

GEOGRAPHE BAY FORESHORE MANAGEMENT PLAN PROPOSALS

Prepared for the

**Shire of Busselton
and the
Geographe Catchment Council**

With funding from Coastwest and Coastcare

by

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1. INTRODUCTION

1.1 BACKGROUND

The Geographe Bay foreshore is a dynamic coastal environment that has been subject to phases of erosion and progradation over the past few decades. An ongoing series of issues, such as building developments being threatened, led to considerable debate about the future management of the coast.

There is presently a high rate of proposed urban development, particularly for residential and tourism. Land use pressures along the coast are expected in the future.

There have been a number of studies of the Geographe Bay coast in the past. These have examined foreshore movements, seagrass, boat launching and building setbacks. To date there has been no overall coastal management plan to identify priority issues, develop an integrated strategy and prepare a schedule of priorities.

In 1999, the Shire of Busselton, in partnership with the Geographe Catchment Council, was given a CoastCare Grant to assist with the preparation of a foreshore management plan for the Geographe Bay coast. In October 1999, CoastWise was commissioned to prepare The Geographe Bay Foreshore Management Plan.

1.2 GOAL AND OBJECTIVES

The objective of the Foreshore Management Plan was set out in the brief and is as follows;

‘To provide direction to the Shire of Busselton, developers and community groups by developing a framework for the future management, protection and preservation of the foreshore of Geographe Bay, both reserve and private areas.’

As an outcome, the Geographe Bay Foreshore Management Plan will differentiate sectors according to management issues. It will include recommendations relating to rehabilitation, revegetation, access, boat launching facilities, dual use paths, recreational activities, community involvement and community ownership. The final recommendations will be in a form suitable for incorporation into foreshore planning policies.

It should be noted that at the first meeting between the clients and the consultants, the consultants were instructed not to focus on coastal protection matters. The issue of using structures such as groynes for coastal protection was not described as part of the project brief. The investigation of matters such as this require a far more detailed presentation and it was considered a separate forum was required for this discussion.

1.3 STUDY AREA

The study area for this project includes the foreshore from Forrest Street in Dunsborough, around the coast of Geographe Bay to the south-western boundary of the Port Geographe canal development site in Busselton (Figure 1).

The study area therefore includes the developed coastal zone of the Shire of Busselton. The study area consists mainly of public reserves but does include some private land.

1.4 STUDY TEAM

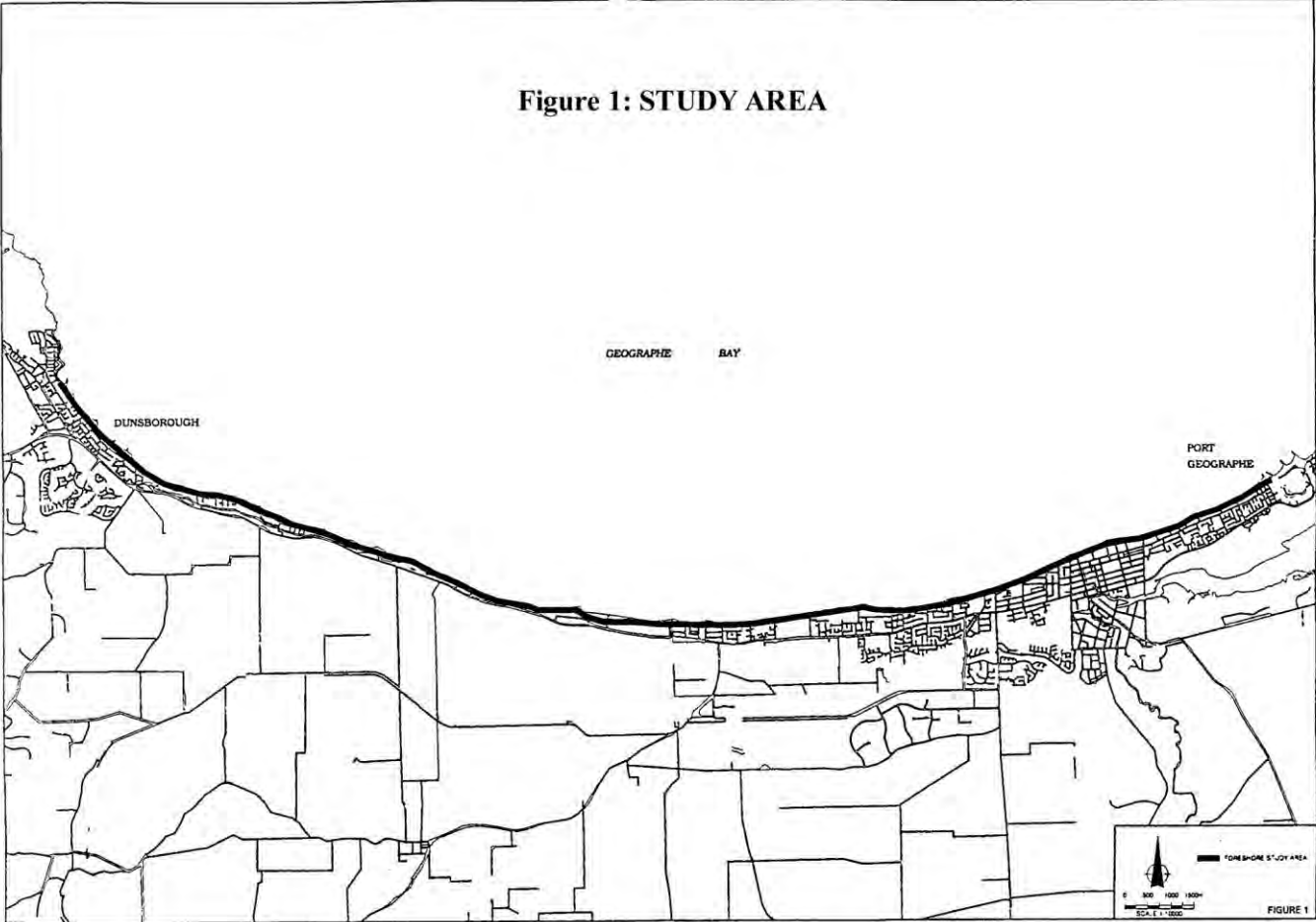
1.4.1 Project Directors

- Jon Bettink - Director Technical Services, Shire of Busselton
- Kirrily White - Environmental Officer, Shire of Busselton
- Anthony Sutton - Coordinator Geocatch

1.4.2 Consulting Team

- Rory O'Brien: Principal, **CoastWise**
- Michael Lundstrom: Principal, *M J Lundstrom Pty Ltd - Environmental*
- Amanda Maxwell: Coastal Consultant, **CoastWise**
- Dirima Cuthbert: Principal, *Indigenous Consultation*
- Agatha Banks: Principal, *Town Planning Cartographics*

Figure 1: STUDY AREA



2. SUMMARY OF RESEARCH AND ANALYSIS

2.1 INTRODUCTION

The detailed research and analysis that led to the proposals in this report has been fully documented in a separate Technical Report. The following section contains a summary of the research and analysis from the Technical Report.

2.2 COMMUNITY CONSULTATION

The past two decades have seen a shift in the way planning is approached, from being a rather 'behind the scenes' procedure to a highly democratic process that is open to public scrutiny at almost every stage. The planner has adopted the new role of 'facilitator of community aspirations', working in partnership with all stakeholders to develop a plan that is agreed to by the majority of the people. Such an approach was taken in preparation of this plan.

A summary of the outcomes of consultation with the general public (questionnaire survey), community groups (Visions Workshop), indigenous community and individual stakeholders is provided in this section of the report.

2.2.1 Questionnaire Survey

The Geographe Bay Foreshore Management Plan Questionnaire was published in the Busselton-Margaret River Times on 2 December 1999. The questionnaire was designed to obtain feedback and public views on the Geographe Bay Coast. A total of 51 completed questionnaires were returned.

2.2.2 Visions Workshop

A Visions Workshop was held at the St. Mary's Family Centre on Thursday 16 December 1999. The workshop was advertised in the Busselton-Margaret River Times on 2 December 1999. Approximately 40 people attended the workshop.

2.2.3 Submissions from the Community

In response to a request for public submissions published in the Busselton-Margaret River Times on 2 December 1999, submissions were received from the Dunsborough Resident Group, the Dunsborough Coastcare Group and residents from Dunsborough and Busselton.

2.2.4 Indigenous Consultation

The Aboriginal Heritage of the Geographe Bay foreshore was researched as part of this study. Issues and concerns of Aboriginal Heritage Sites, Native Title, research and community education were reviewed. Local Indigenous people were consulted and their views on the recreational and environmental issues of the foreshore were obtained.

2.2.5 Meetings with Community Groups and Individuals

As part of the overall consultation program, meetings were held with a number of community groups and individuals to obtain first hand knowledge about the Geographe Bay foreshore. Meetings were held with the Dunsborough and Districts Progress Association Inc Coastcare Group, interested community members at the Environment Centre, the Marybrook Coastal Care Group, professional fishers, the Toby Inlet Management Group and the Geographe Bay Yacht Club.

2.2.6 Outcomes of Community Consultation

The following are the main conclusions from consultation with members of the community and representatives of community groups:

- The majority of people who use the coast do so on a daily basis and arrive on foot.
- The coastal aspects most valued by the community are the sheltered bay, coastal vegetation, marine fauna and easy access.
- There is a perceived need for a service jetty and an additional ramp at the Sea Rescue site, a pedestrian pier off the end of Dunn Bay Road and a service jetty near Fish Rock.
- Concerns have been raised about the lagoon that has formed at the end of Elmore Road. The closed lagoon results in algal blooms, fish deaths and bad odours.
- There is concern about the construction of rock structures and groynes along the coast.
- There is concern about traffic routes close to the coast becoming congested and causing a barrier to beach access.
- The Shire Council should develop a formal structure to co-ordinate the activities of the coast care groups within the Shire.
- Concern exists about the length of the Siesta Park groyne and erosion of the coast at Locke Estate.
- Concern was raised about the presence of dogs on non-dog beaches.
- Providing shelters, food outlets and more public open space will encourage recreational use of the foreshore.
- A 200 metre buffer between the vegetation line and any new development is favoured.
- The car park at Dunn Bay and the stormwater drains in this vicinity need to be reconsidered.
- There is evidence of previous erosion along the coast in front of the Backpackers' Hostel.
- The Sea Rescue boat ramp is ideal for boating owing to the easy access it provides to deep water. Concerns were raised about the construction of a jetty at this location.
- The Environmental Centre raised concerns about the groynes, access, litter, signs, feral animals, dogs and trees.
- The narrowness of the Marybrook coastal reserve has been raised as an issue relating to the alignment of a dual use path through the area.
- Concern was expressed about the invasion of wire weed and the loss of seagrass meadows in the Bay.
- Professional fishers generally launch their crafts from the boat ramp at Quindalup. There is presently a shortage of parking in this area.
- A combined entrance to both Toby Inlet and Station Gully Drain is considered a good management option.

- The Toby Inlet Management Group is opposed to the construction of a bridge across the Inlet to improve boat access to the launching area.
- Concerns were raised about the burning off policy.
- The Geographe Bay Yacht Club boat ramp has recently been extended and this has resulted in erosion of the beach.

2.3. COASTAL ENVIRONMENTAL ASSESSMENT

2.3.1 Introduction

Geographe Bay is a sandy, highly mobile and environmentally sensitive coastline. Sandy coastlines are fragile even in their natural state and when human uses are introduced their fragility is further exposed. Geographe Bay has a northerly aspect in the eastern lee of a major promontory, Cape Naturaliste, and may be unique with respect to geomorphology and oceanography. There is a lack of extensive research conducted on low energy shorelines such as Geographe Bay. A sound understanding of the particular coastal environment is, however, essential for good planning of the coastal zone.

For this reason the various components of the Geographe Bay coastal environment have been examined and a summary of findings is provided in this section of the report.

2.3.2 Geology and Geomorphology

The study area falls mainly within the southern extremity of the Swan Coastal Plain, which is a low-lying surface comprised of marine and fluvial sediments. The Plain is terminated inland by the Whicher Scarp and the Dunsborough fault. To the west of the Dunsborough fault is a series of rocky bays created by wave erosion, whilst to the east the coastline is more sinuous, low lying and sandy.

Geographe Bay beaches are protected from the prevailing southwesterly swell direction by Cape Naturaliste and by the broad, shallow inner continental shelf. The current directions are predominantly easterly, though they often swing westerly and north westerly.

The beaches in Geographe Bay are currently subject to a long-term accretion period. Notwithstanding this generality, certain isolated areas are subject to erosion, an occurrence which has been attributed to unbroken seagrass meadows directly offshore, whilst localised accretion has been attributed to the decrease in area of local seagrass meadows.

2.3.3 Vegetation

Three zones of vegetation have been identified, namely the Incipient Foredune Zone, the Foredune Zone and the Backdune Zone/Intertidal Slack Zone. Vegetation is absent in the Beach and Intertidal Zone due to tidal exchange and wave activity.

The Incipient Foredune supports only pioneer species such as *Spinifex hirsutus*, **Trachyandra divaricata*, **Tetragonia decumbens* and **Pelargonium capitatum* (among others). The Backdune and Intertidal Zone vegetation is open heathland grading to *Agonis flexuosa* woodland.

Species present include *Agonis equisetifolia*, **Asparagus asparagoides*, *Acacia saligna* and *Acacia preseii*. The latter two species also occur in the Fore-dune Zone along with *Olearia axillaris*, *Scaevola crassifolia* and *Acanthocarpus preseii*. (*exotic species).

Natural dune vegetation communities are vulnerable to fire due to the harshness of the coastal environment and the lack of body in youthful sandy soils. It has been proposed that fire management should include only very small prescribed burning cells to leave surrounding habitat in tact, rehabilitation of burnt areas should occur, open fires should not be permitted in Busselton's coastal reserves and weed control of Peppermint forest understorey should be practised to minimize fire hazards.

Dune vegetation is easily damaged by pedestrian and other traffic, and protection is therefore necessary where potential for damage to vegetation exists.

Vegetation is a particularly significant factor in coastal planning because it acts as a buffer against coastal erosion, enhances the appeal of the area and creates a 'sense of place', and provides habitat for fauna. There are a number of key areas of coastal vegetation (particularly in the Broadwater Precinct) that supply an important function as fauna corridors. The most important of these coastal vegetation communities is *Agonis flexuosa woodland* and associated understorey.

Disturbance to the vegetation in the study area occurs through encroachment of car parks and campsites, clearing for development, landscaping with exotic species, fire damage and invasion by environmental weed species.

2.3.4 Fauna

Habitat for fauna in the study precinct is limited in area owing to recreational and development activities. Native vertebrate species including frogs, geckos, legless lizards, dragon lizards, skinks, monitors, snakes, possums and bandicoots are present, as are introduced species such as mice, rats, foxes, cats and rabbits.

The Western Ringtail Possum is a Schedule 1 Rare Species. The Southern Brown Bandicoot has recently been removed as a classified rare species but is still considered to be of conservation significance.

A total of 28 bird species inhabit dune vegetation within Geographe Bay at various times of the year, though only the Splendid-fairy Wren and the White-browed Wren are year round residents.

Recommendations for protection of fauna occurring in Toby Inlet include preventing disturbance to native vegetation, control of feral and domestic animals, fire control, weed control, green corridors linking habitats and protection of bush remnants on private property. Area-specific management plans have been proposed as the most effective way of implementing such recommendations.

2.3.5 Marine Biota

The sand surface under the waters of Geographe Bay is approximately 70% covered by dense seagrass meadows of primarily *Posidonia sinuosa*.

Sea-grass is important in that it attenuates bottom flow and thus reduces the impact of currents and waves on the shore, it traps organic detritus and makes it available to the food chain and it serves as a nursery for juvenile fish species.

The South Western Stinger is abundant in the shallows of Geographe Bay during summer. Its mild to severe sting makes it a nuisance to beach users.

