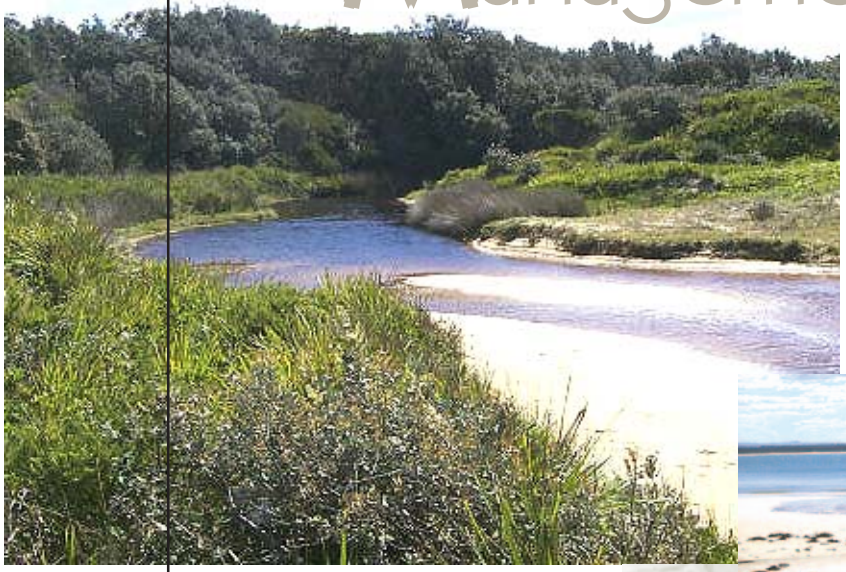
Shoalhaven City Council

Currarong Natural Resources Management Strategy



December 2001

CURRARONG NATURAL

RESOURCES MANAGEMENT

STRATEGY

FOREWORD

Why A Natural Resources Management Strategy?

Currarong's waterways and their catchments are important community assets for environmental, economic, recreational and social reasons. Increasing demands for residential and recreational opportunities need to be balanced with protection of the very values that people find attractive at Currarong. We need to ensure the long-term protection of our environment, and to minimise our impacts on the natural resources of the area. To this end, Shoalhaven City Council, NSW and Commonwealth Government agencies and the community have prepared this Natural Resources Management Strategy for Currarong Creek, Abrahams Bosom Creek, Plutus Creek and their catchments. It acknowledges past environmental management, attempts to integrate current programs and proposes some new approaches. We are doing this to safeguard the ecology of the creeks and their catchments, to balance potentially competing uses and to provide a framework for future planning.

Project supported by:

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CONTENTS

ABBREVIATIONS

Defence	Department of Defence and Royal Australian Navy
DLWC	Department of Land and Water Conservation
DUAP	Department of Urban Affairs and Planning
EA	Environment Australia
EPA	Environment Protection Authority
JBMP	Jervis Bay Marine Park
LEP	Local Environmental Plan
L/s	Litres per second
MPA	Marine Parks Authority
NPWS	National Parks and Wildlife Service
REP	Regional Environmental Plan
SCC	Shoalhaven City Council
SEPP	State Environmental Planning Policy

SUMMARY

This Currarong Natural Resources Management Strategy provides a comprehensive and integrated set of strategies to restore, protect and conserve the natural resources of Currarong's waterways and their catchments to ensure that their use is ecologically sustainable in the long term.

The document is the result of combining catchment management planning and estuary management planning into one process. In recognition of the fact that it covers the creeks of Currarong as well as their catchments, the document has been called the Currarong Natural Resources Management Strategy.

The strategies and actions in the document deal with seven management areas: water quality, erosion and sedimentation, water flow, nature conservation, coastal processes, recreation and visual quality. For each management area the plan contains values, objectives, issues, strategies and actions. The strategies for each management area are set out in the tables below. The actions proposed for carrying out each strategy are set out in the tables in sections 6 through 12 of this document. The strategies and actions are of four types: planning and development controls, protective and remedial works, education programs and monitoring/research.

The primary point of contact with the community during the preparation of this document has been the Currarong Estuary Management Task Force. The task force has reviewed a number of drafts of the document and individual task force members have contributed greatly to its preparation.

Extensive community consultation was undertaken to guide the preparation of the document. In addition to informal discussions held with many other people that have an interest in Currarong, the broader community has had a number of formal opportunities to contribute to the preparation of this plan. These include a public information session held at Currarong in July 1999 and a comprehensive survey of community values and issues in November 1999. The third phase of formal consultation during the preparation of a Natural Resources Management Strategy for Currarong was the exhibition of a draft for public comment in August 2001.

Strategies for Water Quality
WQ1 - Until reticulated sewerage scheme is built, minimise sewage contamination of Currarong's Creeks from existing sewage management systems
WQ2 - Design and build reticulated sewerage scheme
WQ3 - Control other pollutants at source
WQ4 - Minimise sediment and other pollutant transport in stormwater drains
WQ5 - Monitor water quality
WQ6 - Educate residents and visitors on stormwater issues and solutions

Strategies for Erosion and Sedimentation
ER1 - Accommodate natural process of creek bank erosion and accretion, but reduce human-induced erosion
ER2 - Reduce amount of sediment entering the creeks from the catchments by controlling erosion at its sources
ER3 - Reduce amount of sediment entering the creeks by intercepting it at the ends of drains
ER4 - Remove unnatural deposits of sediment from creeks at the outlets of stormwater drains

Strategies for Water Flow
WF1 - Protect natural low flows
WF2 - Maintain natural flow variability in creeks
WF3 - Minimise impact of instream structures
WF4 - Maintain groundwater within natural levels
WF5 - Investigate impacts of any stormwater overflows in village

Strategies for Nature Conservation
NC1 - Manage for conservation purposes some areas of land known to support populations of rare or threatened species
NC2 - Manage for conservation purposes large natural areas to west, south, north-east and east of village (including Abrahams Bosom Reserve) (see fig. 9-2)
NC3 - Protect important areas of native vegetation within the village of Currarong
NC4 - Protect the natural values of Currarong Creek
NC5 - Ensure that use of the Beecroft Weapons Range is ecologically sustainable
NC6 - Educate visitors and residents on importance of protecting natural values
NC7 - Remove piles of garden waste from public areas
NC8 - Control weeds in bushland areas
NC9 - Maintain or establish buffer zones between developed areas and sensitive habitats, where possible
NC10 - Minimise impacts of fire on the natural values of the area
NC11 - Control introduced pest animals

Strategies for Coastal Processes
CP1 – Investigate need to manage vehicle access to Currarong Beach
CP2 - Reduce rate of recession of foreshore in front of Warrain Crescent and, if necessary, Beecroft Parade

Strategies for Recreation
R1 - Improve useability of Yalwal Street boat ramp (existing facilities)
R2 - Provide a boat launching area at Currarong to a standard suitable for 2 wheel drive vehicles under appropriate sea conditions, if possible
R3 - Until new/improved facility provided, restore navigability of Currarong Creek entrance channel when criteria met
R4 - Following provision of new/improved facility, retain Warrain Crescent boat ramp for use when natural entrance conditions allow
R5 - Reduce conflict between recreational users

Strategies for Visual Quality
VQ1 - Maintain or restore visual character of natural landscapes and landforms
VQ2 - Ensure built forms do not impact adversely on coastal scenery

1 INTRODUCTION

1.1 CURRARONG

Currarong is located in the City of Shoalhaven on the New South Wales south coast (see Figure 1-1).

There are three small, permanent creek systems at Currarong: Plutus Creek, Abrahams Bosom Creek and Currarong Creek. Currarong village has been built around the entrance to Currarong Creek.

Most of the land surrounding the village is bushland, reserved for public recreation, environmental protection or defence purposes. The ocean waters adjacent to the village and the tidal part of Currarong Creek are part of the Jervis Bay Marine Park.

Currarong's waterways and their catchments are characterised by many environmental, social, commercial and recreational values that make them popular places for a wide variety of activities. However, the pressure of these uses has sometimes resulted in competition for and degradation of the area's natural resources.

1.2 AIM

This Currarong Natural Resources Management Strategy provides a comprehensive and integrated set of strategies **to restore, protect and conserve the natural resources of Currarong's waterways and their catchments so as to ensure that their use is ecologically sustainable in the long term**.

A number of government agencies, community groups and individuals have been involved in the management of the natural resources of the Currarong area prior to the preparation of this plan. This plan aims to integrate existing programs and proposes some new approaches.

The plan has been prepared under the following hierarchy of NSW Government policies.

1.2.1 Total Catchment Management

Total Catchment Management (TCM) is the overlying management approach that involves the coordinated use and management of land, water, vegetation, ecosystems and other resources within a drainage basin.

1.2.2 State Rivers and Estuaries Policy

The NSW State Rivers and Estuaries Policy focuses on the river and estuarine resources with the intent of reducing and where possible halting degradation and encouraging environmental restoration activities.

1.2.3 NSW Estuary Management Policy

Recognising the value and importance of estuaries and the need to improve their management, the NSW Government developed an Estuary Management Policy.

The policy '*provides for the assessment of all estuarine uses, the resolution of conflicts and the production of a unified and sustainable management plan for each estuary, including remedial works and the redirection of activities where appropriate'* (NSW Government, 1992).

The goal of the Government's Estuary Management Policy is to achieve integrated, balanced, responsible and ecologically sustainable use of the State's estuaries, which form a key component of coastal catchments.

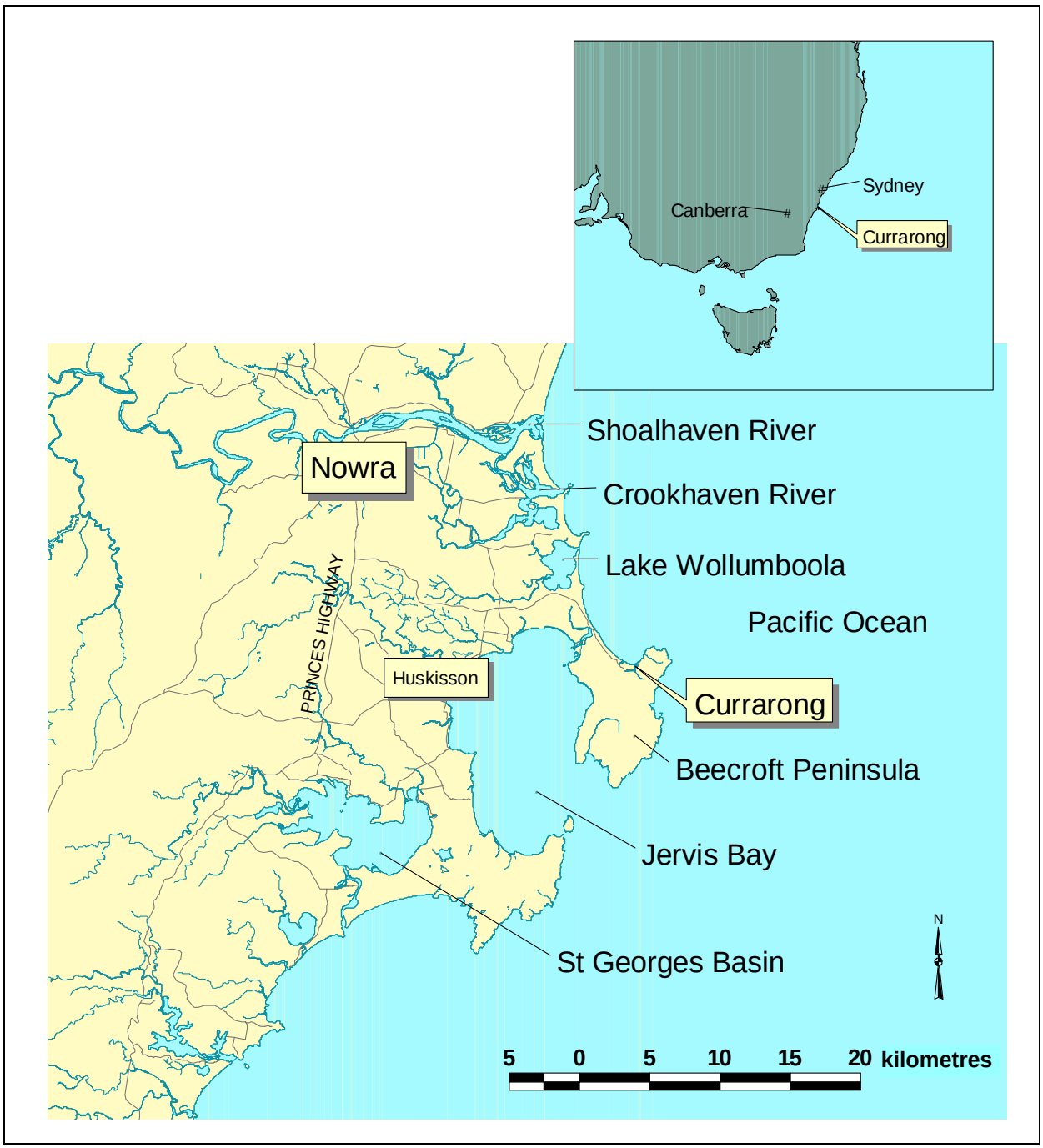

Figure 1-1. Location of Currarong

1.3 PLANNING PROCESS

A Management Team consisting of SCC and DLWC has overseen the preparation of this plan. A project officer prepared the plan, working with the community in doing so. The primary point of contact with the community has been the Currarong Estuary Management Task Force. The project officer was employed by Shoalhaven City Council on behalf of the Management Team.

This plan is the result of combining catchment management planning and estuary management planning into one process. This approach to natural resource management is based on the following:

- the quality of estuaries is largely determined by management of their catchments;
- one of the goals of catchment management is to work with local communities in developing a concise statement of major issues and preferred management for each of the major land & water units (catchments) in the area;
- it is the policy of government to integrate the management of natural resources
- the approach will increase community understanding about how activities in the catchment impact the estuary
- it will increase community input to planning
- the strategies will identify landcare needs in the catchment.

1.4 PLANNING FRAMEWORK

There were a range of policies, plans and strategies that were considered during the preparation of this plan. These included:

- NSW State Rivers & Estuaries Policy
- NSW Wetlands Management Policy
- NSW Coastal Policy 1997
- Crown Land Foreshore Tenures Policy (non commercial occupations) (1991)
- Crown Lands Caravan Parks Policy
- Jervis Bay Marine Park Issues and Options Paper 1999.

