until such time as funding and other limitations are overcome, and our understanding of climate change impacts are better defined. The short to medium term management strategy for Kingscliff Beach (the Cudgen Headland SLSC and Kingscliff Beach Bowls Club) is outlined in Section 3.

As stated in the Kingscliff CRMS, the principles that underpin the most appropriate management solution for addressing current and future coastal hazards at Kingscliff are as follows:

- (1) Works are affordable to both Council and State Government. This would most likely be best achieved through staging of works over a number of years and integrating works with broader asset management programs;
- (2) Works do not inhibit or preclude the potential for a full suite of options to be re-considered in the future. The approach needs to remain adaptive and flexible in order to meet future needs and demands that are not yet realised;
- (3) Impacts of the existing seawalls on beach amenity need to be mitigated;

- (4) Public access along the beach and/or foreshore needs to be maintained;
- (5) Capitalise on the remaining functional life (and significant prior financial investment) of shoreline assets in providing amenity and value to the community;
- (6) Nourishment should target opportunities for adding new sand to the coastal compartment rather than just recycling sand already within the active coastal zone;
- (7) Accommodate the potential to successfully secure funding for one-off large scale works, such as river dredging; and
- (8) Irrespective of the presence of any terminal protection works, planned or in place, the coastal hazard lines (as updated and adopted periodically by Council) are retained and applied to future development applications to ensure that overdevelopment or overcapitalisation with the coastal risk areas does not occur.

1.5 Community Consultation

In March 2016, Council resolved to place the Draft Kingscliff – Dreamtime Beach Coastal Zone Management Plan on public exhibition for a period of 42 days from 23 March to 4 May 2016. The consultation methods included print media, direct mail, workshops and direct access to staff and Consultants at the Kingscliff Matters shopfront.

This formal exhibition period followed extensive studies, management planning and consultation undertaken over a 16 year period on coastal erosion hazard and other coastline management issues at Kingscliff.

The Tweed Link, a weekly newsletter delivered to every household in Tweed Shire, is Council’s main print media outlet. Four feature stories were run in the Tweed Link on 23 and 16 February 2016, 15 and 22 March 2016 with the formal public exhibition announcement in the 22 March edition.

The Kingscliff Matters shopfront was established in Marine Parade, Kingscliff from 22 February till 22 April 2016. This temporary display area provided residents and visitors an easy avenue for information about several key Council projects in the town. These included the Kingscliff Foreshore Revitalisation, Kingscliff Locality Plan and the Kingscliff Coastal Zone Management Plan. The Kingscliff Matters shopfront project was presented with the 2016 Australian Coastal Councils Award for Community Engagement.

The Consultant for the Plan conducted a targeted information and feedback session at the Kingscliff Matters shopfront on Wednesday 30 March. This followed a workshop with Council’s Tweed Coastal Committee, the community and government advisory committee to Council on coastal and estuarine management matters.

Presentations on the Draft Plan were made to the Kingscliff Residents and Ratepayers Association and Kingscliff and District Business Chamber during the exhibition period.

There were six (6) submissions to the Draft Kingscliff – Dreamtime Beach CZMP. They are summarised in PART B Appendix F, with the submissions from Department of Industry – Lands and Office of Environment and Heritage included in full.

The predominant issue raised was the need for Council to commit to sand nourishment to ameliorate the impacts from construction of a seawall to protect the foreshore. Another concern was the ongoing maintenance cost to Council.

2 Coastal Management Precincts

To assist in managing Kingscliff-Dreamtime Beach in this CZMP, the embayment has been separated into management “precincts”. The precincts are defined in terms of the different risks and values within them, that in turn support a different level of community usage and development, ecological habitats and functions, and therefore, different management intent and actions.

The following management precincts were defined for Kingscliff - Dreamtime Beach embayment, as mapped in Figure 2-1:

- **Natural Beach and Habitat Precinct:** covering Dreamtime Beach between Fingal Head and the northern boundary of Jack Bayliss Park. This precinct is defined by the quality of natural habitat supported along the beach, which in turn supports nesting shorebirds and turtles, and therefore, needs a gentle approach to community access and use. Management actions in this precinct are centred around maintaining and rehabilitating the natural habitat and reducing anthropogenic impacts;
- **Passive Community Use Precinct:** there are two areas, covering Faulks Park / Lions Park, and Jack Bayliss Park. The precinct is already used for passive community activities such as walking and picnicking, within the parkland of the precinct. While some minor works to support dune vegetation are recommended, the management intent for the precinct is to continue to promote passive community recreation; and
- **Hazard Protection Precinct:** extending from the Cudgen Headland SLSC to the Kingscliff Beach Bowling Club, inclusive. This precinct was the subject of detailed analysis through the Kingscliff CRMS, as it is subject to existing, severe risks from erosion and inundation. The precinct is already fortified by existing protection structures, with the land behind used for more intensive community activity through the Cudgen Headland SLSC, the Kingscliff Beach Holiday Park, and the Kingscliff Beach Bowling Club. As determined through the Kingscliff CRMS, over the medium term while the hazard protection remains in place and can be reasonably maintained and upgraded, the precinct can continue to support a higher level of community and commercial activity.

The three different precincts provide for varied usage and values to be supported along the entire embayment. The proposed management intents, permissible uses and management actions for these different precincts are illustrated in Figures 2.1 to 2.4.