2.3.6 Coastal Processes

Coastal processes at Geographe Bay are different to most of the south west coast of Western Australia owing to the degree of shelter the bay obtains from Cape Naturaliste. Wind data based on a five-year average shows that in summer a daily sea breeze of approximately 37km/hr blows from the south west, while easterly winds of approximately 28km/hr occur with a 12% frequency. Winter winds are dominated by westerlies averaging 36km/hr and exceeding 50km/hr on many occasions.

Southwesterly swells are dominant and are refracted by Cape Naturaliste. As a result dominant waves are from the northwest. Wave energy at the shoreline is generally very low. Tidal movement in the Bay averages at 0.5 metres, with one tidal exchange per day. In winter the tidal pattern is sometimes masked by storm surges.

Two regional currents influence the waters of the Bay at different times and these are the warm Leeuwin Current and the cold Capes Current. The Leeuwin flows southward approximately 50 km offshore, whilst the Capes Current flows from the south and is situated between the Leeuwin Current and the coast. The Capes Current is important in terms of the flushing of Geographe Bay.

Sediment movement occurs in both longshore and cross-shore directions. Cross-shore movement is generated by waves acting obliquely on the shoreline whilst longshore drifting is produced by both swell and wind generated waves and occurs mainly from west to east. The presence of Cape Naturaliste to the south of Geographe Bay effectively isolates the coastline from beaches to the south. The net annual sediment transport in Geographe Bay is to the east and is not marked by any progradational down drift.

Offshore seagrass meadows are broken by sandy depressions ranging in size from square metres to hectares. The depressions are either parabolic scours or traverse furrows, both features are thought to arise from isolated storm erosion. Lobate bodies of sand extend from the northeastern margins of traverse furrows and are likely to be caused by the easterly longshore current. At the landward edge of these furrows, linear sand bars surfaced by mobile sediment are formed. The relationship between scours, furrows, sand lobes and sand bars is complex and not well understood at present.

Analysis of aerial photographs taken between 1941 and 1993 has shown an average rate of shoreline accretion of 1.1 hectare per year. This rate is not constant since storm events tend to erode the coastline and calm summer conditions allow it to rebuild. Seagrass decline is of major concern, as this leads to coastal accretion that will continue until the sediment supply is exhausted, at which point coastal erosion rates will become very high.

The actual beach width at any time is a function of seasonal cycles where winter storms sweep sediment off the beach face making it narrower; longer term (11-12 year) storm cycles where severe storms can cause considerable erosion to beaches (such as the 1988 storms); and short term cyclone cycles which can produce intense storms capable of extensive damage.

Winter storms and occasionally dissipating tropical cyclones generate high-energy steep waves, that when combined with elevated sea levels, can result in erosion of much of the beach face.

Whilst the Greenhouse Effect has yet to be proven, it has been predicted that an increase in cyclone frequency, increase in sea level and changes in regional scale meteorological features may lead to changes in the wave climate. The Institution of Engineers Australia has presented three scenarios for possible changes in Global Mean Sea Level for the years 2030, 2050, and 2100. The 'Low Scenario' for 2050 predicts a 0.16 metre rise (which will lead to a 16m beach recession), whereas the 'High Scenario' for the same year shows a 0.51 metre rise (which will lead to a 51 metre beach recession). It has been deemed appropriate to allow for a 0.2-0.3 metre rise (20-30 metre beach recession) in this study, as a compromise between present day cost/inconvenience and future risk.

2.4 COASTAL LAND USE ASSESSMENT

2.4.1 Introduction

An examination of the human use of Geographe Bay was undertaken to gain a comprehensive understanding of how the land use of the area operates in order to help guide future development in a desirable manner. Existing and future human use patterns were investigated.

2.4.2 Aboriginal Heritage

Indigenous people have long occupied Geographe Bay. Archaeological investigations have shown that people occupied the area at least 47,000 years ago. When British colonisation of Western Australia occurred in 1829 there were thirteen groups of Aboriginal people sharing similar language and customs extending along the south Western Australian coast. These groups are now collectively known as Nyungar.

The Geographe Bay foreshore is part of the traditional territory of the Wardandi group who moved throughout the Bay in nuclear families and larger bands coming together for social and ceremonial purposes. The Wardandi people lived on food and resources supplied by the natural environment of the Bay and its wetlands. Eventually European settlement and demand for resources led to the displacement of the Wardandi group, but despite this they have maintained their cultural, spiritual and family connections with Geographe Bay.

There are many archaeological and ethnographic sites in the Region that are protected by the Aboriginal Heritage Act (1972), whether recorded or not. The Aboriginal Affairs Department can provide guidelines to avoid disturbance of these sites in planning.

There are presently two Native Title claims that cover the Geographe Bay coastline, namely the Harris Family and South West Boojarah.

Claimants have the right to negotiate about certain future acts proposed by government; conditional access rights to non-exclusive agricultural or pastoral leases; the right to prevent future acts from being excluded from the Native Title process; and the capacity to enter into some land use agreements.

2.4.3 European Heritage

Settlement in the Region by European people began shortly after 1829. The earliest known settlers were the Molloy, Turner and Bussell families. The town site for Busselton was surveyed in 1837 and the flourishing whaling industry of the day is said to have been a major attraction to the area.

Settlement was accelerated by Government programs, the construction of roads and rail networks, the Group Settlement and Returned Soldiers Scheme in the 1920s and 1930s and the establishment of irrigation and drainage facilities. Physical remains of settlement phases still exist, notably the Busselton railway jetty. There are many other buildings and sites from the early years of European settlement that together with Aboriginal sites, form an important part of the character and human settlement history of the Region.

2.4.4 Regional and Local Planning

The State Planning Strategy provides a strategic guide for land use planning in Western Australia to the year 2029. The Strategy aims to develop a land use planning system to fulfil the goals of focusing on environmental and economic matters; providing a range of residential lifestyles, tourist experiences and economic opportunities; continuing the development of intensive agriculture, resource development and downstream processing industry; protecting the coastal, riparian, heritage and natural environments; and developing an integrated intra-regional and inter-regional transport system.

A number of coastal planning policies and studies with relevance to this project exist. A selection is outlined as follows:

- In 1986, a Country Coastal Planning Policy, WAPC No DC.6.1, was developed in Western Australia. It incorporates coastal planning and management principals. Subsequently the Western Australian Planning Commission published a coastal planning and development policy framework in 1996, however this has yet to be finalised.
- In 1994, the Department of Transport prepared the Strategic Plan for Maritime Facilities in Western Australia.
- Gutteridge Haskins & Davey consultants prepared the Busselton Foreshore Development Study in 1989. The report contained a detailed assessment of the study area with regard to development and management of the urban beachfront of Busselton.
- In 1998, the Western Australian Planning Commission published the Leeuwin Naturaliste Ridge Statement of Planning Policy. The policy statement addresses the issues of settlement, nature conservation, landscape, agriculture, tourism, cultural heritage and resources. The Statement of Planning Policy is yet to be gazetted. It should be noted that only a small section of the study area falls under the Policy Area.

- The Shire of Busselton Planning Scheme No. 20 gives the Shire full discretionary powers with respect to development in the coastal zone. The Scheme provision requires that applications for development within Coastal Management Areas may be referred to the Department of Transport, the Water & Rivers Commission and the Ministry for Planning for comment.
- The 1992 Geographe Bay report proposed a setback line for permanent development. The report was not adopted by the Shire of Busselton, however it contains good background material relating to the foreshore.
- In 1995 a report by the Department of Transport titled “Busselton Foreshore Environs Management of Residential Development” was prepared.

2.4.5 Current Beach Management

The Shire of Busselton Parks and Gardens staff are presently responsible for beach management in the study area. Their tasks include clearing rubbish bins, litter removal, clearing of drains and maintenance of access paths. Issues identified by Parks and Gardens were management of sand movement, the tendency for beach users to build fires and leave mess and sand accumulation adjacent to rock revetments and jetties.

2.4.6 Beach Recreation and User Groups

Geographe Bay is a low-energy, sheltered stretch of coast ideal for swimming, boating, skiing, fishing, yachting, diving and a wide range of other recreational activities. Dog exercising is a common practice and there are 10 areas designated specifically for this purpose within the study area. As identified by the community, it is important to make dog owners aware of these areas and to provide equipment to ensure the beaches are kept clean.

2.4.7 Beach Access and Parking

The close proximity of main roads to the coast and the level of residential development along the coast provide ease of access to the beach for pedestrians. An aerial study taken on Australia Day 2000 suggests that Busselton and Dunsborough settlements have sufficient parking to accommodate vehicles during peak beach use times.

Outside the main settlements parking appears to be sufficient and may require rationalisation to ensure parking facilities are adequately maintained.

Dual use paths exist along much of the coast in the coastal reserve. At Siesta Park the dual use path has been constructed in the Caves Road reserve to avoid areas affected by coastal erosion. The Marybrook Coastal Care Group has also planned for a Caves Road alignment.

2.4.8 Public Safety

To assist with public safety, the Department of Transport has prepared a boating guide for Geographe Bay outlining areas where landing and water skiing are permitted.

The Shire of Busselton Community Police Officers have the responsibility of beach surveillance in the study area. The Police reported continual concerns with vehicles on the beach and in dunes, dog owners exercising outside prescribed areas, beach parties, vegetation damage and littering.

2.4.9 Fishing and Boating

In total there are 36 boat launching facilities located within Geographe Bay. A new boat launching facility is proposed at Port Geographe and its construction may allow other ramps to be down graded or removed. Sand drift and wind exposure appear to be ongoing problems at the main boat launching facilities at Scout Road, Georgette Street, Dolphin Road, and New Town Beach.

The Geographe Bay Road ramp is the most well used as it is accessible by two-wheel drive vehicles and has the parking capacity for 100 vehicles. Users of this ramp have identified that they would prefer better facilities in terms of landscaping, toilet facilities and parking.

In the early 1980s the Shire of Busselton sought assistance from the State Government for a recreational boat harbour in Geographe Bay. Point Piquet was nominated as the most suitable site and an environmental review was undertaken. Findings from the review were that development would not significantly affect the physical or biological environment of the Region. The Department of Environmental Protection assessed the proposal and concluded that without a broad regional plan the fishing boat harbour should not be constructed. The proposed harbour was to cater for boat launching, fuelling, sullage disposal, boat pens and the yacht club and was considered to be desirable for the local commercial and recreational fishing industries.

The Fisheries Department stated in 1984 that the fishing fleet in Geographe Bay was unlikely to increase significantly in numbers in the foreseeable future, but that the industry would benefit from protected waters within the Bay. It was also thought that existing fish stocks, excluding pilchards, skipjack tuna and demersal fish stocks, were fully utilised.

The Shire of Busselton has been named by Fisheries Western Australia as having the third greatest fishing effort out of twelve fishing districts within the fishing region, in terms of fishing days and number of boat trips. Conflict between commercial and recreational fishers has been reported and the Department of Transport has identified a ratio of fish catch levels that is governed by the degree of difficulty which fishers face when launching and retrieving vessels. Improvements in boat launching facilities in the study area are likely to result in an increase in numbers of recreational fishers and therefore the catch levels of the recreational fishing industry would rise accordingly.

The boat charter industry in Busselton is confronted with similar difficulties as the fishing industry resulting from the lack of protected waters for transfer facilities. The provision of protected waters in the western end of Geographe Bay would benefit both these industries but may have a negative impact on boat numbers and catches.

2.4.10 Tourism

The tourism and recreation industries generated approximately \$206 million for the South West region during 1996. Busselton was judged as Western Australia's Top Tourism Town in 1995, 1996 and 1999 and is the premier seaside resort town in the State. Busselton is popular with fishers, skiers, snorkellers, scuba divers, windsurfers and sailors. Dunsborough is also an ideal family retreat because of its quiet coves, sandy beaches, surrounding national park, nature reserves and numerous scenic walk trails.

The majority of visitors to the region are from within Western Australia though there has been a noted increase in the number of interstate visitors during the past decade. It is anticipated that this trend will continue as a result of the completion of the Busselton airport and continued promotion of the area as a holiday destination.

Several specific tourist attractions lie within the study area such as the sunken wreck of the HMAS Swan to the north east of Point Piquet which is a popular dive spot and the Busselton Jetty which is the longest jetty in the Southern Hemisphere. An underwater viewing area has been proposed for the Busselton Jetty but a fire in late 1999 held up planning for the facility.

Provision of catering facilities is necessary whenever an area is promoted to visitors. The only identifiable restaurants or cafés along the Geographe Bay coast are at the Busselton Jetty and Holgate Road in Broadwater. These venues serve their purpose, though an additional catering facility could be provided at Dunsborough.

The Busselton Beach promenade engages visitor interest and promotes exploration of the beach and jetty. This area is an important asset for the tourism industry of Busselton and provides a focal point for visitors. Additional measures need to be taken to improve the appearance of the promenade in terms of a common theme for lighting and furniture. Additional bins are also required to reduce litter.

2.5 OPPORTUNITIES AND CONSTRAINTS

2.5.1 Introduction

The Geographe Bay coast has a number of planning and management opportunities and constraints for environmental conservation and human use. The following opportunities and constraints provide the framework for making recommendations on the future management, protection and preservation of the foreshore of Geographe Bay.

2.5.2 Opportunities

The following were the main opportunities:

- Geographe Bay is a sheltered embayment.
- The beaches are protected from prevailing southwesterly swells.
- There is easy access to the beach from the residential areas of Dunsborough and Busselton.
- There is scope for improvement of parking at the Sea Rescue site.
- Provision of additional shade shelters and food outlets would be beneficial.

- The boat ramp at the Sea Rescue area provides access to deep water.
- The peppermint groves, rocky bays and the Naturalist Ridge provide a scenic backdrop to the long sweeping beaches.
- The population of the Shire of Busselton has been increasing over the past two decades.
- There are generally plentiful parking facilities, however, some specific areas are congested.
- There exists a good supply of boat launching facilities.
- There is good boat launching potential at the end of Forest Road.
- The HMAS Swan is a valuable tourism asset.
- The Busselton jetty is a major tourist asset.

2.5.3 Constraints

The main constraints in Geographe Bay are as follows:

- The Elmore Street lagoon experiences algal blooms, fish deaths and odours.
- Rock revetments and wooden groynes along the coast have aggravated erosion.
- Congestion of Geographe Bay Road in Dunsborough and parked vehicles block access to the beach.
- The presence of dogs on non-dog beaches concerns the community.
- The use of four wheel drive vehicles on the beach is an issue in some places.
- Some development is situated too close to the beach.
- The car park and stormwater drains at Dunn Bay need reconsideration.
- The invasion of seagrass meadows by wire weed continues.
- There is presently a shortage of parking at the Sea Rescue boat ramp in summer.
- Informal pedestrian and vehicular access can lead to degradation of coastal vegetation.
- Removal of coastal vegetation can result in the introduction of exotic vegetation.
- Feral animals have depleted populations of natural fauna.
- Natural accumulation of seagrass wrack on beaches occurs in some areas.
- There is a tendency for beach sand depletion in front of rock revetments.
- Wooden groynes have fallen into disrepair and pose a safety problem along the beach.

3. MANAGEMENT PROPOSALS

3.1 INTRODUCTION

The coastline of Geographe Bay is unique in the south-west of Western Australia owing to its north facing beaches and its lineal development which has occurred along the coast from Dunsborough in the west to Port Geographe in the east. The coast in this area is constantly under pressure from development for residential, tourist and recreational purposes as people are attracted to the “quality of life”. Substantial expansion has occurred in the Shire of Busselton which is the fastest growing local government area outside the Perth Metropolitan area.

The growth rates for the Shire are indicative of the overall change being experienced in the area and the pressures being placed on the natural environment to sustain growth. This is particularly evident in the Leeuwin-Naturaliste Statement of Planning Policy which projected that the population of the Shire of Busselton will almost double over the next 26 years.

