

EXECUTIVE SUMMARY

The east coast of Australia has become the most desirable place in the country to live, and the Tweed coastline is one of the most popular and fastest growing stretches of the coast. Visitors to the Tweed coast come from within Australia and overseas, as it is located in a world renowned tourist area that stretches from Byron Bay to the Sunshine Coast of Queensland.

The Tweed coastline offers a relatively natural and relaxed environment, particularly when compared to the neighbouring southeastern Queensland coast. This coastline is highly valued for these features by its residents, and by a regional population that extends well beyond the boundaries of the shire. Many domestic tourists are attracted from interstate to this naturalness, which has been preserved by the fact the majority of existing development is not visible from the scenic beaches and headlands.

Responsible for the management of the Tweed coastline, Tweed Shire Council must manage the coast in a sustainable manner into the future, balancing natural, cultural, social and economic values. This Tweed Shire Coastline Management Plan provides Council with an integrated management planning framework that aims for a balance between the long term use of the coastline and its conservation. Implementation of the prioritised strategic actions within the Plan, over time, will guide the improvement of coastline facilities and infrastructure. The Plan has been designed to cater for users of all ages and abilities, enhance the amenity and functionality of the coastline, and assist in protecting public assets against coastal hazards.

Tweed Shire's coastline was formed geologically over millions of years, and influenced significantly in more recent time by human activity on the coastline's basic natural environment. The coastline was formerly the exclusive home of the Bundjalung Aboriginal people, and remnant physical evidence of their activities is preserved. With European settlement, however, the coastline has been extensively sand mined over the past 60 years, which has permanently altered the beach profile. Today, the coastline forms the setting for the growth of the Shire's future population.

This Plan applies to the Shire's 37 kilometre coastline that stretches from the border with Byron Council in the south, to the Queensland border at Point Danger in the north. It includes a seaward boundary of the near-shore marine areas and a landward boundary that includes all lands likely to be impacted by coastline hazards plus relevant Crown lands.

In NSW, the Coastline Management Manual (1990) provides the management framework that requires planning factors, such as social, economic, recreational, aesthetic and ecological issues, be taken into consideration along with coastline hazard and beach amenity requirements, when making decisions regarding coastal management and development. These requirements are reinforced in the NSW Coastal Policy (1997). This Plan has been prepared in accordance with these guidelines and other State Government policies.

The coastline hazards and underlying coastal processes affecting the Tweed Shire coastline have been identified and defined by the *Tweed Shire Coastline Hazard Definition Study* (TSC, 2001). The Study delineates the landward extent of the hazard zones for the Immediate, 50 year and 100 year planning timeframes. Of the natural processes investigated, the significant issue identified and mapped for the Tweed Coastline Management Plan project is the potential for coastal erosion and foreshore recession. In assessing the risks to existing development, it has been determined that the 50 year planning period was appropriate. In assessing risk to undeveloped land, a 100 year planning period has been adopted.

While the majority of the coastal hazard risks on the Tweed coastline do not presently warrant any significant structural mitigation measures, the beachfront development at Kingscliff is recommended for protection through the extension of the existing seawall. Sand nourishment is integral to this strategy for maintaining beach amenity in accordance with the principles of Ecologically Sustainable Development (ESD), as directed by the NSW Coastal Policy (1997). The estimated capital cost of this strategy is over eight million dollars.

While coastal hazards at Cabarita Beach within the 50 year planning period do not warrant any significant protective works, a combination of environmental planning (planned retreat), development control (requiring deep piled foundations) and hazard line review within 10 years, are required for the beachfront properties at Cypress Crescent, Palm Avenue and Pandanus Parade.

To achieve a more sustainable use of the Tweed coastline as a whole, it is a high priority for Council to continue its integrated planning and management of the individual beaches and coastline reserve that make up the Tweed coastline. This has been recently initiated with the construction of a continuous coast cycleway/walkway and the provision of bus shelters for public (or private) transport. Further essential planning and integrated management strategies recommended within this Plan include:

- improving the linkages between the coastal cycleway/walkway with activity nodes, villages and the beaches;
- preparation of Locality Plans for key locations, or activity nodes, and adjoining streets, to provide implementation of the Coastline Management Plan in regard to planning of shade, shelter, recreational and visual amenity aspects.

An integral part of this is the integration of existing Plans of Management, which include areas of the coastline covered by the Coastline Management Plan. Some of these plans may need to be updated to ensure the guiding principles of the Coastline Management Plan are included in such Plans of Management. These Plans of Management include the Draft Tweed Coast Reserve Plan of Management; Tweed Coast Estuaries Management Plan; Draft Duranbah Beach Dune Management Plan, numerous Vegetation Management Plans and SEPP 26 Management Plans;

- retention of the 7(f) zone in its current alignment;
- all new tourist and residential developments to be located landward of the 7(f) zone or landward of the 100 year hazard line where the 7(f) zone does not apply;
- where necessary, a Coastline Development Control Plan (DCP), or revised DCP 48 and 51, to address the high aesthetic and recreational value of the coastline, the desired character of the coastline corridor, the preservation of views, and the height and scale of future development;
- the preparation of a Vegetation Management Plan to confirm strategic principles and priorities for landscaping the coastline corridor; and
- review of Permit Holder Vehicle (4WD) areas on stretches of the coastline that can no longer support such activities in light of the increased population pressures associated with the beaches.

The time frame for the program of works identified by the Coastline Management Plan is in excess of 15 years and up to 20 years. Within this 20 year time period, priorities and completion timeframes have been set for all works and actions relating to the Tweed Coastline Management Plan. The Plan also makes provision for a review and reporting process to enable the broader community to be informed and proposed actions and priorities refined as necessary.

The Coastline Management Study and Plan was on public display for twelve (12) weeks between 28 June 2004 and 17 September 2004. During that period comment from the community and Government agencies was sought. Following the display period, submissions from the community and Government agencies were reviewed and the Plan has been modified, where necessary, in consultation with the Tweed Coastal Committee. This document has been finalised for adoption by Council and the relevant State Minister.

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1.0 BACKGROUND AND PROCESS

1.1 INTRODUCTION

Severe coastal storms in the late 1960s and 1970s focused attention on the NSW coastline as houses, roads and infrastructure were lost or threatened by the sea. The NSW Government responded to these events by undertaking a number of investigations to gain an understanding of the coastal processes and the coastline trends for the far north coast of NSW.

Coastal storms in May 1996 and mid 1999 again highlighted the threat to developments, particularly on the Tweed coast. Since then it was recognised that much of the early coastline hazard advice for the Tweed (early 1980s) required updating. Together with continuing development pressures and the need to protect and improve the coastline values and assets, it was determined that a balanced, integrated and sustainable Coastline Management Plan for the Tweed Shire is required.

The 37 kilometre long Tweed coastline comprises long sandy beaches separated by rock headlands that control its coastal alignment. The beaches extend over 96% of the coastline, with the remainder taken up by the rock headlands, the Tweed River entrance and the three minor estuary entrances of Cudgen, Cudgera and Mooball Creeks.

The Tweed Shire Coastline Management Plan provides a management framework for its entire coastline, which is bounded by the southern and northern extremities of the Tweed Shire. The seaward and landward boundary is variable and includes the near-shore marine areas and a landward boundary that includes all lands likely to be impacted by coastline hazards as well as relevant public lands.

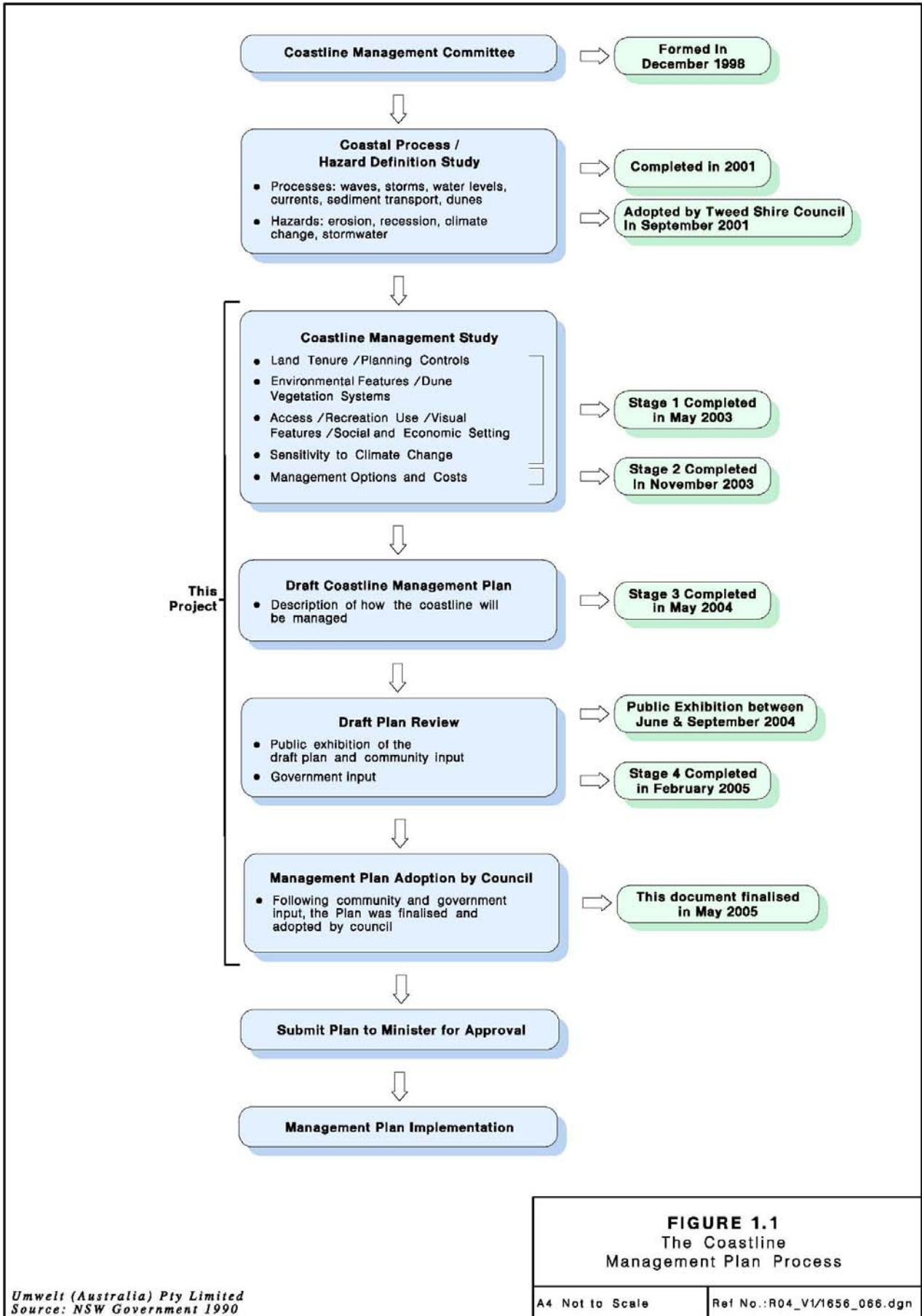
1.1.1 The Coastal Management Framework

The three spheres of government (Commonwealth, State and Local) share responsibility for management of the Australian coastal zone, its resources and the offshore waters. The legislative basis, or management framework, for planning and management of the land area of the coastal zone in New South Wales (NSW) is provided by the State Government, and Local Government is responsible for the day-to-day decision-making.

In 1988 the NSW Government adopted the Coastline Hazard Policy with the primary objective to reduce the impact of coastline hazards on owners of private and public land. The Coastline Management Manual (1990) was released with the Hazard Policy in order to provide local Councils with a better understanding of coastal processes, hazards and coastline management so that balanced, merit based decisions could be reached. The Manual sets down a management system that requires other planning factors, such as social, economic, recreational, aesthetic and ecological issues, be weighed along with coastline hazard considerations and beach amenity requirements, when making decisions regarding coastal development.

The application of the Coastline Management Plan is given direction through the NSW Coastal Policy 1997. The Policy provides guidance about a range of objectives for the implementation of the principles of ecologically sustainable development (ESD) in the coastal zone.

The steps involved in formulating the Tweed Shire Coastline Management Plan are depicted in **Figure 1.1**. In broad terms, they include:



1. Establishing a coastline management committee. The Tweed Coastal Committee was formed in 1998, under the stewardship of Tweed Shire Council (TSC), with technical assistance from State agencies and representatives of the local community.
2. Identifying the type, nature and significance of the various coastal processes and hazards that affect the area of interest (Coastline Hazard Definition Study). This study, undertaken by WBM Oceanics Australia on behalf of the Committee, was completed in 2001 and was adopted by Tweed Shire Council in September 2001.
3. Conducting a Coastline Management Study to develop management objectives and consider all feasible management options whilst also assessing the social, economic, aesthetic, recreational and ecological issues associated with land uses of the coastline. (In this instance, the Coastline Management Study was prepared in two stages as described further in **Section 1.1.2.**)
4. Preparing a Coastline Management Plan consisting of the best combination of options for dealing with the various social, economic, aesthetics, recreational, ecological and hazard issues and problems.
5. Adoption of the Plan by Tweed Shire Council and approval by the Minister for Infrastructure and Planning, Minister for Natural Resources.
6. Implementation of the Plan.

Detail of the range of other relevant policies and legislation underlying the NSW coastline management framework is provided in the *Tweed Shire Coastline Management Study Stage 1 - Values Assessment* report.

Development of the Plan has been overseen by the Tweed Coastal Committee. The four stages leading to the development of the final Coastline Management Plan are detailed in **Section 1.1.2.**

1.1.2 The Tweed Shire Coastline Management Plan Project

The Tweed Coastline Management Plan has been developed in four stages. Stage 1 (*Tweed Shire Coastline Management Study Stage 1 - Values Assessment* report) identified the values that make the Tweed coastline important in a local, regional and national sense, and explored the issues that needed to be addressed to maintain those values. Having quantified both the coastline hazards and coastline values of the Tweed, the next stage was the development of management objectives and identification of management options. This culminated in the development of the Coastline Management Study (Stage 2).

The Draft Coastline Management Plan (Stage 3), was developed to provide strategic and practical guidance for future management of the coastline. It was placed on public exhibition during 2004 and comments from the community and Government agencies were sought.

Stage 4 involved review of submissions and modification of the Draft Plan, where necessary, to produce this document.

The Plan has been prepared in accordance with the State Government's Coastline Management Manual (NSW Government 1990) and will facilitate local government access to joint funding programs. Having an adopted Coastline Management Plan is an important consideration for the State Government when it is prioritising grant funding to local Councils through the Coastal Management Program. The Program is administered by the State

Department of Infrastructure, Planning and Natural Resources (DIPNR). Funding is discussed further in **Section 3.1**.

1.2 STAKEHOLDER CONSULTATION

1.2.1 Tweed Coastal Committee

The preparation of the Coastline Management Study and Plan was supervised by the Tweed Coastal Committee. The Committee was established by Tweed Shire Council as an advisory committee to Council and to provide broad representation of local and State Government authorities, coastal user groups and community conservation interests in planning for the sustainable use of the Tweed coastal zone. The preparation of the Coastline Management Study and Plan provides opportunities for Council and the community to create a partnership with the NSW Government to meet the objectives of the NSW Coastal Policy (1997).

1.2.2 Community Input

Community input to the development of the Management Plan is fundamental in ensuring that the wide range of community views are taken into consideration and that a sense of ownership is developed amongst community members. To this end four community workshops were held to discuss issues and potential management options for the coastline and input was received from the community throughout the preparation of the Study.

In October 2002, Council's consultants conducted the first community workshop. This workshop provided the community with an opportunity to contribute to the development of the Study and Plan early in the planning process. Local residents and coastline users who attended the workshop were asked to describe how they use the coast and the features of the coastline that are important to them.

A second and third workshop were held in May 2003, on consecutive evenings, during the Management Study compilation, to confirm the issues and management options before finalisation of the Management Study. A discussion paper was developed to assist the community in appreciating the hazard management options available, which also formed the basis for the discussion at the workshops. The *Discussion Paper: Tweed Shire Coastline Management Hazard Options* was available prior to the workshops.

The fourth community workshop took place in December 2003. The Draft Tweed Shire Coastline Management Study Stage 2 - Management Objectives report was used as the basis for discussion at the workshop. One aim of that discussion was to gauge community preferences for the numerous management options proposed in the report, to assist in the preparation of the Draft Coastline Management Plan.

The Draft Coastline Management Plan and Study was placed on public exhibition from June to September 2004. All submissions received by TSC regarding the Draft Plan were reviewed and, where necessary, the issues raised have been incorporated into the final revision of the Plan.

1.2.3 Tweed Shire Council

In addressing issues and developing management options for the coastline, there has been constant liaison with key Council staff who are responsible for development and future management of the coastline. This contact has provided a valuable insight into the issues and resources required to manage the coastline.

1.2.4 State Government

There are numerous State government authorities with management and regulatory responsibilities relevant to the Tweed coastline. These authorities have been directly consulted where necessary, throughout the development of the Plan. Of these authorities, the key stakeholders include relevant sections of DIPNR, Department of Lands, NSW Fisheries, and the Department of Environment and Conservation (DEC), which incorporates a Division that was previously known as the NSW National Parks and Wildlife Service.

2.0 KEY FINDINGS OF THE MANAGEMENT STUDY

2.1 COASTLINE VALUES AND SIGNIFICANCE

The *Tweed Coastline Management Study Stage 1 - Values Assessment* report identified the values that make the Tweed coastline important in a local, regional and national sense, and explored the issues and quantified the coastline hazards of the Tweed, which need to be addressed to maintain those values. The values and issues have been identified from the results of a community workshop, the consideration of Council and regional policies, and discussions with relevant Council and State agency staff.

The Tweed coastline has a number of outstanding features that contribute to it being highly valued by residents and visitors to the area, which include the following:

- The coastline occupies a unique location on the Australian east coast. It is located in a world-renowned tourist area that stretches from Byron Bay in the south, to the Sunshine Coast of Queensland in the north. Due to the largely undeveloped and relatively natural coastline, the Tweed coastline offers a vastly different and more relaxed experience compared to the south eastern Queensland coast.
- It is valued by a regional population that extends well beyond the boundaries of the Tweed Shire local government area. Many domestic tourists attracted from interstate and more southern sections of NSW visit and stay on the Tweed coast.
- The natural state of the coastline means that along the majority of the coast existing development cannot be seen from the beaches and headlands. This adds to the natural amenity of the coastline and is highly valued by its residents.
- For a long time the regional economy of the Tweed relied on the tourist industry during holiday seasons as the main driver of growth and employment. While the growth of the tourist industry will continue, the permanent residency is now rising rapidly.
- The Tweed coastline was formerly the home of the Bundjalung Aboriginal people, and remnant physical evidence of their activities is preserved. Many of the Shire's towns and villages derive their names from the languages of the local Aboriginal people.
- The coastline supports some significant natural assets such as Nature Reserves and State protected wetlands and rainforest. The dunal vegetation is a significant part of the coastline's natural amenity.

