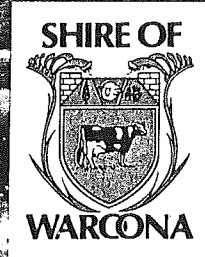
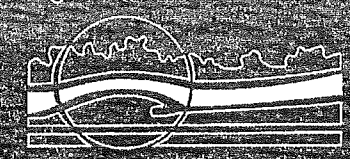


WAROONA FORESHORE MANAGEMENT PLAN



for the
Shire of Waroona

and the
Preston Beach
Progress Association



CoastWise
Coastal Planning & Management



**WAROONA FORESHORE
MANAGEMENT PLAN**

for the

SHIRE OF WAROONA

and the

**PRESTON BEACH
PROGRESS ASSOCIATION**

Volume 1: Management Plan Report

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Volume 2 comprises a set of photographs of the Waroona coast taken in October 2001.

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1. INTRODUCTION

1.1 BACKGROUND

The Waroona Coast is a predominantly sandy coastal sector, exposed to the ocean energy with dune building on-shore prevailing winds. The resulting coast is dune dominated and is known as an area with deflation hollows and fragile sand dunes. Owing to the coastal lakelands to the east of the dunes the area is not easily accessible to the broader population. Preston Beach is the only two wheel drive coastal access between Dawesville in the City of Mandurah and Myalup in the Shire of Harvey.

A coastal management plan was prepared by Forestec Pty Ltd in 1990 and most of the recommendations have been implemented. There is also evidence of considerable on-ground management in the way of brushing, revegetation and on-ground management works.

In September 2001, the Preston Beach Progress Association, in conjunction with the Shire of Waroona, commissioned **CoastWise** Coastal Planning and Management to review the previous plans and to prepare a new Foreshore Management Plan for the Waroona coast. This plan was funded by a Coastwest/Coastcare grant.

1.2 OBJECTIVES OF THE PROJECT

The main objectives of the project are as follows:

- Prepare a Foreshore Management Plan that will provide direction to the Shire of Waroona, developers and community groups by developing a framework for the future management, protection and preservation of the foreshore in public and private land areas.
- Examine 3 sectors in the final management plan; north, Town and south; and make recommendations relating to rehabilitation, re-vegetation, access, boat launching facilities, paths, water based recreational activities, community involvement and community ownership. The final recommendations will be presented to Council in a form suitable for incorporation into foreshore management policies.

The required tasks set out in the consultants brief are as follows:

- The Foreshore Management Plan should be for the entire Shire coast but should focus on the area adjacent to the Preston beach Townsite.
- Review existing Foreshore Management Plans.
- Undertake site inspections and liaise with the Shire and the Preston Beach Coastcare Group representatives.
- Examine the existing and future human usage demands and patterns, identifying issues such as access, public safety and increasing future usage.
- Identify environmental issues including; dune erosion (natural, human and animal), storm damage, fire management, protection and identification and rehabilitation of fauna habitats and breeding sites and litter.
- Make prioritized recommendations regarding future management of the foreshore on a sector-by-sector basis.
- Consult the general public and community groups on roles, needs and requirements on the foreshore. Hold an initial meeting with the community to identify the issues and a follow-up meeting to present the draft report and obtain feedback.
- Prepare the final report.

1.3 STUDY AREA

The study area includes the coast from the northern boundary with the City of Mandurah to the southern boundary with the Shire of Harvey (approx 19km) excluding Yalgorup National Park (Figures 1 and 2). The boundary extends west from low water mark and east to the eastern edge of the coastal reserve. The coastal reserves included are: Nos 41776, 22091, 41776 and 33345. The area also includes two carparks (reserves No 32010 and No 41776) The reserve numbers refer to the Town Planning Scheme No 7 for the Shire of Waroona (Map Sheets 1/10, 4/10 and 8/10).

The study area is land vested in the Shire of Waroona and controlled by the Local Government Act. The area adjacent to the study area is either private land or land vested in the Department of Conservation and Land Management and managed as National Park.

1.4 COASTAL PLANNING AND 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. More recently a revised Coastal Zone Management Policy for Western Australia was released for public comment, 2001.