Based on the goals, objectives and principles and informed by the analysis, consultation with stakeholders and the public, the following are the planning and management proposals for the Geographe Bay coastline between Port Geographe and Dunsborough.

The study area has been divided into precincts based on the Shire of Busselton localities for the purpose of enabling the Shire of Busselton to incorporate the proposals into foreshore planning policies (Figure 2).

The management proposals relate to the ongoing procedures for managing the coastal environmental system and provide a framework for the Shire to preserve and enhance the foreshore of Geographe Bay in the future.

The following proposals should be read in conjunction with the precinct plans that have been prepared for the study area.

3.2 COASTAL MANAGEMENT PRINCIPLES

Coastal planning and management principles were developed for the Western Australian coastline in the 1980s. These were included in a Cabinet Endorsed Government Position Paper in 1983, in the Country Coastal Planning Policy in 1986 and in Coastal Planning and Development in Western Australia: Towards a Policy Framework (1996).

The following were the major principles set out in the above documents:

Environmental

- Natural habitats, particularly areas of high biological productivity, should be protected.
- Disturbance to vegetation should be minimised.
- Indigenous plants should be utilised to encourage regeneration, where required.
- Places of unique landscape, scientific and cultural significance should be conserved and managed, including geomorphological, ecological, anthropological and historic sites.

Coastal

- The beach, between the water line and the vegetation line, is stable and can accommodate high levels of human use.
- Development should be separated from the coast by a foreshore reserve.
- Coastal land should be retained in public ownership.

Developmental

- Public access to the beach should be provided in a sustainable manner.
- Development that is in harmony with the sensitive nature of the coast should be encouraged.
- Development should be concentrated in nodes.
- Development should not cast shadows on the beach or increase wind velocities.
- New developments should be fully serviced, including sewerage and drainage.
- Development should not result in effluent discharges that may pollute the beach.
- Priority should be given to coast dependent development.
- Signs should be limited in number and placed so as to avoid blocking views.
- Service facilities should be designed to minimise impact on landform.

3.3 GENERAL MANAGEMENT PROPOSALS

3.3.1 Introduction

The following management issues have been examined in a general manner. Many of these are also examined in more detail on a precinct by precinct basis. The main purpose of this section is to draw from the research and analysis and set out planning and management and development proposals that can be implemented by the Shire or other authorities.

3.3.2 Revegetation and Weed Management

The quality of the vegetation along the Geographe Bay coast varies from place to place. Some areas contain a relatively natural system and others are dominated by exotic vegetation (See Section 3.3 in the Technical Report).

Damage to vegetation in the coastal zone generally leads to increased weed invasion or wind erosion of the dune sand. Pedestrian and vehicular traffic are a major cause of vegetation damage.

Proposal 1: *Pedestrian and vehicular access points onto the beach should be clearly fenced and signposted to prevent general deterioration of vegetation in their vicinity.*

Clearing of vegetation in the vicinity of new resort developments and residential areas to obtain sought after views of the coast has led to degradation of the coastal vegetation.

Proposal 2: *Clearing of coastal vegetation in front of resort developments should be controlled to maintain continuity.*

Vegetation cover along the edge of formal coastal pathways and the cycle path is being rapidly degraded, especially in high use areas and where no fencing occurs.

Proposal 3: *Areas which are rapidly degrading along formal walking and cycle paths should be fenced or should have signs requesting users to stay on the path.*

Many areas of the Geographe Bay coast are devoid of natural vegetation. Exotic lawn grasses that have no capacity to trap sand and build dunes have been planted. Also, exotic trees such as the Norfolk Island Pine and Moreton Bay Fig have been planted in some places. Such landscaping does have benefits in high use areas, however, these should not be permitted to replace the natural vegetation.

Proposal 4: *Local native plant species should be used for landscaping in as many places as possible and the spread of exotic plant species should be discouraged wherever possible.*

Proposal 5: *Key areas of coastal vegetation communities representing important fauna corridor functions should be identified for retention, restoration and management.*

The invasion of weeds along the Geographe Bay coast has led to the degradation of the understorey in coastal forests. Chemical treatment of weeds by herbicides can cause as many problems as it solves. Manual pulling of weeds and replacement with local indigenous species is one of the better methods but is time consuming and expensive.

Proposal 6: *Localised areas of weed invasion should be separately assessed as to the best method of weed eradication and management programs based on the most effective methods should be prepared.*

Degraded areas of the coastal dune vegetation need to be repaired in order to prevent sand drift and increasing degradation. One of the most effective methods used in Western Australia is to cover exposed areas with brush. This technique lifts the wind off the sand and prevents sand drift while at the same time providing a habitat for wind blown seed to germinate.

Proposal 7: *Degraded dune areas should be fenced and covered with brush to discourage pedestrian and vehicle traffic, to lift the wind off the sand and to promote seed germination and revegetation.*

3.3.3 Rehabilitation and Feral Animal Control

The development of the Geographe Bay foreshore, in general, and the construction of roads and drains, in particular, have been the cause of the decline of faunal habitats. An examination of known vertebrate fauna species on the coast indicates the paucity of the fauna and the strong representation of feral animals (See Section 3.4 in the Technical Report).

The Western Ringtail Possum, a Schedule 1 Rare Species, is dependent on Peppermint trees and has struggled to adapt to the ongoing disturbance of its habitat.

Proposal 8: *A program to enhance the habitat of the Western Ringtail Possum should be undertaken. Increasing the cover of Peppermint trees as a viable canopy to facilitate movement, and "possum overpasses" across roads and drains, should be given consideration.*

The Fox and feral Cat cause major problems in the study area as they prey on indigenous animals. The Rabbit is also a major problem in that it grazes young shoots of native plant species and results in the spread of weeds. Control of feral animals is complex and requires site specific treatment.

Proposal 9: *A program to eradicate feral animals from particular areas should be developed by the Shire and CALM in conjunction with the Agricultural Protection Board. The use of baits, trapping and fencing of certain habitats needs to be considered on a site specific basis.*

3.3.4 Beach Access

Owing to the linearity of the Geographe Bay coast, the pattern of development, the location of regional roads, the resident and visitor populations are generally considered to have excellent access to the Geographe Bay foreshore. In addition, the coast is particularly well supplied with parking facilities. An aerial survey and ground survey of access and parking undertaken during the peak season indicates that there is adequate supply to meet peak needs.

The quality of the parking facilities and the location of the facilities in certain places has been provided too close to the shoreline (See Section 4.7 on the Technical Report).

Proposal 10: *Parking facilities should be set back from the beach on stable land so that the parking installations do not suffer damage from storm activity and that the beach profile is not degraded by the installation. Ideally, parking areas should be separated from the active foreshore by a managed dune buffer.*

3.3.5 Dual Use Path

With the increasing use of cycling as a means of travel, a form of exercise and a leisure pursuit, the construction of pedestrian/cycle paths has been on the increase (See Section 4.7 in the Technical Report). It is presently possible to cycle along the majority of the Geographe Bay Coast and it is the goal of certain members of the community that, eventually, this will be possible along the entire coast. Some parts of the coast do not lend themselves easily to the construction of the path along the foreshore. The Siesta Park foreshore has experienced coastal erosion and it is not possible to easily construct a path in that area. A dual use path has, however, been constructed along Caves Road to by-pass the camps. A similar Caves Road alignment has been proposed in the Marybrook locality. The drains create a major dislocation to the concept of a continuous cycle/pedestrian path along the Geographe Bay foreshore.

3.3.6 Boat Launching

Boating is a major form of recreation activity on the Geographe Bay foreshore. Eighty eight boats were recorded during the beach user survey on 26 January 2000. Large numbers were recorded at Dunsborough (recreation), Quindalup (professional fishermen), Siesta Park (recreation) and Broadwater (recreation). Overall there would appear to be adequate facilities except for Quindalup where the vehicle and trailer parking is congested and at Dunsborough where the existing boat launch facility is awkward and congested (See Section 4.9.1 in the Technical Report).

Proposal 11: *Additional boat launching facilities should be further investigated at Forrest Street, Dunsborough, where deeper water is accessible on an area of rocky coast. Additional trailer storage should be investigated at Quindalup (Sea Rescue and Professional Fishermans areas) to cater for the growing needs.*

It should be noted that the Forrest Road site presents serious constraints to the provision of sufficient infrastructure for a boat ramp, and as a result it is unlikely that this proposal will be implemented.

3.3.7 Recreation Activity

The Geographe Bay coast is in itself a recreation facility in that residents and visitors are able to use the foreshore for a wide range of recreational uses. The water areas are used for boating, yachting, fishing, diving, swimming, paddling, skiing and snorkeling. The beach areas are used for games, sunbathing, picnics, walking, jogging, fishing and paddling. The reserve areas behind the beach are used for camping, cycling, caravanning, boat launching, parking and promenading. In addition, the Geographe Bay foreshore has restaurants, kiosks, shady lawns and the Busselton Jetty to provide for recreational activities.

Proposal 12: *Recreational activities should be given a high priority as a beach use along the Geographe Bay foreshore.*

3.3.8 Community Ownership and Involvement

During the course of the study considerable interaction was established between members of the public and community groups. These took the form of a questionnaire survey, visions workshop, submissions from the community and community groups, and liaison with the indigenous community. The Dunsborough Coastcare Group was particularly concerned about issues in their area. Overall a high level of community ownership and involvement was experienced.

Proposal 13: *The focus of the Busselton Environment Forum is to be expanded to include the provision of advice to Council on coastal issues.*

3.3.9 Fire Management

Fire has been examined in Section 3.6 in the Technical Report. Overall it is considered that the use of regular burning as a management tool in the coastal zone would be inadvisable. The development of the drains and roads along the coast has effectively created fire breaks that reduce the ability of fires to spread along broad areas of coastal front.

Proposal 14: *The use of fire as a management tool should be undertaken only on a limited basis and should be implemented as part of an integrated management plan on an as needed basis.*

Proposal 15: *The use of fires along the coast for picnics and barbeques should be reduced and replaced by the use of gas barbeques in order to further reduce the risk of fire spreading to surrounding bushland areas.*

Proposal 16: *In the event of a fire, direct planting of tube stock should be implemented to ensure species diversity is maintained and that vegetation cover is replaced as soon as possible.*

3.3.10 Coastal Protection and Sand Replenishment

The erosion of beaches and dunes within the study area is an annual event, particularly following storm surges during winter months. Coastal protection and rehabilitation are therefore key tasks to be considered in the management of all precincts, although the use of groynes and other coastal protection structures will not be considered as part of this management plan.

Sand replenishment following an erosion event can be a slow process when allowing for natural sand accretion and wind and water shaping of dunes. The use of imported fill is a potential management and rehabilitation tool both to prevent annual erosion events by buffering dunes during storm surges or to replace sand lost during severe erosion events. The fill must be selected to be of suitable grading (similar to the beach sand) and colour.

There is a possibility that pollutants may be introduced to coastal environments if contaminated fill is brought in during these processes. The utmost caution must be exercised to prevent this from happening.

Proposal 17: *Only suitably graded and coloured clean fill is to be used for coastal protection and rehabilitation or sand replenishment.*

3.3.11 Litter

The presence of litter detracts from the visual quality of a beach and most other natural areas. From the field survey and general observation very little litter was evident on the Geographe Bay foreshore. There was some litter in high usage areas but these were well supplied with rubbish bins and they appeared to be well used.

Proposal 18: *The Shire's staff should continue the good work of rubbish collection in order to ensure the maintenance of a litter free coastal environment.*

Proposal 19: *That on more inaccessible beaches signs should be erected requesting beach users to remove rubbish and dispose of it via existing rubbish removal services.*

3.3.12 Signs

Signs are a necessary part of the foreshore development as a means of directing people or guiding people to do certain actions and refrain from others. In total, signs can become overpowering and if there are too many they can become counter productive. Signs were generally not considered to be a problem along the Geographe Bay foreshore. There were, however, a couple of places where a large number of signs blocked views and were unsightly, namely, at the Sea Rescue Boat Ramp at Quindalup.

Proposal 20: *A system of signs for coastal reserves and parks in the Shire should be prepared along with locational guidelines so as to ensure that signs enhance the landscape rather than detract from it.*

3.4 PRECINCT MANAGEMENT PROPOSALS

The following section focuses in more detail on the individual precincts of the Geographe Bay foreshore.

3.4.1 DUNSBOROUGH PRECINCT PROPOSALS

Introduction

The Dunsborough Precinct is located to the immediate west of the Quindalup Precinct and ends at the western extremity of the Dunsborough townsite. The precinct is comprised of Reserves 22965 and 44343. The land to the south of the precinct is residential and tourist related land uses associated with the townsite of Dunsborough (Figure 3).

The Reserve on the eastern side is wider than the western side, where the sandy beaches of Geographe Bay give way to rocky headlands and small embayments. The beaches are well protected and offer good swimming. The land behind the beaches has been grassed and trees provide shade for beach users. The majority of the properties in Dunsborough are separated from the beach by the alignment of Geographe Bay Road, with the exception of some tourist zoned properties such as the Greenacres Caravan Park and neighbouring tourist beach houses.

Planning and Management Proposals

Revegetation and Weed Management

Proposal 21: *Small, well managed clusters of native vegetation planting's should be undertaken along the seaward side of Vincent Road and Geographe Bay Road to replace grass. This should be done in a staged manner allowing for the successful management of weeds within each planting cluster. Over time an infill program can be implemented until the entire strip is replaced by appropriate native species. Management of weeds could possibly be achieved by the organisation of street committees who can keep a close watch on emerging species.*

Proposal 22: *Landscaping on the beach side of new coastal developments should avoid the use of extensive lawns which can be invasive into the dune vegetation and also require high maintenance. Whilst the planting of lawns is necessary to provide areas for recreation, these areas should be reduced in size so as to allow for linked corridors of native vegetation.*

Proposal 23: *The high incidence of Lagurus ovatus (Hares Tail grass) in the Peppermint forest on the north of Geographe Bay Road is leading to a decline in native species cover and diversity as a result of competition for nutrients and moisture. This grass also renders the coastal forest more susceptible to fire particularly during late summer when the grass is very dry. Photograph 8 (in the Technical Report) shows how dense the cover is in the Siesta Park Reserve. No single, simple solution exists for the control of this plant. The most effective method is, as with other weed species, is to achieve a strong cover of native species and this, in turn, relates to the integrated management of the coastal zone.*

Rehabilitation and Feral Animals

The Dunsborough coastline comprises a relatively narrow fringe of coastal reserves that contain discontinuous stands of taller native vegetation and lawns of exotic grasses. Owing to the narrowness of the reserves and the high usage it is not proposed to pursue any specific management measures to conserve natural habitats or feral animal control apart from the normal 'duty of care' currently being practised.

Beach Access

Owing to the close contact between the Dunsborough residential areas and the foreshore, a high level of beach access is maintained along the coast. Virtually the entire length of the precinct's coast is accessible. One aspect that could be improved is the parking situation. The Dunn Bay Road carpark has been constructed too close to the dynamic beach environment. This carpark acts as a rock revetment and has resulted in loss of beach and undermining of the carpark.

Proposal 24: *The Dunn Bay Road carpark should be redeveloped further back from the existing beach.*

Proposal 25: *Parallel parking should be provided along Geographe Bay Road on the northern side to provide access to the coastal reserve.*

(Proposal 24 & 25 to be assessed as part of the Review of the Dunsborough Town Centre)

Dual Use Path

It is presently possible to cycle along most of the precinct's foreshore, using existing road frontages, apart from a few areas where the road turns inland and in front of existing caravan parks and chalet developments.

Proposal 26: *A dual use path should be constructed in the short term to join existing areas where no road access exists and to be a separate continuous path in the long term.*

Proposal 27: *A dual use path should be constructed to link Meelup Park to the Dunsborough townsite.*

Boat Launching Facilities

There is presently a boat ramp at Pt Dalling which is well used by residents and visitors. The Dunsborough Progress Association has examined other options in the area and has a preference for a site at the end of Forrest Road which has natural stability in the form of rock which could be converted to hard standing and has relatively deep water close by.