2.2 COASTLINE HAZARD ASSESSMENT

The coastline hazards and underlying coastal processes affecting the Tweed Shire coastline have been identified and defined by the *Tweed Shire Coastline Hazard Definition Study* (TSC, 2001). The Study delineates the landward extent of the hazard zones for the Immediate, 50 year and 100 year planning timeframes. A summary of the prevailing coastline hazards is contained in Section 4.0 of the *Tweed Coastline Management Study Stage 1 - Values Assessment* report.

Of the natural processes investigated in Council's *Hazard Definition Study*, the significant issue identified and mapped for the Tweed Coastline Management Plan project is the potential for coastal erosion and foreshore recession. In defining the erosion hazard, the *Hazard Definition Study* took account of uncertainty in estimating future erosion and, to assist coastline management decisions for planning purposes, the study recommended the

application of a 'best estimate' definition of the erosion hazard. This has been adopted for this Plan as follows, for the planning periods that were mapped in the *Hazard Definition Study*:

presently developed areas:	50 years;
future developments:	100 years.

Therefore, in assessing the risks to existing development, Council and DIPNR determined that the 50 year planning period was appropriate. In assessing risk to undeveloped land, a 100 year planning period has been adopted.

There are various methods of dealing with coastal hazards and threats, including planning for environmental change, applying development controls and undertaking civil engineering works. The choice of management options is guided by the State Government's Coastal Policy 1997, which has the objective of managing the coast in an ecologically sustainable way. It is worth noting that current State Government policy strongly advocates the protection and maintenance of beach amenity and access when dealing with coastline hazards.

The various coastal management options commonly available in NSW (after NSW Coastline Management Manual, 1990), were detailed in Section 4.0 of the *Tweed Shire Coastline Hazard Management Options - Discussion Paper* (Umwelt 2003a).

The majority of the coastal hazard risks on the Tweed coastline do not warrant any significant structural mitigation measures (seawalls, groynes, breakwaters, etc) in the short term, except for the beach at Kingscliff. The recommended coastal hazard management option for Kingscliff is discussed in detail in **Section 3.2.4**. A combination of environmental planning, development control, dune management measures, and routine coastline monitoring are recommended for the remaining beaches. The strategies are described in more detail in **Section 3.2**.

2.3 CURRENT USES AND CONFLICTS

2.3.1 Current Land Use

The entire shoreline of the Tweed coastline is in public ownership. About 31.5 of the 37 kilometres of coastline in the Tweed Shire is currently Crown Land, most of which is under the control of TSC and Tweed Coast Reserves Trust, with 5.5 kilometres of the remainder under the control of the DEC, in Cudgen, Wooyung and Billinudgel Nature Reserves.

The majority of coastal Crown Land is part of the Tweed Coast Reserve, which generally extends from the mean low water mark (MLWM) of the Pacific Ocean to the eastern boundary of the Tweed Coast Road, as well as a number of areas west of the Coast Road south of Hastings Point and Pottsville.

The Crown Lands currently occupied by the coastal Holiday Parks (or identified for Holiday Park extension) have been excluded from the reserve and separately reserved for the public purpose of Holiday Park. They are managed under separate business plans. The coastal Crown Holiday Parks include Fingal Head Holiday Park, North Kingscliff Holiday Park, Kingscliff Main Beach Holiday Park, Hastings Point Holiday Park, Pottsville North Holiday Park and Pottsville Holiday Park.

In addition, the South Kingscliff Gateway Crown Reserve (Lot 490) will be developed for tourist facilities and services.

Recently, a large section of the Fingal Peninsula was granted to the Tweed Byron Local Aboriginal Land Council, with areas to the north and south of Fingal village being granted. Landward of the Crown Reserves there are “pockets” of public land owned and managed by TSC, classified as either Community or Operational Land under the *Local Government Act 1993* (as amended).

There are also areas of privately owned residential land that abut the public lands, thus restricting public access at these locations. This occurs in the developed towns on the coastline at Fingal Head and to a lesser extent at Cabarita Beach, Hastings Point and Pottsville.

Cook Island is located about 600 metres offshore from Fingal Head. Cook Island Aquatic Reserve includes the waters within and around Cook Island to a 500 metre radius from a survey marker on the island (approximately 78 hectares).

2.3.1.1 Land Use Planning

There are numerous land use planning instruments and policies relevant to the current and future management of the Tweed coastline. Those with direct influence in management of the coastline include:

- Tweed Shire 2000+ Strategic Plan;
- Land Zoning:

The majority of the immediate coastline has been zoned under the Tweed Local Environmental Plan 2000 (TLEP 2000) for environmental purposes or open space/recreation purposes.

- Development Control Plans, such as:
 - Draft DCP 8 - Development of Land Liable to Coastal Erosion;
 - DCP 11 - Kings Beach;
 - DCP 16 - Subdivision Manual;
 - Draft DCP 20 - Black Rocks;
 - DCP 21 - Searanch;
 - DCP 43 - Kingscliff;
 - DCP 45 - Socio-Economic Impacts of Development;
 - Draft DCP 46 and Plan of Management - South Kingscliff Gateway;
 - DCP 48 - Tweed Coast Building Heights;
 - DCP 51 - Tweed Coast Strategy.
- Section 94 of the *Environmental Planning & Assessment Act 1979* (EP&A Act), which gives Council the power to levy contributions from developments for public services and public amenities required as a consequence of that development.
- Crown Lands Management Policies.

2.3.1.2 Land and Water Management Stakeholders

The key stakeholders with direct land ownership and management responsibilities are:

- The Department of Lands - responsible for the administration of the *Crown Lands Act 1989* (CL Act), and all dealings involving Crown Land.
- Tweed Shire Council - caretakers of the relevant Crown Lands includes the establishment and maintenance of community facilities and infrastructure, strategic planning and development control and recreation service provision.

TSC has been appointed as corporate manager of the Reserve Trusts to enable the Crown Land on the Tweed coast to be managed in a consistent and holistic manner by one management body.

- The Tweed Coast Holiday Parks Reserve Trust and Tweed Coast Reserve Trust - manage the coastal holiday parks and the Tweed Coast Reserve respectively.
- Dunecare and Coastcare groups.
- The DEC, previously NPWS - are owners and managers of the Cudgen, Billinudgel and Wooyung Nature Reserves.
- NSW Fisheries - regulate the commercial fishing, and to a lesser extent recreational fishing activity in the State, and therefore the Tweed coastline.

2.3.2 General Recreational Demand of the Coastline

Recreation is probably the most popular use of the coastline and includes a wide variety of activities. The beaches of the Tweed Coastline are utilised by the local community and tourist population all year round. This usage is attributable to the climate of the North Coast and the natural and scenic values associated with the Tweed coastline.

Recreational demand was divided into the following issues and discussed in detail in the *Tweed Shire Coastline Management Study Stage 1 – Values Assessment* report:

- Access and Facility Provision;
- Off-Road Vehicle Beach Usage;
- Fishing - Commercial Fishing and Recreational Fishing;
- Public Safety;
- Companion Animals; and
- Residential Encroachment.

2.3.3 Specific Area Uses and Conflicts

Some uses and conflicts on the Tweed coastline are not as generic as discussed above. Uses and conflicts specific to certain areas or compartments of the coastline, mainly centred around a town or village, were discussed in **Section 5.3** of the Stage 1 Report.

2.4 FUTURE DEMANDS AND ISSUES

2.4.1 Whole of Tweed Coastline

Many demands and management issues were found to be relevant to the entire Tweed coastline, or a significant length of the coastline, rather than individual beach compartments or group of beaches. For this reason they have been grouped as “whole of coastline” demands and issues and discussed here in **Section 2.4.1**. Many of the whole of coastline demands and issues are addressed at a more strategic level, to provide unity in the management of the entire coastline.

A summary of the whole of coastline issues detailed in the Management Study is provided in **Table 3.2**. Those issues more relevant to specific beach compartments, or a group of beaches, are listed under the relevant individual beach areas in **Sections 3.1.3 to 3.1.7**.

2.4.1.1 Recreation

Recreation is considered in terms of the level of use and the capacity for coastal areas to sustain that use without detracting from the natural and social values.

The provision of formalised pedestrian and vehicular access is an important consideration in planning for the future demands on the coastline. Access near built-up areas requires careful consideration regarding such aspects as the number of car spaces to be provided. Car parking in Pandanus Parade, Cabarita Beach, for example, is currently inadequate, and Council has earmarked a potential site that may alleviate the congestion without impacting on the natural and scenic values held by the community. However, this may not always be the case and other means of providing access need to be investigated, such as improved public transport or link services between beaches.

The Tweed Shire Bike/Walkway Plan that has been proposed, and adopted in principle with Strategic Plan 2000+, is to extend from Kingscliff down to Wooyung in association with the upgrade of the Coast Road, and will considerably enhance the recreational value and scope for activities in the region. At present, the majority of the bike/walkway has been constructed. Further, such a pathway will help link beach accesses, and assist in the lessening of the demand for car parking spaces.

Public safety is also integral to beach access planning for the future demands of the population. An integral part of public safety is the role played by surf clubs. A number of surf clubs already exist and it is envisaged more will be required as the development of the coastline, particularly at South Kingscliff, continues. A surf life saving facility is currently proposed at Salt, South Kingscliff.

2.4.1.2 Water Quality

Water quality of the Tweed coast beaches is considered excellent, however, water quality in the Tweed River and coastal creek entrances is intermittently subject to high influxes of pollutants from their developed catchments. This does not appear to be a major problem at present, however, as the catchments are developed further, the creek entrances may be subject to reduced water quality, particularly after heavy rainfall events. Management of water quality in the Tweed River and coastal creeks is addressed by strategies within the estuary management plans for these waterways.

2.4.1.3 Heritage

Tweed Shire Council has initiated a Community-Based Heritage Study, under NSW Heritage Office guidelines. The main difference between the community-based heritage study and the conventional expert-based model is that the community is not just consulted, but is actively involved in researching and nominating items and in considering recommendations for their future management and promotion. The Fingal Head Lighthouse will need to be included in the Study, particularly due to its National significance level, and its association with the development of the Shire.

Tweed Shire Council is also in the process of gaining support across the relevant local government areas and state government agencies for a Regional Aboriginal Heritage Study. A key goal of the study will be to provide council with more certainty in decision-making processes in respect to development issues and aims to:

- identify sites and places in the region that are significant to the Aboriginal community;
- produce a public document that can be used as a strategic land use planning resource;
- improve public knowledge of Aboriginal cultural issues and minimise adverse impacts on sites or places of Aboriginal heritage; and
- involve the local Aboriginal community in all phases of the study process.

The initiation of such a Study will assist in the recording of local knowledge and protection of remaining sites from inappropriate development or vandalism in those areas that have not been sand mined.

2.4.1.4 Land Use and Development Potential

The majority of development on the Tweed Coast is to the west of the Coast Road, however, there are some areas zoned for residential and tourist purposes on the eastern side of the Coast Road:

- areas zoned for residential and tourist purposes on the eastern side of the Coast Road have management problems such as encroachment and coastal hazards;
- development pressures are increasing demand for the construction of community facilities including toilet blocks, car parks, surf life saving facilities and tourist accommodation/resorts; and
- NSW Coastal Policy 1997 supports ecologically sustainable development principles, retention of public access to foreshore areas, preservation of undeveloped headlands and protection of beaches and waterfront open space from over-shadowing.

2.4.1.5 Coastal Ecology

The extent of development along the Tweed's coastline is not currently expansive when compared to neighbouring Local Government Areas (LGAs), particularly the Gold Coast to the north. The population growth of the Tweed area is high and expected to continue. Such development brings pressure on the use of coastline resources, which may potentially impact on environmentally sensitive lands and the natural and scenic amenity valued so highly by the local community and tourists.

While the coastline was extensively sand mined over the past 60 years, the coastal Crown Lands have definite value as a wildlife corridor along the coast from Fingal Peninsula down

into Byron Shire. According to the Department of Land and Water Conservation (DLWC) (1997), the ongoing rehabilitation of this corridor with a suitable and diverse vegetation composition will enhance the value of these lands for habitat and biodiversity purposes.

2.4.1.6 Social and Economic Demand

The Tweed's coastline population represents a significant proportion of the Tweed Shire's population. Increased pressure for use of the Tweed coastline and the amenity it provides is predicted. This will be driven by anticipated urban growth, in particular from the retiree population, tourist development and, people's desire for a more secluded beach experience than is available in other regional coastal destinations.

The Tweed's beaches represent a social resource for the whole community and for visitors. There is, however, a notable absence of the region's young adult group. Presumably the bigger cities of southeast Queensland appeal more to this age bracket than the relaxed coastal villages of the Tweed, in conjunction with the lack of opportunities in the Shire. Whilst this is not an issue a coastline management plan can directly address, it is a social issue that needs consideration when addressing management options for the coastline.

There also appears to be a low level of public transport use along the coast. Many regional businesses, community and recreational functions are located in Tweed Heads and Tweed South. The public transport system also focuses on these centres which are not on the coast. The natural elongated geography of the coastline, with communities separated by considerable distances, makes it difficult to provide an efficient public transport service to the Tweed's coastline community. However, the provision of appropriate public transport will be integral to planning for the sustainable use of this coastline, particularly in relation to alleviating the need for large car parks.

The natural undeveloped state of the Tweed coastline increases its economic significance in terms of the tourism industry and should be maintained and enhanced to add to the future economic potential of the industry. These natural assets are most consistent with the development of extensive car parking areas immediately adjacent to the coastline.

2.4.2 Specific Areas

2.4.2.1 Point Danger - Fingal Head Area

Surfing at Duranbah Beach is expected by the community to continue to be the most popular recreational pursuit at that beach into the future. However, the beach and dunes of Duranbah Beach are subject to the Tweed River Entrance Sand Bypass Project (TRESBP) system, and Duranbah receives intermittent supply of sand as part of the current contractual arrangement between the Queensland and NSW governments. This supply of sand is aimed at catering for both ongoing beach amenity and surfing.

Letitia Spit is mostly vegetated and regularly used as nesting sites for turtles and wader birds. The Letitia Spit stretch of beach, between the Tweed River Entrance (South Head Beach) and Fingal Head, is ideally suited for management actions that protect these sites into the future, due to the relative isolation of this beach.

Access to the Fingal Head village is mainly by car, due to its relative isolation. The car parking area associated with the main access to the headland is inadequately managed to cater for future increases in visitation, particularly in peak periods. There is the potential for significant impacts on the neighbouring residences and public safety.

2.4.2.2 Kingscliff - South Kingscliff Area

The proposed increase in permanent residents and tourist accommodation at South Kingscliff will produce a demand on the natural environment, public facilities and open space that is difficult to predict at this stage. While TSC is currently developing a town planning strategy for South Kingscliff (DCP No 51 - *Tweed Coast Strategy*), it does not necessarily cater for the immediate to medium-term increase in beach usage that will come with the short term increase in local population. Demand for coastline infrastructure and public assets at Kingscliff and Cabarita Beach will also increase as residents from South Kingscliff look to these villages for provision of services and beach recreation that currently do not exist at South Kingscliff.

There is also a high potential for conflicts to arise in the beach off-leash dog exercise area at South Kingscliff in light of the proposed increase in population at South Kingscliff wanting to use the same stretch of beach.

2.4.2.3 Bogangar - Cabarita Beach Area

The Cudgen Nature Reserve is the main geographical feature that separates the South Kingscliff area from the Bogangar/Cabarita Beach community. However, there is little doubt that the services provided at Cabarita Beach will be utilised by the South Kingscliff population until the planned 'Kings Forest' development provides services and facilities to meet the demand.

There are redevelopment proposals underway for the Cabarita Beach Surf Life Saving Club building and Cabarita Beach Hotel. The impact of these relatively large-scale redevelopments on the already congested Pandanus Parade access to Cabarita Beach is a potential issue.

2.4.2.4 Hastings Point Area

Council proposes to extend the Hastings Point Dune Disposal System north of the existing site. While regular monitoring shows the operation continues to comply with EPA requirements, it is necessary to ensure public health and safety in the area and to inform the community of the system's compliance with health and safety regulations.

People often access the beach from the Hastings Point car parking areas via the Cudgera Creek entrance. The potential for people to get swept away in an ebb or flood tide of the creek entrance is a concern.

2.4.2.5 Pottsville - Wooyung Area

The remoteness and length of Mooball and Wooyung Beaches combined with the proposed increase in residents to the Pottsville area may make it increasingly difficult for Council and National Parks and Wildlife to police unauthorised activity along the coastline.

Further, the abovementioned population increase proposed for the area will place higher demands on the relatively small area for recreation at Ambrose Brown Park, as well as access to Cudgera Beach.

3.0 MANAGEMENT PLAN ACTIONS

The management actions detailed within **Section 3** have been drawn from the management options identified in the Coastline Management Study. The management actions in the Coastline Management Plan have been chosen as a result of liaison between Council and relevant government agencies and community input. Following public exhibition of the Draft Management Plan, comments from the community and Government agencies have been reviewed and, where appropriate, incorporated in this document, the final Coastline Management Plan.

It is envisaged that the full extent of the works identified by the Coastline Management Plan will take a few decades to fully implement, particularly in light of the long-term planning period for dealing with coastal hazards i.e. 50 and 100 year planning periods. In addition, the extent and detail of some works will not be able to be defined until, in some instances, strategic planning decisions are made and in other cases end land uses are determined.

Where works have been defined, indicative cost estimates have been prepared and these are provided in **Table 3.3**. Potential sources of funds to complete some of those works are discussed briefly in **Section 3.3.1**.

3.1 MANAGEMENT ACTION PLAN

3.1.1 Management Objectives

To ensure a balance between long-term utilisation and conservation of the Tweed Coastline, the nine goals of the Coastal Policy 1997 are proposed as the objectives for the Tweed Shire Coastline Management Plan. A set of secondary objectives, which have been developed by the Tweed Coastal Committee, have been used in the analysis of all proposed coastline management options. This set of objectives and secondary objectives is detailed in **Table 3.1**.

Table 3.1 – Management Plan Objectives

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.

Table 3.1 – Management Plan Objectives (cont)

Objective	Secondary Objectives
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 enable effective management.	8.1 To ensure that coastline information relevant to the Tweed 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: <ul style="list-style-type: none"> • LEP and DCPs • Estuary Management Plans • Urban Stormwater Management Plans 9.3 To ensure consistency with regional, State and National coastal zone policies.

3.1.2 Whole of Coastline Management Actions

Tweed Shire Council has the management responsibility of almost the entire coastline and as such, must manage and plan for the management of its beaches individually as well as components of a unique stretch of the NSW coastline.

The Coastline Management Study has revealed that there are numerous issues requiring holistic management by Tweed Shire Council, in conjunction with the relevant State agencies. The whole of coastline issues include the ongoing maintenance of existing infrastructure such as roads, car parks, surf clubs, public facilities and other structures. The cost associated with such maintenance is high and integral to maintaining the coastline facilities. However, management of the coastline requires more than the maintenance of structures, particularly in regard to coastal processes. Council must also manage for sustainable use of the entire coastline, providing safe access to all members of the community, and a range of recreational opportunities without deteriorating the natural and cultural environment of the coastline. The many issues relevant to the coastline include the management of the rock platforms at Fingal Head, Norries Head and Hastings Point, the increase in demand for lifestyle recreation, provision of additional picnic facilities, facilitation of appropriate commercial opportunities, maintenance of public access and the aesthetic quality of the coastline as a whole.