At the same time as this plan was being prepared, the Marine Parks Authority was preparing zoning and operational plans for the Jervis Bay Marine Park. Liaison with the authority has been maintained in an attempt to achieve consistency.

The Department of Defence is a major land holder in the catchments. Defence is committed to ecologically sustainable use of its land and has prepared and funded an Environmental Management Plan for the Beecroft Weapons Range. This Currarong NRMS incorporates Defence environmental management initiatives so that a Total Catchment Management perspective can be presented.

Some of the strategies in this plan may require amendments to existing Council planning and development controls (eg the LEP and Council policies). Others affect the granting of development consents, permits and/or licences for works to repair existing degradation (eg bank stabilisation work) and to prevent future damage (eg sediment traps, artificial wetlands). Where possible, any plans to be amended or created have been identified in the actions for each strategy.

Actions carried out as a result of this plan will have to comply with such legislation as:

- *Local Government Act 1993* (SCC)
- *Environmental Planning & Assessment Act 1979* (DUAP)
- *State Environmental Planning Policy No. 14 - Coastal Wetlands* (DUAP)

- *State Environmental Planning Policy No. 26 - Littoral Rainforest* (DUAP)
- *State Environmental Planning Policy No. 35 - Maintenance Dredging of Tidal Waterways* (DUAP)
- *Jervis Bay Regional Environmental Plan 1996* (DUAP)
- *Local Environmental Plan 1985,* (SCC)
- *Crown Lands Act 1989* (DLWC)
- *Marine Parks Act 1997* (MPA)
- *Rivers and Foreshores Improvement Act 1948* (DLWC)
- *Soil Conservation Act 1938* (DLWC)
- *Coastal Protection Act 1979* (DLWC)
- *Maritime Services Act 1935* (Waterways Authority)
- *Fisheries Management Act 1994* (NSW Fisheries)
- *Protection of the Environment Operations Act 1997* (EPA)
- *Native Vegetation Conservation Act 1997* (DLWC*)*
- *National Parks & Wildlife Act 1974* (NPWS)
- *Threatened Species Conservation Act 1995* (NPWS)
- *Commonwealth Environment Protection and Biodiversity Conservation Act 1999* (EA)
- *Defence Force Regulation 1952* .

The information in the plan will also be used by Council to develop its annual State of the Environment report and its Strategic Business Plan which forms part of its internal Management Plan required by the Local Government Act.

1.5 ASSISTANCE

Shoalhaven City Council and the Commonwealth Government (Natural Heritage Trust, National Landcare Program and Coasts and Clean Seas Initiative) provided financial assistance for the preparation of this plan.

In addition, technical assistance has been provided by:

- Department of Land & Water Conservation
- Southern Catchment Management Board
- Environment Protection Authority
- Waterways Authority
- NSW Fisheries
- NSW National Parks & Wildlife Service
- Department of Urban Affairs & Planning
- Environment Australia
- National Oceans Office
- University of Wollongong
- Department of Defence.

1.6 CONSULTATION

The Currarong Estuary Management Task Force was established in 1996 as an advisory committee to Shoalhaven City Council. It provides a forum for resolving conflicting demands on Currarong's waterways and formulates long term management strategies to ensure their use is ecologically sustainable.

Committee members are drawn from the local community, together with Council and State Government representatives. The Task Force was established to perform the role of an Estuary Management Committee in accordance with the Estuary Management Policy, but its role broadened to include management of natural resources in the catchment as well. Task force members have contributed greatly to the preparation of this plan.

In addition to informal discussions held with many other people that have an interest in Currarong, the broader community has had a number of formal opportunities to contribute to the preparation of this plan.

Firstly, in July 1999 a public information session was held at Currarong at which a number of natural resource management experts

presented information on the area and the planning process was outlined. All residents were invited by letterbox drop to attend. People were further invited to make submissions on the values and issues that they thought should be considered during plan preparation.

Secondly, a discussion paper and questionnaire was distributed to gauge the Currarong community's opinions on a set of draft values and issues. Approximately one thousand one hundred papers were distributed beginning 12 November 1999 by the following means:

- letterbox drop at Currarong
- mail to all ratepayers with a postal address other than Currarong
- mail to all with on site caravan at Currarong Holiday Haven Tourist Park
- mail to others that have an interest in natural resource management at Currarong, including private citizens, non-government organisations, Federal and State agencies, local politicians, all councillors and many council staff.

Two hundred and forty five responses were received before 25 January 2000. Results are summarised in Sections 3 and 4 of this document.

The third phase of formal consultation during the preparation of a Natural Resources Management Strategy for Currarong was the exhibition of a draft for public comment in August 2001.

2 CURRARONG'S WATERWAYS AND THEIR CATCHMENTS

2.1 LOCATION AND CHARACTER

The village of Currarong is located on the Beecroft Peninsula in the City of Shoalhaven on the New South Wales south coast. By road it is approximately one hundred and ninety kilometres south of Sydney and thirty kilometres south-east of Nowra. The village nestles at the southern end of the Crookhaven Bight, a twelve kilometre long sandy embayment extending between Penguin Head to the north and Beecroft Head to the south (see Figure 1-1). The village has been built around the entrance to Currarong Creek.

Beecroft Peninsula is a large outstand of bedrock that reaches heights of sixty metres above sea level and forms the northern headland of the entrance to Jervis Bay. It shelters the village area from southerly and easterly seas. Beecroft Peninsula is connected to land further to the north by an isthmus of sand that is narrowest near Carama Inlet. The boundary between these two major landforms (rocky headland and sandy isthmus) is basically defined by Currarong Creek. Thus, that part of the village which has been built to the east of the creek has a different character (relatively steep terrain , shallow soil and shallow underlying rock) to that part of the village west of the creek (flatter terrain and deeper sandy soils).

2.2 THE COAST

Major coastal landforms are shown in Figure 2-1 along with underwater reefs near the village. The twelve kilometre long curved embayment which faces east-north-east is known as Warrain Beach at the northern end and Currarong Beach at the southern end. The beach is more deeply embayed at the southern end where Currarong Beach (in front of the village of Currarong) is aligned almost east to west. There are isolated rock outcrops along the beach at Kinghorn Point, Hammerhead, Plutus and just to the west of the mouth of Currarong Creek. The southern end of the embayment forms a long sand spit separating and enclosing Jervis Bay from the ocean. Adjacent to the mouth of Carama Inlet inside Jervis Bay this spit is less than two kilometres wide and the upper reaches of the inlet come to within two hundred metres of the open ocean beach.

The bedrock shoreline extends to the northeast from Currarong Creek entrance to Whale Point and Little Beecroft Head. Small sandy pocket beaches are contained within this headland at Abrahams Bosom Beach and Whale Cove. There are extensive outcrops of rock reef in the nearshore of Crookhaven Bight to the north and east of the Creek. The sandy nearshore zone of Crookhaven Bight is shallowly underlain by bedrock.

The ocean waters adjacent to the village and the tidal part of Currarong Creek are part of the Jervis Bay Marine Park.

2.3 SURFACE WATER

There are three small, permanent creek systems at Currarong: Plutus Creek, Abrahams Bosom Creek and Currarong Creek. These creeks and their catchments are shown in Figure 2-2.

There are also areas that drain directly to the sea via gullies that are dry most of the time. Still other areas are wetlands that are rarely, if ever in direct contact with streams or the sea, but may be in indirect contact via groundwater.

The largest waterway (but nevertheless a small waterway) is Currarong Creek, which flows

Figure 2-1 Coastal features at Currarong

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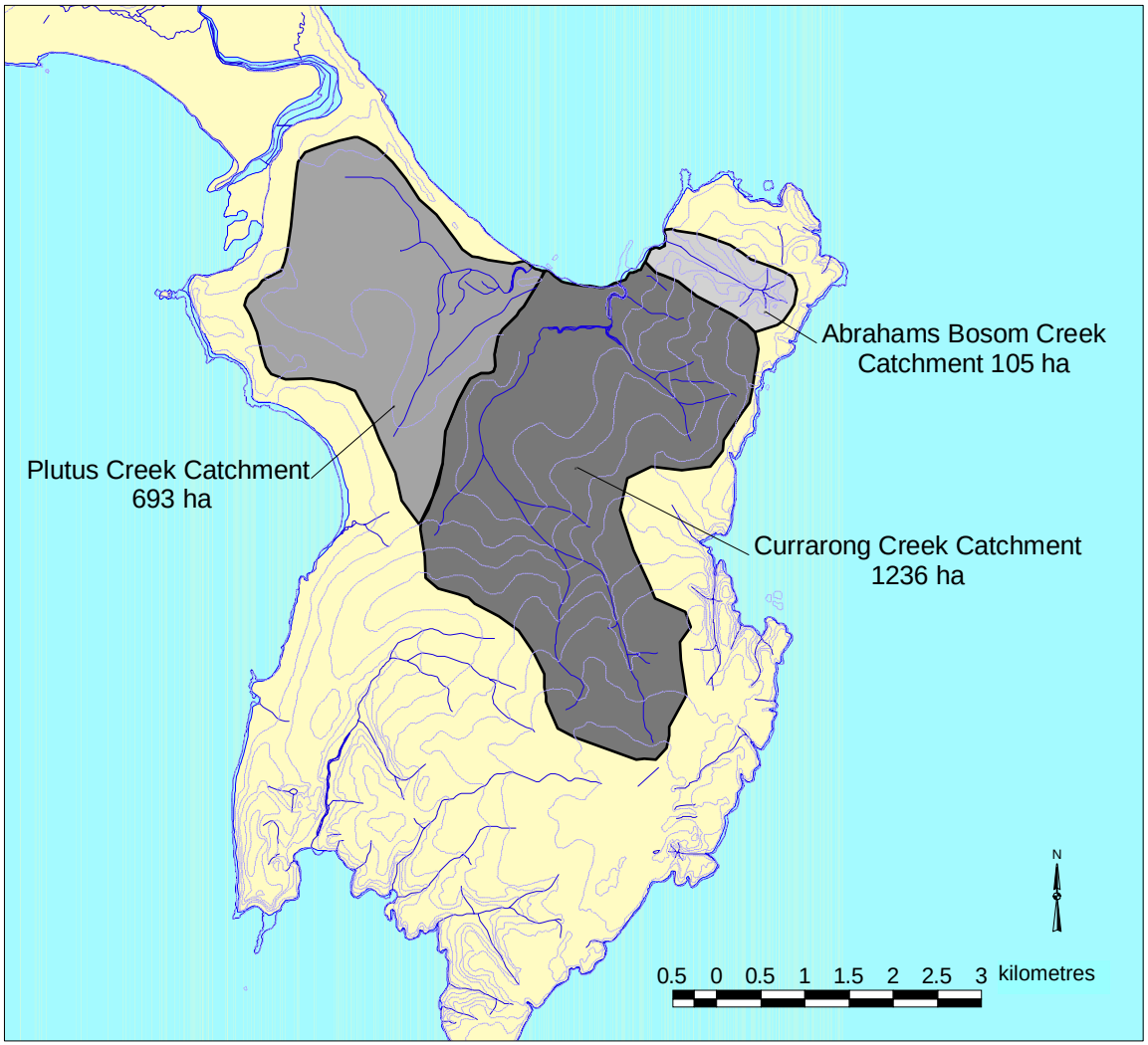

Figure 2-2. Currarong's creeks and their catchments

generally south to north. It commences high up on the headland then drains a low-lying swampy catchment in the centre of Beecroft Peninsula. The creek extends about six kilometres across Beecroft Peninsula, the most seaward kilometre being tidal. To the east the entrance is confined by bedrock outcrops and the artificial rock training wall.

A second creek, Plutus Creek, flows generally west to east and enters the sea on the east facing shoreline, to the west of the village. Plutus Creek is often not connected to the sea, but at times breaks through the beach sands that build up at its entrance. The catchment of Plutus Creek is mostly flat swampy land on the sandy isthmus to the south of Carama Inlet. It is largely undeveloped.

The third waterway is Abrahams Bosom Creek, which flows generally east to west and enters the sea on the west facing shoreline to the north of the village. Like Plutus Creek, Abrahams Bosom Creek is frequently closed to the sea. However, even when the creek is closed, seawater may wash over the sand barrier and into the creek at high tide. The catchment of Abrahams Bosom Creek is the rocky northern part of Beecroft Peninsula.

The estuarine parts of these three creeks are places where marine and terrestrial processes interact to produce particularly sensitive and complex coastal environments.

These estuaries, and others in New South Wales, have a common origin. They formed around six thousand years ago when sea level rose to its present position, drowning coastal river valleys.

This sea level rise also triggered shoreward transport of huge volumes of sand that accumulated as beaches, many of which blocked off bays and river mouths.

The estuaries also have a common destiny. They are very large sediment traps - to be filled with sediment delivered from the surrounding catchments and from the sea.

The time it takes to reach a mature stage depends primarily on catchment characteristics (water and sediment discharge), together with the initial dimensions and configuration of the estuarine basin.

The present day patterns of water and sediment dynamics that we see at Currarong can be explained in terms of the relative importance of catchment inputs, tidal forces and wave climate.

The interaction of these forces also determines prevailing entrance conditions - a crucial factor in explaining the characteristics of a particular estuary.

2.4 GEOLOGY & SOILS

The following description has been summarised from Taylor *et al*. (1995).

Currarong lies within the southern part of the Sydney Basin, a large sedimentary basin formed around 270 to 250 million years ago. The Beecroft Peninsula consists mostly of sandstone. These are the oldest rocks that outcrop in the Jervis Bay area, being Permian rocks of the Snapper Point Formation. There are also Wandrawandian siltstones (another type of Permian sedimentary rock), particularly in the Plutus Creek catchment. Volcanic activity to the north about 250 million years ago probably resulted in the folding of the sedimentary layers and the intrusion of igneous rocks as small dykes and sills.

The sandstone areas are characterised by shallow soils and strong surface runoff. Soils occurring on the sandstone terrain of the Beecroft Peninsula comprise yellow

earths, yellow podsolic soils and peats.

In addition to the old rocks described above, the area has a complex array of surface deposits formed during the past six thousand years. Many of these features are still actively changing. Dune sands occur in the Crookhaven Bight barrier system. Further unconsolidated sediments occur along the creek systems of the peninsula. These comprise alluvial, lagoonal and estuarine clays, silts and sands.