Proposal 28: *A boat launching facility, including a ramp and hard standing, at the end of Forrest Road, should be further investigated by the appropriate authorities.*

It should be noted that the Forrest Road site presents serious constraints to the provision of sufficient infrastructure for a boat ramp, and as a result it is unlikely that this proposal will be implemented.

Recreation Activities

The Dunsborough foreshore is in itself a recreation area and provides for numerous recreational activities. One component that could be added is children's play equipment. Australia wide recreation research has revealed that children's play equipment ranks in the top ten overall leisure time activities for children and adults (childminders). Additional seating and shade for adults should also be provided.

Proposal 29: *Sites for children's play equipment and shade/seating for adult childminders should be selected in the coastal reserve in the vicinity of existing lawns.*

Community Ownership and Involvement

The Dunsborough Progress Association is a particularly aware community group who are involved in the future of their foreshore.

Fire Management

Owing to the narrowness of the coast in this precinct, the relative lack of natural vegetation fire hazards are relatively low. The fact, however, that the coast is highly used suggests gas barbeques should be provided in picnic areas rather than the existing wood barbeques.

Proposal 30: *Gas barbeques should be provided in picnic areas to reduce the risk of fire.*

Litter

The precinct is well provided with rubbish bins and is well maintained. Sometimes, in high use areas, bins become overfilled. Beach users should be requested by means of signs to remove their own rubbish in such cases.

Proposal 31: *Signs requesting beach users to remove their own rubbish should be placed in areas where overflow occurs.*

Signs

The number of signs in this area appears adequate to manage the area appropriately.

Other Issues

The toilet building at Pt Dalling is located in such a way as to block beach views from residents and the adjacent parking area. When this structure is eventually redeveloped, it should be constructed and located to be less visually intrusive.

Proposal 32: *The Pt Dalling toilet building should be more sensitively located and constructed when it is eventually redeveloped.*

3.4.2 QUINDALUP PRECINCT PROPOSALS

Introduction

The Quindalup Precinct is located between the western boundary of the Marybrook/Anniebrook Precinct to between Tulloh and Grove Streets. The precinct is comprised of a portion of Reserve 34111 and Reserves 23730, 12066, 24722 and 29844. Residential properties are located to the south of the precinct between the ocean and Toby Inlet (Figure 4).

The precinct has a wide beach in the east, narrowing slightly in the western area. The beaches of the precinct have stable dunes and a well constructed and located dual use path. Evidence of old rock revetments are evident near the Backpackers on Geographe Bay Road, though these are located well back from the water. The inlet near the end of Elmore Road has an informal boat ramp.

Planning and Management Proposals

Revegetation and Weed Management

The coastal vegetation and dunes are in relatively good overall condition in this precinct and, therefore, ongoing management will need to be maintained.

Proposal 33: *Numerous informal beach access pathways exist within the precinct. It is necessary to select an appropriate number of these and to put in place a program of pathway construction. Whilst elevated timber boardwalks are the most environmentally "friendly" means of constructing access, winding pathways with fences are an acceptable cost saving compromise where slopes are not steep. Rehabilitation of closed pathways using brushing is recommended.*

Proposal 34: *The vegetation and dune surrounds to the professional fishers' car-park are being degraded as a result of pedestrian and vehicle encroachment. This area requires upgrading by the placement of post and rail barriers and by creation of appropriate pedestrian and vehicle access ways. Brushing and fencing of disturbed areas on primary dunes is necessary. Problems associated with *Lagurus ovatus* as noted above are relevant.*

Rehabilitation and Feral Animal Control

The coastal vegetation system in this precinct forms an almost continuous tree canopy for the Western Ringtail Possum to move, above ground apart from the professional fishermans launch area and sea rescue boat ramp where vegetation has been cleared.

Proposal 35: *Elevated Possum crossings should be considered at the Professional Fishermans launch area and at the Sea Rescue boat ramp.*

The Quindalup coast is relatively exposed to feral animals and, owing to the surrounding residential areas and the high cost of fencing, control of feral animals is not proposed.

Beach Access

There are a large number of beach access tracks in this precinct. This is partly caused by the linear nature of the adjacent residential area and the need of the residents to gain access to the beach via the shortest distance. Most of the tracks are in good condition, however, occasionally vehicles use the footpaths which tends to widen the track and leads to degradation.

Proposal 36: *Beach access tracks along the Quindalup foreshore should be rationalised (close off unnecessary tracks) and notices erected at the remaining tracks indicating that they are for pedestrians only. A path every 100 metres (approximately) should be used as a guideline.*

Dual Use Path

Owing to the good quality of the coastal vegetation and the topography (steep northern side) adjacent to Geographe Bay Road it is not proposed that a separate dual use path be constructed. Cyclists should use Geographe Bay Road.

Boat Launching Facilities

There are three boat launching areas in Quindalup, namely, the Elmore Road ramp, the professional Fishermans launch area and the Sea Rescue ramp. All have problems of some kind. The Elmore ramp has no ocean access and should probably be closed. The Professional Fishermans area is short of parking as is the Sea Rescue ramp area.

Proposal 37: *The existing boat ramp at the Elmore Street Lagoon should be decommissioned as it no longer has access to the ocean.*

The professional Fishermans launch area and the Sea Rescue ramp are presently operating at capacity and any further expansion would be at the expense of coastal vegetation and degradation. If congestion continues additional parking may need to be created at the expense of vegetation in the future.

Proposal 38: *The dune vegetation in the vicinity of the Professional Fishermans launch area and the Sea Rescue ramp should be fenced to prevent encroachment by vehicles, boat trailers and picnickers.*

Recreation Activities

Recreation activities along the Quindalup coast relate mainly to boating, fishing, diving and beach recreation activities.

Community Ownership and Involvement

The Dunsborough Progress Association encompasses the Quindalup area and our proposal for Dunsborough is equally valid for the Quindalup Precinct. The Committee for the Preservation of the Quindalup Strip also take an interest in the coastal management in the Quindalup Precinct.

The Toby Inlet Management Group are also concerned about the Quindalup coast but to a lesser extent. Their main interest is the inlet and the development on the edge of the inlet. There has been some discussion about providing road access from Caves Road to the boat ramp across the inlet and the Management group have been opposed to this.

Fire Management

Fire is a greater risk in the Quindalup Precinct than in Dunsborough owing to the extent of the Peppermint forest. Fire restrictions need to be enforced and signs to that effect need to be erected.

Litter

Litter was not found to be a problem along this foreshore, although inevitably there will be some in the vicinity of high use areas. Normal rubbish collection of bins, and signs in more remote places requesting beach users to remove their rubbish should be adapted.

Signs

The signs in the vicinity of the Sea Rescue ramp are numerous confusing and block ocean views.

Proposal 39: *Signs at the Sea Rescue ramp should be rationalised and relocated to improve their effectiveness.*

Other Issues

The Elmore Road Lagoon has been closed off to the ocean, the water has declined in quality and has become a nuisance from the point of bad odours. There is a natural opening to the ocean that could be artificially opened to flush out the stagnant water.

Proposal 40: *A management plan should be formulated to determine the appropriate control of the Elmore Road Lagoon including investigation into the potential for periodically opening the lagoon to the ocean for flushing if concerns are raised regarding health and/or odour. (See photograph 14 in Appendix 7 of the Technical Report).*

3.4.3 MARYBROOK / ANNIEBROOK PRECINCT PROPOSALS

Introduction

The Marybrook/Anniebrook Precinct extends from Mitchell Street in the east to the boundary of Reserve 23572 in the west. The land use to the south of the precinct in the Marybrook locality is mainly low density residential, with the Radisson Beach Resort located on the western side adjoining the reserve land within the Anniebrook locality. The precinct boundary coincides with the boundary of Reserves 23572, 45169, 25150 and 27055 (Figure 5).

The Precinct comprises a narrower beach on the eastern side widening out towards the west adjacent to Toby Inlet. The beach in front of the residential properties is privately managed posing difficulties for the location of public facilities, such as a dual use path connecting Busselton with Dunsborough. The beach has a low profile with houses set well back from the water. The Radisson Beach Resort has implemented good coastal management practices and the area to the west of the Radisson Beach Resort has been well managed.

Planning and Management Proposals

Revegetation and Weed Management

Dune rehabilitation work and beach access pathways undertaken as a part of the Radisson Resort development are proving to be successful and a good example of the correct methodology in this regard.

Several problems exist between Mitchell Street and Molloy Ditch as follows:

Erosion along the beach has resulted in some Owners planting undesirable plant species such as Sea Wheat *Thynopyrum distichum* and Pyp Grass *Erharta villosa* for stabilisation purposes and they should be discouraged from this practice. For appropriate species see Appendix 4 in the Technical Report.

Lawns and gardens have encroached into the coastal strip and rehabilitation work is necessary along this entire section. Opportunity exists for the regeneration of Peppermint forest in some of these areas.

Rehabilitation and Feral Animal Control

The coastal vegetation in this precinct is relatively continuous but clearing in front of private residences and the planting of exotic lawn grasses has resulted in gaps in the tree canopy.

Proposal 41: *Private landowners should be encouraged to replant Peppermint trees to ensure that the canopy is re-established.*

As much of the near coastal land is in private ownership the control of feral animals is unlikely to be a feasible proposal.

Beach Access

This entire precinct is in a relatively narrow corridor between Caves Road and the foreshore. There are a few access points and little or no parking for the public to gain access to the beach. This is not a problem at present because this is not a high demand part of the coast. Mitchell Street, Smith Street and Birl Elbow are the existing access points. The western part of the precinct is relatively inaccessible in that the Toby Inlet is a barrier between Caves Road and the foreshore.

Dual Use Path

The issue of a dual use path through this precinct has been the subject of some debate over the past few years. The Shire Council has resolved that the dual use path alignment will be along Caves Road. We support this decision on the basis of the coastal reserve being narrow and the fact that the dual use path would need to avoid drain entrances and Toby Inlet.

Proposal 42: *The dual use path in the Marybrook/Anniebrook Precinct should be constructed along the Caves Road alignment.*

Boat Launching Facilities

There are no facilities for launching boats in this area apart from small craft which may be manhandled across the beach. Property owners in this locality having offshore moorings and access via dinghies is a proposition.

Recreation Activities

Beach recreation in this area is relatively low key and no special facilities have been provided.

Community Ownership and Involvement

The Marybrook Coastal Care Group are an active and involved group of local residents and property owners who have shown commitment to managing the coast. The group opposes a foreshore reserve path.

Fire Management

Fire is a risk in all vegetated areas, however, with relatively low levels of public use and high private ownership no specific proposals are considered necessary.

Litter

Litter is negligible in this precinct.

Signs

Signs are not an issue in this precinct.

Other Issues

Private encroachment of public coastal reserve has taken place in the vicinity of Smith Street. There is evidence that lawns and the planting of exotic tree species have taken place.

Proposal 43: *Private property boundaries should be marked and local indigenous vegetation should be reinstated on public reserves.*

The land between Toby Inlet and the foreshore in the Anniebrook locality is relatively isolated and is in good environmental condition.

Proposal 44: *A management plan should be prepared for the coastal reserve between the Toby Inlet and the foreshore in the Anniebrook locality.*

3.4.4 SIESTA PARK PRECINCT PROPOSALS

Introduction

The Siesta Park Precinct extends from Forth Street in the east to Mitchell Street in the west. Youth Camps are located to the east of the precinct. The northern part of the camp lots, along the beach, have had part of their property eroded away. The land use to the west of the precinct is mainly residential, with the Siesta Park Holiday Resort located adjacent to the beach at the intersection of Siesta Park Road and Caves Road. The precinct boundary coincides with the boundary of Reserve 22674 and 26871 and 24847 (Figure 6).

The Siesta Park Precinct generally comprises a narrow beach reserve apart from the area to the west of the groyne.

The beach has a low frontal dune with evidence of recent erosion. Rock revetments are prevalent along the coast. Wooden groynes have also been built along the coast.

The Siesta Park Reserve to the east of the groyne is one of the few large reserves in the study area. The construction of the groyne has resulted in the accumulation of a large sand area on the western side of the groyne.

Planning and Management Proposals

Revegetation and Weed Management

Proposal 45: *Dune vegetation in this precinct is under intense pressure from both heavy recreational use and from winter storms. Numerous beach access routes exist which are unfenced. A program addressing beach access in this area is urgently required.*

Proposal 46: *Rehabilitation work should focus initially on the areas of intensive use such as the Siesta Park Resort and the various holiday camps. Opportunity also exists for the regeneration of Peppermint forest within the newly created sand sheet to the west of the Siesta Park groyne.*

Proposal 47: *In several areas lawns encroach into the coastal reserve and clearing of Peppermint trees has been undertaken in the past to maximise views. Opportunity therefore exists for the replanting of these areas. Some form of free seedling scheme (sponsored by the Shire or other organisation) associated with an awareness campaign may assist in obtaining the participation of the local residents.*

Rehabilitation and Feral Animal Control

The Siesta Park bushland reserve is potentially one of the best preserved natural bushland areas on the Geographe Bay foreshore.

Proposal 48: *An environmental management plan should be prepared for the Siesta Park bushland reserve with particular attention given to fencing, weed control, feral animal eradication, public access and revegetation.*

Beach Access

There are numerous beach access roads in this precinct particularly adjacent to the Siesta Park Resort and the Youth Camps.

The beach access paths are presently in reasonably good condition but do need to be rationalised.

Proposal 49: *Beach access tracks adjacent to the Siesta Park Resort should be monitored and unnecessary tracks should be closed and brushed.*

Dual Use Path

A dual use path currently exists along Caves Road frontage to the campsites.

Boat Launching Facilities

There is currently a considerable amount of boat launching in this precinct. The boats are generally launched over the beach and in some places conveyor belting is placed over the beach to prevent vehicles bogging in the sand. Overall the current launching works efficiently and no specific proposals are warranted.

Recreation Activities

The main recreation activities in this precinct involve beach games, swimming, walking, jogging, sailing, diving and fishing. Most of these activities are provided for by nature and personal equipment is brought in by individuals. No specific recreation proposals apply to this area.

Community Ownership and Involvement

There are no overall community groups in this area. The Siesta Park Resort provides management over part of the area to the west of the groyne and the Youth Camps are individually managed. The formation of a coastcare group in this area would be an advantage to the ongoing management.

Proposal 50: *A coastcare group should be formed in the Siesta Park precinct to assist in the decision making for the locality.*

Fire Management

Fire is a potential risk in this locality owing to the number of camps and the informal outdoor cooking that takes place.

Proposal 51: *Fire regulations should be made more obvious in the form of easy to see and read signs in the Siesta Park area.*

Litter

Litter is not a problem in this precinct as Youth Camp managers are responsible for disposal of rubbish.

Signs

Signs are not an issue in this precinct.

Other Issues

There is a house built on Lot 41 Caves Road that is virtually on the beach and is on the ocean side of the dunes.

Proposal 52: *The house built on the beach at Lot 41 should be monitored by the Shire as it is not in a stable location and may result in life threatening risks if undermined during storm conditions.*

It should be noted that the landowner responsible for building this property accepted liability for storm damage to the building via a property covenant.

The private properties to the west of the Siesta Park Resort have a variety of beach management techniques to stabilise their foreshores. Some have used rocks, others have planted dune vegetation and others have a combination of both.

Proposal 53: *Guidelines should be prepared for the management of private foreshores so as to prevent coastal damage and enhance the coast.*

3.4.5 ABBEY PRECINCT PROPOSALS

Introduction

The Abbey Precinct extends from Harnett Street to Forth Street. Residential properties are located to the south of the precinct. The precinct boundary coincides with the boundary of Reserve 24483 and 31371 (Figure 7).