In addition, the rehabilitation of degraded environments has been identified as important in providing for the ecological and aesthetic amenity of the coastline. Tweed Vegetation Management Plans (VMs), Tweed Shire Bitou Bush Strategy and the SEPP 26 Management Plan have recently been developed for the rehabilitation of degraded coastal vegetation on the Tweed coast. These Plans address the need to manage the vegetation within specific sections of the coast in a more holistic manner. Through planning for the long-term management of the vegetation along the coast, the opportunity exists to create a well planned and linked coastline for use by all users into the future.

The 7(f) zone will be retained on its current alignment. This is despite the recent review of coastline hazards by WBM Oceanics (Tweed Shire Council, 2001) that indicates narrower projected band widths for areas subject to coastline hazards over the 50 and 100 year planning periods than when the 7(f) zone was initially delineated in the 1980s. The 7(f) zone provides a long-term buffer area for the management of undeveloped lands susceptible to coastal erosion. In terms of the precautionary principle and intergenerational equity, it is wise to maintain as wide a buffer of land as possible between the natural erosive forces of the sea and developed areas that may be threatened by coastline hazards in the future should coastal erosion proceed as predicted.

The 7(f) zone on its current alignment provides a long-term timeframe over which to accommodate coastline hazards as well as a natural buffer to enhance recreational (including long-term public foreshore access), visual amenity, ecological and environmental values of the zone.

At South Kingscliff, 87% of adjoining lands have been developed, or planned for development, with the 7(f) zone at its current alignment. There is little justification for realignment of the 7(f) zone for the remaining 13% of land.

The highest priority for the coastline as a whole is to continue the integrated planning and management of the individual beaches and coastline reserve that make up the Tweed coastline, that has been initiated recently with the construction of a continuous coast cycleway/walkway and the provision of bus shelters for public (or private) transport. This planning and integrated management includes:

- Where necessary, a Coastline Development Control Plan (DCP 48 and 51), to address the high aesthetic and recreational value of the coastline, the desired character of the corridor, the preservation of views, and the height and scale of future development.
- The preparation of a Vegetation Management Plan to confirm strategic principles and priorities for landscaping the coastline corridor.

- The need to integrate existing Plans of Management, which include areas of the coastline covered by the Coastline Management Plan. Some of these plans may need to be updated to ensure the guiding principles of the Coastline Management Plan are included in such Plans of Management. Example Plans of Management include the Tweed Coast Reserve Plan of Management and Estuary Management Plans for Cudgen, Cudgera and Mooball Creeks.
- European Heritage and Aboriginal Heritage Studies are adequately funded and to ensure proposals / Development Applications with the potential to greatly impact on the coastline values are referred to the Coastal Committee for comment and a consistent approach to coastline planning and management.
- Retention of the 7(f) zone in its current alignment.
- All new tourist and residential developments to be located landward of the 7(f) zone or landward of the 100 year hazard line where the 7(f) zone does not apply.

There is also a need for educational signage at the entrance to the rock platforms in conjunction with community education programs, to preserve the biodiversity of the Tweed coastline.

While there are increased expectations for greater pedestrian amenity, comfort and safety, throughout Australian coastal areas, the rapid growth and traffic related issues have begun to reduce these qualities. Car parking areas have created similar problems in reducing the amenity of pedestrian areas and displacing opportunities for pedestrians to enjoy the coastline, such as Pandanus Parade. An appropriate balance is needed between the requirements of through traffic, vehicular access and parking for coastline users and at the same time, maintaining the amenity of the coastline attractions.

Public transport access to the beaches, in conjunction with other actions, such as the linking of activity nodes and beaches through appropriate path/cycle ways, will assist in reducing the need for large car parks along the coastline, and cater for future demands. The Plan recommends a whole of coastline approach to integrating the provision of car parking and traffic flow with pedestrian amenity as the highest priority through amendment of relevant DCPs, retention of the 7(f) zone corridor, and projects such as the coastline cycleway. The provision of viewing platforms, for example, may assist in decreasing the need to find short to medium term parking close to the beach

There is the potential for complementary commercial activity or operations within beach foreshore and parkland areas to be considered by Council. Such operations may be as low-key as small “ice-cream carts” during peak visitation periods or organised ‘large-scale’ sporting events, such as beach volleyball. To ensure such proposals are assessed in accordance with the principles of this Plan, and where relevant, the Crown Reserve purpose, guidelines should be prepared for the management and operation of such facilities. The guidelines will need to include appropriate leasing and licensing arrangements, as well as providing for flexibility of control over uses in the coastline reserves by allowing only short to medium term leases or licences. Such flexibility needs to be able to meet changing needs for industry and activities within the coastline corridor, whilst maintaining the integrity of the designated purpose of public spaces.

Estimated annual maintenance costs for recreational assets along the Tweed coastline, such as seats, picnic tables, shelters, BBQs etc, is approximately \$135,000 or approximately 3.5% of the current value of the assets. Assuming a discount rate of 7%, it is estimated that annual maintenance costs for the coastal facilities will increase to about \$523,000/year over the next 20 years (A list of assets and maintenance costs were provided in the Stage 2 Report). These total amounts give an indication of the likely expenditure associated with maintenance of the

coastline's current recreational assets. This is intended to assist Council in appreciating and prioritising its maintenance or replacement of such structures in regard to those costs associated with possible new works recommended in **Section 3.1.3** and **3.1.7**.

The opportunities and constraints, values and issues associated with the whole of the coastline, and summarised in this Plan, have been drawn from the Coastline Management Study. The following list (**Table 3.2**) of key issues needs to be addressed to satisfy the Management Plan's objectives (referred to in **Section 3.1.1**). The objective to which each of the issues relates is also identified in **Table 3.2**.

Table 3.2 - Whole of Coastline Management Issues and Objectives

Issue	Objective No.
Large scale coastal urban expansion.	3 & 6
Sustainability of major tourism industry.	5
Uncontrolled 4WD access to beaches.	7
Recreation pressures on coastline facilities & infrastructure.	5
Provision of a Coastal Trail (walkway/cycleway).	7
Community based Heritage Study underway.	4
Comprehensive Coastal Assessment (CCA) underway with Tweed as Pilot Study.	9
Enforcement of appropriate coastline hazard zones for developed and undeveloped land.	2
Management of ecologically significant areas e.g. SEPP 14 - Coastal Wetland & SEPP 26 - Littoral Rainforest.	1 & 3
Appropriate liaison with DEC regarding land abutting Nature Reserves	9
Appropriateness of 7(f) zone	9
Public transport links along, as well as to and from, the coastline	7
Unauthorised use of companion animals, such as dogs, on all beaches	6
Residential encroachment and defacto privatisation of Crown Land, such as mowing, fencing outside private property, etc.	6

Specific management strategies and actions for the whole coastline and their associated priority, implementation responsibility, cost and performance measures are detailed in **Table 3.3**. These management actions have been derived from management options identified in the Coastline Management Study (Umwelt 2003a). The range of criteria considered for determining the most appropriate management actions for the coastline include:

- capital and maintenance costs;
- social, economic and environmental costs and benefits;
- potential to achieve funding for the proposed works/activities;
- ability to implement and likely timeframe for implementation; and
- community preferences identified through the consultation program.

Management options that were not considered feasible or warranted have not been included in the management actions listed.

Table 3.3 - Whole of the Coastline Action Plan**Legend to Table**

DA	Development Application	DL	Dept of Lands	Short	Within 5 years
DCP	Development Control Plan	PWC	Personal Water Craft	Medium	Within 10 years
DEC	Dept Environment & Conservation	SES	State Emergency Service	Long	15+ years
DIPNR	Dept Infrastructure, Planning & Natural Resources	*	Compatible with Tweed Coast Reserve Plan of Management	Ongoing	Required on ongoing basis

Action No.	Action	Priority	Responsibilities	Completion Timeframe	Indicative Capital Cost	Indicative Maintenance Cost (pa)	Performance Measures
To protect, rehabilitate and improve the natural environment							
WC1	Prepare a Vegetation Management Plan for coastal vegetation and fauna habitat rehabilitation and management including recommendations from existing plans	High	TSC, DEC, DL, TBLALC	Short	\$10,000	N/A	Vegetation Management Plan produced
WC2	Implement the Vegetation Management Plan	High and ongoing	TSC, DEC, DL, TBLALC	Short and ongoing	Unknown	Unknown	Plan implemented
WC3	Develop and implement a feral animal control program	Medium	TSC, Rural Lands Protection Board, DEC, DL, TBLALC	Medium and Ongoing	Unknown	Unknown	Feral animal control commenced
To recognise and accommodate natural processes and climate change.							
WC4	Finalise Emergency Action Plan (EAP) for coastal erosion hazards	High & Ongoing	TSC, DIPNR, SES	Short	<\$2,000	Unknown	EAP developed in conjunction with SES and DIPNR
WC5	Enforce development within hazard zones through adoption of revised draft Development Control Plan No 8 for coastline including: <ul style="list-style-type: none"> need for deep pile foundations for development approvals within the maximum 100 year hazard line; and limiting the intensity of redevelopment within the maximum 100 year hazard line. 	High	TSC	Short	>\$5,000	N/A	DCP revised and adopted by Council, and enforced during Development Approval
WC6	Routine coastline monitoring	Medium & Ongoing	DIPNR	Ongoing	N/A	Part of State Govt Program	Monitoring undertaken
To protect and enhance the aesthetic qualities of the coastal zone.							
WC7	Prepare a Vegetation Management Plan to confirm strategic principles and priorities for landscaping undertaken within the coastline corridor.	High	TSC	Short	\$5,000 to \$10,000	N/A	Plan developed and adopted by Council and implemented by Council

Table 3.3 - Whole of the Coastline Action Plan (cont)

Action No.	Action	Priority	Responsibilities	Completion Timeframe	Indicative Capital Cost	Indicative Maintenance Cost (pa)	Performance Measures
WC8	Empower Council lifeguards with the authority to fine offenders of unauthorised activities	Medium & Ongoing	TSC, SLSC	Medium	N/A	\$1,000-\$3,000 for training	Lifeguards' authority is increased and unauthorised activities decrease
To protect and conserve cultural heritage.							
WC9	A detailed management plan be compiled for the Aboriginal cultural heritage values along the coastline	Medium	TSC, TBLALC	Medium	\$20,000	N/A	Plan completed
WC10	Produce interpretive/educational material, such as interpretive signs, to illustrate Aboriginal lifestyle and history and how the landscape was used	Medium	TSC, TBLALC, DEC	Medium	\$20,000	\$2,000	Signs and material produced and installed or distributed
WC11	Continue to provide financial assistance for the community-based Heritage Study	Medium	TSC, Heritage Council	Short	>\$50,000	Unknown	Funding secured
To promote ecologically sustainable development and use of resources							
WC12	Increase Council ranger presence to police residential encroachment onto public lands	High & Ongoing	TSC	Ongoing	\$30,000	\$70,000 per extra ranger	Ranger numbers increased or Ranger visitation to coastline increased
WC13	Remove all encroachments onto public land*	High & Ongoing	TSC, DEC, DL	Ongoing	Unknown	Unknown	Offenders forced to remove encroachments
WC14	Remove and/or reuse elsewhere redundant infrastructure, fences, signage etc and replace with consistent design (or theme) infrastructure	High	TSC	Medium	>\$500,000	Unknown	Recycling opportunities investigated and implemented where possible. Replacement infrastructure/facilities designed with a theme that can be used along the entire coastline
WC15	View preservation from public and private lands should be investigated as part of any master plan compiled	High	TSC	Long	\$2,000	N/A	Investigation completed and findings incorporated into master plans
WC16	Explore themes for whole of coastline and individual areas to provide identity i.e. species of medium to large trees to identify prominent beach/park entry points	Low	TSC	Medium	\$5,000	\$1,000	Facilities and landscaping in highly visual areas designed with a theme that can be used either along the entire coastline or throughout and area/village
WC17	Construct coastline cycleway/walkway as currently programmed by TSC	Medium	TSC	Medium	>\$1.5M	\$10,000	Cycleway and links to beachside parks completed
WC18	Continue to support regional Coastcare facilitator	High & Ongoing	TSC, NRCMA	Long	N/A	\$2,500 and in-kind support	Funding and in-kind support secured

Table 3.3 - Whole of the Coastline Action Plan (cont)

Action No.	Action	Priority	Responsibilities	Completion Timeframe	Indicative Capital Cost	Indicative Maintenance Cost (pa)	Performance Measures
WC19	Assist Coastcare in promotion of their rock platform/ intertidal areas educational program, via Council media.	Medium	TSC, NRCMA	Medium	N/A	\$2,000 to \$4,000	Funding and in-kind support secured and promotion undertaken
WC20	Maintain bus stops installed, as programmed	High & Ongoing	TSC	Long	>\$300,000	>\$15,000	Maintenance program implemented and bus stops remain functional
To provide for ecologically sustainable human settlement.							
WC21	Greater enforcement of regulations and development conditions by relevant agencies, TSC, DEC, Department of Lands and DIPNR including protection of coastal vegetation	High & Ongoing	TSC, DEC, DL, DIPNR	Short and ongoing	Unknown	Unknown	Enforcement is increased, through increased presence, and number of offences are reduced
WC22	Develop and implement a strategy to combat illegal clearing of coastal vegetation	High	TSC, DL	Short	\$5,000	\$1,000	Illegal clearing strategy developed and implemented
WC23	Install new, and upgrade existing, signs regarding use of companion animals on beaches, in relation to Companion Animal Act	High	TSC	Long	\$500 per sign	<\$500 per sign	Signs are upgraded or replaced where necessary
To provide for appropriate public access and use.							
WC24	Regular maintenance program of access infrastructure	High & Ongoing	TSC	Long	N/A	Dependent on level of damage	Maintenance program of coastline assets devised and implemented in accordance with demand
WC25	Install appropriate warning signage in areas where access may be dangerous	High & Ongoing	TSC	Short	\$1,000 per sign	<\$1,000 per sign	Areas where access is dangerous are determined and appropriately signposted if amelioration of access is not appropriate
WC26	Formalise public beach access points and car park areas and close and rehabilitate all inappropriate car parking areas and public access points as part of the preparation and implementation of the Tweed Coastal Reserves Plan of Management	High & Ongoing	TSC, DL, with Dunecare groups	Short	\$ design	Dependant on end land use	Inappropriate areas determined, closed and rehabilitated
WC27	Identify locations for viewing platforms (including some access for all with associated car parks reserved for disabled) at intervals along the coastline as a part of the preparation of the Tweed Coastal Reserves Plan of Management	Medium	TSC, DL	Medium	\$50,000 per platform	\$5,000 per platform	Viewing platforms installed as appropriate

Table 3.3 - Whole of the Coastline Action Plan (cont)

Action No.	Action	Priority	Responsibilities	Completion Timeframe	Indicative Capital Cost	Indicative Maintenance Cost (pa)	Performance Measures
WC28	Develop a policy with regard to future car parking requirements for beach access on the Tweed Coast (urban and non-urban)	Medium	TSC	Medium	\$5,000	N/A	Coastal car park provision policy developed
WC29	Physically restrict unauthorised access points e.g. bollards, rocks and/or vegetation planting	Medium	TSC	Long	\$2,000 per access point	<\$2,000 per access point	Unauthorised access points not deemed suitable for future formalisation are closed and maintained
WC30	Rationalise and standardise regulatory signage	Medium	TSC	Medium	\$500 per sign	\$50 per sign	Signs installed and illegal camping reduced
WC31	Increase enforcement of unauthorised vehicle use on beaches	High & Ongoing	TSC	Medium	N/A	Administrative Cost	Unauthorised activity decreases
WC32	Provide all-weather formal vehicular beach access points at preferred locations, such as designated Permit Holder Entry Points, and maintain signage about 4WD access permissibility	Medium	TSC	Long	>\$10,000 per access point	\$1,000 per access point	Preferred formal access points are determined and constructed
WC33	Monitor any increase in conflicts between horses and other beach users and consider impacts at a future review of the Coastline Management Plan	Low	TSC	Long	\$2,000	NA	Conflicts between horses and other beach users minimised
WC34	Include cycleway linkages to commercial centres	Medium	TSC	Medium	\$ design	<\$1,000	Linkages constructed
WC35	Include cycleway linkages to main beach access points	Medium	TSC	Short	\$ design	<\$1,000	Linkages constructed
To provide information to enable effective management.							
WC36	Initiate targeted residential and broader community education program about residential encroachment onto public land, such as mowing, rubbish dumping etc*	Medium & Ongoing	TSC	Medium	\$15,000	<\$5,000	Program devised and implemented
WC37	Initiate public education campaign in conjunction with 4WD management actions including need for access by commercial fishers	High & Ongoing	TSC	Medium	>\$5,000	\$5,000	Program devised and implemented
WC38	Ensure Council's ranger service telephone number is on signage, ranger vehicles and other locations, to enable community to assist in controlling unauthorised activities, etc	Medium	TSC	Short	\$500 per sign	<\$500 per sign	Telephone numbers included on relevant signs
WC39	Initiate public awareness campaign about unauthorised companion animal usage, in conjunction with other actions	Medium & Ongoing	TSC	Medium	\$5,000	\$5,000	Program devised and implemented

Table 3.3 - Whole of the Coastline Action Plan (cont)

Action No.	Action	Priority	Responsibilities	Completion Timeframe	Indicative Capital Cost	Indicative Maintenance Cost (pa)	Performance Measures
To provide for integrated planning and management.							
WC40	Retain 7(f) Zone within Tweed LEP 2000 * on current alignment	High & Ongoing	TSC	Ongoing	N/A	N/A	Current zone alignment retained
WC41	Investigate rezoning other applicable coastal lands within the 100 year hazard line to 7(f) Coastal Erosion	Medium	TSC	Medium	\$5,000	N/A	All applicable land zoned 7(f)
WC42	Enforce 7(f) with a Development Control Plan for coastline	High	TSC	Short	>\$5,000	N/A	Zone retained and enforced by Council within a DCP
WC43	All new tourist and residential development to be located landward of the 7(f) zone and/or best estimate 100 year hazard line where 7(f) does not exist	High	TSC	Ongoing	N/A	N/A	Development landward of the appropriate demarcation
WC44	Facilitate liaison between TSC, DL, DEC and TBLALC through the Tweed Coastal Committee regarding lands abutting reserves	Ongoing	TSC, DL, DEC, TBLALC	Medium	N/A	N/A	Facilitation process devised and implemented
WC45	Continue liaison between Council and DEC Parks and Wildlife Rangers regarding policing of unauthorised activity	Medium & Ongoing	TSC, DEC	Ongoing	N/A	Administrative cost	Liaison formalised and maintained
WC46	Ensure integration of relevant plans of management in existence e.g. draft Tweed Coast Reserve Plan of Management, Durambah Beach Dune Management Plan, Vegetation Plans of Management and SEPP 26 Plan of Management	Medium	TSC, DEC, DIPNR, DL, Coastcare/ Landcare Groups, Tweed Ministerial Taskforce	Short	Unknown	Unknown	Council formalises and maintains a process to ensure integration
WC47	Undertake a Beach and Coastline Users Survey to collect and collate usage information	High	TSC	Short	\$15,000	N/A	Surveys undertaken and results incorporated into Locality Plans
WC48	Preparation of Locality Plans for key locations, or activity nodes, and adjoining streets to provide implementation of the Coastline Management Plan in conjunction with the Tweed Coast Reserve Plan of Management, etc, in regard to planning of shade, shelter, toilet facilities, recreational and visual amenity aspects.	High	TSC, with assistance from DL, DIPNR, DEC & Landcare/ Coastcare Groups	Short - Medium	\$10,000 per plan	As required	Plans prepared where necessary and implemented

Table 3.3 - Whole of the Coastline Action Plan (cont)

Action No.	Action	Priority	Responsibilities	Completion Timeframe	Indicative Capital Cost	Indicative Maintenance Cost (pa)	Performance Measures
WC49	DCP 48 Tweed Coast Building Heights and DCP 51 Tweed Coast Strategy can be amended to include: <ul style="list-style-type: none"> a comprehensive set of guidelines for the coastline corridor to reflect its significance as a natural coastline including: <ul style="list-style-type: none"> Principles for the whole coastline; Principles for sub-units; and Detailed land use and master/locality plans according to priority. Adopt standards to ensure no overshadowing of beaches and reserves by buildings, DCP to include detailed guidelines for the type, location, and scale of uses appropriate within the public reserves, Include guidelines for the future desired character of the corridor and sub units and guidelines for the design of facilities to achieve the desired character. 	High	TSC	Medium	\$50,000	N/A	Necessary amendments made and adopted by Council
WC50	Prepare guidelines for the management and operation of facilities within the public reserves including appropriate leasing and licensing arrangements	Medium	TSC with DL	Medium	\$5,000	\$1,000	Guidelines prepared, which include consideration of commercial opportunities
WC51	Maintain flexibility of control over uses in the coastline reserves by allowing only short to medium term leases	High	TSC, DL	Ongoing	N/A	N/A	Commercial opportunities do not encroach on public land usage
WC52	Ensure flexibility to meet changing needs for industry and activities within the coastline corridor	High	TSC with DL	Ongoing	N/A	N/A	Council's relevant policies contain the flexibility required
WC53	Investigate opportunities for private supplier of transport	Low	TSC	Long	N/A	N/A	Investigation complete

3.1.3 Point Danger - Fingal Head Area

Point Danger and Duranbah Beach are well connected to the Gold Coast beaches of Rainbow Bay and further through to Coolangatta and so on, via a recently constructed boardwalk that links the majority of the Gold Beaches. In addition to this boardwalk is a footpath that links Duranbah Beach and Point Danger to the commercial centre of Tweed Heads - Coolangatta.