2.5 GROUNDWATER

Groundwater resources occur in two broad aquifer categories: sedimentary rocks (sandstone) and unconsolidated sediments (river alluvium and dune sands). The main groundwater resources of the area are restricted to the Snapper Point Formation sandstone, which is a grey white quartz pebbly sandstone that can be found outcropping around the site. The aquifers within this formation occur at depths of twenty to fifty metres with low to moderate yields of 0.2L/s to 1.6L/s. The Snapper Point Formation sandstone acts as a fractured porous aquifer with joints and bedding planes providing preferred pathways for groundwater movement. Additional storage is available within the porous sandstone. Groundwater salinities are expected to be low. Recharge is assessed to be from rain infiltrating either directly within the outcrop areas, or from leakage from the overlying saturated, unconsolidated sediments (Sinclair, 1998; Smith, 2000).

Limited groundwater resources are being utilised from the dune sands along Currarong Beach. Here, the water table will generally reflect surface topography, mounding on ridges and discharging at low points such as creeks, wetlands and beaches. Shallow groundwater is likely to be connected with wetlands in back dune areas along Currarong Beach and creeks. During wetter periods, the shallow aquifers would generally be recharged by the creeks and wetlands, while during drier periods the aquifers may provide base flow to the surface water systems (Sanders and Sinclair, 1997).

2.6 BEECROFT HABITATS, PLANTS AND ANIMALS

2.6.1 Habitats

The complexity of the physical environment at Currarong results in a wide range of habitats on which plants and animals have become dependent. However the relatively infertile soils and the fact that the peninsula is connected to the mainland by only a thin strip of land may limit the diversity of some types of animals (Daly, 1996).

Nevertheless, Beecroft Peninsula is located where warm temperate species near their geographical southern limit occur with cool temperate species near their northern geographical limit. Hence its biological diversity is relatively high and of great heritage and scientific value.

Habitats on the peninsula include littoral rainforest, open forests, woodlands, wet heaths, shrublands, saltmarsh, freshwater swamps, creeks, rocky shores and beaches.

Some of the wetland habitats adjoining the estuarine section of Currarong Creek have been mapped in figure 2-3 (Wilton, unpublished). SEPP No 14 wetlands are shown in figure 2-5.

Within the creeks there are sand, rock, mud and seagrass habitats. Currarong Creek is likely to be an important nursery area where juveniles of many recreationally and commercially important finfish and shellfish find refuge. Upstream of the road bridge, Currarong Creek is in a relatively undisturbed state. In terms

of physical disturbance, Abrahams Bosom and Plutus Creeks are near pristine, although the quality of their water is unknown.

2.6.2 Plants

The vegetation of the area is diverse and of high conservation value. Large areas, such as Abrahams Bosom Reserve and much of the Commonwealth land, are relatively undisturbed, resulting from the geographical isolation of the area and the restrictions to development and access imposed by the Department of Defence (Skelton and Adam, 1994).

The vegetation varies from tall rainforest remnants to ecologically important wetlands. There are coastal grasslands, shrublands and woodlands, estuarine algae, seagrass, saltmarsh and mangrove, freshwater swamps and sedgelands, eucalypt forest, with large areas of heath and shrubland being the most common. Many of the vegetation types are significant because they are rare in the region, contain rare or threatened plants, are at the southern limit of their distribution, or are valuable animal habitat (Skelton and Adam, 1994; Mills, 1993).

Skelton and Adam (1994) identified those vegetation communities on Commonwealth land that require active management to ensure conservation. Their recommendations are summarised in table 2-1.

Some plant species of conservation importance at Currarong are:

Prostanthera densa
Villous Mint Bush,
Grevillea barklyana macleayana
Large-leaf Grevillea
Eucalyptus robusta
Swamp Mahogany
Chamaesyce psammogeton
Sand Spurge

A Crown Land Assessment (DLWC, 1999) identified environmental protection as the preferred use for the Crown land between the bowling club and Fishery Road, as well as for the land between Crookhaven Parade and the houses in Fishery Road. The main reason was the presence of populations of the threatened plant *Prostanthera densa* and the rare plant *Grevillea macleayana*.

2.6.3 Animals

The vegetation communities described above provide essential habitat for a variety of native animals, but animals also occupy unvegetated areas such as beaches, bare rock and the water column of the creeks.

Daly (1996) listed 25 species of reptiles and 15 species of amphibians that have been observed or are expected to occur on the Beecroft Peninsula.

Nine species of native mammals and five introduced species have been recorded on the peninsula (Dexter & Meek, 1996).

Fifty-eight bird species have been recorded at Currarong as part of the Jervis Bay Cumulative Impact Monitoring Program (Shoalhaven CMC, unpublished.)

Some animal species of conservation importance at Currarong are:

Ground parrot
Powerful owl
Large-footed fishing bat
Long-nosed Bandicoot
Terek Sandpiper
Sooty Oystercatcher
Possibly Black Bittern
Hooded plover

Vegetation Type	Conservation	Fire Sensitivity	Vegetation Management Recommendation
Mangrove	Meets criteria for SEPP 14 listing	N/A	Scenic, damaged by walking Boardwalk recommended
Saltmarsh	Meets criteria for SEPP 14 listing	N/A	Scenic, damaged by walking Boardwalk recommended
Melaleuca ericifolia Swamp/Heath	Many areas protected by SEPP 14	Sensitive to fire during drought	Sensitive to changes in water level and water quality
Sedgeland	Unknown, likely to be very rare	Likely to recover however the effect of frequency is unknown	Actively conserve due to rarity
Banksia ericifolia Heath	Widespread and abundant on Peninsula uncommon outside	Will recover, the effect of fire frequency is uncertain	Fire frequency management needed, see Bradstock and Keith NSW NPWS
Callistemon linearis Heath	Rare in region	Likely to recover however the effect of frequency is unknown	Conserve due to rarity regenerate Bivouac
Heath on clay	Rare in the region	Likely to recover however the effect of frequency is unknown	Actively conserve due to rarity
Clifftop Shrubland	Uncommon, occurs on southern head, restricted to cliff tops	Will recover from fire but fire during high wind may destroy	Prevent damage by fishermen and tourists
Allocasuarina distyla Shrubland	Widespread on Peninsula but limited in region	Will recover but the effect of fire frequency is unknown	Suitable for walking tracks and mosaic burning
Kunzea ambigua /Leptospermum epacridoideum Shrubland	Very rare	Fire must be managed very carefully	Fire and people management are important
Dune Heathland	High species richness, likely to be uncommon and restricted to coast	Will recover but the effect of fire frequency is unknown	Soil is easily eroded by wind if vegetation is disturbed.
Eucalyptus gummifera / E. sieberi Woodland	Probably common in region	Will recover but the effect of fire frequency is unknown	Many areas have been cleared, only a few pockets remain on Peninsula
Dune Woodland	Uncommon restricted to coast	Will recover but the effect of fire frequency is unknown	Important for providing shelter for other communities
Eucalyptus piperita /Angophora floribunda Tall Forest on alluvium	Probably widespread outside area	Will recover, effect of frequency unknown, buffers Rainforest from fire	Suitable for walking trails on flat areas
Eucalyptus piperita / Allocasuarina littoralis Forest on clay	Probably widespread outside area	Will recover from low cool fires Effect of fire frequency is unknown	Suitable for walking
Eucalyptic botryoides / E. sclerophylla Forest on sand	Probably widespread outside area	Will recover from low cool fires Effect of fire frequency is unknown	Scenic, suitable for walking on flat areas only
Eucalyptus gummifera Open Forest	Probably widespread outside area	Will recover from low cool fires Effect of fire frequency is unknown	Suitable for walking
Casuarina glauca Forest	Widespread	Will recover from low cool fires Effect of fire frequency is unknown	
Syncarpia glomulifera Tall Closed Forest	Rare on Peninsula	Will recover from low cool fires Effect of fire frequency is unknown	Good for walking, some regeneration and weed control needed
Littoral Rainforest	Botanically important, regionally rare, southern limit	Very fire sensitive, fire management should aim at increasing area	Suitable for walking may need a board walk in areas.

Table 2-1. Recommended management of some vegetation communities on Beecroft Peninsula (Skelton and Adam, 1994)

Little penguins are believed to have attempted to nest near the Currarong Creek entrance in the past and are reported to still visit the creek.

2.7 ABORIGINAL HERITAGE

Archaeological excavations (Lampert, 1971) in rock shelters located in woodland areas near Currarong have dated Aboriginal occupation of the area from at least 3 000 years ago, possibly as much as 7 000 years. Because the sea rose to its present level at about that time, any evidence for earlier occupation of the previous coastline now lies under the sea (Egloff *et al*., 1995).

The deposits in the rock shelters provide important information on the use of stone tools and fish hooks and shows technological changes over the last few thousand years. They also indicate utilisation of a wide range of terrestrial and marine animals, including mammals, birds, reptiles, fish and shellfish.

More recent midden deposits are scattered along the seashore at Currarong and are an indication of the extensive use of marine resources by aboriginal people.

2.8 EUROPEAN HERITAGE

Currarong was a popular camping area in the early 1900s. During the 1920s, war pensioners, fishermen, and the unemployed began to settle in Currarong and the village continued to grow to its present size.

A number of Currarong's cottages and the rotunda are listed as items of significance in Shoalhaven City Council's Heritage Study Inventory (Freeman, 1998).

The wreck of the *SS Merimbula*, which ran aground in 1928, lies in the shore at Whale Point.

2.9 RESOURCE USE

2.9.1 Waterways

Currarong's protected ocean beaches are very popular for swimming. Recreational uses of the creeks are limited by the small size of the waterways. The creeks are appreciated for their scenic value and the entrance area of Currarong Creek is used for passive recreation and swimming.

A small amount of recreational fishing and bait collection are done in Currarong Creek but the small size of the waterways limits fish stocks.

Ocean fishing from boats is more common and is focussed on inshore reefs, sand and gravel areas, as well as on areas further offshore such as Sir John Young Banks, which lie approximately 7 kilometres north-east of Currarong. Shore-based fishing is done from the ocean beaches and from the rocky shores around Beecroft Head.

Residents and visitors to Currarong have long used Currarong Creek as a place to moor or launch their boats and, when possible, have taken their boats through the creek entrance to the sea. There is a public boat ramp in the creek (at Warrain Crescent) and a number of private ramps and jetties. A small number of permanent moorings are licensed near the creek entrance, but their use is declining possibly due a build up of sand, there being fewer commercial fishers, and/or a change in the type of boats used, particularly a trend toward trailer boats amongst recreational fishers. Boats are also launched and retrieved from the beach just west of Currarong Creek. To the east there is a boat launching area direct to the Crookhaven Bight that is accessed via Yalwal Street (see section 11).

There is no commercial fishing in the creeks, though a few commercial

fishermen launch and retrieve in Currarong Creek when fishing the ocean beaches and inshore reefs.

Recreational snorkelling, SCUBA diving and spearfishing are also done on the inshore reefs, both from the shore and from boats. Surfing, sailing and use of jetskis are other activities in the ocean waters adjacent to the village.

In general, waterway usage increases greatly during the summer months and holiday periods.

The tidal part of Currarong Creek and the ocean waters adjacent to Currarong are part of the Jervis Bay Marine Park. The Marine Parks Authority is preparing zoning and operational plans and these will set out how the park will be used and managed. A draft zoning plan was released for public comment in October 2001. Development within the Jervis Bay Marine Park requires the concurrence of the Marine Parks Authority, while development within the locality (catchment) of the marine park must be referred to the Authority for comment where the consent authority, e.g. Council, believes it may have an effect on the plants, animals, or habitat within the marine park.

The creek is currently not zoned by Council's Local Environmental Plan (shown as uncoloured on the LEP map). However, all development within the creek requires Council's consent (under Clauses 23 and 36 of the LEP).

Any development in or within 40 metres of the creek, which involves the excavation of materials and/or the placement of fill, may require the consent of DLWC under the Rivers and Foreshores Improvement Act.

The bed of the creek is Crown land and is subject to the Crowns Lands Act 1989. The submerged and intertidal areas of the creek have been assessed by the Department of Land and Water Conservation as having preferred uses of environmental protection and recreation (natural).

2.9.2 Groundwater

The majority of groundwater users in the area are in the town of Currarong, where numerous bores are drilled through the surface to access the sandstone and dune sand aquifers. Currarong is serviced by a reticulated water supply, (treated Shoalhaven River water) and so ground water is used less than it used to be and probably mainly for watering of gardens.

2.9.3 Land Use

Land use in the Currarong area is subject to the Jervis Bay Regional Environmental Plan (REP) 1996 and the Shoalhaven Local Environmental Plan (LEP) 1985. Figures 2-4, 2-5 and 2-6 show land ownership and land use zoning on the Beecroft Peninsula as at May 2001. The approximate land area for each zone on the Beecroft Peninsula is shown in Table 2-2.

Currently, the majority of land within Currarong's catchments is reserved for defence purposes. The Royal Australian Navy Weapons Range occupies approximately 4,200 hectares of the Beecroft Peninsula, including a large area zoned 5(a) and an area in the Plutus Creek catchment zoned 7(f2) (Environmental Protection). The range is managed by the Commonwealth for defence training. A small part of the range is used for bombardment practice. The range is also an important conservation and recreation area, and is managed for these purposes by Environment Australia (Beecroft Rangers) on behalf of the Department of Defence.