Figure 2.1 - CZMP Management Precincts, Kingscliff - Dreamtime Beach

Kingscliff - Dreamtime Beach Coastal Zone Management Plan

Natural Beach and Habitat Precinct

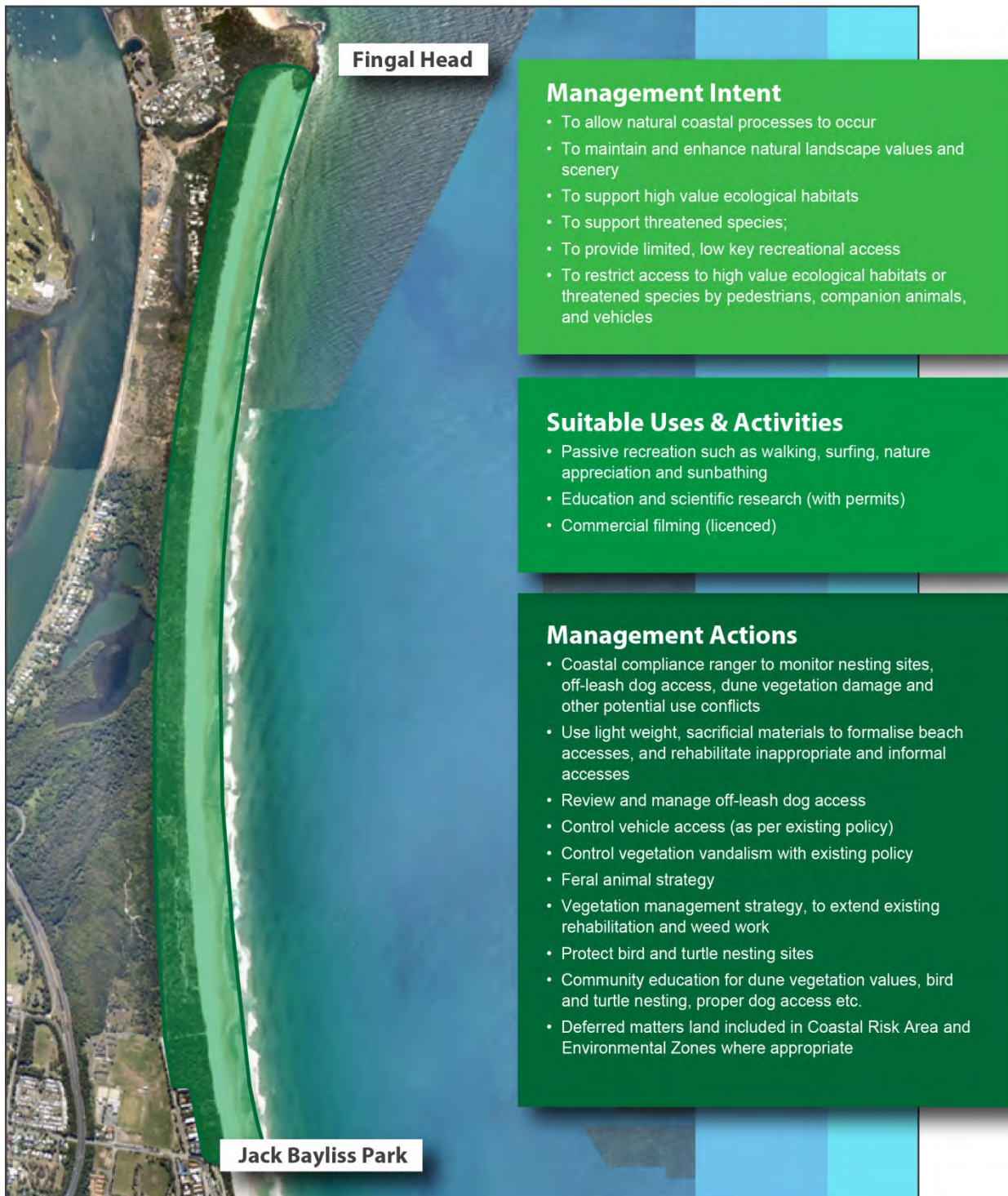


Figure 2.2 - Natural Beach and Habitat Precinct

Kingscliff - Dreamtime Beach Coastal Zone Management Plan

Passive Community Use Precinct

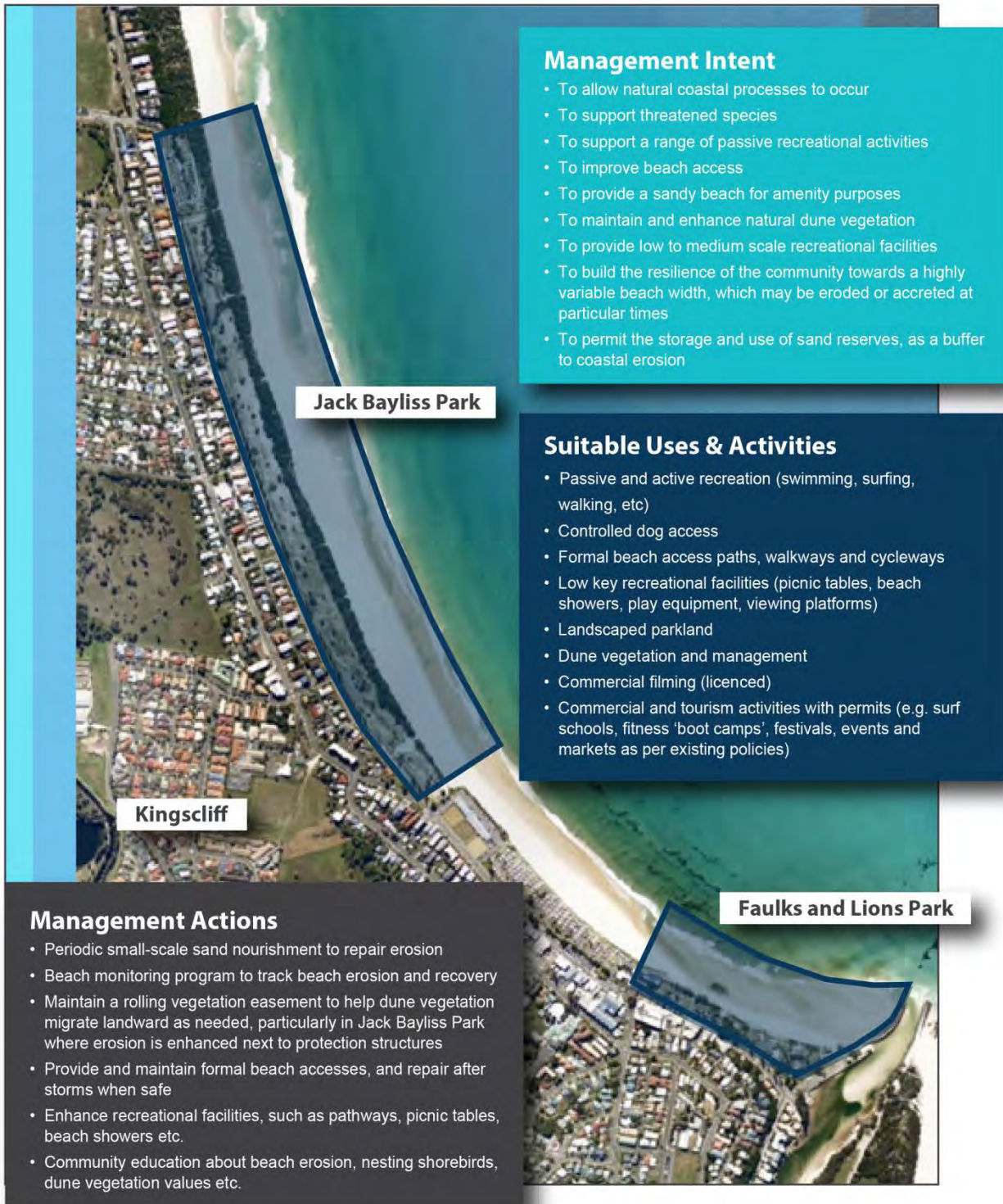


Figure 2.3 - Passive Community Use Precinct

Kingscliff - Dreamtime Beach Coastal Zone Management Plan

Hazard Protection Precinct

Management Intent

- To manage the impact of coastal hazards (erosion and wave inundation) progressively over time
- To accept a limited sandy beach amenity at times, and build community resilience for this
- To maintain and enhance the high value recreational opportunities, access and facilities behind the beach
- To sustain the existing high economic values from assets behind the beach (i.e. Kingscliff Beach Holiday Park, Cudgen Headland SLSC, Kingscliff Beach Bowling Club)
- To facilitate the staged upgrade of existing protection structures to suitable engineering standard for coastal protection
- To retain the option of retreat and relocation of assets in the long term

Suitable Uses & Activities

- Passive and active recreation (swimming, surfing, walking, cycling, etc)
- Re-development of commercial facilities, e.g. Kingscliff Beach Holiday Park, Cudgen Headland SLSC, Kingscliff Beach Bowling Club
- Commercial and tourism activities with permits (e.g. surf schools, fitness 'boot camps', festivals, events and markets as per existing policies)
- Structured road access and parking
- Surf life saving facilities and programs
- Controlled dog access
- Structured recreational facilities, including footpaths, cycleways, park furniture and picnic facilities
- Landscaped parkland and plantings
- Low growing dune vegetation and fencing



Management Actions

<p>Short Term (next 0-5 yrs)</p> <ul style="list-style-type: none"> • Replace protection structure along Holiday Park • Upgrade Holiday Park and create a Central Park including children's play areas, picnic areas, etc. • Upgrade SLSC vertical seawall • Small scale sand nourishment as sand reserves become available 	<p>Long Term (up to 2050)</p> <ul style="list-style-type: none"> • Consider a large-scale nourishment program by 2030 • Reconsider protection versus retreat and relocation options at 2050 	<p>Ongoing</p> <ul style="list-style-type: none"> • Maintenance of low-growing dune species in suitable locations • Planning controls for developments (refer existing LEP, DCP)
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Figure 2.4 - Hazard Protection Precinct

3 Implementation Schedule

3.1 Summary of Risks

Along with the threats to the coast from erosion, recession and inundation, consideration has been given to other risks to the natural beach and habitat values, and social / recreational values of the coast (particularly within the care and control of Council). A full list of risks to Kingscliff / Dreamtime Beach was identified through a review of the issues raised in the Tweed CMP (2005) and further consultation with relevant Council and Office of Environment and Heritage staff.

All risks were assessed through a risk assessment process, as detailed in PART B Appendix D and summarised in **Error! Reference source not found.** In determining the overall level of risk, existing controls (i.e. management actions) already underway by Council and other agencies were documented. The likelihood and consequence of each risk accounting for the existing controls were assessed to determine the residual level of risk that requires managing.

3.2 Summary of Recommended Actions

Actions to treat residual risks were initially derived from the actions in the Tweed CMP (2005) that were not (or only partially) implemented, but which remain valid and appropriate today. Amendments were made to these actions as necessary. New management actions were also developed to treat the residual risks. All actions to address the risks to Kingscliff / Dreamtime Beach are listed in Table 3.2 .