There is ample open space provision and car parking, which could be enhanced with relatively minor spending on additional facilities such as shelters.

The supply of sand from the TRESBP at Duranbah Beach must continue to be monitored and the results of that monitoring articulated to the public to keep them informed. A Duranbah Beach Dune Management Plan is being formulated to address dune configuration, vegetation, beach access and amenity and surfing amenity issues in light of the TRESBP operation. Once finalised, the Duranbah Beach Dune Management Plan's implementation will need to be in accordance with the principles of the Tweed Coastline Management Plan and prioritised in the whole of coastline context. The Dune Management Plan recommends "on-the-ground" works for the beach and its surrounds.

Access to Fingal Head will continue to be in demand as the popularity of the Tweed coast increases. The Fingal Head headland is a major vantage point and includes the main coastal European heritage item of Fingal Head Lighthouse. There is a need to address the public safety aspects at the headland and its environ, to accommodate this popularity. Further, the car parking at Lighthouse Parade, the main access point to the headland, requires formalisation and greater control of its use to avoid impacting on the nearby residences and vegetation.

Fingal Rovers Surf Lifesaving Clubhouse is dilapidated and aesthetically displeasing. It is currently the subject of planning for a new structure which will need to be located landward of the 50 year hazard zone. Routine coastline monitoring of the coast is particularly relevant for the Fingal Holiday Park to monitor the extent of erosion and the likelihood of affectation within that planning period.

There are known wader bird and turtle habitat nesting sites that occur intermittently along the Fingal Peninsula. Cooperative management between DEC and TSC is required to protect these sites. These sites will become less frequent along the Tweed coastline as the local population increases over time, unless a proactive approach to their management is taken. TRESBP has a responsibility for wader birds and turtles on Letitia Spit in view of the project's operation.

The opportunities and constraints, values and issues that are associated with the Point Danger – Fingal Head area, and summarised in this Plan, have been drawn from the Coastline Management Study. The following list (**Table 3.4**) of key issues needs to be addressed to satisfy the Management Plan's objectives (referred to in **Section 3.1.1**). The objective to which each of the issues relate is also identified in **Table 3.4**.

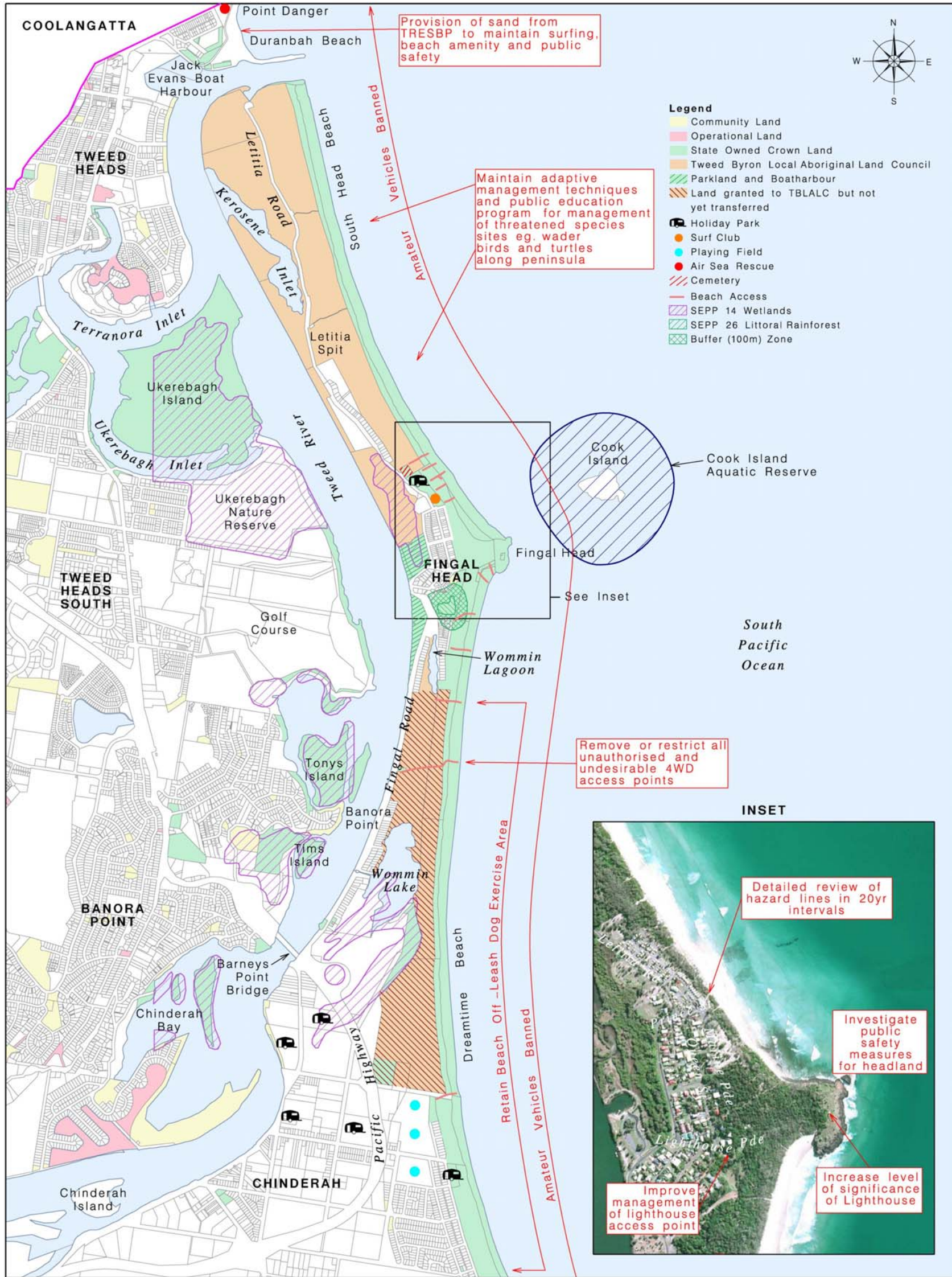
Table 3.4 - Management Issues and Objectives

Issue	Objective No.
The immediate hazard zone extends to about the seaward boundary of the Fingal Holiday Park and Surf Club building. The 50 and 100 year hazard zones extend further into the Holiday Park.	2
No residential development is affected by the 50 year hazard line. However, there is possible affectation on one residential property in Queen Street by the 100 year hazard line	2
Weed infestation and potential for rehabilitation.	1
Appropriate management of threatened species habitat e.g. shorebirds and turtles.	1
Uncontrolled off-road vehicle access, particularly in regard to threatened species impacts and inappropriate behaviour	7
Protection of popular surfing break at Duranbah, and impacts of the intermittent sand nourishment of Duranbah Beach (under TRESBP)	5
Appropriate management of lighthouse as heritage item	4

Figure 3.1 illustrates the key management actions for the Point Danger – Fingal Head Area. Specific management strategies and actions for the Point Danger – Fingal Head Area and their associated priority, implementation responsibility, cost and performance measures are detailed in **Table 3.5**. These management actions have been derived from management options identified in the Coastline Management Study. The range of criteria considered for determining the most appropriate management actions for the coastline include:

- capital and maintenance costs;
- social, economic and environmental costs and benefits;
- potential to achieve funding for the proposed works/activities;
- ability to implement and likely timeframe for implementation; and
- community preferences identified through the consultation program.

Management options that were not considered feasible or warranted have not been included in the management actions listed.



- Legend**
- Community Land
 - Operational Land
 - State Owned Crown Land
 - Tweed Byron Local Aboriginal Land Council
 - Parkland and Boatharbour
 - Land granted to TBLALC but not yet transferred
 - Holiday Park
 - Surf Club
 - Playing Field
 - Air Sea Rescue
 - Cemetery
 - Beach Access
 - SEPP 14 Wetlands
 - SEPP 26 Littoral Rainforest
 - Buffer (100m) Zone

FIGURE 3.1
Point Danger – Fingal Head Area Management Actions

Umwelt (Australia) Pty Limited
Source: SEPP14 & SEPP26 boundaries from Tweed Shire Council
Base Source: Tweed Shire Council



Ref No.:R04_V1/1656_067.dgn

Table 3.5 - Point Danger - Fingal Head Area Management Actions**Legend to Table**

DA	Development Application	M	Million	Short	Within 5 years
DCP	Development Control Plan	PWC	Personal Water Craft	Medium	Within 10 years
DIPNR	Dept Infrastructure, Planning & Natural Resources	*	Compatible with Tweed Coast Reserve Plan of Management	Long	15+ years
DL	Dept of Lands			Ongoing	Required on ongoing basis

Action No.	Action	Priority	Responsibilities	Completion Timeframe	Indicative Capital Cost	Indicative Maintenance Cost (pa)	Performance Measures
To protect, rehabilitate and improve the natural environment							
FH1	Enforce policing of NSW Fisheries bag limits for taking of individual species	High	DPI Fisheries	Short & Ongoing	N/A	Administrative cost	Policing is enforced and species collection reduces
FH2	Implement vegetation management actions in accordance with Action WC1 – Vegetation Management Plan	High	TSC, Dunecare, NRCMA, TBLALC	Short and ongoing	Unknown	Unknown	Appropriate vegetation management undertaken
FH3	Establish close working relationship with DEC in designating and protecting threatened species habitat, such as shorebird and turtle sites	High & Ongoing	TSC, DEC	Short and ongoing	N/A	N/A	Formal process for communication established and maintained
FH4	Install relocatable signs and fencing to protect threatened species habitat sites	High	TSC, DEC	Short & Ongoing	>\$10,000	\$1,000-5,000	Relocatable infrastructure purchased and implemented
FH5	Install and maintain signage regarding unauthorised vehicular access to beach.	Medium	TSC	Short	\$1,500 (3 signs @ \$500 per sign)	\$1,000	Signs installed and vehicular movements reduced.
FH6	Physically restrict unauthorised vehicle access points	Medium	TSC/DEC / DIPNR	Short	\$4,000 (2 access points @ \$2,000 per access point)	\$2,000	Barriers constructed and vehicular movements stopped.
FH7	Implement actions to detour stormwater drainage at Duranbah Beach as outlined in the Duranbah Beach Dune Management Plan	Medium	TSC	Medium	Unknown	N/A	Stormwater drainage has minimal impact on Duranbah Beach
To recognise and accommodate natural processes and climate change							
FH8	Undertake routine coastline monitoring to assist in monitoring of 50 year hazard zone line affectation.	Medium & Ongoing	DIPNR	Ongoing	N/A	Part of State Govt Programme	Monitoring undertaken
FH9	Detailed review of hazard lines in 20 year intervals	Low	TSC, DIPNR	Long	>\$100,000	N/A	Detailed review completed

Table 3.5 - Point Danger - Fingal Head Area Management Actions (cont)

Action No.	Action	Priority	Responsibilities	Completion Timeframe	Indicative Capital Cost	Indicative Maintenance Cost (pa)	Performance Measures
FH10	Retain 7(f) Zone within Tweed LEP 2000 on current alignment	High & Ongoing	TSC	Ongoing	N/A	N/A	Current zone alignment retained
To protect and conserve cultural heritage.							
FH11	Finalisation of Conservation Management Plan for Fingal Head Lighthouse	Low	DL	Medium	N/A	Unknown	Plan prepared and implementation underway
FH12	Increase the heritage designation of Fingal Head Lighthouse within Tweed LEP 2000 through the Heritage Study	Medium	TSC	Short	\$1,000	N/A	LEP revised and adopted by Council and DIPNR
To promote ecologically sustainable development.							
FH13	Provision of sand at Duranbah from the TRESBP through a permanent outlet in sufficient quantities to sustain the existing dune and offshore bars, ensure long term surf quality and maintain sand cover over the second level rocks and Tyalgum wreck.	High and Ongoing	TSC, DL, TRESBP	Short & Ongoing	Unknown	\$30,000	Required quantity of sand provided
FH14	Implement illegal clearing strategy in accordance with Action WC22	High and Ongoing	TSC, DL	Short and Ongoing	N/A	\$5,000	Illegal clearing reduced
To provide for appropriate public access and use.							
FH15	Provision and maintenance of appropriate signage, fencing and vegetative cover in parkland and dune areas of Duranbah Beach in accordance with Dune Management Plan	High and Ongoing	TSC	Medium	\$50,000	\$7,000	Recommendations within the Dune Plan implemented, where possible in accordance with principles of this Plan
FH16	Investigate the need for public safety measures for Fingal Headland including access and track maintenance matters	High	TSC	Medium	Dependent on what measures are required	<\$2,000	Investigation completed and necessary measures completed
FH17	Formalise car parking area at Lighthouse Parade and investigate long-term measures for improved management of lighthouse access	High	TSC	Medium	\$15,000	<\$2,000	Car park formalised and investigation complete and outcomes of investigation implemented
To provide information to enable effective management.							
FH18	Monitoring undertaken as part of TRESBP should continue to be reported to the community.	High & Ongoing	TSC, DL	Ongoing	N/A	Part of project budget	Reporting undertaken
FH19	TRESBP monitoring program be reported throughout all available media, such as Council's Tweed Link	Medium & Ongoing	TSC, DL, QLD govt	Ongoing	N/A	\$5,000	Reporting undertaken
FH20	Initiate adaptive public education program to coincide with protection of threatened species habitat	Ongoing	TSC, DEC	Short	\$5,000	\$2,000	Program devised and implemented

3.1.4 Kingscliff - South Kingscliff Area

At the village of Kingscliff, the Bowls Club, Surf Club, Kingscliff Holiday Park, and other public infrastructure all lie within the zone of Immediate Coastal Erosion Hazard. The rock revetment protecting the Bowls Club was upgraded during the mid-1990s to an appropriate engineering standard. However, there are no other works to protect the Surf Club, Holiday Park and public amenities buildings and associated infrastructure.

Terminal protection by construction of a seawall (or revetment) is proposed to prevent erosion of the Holiday Park and to protect the Cudgen Headland Surf Club. An extension of the existing seawall would be 500 metres long and of a similar design to that constructed for the Bowls Club (**Figure 3.2**).

The construction of the seawall on the receding coastline, such as Tweed's coastline, can lead to progressive lowering of the beach in front of the seawall and, in the long-term, loss of the beach altogether. Therefore, sand nourishment is mandatory to maintain the integrity of the structure and provide for beach amenity under the guiding principles of Ecologically Sustainable Development (ESD) within the NSW Coastal Policy.

The capital costs of the preferred management options for Kingscliff, i.e. extending the existing seawall versus planned retreat (which included relocation of the Holiday Park) were comparable. The social and amenity costs and benefits associated with the above two options are somewhat different however, and are far more difficult to measure.

There are several key factors in the decision-making process to recommend a seawall in this Plan, the most outstanding include:

- The planned retreat option did not include the Kingscliff Bowls Club and associated infrastructure due to it recently having considerable public funds spent on its maintenance and upgrade to extend its design life to 100 years. Retreat of the Holiday Park and Surf Club, while maintaining isolated protection of the Bowls Club meant that the Bowls Club would become progressively more 'proud' of the retreating foreshore alignment. Further works on the extremities of the seawall would also be required to reduce erosion at the ends of the structure.
- Sand extraction from the Tweed River is approved already and sufficient quantities are available for the nourishment requirements for this strategy into the medium term and possibly long term. The grain size of the available sediment is ideal for nourishment, and maintenance of the beach amenity, as far as practical, is therefore possible.
- Community feedback provided through public workshops, direct correspondence and conversations showed a general acceptance of the option. This general acceptance relied heavily on the proviso that beach amenity associated with such a structure was maintained and that no other adverse impacts would result.

The seawall would be built along the shoreline parallel to the beach. It would be set as far landward as possible to minimise its obtrusiveness while maximising the area of protected land. Being located landward as far as possible, the seawall could be buried in sand for most of the time during fair weather, becoming exposed during storms. Following storms, sand could be scraped off the beach berm to bury the structure.