As shown in figure 2-4, most other public land outside the village is a

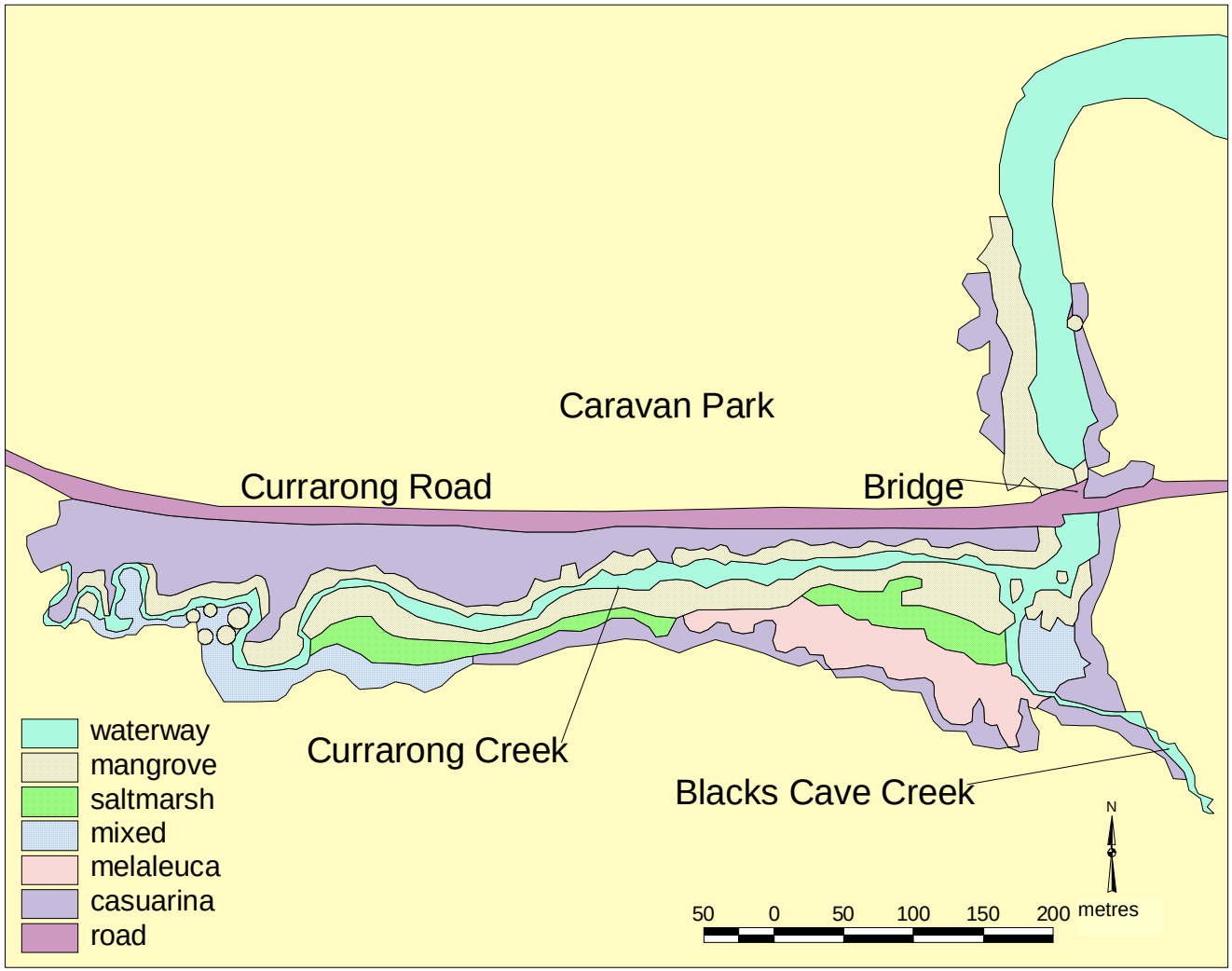

Figure 2-3. Estuarine wetland vegetation of Currarong Creek mapped from 1993 air photo (Wilton, unpublished).

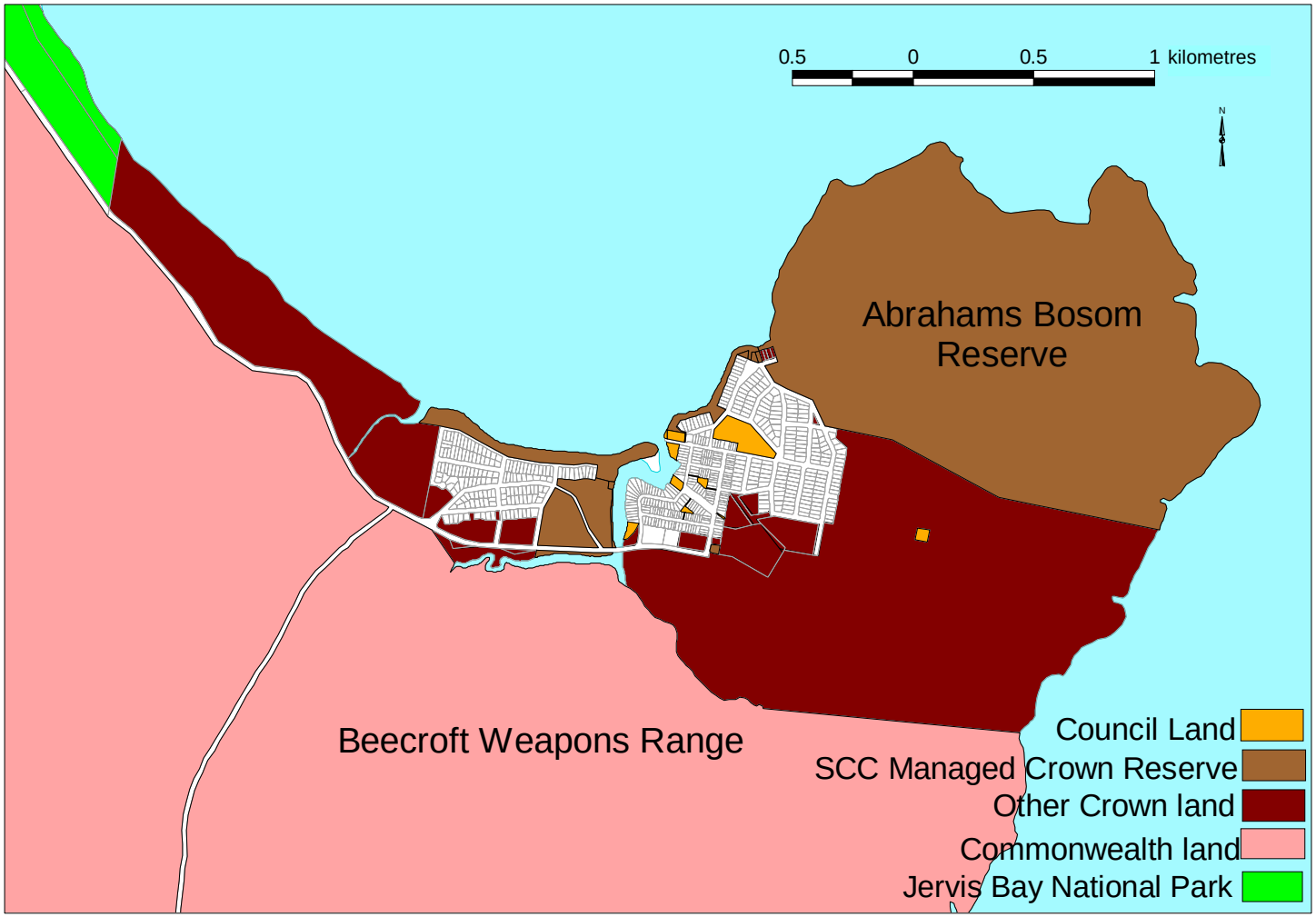

Figure 2-4 Land tenure at Currarong.

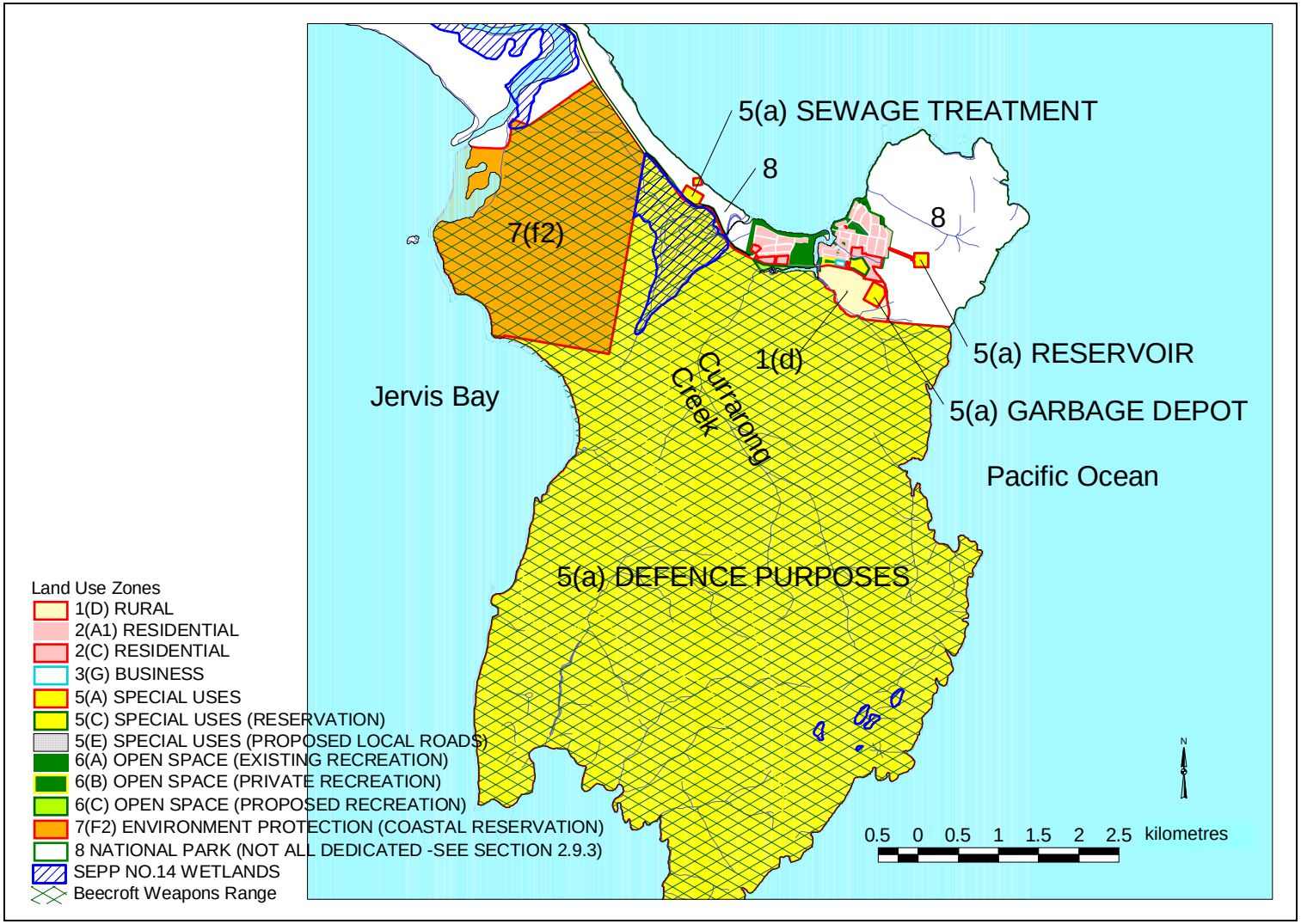

Figure 2-5. Land use zoning on Beecroft Peninsula.

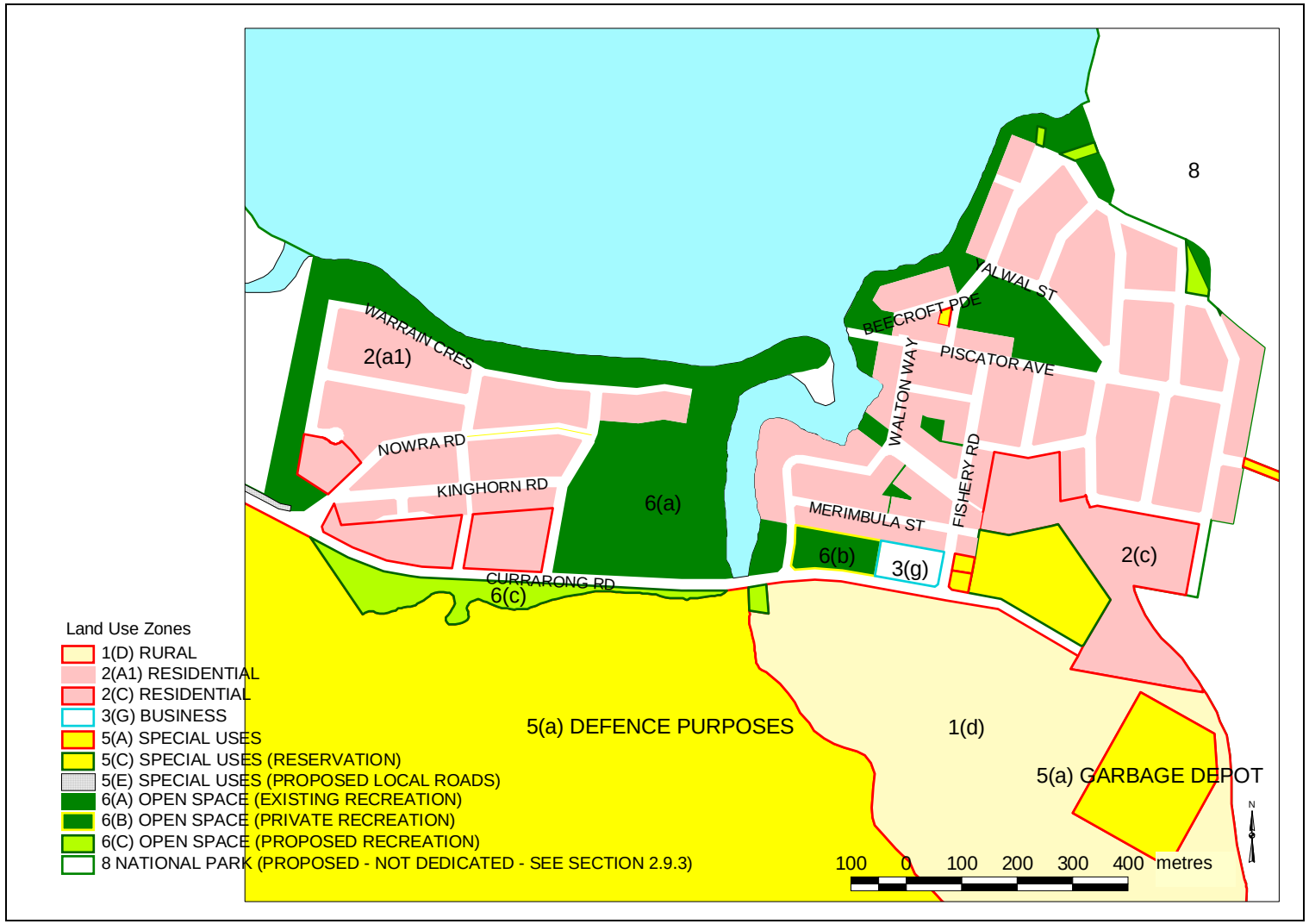

Figure 2-6. Land use zoning in Currarong village.