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 minimized.
- Indigenous plants should be utilized 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 relatively stable and can accommodate human use (but not development).
- Development should be separated from the coast by a foreshore reserve.

Developmental

- Signs should be limited in number and placed to avoid blocking views.
- Service facilities should be designed to minimize impact on landform.
- Public access to the beach should be provided in a sustainable manner.
- Development that is in harmony with the nature of the coast should be encouraged.
- Development should be concentrated in nodes.
- Buildings 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 on effluent discharges that may pollute the beach or nearshore waters.
- Priority should be given to coast dependent development.

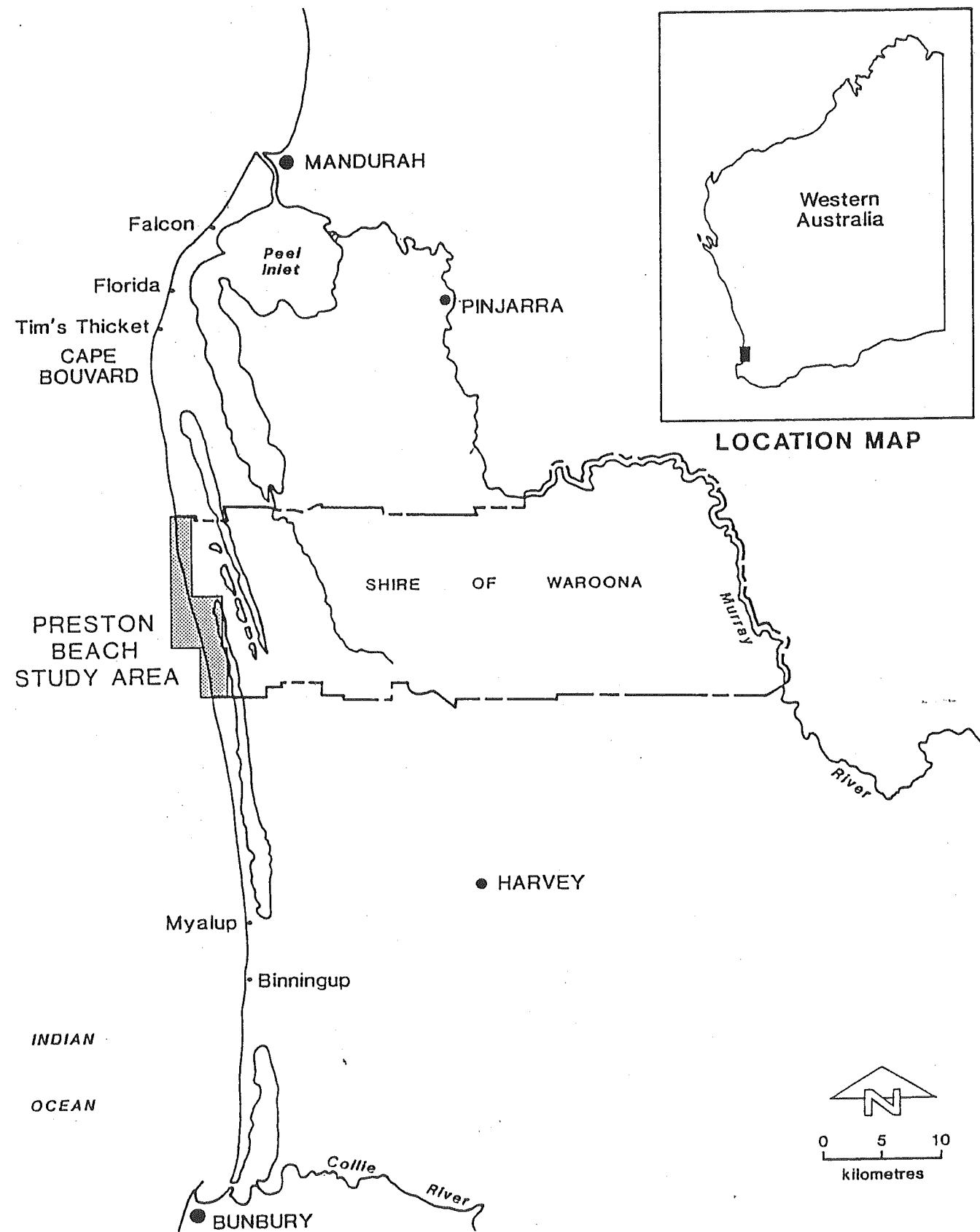


Figure 1: Study Area
Source: State Planning Commission

2. COAST FLIGHT AND SITE INSPECTION

2.1 COAST FLIGHT

Owing to the remoteness of parts of the Waroona coast it was decided to undertake an aerial photographic assessment of the Shire's coast. The flight was made on 10 October 2001 flying north to south along the coast at an altitude of 200 metres. A series of 82 photographs were taken of most of the main features on the coast. Some of the main features photographed were as follows:

- Signs of human usage
- Parabolic blow-outs
- Unstable dune area
- Vehicle access tracks
- Recreation activities
- Deflation hollows
- Preston beach foreshore
- Large sand sheets south of Preston Beach

Some of the overall impressions of the Waroona coast, as a result of the coast flight, were as follows:

- There are large areas of sand sheets, deflation hollows and parabolic dune blowouts, however, these appear to be natural landforms.
- There did not appear to be much in the way of vehicle track degradation.
- The only area that may need to be carefully monitored is the unstable dune area to the south of Preston Beach. If this area is further destabilised as a result of random beach access it may lead to serious consequences such as private properties and buildings being inundated by moving sand.

The set of 82 photographs of the Waroona coast have been compiled into a separate Volume 2 as a baseline study of the coast on 10 October 2001.

2.2 SITE INSPECTION