A flexible seawall, such as that constructed from quarry rock at the Bowls Club, is favoured (see **Figure 3.3** for example seawall profile). While not as compact as rigid seawalls, flexible seawalls can sustain considerable deformation and settlement, as may be caused by storm wave action, without total failure occurring. Further, sloping flexible seawalls absorb considerable wave energy, which reduces the scour of the beach that often occurs in front of

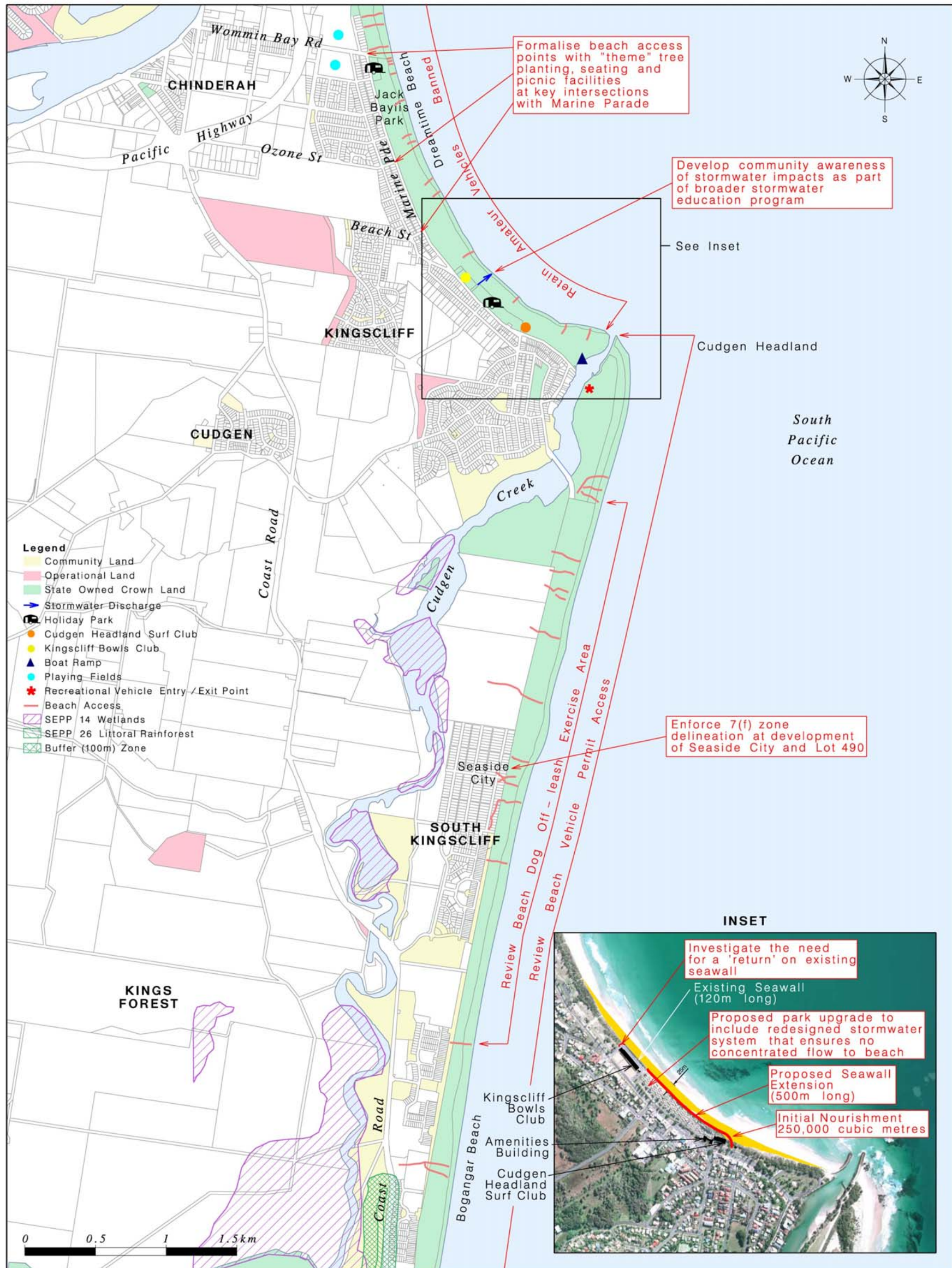


FIGURE 3.2
Kingscliff - South Kingscliff Area
Management Actions

Umwelt (Australia) Pty Limited
Source: Tweed Shire Council

Ref No.:R04_V1/1656_070.dgn



View of site for proposed seawall, looking south from existing seawall.



Existing BOWLS Club seawall looking north. The seawall is sparsely vegetated and partly buried with sand.

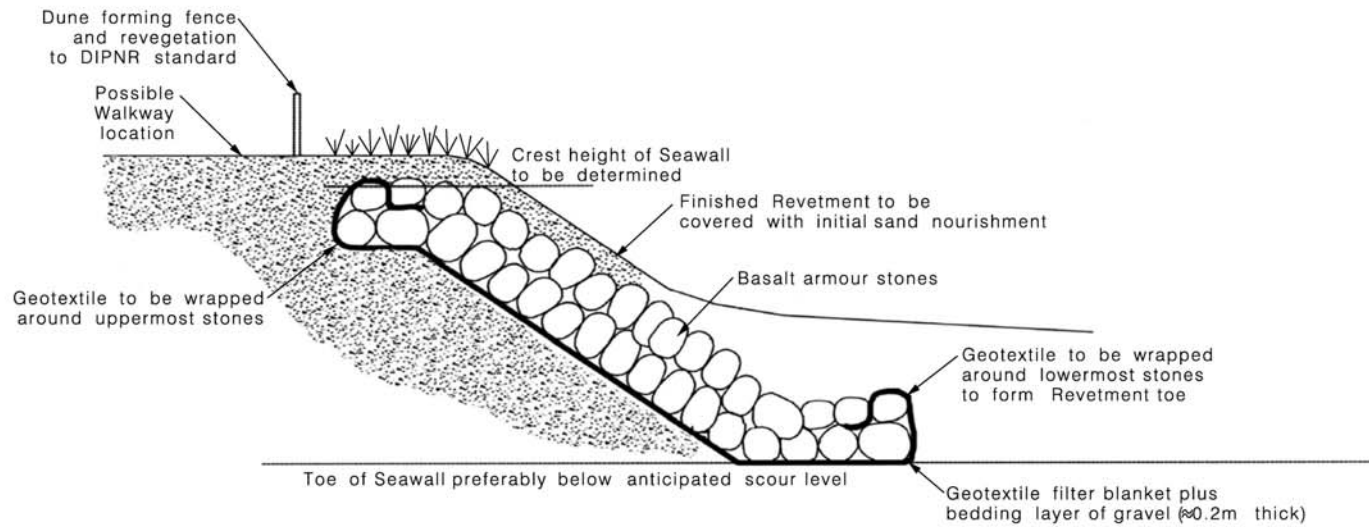


FIGURE 3.3
Example Seawall Profile

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Umwelt (Australia) Pty Limited
Source: SMEC Australia Pty Ltd

rigid vertical seawalls. Because of the broken nature of their surface, however, flexible seawalls tend to harbour rubbish and vermin if they are not covered in sand. Accordingly the beach nourishment philosophy should aim to fully cover the seawall (including the existing Bowls Club seawall) with sand and its exposure should only occur following large coastal storm events.

The amenity of the seawall would be enhanced through revegetation and the provision of walkways, ramps and stairs to provide safe public access to and from the beach as well as viewing platforms.

The capital cost of such a structure would be around \$4.2 M with an annual maintenance allowance of \$0.04 M. A seawall could result in reduction of the beach amenity, which could be ameliorated with sand nourishment of some 250,000 m³, at an additional cost of \$3.8 M. Maintenance for the nourishment is estimated at \$0.05 M per annum. The EIS for the proposal would cost around \$250,000. Therefore, the total cost of the option would be \$8.2M + \$0.1M per annum.

The proposed seawall would be constructed completely within an area controlled by Tweed LEP 2000, currently zoned as 6(a) Open Space. The seawall would conceivably be allowed without consent as an 'environmental facility' under the Tweed LEP 2000. This consequently triggers Part 5 (particularly Section 112) of the *Environmental Planning and Assessment Act 1979* (EP&A Act), which requires Council to prepare an Environmental Impact Statement (EIS) for the proposed works. Further, the extraction and placement of sand on the beach for the initial nourishment purposes may be considered 'designated development', which also requires the preparation of an EIS. Nonetheless, the entire project would be considered in one EIS. It is anticipated that it would take at least two years to prepare such an EIS and obtain the necessary approvals, and cost in the order of \$250,000. The protective works options will also be subject to the provisions of the *Coastal Protection Act 1979*. Therefore, the concurrence of the relevant Minister will be required.

Often linked to the management of Kingscliff Beach is the management of the Cudgen Creek entrance. An Information Paper has been written for DIPNR (Hagley, 2003) addressing the difficult and complex questions surrounding the management of the Cudgen Creek entrance. The dredging of the creek entrance is addressed by the Draft Tweed Coast Estuaries Management Plan, and may be subject to a separate EIS.

There are vegetation management plans for the dunes and 7(f) zoned land provided for at the recently approved development of 'Salt' (Lot 500 and 7(f) Zone Management Plan, November 2002) and 'Casuarina' (Dune Management Plan for Kings (Casuarina) Beach, May 2000), and in draft DCP No. 46 and Plan of Management for South Kingscliff Gateway (Lot 490).

A similar provision should be required of the development of Seaside City. This will also enable the continuation of the alignment of the dunal walkway/cycleway currently proposed and provided for in the above developments. Public facilities and open space have been, and will continue to be, provided as part of these developments.

Strategies for improved coastline infrastructure and public facilities for the town of Kingscliff, in light of the increased population from South Kingscliff, are provided for in DCP No. 43 in accordance with the DCP's Vision for the town of Kingscliff. A small formalised pedestrian space incorporating planting, seating and picnic tables should be provided adjacent to Marine Parade, at the entrance to the beach access opposite Ozone Street. Similar treatment could be provided at other locations along Marine Parade, such as the intersection with Beach Street and Wommin Bay Road. This will provide a more aesthetically pleasing landscape than currently exists, provide landmark entry points to the Kingscliff foreshore, and improve the general amenity along the elongated Crown Reserve.

The Cudgen Creek entrance is not an ideal swimming area when compared with the shallower and calmer entrance of Cudgera Creek. As such, swimming is often concentrated alongside the sandy shores. Personal water craft should not be permitted in these areas and restricted to traversing the creek to gain access to open water only.

In view of the predicted increase in population adjacent to the South Kingscliff stretch of beach, (potentially in excess of 25,000), there will be increased potential for conflicts between beach users and the existing off-leash dog exercise area. The Draft Coastline Management Plan recommended removal of the South Kingscliff off-leash dog exercise area. However, community submissions provided strong support for maintaining the current exercise area. It is therefore recommended that review of off-leash dog exercise areas be conducted in the future, particularly when conflicts are identified, and that potential for removing these areas be considered. Any review will be conducted with community consultation.

Similarly, there is a high potential for conflict between beach vehicle permit holders accessing South Kingscliff Beach and other beach users. A review of Tweed Shire Council's "Beach Vehicle Policy" was being conducted at the time finalisation of this document (April/May 2005).

Car parking at Kingscliff is a contentious issue although there is ample parking most of the time. The provision of the coastal cycleway/footpath means that there is no constraint to people accessing the beach from the numerous car parks that exist along the parkland. Any increase in car parks will encroach into the areas of open space which are considered necessary to provide for the long-term provision of passive open space.

Stormwater management systems are to be redesigned with the Kingscliff Holiday Park upgrade so that no stormwater leaves the site by concentrated surface flow onto the beach. This can be done for most flows through the use of infiltration pits placed throughout the Park. Larger event flows could be spread along a swale to minimise the impact of concentrated flows on the beach. The Bowls Club car park runoff could also be diverted into an infiltration system.

The opportunities and constraints, values and issues associated with the Kingscliff – South Kingscliff area, and summarised in this Plan, have been drawn from the Coastline Management Study. The following key issues have been identified to be addressed to satisfy the Management Plan's objectives (referred to in **Section 3.1.1**). The objective to which each of the issues relate is identified in **Table 3.6**.

Table 3.6 - Management Issues and Objectives

Issue	Objective No.
The immediate hazard zone extends substantially into the Holiday Park at Kingscliff, Cudgen Headland Surf Club building and Kingscliff Bowls Club (although protected by existing seawall). The 50 year hazard zone encompasses all of the above, and part of the Kingscliff Amenities Hall.	2
No existing residential development is affected by the 50 year or 100 year hazard lines	2
Stormwater outlets onto Kingscliff Beach	1
Unmanaged beach access along South Kingscliff	7
Concerns over boat navigation at Cudgen Creek entrance and the need for dredging, particularly by the VMR Coastguard	7
Potential for conflict between increased boat usage and safe family swimming at creek entrance (contrary to the above point).	7
Management of the 7(f) zoned lands	1 & 2
There is concern that pressure to clear dune vegetation to improve ocean views and access to beach will intensify as the population increases in this area	6

Table 3.6 - Management Issues and Objectives (cont)

Issue	Objective No.
Potential future conflict with existing beach off-leash dog exercise area and residents of recent and proposed developments	7
Car parking provision is highly congested during peak periods around Kingscliff	6

Figure 3.2 illustrates the key management actions for the Kingscliff to South Kingscliff Area. Specific management strategies and actions for the Kingscliff to South Kingscliff area and their associated priority, implementation responsibility, cost and performance measures are detailed in **Table 3.7**. These management actions have been derived from management options identified in the Coastline Management Study. The range of criteria considered for determining the most appropriate management actions for the coastline include:

- capital and maintenance costs;
- social, economic and environmental costs and benefits;
- potential to achieve funding for the proposed works/activities;
- ability to implement and likely timeframe for implementation; and
- community preferences identified through the consultation program.

Management options that were not considered feasible or warranted have not been included in the management actions listed.

Table 3.7 - Kingscliff - South Kingscliff Area Management Actions**Legend to Table**

DA	Development Application	M	Million	Short	Within 5 years
DCP	Development Control Plan	PWC	Personal Water Craft	Medium	Within 10 years
DIPNR	Dept Infrastructure, Planning & Natural Resources	*	Compatible with Tweed Coast Reserve Plan of Management	Long	15+ years
DL	Dept of Lands			Ongoing	Required on ongoing basis

Action No.	Action	Priority	Responsibilities	Completion Timeframe	Indicative Capital Cost	Indicative Maintenance Cost (pa)	Performance Measures
To protect, rehabilitate and improve the natural environment							
KC1	Implement vegetation management actions in accordance with Action WC1 – Vegetation Management Plan	High	TSC, Dunecare, NRCMA	Short and ongoing	Unknown	Unknown	Appropriate vegetation management undertaken
To recognise and accommodate natural processes and climate change.							
KC2	Extend existing seawall fronting Bowls Club south, with sand nourishment program. Construction of the seawall must include: <ul style="list-style-type: none"> Environmental Impact Assessment and approvals, and Appropriate access ways for all and revegetation 	High	TSC, DIPNR	Short - Medium	\$7.75 M \$250,000 \$207,000	\$97,000	Seawall approved, funding secured, and constructed
KC3	Management of Cudgen Creek entrance in accordance with revised Estuary Management Plan	Ongoing	TSC	Ongoing	Refer to Estuary Plan	Refer to Estuary Plan	Management implemented in accordance with Estuary Plan
KC4	Retain 7(f) Zone within Tweed LEP 2000 on current alignment	Ongoing	TSC	Ongoing	N/A	N/A	Current zone alignment retained
KC5	Enforce the recommendations within the existing management plans for 7(f) zoned lands and enforce with a Development Control Plan for Coastline	High & Ongoing	TSC	Short & Ongoing	N/A	N/A	Zone retained and enforced by Council within a DCP
To promote ecologically sustainable development.							
KC6	Redesign stormwater management systems with the Kingscliff Holiday Park upgrade so that no stormwater leaves the site by concentrated surface flow onto the beach. The Bowls Club car park runoff could also be diverted into an infiltration system.	High, Ongoing	TSC	Medium	N/A	\$1,000-\$3,000 per outlet	Redesign completed and constructed

Table 3.7 - Kingscliff - South Kingscliff Area Management Actions (cont)

Action No.	Action	Priority	Responsibilities	Completion Timeframe	Indicative Capital Cost	Indicative Maintenance Cost (pa)	Performance Measures
KC7	Implement illegal clearing strategy in accordance with Action WC22	High and Ongoing	TSC, DL	Short and Ongoing	N/A	\$5,000	Illegal clearing reduced
To provide for appropriate public access and use.							
KC9	New development is required to provide public parking spaces on development consent	High	TSC	Ongoing	Development consent condition	N/A	Parking provided within consent and enforced by Council
KC10	Review off-leash dog exercise areas on Tweed Coast beaches when a future review of the Coastline Management Plan is conducted or when identifiable conflicts arise	Low	TSC	Medium	\$2,000	N/A	Off-leash dog exercise areas reviewed
KC11	Move the South Kingscliff off-leash dog exercise area northwards to extend from the southern entrance wall of Cudgen Creek to the northern extent of the Salt development and undertake further consultation in relation to off-leash areas on South Kingscliff Beach	Medium	TSC	Short	\$2,000	\$500	Off-leash dog exercise area moved to minimise conflicts
KC12	Implement recommendations from Beach Vehicle Permit Policy review (April/May 2005)	High	TSC	Short	Unknown	N/A	Policy review recommendations implemented
KC13	Maintain existing restrictions on powered vessels and PWC movement in Cudgen Creek	Medium	NSW Maritime Authority	Medium	N/A	Administrative cost	Powered vessels and PWC movements enforced
To provide information to enable effective management.							
KC14	Undertake public education program regarding the increase in clearing of vegetation to improve views from private property	Medium	TSC	Short & Ongoing	\$5,000	Unknown	Program initiated and implemented
KC15	Public education on issues pertaining to dredging within Cudgen Creek entrance	Medium	TSC, DIPNR	Short & Ongoing	Refer to Estuary Plan	Refer to Estuary Plan	Education program initiated in accordance with Estuary Management Plan
To provide for integrated planning and management.							
KC16	Implement Kingscliff Vegetation Management Plan in accordance with the principles of this Plan	Medium	TSC	Short & Ongoing	Unknown	Unknown	Recommendations implemented in accordance with the principles within this Plan, where possible
KC17	Develop community awareness of the impact of catchment activities on the quality of stormwater as part of LGA catchment management program	High	TSC	Medium	\$design	\$5,000 to \$10,000	Awareness program devised and undertaken

3.1.5 Bogangar - Cabarita Beach Area

The removal of the 4WD access should increase the conservation viability of the Cudgen Nature Reserve (refer to **Figure 3.4**). However, this action in isolation may not prove sufficient to improve the ecological integrity of the reserve. An increase in public education about encroachment into the Nature Reserve and other public lands is also required, which may also need to be aided by an increase in Ranger presence and heavier fines for offenders.

The Improvement Plan for Norries Head (**Figure 3.5**) adopted by TSC in 2000, is possibly the most critical to solving the congested foreshore area at the end of Pandanus Parade, the lack of car parking in the area, and controlling unsafe access to Cove and Little Cove Beaches. The impact on public car parking and access for surf club events needs to be considered for any future development between Palm Avenue and Pandanus Parade.

There are some minor public safety issues to be addressed at the headland associated with the existing boardwalk and access to Little Cove and Cove Beach.

Low-key facilities are recommended for the foreshore area between the houses and dunes at Cabarita, to enhance the passive recreation opportunities at Cabarita Beach.

The management of the Aboriginal cultural site requires liaison with the Tweed-Byron Local Aboriginal Land Council and is subject to further recommendations for management from the Land Council.