Figure 2-7. Areas subject to Aboriginal land claims..

mixture of Crown Reserve and vacant Crown land. (In figure 2-5, the areas zoned 8 by the REP as proposed additions to the NSW Jervis Bay National Park have not been dedicated as there are longstanding but unresolved Aboriginal Land Claims, see below). These areas, in addition to their conservation values, are used as a recreational resource (especially for walking and nature observation) by Currarong residents and visitors.

Figure 2-7 shows areas of Crown land around the village of Currarong that are subject to unresolved Aboriginal Land Claims under the NSW Aboriginal Land Rights Act 1983 (not the same as Commonwealth Native Title legislation). The NSW Minister for Land and Water Conservation is responsible for the determination of these claims.

Within the village, there is a mix of urban zones, with most of the ocean foreshore zoned for recreation. The western bank of Currarong Creek is zoned for recreation, but much of the land on the eastern side of the creek is in private ownership and is zoned residential.

The 1996 Settlement and Population Statistics for Currarong are shown in Table 2-3. Most privately owned land that is zoned for residential development has been built on, but about half these dwellings are not permanently occupied. Some small, undeveloped areas of Crown land in the village have been assessed by the Department of Land and Water Conservation as having a preferred use of residential development. Overall, the expansion of the village is very limited.

Currarong is a popular tourist destination for families, caravanners and fishers. Tourist accommodation is restricted to the letting of a small number of holiday houses, cabins, bed and breakfast establishments and a range of caravan, cabin and camping accommodation in the one caravan park. The peak tourist season is over the summer holiday period.

Table 2-2 Zoning categories and land areas on Beecroft Peninsula as at May 2001.

Zone Category	Approximate land area (hectares)
1 (d) Rural (General Rural)	33.9
2 (a1) Residential	35.0
2 (c) Residential (Living Area)	10.9
Road Reserves in Village (unzoned)	19.9
3 (g) Business (Development Area)	0.8
5 (a) Special Uses (defence purposes)	3545.9
5 (a) Special Uses (other community facilities)	13.3
5 (c) Special Uses (School)	3.3
5 (e) Special Uses (proposed future roads)	7.9
6 (a) Open Space – Recreation (Existing)	22.0
6 (b) Open Space – Recreation (Private)	1.1
6 (c) Open Space – Recreation (Proposed)	3.1
7 (f2) Environment Protection (Coastal Reservation)	596.4
8 National Park (existing or proposed)	439

Table 2-3 1996 Settlement Population and Dwelling Statistics (SCC, undated).

Population	554
1991 – 1996 Yearly Growth Rate	-0.6
Occupied Private Dwellings	261
Unoccupied Private Dwellings	312
Total Private Dwellings	573
Percentage Unoccupied	54.5

3 KEY VALUES

To equitably manage a resource requires identification of the key ecological, social and economic values that people with an interest in the area consider important and wish to see preserved into the future. Values can be important in a local, regional or national sense.

Through identification of the values of the area's resources and the threats to the condition of the resources, objectives for future management of the area can be developed.

The following statements of what is important about Currarong Creek, Abrahams Bosom Creek, Plutus Creek and their catchments have been taken from records of public meetings, Task Force meetings, and from other research on the area. These are what the Currarong Natural Resource Management Strategy will be trying to protect.

Also shown are the percentages of questionnaire responses for each of the values that were presented in the November 1999 questionnaire, listed according to community priority. The priority was established by creating an index that takes into account the number of ticks in all three boxes. To calculate the index, for each questionnaire a score of plus one was attributed to a tick in the first column, zero to a tick in the second column and minus one to a tick in the third column, and these were summed for all questionnaires. The index is then the sum of these three values. This is the same as (number of questionnaires with tick in first column - number of questionnaires with tick in third column). For ease of comparison, this value was then divided by the total number of questionnaires returned so that the index is a number between zero and one.

The list below is ordered according to the index. This gives a slightly different order to that resulting if they were to be ordered according to just the first column or just the last column, but is a fairer representation of what the community as a whole thinks because it takes into account scores for all three columns. The categories of most highly rate, moderately highly rated and least highly rated have been arbitrarily assigned to break up the list a little.

	importance			
	high	medium	low	index
Most highly rated values				
The ocean beaches (Warrain Beach & Abrahams Bosom Beach) are popular places for swimming.	91%	7%	1%	0.90
The scenic qualities of the area are major assets for both residents & visitors. The values derive from the creeks & their foreshores, the near & distant coastline (including the sea itself, beaches, headlands & cliffs), views to the escarpment & hills north of Nowra, the large areas of native vegetation & the wildlife.	90%	8%	1%	0.89
The coastal landscapes around Currarong are some of the best on the south coast, & are recognised in the register of the national estate.	86%	11%	1%	0.85
There is limited scope for expansion of the village, which will help protect the existing lifestyle.	86%	9%	5%	0.81
The seagrass & foreshore vegetation, such as mangroves, provide an important habitat, oxygenate the water & assist to stabilise the sediments on the creek beds.	83%	13%	2%	0.80
Moderately highly rated values				
Currarong provides opportunities for a diverse range of aquatic recreational activities, in particular boating, fishing, diving & swimming.	78%	18%	2%	0.76
The banks of the creeks are mostly vegetated, providing habitat corridors & protecting the creek banks from instream erosion.	80%	16%	4%	0.76
The waters of the creeks are important in supporting a range of plants & animals.	80%	14%	5%	0.75
A range of internationally protected wading birds use the foreshore vegetation, sand & mud flats, rocky shores, beach sands & wetlands for feeding, resting & breeding sites.	78%	16%	4%	0.74
The natural areas around Currarong provide opportunities for a wide range of outdoors & nature based recreation activities, such as walking, biking, painting, drawing, photography & nature study.	76%	21%	2%	0.73
Currarong village offers a high quality residential lifestyle in a small community.	75%	22%	2%	0.73
The heaths, swamps, woodlands & littoral rainforest of the Beecroft Peninsula are unique & distinct from the vegetation of the Shoalhaven coastal plain. Many regionally significant plant & animal species are only found in these ecological communities.	76%	18%	5%	0.71
Abrahams Bosom Creek & Plutus Creek are rare examples of small coastal creeks with little development at all in their catchments.	77%	17%	6%	0.71

The fish, shellfish, crustaceans & other aquatic species are a valuable resource for both commercial & recreational fishers. There are links between the animal populations that live in the creeks & those in the sea.	75%	18%	5%	0.70
Currarong Creek supports a diversity of habitats and has little development in the upper catchment.	74%	20%	4%	0.70
The wetland around Plutus Creek is protected under Coastal Wetlands State Environmental Planning Policy No 14. Other wetlands that occupy Commonwealth land are also significant.	74%	20%	4%	0.69
Currarong is an important holiday destination for many families who have been coming here for many years.	73%	20%	6%	0.67
Currarong Creek entrance area is valued for passive recreation & swimming, & is appreciated for its clean white sand.	75%	16%	9%	0.67
Populations of a number of rare or threatened plant & animal species are known to exist in the area.	69%	22%	7%	0.62
Least highly rated				
Currarong provides a convenient point for residents & tourists to access dive sites & offshore fishing grounds, including the popular Sir John Young Banks.	62%	25%	13%	0.49
The coastal foreshore, headlands & caves with rock paintings are significant sites of Aboriginal occupation. Important academic research has been done in the catchment.	56%	32%	11%	0.44
There are relics of past maritime uses of the area such as shipwrecks, remains of wharves & jettisoned cargo.	48%	39%	11%	0.37
The Beecroft Weapons Range is an important defence facility.	41%	24%	33%	0.08

4 MANAGEMENT ISSUES

Key issues and conflicts associated with the area were identified by the community, task force members, and Local, State and Commonwealth Government representatives and from previous studies and reports.

Concerns have been raised by the community on the pressures on some of the area's natural resources and the degradation that may occur in the future.

Presented below is a range of issues or problems, which, if left unchecked, might damage those things about Currarong that we want to retain. They are discussed in detail in the management plan section of this strategy and, where appropriate, management actions are proposed for dealing with them.

Also shown are the percentages of questionnaire responses for each of the issues that were presented in the November 1999 questionnaire, listed according to community priority. The priority was established by creating an index that takes into account the number of ticks in all three boxes. To calculate the index, for each questionnaire a score of plus one was attributed to a tick in the first column, zero to a tick in the second column and minus one to a tick in the third column, and these were summed for all questionnaires. The index is then the sum of these three values. This is the same as (number of questionnaires with tick in first column - number of questionnaires with tick in third column). For ease of comparison, this value was then divided by the total number of questionnaires returned so that the index is a number between zero and one.

The list below is ordered according to the index. This gives a slightly different order to that resulting if they were to be ordered according to just the first column or just the last column, but is a fairer representation of what the community as a whole thinks because it takes into account scores for all three columns. The categories of most highly rate, moderately highly rated and least highly rated have been arbitrarily assigned to break up the list a little.

	major issue	small issue	not an issue	index
Most highly rated issues				
Water quality in Currarong Creek is sometimes affected by sewage contamination leading to potential health risks for swimmers.*	87%	9%	3%	0.84
Pollution from septic tanks in the village & the caravan park & bowling club effluent disposal areas is believed to be affecting water quality in the creek.	80%	13%	3%	0.77
Rubbish is washed onto beaches & into creeks.	76%	20%	3%	0.73
Introduced animals, including foxes, cats, black rats & rabbits, threaten native animal & plant populations.*	76%	16%	5%	0.71
Boat launching at the Yalwal Street ramp is, at times, hazardous, placing greater pressure on creek usage.	69%	20%	9%	0.60
Modifications to Currarong Creek (the sand spur, which is not a natural feature of the creek system, & the loss of the former distinct ebb/flood channels, constriction by bridge buttresses) are believed to have reduced the natural flushing of sand from the entrance during floods.	69%	21%	9%	0.60
Modifications to Currarong Creek are believed to have affected its natural values.	64%	25%	7%	0.57
Moderately rated issues				
Powerboat usage in the creek may adversely affect swimming & other water-based activities.	56%	30%	12%	0.44
Vehicles accessing the beach are causing damage to the dune.	58%	24%	16%	0.42
Frequent creek entrance excavation & dredging of the channel may degrade the habitat for fish & other aquatic species.	58%	22%	18%	0.40
Erosion of the dune at Warrain Beach threatens the road & houses in Warrain Crescent.*	49%	37%	10%	0.38
The sediment load of Currarong Creek is contributed to from erosion of tracks & craters on Beecroft Weapons Range, erosion of unsealed road verges & stormwater drains in Currarong Village, the gravel pit off Lighthouse Road & other disturbed areas.*	50%	33%	12%	0.38
Weeds, although scarce overall (only 25 species have been recorded on the Beecroft Weapons Range), are prevalent in some areas where they threaten native plant communities.*	49%	37%	12%	0.37
The foreshore at the end of Piscator Avenue is being eroded.	49%	35%	13%	0.37
Removal of sand from the entrance of the creek & other dredging has a high financial cost.	52%	28%	16%	0.36
Least highly rated issues				
Frequent fires in some areas affect the viability of some plant & animal populations.*	40%	42%	16%	0.25
Water flows in Plutus Creek have been modified, affecting flooding of Currarong Road & the creek entrance condition.	38%	42%	15%	0.23

There is bank erosion downstream of the boat ramp in Currarong Creek.	40%	39%	17%	0.23
Runoff from the now closed tip site may leach pollutants into the creek.	42%	35%	20%	0.23
There is localised flooding at times in the village when stormwater drains overflow.	38%	42%	16%	0.21
The entrance of Currarong Creek is at times not navigable due to inflow of marine sand & hence shallow water depth.	45%	29%	25%	0.20
Some aboriginal sites are being damaged.	38%	36%	23%	0.15
Sedimentation & growth of seagrass in Currarong Creek has reduced navigability for residents upstream of the ramp & for residents & tourists downstream of the boat ramp.	39%	33%	27%	0.12
Sedimentation has reduced the area of the creek available for swimming, most particularly those quiet areas attracting sediments & where mangroves are beginning to establish behind the sand dune.	38%	31%	27%	0.11
Sea level rise as a result of global warming may threaten private & public facilities.*	30%	33%	31%	-0.01

5 MANAGEMENT PLAN

5.1 STRUCTURE OF PLAN

This management plan is grouped into seven management areas:

1. Water Quality
2. Erosion and Sedimentation
3. Water Flow
4. Nature Conservation
5. Coastal Processes
6. Recreation
7. Visual Quality

Each management area is discussed in further detail in the following sections. For each management area the plan contains values, objectives, issues, strategies and actions.

Values are statements of what is important about Currarong Creek, Abrahams Bosom Creek, Plutus Creek and their catchments. These are what the Currarong Natural Resource Management Strategy will be trying to protect.

Management **objectives** were developed to ensure that the area's key values are maintained or improved. The objectives developed address the seven management areas identified.

The **issues** of concern are documented in detail. Issues are problems, which, if left unchecked, might damage those things about Currarong that we want to retain.

Management **strategies** have been written to achieve the management objectives by addressing identified issues.

Actions required to implement the strategies are detailed for each management area, as are the environmental **performance measures** necessary for gauging the effectiveness of the actions in achieving environmental outcomes.

The various actions consist of:

- planning and development controls
- protective and remedial works
- education programs
- monitoring and research.

5.2 IMPLEMENTATION

Responsibility for implementation of the Management Plan and its individual components lies with the various organisations and individuals listed in the strategy and action tables for each management area. The Currarong Estuary Management Task Force will oversee this implementation.

Following exhibition of the draft plan, submissions were assessed, changes to the draft plan discussed by the task force and a final plan put to Council for adoption. The task force will work with government departments, community groups, the Southern Catchment Management Board and funding agencies to implement the plan.

Regular meetings will be required to assess the progress of implementation. Task Force members (community and government) will have responsibility for doing the work, or organising others to do the work.

Timing for implementation of strategies is indicated. Three timeframes for implementation were chosen:

short term - present to June 2003
medium term - July 2003 to June 2006
long term - July 2006 to June 2011.

Implementation will depend on cost of the strategies and available funds. Consequently, some low priority strategies may be implemented in the short term because they require little or no additional funding for implementation. Indicative costs of strategies are given in the tables.