A meeting and site inspection was held with the Preston Beach Progress Association on 16 November 2001. A representative of the Shire of Waroona was also present. The meeting took the form of a discussion of progress and covered a number of issues, namely:

- Questionnaire survey
- Submissions received
- Examination of broad scale map of coast and coastal access
- Relative stability of the dunes
- People management to prevent dune instability
- Vehicles on beaches
- The picnic area
- Sandboarding
- Stage 2 development

At the end of the meeting a field survey was undertaken to examine the following aspects:

- Stage 2 development area
- Shire owned land
- Beachfront parking areas

- Picnic areas
- Vegetation rehabilitation
- Beach access
- Vehicle tracks to beach and the alignment of these
- Land at the end of Stables Road

At the end of the meeting a date was set for the follow-up meeting, namely 9 December 2001.



Photograph 1: Preston Beach

3. COASTAL ENVIRONMENTAL ASSESSMENT

3.1 INTRODUCTION

The Waroona coast is a sandy, highly mobile and environmentally sensitive coastline. Sandy coasts are fragile even in their natural state and when human uses are introduced their fragility is further exposed. The Waroona coast has a westerly aspect, is partly protected by fringing limestone reefs and is unique on the West Australian coast in terms of plentiful sand being driven on-shore by the prevailing south-south-westerly wind. A sound understanding of the natural processes occurring on the Waroona coast is essential in order to prepare a successful management plan. For this reason the various environmental components will be examined.

3.2 WAROONA COAST

On the Waroona coast, swell waves, strong onshore sea breezes and summer winds arrive from the southwest. The low to moderate energy surfzone has shallow offshore reefs and the beach typically exhibits beach cusps (Conservation and Environment, 1984).

In response to the strong prevailing onshore wind and wave energy, erosion of the seaward face of this sandy coast is common and results in the eastward migration of the barrier dune system. There is also significant longshore transport of material in the littoral and nearshore zones. Under conditions of combined prevailing wind waves and swell, sediment is impelled northwards. Although this pattern can be briefly interrupted by northerly storms, the net direction of transport year round is northward (Coastal and Lakelands Planning Strategy, 1999).