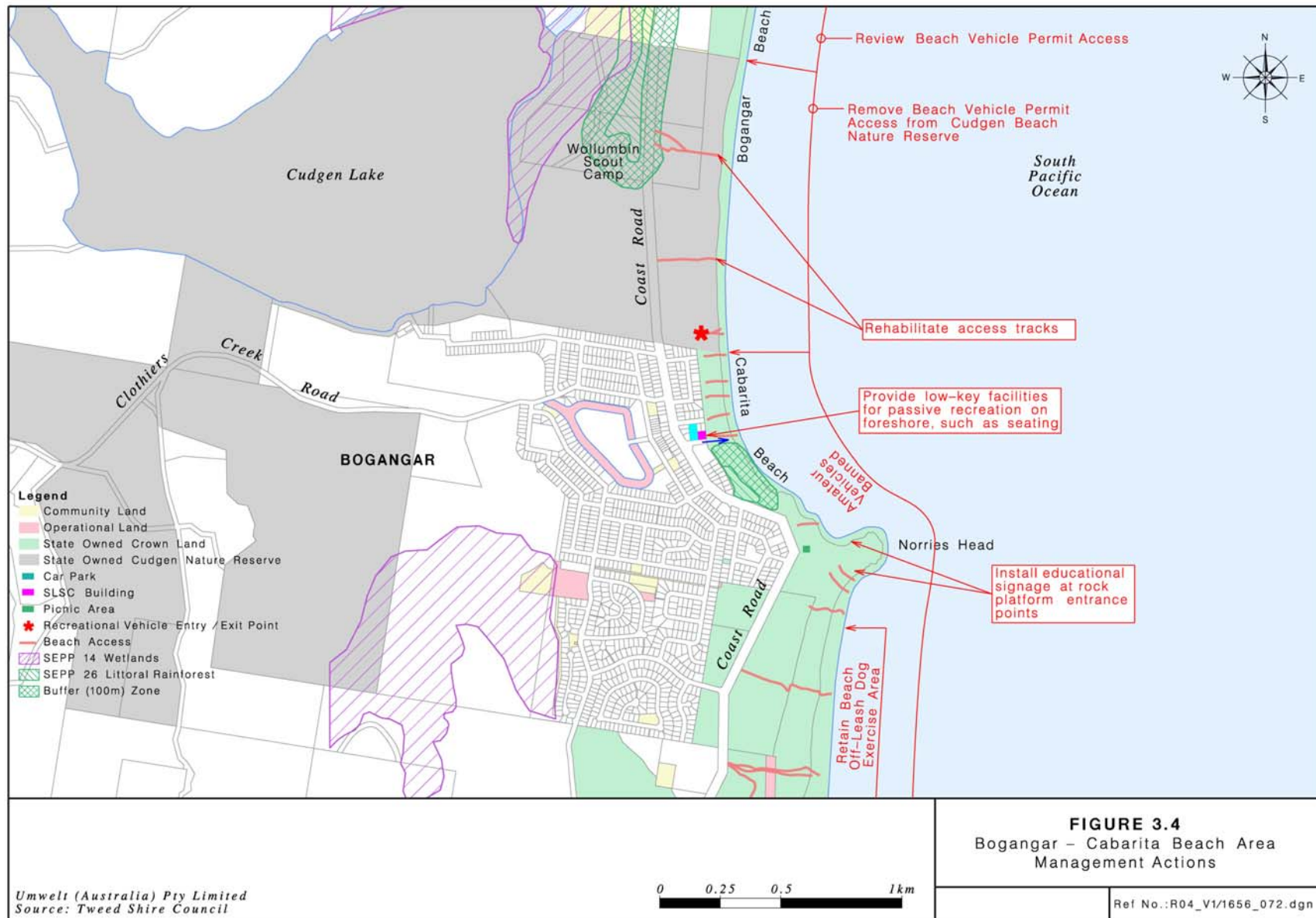
A stormwater outlet maintenance schedule that involves the regular surveillance of Cabarita Beach stormwater outlet after major rainfall events is required. This would be incorporated into existing beach cleaning and maintenance practices, to reduce the cost to Council. Should adverse erosion occur, such as deep scour of the beach dune, as a result of rainfall, mechanical manipulation of the sand to remove the scarp formed would return beach amenity. This would also remove the potential for stormwater to form a pond, which may contain bacteria that may present a public health hazard.

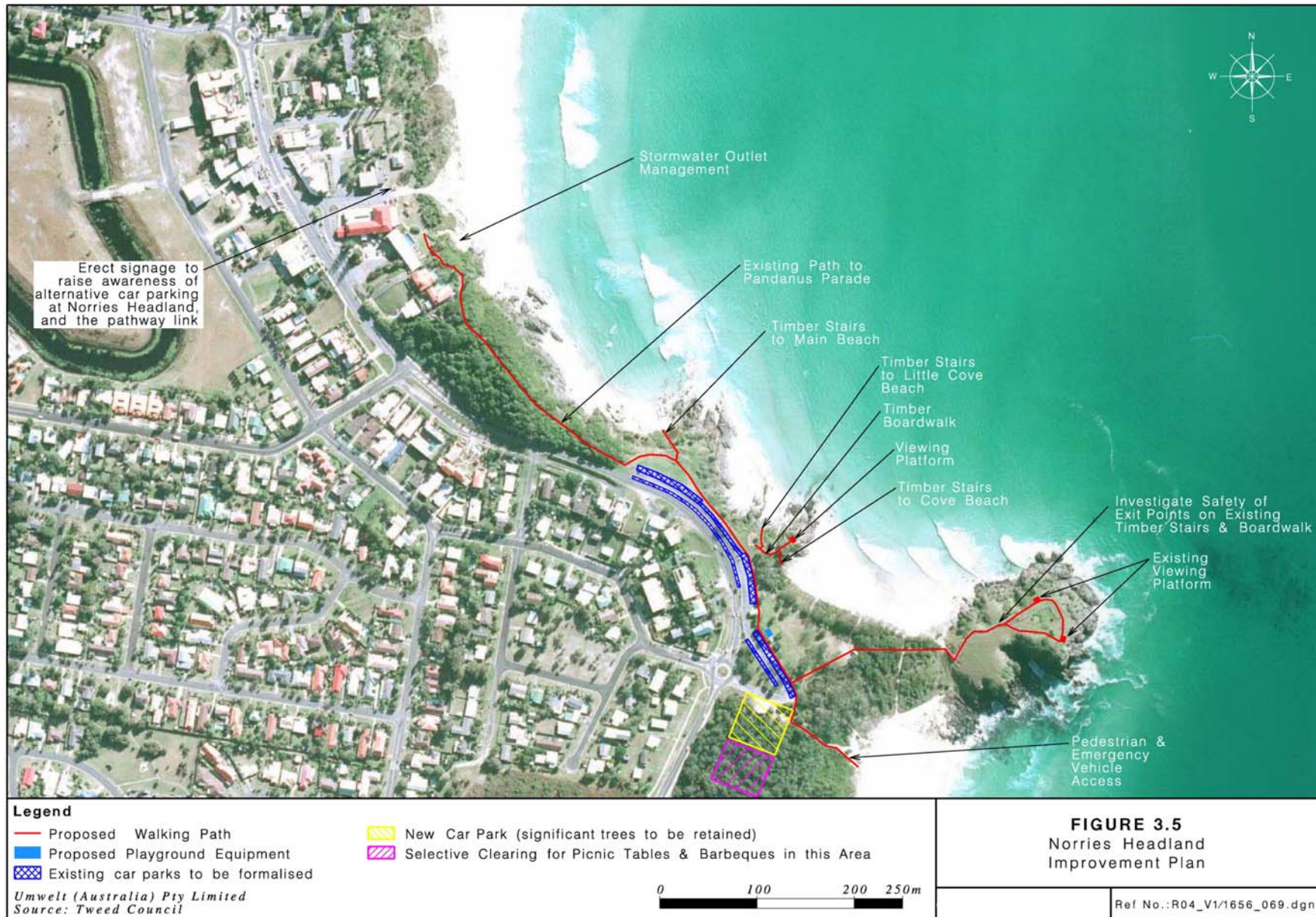
In regard to coastal hazards, the risks within the 50 year planning period do not warrant any significant protective works, such as a seawall. Instead, a combination of environmental planning (planned retreat), development control and dune management measures, as well as routine coastline monitoring and hazard line review, are required for the beachfront properties at Cypress Crescent, Palm Avenue and Pandanus Parade. This combination of measures is detailed below.

The planned retreat of the beachfront development, combined with appropriate development control, is considered the most effective tool available in maximising the land use on the receding coastline at Cabarita Beach. This allows the continuation of residential use of the land until the rate of erosion is confirmed to be at, or near, that currently predicted.

Routine coastline monitoring and a major review of the hazard lines in 10 and in 20 years time from adoption of this Plan is required. Should the erosion prove to be as currently predicted, limited occupation of the existing dwellings should be imposed.

In the years leading up to hazard line review, i.e. years 10 and 20, foundation requirements are required through development control, where buildings are proposed for renovation or redevelopment. In such cases, a coastal engineer's report would be required for all building applications for additions to existing buildings or for the complete redevelopment of the property at risk. To ensure that existing property is not exposed to additional risk and that





Council's liability is minimised, Council should treat any addition to buildings fronting the beach as at potential risk.

Appropriate foundation design for the redevelopment of the Cabarita Beach Surf Life Saving Club building and Cabarita Beach Hotel site was required as part of the recent approvals for these redevelopment sites, which sets an appropriate standard (precedent). It is a recommendation of this Plan that all residents fronting the beach are required to do similar.

A new Development Control Plan (DCP) or revision of draft DCP No 8, would most likely be required to enforce the need for foundation requirements. Information to be supplied with a Development Application for those properties landward of the 50 Year Best Estimate Hazard Line includes:

1. plans showing the location of the erosion line on the site;
2. a structural engineering report of the instability zones as set out on **Figure 3.6**; and
3. a coastal engineers report giving consideration to storm events larger than the predicted storm events.

If Council were to allow the erection of buildings designed to withstand the effects of erosion, i.e. on deep piled foundations, past the 20 year period, this may result in the beach itself being occupied by private buildings over this time period. This is not acceptable under current government policies or from a beach amenity viewpoint. Furthermore, it is expected that there would be difficulties encountered in providing services to such buildings.

In the long term, if these beachfront properties are removed, an appropriate buffer zone would be created that allows for both maintenance of natural beach amenity and also for the impact of natural processes without demands on the public funds for protection of structures.

Figure 3.6 illustrates the proximity of dwellings and structures located on Cypress Crescent, Palm Avenue and Pandanus Parade to the 50 year and 100 year hazard lines and indicative stability zones at these sites. The use of suitable foundations can prolong the life of coastal development. Adequate foundations may involve the use of deep piles driven to a suitable depth (i.e. stable foundation zone or bedrock) to ensure that the building remains stable if the sand mass beneath the structure fails (Nielsen *et al.* 1992). The Zone of Reduced foundation capacity landward of the Best Estimate 50 year Hazard Line is typically in the order of 10-15 metres. However, a coastal engineer's report will be required to determine the exact distance landward and depth of piling required.

The opportunities and constraints, values and issues associated with the Cabarita Beach area, and summarised in this Plan, have been drawn from the Coastline Management Study. The following list (**Table 3.8**) of key issues needs to be addressed to satisfy the Management Plan's objectives (referred to in **Section 3.1.1**). The objective to which each of the issues relates is also identified in **Table 3.8**.

Table 3.8 - Management Issues and Objectives

Issue	Objective No.
Amenities building is outside the immediate hazard line but lies within the 50 year hazard line. Some residential property boundaries are aligned with the best estimate 50 year hazard line, but no buildings are affected.	2
Inadequate and dangerous access to beach via Pandanus Parade combined with car parking congestion.	7

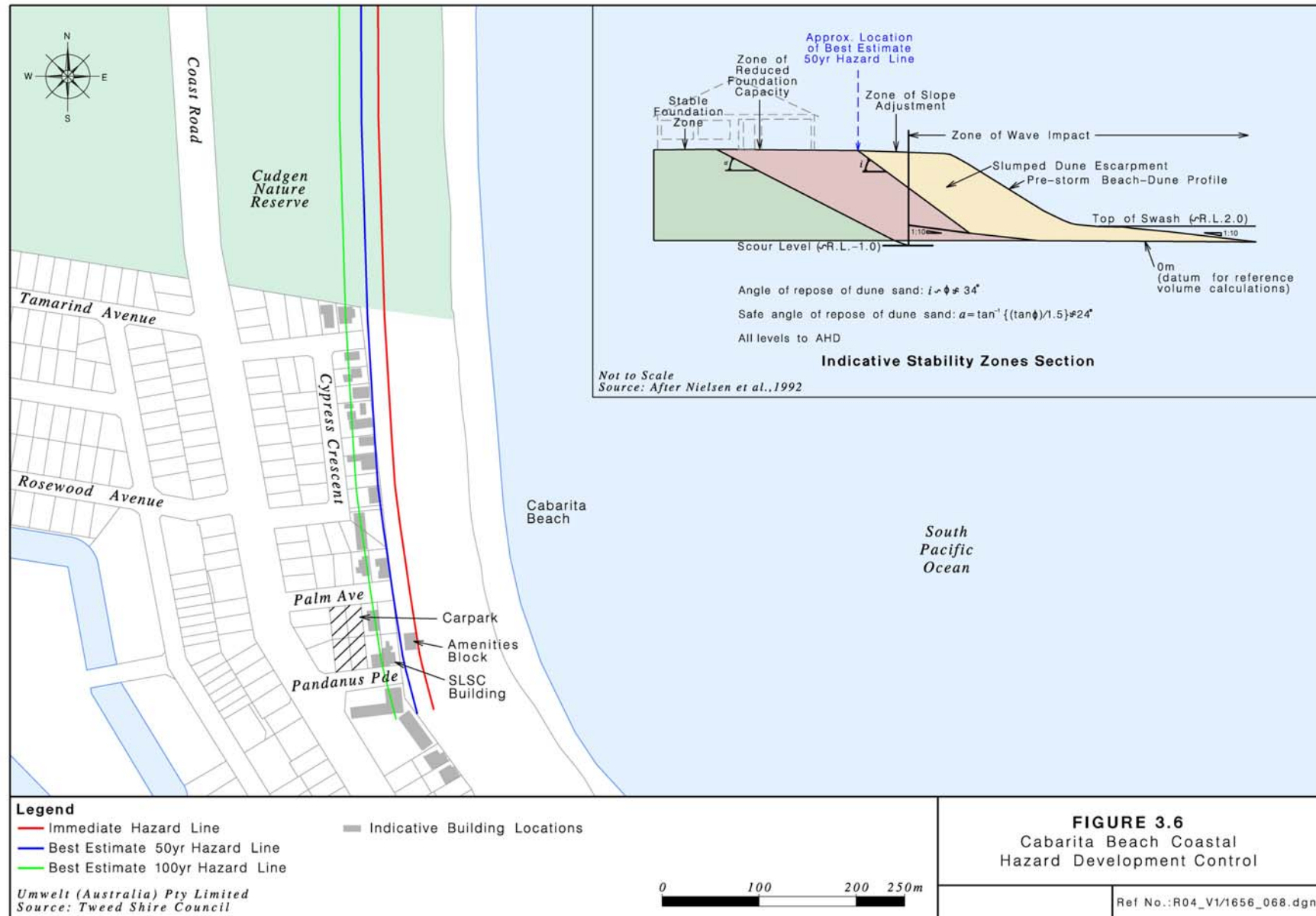


Table 3.8 - Management Issues and Objectives (cont)

Issue	Objective No.
Safety aspects associated with Norries Head, and from the boardwalk at Norries Head	7
Removal of marine organisms from rock platforms	1
Appropriate management of stormwater outlet onto beach near SLSC	1
Unauthorised beach access through Cudgen Nature Reserve	7
Proposed new Holiday Park, south of township, in native vegetation area	6
Urban expansion of Cabarita Beach township	6
Redevelopment of the Cabarita Beach Surf Life Saving Club building and Cabarita Beach Hotel site	9
Site of cultural significance near Norries Head	4

Figures 3.4, 3.5 and 3.6 illustrate the key management actions for the Bogangar to Cabarita Beach area. Specific management strategies and actions for the Bogangar – Cabarita Beach area and their associated priority, implementation responsibility, cost and performance measures are detailed in **Table 3.9**. These management actions have been derived from management options identified in the Coastline Management Study. The range of criteria considered for determining the most appropriate management actions for the coastline include:

- capital and maintenance costs;
- social, economic and environmental costs and benefits;
- potential to achieve funding for the proposed works/activities;
- ability to implement and likely timeframe for implementation; and
- community preferences identified through the consultation program.

Management options that were not considered feasible or warranted have not been included in the management actions listed.