The Abbey Precinct comprises a wide beach with houses set well back and a well located and constructed dual use path.

The Roberts Road boat ramp has a large car park with an ablution block. The ramp is not an ideal coastal structure, though suitable for boat launching on a sandy coast.

Planning and Management Proposals

Revegetation and Weed Management

In relative terms, the quality of the coastal vegetation in this precinct is good. This is as a result of the width of the reserve and the fact that beach access paths are limited.

Proposal 54: *The entire coastal reserve presents an opportunity for the long term regeneration of an almost continuous canopy of Peppermint trees. Major threats to new plantings will be property owners wanting to maintain ocean views. Much of this can be addressed by consultation with property owners and a participatory approach to achieving environmental goals.*

Proposal 55: *Several pathways should be formally treated (fencing) and these are at the north of Cuthbert, Newtown Beach and Harvest Roads. Some peripheral damage to vegetation surrounding the boat launch parking area is occurring and fencing should be installed.*

Rehabilitation and Feral Animal Control

The coastal strip in this locality is narrow and it would be possible to re-establish Peppermint trees. The dune vegetation is generally in good condition and signs should be erected requesting people to use the established pathways. Control of feral animals in this area is impractical owing to the narrowness of the reserve and the linear nature of the surrounding residential development.

Proposal 56: *Signs should be erected requesting people to use the established pathways and to control pets.*

Beach Access

Beach access is easily available in this area. The parking area at Harnett Street is very close to the beach and should be relocated behind the frontal dune.

Proposal 57: *The Harnett Street carpark should be relocated back from the beach and parking should be formalised along the small section of Geographe Bay Road.*

Dual Use Path

This precinct has an existing dual use path which utilises the beachside road with connecting paths.

Boat Launching Facilities

A substantial boat launching facility is located to the west of Geographe Bay Road between Roberts Road and Newton Beach Road. This launch facility has been formed by building a rock structure which also contains space for boat trailer parking and a toilet block. This facility operates adequately at present.

Recreation Activities

Boating, fishing and beach activities are the main recreation activities in this precinct.
Community Ownership and Involvement

There is no coastcare group in the Abbey precinct, however, the Abbey Progress Association takes a strong interest and has undertaken some rehabilitation.

Fire Management

Owing to the narrowness of the coastal reserve normal fire prevention policies should apply.

Litter

Litter is not an issue in this area.

Signs

Signs are not an issue in this precinct.

3.4.6 BROADWATER PRECINCT PROPOSALS

Introduction

The Broadwater Precinct extends from Dolphin Road in the east to Harnett Street. The land uses to the immediate south of the precinct are residential and holiday accommodation. The precinct is comprised of Reserve 31372, 22624, 22624, 41550 and a portion of Reserve 24483 (Figure 8).

The Broadwater Precinct has a wide beach with areas of surplus sand as a result of accretion. Sections of the beach contain illmenite mineral sands and result in the black colour of the beach sand. This area is a major tourist destination owing to the concentration of holiday resorts that abut the coastal reserve. The beach is wide in the east of the precinct, though narrows in the west. Stilts Restaurant at the end of Holgate Road is a focal point for the precinct. The boat ramp in the east of the precinct at Dolphin Road is well located and has ablutions.

Planning and Management Proposals

Revegetation and Weed Management

Proposal 58: *The relatively wide setback that exists between Dolphin Road launch ramp extending westwards to Broadwater Resort is a section of coastal reserve which has a good coverage of Peppermint trees, but they do not all touch.*

This area presents an opportunity to undertake planting programs that will eventually result in a continuous linear canopy with belts extending towards the south through private land and over the Highway by means of a “possum overpass” as discussed in Section 3.4. of the Technical Report.

Proposal 59: *The two reserves on the seaward side of William and Geographe Bay Roads are mainly grass with isolated trees. These should have additional planting of Peppermint trees to enlarge the possum habitat within this precinct.*

Proposal 60: *The installation of a fence along the dual use path should be constructed to stop the peripheral vegetation damage being caused at present.*

Proposal 61: *Areas on either side of the pathway which have been disturbed (between Harvest Road and Broadwater Resort) should be brushed and planted before weeds gain a foothold. (It is noted that in several places a heavy wood chip mulch has been used to stabilise the sand, but this method is only successful where significant planting has been concurrently undertaken).*

Proposal 62: *Dune vegetation has been destabilised on both sides of the boat launch area at the end of Armstrong Road as a result of construction activity and fire. This area should be brushed and planted.*

Proposal 63: *At the northern end of Alan Street the destabilisation resulting from the construction of the storm water detention pond in the dunes should be rehabilitated.*

Proposal 64: *The Dolphin Road launch facility car park should be formalised by the installation of fencing to prevent the encroachment of vehicles into the dune vegetation. Priority Immediate.*

Rehabilitation and Feral Animal Control

Owing to the depth of the coastal vegetation cover in this precinct there is a substantial area of potential fauna habitat. For this reason feral animal control and protection of native species may be an option.

Proposal 65: *The protection of faunal habitats should be further investigated in the Broadwater precinct.*

Beach Access

There are a number of beach access locations in this precinct. Parking areas at Norman Road and Holgate Street are located too close to the beach and these should be moved south into the coastal reserve.

Proposal 66: *The Norman and Harvest Road carparks should be moved south into the coastal reserve.*

The carpark at Dolphin Road is relatively well located, however, the vehicle access onto the beach needs to be fenced to limit vegetation damage.

Proposal 67: *The Dolphin Road carpark vehicle access onto the beach should be fenced and degraded areas brushed.*

Dual Use Path

The dual use path in this precinct is non continuous but where present it is well located and is well used by residents and visitors.

Boat Launching Facilities

Boat launching is possible over the beach from the Dolphin Road carpark.

Recreation Activities

The main recreation activities in this precinct are boating, walking, jogging, cycling, fishing, swimming, diving and general beach recreation. These uses are well catered for.

Community Ownership and Involvement

No specific coastal community groups were evident during the community consultation phase.

Fire Management

Fire management is a risk in the Broadwater precinct. There was evidence of a recent fire in the Holgate Road area at the time of the survey (January 2000).

Proposal 68: *Signs warning about the hazards of fire should be erected at the Holgate Road parking area.*

Litter

Litter is not an issue in this precinct.

Signs

Signs are not an issue in this precinct.

3.4.7 WEST BUSSELTON PRECINCT PROPOSALS

Introduction

The West Busselton Precinct extends from West Street to Dolphin Road. The precinct is to the north of predominantly residential R15 & R30 land uses, though a reserve for public purposes being the Busselton Region Hospital adjoins the coastal reserve in the western part of the precinct. The boundary of the precinct is defined by the boundaries of Reserve 37207, 17319, 37813, 26263, 26463 and Lots 30 and 38 (Figure 9).

The West Busselton Precinct comprises a narrow beach in the east and widens to the west. Rock revetments have been used along the beach to stabilise grassed playing areas.

The Yacht Club in the east of the precinct has extended its boat ramp and has resulted in localised erosion to the east of the boat ramp and accretion to the west. However, the main influence of this is likely to have been caused by sand drift and outflow from the Vasse River Diversion Drain acting as a groyne during 1999. Stairs have recently been constructed to enable pedestrian movement over the boat ramp. The beach in front of the yacht club is in a degraded state owing to localised erosion.

The Vasse River Diversion drain divides the beach in this precinct. Accretion has occurred in front of the diversion drain causing the discharge water to meander through the beach to the ocean. Rock revetments have been used extensively along the beach. Houses in this precinct have been well setback from the beachfront.

The dunes to the west of the Yacht Club and to the east of the Regional Hospital have been well managed. To the west of the Regional Hospital, rock revetments have been used as a means to protect properties located close to the beach along Geographe Bay Road.

Planning and Management Proposals

Revegetation and Weed Management

Proposal 69: *Numerous informal beach access routes exist in this Precinct, some of which are very close together. The identification and formalisation of a limited number of these is necessary, with the remainder requiring stabilisation by means of brushing and planting.*

Rehabilitation and Feral Animal Control

The coastal reserve is extremely narrow on the western side of this precinct and very little remains to rehabilitate. To the west of the Vasse diversion drain the coastal reserves widen and tree coverage is sufficient to form a canopy. This continues east to the western side of the Geographe Bay Yacht Club.

There has been some erosion of the beach and dune on either side of the yacht club launching ramp which has recently been extended.

Proposal 70: *Sand nourishment should be provided to both sides of the launching ramp at the Geographe Bay Yacht Club and the dune should be brushed and replanted with native coastal species.*

Proposal 71: *Trees should be planted to the south of the Yacht Club to close the gap in the forest canopy.*

Proposal 72: *Possum overpasses should be investigated to link tree canopies in this precinct.*

Proposal 73: *The dune between Gale Street and High Street is degraded and should be fenced off, brushed and replanted with native dune vegetation.*

Beach Access

Beach access in this precinct is well catered for with adequate roads and parking facilities. There is some scope to improve the layout and quality of the parking areas.

There is a parking area at the end of Mill Road which also provides beach access for vehicles and boat launching over the beach.

Proposal 74: *The beach access from the Mill Road carpark should be formalised by means of fencing to reduce degradation of the dune vegetation.*

The bitumen parking area to the east of the yacht club, King Street, is close to the beach and could be improved by setting it further back and breaking up the area with tree planting.

Proposal 75: *The King Street parking area should be set back further from the beach and should be landscaped with Peppermint trees.*

The parking area between Gale Street and West Street has a row of Norfolk Island Pines. Additional tree planting of Peppermint trees in this area would provide more shade.

Proposal 76: *Peppermint trees should be planted in the foreshore recreation area and parking area between Gale Street and West Street.*

Dual Use Path

The existing road adjacent to the foreshore, Geographe Bay Road, provides for cycling and pedestrian movement. This connection is interrupted to the south of the yacht club and should be connected through the Lou Weston Oval.

Boat Launching Facilities

Boats are launched over the beach at Mill Road. Launching is also possible at the Geographe Bay Yacht Club for club members. These facilities appear to be adequate for the existing demand.

Recreation Activities

A broad range of foreshore recreation activities are provided in this area. Yachting, boating, swimming, fishing and general beach recreation are the main uses. It would appear that the facilities are adequate.

Community Ownership and Involvement

The West Busselton community do not have any specific coastcare group, however, they are part of the general Busselton community who responded strongly to the questionnaire survey, attended the visions workshop and provided written comments.

Proposal 77: *A Busselton coastcare group should be formed to be involved with coastal activities such as dune rehabilitation and decision making in general.*

Fire Management

Fire may be a risk in the areas of the precinct that are well vegetated. Gas barbeques should be supplied in picnic areas and signs warning about fire risk should be erected in well vegetated areas. Otherwise, normal fire precautions should be adequate.

Litter

Litter does not appear to be a problem. Existing rubbish bins and Council removal appear to be working well. The community is concerned about dogs using non-dog allocated beaches. Signs clearly demarcating dog and non-dog beaches need to be erected and rangers should enforce the regulations (See Section 4.6 of the Technical Report).

Signs

Signs do not appear to be a problem in this precinct. An overall uniform approach to signs as discussed in Section 3.3.11 of this report should be implemented.

3.4.8 BUSSELTON PRECINCT PROPOSALS

Introduction

The Busselton Precinct extends from the western boundary of the Geographe Precinct at Ford Road to West Street, with the southern boundary being defined by the alignment of Marine Terrace. The Precinct incorporates the main recreation and parking areas adjacent to the Busselton Jetty. The precinct is adjacent to the Busselton Town Centre where a mix of land uses occurs (Figure 10). The precinct is comprised of A Class Reserves 38872, 28536 and 8485 and Reserves 38558 and 24667 including a portion of Reserve 37207.

The Busselton Precinct comprises a wide Reserve (Barnard Park) and a narrow beach. The main values within this precinct are the Busselton Jetty and a small jetty to the east of the main jetty used for boat launching. Two boat ramps on the beach are located in the east of the precinct. A low frontal dune and remnants of timber piles characterize the beach. By virtue of the Town Centre located to the south of the beach and the Busselton Jetty, this area is a major focus for tourism in Busselton.

Planning and Management Proposals

Revegetation and Weed Management

The Busselton Precinct is probably the most modified of the precincts on the Geographe Bay foreshore. The precinct has a number of exotic vegetation species such as Norfolk Island Pines and Moreton Bay Figs. To the west of the Busselton Jetty the coastline comprises rock revetments with lawns and tree planting on the remains of the dune. To the east of the small jetty the coast has more natural dunes and vegetation. This vegetation appears to be in good condition except for some degradation in front of the Georgette Street carpark.

Proposal 78: *The dune vegetation in front of the Georgette Street carpark should be rehabilitated with brush and fenced to ensure revegetation.*

A program of native plant introduction should be undertaken for the Jetty car park, with no further planting of exotic species such as Norfolk Island Pines. The planting of Casuarina trees instead would be appropriate. Such a program could commence with the removal of smaller Norfolk Island Pines and their replacement with moderately sized *Casuarina equisetifolia* tree seedlings.

Proposal 79: *Some of the grassed area should be replaced with garden beds of selected native shrubs. This should be implemented in a manner that creates a buffer zone between the grassed areas and the beach with protective fencing.*

Rehabilitation and Feral Animal Control

The environment in this precinct has been extremely modified and there is little opportunity for native fauna to find suitable habitats. Specific feral animal controls would not be appropriate.

Beach Access

This precinct has maximal beach access with good access roads and adequate parking. No additional proposals are considered appropriate.

Dual Use Path

The area is well served by a dual use path and cycle access through parking areas. The dual use path is located partly through the frontal dunes to the east of the short jetty and there has been some peripheral degradation.

Proposal 80: *Signs should be erected along the dual use path, to the east of the small jetty, requesting the public not to walk to the beach over the dunes. Alternatively fencing should be erected.*

Boat Launching Facilities

There are boat launching facilities at Scout Road and Georgette Street. Both of these appear to operate well except for the Georgette Street area that was discussed above. No additional proposals are considered.

Recreation Activities

The Busselton Precinct already has a considerable number of recreation activities, namely: fun park, food outlets, boating, swimming, fishing, walking, jogging and cycling. The Busselton Jetty is also a major recreation activity with walking and fishing as important activities.

Community Ownership and Involvement

The Busselton community have a high level of ownership and involvement in their coastline as shown through the questionnaire survey, attendance at meetings and individual comments. A Busselton coastcare group to be involved with practical activities and decision making has already been proposed.

Fire Management

Normal fire prevention measures should be put in place including the provision of gas barbeques in picnic areas.

Litter

The Busselton Precinct is potentially the greatest litter area in the Shire. Existing rubbish removal mechanisms appear to be appropriate. Comments above, on dogs using non-dog beaches, also apply.

Signs

Signs are not an issue in this precinct. A uniform sign approach should be adopted as discussed above.

3.4.9 GEOGRAPHE PRECINCT PROPOSALS

Introduction

The Geographe Precinct extends from the western side of the Port Geographe harbour development to Ford Road. The southern boundary of the precinct is defined by the alignment of Geographe Bay Road and conforming to the boundaries of Reserves 26354 and 24455 (Figure 11).

The land use to the south of the precinct is mainly residential with a density allocation of R15. The Busselton Beach Resort directly abuts the study area and is zoned Tourist under the Shire of Busselton Town Planning Scheme No. 20.

The Geographe Precinct comprises an accreting beach with sand accumulation evident on the western side of the breakwater of the Port Geographe harbour development, this is evident by recent establishment of dune vegetation. The beach is wide with a relatively even width along the extent of the precinct. The recently constructed dual use path is set well back.

Planning and Management Proposals

Revegetation and Weed Management

The frontal dune and its vegetation are generally in good condition. There are, however, a large number of beach access tracks. These should be rationalised and superfluous tracks should be closed and brushed. Tracks should be provided at intervals of approximately 100 metres. Signs requesting beach users to take existing paths should solve the matter. Short sections of fencing around beach access paths may be required.