This CZMP supports the continued implementation of those existing controls that reduce known risks, such as Council policies and strategic plans, formal planning controls (e.g. LEP, DCP), and on-ground works. The existing controls are listed in Table 3.2, also with their previous action number from the Tweed CMP (2005), and listing of the relevant risk(s) treated. Implementation details are not given for the existing controls as they are already underway.

Risks arising from erosion hazards within the Hazard Protection Precinct, and the recommended strategy for managing these risks were assessed in the Kingscliff CRMS (PART B Appendix A). The actions determined for the Hazard Protection Precinct in the Kingscliff CRMS have been incorporated into the Implementation Schedule for the entire embayment, to form one holistic CZMP. Summary details for the strategy recommended in the Kingscliff CRMS are also given in Section 3.5. To reflect the risks arising from erosion and inundation, the Hazard Protection Precinct has been included in the summary table of risks (**Error! Reference source not found.**).

Table 3.1 Summary of Risks to Kingscliff - Dreamtime Beach

Risk No.	Risk statement	Level of Risk	Precinct where primarily applicable
1	There is a risk that inappropriate development will occur in coastal hazard zones due to inadequate planning, which will result in social and financial hardship	Low	Passive Community Use
2	There is a risk that coastal erosion caused by storms will result in a loss of public land that will affect public access and amenity	Medium	Passive Community Use
3	There is a risk that a lack of community understanding about natural variability in beach width will result in community pressure on decision makers during periods of erosion, resulting in inappropriate, costly and/or obstructive management responses	High	Passive Community Use
4	There is a risk that feral animals will cause increased mortality of shorebirds, turtles, and other threatened species, resulting in reduced biodiversity values	High	Natural Beach and Habitat
5	There is a risk that existing recreational facilities will not satisfy demand created by nearby urban expansion and tourism, resulting in lost tourism potential and poor social amenity	Medium	Passive Community Use
6	There is a risk that off-road vehicle access will impacts on shorebirds, turtles, and natural areas resulting in reduced biodiversity value	Medium	Natural Beach and Habitat
7	There is a risk that off-leash dogs will affect breeding outcomes for shorebirds and turtles, causing a reduction in their numbers	High	Natural Beach and Habitat
8	There is a risk that loss of native vegetation caused by vandalism of trees and vegetation will result in reduced scenic and biodiversity values	Medium	Natural Beach and Habitat
9	There is a risk that native vegetation will be displaced by weed infestation, resulting in reduced habitat value	High	Natural Beach and Habitat
10	There is a risk that coastal erosion caused by storms will result in a loss of Aboriginal Heritage values	UNKNOWN	Natural Beach and Habitat
11	There is a risk that illegal camping/sheltering in the dunes will result in damage to dune vegetation, littering and other waste disposal, and an increased risk of bushfires due to the lighting of camp fires.	Medium	Natural Beach and Habitat
12	There is a risk that water pollution caused by stormwater runoff will result in human and environmental health impacts	Low	Passive Community Use
13	There is a risk that poor decision making as a consequence of unrecognised data gaps will result in future issues that will impact on social and environmental values	Medium	Hazard Protection
14	There is a risk that incompatible management regimes across multiple land managers will impact on social and environmental values	Low	Passive Community Use
15	There is a risk that coastal erosion caused down drift of the Kingscliff hazard protection structures will impact upon ecological habitats, threatened species, public beach amenity and beachfront development	Medium	Passive Community Use
n/a	<i>Erosion Risks to the Hazard Protection Precinct (as reviewed in the Kingscliff CRMS)</i>	High	Hazard Protection

Table 3.2 Actions Recommended to Treat the Coastal Risks

Actions	CMP 2005 Action No.	New Action No.
Retained Actions (from CMP 2005, with amendments)		
<p>Develop and implement a beach monitoring program, particularly for Kingscliff Beach. Ideally, the monitoring program should extend southwards to Cabarita and northwards to Fingal Head, to capture the formation and movement of sediment 'slugs' bypassing Cudgen Headland.</p> <p>Beach monitoring data will also be used to assess downdrift impacts of seawall (addressing Risk 15) and inform future studies on coastal hazard risk.</p>	WC6, FH8 amended	KD1
<p>Upgrade the seawall along the Kingscliff Beach Holiday Park shoreline, as part of the Kingscliff Beach Holiday Park Renewal and Central Park developments. The design shall cater for improved public access and amenity, and stormwater outflow and treatment. The Kingscliff Holiday Park Renewal shall include reducing the number of sites to make space for a Central Park; and new amenities, recreational elements, landscaping and other facilities. Central Park shall include a promenade, landscaping, picnic shelters, barbeques, and a cenotaph. The action will be jointly funded by Council, the Holiday Park (owned by Council) and the Australian Government's National Stronger Regions Fund.</p>	KC2, KC6 amended	KD5
<p>Fund a Coastal Compliance Ranger, to monitor:</p> <ul style="list-style-type: none"> • Shorebird and turtle nesting sites, and fence off nesting sites or close beach access points as necessary over the breeding season; • Wildlife Protection Areas; • Off-leash dog access, particularly during shorebird and turtle nesting seasons • Beach vehicle use, particularly during shorebird and turtle nesting season • Damage to dune vegetation due to illegal camping, illegal pruning, creation of informal tracks etc.; • Protection and rehabilitation of adjacent dune vegetation required as part of development conditions of consent; and • Other recreational or access issues that may affect coastal biodiversity values. 	WC12, FH4, WC21 amended	KD9
<p>Undertake a comprehensive coastal Community Education Strategy, targeting:</p> <ul style="list-style-type: none"> • The use of native species and weed management in residential gardens to reduce weeds escaping into adjacent native habitat (dunes, littoral rainforest etc.); • Shorebird and turtle nesting, particularly when accessways must be closed or areas cordoned off for the breeding season; • Aboriginal heritage and culture on the coast; • The important values provided by dune vegetation particular to discourage its destruction, and the vegetation "rolling easement" concept; • Coastal processes and the movement of large volumes of sand that periodically causes erosion, which could be supported with the results of beach sand monitoring; and • Management actions being implemented, such as small scale sand nourishment, and the new seawall. <p>The strategy may be delivered via a range of media, including brochures (e.g. for species in gardens, values of dune vegetation, shorebird and turtle nesting for animal owners and 4WDers), signage (e.g. celebrating Aboriginal culture, shorebird and turtle nesting), website links (e.g. for implementation of coastal management actions), street workshops (e.g. for dune vegetation values and species selection with residents adjacent to native habitat), beach walk & talks (e.g. to explain periodic occurrence of erosion, management actions etc.), school visits (explaining coastal processes, dune vegetation values) and so on. The strategy should also link with existing successful programs, for example, Dogs Breakfast.</p>	WC36 amended, WC10 in relation to signage for Aboriginal heritage, WC22 and KC14 in relation to dune values, FC20 in relation to threatened species.	KD10