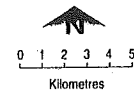
Analysis by the Department of Planning and Infrastructure 1987 (Marine Division) indicates that, from 1955 to 1982, there was **accretion** of the coast, 3 kilometres south of Preston Beach to 7 kilometres north of Preston Beach. The northern 3 kilometres of the Shire (adjacent to the Yalgorup National Park) and the southern 3 kilometres of the coast adjacent to private land, **receded** between 1955 and 1982 (Coastal and Lakelands Planning Strategy, 1999) (Figure 3).

It is worth noting that the **accreting** part of the coast is adjacent to the most unstable dune areas that are dominated by parabolic dune blowouts and deflation areas.

3.3 COASTAL DUNES

The Waroona coast consists primarily of Quindalup Dunes that fringe the coastline and are the most recent unconsolidated aeolian deposit. The actual sand is referred to in geological terms as Safety Bay Sand. The main landforms are complex nested parabolic dunes with gentle seaward slopes and steep inland slope faces. Relatively low-relief foredune ridges front the parabolic dune terrain (Figure 4).

The Quindalup sands are described as being well drained, uniform pale calcareous sands with little evidence of soil development apart from a small amount of organic matter near the surface. The use of these soils for agricultural purposes is restricted by alkalinity, low water holding capability, saline groundwater, exposed conditions and high wind erosion hazard. The vegetation cover is also highly susceptible to damage from people pressure (vehicle and pedestrians), clearing and grazing. The foredunes are particularly vulnerable to erosion (Coastal and Lakelands Planning Strategy, 1999).



Produced by Project Mapping Section
Land Information Branch, Ministry for
Planning, Perth W.A. February 1999

ntw-map11/lakelands/lpub99/clfig315.dgn

Source: Shoreline Movement - Department of Marine and Harbours 1987
Other data - Searle and Semeniuk 1985, Department of Conservation
and Environment 1985, Aerial photo interpretation 1993-94

Limestone reef along coast and nearshore
area. Pocket beaches. Old predominantly
vegetated blow-outs within hind dunes

Similar coastline to above but with considerable
onshore sand drift over limestone.

↑ Cape Bouvard - Trigg Coastal Section
↓ Leschenault - Preston Coastal Section

INDIAN

Sandy beaches with limestone reef outcrops in north.
Thinly vegetated foredunes but hind dunes are
predominantly vegetated.

North-westerly mid
latitude storm
direction

Sandy Beaches - well vegetated foredunes and hind dunes

Sandy beaches. Thinly vegetated foredunes
backed by extensive areas of sand drift and
blow-outs within hind dunes

LEGEND

Shoreline Movement

■ Erosion (1955 - 1982)

▨ Accretion (1955-1982)

Landform Key

○ Quindalup Dunes - bare mobile sand

■ Quindalup Dunes - vegetated

▨ Spearwood Dune and Plain System

■ Vasse Lagoonal and Estuarine Deposits

→ Littoral Drift Direction

— Major Road

— Local Government
Boundary

— Study Boundary

OCEAN

South-westerly
prevailing wind
direction and ocean
swell direction

Sandy beaches with outcrops of beach and
nearshore limestone reef near Binningup.
Thinly vegetated foredunes with more localised
blow-outs within hind dunes.