5.3 FUNDING SOURCES

Council will fund many of the actions set out in the plan. The level of resourcing provided by Council will be balanced against all of Council's other areas of expenditure. Defence has committed funds to the implementation of the Environmental Management Plan for the Beecroft Weapons Range.

A wide range of funding sources (both State and Commonwealth) is presently available to assist with implementation of this plan. Tables 5-1 and 5-2 indicate State and Commonwealth funding programs respectively and the administering Department.

Some of these programs accept grant applications at any time during the year whilst others have fixed submission periods. The organisations and individuals responsible for implementation of the plan will have to develop and submit applications for funds in a timely manner.

5.4 ADAPTIVE MANAGEMENT - REVIEW

The Management Plan will be reviewed on an annual basis. The success of the plan will be judged against specific environmental performance measures and targets developed to assess actions and strategies against objectives. The plan will be updated as new data and feedback from the performance measures become available, as strategies are implemented and as community values or issues change.

Table 5-1 State Funding Sources

Department	Program
Department of Land and Water Conservation	• Estuary Management Program • Coastal Management Program • Waterways Program • Floodplain Management Program • Public Reserves Management Fund • Country Towns Water Supply and Sewerage • Farming for the Future
Waterways Authority	• Waterways Asset Development and Management Program
Roads & Traffic Authority	• Roadside Vegetation Corridors
NSW Fisheries	• Recreational Fishing Trusts • Fisheries Conservation Trust • Weir Review Program
EPA	• Environmental Trust • Stormwater Trust

Table 5-2 Commonwealth Funding Sources

Department	Program
Agriculture, Fisheries and Forestry Australia	• Natural Heritage Trust (including Fisheries Action Program, National Landcare Program, etc)
Environment Australia	• Natural Heritage Trust (including Coast and Clean Seas, Bushcare, etc)
Dept of Employment	• Work for the Dole • Community Work
Conservation Volunteers Australia	• Green Corps

6 MANAGEMENT AREA 1 - WATER QUALITY

6.1 VALUES

Water quality is one of the key factors determining the ecological character of an estuary. It is also important to people using the estuary for recreational purposes and for those living on its foreshores and adjacent areas.

The waters of all of Currarong's creeks are important in supporting a range of plants and animals.

Currarong Creek entrance area is valued for passive recreation and swimming, and is appreciated for its clean, white sand.

The water quality of Currarong Creek is considered to be generally good. However, problems do occur from time to time, particularly with bacterial pollution. If the biological communities and habitats of ecological value found in the creek and the variety of recreational opportunities are to be maintained, it is essential the water is of an acceptable standard.

6.2 OBJECTIVES

To ensure that water quality in the creeks is adequate for the protection of:

- aquatic ecosystems,
- visual amenity,
- primary contact recreation,
- secondary contact recreation, and
- human consumers of cooked fish, shellfish and crustaceans.

These objectives are based on the NSW Government's water quality interim environmental objectives as recommended for Currarong Creek (EPA, 1999).

6.3 ISSUES

If water quality is not protected, several key estuarine attributes can degrade as follows:

- the ecology of an estuary (ie. the diversity and abundance of plant and animal communities) may degrade if water quality levels deteriorate sufficiently (eg. excessive sediment levels in the water may degrade seagrass beds, which in turn may affect fish and prawn populations)
- the visual characteristics and aesthetic appeal of water may diminish (eg the water may appear ‘dirty’, or contain nuisance algae)
- the recreational value of an estuary may be seriously affected (eg. people do not want to swim in ‘dirty’ water)

Local industry that relies on existing attributes of an estuary may be affected through reduced tourist interest.

The issues investigated during the preparation of this plan were:

1. Rubbish is washed onto beaches and into creeks (refer to section 12 Visual Quality for further discussion of this issue)
2. Sewage contamination is known to have an effect on water quality in the creek from time to time. Possible sources of sewage contamination may include:
    - ineffective on site treatment systems, septic tanks & trenches
    - deliberate illegal disposal from holding tanks
    - sewage management premises regulated by the EPA (caravan park and bowling club)
3. Other pollutants from urban stormwater enter the creeks
4. Poor stormwater management practices

6.4 STRATEGIES

Strategy	Action	Priority	Timing (see section 5.2)	Estimated Cost	Responsibility	Performance Evaluation
WQ1 - Until reticulated sewerage scheme is built, minimise sewage contamination of Currarong's Creeks from existing sewage management systems	1. Inspect septic tank systems for compliance with NSW Government's Environment and Health Protection Guidelines 'On-site Sewage Management for Single Households.'	High	Short	Funded by licence fees	SCC	Inspections completed
	2. Ensure septic tanks and other effluent disposal/storage systems are working effectively.	High	Short	Variable	Property owner	level of compliance; increase in number of pumpouts and cleanouts performed
	3. Ensure that sewage holding tanks in village are pumped out regularly.	High	Ongoing	Variable	Property owner or occupier	As above; Reductions in coliform counts in creek
	4. Annually review pump-out volumes in relation to water usage for each property in village to identify anomalies and guide investigation for illegal discharges.	Medium	Short	$1000	SCC	Review completed; anomalies investigated

Strategy	Action	Priority	Timing (see section 5.2)	Estimated Cost	Responsibility	Performance Evaluation
	5. Ensure sewage management premises regulated by the EPA continue to meet EPA licence requirements	High	Ongoing	Variable	Licencees EPA	Continued compliance with EPA licences;
	6. Ensure integrity of rising mains between sewage management premises regulated by EPA and their effluent management ponds to the south	High	Short	$1000	Licencees EPA	No leaks or breakages. Continued compliance with EPA licences
	7. Produce and distribute brochure for delivery to all Currarong properties on importance of keeping sewage out of creek, and the role of the community in ensuring this	High	Short	$2000	SCC Community	**Brochure distributed**
	8. Continue to monitor creek for indication of sewage contamination	High	Ongoing	No additional cost	SCC Community	Quarterly testing completed
	9. Supplement creek water testing with sampling during rainfall events and school holidays	Medium	Short	$1500	SCC Community	Creek water testing supplemented
	10. Monitor stormwater drains in village for indication of sewage contamination after rainfall events	High	Ongoing	$1000	SCC Community	Testing regime completed

Strategy	Action	Priority	Timing (see section 5.2)	Estimated Cost	Responsibility	Performance Evaluation
	11. Complete monitoring of groundwater movement and groundwater quality near bulk disposal ponds	Medium	Short	$15000	SCC	Testing regime completed
WQ2 - Design and build reticulated sewerage scheme	12. Adopt Currarong Sewerage & Effluent Management Strategy Study	High	Short	-	SCC	Complete study
	13. Prepare proposal for option development and estimate to seek funding from Minister	High	Short	-	DLWC	Funding commitment secured
	14. Complete option development and EIS, including wide community consultation	High	Short	$100,000	DPWS SCC DLWC	Strategy adopted
	15. Design selected option in detail	High	Medium	Included below	SCC DLWC	Design Complete
	16. Construct sewerage system	High	Medium	$5,000,000 - $10,000,000	SCC DLWC	Scheme in operation
WQ3 - Control other pollutants at source	17. Undertake sediment and erosion control on building sites according to EPA's 'Managing Urban Water Guidelines, Construction Activities' and Department of Housing's 'Managing Urban Stormwater, Soils and Construction'	Medium	Short	Variable	Builders SCC	Best management practices widely used
	18. Educate builders and others in industry on appropriate soil, waste and water management on building sites	Medium	Short	$1000	SCC	Education program completed

Strategy	Action	Priority	Timing (see section 5.2)	Estimated Cost	Responsibility	Performance Evaluation
	19. Educate residents on appropriate use of chemical and fertilisers in house and garden	Medium	Medium	$1000	SCC Community	Education program completed
	20. Ensure that areas shown as high risk on NSW Government's Acid Sulfate Soils Risk Maps are not drained or excavated without appropriate development controls (refer to NSW Government's Acid Sulfate Soil Manual)	High	Ongoing	-	SCC Defence	No acid runoff to creek
WQ4 - Minimise sediment and other pollutant transport in stormwater drains	21. Prepare local stormwater management plan	Medium	Medium	$15000	SCC	Plan prepared
	22. Retain vegetation lining in 'soft' drains	High	Short	No additional cost	SCC	Strategy adopted by Council
	23. When necessary, remove sediment from drains in sections, leaving time for one section to recover before disturbance of next section	Medium	Short	No additional cost	SCC	Strategy adopted by Council
	24. Ensure new or remodelled drains are designed with adequate capacity to incorporate vegetation	Medium	Medium	Variable	SCC	SCC internal design guideline adopted

Strategy	Action	Priority	Timing (see section 5.2)	Estimated Cost	Responsibility	Performance Evaluation
	25. Continue to educate Council field staff in best practice for stormwater management	Medium	Short	$1000	SCC	Education program completed
	26. Use best practice sediment controls when working in drains	High	Short	No additional cost	SCC	SCC internal design guideline adopted
	27. Intercept pollutants at drain outlets as per citywide Stormwater Management Plan	Low	Medium	$150,000	SCC	GPTs/wetlands constructed
WQ5 - Monitor water quality	28. Continue quarterly monitoring of water quality parameters other than faecal coliforms	Medium	Ongoing	No additional cost	SCC	Quarterly testing completed
	29. Test for leachate contamination in groundwater down-gradient of disused rubbish tip	Low	Medium	$1000	SCC	Groundwater tested
WQ6 - Educate residents and visitors on stormwater issues and solutions	30. Implement Stormwater Management Plan education initiatives	Medium	Short	Refer Stormwater Management Plan	SCC	Education programs completed

7 MANAGEMENT AREA 2 - EROSION AND SEDIMENTATION

7.1 VALUES

Stable soils and creek banks mean that land remains productive, either for sustaining ecological communities or supporting human uses. Coastal waterways are subject to some natural infilling by sediment transported from the catchment and eroded from banks. However the rate of erosion and sedimentation may be accelerated by human activities in the catchment.

7.2 OBJECTIVES

To minimise the erosion of soil from the catchments and creek banks and to protect Currarong's creeks from excessive sedimentation.

7.3 ISSUES

1. The sediment load of Currarong Creek is contributed to from erosion of tracks & craters on Beecroft Weapons Range, erosion of unsealed road verges & stormwater drains in Currarong Village, the gravel pit off Lighthouse Road & other disturbed areas.
2. Sedimentation has reduced the area of the creek available for swimming, most particularly those quiet areas attracting sediments & where mangroves are beginning to establish behind the sand dune.
3. There is bank erosion downstream of the boat ramp in Currarong Creek.
4. Sedimentation in the entrance area of the creek is from infilling with marine sand. This is dealt with further on in the plan, in the Coastal Processes section.

7.4 STRATEGIES

Strategy	Action	Priority	Timing (see section 5.2)	Estimated Cost	Responsibility	Performance Evaluation
ER1 - Accommodate natural process of creek bank erosion and accretion, but reduce human-induced erosion	31. Ensure new developments comply with development control plan for foreshores and statutory requirements	High	Case by case	Variable	SCC DLWC	No further encroachment on creek banks
	32. Disallow further development and retain and/or re-establish riparian vegetation along creek banks to prevent human-induced creek bank erosion	High	Ongoing	-	SCC DLWC	Erosion reduced
ER2 - Reduce amount of sediment entering the creeks from the catchments by controlling erosion at its sources	17. Undertake sediment and erosion control on building sites according to EPA's 'Managing Urban Water Guidelines, Construction Activities' and Department of Housing's 'Managing Urban Stormwater, Soils and Construction'	Medium	Short	Variable	Builders SCC	Best management practices widely used
	18. Educate builders and others in industry on appropriate soil, waste and water management on building sites	Medium	Short	$1000	SCC	Education program completed
	33. Enforce anti-pollution laws on building sites and other areas where there is soil disturbance	High	Ongoing	-	SCC	Minimal soil washing from building sites

Strategy	Action	Priority	Timing (see section 5.2)	Estimated Cost	Responsibility	Performance Evaluation
	34. Develop a strategy between Council and the community for the stabilisation and vegetation of unsealed road verges in urban areas	High	Short	$5000	SCC	Strategy agreed and adopted
	35. Stabilise unsealed road verges in the village and rural areas, including Lighthouse Road	High	Short	$20,000	SCC	No visible erosion after rainfall events
	36. Maintain vegetation in road verges to minimise erosion and trap pollutants	High	Short	-	Community SCC	Stable vegetation road verges
	37. Stabilise fire trails and other vehicle tracks on weapons range	Medium	Short	$150,000 in 2001/2002	Defence	Track upgrade complete
	38. Restrict vehicle access to groundwater sampling bores	High	Short	$5000	SCC	Access restricted
	39. Prevent damage from track created for groundwater testing, particularly at Black's Cave Creek	High	Short	$5000	SCC	**Damage stopped**
	40. Assess condition of and need for other vehicle tracks on Crown land and rationalise as appropriate	Medium	Medium	-	SCC DLWC	Erosion reduced
	41. Rationalise and stabilise walking tracks on Abrahams Bosom reserve	Medium	Short	$30,000	SCC	**Track upgrade complete**

Strategy	Action	Priority	Timing (see section 5.2)	Estimated Cost	Responsibility	Performance Evaluation
ER3 - Reduce amount of sediment entering the creeks by intercepting it at the ends of drains	27. Intercept pollutants at drain outlets as per citywide Stormwater Management Plan	Low	Medium	$150,000	SCC	GPTs/wetlands constructed
ER4 - Remove unnatural deposits of sediment from creeks at the outlets of stormwater drains	42. Investigate whether sediment plume at drain below Merimbula Street can be removed in environmentally sensitive manner	Low	Short	$1000	SCC	Removal of plume

8 MANAGEMENT AREA 3 - WATER FLOW

8.1 VALUES

The timing, duration and size of freshwater and tidal flows have a significant effect on the ecology and human use of our waterways.

Pools and wetlands are refuges for plants and animals during dry times.

Rises in water flows can trigger migration of animals and reproduction in both plants and animals. They can also replenish wetlands and floodplain communities.

8.2 OBJECTIVES

To ensure that water flow in the creeks is adequate to:

- protect pools in dry times,
- protect natural low flows
- protect important rises in water levels
- maintain wetland and floodplain inundation
- mimic natural drying in temporary waterways
- maintain natural flow variability
- manage groundwater for ecosystems
- minimise effects of weirs and other structures
- maintain or rehabilitate estuarine processes and habitats.