Actions	CMP 2005 Action No.	New Action No.
Review off-leash and prohibited dog areas following development of Tweed Shire Council Guidelines. Considerations for Dreamtime Beach include impact on nesting turtles, migratory and shore birds.	KC10 amended	KD11
Upgrade signage regarding off leash and prohibited areas making the extents of the designated areas very clear, and to provide education about nesting animals and responsible pet ownership.	WC23, FH4 amended	KD12
Develop and implement a vertebrate pest animal management strategy.	WC3	KD15
Prepare and implement a broad based Vegetation Management strategy and principles for the whole of the Tweed coast.	WC1 amended	KD16
Update and expand site specific Dune Vegetation Management Plans to fill the gaps between Dunecare work areas.	WC1 amended	KD17
Review environmental zones, including areas currently identified as deferred matter in accordance with the environmental zone criteria specified by the Final Recommendation Report of the Northern Councils EZone Review.	WC41 amended	KD18
New Actions		
Undertake periodic nourishment using available sand sources to remediate erosion in areas of high public access demand, including areas affected by edge erosion effects from the Kingscliff seawall (e.g. beach fronting Jack Bayliss Park, Faulks and Lions Parks). Sand sources may include, but not be limited to, dredged marine sand from Cudgen Creek or Tweed River, as may become available from time to time (see Kingscliff CRMS, BMT WBM 2015 for further details).		KD2
Determine preferred option for extraction of sand from Area 5 of the Tweed River (downstream of Barneys Point Bridge), for use as sand nourishment on Kingscliff - Dreamtime Beach. This action shall provide an interim sand nourishment source of up to 660,000 m ³ to support environmental beach amenity on Kingscliff - Dreamtime Beach, until a large-scale nourishment program is investigated in 2030 (see Section 3.5.1).		KD3
Re-establish a coastal dune along the foreshore of Faulks Park and Lions Park. Volume of sand required is approximately 20,000m ³ . Source of sand can be terrestrial or marine (e.g. Tweed River, Cudgen Creek, Area 5, as noted in Actions KD2 and KD3 above). Dunes to be vegetated and protected.		KD4
Modify/protect vertical seawall in front of Cudgen Headland SLSC to ensure compatibility with adjacent foreshore protection structures.		KD6
Develop a staged implementation plan for a "rolling vegetation easement" that will facilitate (through plantings and fencing) the migration of dune vegetation into the parkland behind, as required in the future due to progressive beach recession. The easement should extend from Fingal Head to Jack Bayliss Park. The rolling easement shall aim to improve the dune buffer, irrespective of other (protection) works on the beach. The rolling easement would need to accommodate nesting birds (e.g. bush stone curlew that requires cleared unvegetated areas); and installation of facilities, e.g. play equipment. The action should be promoted within the community as part of education regarding dune vegetation values (see Community Education action).		KD7
Develop guidelines for placing restrictive covenants on new subdivisions to limit and control keeping of companion animals to reduce impacts on wildlife.		KD13
Investigate development of a Council Policy for Responsible Cat Ownership. This Policy will consider options for promoting and managing responsible cat ownership including community education and awareness strategies.		KD14

Actions	CMP 2005 Action No.	New Action No.
Refer to the process to be followed for the inadvertent discovery of an object and inadvertent discovery of burial or human remains as outlined in the Aboriginal Cultural Heritage Management Plan (in prep).		KD19
Coordinate within Council to enable the provision of maintenance activities in cross-over regions between parks, beach accesses and dunes, and cycle ways, which are managed respectively by Recreation Services Unit, NRM Unit - Coastal and Roads and Stormwater maintenance crews. These groups manage adjacent areas of land (parks and adjacent beach accesses and dunes) and the assets within these areas. The action is aimed at enabling the different works crews to undertake pruning, grass cutting and other minor maintenance tasks at the edges of their respective areas of responsibility, e.g. where a park leads into a beach accessway bounded by dune vegetation. The action may require some limited "sharing" of budget, to provide for the maintenance tasks, plus training of the respective crews for correct methods in their adjacent regions.		KD20
As necessary, facilitate working groups with relevant stakeholders (state agencies, members from different Council departments, etc.) to co-ordinate action on coastal management issues.		KD21

Table 3.3 Existing Controls Supported for Continued Implementation

Existing Actions	CMP 2005 Action No.
Tweed Local Environment Plan 2014 (LEP 2014) contains Clause 7.5 Coastal Risk Planning. Support ongoing implementation, and update the LEP Coastal Risk Planning area (and state-wide maps in future) with new coastal vulnerability information as it becomes available.	WC43
For land that is deferred matters, the Tweed LEP 2000 applies. It contains Clause 26 Development in Zone 7 (f) Environmental Protection (Coastal Lands) and Clause 36 Coastal erosion outside Zone 7 (f), both of which aim to protect land that may be susceptible to coastal erosion processes from inappropriate development.	WC43
Tweed Development Control Plan Section B25 - Coastal Hazards ('DCP B25'). Support ongoing implementation but also update of the DCP as new information becomes available.	WC5, WC43
Kingscliff - Dreamtime Beach Emergency Action Sub Plan (EASP), to be implemented and regularly updated as new hazard and monitoring information is collated.	WC4
Fox management involving fumigating dens.	
Kingscliff Locality Plan.	WC48, amended
Beach Vehicle Policy.	WC31

Existing Actions	CMP 2005 Action No.
<p>NRM Unit's Dune Crew is responsible for:</p> <p>Management of beach accessways (repair and upkeep, proper demarking of formal accesses, viewing platforms);</p> <p>Inspection, temporary closure, and repair of erosion damage to public land and beach accesses after erosion events;</p> <p>Rehabilitation of illegal vehicle and pedestrian access points; and</p> <p>Dune vegetation rehabilitation and management, including weed removal, and monitoring and rehabilitation of damaged vegetation (such as due to vandalism, illegal camping/sheltering etc.).</p>	<p>WC24, WC25, WC26, WC27, WC29 (all relate to beach access); incorporates intent of WC18 relating to dune rehab, FH5 and FH6 in relation to managing unauthorised vehicle access via existing or informal accessways.</p>
<p>Volunteer based dune rehabilitation groups, such as Fingal Head Coastcare and Kingscliff Community Dunecare. Council should continue to seek grant funding and support these groups, as well as help to develop new groups.</p>	<p>Incorporates intent of WC18, WC25</p>
<p>"Dogs Breakfast" events to provide education and engagement with local dog owners on key issues.</p>	
<p>Vegetation Vandalism on Public Land Policy (2014).</p>	<p>WC22, FH14, & incorporates issues on coast relating to WC13.</p>
<p>Bitou Bush management (funded by various grant programs), as supported by the Tweed Shire Bitou Bush Control Strategy (2003).</p>	
<p>Annual aerial monitoring of Bitou Bush for the Tweed (and National Northern Containment Zone).</p>	
<p>Aboriginal Cultural Heritage Management Plan.</p>	<p>WC9</p>
<p>Species Selection Guide For Parks, to provide for suitable species to be used in coastal parks adjacent to dune vegetation.</p>	<p>WC7</p>
<p>Development Design Specifications D14 – Landscaping Public Space.</p>	<p>WC14</p>
<p>Maintain the Tweed Vegetation Committee to facilitate liaison between Council, Department of Industry - Lands, OEH (NPWS, Coastal Branch) and TBLALC regarding consistent management of adjoining areas of natural habitat. This could cover issues relating to vegetation vandalism, weed management (especially large scale Bitou spraying programs), protecting shorebird and turtle nesting sites, and management of specific habitats (e.g. Littoral Rainforest, Coastal Wetlands).</p>	<p>WC44, WC45, FH3, amended</p>
<p>Maintain the Kingscliff Foreshore Management Group as long as necessary to facilitate integration of the various plans covering the coastal region.</p>	<p>WC46, amended</p>
<p>Maintain framework for managing leases in Council Reserves, as per the Commercial use of Council Managed Land Policy and generic Plan of Management for Community Land.</p>	<p>WC50, WC51, WC52</p>

3.3 Funding Opportunities

A range of grant funding opportunities are available to assist with actions in a certified CZMP. These may be sought by Council and used to implement the actions contained within this CZMP. This is in addition to the existing budgets and resources of Council that are available when implementing actions in its Delivery Program and Operational Plan. The following programs and other potential revenue streams may be investigated by Council when implementing actions in this CZMP:

- NSW Government Coastal Management Program (administered by OEH);
- NSW Government Estuary Management Program (administered by OEH);
- NSW Government Floodplain Management Program (administered by OEH);
- NSW Government's Environmental Trust Grant Programs, covering a range of topics including climate change adaptation, community education, Aboriginal Heritage, and habitat rehabilitation;
- Crown Lands Grant Programs;
- NSW Government's Sustainable Dredging Strategy;
- Federal and State Government Emergency Management Funding and Disaster Relief Funding;
- Federal and State Government programs, e.g. National Stronger Regions Fund, or other Climate Change adaptation funds;
- New Council levies or increased land rates;
- Revenue generated through hire, rental or other commercial partnerships with Council (e.g. the SLSCs, Holiday Parks).