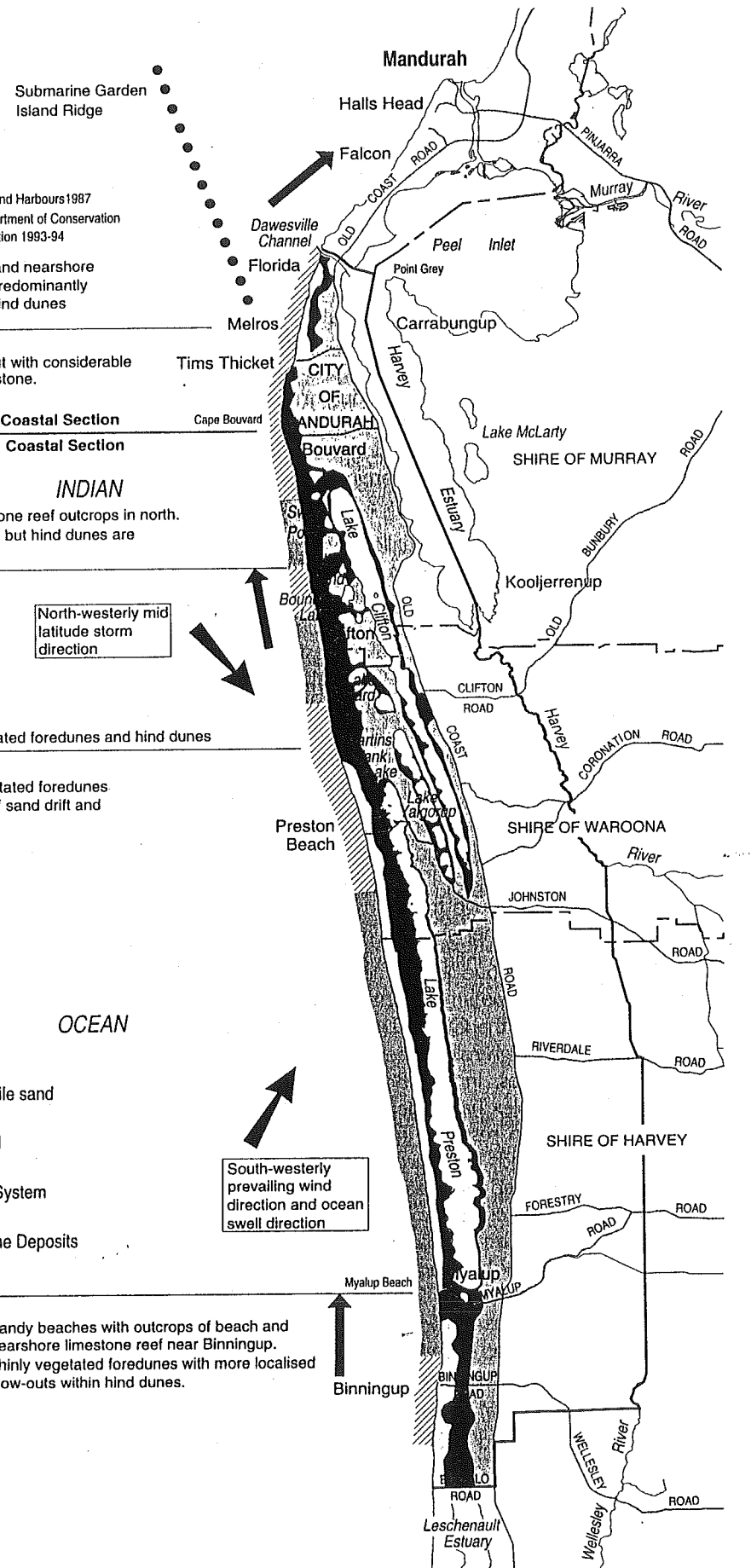


Figure 3: Coastal Environment and Processes

Source: WAPC, Coastal and Lakelands Planning Strategy, 1999.