These objectives are based on the NSW Government's water flow interim environmental objectives for Currarong Creek (EPA, 1999).

8.3 ISSUES

1. Water flows in Plutus Creek may have been modified, possibly affecting flooding of Currarong Road, wetland areas & the creek entrance condition.
2. There is localised overland flow of stormwater in the village at times.
3. Artificial structures in Currarong Creek may affect water flow.

8.4 STRATEGIES

Strategy	Action	Priority	Timing (see section 5.2)	Estimated Cost	Responsibility	Performance Evaluation
WF1 - Protect natural low flows	43. Restrict any future water extractions to moderate and high flows, ie, fully protect very low natural flows	Low	Ongoing	-	DLWC	Restrictions on licences
WF2 - Maintain natural flow variability in creeks	44. Design future developments and road works to allow infiltration of stormwater	High	Ongoing	Variable	SCC Defence NPWS	Incorporated in design brief for future works
WF3 - Minimise impact of instream structures	45. Investigate impact on water flow caused by Beekeepers Road and Currarong Road	Low	Medium	$5000	Defence	Investigation completed
	46. Investigate effects of removal of sand spur	High	Medium	$5000	SCC DLWC	Investigation completed
	47. Investigate effects of other man-made structures	Low	Medium	$1000	SCC	Investigation completed
WF4 - Maintain groundwater within natural levels	48. Restrict future groundwater licences on lands which feed creeks during low flows and on lands adjacent to wetlands	High	Ongoing	-	DLWC	Strategy adopted and implemented
WF5 – Investigate impacts of any stormwater overflows in village	49. Unblock drains where problems occur using best management practices	High	Ongoing	Variable	SCC Community	Reduced complaints
	50. Educate community about design capacities for drains and ways of reducing runoff from their properties	High	Short	$1000	SCC	Reduction in number of complaints

9 MANAGEMENT AREA 4 - NATURE CONSERVATION

9.1 VALUES

Currarong's Creeks and their catchments support a range of relatively undisturbed ecological communities, which is important from a conservation perspective and is also an attractive attribute of the area for many residents and visitors. The following specific nature conservation values were identified during the preparation of this plan:

1. Currarong Creek supports a diversity of habitats and has little development in the upper catchment.
2. Plutus Creek is a rare example of a small coastal creek with little development at all in its catchment.
3. Abrahams Bosom Creek is a small coastal creek that is little modified, although there is some residential development in its catchment.
4. The fish, shellfish, crustaceans & other aquatic species are a valuable resource for both commercial & recreational fishers. There are links between the animal populations that live in the creeks & those in the sea.
5. The seagrass & foreshore vegetation, such as mangroves, provide an important habitat, oxygenate the water & assist to stabilise the sediments on the creek beds.
6. A range of internationally protected wading birds use the foreshore vegetation, sand & mud flats, rocky shores, beach sands & wetlands for feeding, resting & breeding sites.
7. The wetland around Plutus Creek is protected under State Environmental Planning Policy No 14 - Coastal Wetlands. Other wetlands that occupy Commonwealth land are also significant.
8. The heaths, swamps, woodlands & littoral rainforest of the Beecroft Peninsula are unique & distinct from the vegetation of the Shoalhaven coastal plain. Many regionally significant plant & animal species are only found in these ecological communities.
9. The banks of the creeks are mostly vegetated, providing habitat corridors & protecting the creek banks from instream erosion.
10. Populations of a number of rare or threatened plant & animal species are known to exist in the area.

9.2 OBJECTIVES

To maintain or, where appropriate, restore the ecological integrity and biodiversity of Currarong's creeks, foreshores and catchments.

9.3 ISSUES

The issues investigated during the preparation of this plan were:

1. Introduced animals, including foxes, cats, black rats & rabbits, threaten native animal & plant populations.
2. Frequent fires in some areas affect the viability of some plant & animal populations.
3. Weeds, although scarce overall (only 25 species have been recorded on the Beecroft Weapons Range), are prevalent in some areas where they threaten native plant communities. Particular problem areas for dumping of garden refuse are: Warrain Crescent dune, the drain east of Cambewarra Road and urban area/bushland interfaces to the south, west and east of the village. A large pile of grass clippings is in

the bush on the southern side of Currarong Road just east of the bridge.

4. Modifications to Currarong Creek are believed to have affected its natural values.
5. Frequent creek entrance excavation & dredging of the channel may degrade the habitat for fish & other aquatic species.
6. There has been dieback of mangroves in Currarong Creek.
7. Populations of threatened and rare species exist on land that is not part of a reserve system.
8. Some residents of Currarong believe that bandicoots should be culled as they cause some damage to gardens.

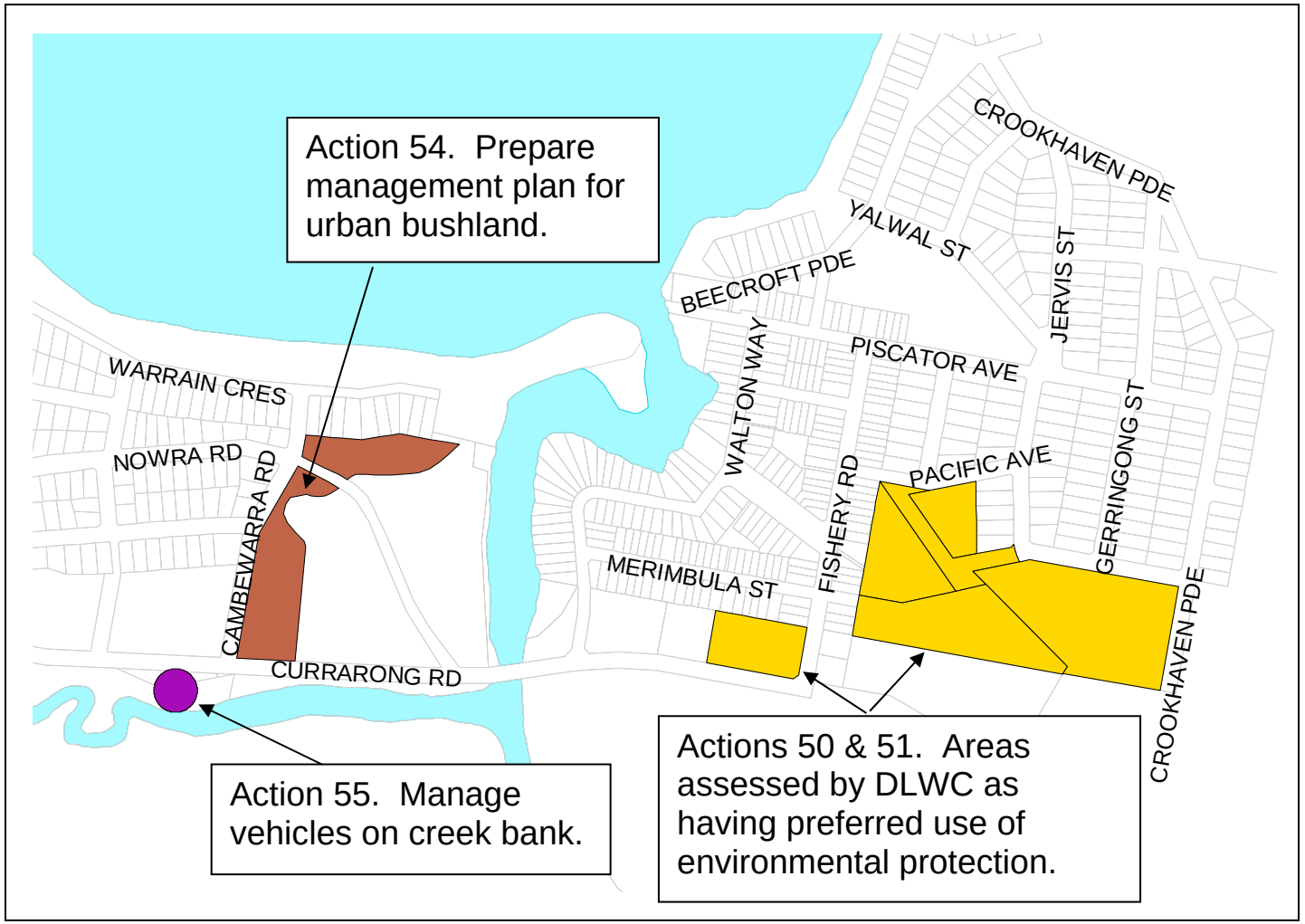

Figure 9-1. Areas referred to in nature conservation strategies table.

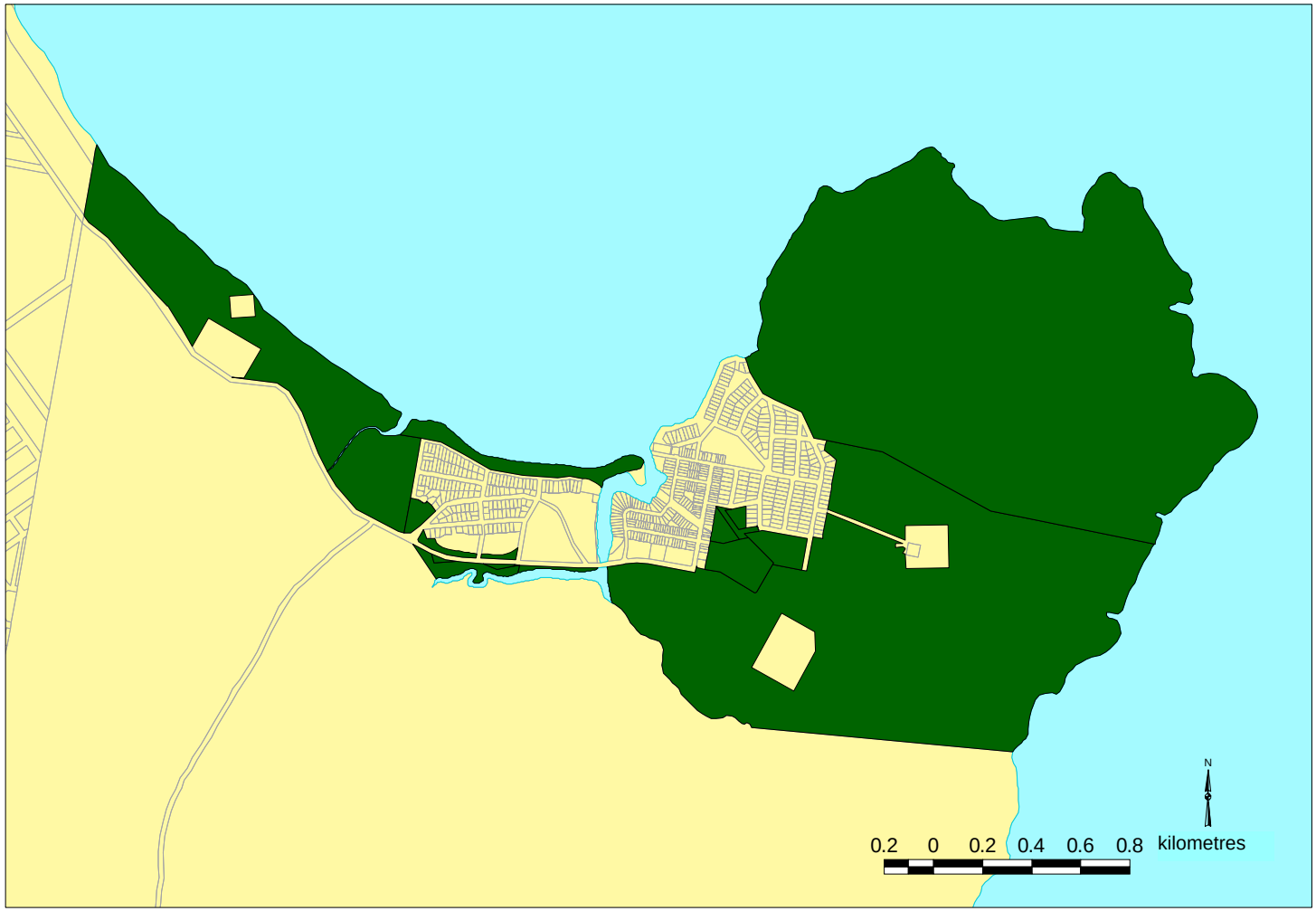

Figure 9-2. Bushland areas that could be managed for conservation purposes in conjunction with existing or future uses (shown green).