3.4 Implementation Schedule

Table 3.4 Implementation Schedule

Action No.	Action	Details	IP&R Strategy	Owner & Delivery Partner	Key Performance Indicator & Target	Cost / Resources / Funding Option	Location Further Details
KD1	Beach Sand Monitoring Program	<p>Develop and deliver a monitoring program for beach condition and volume to improve data on coastal processes, for future revision of coastal hazard studies, trends, and trigger monitoring.</p> <ul style="list-style-type: none"> Undertake monitoring after storm events. Check beach condition if the real time $H_s \geq 3$ m and/or ocean water level ≥ 1.3 m AHD. Conduct monitoring if erosion is evident. Undertake monitoring following sand nourishment to record changes in volume and distribution in response to environmental conditions. Review monitoring data for erosion/accretion trends, including potential erosion effects of the Kingscliff seawall. Make results available to community (e.g. promoted on website). Combine outputs with existing NSW Government 3 yearly LiDAR and aerial photography / photogrammetry collection program. Data to be used to assess coastal hazards and impacts of seawall construction (e.g. edge erosion effects) when revising coastal hazard mapping. 	1.1.3	<p>Coordinator Natural Resource Management: Coastal Program</p> <p>Link with Existing NSW Government Programs</p>	<p>100% of monitoring program developed by end 2017.</p> <p>Monitoring program delivered ≥ 2 / year.</p>	<p>\$35,000* for whole coastline monitored 2-3 times / year.</p> <p>Staff time and ongoing budget allocation incorporated into maintenance</p> <p>Additional Funding Options: NSW Coastal Program; NSW Environment Trust (climate adaptation); Federal programs.</p> <p>* included in calculations for maintenance of seawall KD5</p>	<p>High Priority Location: Coast between Fingal Head and Cabarita Beach, to capture the formation and movement of sediment 'slugs' bypassing Cudgen Headland.</p> <p>Further Information</p> <ul style="list-style-type: none"> It is more likely to be cost-effective to run the program across the entire Tweed coastline, rather than one beach. Investigate the use of unmanned aerial vehicles (drones) to collect and process data (e.g. ADS80 aerial photogrammetry). Collaborate with NSW Government (OEH) where storm erosion is severe across a large region. Survey methods and profile locations to be consistent with previous surveys to ensure continuity of data.

Action No.	Action	Details	IP&R Strategy	Owner & Delivery Partner	Key Performance Indicator & Target	Cost / Resources / Funding Option	Location Further Details
KD2	Sand Nourishment - Periodic and Opportunistic	<p>Undertake periodic nourishment using available sand sources to remediate erosion in areas of high demand for public access, including areas affected by edge erosion effects from the Kingscliff seawall (KD5).</p> <p>The intention is to introduce to the sediment compartment a volume of material that is equivalent to that which would have been released as a result of ongoing shoreline recession. Therefore, despite the fixed location of the shoreline following the construction of the proposed concrete and rubble mound seawalls, the equivalent volume of material is available for nourishing down-drift, northern areas.</p> <p>In addition, continue to utilise opportunistic sand nourishment from dredging activities in the Tweed River and Cudgen Creek. For example, from 2015 to 2017, 47,000m³ of sand dredged from Terranora Inlet and Cudgen Creek was placed on Kingscliff Beach by NSW Department of Industry – Lands.</p>	1.1.3	Coordinator Natural Resource Management: Coast and Waterways Programs	Nourishment undertaken on average every 4-5 years, based on estimates of 3,000 m ³ /yr to address long term recession and sea level rise or as required based on monitoring.	<p>\$50,000-\$200,000* per episode.</p> <p>Staff time and ongoing budget allocation for maintenance.</p> <p>Additional Funding Options: NSW Government Sustainable Dredging Strategy (e.g. "Rescuing our Waterways"); Coastal Program.</p> <p>* included in calculations for maintenance of seawall KD5</p>	<p>Location: Kingscliff Beach fronting Jack Bayliss Park, Faulks and Lions Parks; other areas as required.</p> <p>Further Information:</p> <p>The volume of sand that is no longer available for transport due to the presence of foreshore protection works on Kingscliff Beach, for projected recession rates, is estimated at 2,475 m³/year (see PART B Appendix H – Sand Nourishment Calculations)</p> <p>Sand sources may include, but not be limited to, dredged marine sand from Cudgen Creek or Tweed River (Action KD3), extraction from beach hind dunes at Cudgen Headland, or other sources as may become available from time to time.</p>
KD3	Area 5 Sand Source Investigation	Determine preferred option for extraction of sand from Area 5 of the Tweed River (downstream of Barneys Point Bridge), for use as sand nourishment on Kingscliff - Dreamtime Beach. This action shall provide a sand nourishment source of up to 660,000 m ³ to support environmental beach amenity and reduce the edge erosion effects of the seawall on Kingscliff - Dreamtime Beach, until an additional large-scale nourishment program is investigated in 2030 (see Section 3.5.1).	1.1.3	Coordinator Natural Resource Management. Manager Design	Sand extraction method and volumes determined by 2020. Funding mechanism determined by 2020.	<p>Existing grant and staff time.</p> <p>Additional Funding Options: NSW Government Coastal Program; Federal Government Grant programs</p>	<p>Location: Area 5, Tweed River, for use as nourishment on Kingscliff - Dreamtime Beach.</p> <p>Further Information:</p> <p>Sand volumes above what is available through opportunistic sources have been identified in Area 5 in the Tweed River.</p> <p>Extensive studies (EIS, costings) have already been undertaken for a program of bulk extraction of up to 660,000 m³ from Area 5, for storage and use as sand nourishment.</p> <p>This action shall involve investigating the feasibility of multiple small scale extractions of up to 30,000 m³ per episode. Feasibility and costs can then be compared, to decide whether to perform one bulk or multiple small sand extraction episodes.</p>

Action No.	Action	Details	IP&R Strategy	Owner & Delivery Partner	Key Performance Indicator & Target	Cost / Resources / Funding Option	Location Further Details
KD4	Rebuild Coastal Dune at Faulks and Lions Parks	Re-establish a coastal dune along the foreshore of Faulks Park and Lions Park. Volume of sand required is approximately 20,000m ³ . Source of sand can be terrestrial or marine (e.g. Tweed River, Cudgen Creek, Area 5, as noted in Actions KD2 and KD3 above). Dunes to be vegetated and protected.	1.1.3	Coordinator Natural Resource Management: Coastal Program Department of Industry – Lands (2017 dredging and nourishment program)	Dune volume increased, fencing and revegetation completed by 2018.	\$10,000 Budget allocation for coastal dune fencing works. Sand nourishment of 50,000m ³ is programmed by Dept of Industry – Lands for dune rebuild north of Kingscliff seawall in mid-2017. Additional Funding Options: NSW Government Sustainable Dredging Strategy (e.g. “Rescuing our Waterways”); Coastal Program.	Location: Faulks & Lions Parks foreshore Further Information: The dune should be constructed along the crest of the existing low dune, and avoid the active beach to reduce losses from short-term erosion. The vegetated dune will reduce wave overtopping, capture sand drift, and in the long term, provide a buffer to future long term erosion. Refer to Kingscliff CRMS (PART B Appendix A) for further details. This action is complete for Faulks and Lions Parks. From 2015 to 2017, 47,000m ³ of sand dredged from Terranora Inlet and Cudgen Creek was placed on Kingscliff Beach by NSW Department of Industry – Lands. This rebuilt the dune from the Cudgen Headland Surf Club south (Faulks and Lions Parks).