Table 3.9 – Bogangar - Cabarita Beach Area Management Actions**Legend to Table**

DA	Development Application	M	Million	Short	Within 5 years
DCP	Development Control Plan	PWC	Personal Water Craft	Medium	Within 10 years
DIPNR	Dept Infrastructure, Planning & Natural Resources	*	Compatible with Tweed Coast Reserve Plan of Management	Long	15+ years
DL	Dept of Lands			Ongoing	Required on ongoing basis

Action No.	Action	Priority	Responsibilities	Completion Timeframe	Indicative Capital Cost	Indicative Maintenance Cost (pa)	Performance Measures
To protect, rehabilitate and improve the natural environment							
BC1	Install international standard educational signage at each rock platform entrance point – regarding the ecology and collection of intertidal species.	High	TSC, DPI Fisheries	Short	\$10,000	\$2,000	Appropriate signage designed and installed
BC2	Enforce policing of NSW Fisheries bag limits for taking of individual species	High	DPI Fisheries	Ongoing	N/A	N/A	Policing is enforced and species collection reduces
BC3	Implement vegetation management actions in accordance with Action WC1 – Vegetation Management Plan	High	TSC, Dunecare, NRCMA	Short and Ongoing	Unknown	Unknown	Appropriate vegetation management is undertaken
To recognise and accommodate natural processes and climate change.							
BC4	For beachfront properties that are within the maximum 50 year hazard line, initiate combination of: <ul style="list-style-type: none"> detailed review of hazard lines in 10 and 20 years; investigate long-term planned retreat with either purchase or leaseback system to ensure retention of beach amenity and public foreshore access; foundation requirements in accordance with Action WC5 (deep pile foundations) ; redevelopment to be set back behind the maximum 50 year hazard line; and all lands within the maximum 100 year hazard line be maintained in the existing 2(a) zone: 	Medium	TSC	Short	\$50,000 for hazard lines Purchase and/or leaseback costs unknown	Unknown	Council adopts coastal hazard management measures and enforces them, preferably within a DCP
BC5	Public amenities building removed immediately after new Surf Club Building is erected and public amenities provided in the Surf Club building	Low	TSC	Medium	\$10,000	N/A	Building removed and public amenities incorporated into new SLSC building

Table 3.9 – Bogangar - Cabarita Beach Area Management Actions (cont)

Action No.	Action	Priority	Responsibilities	Completion Timeframe	Indicative Capital Cost	Indicative Maintenance Cost (pa)	Performance Measures
BC6	Finalise DCP 8 (Coastal Lands) to include recommendations of the Tweed Coastline Management Plan regarding Cabarita Beachfront development.	High	TSC, DIPNR	Short	\$5,000	N/A	A relevant DCP is adopted and enforced by Council
To protect and enhance the aesthetic qualities of the coastal zone							
BC7	Increase foreshore facilities, between Pandanus Pde & Cypress Cr, such as BBQs, picnic shelters & seating	Low	TSC	Medium to Long	\$150,000	\$10,000	Facilities installed
BC8	Provide for tree landscaping at the end of Palm Avenue with seating and picnic facilities, with trees positioned to maintain views for residents	Medium	TSC	Long	\$20,000 (5 sites @ \$4,000 per site)	\$5,000	Landscaping established.
To protect and conserve cultural heritage.							
BC9	Maintenance of site of Aboriginal cultural significance near Norries Head is undertaken in conjunction with Tweed Byron LALC	High & Ongoing	TSC, TBLALC, DEC	Short and ongoing	N/A	<\$1,000	Site maintained
BC10	Erect appropriate interpretive signage at Aboriginal cultural significance site	Medium	TSC, TBLALC, DEC	Medium	\$2,000	<\$1,000	Signage installed where necessary
BC11	Erect appropriate fencing at Aboriginal cultural significance site	Low	TSC, TBLALC, DEC	Short	\$8,000	<\$2,000	Fencing installed where necessary
BC12	Continue to liaise with TBLALC regarding appropriate management action for culturally significant site	Ongoing	TSC, TBLALC, DEC	Ongoing	N/A	N/A	Liaison process formalised and maintained
To promote ecologically sustainable development.							
BC13	Implement stormwater outlet maintenance program, particularly after heavy rain events, to reshape dunes and remove ponding. Erect signs after rainfall events if ponding occurs to warn public of public health risk, if necessary	High, Ongoing	TSC	Short	N/A	\$1,000-\$3,000 per outlet	Maintenance program devised and implemented
BC14	Implement illegal clearing strategy in accordance with Action WC22	High and Ongoing	TSC, DL	Short and Ongoing	N/A	\$5,000	Illegal clearing reduced
To provide for ecologically sustainable human settlement							
BC15	Determine the need for a new Holiday Park. If resolved that new park required, investigate all reasonable alternatives. Undertake community consultation at both stages.	Medium	TSC	Short – Medium	\$15,000	N/A	Further investigation complete and publicly exhibited

Table 3.9 – Bogangar - Cabarita Beach Area Management Actions (cont)

Action No.	Action	Priority	Responsibilities	Completion Timeframe	Indicative Capital Cost	Indicative Maintenance Cost (pa)	Performance Measures
BC16	Should the proposed Holiday Park be constructed, ensure park does not encroach into 7(f) zoned land	High	TSC	Short – Medium	N/A	N/A	Construction remains landward of 7(f) zone
To provide for appropriate public access and use.							
BC17	Implement Norries Headland Improvement Plan as adopted by Council 15/03/2000, which includes: <ul style="list-style-type: none"> Implement new car park at Norries Head, sensitive to existing native vegetation; Installation of new pathways/boardwalks and facilities Installation of signage at Pandanus Pde alerting people to the extra car parking at Norries Head and to the walkway. Investigate public safety at exit points on existing headland boardwalk 	High	TSC	Medium – Long	\$ 325,000	<\$10,000	Improvement Plan funded and implemented, and maintained into the future.
BC18	Remove Beach Vehicle Permit Access from Cudgen Nature Reserve and physically restrict unauthorised access points e.g. bollards or vegetation planting	Medium	TSC, DEC	Medium	\$2,000 per access point	<\$2,000 per access point	Access points restricted and maintained
To provide information to enable effective management.							
BC19	Develop community awareness of the impact of catchment activities on the quality of stormwater as part of LGA catchment management program.	High	TSC	Long	\$ design	\$5,000 to \$10,000	Awareness program for the coastline devised
BC20	Initiate public education campaign in conjunction with removal of Permit Holders Vehicles Permitted area from Bogangar	Medium & Ongoing	TSC	Medium	>\$5,000	\$5,000	Campaign initiated and completed

3.1.6 Hastings Point Area

There is a danger associated with crossing the creek entrance to reach the main beach at Hastings Point at certain times. Access to the beach to the north from the headland often requires a relatively long walk across the road bridge and through the residential area. Access to the beach at the north of Cudgera Creek entrance requires signage or similar, to warn people of the dangers associated with fast moving water.

The routine coastline monitoring will cater for the residents in the short to medium term, as there are no properties under threat within the 50 year planning period. Any redevelopment within the maximum 100 year hazard line should require deep pile foundations or similar.

A Coastal Inundation Study is recommended for the Cudgera Creek entrance (refer to **Section 3.3.2.2**) to address the low-lying properties, although the majority of residences have now been built on higher ground, in light of a recent event whereby water overlapped a deck at a creek-front property.

There is a need to better inform the community of any proposal to increase the Hastings Infiltration area to ensure open management of the facility and alleviate community concerns associated with the system. While regular monitoring of Hastings Point Dune Disposal System shows the operation continues to comply with EPA requirements, it will be necessary to ensure public health and safety in the area, through appropriate signage, etc. Regular reporting of the results of monitoring would help alleviate community concerns. The Tweed Link can be used to report the results.

The rock platform at Hastings Point is both a biological resource and a highly utilised educational resource. There is a need for improved educational signage and community education programs. These strategies should focus on educating people on the biodiversity values of the platform and subsequently alerting the community to the fines associated with illegal species collection. Steps will be taken to include Hastings Point rock platform in an Intertidal Protected Area, or similar, under the Fisheries Management Act 1994.

The management of the Aboriginal cultural site requires liaison with the Tweed-Byron Local Aboriginal Land Council and is subject to further recommendations for management from the Land Council.

The opportunities and constraints, values and issues associated with the Hastings Point area, and summarised in this Plan, have been drawn from the Coastline Management Study. The following key issues have been identified to be addressed to satisfy the Management Plan's objectives (referred to in **Section 3.1.1**). The objective to which each of the issues relates is identified in **Table 3.10**.

Table 3.10 – Management Issues and Objectives

Issue	Objective No.
No residential property is affected by the 50 year hazard line	2
Safety aspects associated with Hastings Point headland	7
Removal of marine organisms from the intertidal rocky shores.	1
Provision of facilities in parkland near creek entrance.	5
Conflicting recreational uses including personal water craft (e.g. jet skis).	8
Sites of Aboriginal cultural significance.	4
Extension of the Hastings Point Dune Disposal System	6 & 8

Figure 3.7 illustrates the key management actions for the Hastings Point area. Specific management strategies and actions for the Hastings Point area and their associated priority, implementation responsibility, cost and performance measures are detailed in **Table 3.11**. These management actions have been derived from management options identified in the Coastline Management Study. The range of criteria considered for determining the most appropriate management actions for the coastline include:

- capital and maintenance costs;
- social, economic and environmental costs and benefits;
- potential to achieve funding for the proposed works/activities;
- ability to implement and likely timeframe for implementation; and
- community preferences identified through the consultation program.

Management options that were not considered feasible or warranted have not been included in the management actions listed.

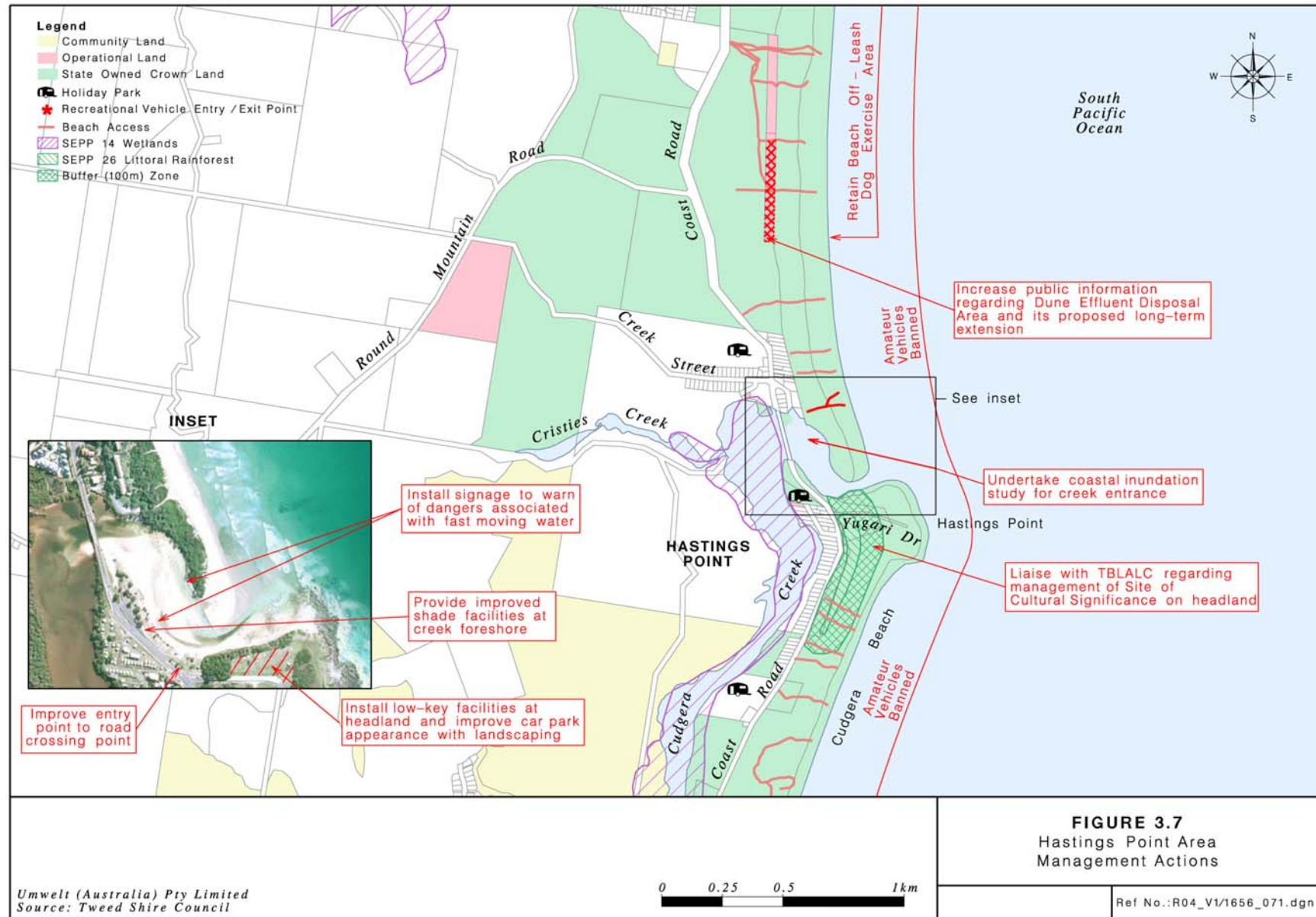


Table 3.11 – Hastings Point Area Management Actions**Legend to Table**

DA	Development Application	M	Million	Short	Within 5 years
DCP	Development Control Plan	PWC	Personal Water Craft	Medium	Within 10 years
DIPNR	Dept Infrastructure, Planning & Natural Resources	*	Compatible with Tweed Coast Reserve Plan of Management	Long	15+ years
DL	Dept of Lands			Ongoing	Required on ongoing basis

Action No.	Action	Priority	Responsibilities	Completion Timeframe	Indicative Capital Cost	Indicative Maintenance Cost (pa)	Performance Measures
To protect, rehabilitate and improve the natural environment.							
HP1	Implement vegetation management actions in accordance with Action WC1 - Vegetation Management Plan	High	TSC, DL	Short & Ongoing	Unknown	Unknown	Appropriate vegetation management undertaken
HP2	Install international standard educational signage at each rock platform entrance point – regarding the ecology and collection of intertidal species	High	TSC	Short	\$1,000 per sign	<\$2,000 per sign	Appropriate signage installed
HP3	Enforce policing of NSW Fisheries bag limits for taking of individual species	High	DPI Fisheries	Medium	N/A	Administrative cost	Policing is enforced and species collection reduces
HP4	Continue to liaise with DPI Fisheries to find means to provide protection for Hastings Point rock platform in view of educational opportunities and ecological significance of the site	High	DPI Fisheries	Medium	N/A	N/A	Hastings Point rock platform protected
To recognise and accommodate natural processes and climate change.							
HP5	Routine coastline monitoring	Medium & Ongoing	DIPNR	Ongoing	N/A	Part of State Government Program	Monitoring undertaken
HP6	Detailed review of hazard lines in 20 year intervals	Low	TSC, DIPNR	Long	>\$100,000	N/A	Review completed
To protect and enhance the aesthetic qualities of the coastal zone.							
HP7	Provide shade facilities using trees and improved shade structures at creek foreshore.	High	TSC	Medium	\$10,000	\$2,000	Facilities provided and maintained

Table 3.11 – Hastings Point Area Management Actions (cont)

Action No.	Action	Priority	Responsibilities	Completion Timeframe	Indicative Capital Cost	Indicative Maintenance Cost (pa)	Performance Measures
To protect and conserve cultural heritage.							
HP8	Maintenance of site of Aboriginal cultural significance at Hastings Point is undertaken in conjunction with Tweed Byron LALC	High & Ongoing	TSC, TBLALC	Ongoing	N/A	<\$1,000	Site maintained
HP9	Erect appropriate interpretive signage at Aboriginal culturally significant site	Medium	TSC, TBLALC	Medium	\$2,000	<\$1,000	Signage installed where necessary
HP10	Erect appropriate fencing at Aboriginal culturally significant site	Low	TSC, TBLALC	Medium	\$8,000	<\$2,000	Fencing installed where necessary
To promote ecologically sustainable development.							
HP11	Install further and modern picnic facilities & playground at headland park area	High	TSC	Medium	\$125,000	\$12,000	Facilities installed and maintained
HP12	Install low-key facilities at Hastings Point headland to increase passive recreation opportunities, such as seating	Low	TSC	Medium	\$100,000	<\$10,000	Low-key facilities installed and maintained
HP13	Implement illegal clearing strategy in accordance with Action WC22	High and Ongoing	TSC, DL	Short and Ongoing	N/A	\$5,000	Illegal clearing reduced
To provide for appropriate public access and use.							
HP14	Maintain existing restrictions on powered vessels and PWC movement in Cudgera Creek	High	TSC, NSW Maritime Authority	Short & Ongoing	N/A	Administrative cost	Powered vessels and PWC restrictions and movements enforced
HP15	Erect warning signs regarding the dangers of crossing the Cudgera Creek entrance to access the beach	High	TSC, DIPNR	Short	\$1,000 per sign	<\$1,000 per	Appropriate signs installed and maintained
HP16	Improve entry point to road crossing between Cudgera Creek foreshore park and shops/Holiday Park across Coast Road	Medium	TSC	Medium	\$design	\$design	Entry point improved and maintained
To provide information to enable effective management.							
HP17	Assist Coastcare in promotion of their rock platform/intertidal areas educational program, via Council media	Medium	TSC	Ongoing	N/A	\$2,000 to \$4,000	Financial and/or in-kind support provided
HP18	Increase public reporting of monitoring data associated with the Hastings Point Dune Disposal System proposed extension	Medium	TSC	Ongoing	N/A	\$3,000	Reporting level of data increased and feedback monitored for effectiveness

Table 3.11 – Hastings Point Area Management Actions (cont)

Action No.	Action	Priority	Responsibilities	Completion Timeframe	Indicative Capital Cost	Indicative Maintenance Cost (pa)	Performance Measures
To provide for integrated planning and management.							
HP19	Improve design of headland car park with landscaping and formal access ways leading away from the car park.	Low	TSC	Long	\$100,000	\$3,000	Car park improvements completed and maintained

3.1.7 Pottsville - Wooyung Area

Ambrose Brown Park is one of the main points of access to Cudgera Beach and the Mooball Creek entrance foreshore, which can often get extremely congested with people and cars. The parkland directly west of Ambrose Brown Park, which is mainly designated for organised sport at present, appears to be the only site available for relieving the congestion associated with cars and people during peak visitation times.

Formalisation of the Ambrose Brown Park car park should assist in improving the safety of the area as would greater directional signage to the road crossing points currently in place, particularly pedestrian access to the village from the park. Vehicular closure of the northern entrance to the park could reduce the safety risk associated with exiting the park, which can be considered dangerous during busy periods.

The expanding residential areas of Black Rocks, in conjunction with the newly constructed road bridge, mean that a much larger number of people have direct access to the beach between Potts Point and Black Rocks. The Draft Plan recommended a reduction in the authorised 4WD area and removal of the off-leash dog exercise area. However, community submissions provided strong support for maintaining the current dog off-leash exercise area. It is therefore recommended that review of off-leash dog exercise areas be conducted in the future, particularly when conflicts are identified, and that potential for removing these areas be considered. Any review will be conducted with community consultation.

Four wheel drive vehicle use in this area is incompatible with the natural values associated with the Nature Reserves and a reduced area may enable better policing of unauthorised activities. A review of Tweed Shire Council's "Beach Vehicle Policy" was being conducted at the time finalisation of this document (April/May 2005). The pressure for a safe and clean beach at Pottsville will continue to increase and is expected by the community.

The increase in the property values of the coastline and planned subdivisions means that Pottsville is experiencing its greatest population growth in decades. The current lack of facilities may mean that the newly arriving population will have greater expectation and therefore greater demands for more coastal facilities such as shelters, barbecues and viewing locations or platforms. Viewing platforms in this area would assist in controlling or reducing the large number of beach access ways that hinder the management of dune vegetation in the area.

Access to the beach for the disabled and elderly is lacking in this area and it is recommended that an all-weather access point be made at Potts Point.

Routine coastline monitoring will be sufficient to gauge any long-term threat to the Tweed Coast Road. Further, the recommended 20 year comprehensive review of the hazard lines for the Tweed Coast will provide a greater level of certainty in the medium-term.

The relative remoteness and length of Mooball and Wooyung Beaches, combined with the proposed increase in residents to the Pottsville area, make it difficult for policing of unauthorised activity in the area. Greater enforcement of the relevant regulations regarding public land is one of the only methods of partly dealing with the issue.

The opportunities and constraints, values and issues associated with the Pottsville - Wooyung Area, and summarised in this Plan, have been drawn from the Coastline Management Study. The following key issues have been identified to be addressed to satisfy the Management Plan's objectives (referred to in **Section 3.1.1**). The objective to which each of the issues relates is identified in **Table 3.12**.