9.4 STRATEGIES

Strategy	Action	Priority	Timing (see section 5.2)	Estimated Cost	Responsibility	Performance Evaluation
NC1 - Manage for conservation purposes some areas of land known to support populations of rare or threatened species	51. Consider environmental protection zoning for Crown land between bowling club and Crookhaven Parade (see figure 9-1) when next rezoning any land in the area	Medium	Medium	-	SCC	Rezoning completed
	52. Consider dedication of Crown land between bowling club and Crookhaven Parade (see figure 9-1) as part of Jervis Bay National Park if adjoining land is added to park	Medium	Medium	-	DLWC NPWS	Reservation completed
NC2 - Manage for conservation purposes large natural areas to west, south, north-east and east of village (including Abrahams Bosom Reserve) (see figure 9-2)	53. Investigate dedication of appropriate areas as part of Jervis Bay National Park	Medium	Medium	-	NPWS	Areas dedicated
	54. Consider environmental protection zoning for remainder of this land when next rezoning any land in the area	Medium	Medium	-	SCC	Rezoning completed
NC3 - Protect important areas of native vegetation within the village of Currarong	55. Prepare management plan for bushland between Cambewarra Road and cleared areas of Caravan Park (see figure 9-1)	High	Short	$2000	SCC DLWC	Plan prepared

Strategy	Action	Priority	Timing (see section 5.2)	Estimated Cost	Responsibility	Performance Evaluation
	56. Prevent vehicles from entering bushland beside Currarong Creek south of Currarong Road and west of Cambewarra Road (see figure 9-1)	High	Short	$1000	DLWC	Vehicle controls in place
NC4 - Protect the natural values of Currarong Creek	57. Apply an appropriate level of protection to Currarong Creek in Jervis Bay Marine Park zoning plan	Medium	Short	-	MPA	Zoning plan adopted
	58. When next rezoning any land in the area, incorporate objective of having environmental protection for foreshores and wetlands, and consider appropriate zoning	Medium	Medium	-	SCC	Rezoning completed
	59. Investigate and deal with unlicensed structures in creek	Medium	Short	$2000	DLWC Waterways	All structures licensed or removed
	60. Control access into mangroves from caravan park	Medium	Short	$3000	SCC	Pedestrian controls in place
	61. Remove dumped building materials from western side of creek downstream of bridge	Medium	Short	$1000	SCC	Removal of rubbish
NC5 - Ensure that use of the Beecroft Weapons Range is ecologically sustainable	62. Implement environmental management plan for the weapons range	High	Ongoing	$500,000 pa	Defence	Plan implemented

Strategy	Action	Priority	Timing (see section 5.2)	Estimated Cost	Responsibility	Performance Evaluation
	37. Stabilise fire trails and other vehicle tracks on weapons range	Medium	Short	$150,000 in 2001/02	Defence	Track upgrade complete
NC6 - Educate visitors and residents on importance of protecting natural values	63. Erect educational signs along foreshore area in caravan park to highlight importance of mangroves	High	Short	$2000	SCC	Signage erected
	64. Prepare brochures about foreshores and urban bushland for distribution to residents and visitors to town	High	Short	$2000	SCC	Brochures prepared and distributed
	65. Develop ongoing community education on bandicoot biology and ways to reduce garden damage	Low	Ongoing	$2000	NPWS Beecroft Rangers	Education program implemented
	66. Identify most likely sources of dumped lawn clippings and garden waste in bushland and on dune.	Medium	Short	$1000	SCC DLWC NPWS Defence	Investigation completed
	67. Investigate Council's practices for disposal of grass cuttings	High	Short	-	SCC	Council practices reviewed
	68. Conduct targeted education and enforcement campaign to alter behaviour of garden waste dumpers	Medium	Short	$1500	SCC DLWC NPWS Defence	Absence of rubbish in bushland areas
NC7 - Remove piles of garden waste from public areas	69. Focus Clean Up Australia volunteers on collection of dumped garden waste from public areas	Medium	Short	-	Clean up Australia volunteers	Rubbish removed from natural areas

Strategy	Action	Priority	Timing (see section 5.2)	Estimated Cost	Responsibility	Performance Evaluation
NC8 - Control weeds in bushland areas	70. Develop a weed control action plan for Council managed land and vacant Crown land	High	Short	$1000	SCC DLWC	Plan prepared
	71. Engage bush regeneration contractor to implement weed control action plan	Medium	Medium	$10000	SCC DLWC	Reduced weeds in bushland
	72. Integrate weed management plans and activities for all government land.	Medium	Ongoing	-	SCC DLWC NPWS Defence	Weed management integrated
	73. Establish and accommodate project under labour provision program (eg, Greencorp, Work for the Dole, Community Service) to target weed infestations in bushland areas	High	Short	$3000	SCC DLWC NPWS Defence	Reduced weeds in bushland
	74. Re-establish dunecare group and encourage them to remove weeds from Warrain Crescent foreshore	Medium	Short	$1000	SCC	Dune care group active in weed removal
NC9 - Maintain or establish buffer zones between developed areas and sensitive habitats, where possible	75. Restore local native vegetation between caravan park and mangroves	Medium	Short	$2000	SCC	Revegetation completed
	76. Restore patches of local native vegetation along ocean foreshore between Currarong Creek and Abrahams Bosom Beach	Medium	Short	$2000	SCC	Revegetation completed

Strategy	Action	Priority	Timing (see section 5.2)	Estimated Cost	Responsibility	Performance Evaluation
	77. Protect existing vegetation from vandalism on dune adjacent to Warrain Crescent	Medium	Short	-	SCC	Enforcement effective
NC10 - Minimise impacts of fire on the natural values of the area	78. Continue to suppress fires caused by activities on the weapons range when appropriate	High	Ongoing	-	Defence	Fires suppressed
	79. Integrate and continue to implement fire management plans and activities for all government land.	Medium	Short	-	SCC DLWC NPWS Defence	Fire management integrated
NC11 - Control introduced pest animals	80. Integrate and continue to implement pest animal control plans for weapons range and surrounding areas	High	Ongoing	-	SCC DLWC NPWS Defence	Pest animal numbers reduced

10 MANAGEMENT AREA 5 - COASTAL PROCESSES

10.1 VALUES

The coast at Currarong is highly valued for its scenic, recreational and natural heritage qualities.

10.2 OBJECTIVES

To accommodate natural coastal processes when planning and developing human use of the Currarong coast.

10.3 ISSUES

The following issues were raised during the preparation of this plan:

1. The entrance of Currarong Creek is subject to shoaling, with marine sand that washes in with storm waves, mostly over the spit but to some extent from the north-east around and over the training wall, and with wind-blown beach sand, particularly during westerly winds. Shoaling of the entrance is a natural coastal process. Because it affects navigability, this issue is dealt with in section 11 – Recreation.
2. The ocean foreshore is receding. Erosion of the dune at Currarong Beach threatens the road & houses in Warrain Crescent.
3. Modifications have been made to Currarong Creek entrance. Refer to section 8.
4. The effect of the training wall on coastal processes
5. Vehicles accessing the beach are .causing damage to the dune.
6. Sea level rise as a result of global warming may threaten private & public facilities.
7. The effect of disposal of sand dredged from the creek entrance on wave penetration into dunes.

10.4 STRATEGIES

Strategy	Action	Priority	Timing (see section 5.2)	Estimated Cost	Responsibility	Performance Evaluation
CP1 - Investigate need to manage vehicle access to Currarong Beach	81. Assess beach access needs of commercial fishermen and emergency services	Medium	Short	-	SCC DLWC	Assessment completed
	82. Assess damage caused by vehicles passing over sand dune	Medium	Short	$1000	SCC DLWC	Assessment completed
	83. Review authority for beach launching and retrieval	Medium	Short	-	SCC DLWC	Review completed
CP2 - Reduce rate of recession of foreshore in front of Warrain Crescent and, if necessary, Beecroft Parade	84. Review causes and rate of recession of ocean foreshore in front of Warrain Crescent and Beecroft Parade	High	Short	$5000	SCC DLWC	Review completed
	85. Revise estimates of how long until assets are threatened by storm damage	High	Short	Included above	SCC DLWC	Revision completed
	86. Review options for dealing with recession of foreshore	High	Short	$20000	SCC DLWC	Review completed
	87. Review impacts of using sand to nourish foredune if dredging is being done for navigation purposes as per criteria in recreation section of this plan	Medium	Short	Included above	SCC DLWC	Review completed

11 MANAGEMENT AREA 6 - RECREATION

11.1 VALUES

Currarong provides opportunities for a diverse range of aquatic recreational activities, in particular boating, fishing, diving & swimming.

Currarong provides a convenient point for residents & tourists to access dive sites & offshore fishing grounds, including the popular Sir John Young Banks.

The launching areas are shown in figure 11-1.

11.2 OBJECTIVES

To provide a local boat launching facility for Currarong holidaymakers and residents that is safe to use under appropriate sea conditions and fits in with the character and amenity of the village.

11.3 ISSUES

1. There is demand for provision of a reasonable boat launching facility to provide access to fishing and diving areas. Limitations of the existing boat launching facilities at Currarong are listed in Table 11-1. However, some users are satisfied with existing facilities, while others propose changes to make existing facilities more in keeping with the natural amenity of the area.
2. Sedimentation & growth of seagrass in Currarong Creek has reduced navigability for residents upstream of the ramp & for residents & tourists downstream of the boat ramp.
3. The entrance of Currarong Creek is at times not navigable due to inflow of marine sand & hence shallow water depth. Removal of sand from the entrance of the creek & other dredging has a high financial cost.
4. Boat launching at the Yalwal Street ramp is, at times, hazardous, placing greater pressure on creek usage.
5. Because the channel is narrow, powerboat usage in the creek may adversely affect swimming & other water-based activities.

Table 11-1. Limitations of Existing Boat Launching Facilities at Currarong

Launching Area	Limitations
Warrain Crescent	• creek entrance never navigable during lower part of tidal cycle • creek entrance sometimes not navigable during higher part of tidal cycle • inadequate parking • conflict between boats and swimmers in creek channel • beach not useable during holiday times due to presence of other beach users • beach not accessible at high tide • beach access requires four wheel drive or tractor, or risk being bogged
Yalwal Street	• 'low tide' ramp not steep enough leading to water-logging of vehicles • exposed to waves and surge • exposed to prevailing north-east and west winds • four wheel drive or tractor required (except at high tide), or risk being bogged • conditions may change while at sea rendering ramp unsafe for retrieval

Table 11-2. Interim criteria for determining when to consider dredging of Currarong Creek entrance (refer to actions 98 and 102).

- Removal of sand from the entrance of Currarong Creek would only be considered:

- within one month prior to Christmas and Easter **and**
- if the narrowest point in the channel is less than 3 metres wide at mid-tide **or**
- the shallowest point in the channel is less than 0.75 metres deep at mid-tide.

- Sand removal would not be done more than once at Christmas and once at Easter in any year, except under special circumstances.

- Sand removal and disposal would be subject to obtaining the necessary approvals, appropriate consultation and environmental impact assessment.

Figure 11-1. Existing boat launching areas at Currarong

11.4 STRATEGIES

Strategy	Action	Priority	Timing (see section 5.2)	Estimated Cost	Responsibility	Performance Evaluation
R1 - Improve useability of Yalwal Street boat ramp (existing facilities)	88. Remove rocks from middle of 'low tide ramp' next time they are exposed	Medium	Short	$2000	SCC	**Rocks removed**
	89. Implement measures such as signage, education and/or enforcement to prevent illegal placement of material on rock platform and in launching area	Medium	Short	$1000	SCC DLWC	Dumping prevented
	90. Widen approach road to 'high tide ramp'	High	Short	$4000	SCC	Able to launch 2 boats simultaneously
	91. Place navigation markers to indicate safe passage to 'high tide ramp'	High	Short	In kind	Community Waterways	Passage clearly marked
	92. Provide tie-up poles at the side of both high and low tide launching areas.	High	Short	$10,000	Community Waterways DLWC	Poles/buoys installed
R2 - Provide a boat launching area at Currarong to a standard suitable for 2 wheel drive vehicles under appropriate sea conditions, if possible	93. Undertake options study on extent and location of facility	High	Short	$30,000	SCC	Preferred option adopted by Government and community
	94. Implement recommendations of options study	High	Long	Uncosted	SCC DLWC Waterways	New/improved facility in place

Strategy	Action	Priority	Timing (see section 5.2)	Estimated Cost	Responsibility	Performance Evaluation
R3 - Until new/improved facility provided, restore navigability of Currarong Creek entrance channel when criteria met	95. Monitor entrance channel depth and width	Medium	Ongoing	$1000	SCC Community	Channel condition known
	96. When criteria in table 11-2 are met, inform community and gauge public opinion	High	As required	$1000	SCC	Meeting held
	97. Undertake consultation with agencies according to requirements of SEPP 35 and environmental assessment according to requirements of Part V of EP&A Act.	High	As required	$1000	SCC	Consultation completed
	98. Remove sand from shoaled areas of channel as agreed	Medium	As required	$10000 each time	SCC	Shoals removed
	99. Prepare an Entrance Management Strategy	High	Short	$5000	SCC DLWC Community	Strategy prepared
	100. Monitor effects of dredging and spoil disposal, refine criteria for when dredging would be considered (table 11-2) and incorporate into Entrance Management Strategy	High	Short	Included above	SCC DLWC Community	Criteria refined
	82. Assess damage caused by vehicles passing over sand dune	Medium	Short	$1000	SCC DLWC	Assessment completed
	83. Review authority for beach launching and retrieval	Medium	Short	-	SCC DLWC	Review completed

Strategy	Action	Priority	Timing (see section 5.2)	Estimated Cost	Responsibility	Performance Evaluation
R4 - Following provision of new/improved facility, retain Warrain Crescent boat ramp for use when natural entrance conditions allow	101. No action required	Medium	Long	No cost	SCC	Ramp retained
R5 - Reduce conflict between recreational users	102. Investigate restricting use of personal water craft in waters near Abrahams Bosom Beach and Currarong Beach	Medium	Medium	-	Waterways SCC	Conflict reduced
	103. Investigate ways of reducing conflict between swimmers and boaters in Creek entrance area	High	Short	-	Waterways SCC	Conflict reduced

12 MANAGEMENT AREA 7 - VISUAL QUALITY

12.1 VALUES

The scenic qualities of the area are major assets for both residents & visitors. The values derive from the creeks & their foreshores, the near & distant coastline (including the sea itself, beaches, headlands & cliffs), views to the escarpment & hills north of Nowra, the large areas of native vegetation & the wildlife.

The coastal landscapes around Currarong are some of the best on the south coast, & are recognised in the register of the national estate.

12.2 OBJECTIVES

To maintain, rehabilitate where necessary and enhance where appropriate the high visual qualities of Currarong.

12.3 ISSUES

1. Rubbish is washed onto beaches and into creeks
2. Native vegetation is being removed from oceanfront land
3. Buildings and other structures can degrade coastal scenery
4. Visual character of approach to Currarong could be adversely affected by development

12.4 STRATEGIES

Strategy	Action	Priority	Timing (see section 5.2)	Estimated Cost	Responsibility	Performance Evaluation
VQ1 - Maintain or restore visual character of natural landscapes and landforms	104. Maintain existing areas of native vegetation, particularly on foreshores	High	Ongoing	-	SCC	No loss of foreshore vegetation
	105. Restore areas of native vegetation on ocean frontage of Warrain Crescent	Low	Short	$2000	SCC	Revegetation completed
	76. Restore patches of local native vegetation along ocean foreshore between Currarong Creek and Abrahams Bosom Beach	Medium	Short	$2000	SCC	Revegetation completed
	106. Maintain visual character of approaches to Currarong	High	Ongoing	-	SCC Community	Visual character maintained
	107. Remove rubbish from bushland and beaches	Medium	Short	Uncosted	SCC Community	No visible rubbish
	108. Conduct public education on impact of rubbish on environment	Medium	Medium	$1000	SCC	Education program completed
	64. Prepare brochures about foreshores and urban bushland for distribution to residents and visitors to town	High	Short	$2000	SCC	Brochures prepared and distributed
VQ2 - Ensure built forms do not impact adversely on coastal scenery	109. Ensure new developments comply with development control plan for foreshores	High	Case by case	-	SCC	Visual quality maintained

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