Action No.	Action	Details	IP&R Strategy	Owner & Delivery Partner	Key Performance Indicator & Target	Cost / Resources / Funding Option	Location Further Details
KD5	Kingscliff Seawall Upgrade	Upgrade the seawall along the Kingscliff foreshore, as part of the Kingscliff Beach Holiday Park Renewal and Central Park developments. The seawall design shall cater for improved public access and amenity via stepped seating, viewing platforms and a promenade along its crest; and for improved stormwater outflow and treatment.	1.1.3	Kingscliff Foreshore Revitalisation Project Manager Coordinator Natural Resource Management: Coastal Program	100% of the Kingscliff seawall built by 2019.	\$21.2 million for whole Kingscliff Foreshore Revitalisation Project, including seawall. Funding has been sourced jointly from Council (\$3.89 million), Kingscliff Beach Holiday Park (\$7.5 million) and the Australian Government's National Stronger Regions Fund \$9.81 million). Ongoing maintenance budget of \$122,500 per annum including sand nourishment and monitoring.	Location: Seawall to extend from Cudgen Headland SLSC to Kingscliff Beach Bowling Club. Further Information: Kingscliff Holiday Park Renewal shall include reducing the number of sites to make space for a Central Park; with new amenities, recreational facilities and landscaping. Central Park shall include a promenade, landscaping, picnic shelters, barbeques and cenotaph area. A risk management plan will be required to manage public use of the cycleway along the seawall during storm wave overtopping events.
KD6	Upgrade Cudgen Headland SLSC Seawall	Modify/protect vertical seawall in front of Cudgen Headland Surf Life Saving Club to ensure compatibility with adjacent foreshore protection structures.	1.1.3	Coordinator Natural Resource Management: Coastal Program Manager Design	100% of design and approvals completed by 2021. 100% of seawall upgrade constructed by 2025.	\$200,000 for design and approvals. \$1 million for construction (consideration in the 2021 – 2025 Delivery Program) Additional Funding Options: State and Federal community facility grant programs, NSW Coastal Program.	Location: Vertical piled seawall fronting Cudgen Headland SLSC Further Information: Continued exposure of the vertical wall is likely to compromise its integrity. Upgrades should be designed following an engineering assessment of the existing structure. The new design should cater for improved beach access and amenity from the SLSC, and would allow for refurbishment of the SLSC. Refer Kingscliff CRMS for further details.

Action No.	Action	Details	IP&R Strategy	Owner & Delivery Partner	Key Performance Indicator & Target	Cost / Resources / Funding Option	Location Further Details
KD7	Rolling Vegetation Easement	<p>Develop a staged implementation plan for a "rolling vegetation easement", to facilitate (through plantings and fencing) the migration of dune vegetation into the parkland behind.</p> <p>The Rolling Vegetation Easement shall also provide for the erosion and roll-back of coastal dunes in Jack Bayliss Park, which is proposed as an erosion buffer in response to the adjacent hardened foreshore of the Hazard Protection Precinct, in the Kingscliff CRMS.</p> <p>The action should be promoted within the community as part of education regarding dune vegetation values (see Community Education action). For Jack Bayliss Park, education should explain that this area is permitted to erode as a buffer for the adjacent hardened foreshore.</p>	1.1.3	Coordinator Natural Resource Management: Coastal Program, Manager Recreation Services	100% of Plan developed by 2018. Implementation commenced in 2019.	Staff Time (Plan) ~\$100,000 to facilitate roll-back particularly in Jack Bayliss Park. Additional Funding Options: NSW Coastal Program.	<p>Location: The easement shall extend from Fingal Head to Jack Bayliss Park, inclusive.</p> <p>Further Information: Dune migration will occur in future due to progressive beach recession. The rolling easement shall aim to improve the dune buffer, irrespective of other (protection) works on the beach. The easement should accommodate nesting birds (e.g. bush stone curlew that requires cleared unvegetated areas); and facilities, e.g. play equipment. It is recommended the easement be extended to Tweed River entrance and south to Wooyung, when planning for the remainder of the Tweed coast is updated.</p>
KD8	Threatened Species Habitat Protection	Identify, protect and enhance habitat for threatened species known to occur in the Plan area (Bush Stone-curlew and Glossy Black-cockatoo). A program will be developed to identify, protect and enhance critical habitat features for threatened bird species including foraging and watering sites for the Glossy Black-cockatoo and roosting and nesting sites for the Bush Stone-curlew.	1.1.1 1.1.3	Coordinator Natural Resource Management: Coastal and Biodiversity Programs	Plan completed in 2018.	\$10,000 (plan) \$10,000 per annum. Funding Options: State and Federal grant programs e.g. NSW Environmental Trust	<p>Location: Jack Bayliss Park, Cudgen Foreshore Park, Ed Parker Rotary Park, Robert Dixon Park, Sutherland Point Park.</p> <p>Further Information: In addition to threatened species habitat protection, this program will also consider and promote passive recreation opportunities (bird watching, nature appreciation).</p>

Action No.	Action	Details	IP&R Strategy	Owner & Delivery Partner	Key Performance Indicator & Target	Cost / Resources / Funding Option	Location Further Details
KD9	Coastal Compliance Ranger	<p>Fund a Coastal Compliance Ranger, to monitor:</p> <ul style="list-style-type: none"> Shorebird and turtle nesting sites, and fence off nesting sites or close beach access points as necessary over the breeding season; Wildlife Protection Areas; Off-leash dog access, particularly during shorebird and turtle nesting seasons Beach vehicle use, particularly during shorebird and turtle nesting season Damage to dune vegetation due to illegal camping, illegal pruning, creation of informal tracks etc.; Protection and rehabilitation of adjacent dune vegetation required as part of development conditions of consent; and Other recreational or access issues that may affect coastal biodiversity values. 	<p>1.1.1 1.1.3 2.2.1</p>	<p>Coordinator Natural Resource Management: Coastal and Biodiversity Programs Team Leader Compliance</p>	<p>Hire of Ranger by 2018.</p>	<p>\$100,000 per annum. Joint funding by: existing Council resource stream; and a requirement for grant funding applications by the employee.</p>	<p>Location: Ranger would be most cost effective if employed for entire Tweed Coastline, but concentrating on Kingscliff and other key areas (e.g. nesting sites) as needed. Further Information: Ranger may need to be authorised under the <i>Crown Lands Act</i> to effect compliance on Crown Land.</p>
KD10	Community Education	<p>Undertake a comprehensive coastal Community Education Strategy, covering:</p> <ul style="list-style-type: none"> The use of native species and weed management in residential gardens to reduce weeds escaping into adjacent native habitat (dunes, littoral rainforest etc.); Shorebird and turtle nesting, particularly when accesses must be closed or areas cordoned off for the breeding season; Responsible pet ownership Aboriginal heritage and culture on the coast; The value of dune vegetation, particularly to discourage its destruction, and the "rolling vegetation easement" concept; Coastal processes and the movement of large volumes of sand that periodically causes erosion, which could be supported with the results of beach sand monitoring; and Management actions being implemented, such as small scale sand nourishment, and the new Kingscliff seawall. 	<p>1.1.3 2.2.2</p>	<p>from Natural Resource Management Unit for content Unit Coordinator Communications and Customer Services</p>	<p>Strategy developed by 2018. Implementation commencing in 2018.</p>	<p>Staff time and project / program budgets. Funding Options: State / Federal Grant programs, e.g. NSW Environmental Trust.</p>	<p>Further Information: The strategy may be delivered via a range of media, including brochures / e-brochures (e.g. for species in gardens, values of dune vegetation, shorebird and turtle nesting for animal owners and 4WDers), signage (e.g. celebrating Aboriginal culture, shorebird and turtle nesting), website links (e.g. for implementation of coastal management actions), street workshops (e.g. for dune vegetation values and species selection with residents adjacent to native habitat), beach walk & talks (e.g. to explain periodic occurrence of erosion, management actions etc.), school visits (explaining coastal processes, dune vegetation values). The strategy should also link with existing successful programs, for example, Dogs Breakfast.</p>