Proposal 81: *Beach access paths should be reviewed on the basis of one path per 100 metres, approximately. Surplus paths should be closed, brushed and possibly fenced. Fencing of entry and exit points of access paths should be undertaken to prevent peripheral damage. Signs requesting beach users to take the formal paths should be erected.*

Rehabilitation and Feral Animal Control

The narrow nature of the coastal dunes, lack of upper storey vegetation and exposure to residential areas to the south suggest that feral animal control would be difficult unless major costs were incurred. For this reason and the fact there is a minimum number of fauna species in the area, no specific controls are proposed.

Proposal 82: *Bare sandy areas within the dune vegetation area should be brushed if the sand becomes mobile.*

Beach Access

There are informal parking areas at Morgan Street and Russell Street that should be formalised.

Proposal 83: *Parking areas at Morgan and Russell Streets should be formalised by providing edge barriers (pine log) and fencing of beach access paths.*

Dual Use Path

The dual use path in this precinct is well established and operates well.

Proposal 84: *Post and rail fencing should be erected to manage pedestrian access to adjacent reserves via formal pathways.*

Boat Launching Facilities

No specific boat launching facilities are provided in this precinct. Small craft may, however, be launched across the beach in some places.

Recreation Activities

Recreation activities in this precinct are informal. Swimming, walking, fishing, jogging and cycling are the main activities. No further proposals are appropriate.

Community Ownership and Involvement

As with other precincts in Busselton town the community have high ownership and involvement. A Busselton coastcare group has been proposed to ensure their ability to participate in activities and decision making.

Fire Management

Fire is a risk in the Geographe Precinct, however, the risk is fairly low and normal fire protection procedures should be adequate.

Litter

Litter does not appear to be an issue in this area. Council rubbish removal appears to work adequately and dog beach regulations need to be observed.

Signs

Signs are not an issue in this precinct apart from the earlier proposal on sign uniformity.

4. IMPLEMENTATION STRATEGY

4.1 INTRODUCTION

The implementation of the proposals set out in the Geographe Bay Foreshore Management Plan will involve a considerable amount of work and cost over many years. Once the priority issues have been identified and programmed, they will need to be costed and budgeted for by the Shire. If some of the proposals are capital creative, they should be identified at an early stage to assist in the funding of other proposals.

4.2 PRIORITIES

Priorities have been categorised as follows:

| | | |
|----------------|-----|--------------------------------|
| Immediate term | (I) | within the next financial year |
| Medium term | (M) | within the next 5 years |
| Long term | (L) | unspecified |
| Ongoing | (O) | as required |

4.3 GENERAL PROPOSALS AND PRIORITIES

| PROPOSALS | PRIORITY |
|---|----------|
| Proposal 1: Pedestrian and vehicular access points onto the beach should be clearly fenced and signposted to prevent general deterioration of vegetation in their vicinity. | I |
| Proposal 2: Clearing of coastal vegetation in front of resort developments should be controlled to maintain continuity. | I |
| Proposal 3: Areas which are rapidly degrading along formal walking and cycle paths should be fenced or should have signs requesting users to stay on the path. | I |
| Proposal 4: Local native plant species should be used for landscaping in as many places as possible and the spread of exotic plant species should be discouraged wherever possible. | I |
| Proposal 5: Key areas of coastal vegetation communities representing important fauna corridor functions should be identified for retention, restoration and management. | I |
| Proposal 6: Localised areas of weed invasion should be separately assessed as to the best method of weed eradication and management programs based on the most effective methods should be prepared. | M |
| Proposal 7: Degraded dune areas should be fenced and covered with brush to discourage pedestrian and vehicle traffic, to lift the wind off the sand and to promote seed germination and revegetation. | I |
| Proposal 8: A program to enhance the habitat of the Western Ringtail Possum should be undertaken. Increasing the cover of Peppermint trees as a viable canopy to facilitate movement, and "possum overpasses" across roads and drains, should be given consideration. | M |
| Proposal 9: A program to eradicate feral animals from particular areas should be developed by the Shire and CALM in conjunction with the Agricultural Protection Board. The use of baits, trapping and fencing of certain habitats needs to be considered on a site specific basis. | M |
| Proposal 10: Parking facilities should be set back from the beach on stable land so that the parking installations do not suffer damage from storm activity and that the beach profile is not degraded by the installation. Ideally, parking areas should be separated from the active foreshore by a managed dune buffer. | I |
| Proposal 11: Additional boat launching facilities should be further investigated at Forrest Street, Dunsborough where deeper water is accessible on an area of rocky coast. Additional trailer storage should be investigated at Quindalup (Sea Rescue and Professional Fishermans areas) to cater for the growing needs. | M |
| Proposal 12: Recreational activities should be given a high priority as a beach use along the Geographe Bay foreshore. | I |
| Proposal 13: The focus of the Busselton Environment Forum is to be expanded to include the provision of advice to Council on coastal issues. | O |
| Proposal 14: The use of fire as a management tool should be undertaken only on a limited basis and should be implemented as part of an integrated management plan on an as needed basis. | I |
| Proposal 15: The use of fires along the coast for picnics and barbeques should be reduced gradually and replaced by the use of gas barbeques in order to reduce the risk of fire spreading to surrounding bushland areas. | I |

| | |
|---|---|
| Proposal 16: In the event of a fire, direct planting of tube stock should be implemented to ensure species diversity is maintained and that vegetation cover is replaced as soon as possible. | I |
| Proposal 17: Only suitably graded and coloured clean fill is to be used for coastal protection and rehabilitation or sand replenishment. | O |
| Proposal 18: The Shire's staff should continue the good work of rubbish collection in order to ensure the maintenance of a litter free coastal environment. | I |
| Proposal 19: That on more inaccessible beaches signs should be erected requesting beach users to remove rubbish and dispose of it via existing rubbish removal services. | I |
| Proposal 20: A system of signs for coastal reserves and parks in the Shire should be prepared along with locational guidelines so as to ensure that signs enhance the landscape rather than detract from it. | M |

4.4 PRECINCT PROPOSALS AND PRIORITIES

4.4.1 Dunsborough Precinct

| PROPOSALS | PRIORITY |
|---|----------|
| Proposal 21: Small, well managed clusters of native vegetation planting's should be undertaken along the seaward side of Vincent Road and Geographe Bay Road to replace grass. This should be done in a staged manner allowing for the successful management of weeds within each planting cluster. Over time an infill program can be implemented until the entire strip is replaced by appropriate native species. Management of weeds could possibly be achieved by the organisation of street committees who can keep a close watch on emerging species. | M |
| Proposal 22: Landscaping on the beach side of new coastal developments should avoid the use of extensive lawns which can be invasive into the dune vegetation and also require high maintenance. Whilst the planting of lawns is necessary to provide areas for recreation, these areas should be reduced in size so as to allow for linked corridors of native vegetation. | M |
| Proposal 23: The high incidence of Lagurus ovatus (Hares Tail grass) in the Peppermint forest on the north of Geographe Bay Road is leading to a decline in native species cover and diversity as a result of competition for nutrients and moisture. This grass also renders the coastal forest more susceptible to fire particularly during late summer when the grass is very dry. Photograph 8 (in the Technical Report) shows how dense the cover is in the Siesta Park Reserve. No single, simple solution exists for the control of this plant. The most effective method is, as with other weed species, is to achieve a strong cover of native species and this, in turn, relates to the integrated management of the coastal zone. | M |
| Proposal 24: The Dunn Bay Road carpark should be redeveloped further back from the existing beach. | M - L |
| Proposal 25: Parallel parking should be provided along Geographe Bay Road on the northern side to provide access to the coastal reserve. | M |
| Proposal 26: A dual use path should be constructed in the short term to join existing areas where no road access exists and to be a separate continuous path in the long term. | M |

| | |
|---|---|
| Proposal 27: A dual use path should be constructed to link Meelup Park to the Dunsborough townsite. | M |
| Proposal 28: A boat launching facility, including a ramp and hard standing, at the end of Forrest Road, should be further investigated by the appropriate authorities. | M |
| Proposal 29: Sites for children's play equipment and shade/seating for adult childminders should be selected in the coastal reserve in the vicinity of existing lawns. | M |
| Proposal 30: Gas barbeques should be provided in picnic areas to reduce the risk of fire. | M |
| Proposal 31: Signs requesting beach users to remove their own rubbish should be placed in areas where overflow occurs. | I |
| Proposal 32: The Pt Dalling toilet building should be more sensitively located and constructed when it is eventually redeveloped. | L |

4.4.2 Quindalup Precinct

| PROPOSALS | PRIORITY |
|---|----------|
| Proposal 33: Numerous informal beach access pathways exist within the precinct. It is necessary to select an appropriate number of these and to put in place a program of pathway construction. Whilst elevated timber boardwalks are the most environmentally "friendly" means of constructing access, winding pathways with fences are an acceptable cost saving compromise where slopes are not steep. Rehabilitation of closed pathways using brushing is recommended. | M |
| Proposal 34: The vegetation and dune surrounds to the professional fishers' car-park are being degraded as a result of pedestrian and vehicle encroachment. This area requires upgrading by the placement of post and rail barriers and by creation of appropriate pedestrian and vehicle access ways. Brushing of disturbed areas on primary dunes is necessary. Problems associated with Lagurus ovatus as noted above are relevant. | M |
| Proposal 35: Elevated Possum crossings should be considered at the Professional Fishermans launch area and at the Sea Rescue boat ramp. | M |
| Proposal 36: Beach access tracks along the Quindalup foreshore should be rationalised (close off unnecessary tracks) and notices erected at the remaining tracks indicating that they are for pedestrians only. A path every 100 metres (approximately) should be used as a guideline. | I |
| Proposal 37: The existing boat ramp at the Elmore Street Lagoon should be decommissioned as it no longer has access to the ocean. | M |
| Proposal 38: The dune vegetation in the vicinity of the Professional Fishermans launch area and the Sea Rescue ramp should be fenced to prevent encroachment by vehicles, boat trailers and picnickers. | I |
| Proposal 39: Signs at the Sea Rescue ramp should be rationalised and relocated to improve their effectiveness. | I |
| Proposal 40: A management plan should be formulated to determine the appropriate control of the Elmore Road Lagoon including investigation into the potential for periodically opening the lagoon to the ocean for flushing if concerns are raised regarding health and/or odour (See photograph 14 in Appendix 7 of the Technical Report). | O |

4.4.3 Marybrook/Anniebrook Precinct

| PROPOSALS | PRIORITY |
|---|----------|
| Proposal 41: Private landowners should be encouraged to replant Peppermint trees to ensure that the canopy is re-established. | O |
| Proposal 42: The dual use path in the Marybrook/Anniebrook Precinct should be constructed along the Caves Road alignment. | M |
| Proposal 43: Private property boundaries should be marked and local indigenous vegetation should be reinstated on public reserves. | I - M |
| Proposal 44: A management plan should be prepared for the coastal reserve between the Toby Inlet and the foreshore in the Anniebrook locality. | M |

4.4.4 Siesta Park Precinct

| PROPOSALS | PRIORITY |
|--|----------|
| Proposal 45: Dune vegetation in this precinct is under intense pressure from both heavy recreational use and from winter storms. Numerous beach access routes exist which are unfenced. A program addressing beach access in this area is required. | I |
| Proposal 46: Rehabilitation work should focus initially on the areas of intensive use such as the Siesta Park Resort and the various holiday camps. Opportunity also exists for the regeneration of Peppermint forest within the newly created sand sheet to the west of the Siesta Park groyne. | M |
| Proposal 47: In several areas lawns encroach into the coastal reserve and clearing of Peppermint trees has been undertaken in the past to maximise views. Much opportunity therefore exists for the replanting of these areas. Some form of free seedling scheme (sponsored by the Shire or other organisation) associated with an awareness campaign may assist in obtaining the participation of the local residents. | M - L |
| Proposal 48: An environmental management plan should be prepared for the Siesta Park bushland reserve with particular attention given to fencing, weed control, feral animal eradication, public access and revegetation. | M |
| Proposal 49: Beach access tracks adjacent to the Siesta Park Resort should be monitored and unnecessary tracks should be closed and brushed. | I |
| Proposal 50: A coastcare group should be formed in the Siesta Park precinct to assist in the decision making for the locality. | I |
| Proposal 51: Fire regulations should be made more obvious in the form of easy to see and read signs in the Siesta Park area. | I |
| Proposal 52: The house built on the beach at Lot 41 should be monitored by the Shire as it is not in a stable location and may result in life threatening risks if undermined during storm conditions. | I |
| Proposal 53: Guidelines should be prepared for the management of private foreshores so as to prevent coastal damage and enhance the coast. | O |

4.4.5 Abbey Precinct

| PROPOSALS | PRIORITY |
|--|----------|
| Proposal 54: The entire coastal reserve presents an opportunity for the long term regeneration of an almost continuous canopy of Peppermint trees. Major threats to new plantings will be property owners wanting to maintain ocean views. Much of this can be addressed by consultation and a participatory approach to achieving environmental goals. | M - L |
| Proposal 55: Several pathways should be formally treated (fencing) and these are at the north of Cuthbert, Newtown Beach and Harvest Roads. Some peripheral damage to vegetation surrounding the boat launch parking area is occurring and fencing should be installed. | M |
| Proposal 56: Signs should be erected requesting people to use the established pathways and to control pets. | I |
| Proposal 57: The Harnett Street carpark should be relocated back from the beach and parking should be formalised along the small section of Geographe Bay Road. | M - L |

4.4.6 Broadwater Precinct

| PROPOSALS | PRIORITY |
|---|----------|
| Proposal 58: The relatively wide setback that exists between Dolphin Road launch ramp extending westwards to Broadwater Resort is a section of coastal reserve which has a good coverage of Peppermint trees, but they do not all touch. This area presents an opportunity to undertake planting programs that will eventually result in a continuous linear canopy with belts extending towards the south through private land and over the Highway by means of a “possum overpass” as discussed in Section 3.4. of the Technical Report. | M |
| Proposal 59: The two reserves on the seaward side of William and Geographe Bay Roads are mainly grass with isolated trees. These should have additional planting of Peppermint trees to enlarge the possum habitat within this precinct. | M |
| Proposal 60: The installation of a fence along the dual use path should be constructed to stop the peripheral vegetation damage being caused at present. | I |
| Proposal 61: Areas on either side of the pathway which have been disturbed (between Harvest Road and Broadwater Resort) should be brushed and planted before weeds gain a foothold. (It is noted that in several places a heavy wood chip mulch has been used to stabilise the sand, but this method is only successful where significant planting has been concurrently undertaken). | I |
| Proposal 62: Dune vegetation has been destabilised on both sides of the boat launch area at the end of Armstrong Road as a result of construction activity and fire. This area should be brushed and planted. | M |
| Proposal 63: At the northern end of Alan Street the destabilisation resulting from the construction of the storm water detention pond in the dunes should be rehabilitated. | M |
| Proposal 64: The Dolphin Road launch facility car park should be formalised by the installation of fencing to prevent the encroachment of vehicles into the dune vegetation. Priority Immediate. | I |
| Proposal 65: The protection of faunal habitats should be further investigated in the Broadwater precinct. | |

| | |
|---|-------|
| Proposal 66: The Norman and Harvest Road carparks should be moved south into the coastal reserve. | M - L |
| Proposal 67: The Dolphin Road carpark vehicle access onto the beach should be fenced and degraded areas brushed. | I |
| Proposal 68: Signs warning about the hazards of fire should be erected at the Holgate Road parking area. | I |