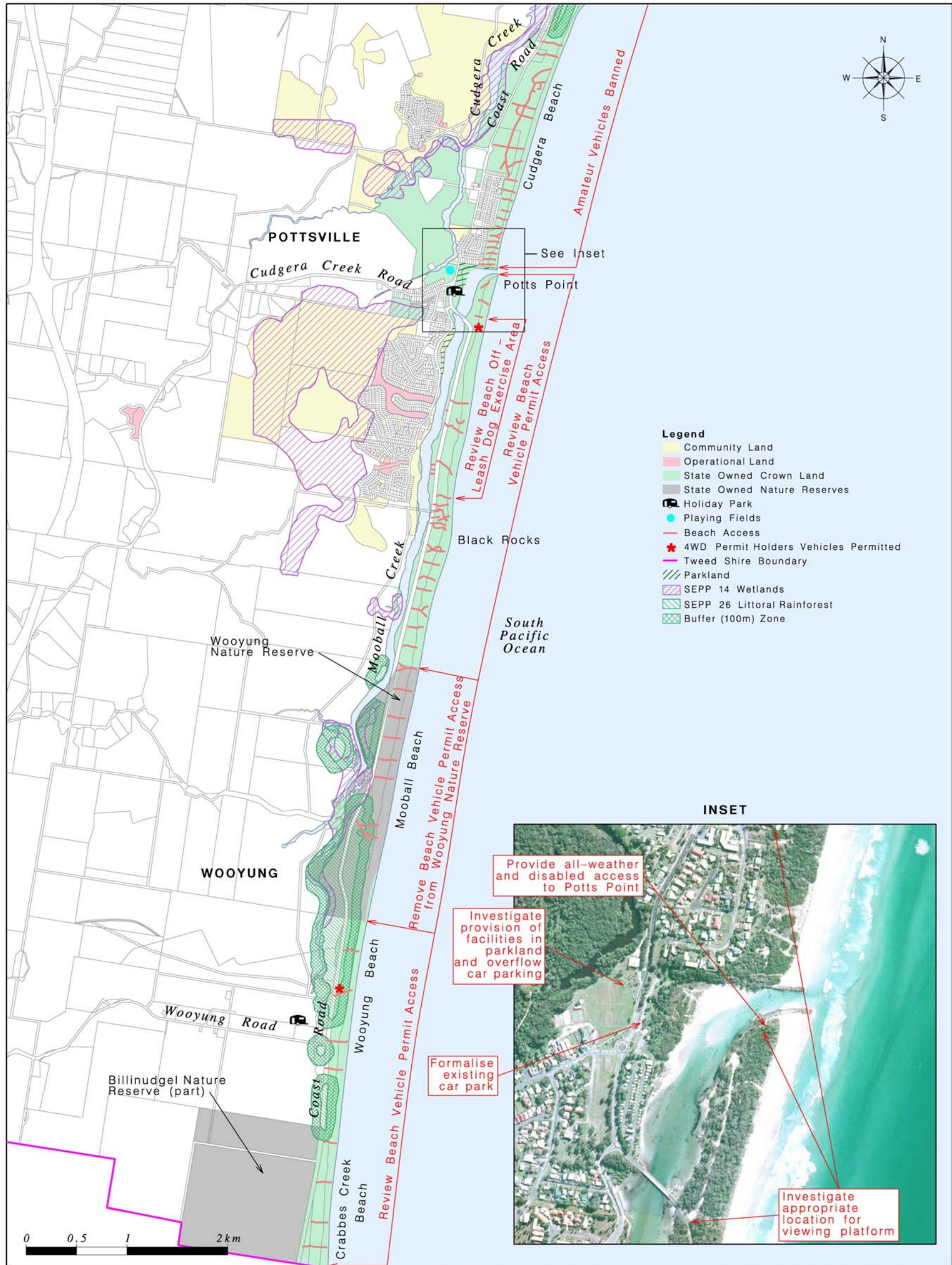
Table 3.12 - Management Issues and Objectives

Issue	Objective No.
Sections of Tweed Coast Road under threat in the long term (100 year planning period).	2
Population pressure places demands on the coastline facilities and access to the beach	6
Long-term water quality management for primary recreation at Mooball Creek entrance	1
Conflicting recreational uses including personal water craft (e.g. jet skis).	8
Off-road vehicle access uncontrolled	7
Unauthorised camping	7
Speed of 4WDs on beach	7
Lack of beach access for the elderly	7

Figure 3.8 illustrates the key management actions for the Pottsville - Wooyung Area. Specific management strategies and actions for the Pottsville - Wooyung area and their associated priority, implementation responsibility, cost and performance measures are detailed in **Table 3.13**. These management actions have been derived from management options identified in the Coastline Management Study. The range of criteria considered for determining the most appropriate management actions for the coastline include:

- capital and maintenance costs;
- social, economic and environmental costs and benefits;
- potential to achieve funding for the proposed works/activities;
- ability to implement and likely timeframe for implementation; and
- community preferences identified through the consultation program.

Management options that were not considered feasible or warranted have not been included in the management actions listed.



- Legend**
- Community Land
 - Operational Land
 - State Owned Crown Land
 - State Owned Nature Reserves
 - Holiday Park
 - Playing Fields
 - Beach Access
 - 4WD Permit Holders Vehicles Permitted
 - Tweed Shire Boundary
 - Parkland
 - SEPP 14 Wetlands
 - SEPP 26 Littoral Rainforest
 - Buffer (100m) Zone

INSET

FIGURE 3.8
Pottsville - Wooyung Area
Management Actions

Umwelt (Australia) Pty Limited
Source: Tweed Shire Council

Ref No.:R04_V1/1656_073.dgn

Table 3.13 – Pottsville – Wooyung Area Management Actions**Legend to Table**

DA	Development Application	M	Million	Short	Within 5 years
DCP	Development Control Plan	PWC	Personal Water Craft	Medium	Within 10 years
DIPNR	Dept Infrastructure, Planning & Natural Resources	*	Compatible with Tweed Coast Reserve Plan of Management	Long	15+ years
DL	Dept of Lands			Ongoing	Required on ongoing basis

Action No.	Action	Priority	Responsibilities	Completion Timeframe	Indicative Capital Cost	Indicative Maintenance Cost (pa)	Performance Measures
To protect, rehabilitate and improve the natural environment							
PW1	Implement vegetation management actions in accordance with Action WC1 – Vegetation Management Plan	High	TSC, Dunecare groups, NRCMA	Short & Ongoing	Unknown	Unknown	Appropriate vegetation management undertaken
To recognise and accommodate natural processes and climate change.							
PW2	Routine coastline monitoring, particularly in regard to the sections of Coast Road under threat in the long term (i.e. 100 year planning period)	Medium	DIPNR	Ongoing	N/A	Part of State Govt Programme	Monitoring undertaken
To promote ecologically sustainable development.							
PW3	Determine future management of kiosk located in Ambrose Brown Park	High	TSC	Short	N/A	N/A	Decision made regarding future of kiosk
PW4	Investigate the provision of facilities in the parkland on the west side of Coast Road, i.e. opposite Ambrose Brown Park. Safe pedestrian access and traffic calming would be required.	High	TSC	Medium	\$5,000	N/A	Investigation completed and infrastructure constructed where necessary
PW5	Implement illegal clearing strategy in accordance with Action WC22	High and Ongoing	TSC, DL	Short and Ongoing	N/A	\$5,000	Illegal clearing reduced
To provide for appropriate public access and use.							
PW6	To address car parking and vehicle access in Ambrose Brown Park: <ul style="list-style-type: none"> Redesign and formalise existing car parking, with permeable surface where practical Investigate additional car park locations to alleviate parking demands in peak usage times 	Medium	TSC	Medium	\$20,000	\$2,000	Formalisation complete and maintained

Table 3.13 – Pottsville – Wooyung Area Management Actions (cont)

Action No.	Action	Priority	Responsibilities	Completion Timeframe	Indicative Capital Cost	Indicative Maintenance Cost (pa)	Performance Measures
PW7	Review off-leash dog exercise areas on Tweed Coast beaches when a future review of the Coastline Management Plan is conducted or when identifiable conflicts arise	Low	TSC	Short Medium	\$2,000	N/A	Off-leash dog exercise areas reviewed
PW8	Maintain existing restrictions on powered vessels and PWC movement in Mooball Creek	Medium	NSW Maritime Authority	Short	N/A	Administrative cost	Powered vessel and PWC restrictions and movements enforced
PW9	Implement recommendations from Beach Vehicle Permit Policy review (April/May 2005)	High	TSC	Short	Unknown	N/A	Policy review recommendations implemented
PW10	Provide all-weather disability access at Potts Point with nearby disability designated parking area	Medium	TSC	Short	\$10,000	\$1,000	Access installed and appropriately maintained
PW11	Increase Council Ranger presence in the area due to the beaches' relative remoteness	Low & Ongoing	TSC	Medium	Unknown	Unknown	Ranger numbers increased or Ranger visitation to coastline increased
To provide information to enable effective management.							
PW12	Develop community awareness of the impact of catchment activities on the quality of stormwater as part of LGA catchment management program.	High	TSC	Ongoing	\$design	\$5,000 to \$10,000	Awareness program undertaken
To provide for integrated planning and management.							
PW13	Greater enforcement of regulations by relevant agencies TSC, DEC, Department of Lands	Low & Ongoing	TSC, DEC, DL	Ongoing	Unknown	Unknown	Enforcement is increased, through increased presence, and number of offences are reduced

3.2 EMERGENCY ACTION PLAN

The Tweed Coastline Hazard Definition Study (2001) has defined immediate and short term beach erosion hazard zones as well as the potential for longer term recession of the shoreline.

In the long term, the Coastline Management Plan will set in place policies, strategies and works for integrated management of the Tweed coastline. Some of these works will be undertaken in the short term with others being implemented progressively over the next 10 to 30 years. In the interim, the preparation of an Emergency Action Plan (EAP) provides considered emergency response actions associated with the impacts of damaging ocean storms.

EAPs are used throughout NSW and consist of appropriate procedures, strategies and actions that can be put in place to deal with severe storms that place property, structures and life at risk. Development of the plan needs to take into consideration the attributes of coastal storms with the severity of the storm and the magnitude of resultant erosion/impact being difficult to predict and even more difficult to do much about when the storm is in full swing. Unlike most flooding situations, where there is frequently advance warning to allow actions to be put in place and where it is possible to use sand bags etc, to prevent damage to property or risk to humans from flood waters, emergencies along the beach front are significantly less predictable and present far less opportunity to implement effective emergency actions.

To address this, the development of emergency and interim actions that recognise the distinct hazard zones of the beach dunal system during a major coastal storm are proposed. These zones are:

- Zone 1 - Land seaward of the existing erosion scarp where wave energy is extremely high and any emergency response actions are likely to be ineffective and dangerous.
- Zone 2 - Between the existing erosion scarp and Immediate Hazard Line (2001) where some emergency response actions or interim measures are feasible and can be undertaken in a safe manner.
- Zone 3 - the zone landward of the Immediate Hazard Line (2001) where a range of emergency actions may be feasible and can be readily implemented to prevent further emergencies such as inundation of adjoining properties.

Within these zones the following emergency and interim actions are proposed:

Zone 1 - No response

This zone contains sand dune undergoing storm wave erosion that it is considered too late to provide any meaningful protection other than the provision of warning signs landward of this zone.

Zone 2 - Interim Actions/Strategies (Before a Storm)

Depending on the beach berm height at the time, the proposed (or combination of) Interim Actions are as follows:

- Sacrificial sand bagging of the Cudgen Headland Surf Club building;
- Beach nourishment or beach scraping to build up the dune profile seaward of the Cudgen Headland Surf Club building and Kingscliff Holiday Park;
- investigating and fencing off of threatened or eroded sections of road or car parks.

Zone 3 - Emergency Response (During and After a Storm)

Temporary works such as sandbagging and dune/embankment construction, possibly at Cabarita Beach (public amenities building and/or private property) and Fingal Head Holiday Park, and halt the inundation of public assets such as car parks.

The draft EAP forms part of the Coastline Management Study and will subsequently be finalised and incorporated into the local Tweed Shire Council Disaster Plan (Displan).

3.3 IMPLEMENTATION AND REVIEW

Typically coastal management issues fall into numerous categories, each with different costs, timeframes and technical complexities with respect to implementation of works and strategies. It is unlikely any coastline management plan that involves expenditure of substantial public funds could be implemented immediately in its entirety. Availability of funding will determine when certain actions can be implemented. Consequently, the strategy recommended for the Tweed Shire Coastline Plan involves staged implementation to address the high priority actions first, taking into consideration their cost and completion timeframe. This does not preclude low or medium priority actions from being implemented before a high priority action, if funding becomes available.

A key mechanism in the implementation of the Plan is through the Tweed Coastal Committee. However, greater liaison between TSC departments in the implementation of the Plan is still required. A sub-committee of the full Coastal Committee could be initiated to implement components of the Coastline Management Plan. The intention of the sub-committee would be to ensure the multiple departments within Council's structure are integrated in their management and implementation of coastline projects, such as 'Locality Planning'. Locality Plans could be prepared to provide detailed location plans for 'on-the-ground' works associated with the numerous management plans that exist (or are in draft form) for the Tweed Coastline.

There are local opportunities for participation in coastal management, particularly through the implementation of the recently completed Vegetation Management Plans. However, this does not address the issue of the appropriate level of community participation and community endorsement of potential management actions. This issue arises at the local scale (e.g. Coastcare and Dunecare projects), but more importantly, in relation to major choices about the focus, structure and direction of management on the Tweed Coastline. In this regard, the Coastline Management Plan is a strategic planning tool, but it complements and is closely aligned with existing strategic planning processes for which community comment has already been, or is currently being, invited. Investigation into building effective partnerships between the community and relevant government agencies is encouraged. The approach would need to address the specific challenges encountered on the coast and the needs of local users. It is essential that other activities, such as the Tweed Coast Reserves Plan of Management, continue and are progressively informed and adjusted in light of any partnership building activity (or agreements).

Council's annual State of the Environment (SoE) report is a tool that can be used to report the implementation of the management plan, both to Council and the community. The annual reporting of the implementation progress of the Plan within the SoE report will also greatly assist Council when review of the Plan is required.

The full costs of some management actions have not been determined as they may rely on the completion of other actions first, such as DCPs or Master Plans. In such cases, it may be necessary to review the priority or timeframe associated with those actions. It is envisaged that the proposed Tweed Coastal Committee Sub-committee would oversee the review of the Coastline Management Plan, to ensure all departments within Council provide input where

required. As a minimum, the Coastline Management Plan should be reviewed in five years from its adoption, as this is the timeframe in which most short term actions are scheduled to be addressed or completed. Further, many funding sources are indefinite, and may cease to exist or be replaced with new grant schemes in the short term. As a result, the five year review of the plan would need to address those strategies or actions likely to be affected by such changes in funding availability.

In June 2001 the NSW Premier announced a review of the State's Coastline Management Program. The review was to include extending and updating the NSW Coastal Policy, and reviewing and combining the Coastline Management Manual and Estuary Management Manual. Proposed changes to the Coastal Policy and the Coastline and Estuary Management Manuals are likely to require the Coastline Management Plan to be reviewed and modified where necessary.

To assist in implementation of strategic actions within the Plan, performance measures have been provided. During review of the Plan, performance measures need also to be reviewed and updated as necessary.

3.3.1 Sources of Funding

Potential external funding sources for identified works include the State's Coastal Management Program that is administered by DIPNR. The Coastal Management Program provides funding for works identified in the Coastline Management Plan that are required to mitigate or offset coastal hazards and other eligible capital works. However, there are state-wide competing demands on available funding. Funds from the State government are typically matched by Tweed Shire Council through general rates revenue. Other funding sources and resources include works undertaken by community groups such as Dunecare and Coastcare, developer contributions and the Commonwealth government. In addition, in the past Council has contributed funds to dune rehabilitation works and to support community groups.

Other funding opportunities available to TSC include:

- 'special' levies and rate increases, to fund (or part fund) major management actions;
- Northern Rivers Catchment Management Authority. May fund high conservation value habitat actions that are consistent with the Northern Rivers Catchment Action Plan;
- Federal government's Natural Disaster Mitigation Programme;
- Revenues raised from the operation of Tweed Holiday Parks and other Tweed Coast Reserve commercial activities;
- Section 94 Contributions; and
- Natural Heritage Trust Fund for measures to protect threatened species.

Funds from these sources could be used to manage and maintain the broad Tweed Coast Reserve.

3.3.2 Future Studies

3.3.2.1 Beach User Survey

There is relatively little known about the day-to-day usage patterns of the Tweed coast beaches, other than in broad terms. This is common to most stretches of coastline in

Australia. As with most LGAs in Australia, there is little historical data available and no current process to collect such data on the Tweed coast.

A survey of the usage of the Tweed beaches and adjoining foreshore areas would prove instrumental in the long-term management of the coastline, particularly as the coastal population of the Tweed increases. Such a study of the beach usage is recommended as a way of gaining further, more accurate, insight into the usage patterns of the Tweed beaches. Such surveys usually include both a written survey and unobtrusive observation. Surveys can either be completed by the community at their leisure, or conducted through on-site interviews.

Staff involved in the “on the ground” management of the beaches and their adjacent public lands and open spaces often make daily observations that are rarely documented. Observations made by TSC staff, National Parks and Department of Lands staff, as well as surf life savers, could easily be recorded into a database of information that could be used in conjunction with the Beach User Survey of the Tweed beaches.

With University campuses at Lismore and the Gold Coast, such a study could easily form part of a final year project with some funding assistance provided by Council or other grant scheme.

3.3.2.2 Cudgera Creek Entrance Coastal Inundation Study

No regions of oceanic inundation were defined or mapped in the *Tweed Coastline Hazard Definition Study*. However, the Study noted that some sections of dune along the coast may be subject to over-topping during extreme storm events (TSC, 2001), which may need to be explored in the future.

However, a recent coastal event that produced elevated water levels in the Cudgera Creek entrance resulted in water inundating the deck of a creek-front property within the creek entrance.

Areas identified at potential risk from oceanic inundation include:

- some creek-front development in the Cudgera Creek entrance at Hastings Point;
- some beachfront areas around Wooyong that have low dunes and are susceptible to erosion and overwash; and
- some beachfront areas around North and South Kingscliff.

The Cudgera Creek entrance at Hastings Point requires detailed wave transformation modelling into the headland area and complex wave setup assessment into the Creek. Detailed photogrammetric mapping of some creek front areas would also be required, which could be provided by DIPNR.

For the North and South Kingscliff and Wooyong beachfront areas the computations should be more straightforward and the requisite topographical data would also be made available from photogrammetry by DIPNR.

The cost to undertake such a study would be in the order of \$15,000 to undertake the hazard inundation mapping.

4.0 REFERENCES

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5.0 GLOSSARY OF ACRONYMS

CCA	Comprehensive Coastal Assessment
CL Act	Crown Lands Act
DCP	Development Control Plan
DEC	Department of Environment and Conservation
DIPNR	Department of Infrastructure, Planning and Natural Resources
DLWC	Department of Land and Water Conservation
DL	Department of Lands
DPI	Department of Primary Industries
EAP	Emergency Action Plan
EP&A Act	Environmental Planning and Assessment Act
ESD	Ecologically Sustainable Development
LALC	Local Aboriginal Land Council
LGA	Local Government Area
LSP	Landscape Structure Plan
MLWM	Mean Low Water Mark
NRCMA	Northern Rivers Catchment Management Authority
PWC	Personal Water Craft
SEPP	State Environmental Planning Policy
SES	State Emergency Services
SLSC	Surf Life Saving Club
SoE	State of Environment
TBLALC	Tweed Byron Local Aboriginal Land Council
TLEP	Tweed Local Environmental Plan
TRESBP	Tweed River Entrance Sand Bypass Project
TSC	Tweed Shire Council
VMP	Vegetation Management Plan
VMR	Volunteer Marine Rescue