Action No.	Action	Details	IP&R Strategy	Owner & Delivery Partner	Key Performance Indicator & Target	Cost / Resources / Funding Option	Location Further Details
KD11	Review Off-leash and Prohibited Dog Access Areas	Review off-leash and prohibited dog areas following development of Tweed Shire Council Guidelines. Considerations for Dreamtime Beach include impact on nesting turtles, migratory and resident shore birds.	1.1.3 2.2.1	Team Leader Compliance Manager Recreation Services Coordinator Natural Resource Management.	100% of Review completed by 2017. Implementation of review recommendations commenced by 2018.	Staff time or minor consultancy (\$10,000). Funding Options: State / Federal Grants Programs.	Location: Dreamtime Beach and Kingscliff Beach including adjacent foreshore areas.
KD12	Upgrade Off-leash and Prohibited Dog Access Area Signage	Upgrade signage and associated amenities for off leash and prohibited areas making the extents of the designated areas very clear, and to provide education about nesting animals and responsible pet ownership.	1.1.3 2.2.1	Team Leader Compliance Manager Recreation Services	100% of signage upgraded by 2019.	Up to \$5,000 for new signs.	Location: Dreamtime Beach and Kingscliff Beach including adjacent foreshore areas. <i>Action should be coordinated with Review Off-leash and Prohibited Dog Access action above.</i>
KD13	Covenant on Companion Animals for New Subdivisions	Develop guidelines for placing restrictive covenants on new subdivisions to limit and control keeping of companion animals to reduce impacts on wildlife.	1.4.1	Coordinator Natural Resource Management (Policy) Manager Development Assessment (Implement)	Guidelines completed by 2019. Implementation commenced by 2020.	Staff time or minor planning consultancy (\$5,000-\$10,000). Additional Funding Option: NSW Government Grants programs.	Location: Covenant to apply to whole of Tweed Shire. Further Information: Seek advice from Responsible Pet Ownership Reference Group (Office of Local Government).
KD14	Council Policy for Responsible Cat Ownership	Investigate development of a Council Policy for Responsible Cat Ownership. This Policy will consider options for promoting and managing responsible cat ownership including community education and awareness strategies.	2.2.1	Coordinator Natural Resource Management (Policy) Manager Development Assessment and Compliance	Policy development commenced by 2020.	Staff time or minor consultancy (\$5,000). Additional Funding Option: NSW Government Grants programs.	Location: Policy to apply to whole of Tweed Shire. Further Information: Seek advice from Responsible Pet Ownership Reference Group (Office of Local Government).
KD15	Vertebrate Pest Animal Management Strategy	Develop and implement a vertebrate pest animal management strategy.	3.1.10	Coordinator Natural Resource Management: Pest Management Program	100% of strategy completed by 2018. Implementation commenced in 2019.	\$30,000 for consultancy. Additional Funding Option: State / Federal Grant programs, e.g. NSW Environmental Trust.	Location: Entire beach and hinterland, linking with existing strategies where relevant (e.g. Fox den fumigation, other pest management activities)

Action No.	Action	Details	IP&R Strategy	Owner & Delivery Partner	Key Performance Indicator & Target	Cost / Resources / Funding Option	Location Further Details
KD16	Vegetation Management Strategy	Prepare and implement a broad based vegetation management strategy and principles for the whole of the Tweed coast.	1.1.1	Coordinator Natural Resource Management: Biodiversity Program.	100% of strategy completed by 2018. Implementation commenced in 2019.	\$40,000 for consultancy. Additional Funding Option: State / Federal Grant programs, e.g. NSW Environmental Trust.	Location: Whole of Tweed Coast (see below for localised plans).
KD17	Update Dune Vegetation Management Plans	Update and expand site specific Vegetation Management Plans to fill the gaps between Dunecare work areas.	1.1.3	Coordinator Natural Resource Management: Biodiversity and Coastal Programs	100% of plans updated and commenced by 2019.	Staff time or \$5,000 per review. Additional Funding Options: NSW Coastal Program or Environmental Trust.	Location: Reviews to include area between Fingal Head Coastcare and Kingscliff Community Dunecare groups.
KD18	Environmental Zoning for Deferred Matters Land	Review environmental zones, including areas currently identified as deferred matter in accordance with the environmental zone criteria specified by the Final Recommendation Report of the <i>Northern Councils EZone Review</i> .	1.1.1 1.4.1	Coordinator Natural Resource Management: Biodiversity and Coastal Programs Unit Coordinator Strategic Planning & Urban Design.	All Deferred Matters Land in Kingscliff-Dreamtime is resolved by 2018.	Staff time.	Location: Refer to Deferred Matters Areas depicted on Tweed LEP maps.
KD19	Management of Aboriginal Cultural Heritage Revealed by Coastal Erosion	Refer to the process to be followed for the inadvertent discovery of an object and inadvertent discovery of burial or human remains as outlined in the Aboriginal Cultural Heritage Management Plan (in prep).	1.4.1	Land Owner Unit Coordinator Strategic Planning & Urban Design	Implementation on an as needs basis.	Staff time.	Location: Dreamtime Beach and Kingscliff Beach. Further Information: The ACHMP currently being prepared will outline procedures and protocols for the management of Aboriginal Cultural Heritage.

Action No.	Action	Details	IP&R Strategy	Owner & Delivery Partner	Key Performance Indicator & Target	Cost / Resources / Funding Option	Location Further Details
KD20	Asset Maintenance in Cross-over Regions of Council Unit Jurisdiction	Coordinate within Council to enable the provision of maintenance activities in cross-over regions between parks, beach accesses and dunes, and cycle ways, which are managed respectively by Recreation Services Unit , NRM Unit - Coastal and Roads and Stormwater maintenance crews. These groups manage adjacent areas of land (parks and adjacent beach accesses and dunes) and the assets within these areas.	1.1.3 3.2.7; 3.3.4	Coordinator Natural Resource Management and Manager Recreation Services and Manager Roads and Stormwater	Service Level Agreements developed by 2018. Number of times cross-over enacted with success per year.	May require some limited "sharing" of budget between Council units, for the maintenance tasks, and training of the respective crews.	Location: Jack Bayliss Park and adjacent beach; Lions & Faulks Park and adjacent beach; Central Park and adjacent beach when complete. Further Information: The action aims to enable the two different works crews to undertake pruning, grass cutting and other minor maintenance tasks at the edges of their respective areas of responsibility, e.g. where a park leads into a beach access way bounded by dune vegetation.
KD21	Co-ordinated Management of Coastal Issues	As necessary, facilitate working groups with relevant stakeholders (state agencies, members from different Council departments, etc.) to co-ordinate action on coastal management issues.	1.1.3; 1.4.1	Coordinator Natural Resource Management to liaise with other Teams and State Agencies as necessary.	Number of times duplication avoided per 4 years (i.e. over the Delivery Program timeframe).	Staff Time.	As needs basis.

Key to Delivery Program Strategies 2017-2021 - Integrated Planning and Reporting (IP&R)

Strategy No.	Service Name	Service Goal
1.1.1	Biodiversity Management	To protect and manage the environment and natural beauty of the Tweed for current and future generations.
1.1.2	Bushland Management	To manage bushland on land owned or under the care and control of Council.
1.1.3	Coastal Management	To protect and manage the use and quality of the Tweed's beaches and foreshores.
1.4.1	Strategic Land-use Planning	Plan for sustainable development which balances economic, environmental and social considerations. Promote good design in the built environment.
2.2.1	Animal Management	To provide effective and responsible care, management and public education for companion animals such as pet dogs and cats.
2.2.2	Communications	To inform, educate and engage the public about Council and community activities.
3.1.10	Pest Management	To manage and reduce the environmental and public health impacts of pest animals.
3.2.7	Parks and Gardens	To provide and manage quality and accessible public parks and gardens for the enjoyment and well-being of the community and visitors to the Tweed.
3.3.4	Roads, traffic, footpaths and cycleways	To provide and maintain a network of roads and bridges, footpaths and cycleways that is safe, efficient and accessible.

3.5 Coastal Management Strategy for the Kingscliff Hazard Protection Precinct

A coastal management strategy for Kingscliff Beach between the Cudgen Headland SLSC and Kingscliff Beach Bowling Club for the next 30-50 years was detailed in the Kingscliff CRMS (BMT WBM, 2015). Actions from this strategy to be completed over the next 5-10 years have been incorporated into the CZMP Implementation Schedule, including:

- **Action KD5:** Upgrade the Kingscliff Beach Holiday Park seawall, as part of the Kingscliff Foreshore Renewal Program, with the seawall design to improve public access and amenity, such as with stepped seating and a cycleway along the crest;
- **Action KD2:** Sand nourishment with local sand sources, to remediate erosion in areas of high public access demand (including in the adjacent Passive Community Use Precinct) and to compensate for edge erosion effects from the seawall. The intention is to introduce to the sediment compartment a volume of material that is equivalent to that which would have been released as a result of ongoing shoreline recession (including Sea Level Rise; see PART B Appendix H – Sand Nourishment Calculations). Therefore, despite the fixed location of the shoreline following the construction of the proposed concrete and rubble mound seawalls, the equivalent volume of material is available to nourish down drift, northern areas;
- **Action KD3:** Determine preferred option for extraction of sand from Area 5 of the Tweed River (downstream of Barneys Point Bridge), for use as sand nourishment. The action shall provide an interim sand nourishment source of up to 660,000 m³ to support environmental beach amenity and reduce the edge erosion effects of the seawall on Kingscliff - Dreamtime Beach, until an additional large-scale nourishment program is investigated in 2030 (see Section 3.5.1);
- **Action KD4:** Re-establishment of a coastal dune along the foreshore of Faulks Park and Lions Park (within the adjacent Passive Community Use Precinct), using sand from local sand sources (as above). This action is complete for Faulks and Lions Parks. From 2015 to 2017, 47,000m³ of sand dredged from Terranora Inlet and Cudgen Creek was placed on Kingscliff Beach by NSW Department of Industry – Lands.;
- **Action KD7:** Implement a “rolling vegetation easement” that shall incidentally facilitate dune roll back particularly in Jack Bayliss Park (within the adjacent Passive Community Use Precinct) that is already experiencing erosion in response to the hazard protection works to the south; and
- **Action KD6:** Upgrade of the vertical piled seawall in front of Cudgen Headland SLSC, which shall additionally allow for refurbishment and life extension of the SLSC to around 2050.