4.2.7 West Busselton Precinct

| PROPOSALS | PRIORITY |
|--|----------|
| Proposal 69: Numerous informal beach access routes exist in this precinct, some of which are very close together. The identification and formalisation of a limited number of these is necessary, with the remainder requiring stabilisation by means of brushing and planting. | |
| Proposal 70: Sand nourishment should be provided to both sides of the launching ramp at the Geographe Bay Yacht Club and the dune should be brushed and replanted with native coastal species. | I |
| Proposal 71: Trees should be planted to the south of the yacht club to close the gap in the forest canopy. | I |
| Proposal 72: Possum overpasses should be investigated to link tree canopys in this precinct. | M |
| Proposal 73: The dune between Gale Street and High Street is degraded and should be fenced off, brushed and replanted with native dune vegetation. | I |
| Proposal 74: The beach access from the Mill Road carpark should be formalised by means of fencing to reduce degradation of the dune vegetation. | I |
| Proposal 75: The King Street parking area should be set back further from the beach and should be landscaped with Peppermint trees. | M - L |
| Proposal 76: Peppermint trees should be planted in the foreshore recreation area and parking area between Gale Street and West Street. | I |
| Proposal 77: A Busselton coastcare group should be formed to be involved with coastal activities such as dune rehabilitation and decision making in general. | I |

4.4.8 Busselton Precinct

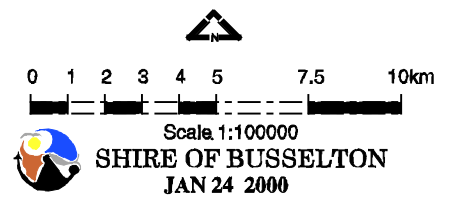
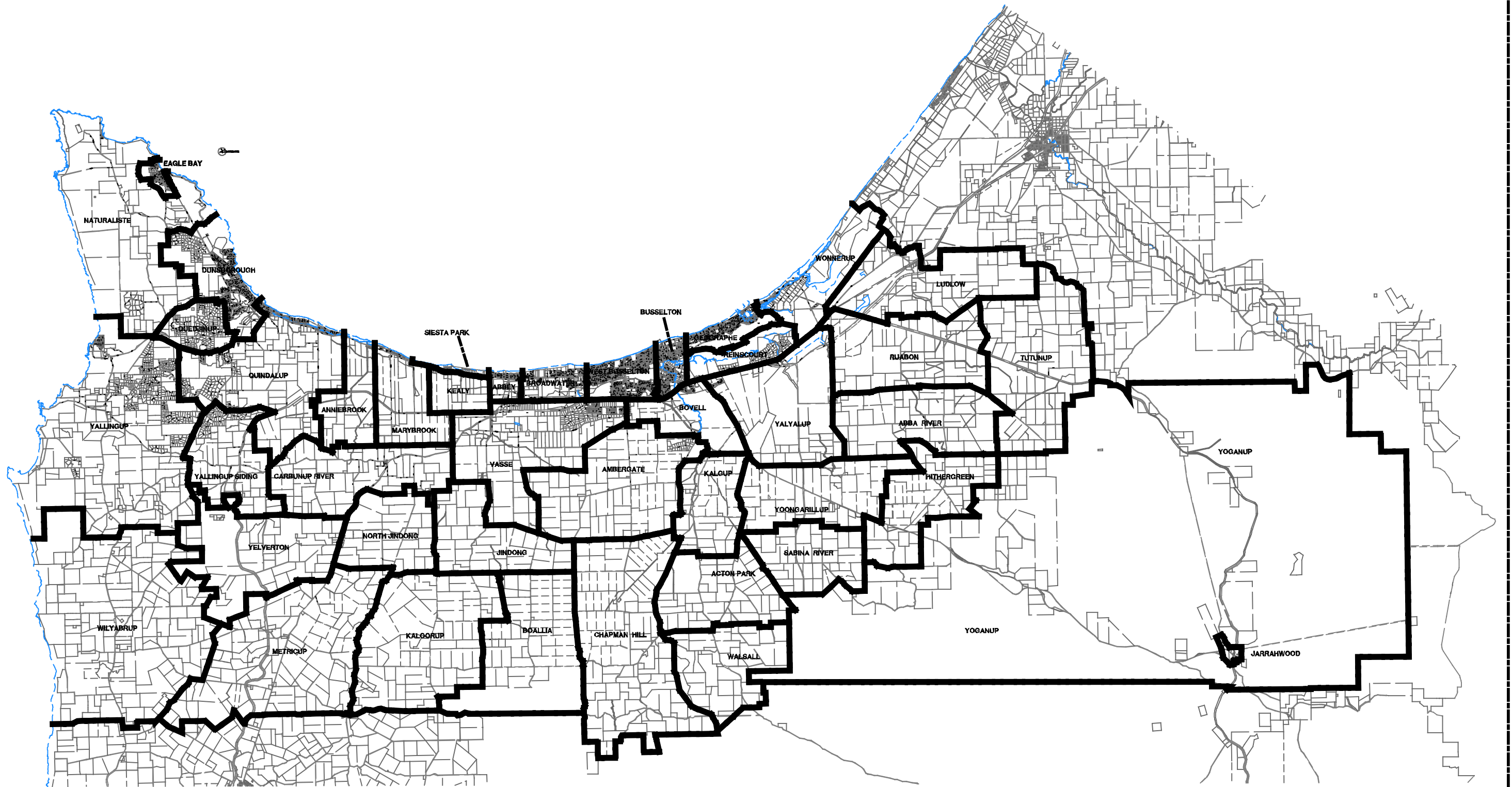
| PROPOSALS | PRIORITY |
|--|----------|
| Proposal 78: The dune vegetation in front of the Georgette Street carpark should be rehabilitated with brush and fenced to ensure revegetation. | I |
| Proposal 79: Some of the grassed area should be replaced with garden beds of selected native shrubs. This should be implemented in a manner that creates a buffer zone between the grassed areas and the beach with protective fencing. | O |
| Proposal 80: Signs should be erected along the dual use path, to the east of the small jetty, requesting the public not to walk to the beach over the dunes. Alternatively, fencing should be erected. | I |

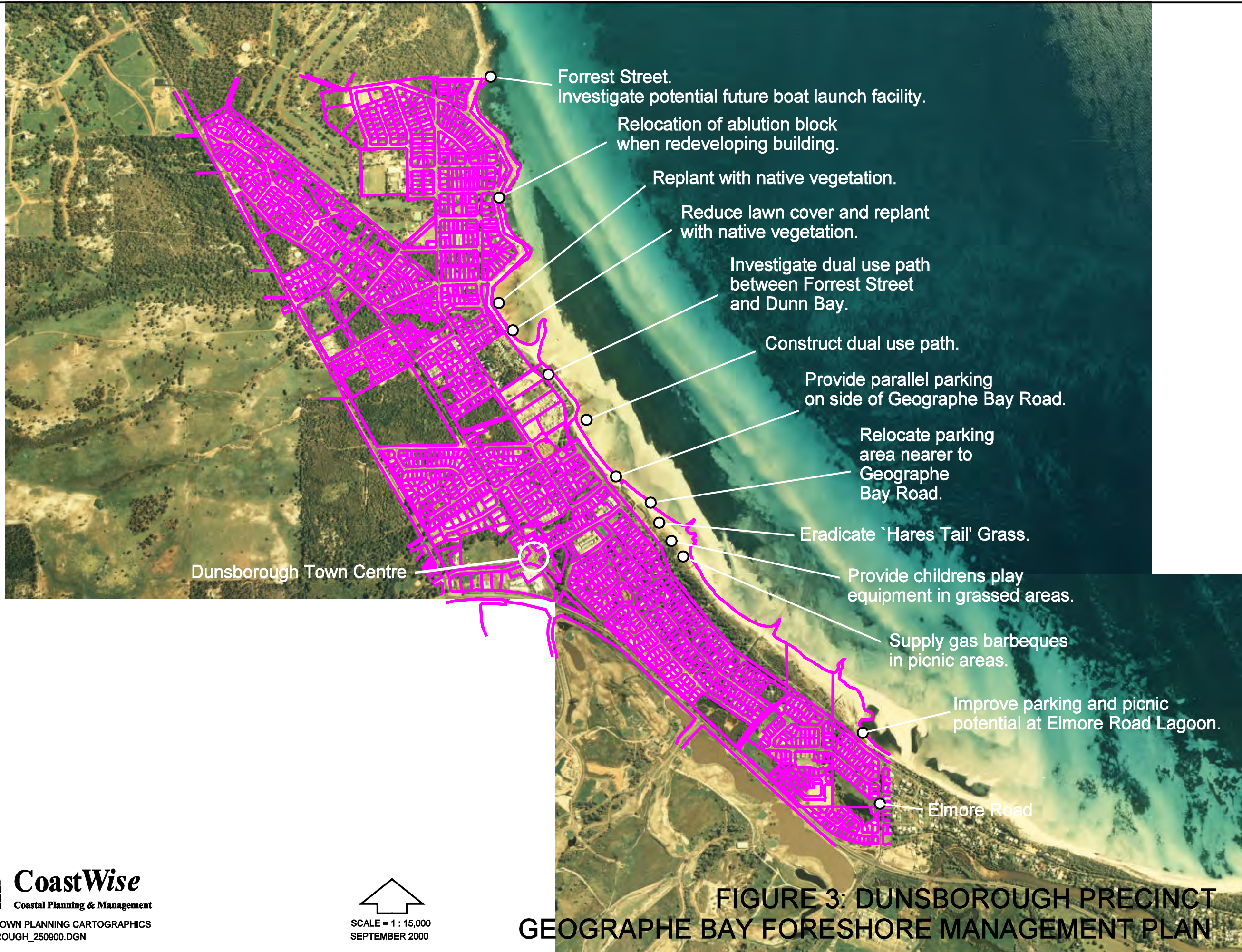
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|---|---|
| Proposal 81: Beach access paths should be reviewed on the basis of one path per 100 metres, approximately. Surplus paths should be closed, brushed and possibly fenced. Fencing of entry and exit points of access paths should be undertaken to prevent peripheral damage. Signs requesting beach users to take the chosen paths should be erected. | I |
|---|---|

4.4.9 Geographe Precinct

| PROPOSALS | PRIORITY |
|---|----------|
| Proposal 82: Bare sandy areas within the dune vegetation area should be brushed if the sand becomes mobile. | I |
| Proposal 83: Parking areas at Morgan and Russell Streets should be formalised by providing edge barriers (pine log) and fencing of beach access paths. | I |
| Proposal 84: Post and rail fencing should be erected to manage pedestrian access to adjacent reserves via formal pathways. | I |

SHIRE OF BUSSELTON LOCALITY BOUNDARIES





**FIGURE 3: DUNSBOROUGH PRECINCT
GEOGRAPHE BAY FORESHORE MANAGEMENT PLAN**



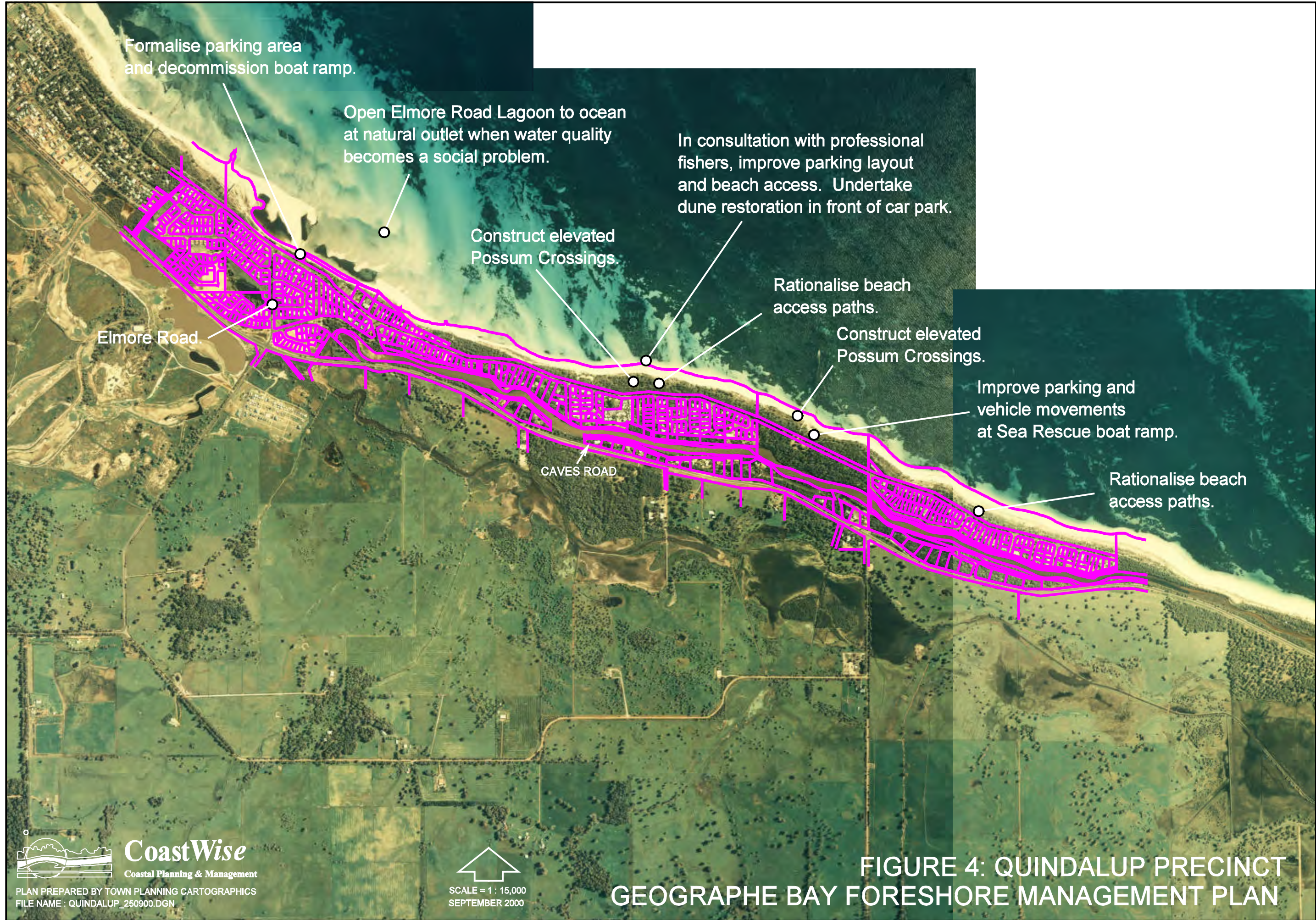
CoastWise

Coastal Planning & Management

PLAN PREPARED BY TOWN PLANNING CARTOGRAPHICS
FILE NAME : DUNSBOROUGH_250900.DGN



SCALE = 1 : 15,000
SEPTEMBER 2000





Prepare management plan for reserve.

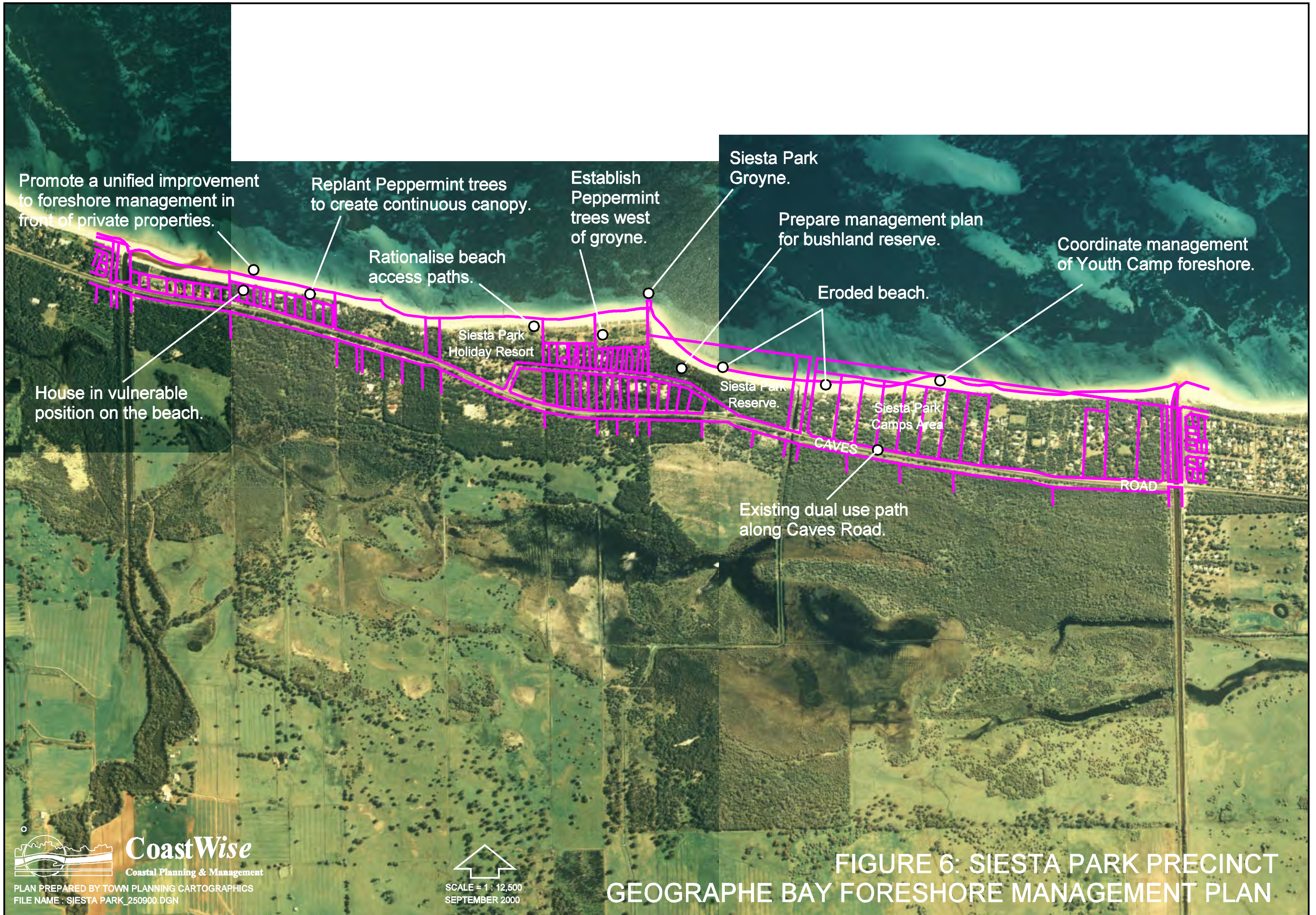
Encourage private landowners to replant Peppermint trees.

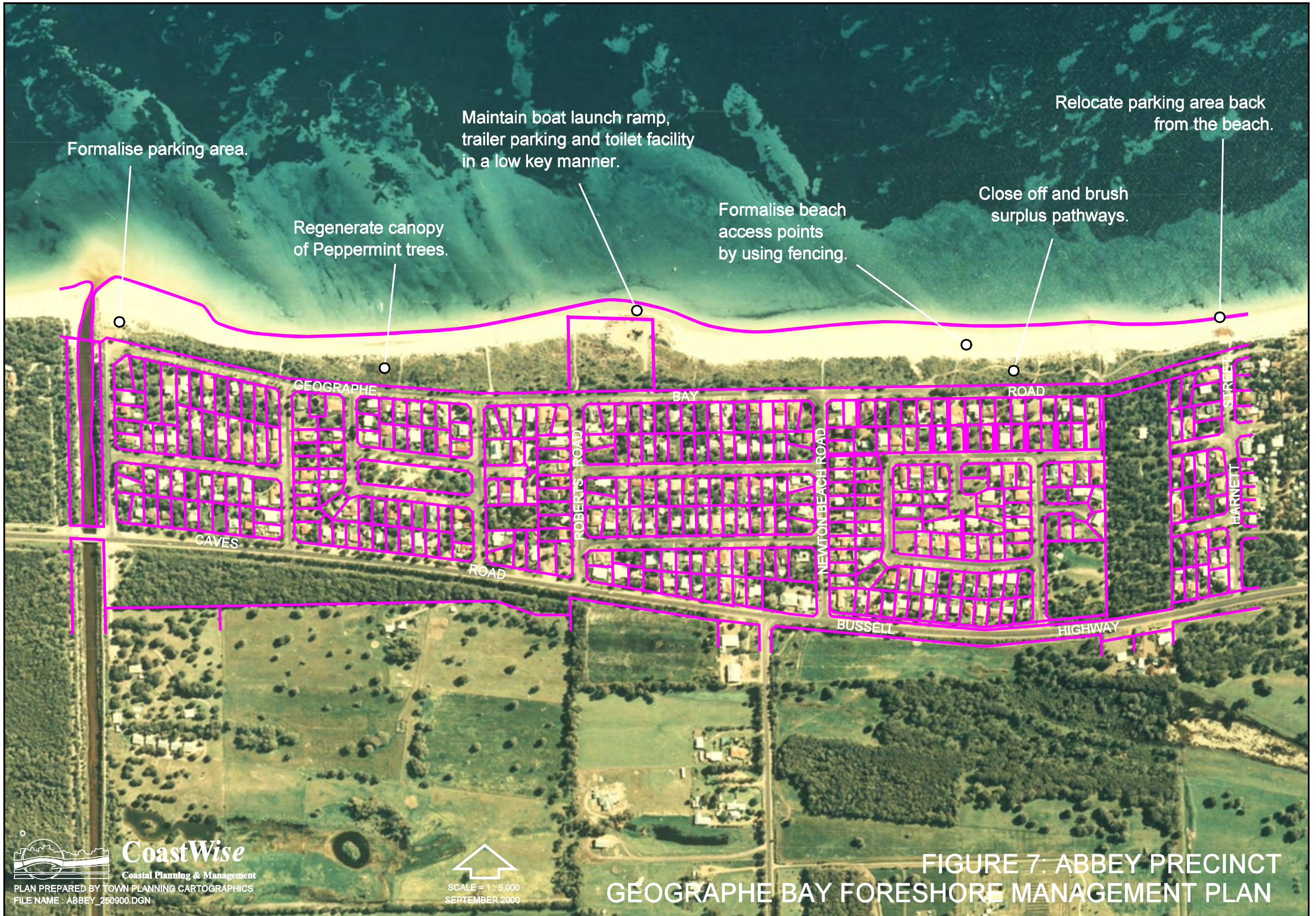
Existing dual use path.

Demarcate boundary of private and public landholdings.

Revegetate public foreshore with native plant species.

Proposed dual use path alignment along Caves Road.





Formalise parking area.

Regenerate canopy of Peppermint trees.

Maintain boat launch ramp, trailer parking and toilet facility in a low key manner.

Formalise beach access points by using fencing.

Close off and brush surplus pathways.

Relocate parking area back from the beach.

GEOGRAPHE

BAY

ROAD

CAVES

ROAD

ROBERTS ROAD

NEWTON BEACH ROAD

HARNETT STREET

BUSWELL

HIGHWAY



CoastWise

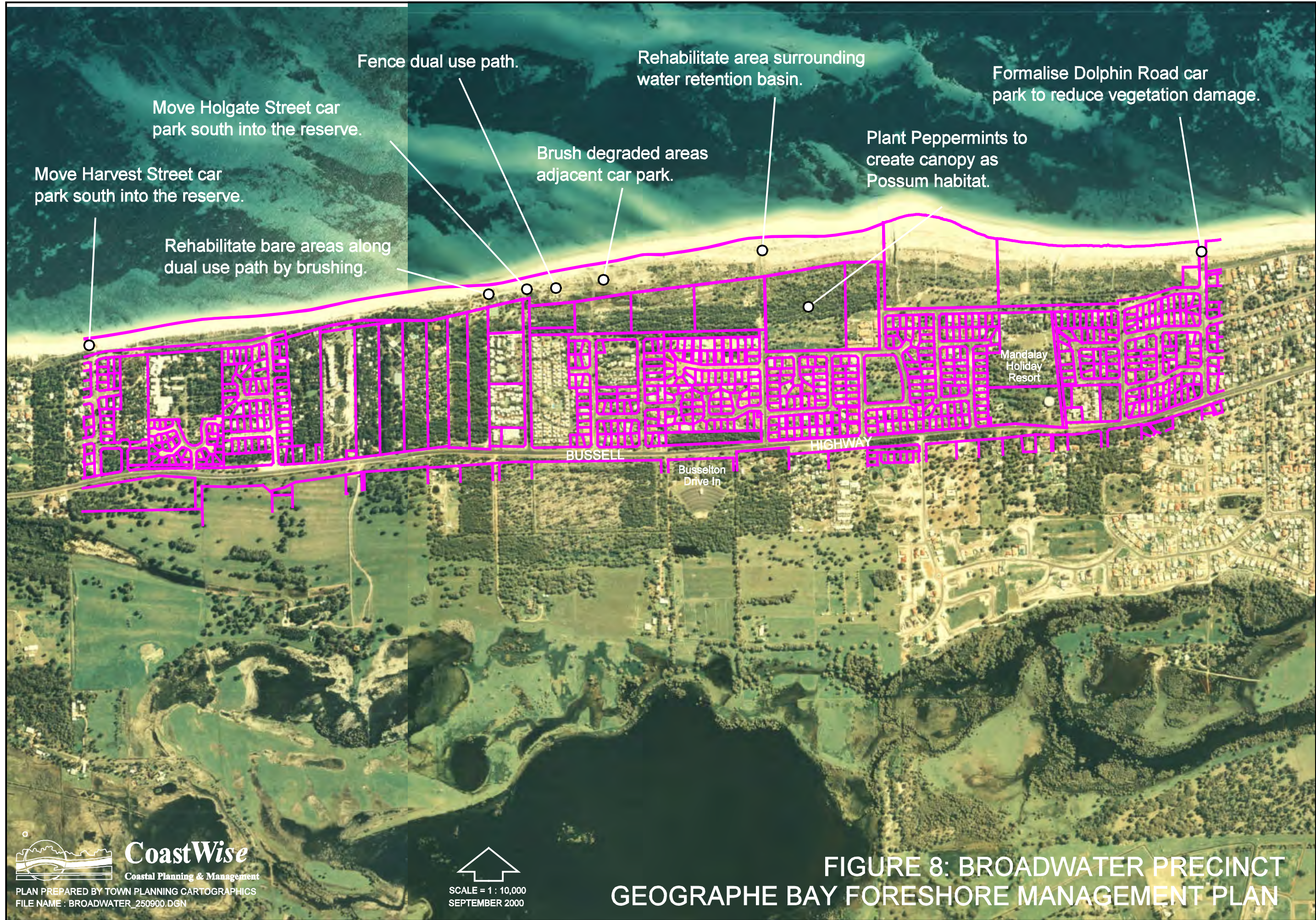
Coastal Planning & Management

PLAN PREPARED BY TOWN PLANNING CARTOGRAPHICS
FILE NAME : ABBEY_250900.DGN



SCALE = 1 : 5,000
SEPTEMBER 2000

**FIGURE 7: ABBEY PRECINCT
GEOGRAPHE BAY FORESHORE MANAGEMENT PLAN**



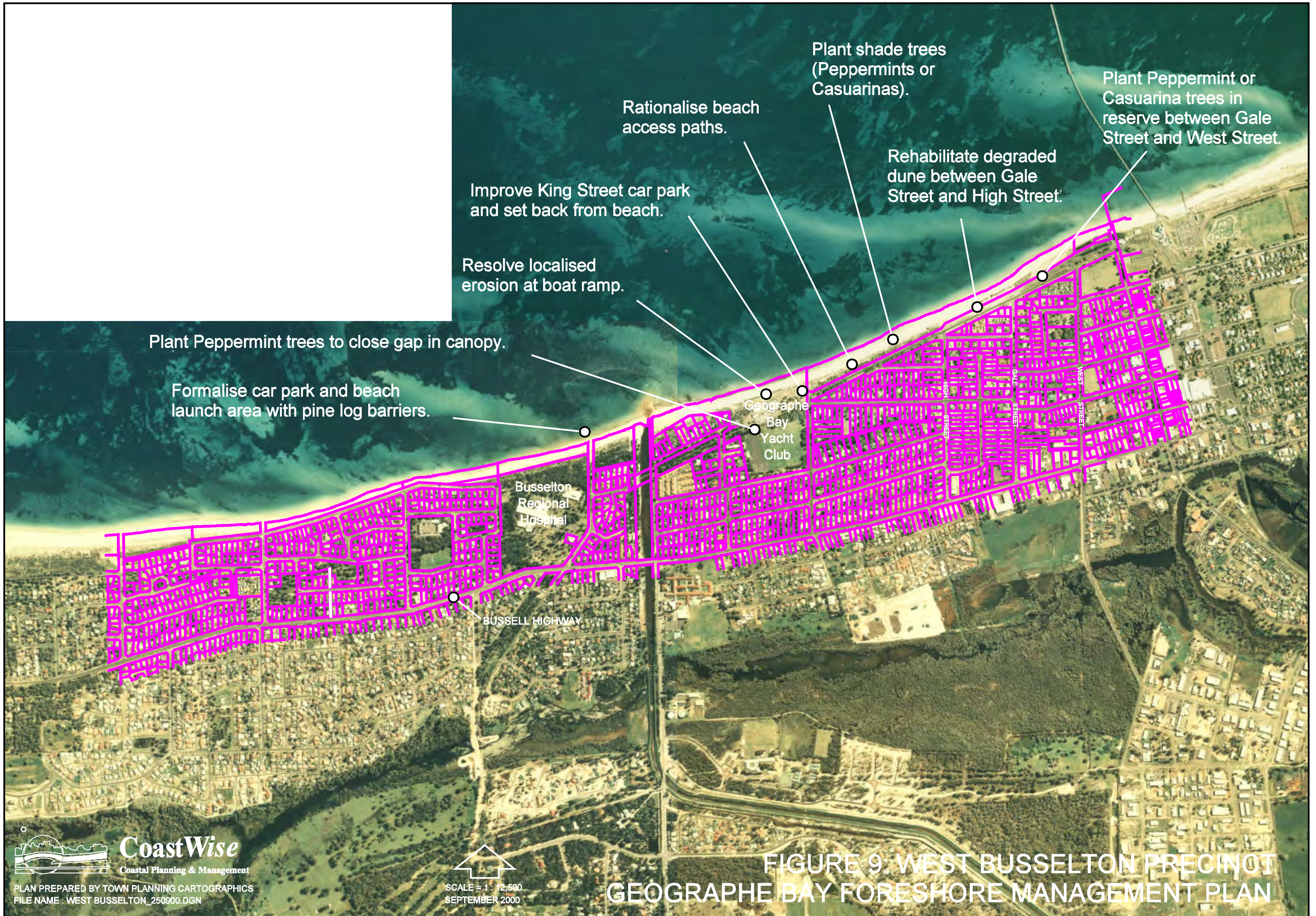


FIGURE 9: WEST BUSSELTON PRECINCT GEOGRAPHE BAY FORESHORE MANAGEMENT PLAN



Create jetty landscape theme. Plant shade trees (Peppermints or Casuarinas).

Erect signs requesting users stay on dual use path and exit via formal paths.

Some of the grassed area should be replanted with native vegetation.

Rehabilitate Georgette Street car park surrounds.

Busselton Jetty.

Public information board.

BARNARD PARK

GEORGETTE STREET

Childrens Playground.

WEST STREET

Busselton Town Centre

FIGURE 10: BUSSELTON PRECINCT
GEOGRAPHE BAY FORESHORE MANAGEMENT PLAN



Fence and erect signs requesting beach users to use paths.

Brush bare sandy areas in dunes.

Improve Russell and Morgan Street parking areas.

Review beach access paths. Close surplus paths.

FORD ROAD

RUSSELL STREET

MORGAN STREET

**FIGURE 11: GEOGRAPHE PRECINCT
GEOGRAPHE BAY FORESHORE MANAGEMENT PLAN**