3.5.1 Actions beyond this CZMP in the Hazard Protection Precinct

A number of risks to the Kingscliff - Dreamtime Beach foreshore, particularly in the Hazard Protection Precinct (and incidentally in the adjacent Passive Community Use Precincts), are unlikely to be abated within the timeframe of this CZMP (i.e. the next 5-10 years), and as such, consideration needs to be given to works and actions that extend beyond this version of the CZMP.

The Kingscliff CRMS recommended a protection strategy for the Hazard Protection Precinct up to 2050, given the existing status of protection works. The majority of actions in the Implementation Schedule of this CZMP will provide for this protection strategy up to 2050, with the understanding that the beach in front of the hardened foreshore will reduce in response to coastal processes. That is, in the absence of a formal and substantial beach nourishment program, there will be increasing periods of diminished beach amenity between Cudgen Headland SLSC and Kingscliff Beach Bowling Club. Future sea level rise will exacerbate this, although up to 2050, the extent of sea level rise and associated shoreline response is expected to be limited.

Two key actions are recommended in the years beyond this CZMP:

(1) **Large-scale Sand Nourishment Program to be investigated by 2030.**

The small scale nourishment program included in this CZMP is intended to redress temporarily lost beach amenity and provide mitigation for the sand locked in behind the seawall. It is not expected to maintain a suitable sand buffer for protection purposes.

A large scale nourishment program is needed to provide a sand buffer for protection and amenity. Given the range of actions to be implemented over the next 10 years, and their potential to redress at least some of the erosion issues at Kingscliff, it is recommended that a large scale nourishment program be investigated after these actions have been implemented, by say 2030 (i.e. in the next iteration of the CZMP).

The investigation of sources for large-scale sand nourishment may include, but will not be limited to, the Tweed Sand Bypass System or offshore sources.

Such a program may also potentially extend the trigger point timeframe for reconsidering the long term approach in this precinct beyond 2050. It is also noted that initial feasibility investigations for a large-scale sand nourishment program have already been completed.

(2) **By 2050, re-assess the long term strategy for the Hazard Protection Precinct, considering all options, from continued protection to retreat and relocation.**

The year 2050 is recommended as an appropriate “trigger” to re-evaluate the full suite of options, from hard-protection through to retreat and relocation. The year 2050 will generally reflect the end of life for existing and potential new foreshore development, and will provide sufficient time to enable a better appreciation of actual shoreline response to expected sea level rise and the associated impacts on beach amenity at Kingscliff. The beach sand monitoring program action in this CZMP will be a vital component for re-assessing the short and long term strategy for managing Kingscliff Beach.

4 Plan Review and Revision

The Kingscliff - Dreamtime Beach CZMP requires evaluation and reporting regarding the success of its implementation, and thus the success of managing existing and future coastal risks. Where implementation performance is sub-optimal, the evaluation process should identify contingencies to remedy the situation.

This CZMP is the second formal iteration of coastal management planning for Kingscliff and Dreamtime Beaches. It is intended that the CZMP, and the studies that underpin it, shall be revised every 5-10 years.

Council will review and transition this CZMP to a Coastal Management Program under the *Coastal Management Act 2016* by December 2021. It may be incorporated into a whole of Tweed coastline Coastal Management Program.

4.1 Annual Internal Communication and Implementation Audit

The importance of internal communications within Council cannot be over emphasised in the success or otherwise of implementation of CZMPs. To support the integration of this CZMP with Council's day to day operations, it is recommended that 12 months after the CZMP is adopted, and henceforth at yearly intervals, key Council Staff responsible for its implementation and the regional OEH Coastal representative undertake an internal workshop to gauge the status of adoption of the CZMP and general understanding of its objectives within Council. The workshop would include a refresher of the CZMP contents, to reinvigorate existing staff and for new staff.

4.2 Annual Report: Linking Review of Implementation of CZMP Actions with the IPR Framework

Council delivers an Annual Report to document its progress in implementing the Delivery Program and Operational Plan activities over each financial year period. Performance indicators are included for each action in the Operational Plan.

In the Implementation Schedule of this CZMP, each action has been given a performance indicator over a particular timeframe. This can be used to feed actions into Council's Delivery Program and Operational Plan or longer term Financial Plan. The performance measures shall also be used to gauge whether the actions have been implemented or not, which can then be reported in the Annual Report. This provides for a yearly evaluation of the implementation status of each action in the CZMP.

Where actions have not been included in the IPR Framework, a yearly evaluation of those CZMP actions by Council's Natural Resource Management Coastal Team is recommended.

If it is determined that an action has not been implemented in accordance with the nominated performance indicator and timeframe, then one or both of the following contingencies should be adopted:

- Determine the cause for the delay in implementation. If delays are funding based, then seek alternative sources of funding. If delays are resource-based, seek additional assistance from stakeholder agencies and / or consider using an external consultancy to coordinate implementation of the action(s); and
- Modify and update the CZMP to reflect a timeframe for implementation of the action that is more achievable. The revised Plan would need to be endorsed by all relevant stakeholders and agencies responsible for implementation.

4.3 Bringing the Plan into the new CMP Framework

As noted in Section 1.3.1, the NSW Government is currently undertaking reforms of the Coastal Management Framework in NSW and it will be necessary for this CZMP to be integrated into the new format by 2021. The NSW Government has indicated that existing certified CZMPs will be able to be fast-tracked into the new framework, to avoid discarding the existing valid work and retain momentum for existing actions.

Under the new framework, CZMPs will become coastal management programs (CMPs), which shall be implemented via the Integrated Planning and Reporting (IPR) Framework. Links between actions in this CZMP and the objectives and strategies of Council's existing Delivery Program have been given in the Implementation Schedule, to assist in transferring this CZMP into the new format.

4.4 Plan Review: Success of CZMP Actions in Mitigating Risk

A review should be conducted after five years to measure the performance of the Plan in terms of actually managing and reducing the risks to the community associated with existing and future coastal hazards. That is, 'how has the Plan made a difference?' and 'has the level of residual risk been reduced?'. Given that the CZMP will need to be brought into the new CMP format by 2021 (see Section 4.3 above), this review and update could be conducted in concert with reformatting the plan at that time.

The main mechanism for gauging whether the Plan has been successful is to re-evaluate the risks through a follow-up risk reassessment process. As for the first risk assessment, all of the existing controls that assist with managing current and future risks should be included when assessing the level of risk.

There are two specific questions to be answered:

- Has the level of risk changed? (including for those risks in this plan that are currently assessed as low); and
- Have the extreme or high risks been adequately managed / mitigated? (i.e., has the level of risk been reduced to a tolerable level through management?).

If it is determined that the risks have not been adequately managed / mitigated, or that new intolerable risks have arisen, the following contingencies should be adopted:

- Carry out a formal review of the implemented management strategies, identifying possible avenues for increasing the effectiveness of the strategy in managing the risks along the coastline (including new risks);
- Commence implementation of additional/back-up management strategies that may assist in meeting the objectives of the Plan (possibly 'fast-tracking' some longer term strategies as necessary);
- Reconsider the urgency of management for key risks. For example, accommodating future changes may no longer be feasible, and upscaling from passive to active management may be needed, e.g. shifting from development controls to planned retreat, asset relocation etc.

Any such changes to the Plan would need to be endorsed by the stakeholders and relevant government agencies, as well as the public.

5 References

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