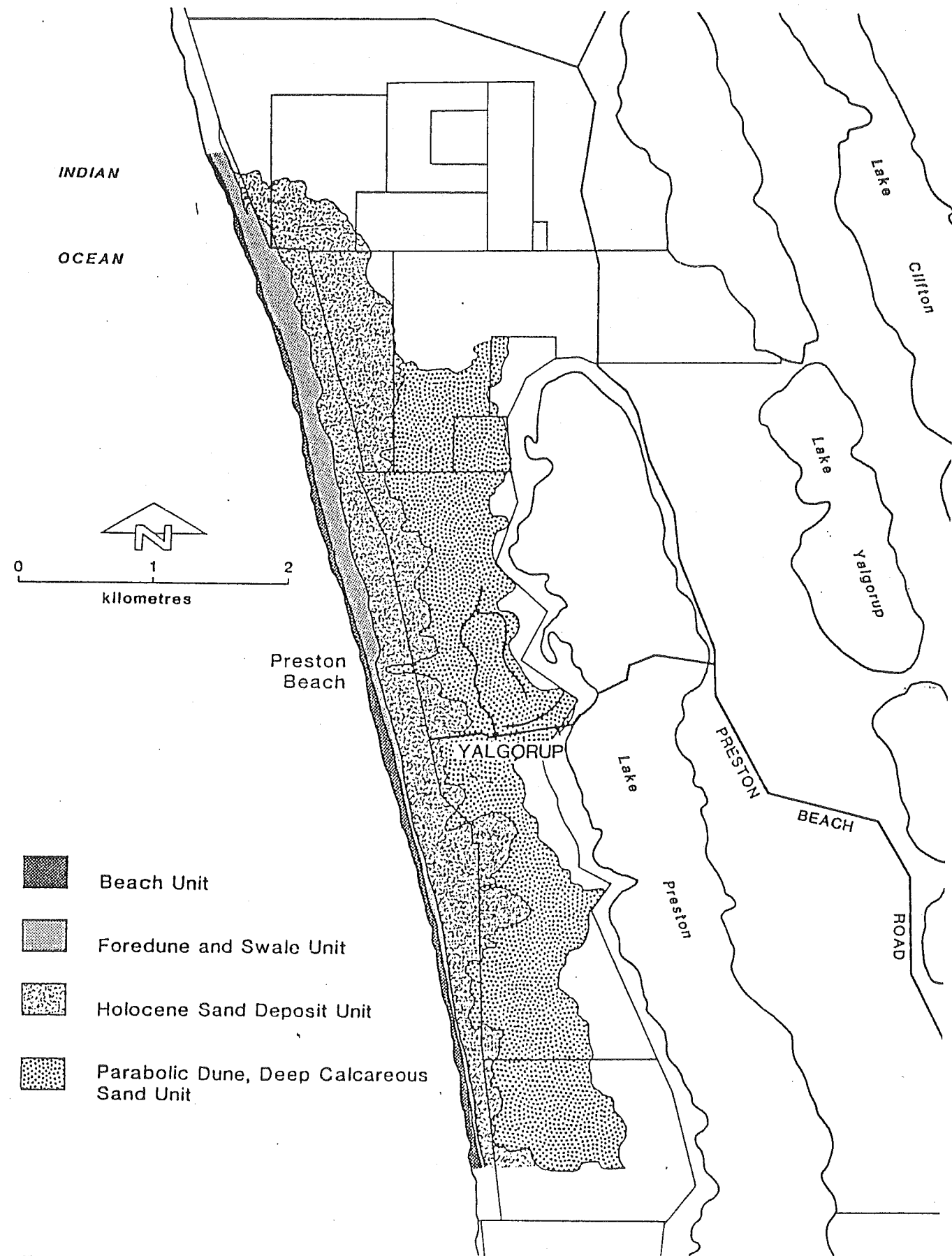


Figure 3: Coastal Land Units
 Source: State Planning Commission, 1988

To the east of the Quindalup Dune System is the Spearwood System that consists of dune ridges and intervening broad swales or plains. These consist of yellowish-brown siliceous sands that overly aeolian or marine limestone (Tamala) at varying depths. It is believed that these sands were originally calcareous, however, leaching has removed the carbonate from the upper levels and precipitated it below to form a hard capping of calcite over the aeolianite or limestone (Coastal and Lakelands Planning Strategy, 1999).

The Waroona coast is noted for a well developed foredune that has been relatively well vegetated in the past. Inland from the foredune there are notable deflation hollows that have been deflated to levels below the winter water table. Sands of the former foredune have been incorporated with reactivated sands of parabolic dunes to form a landward progressing mobile dune sheet. Coastal rehabilitation should follow the guidelines set out in the AgWA, Coastal Rehabilitation Manual by Oma 'et al'. Alternatively, the Department for Planning and Infrastructure is presently preparing a Coastal Manual and advice can be obtained from the Regional Coastal Facilitator in Bunbury.

3.4 COASTAL PROCESSES

3.4.1 Introduction

There are a number of processes at work that shape the coast to its present form. These are all inter-related and tend to form a complex pattern, which would appear difficult to unravel. In this section the main processes will be discussed as a means of simplifying the issues.

3.4.2 Wind

Wind is a dominant climatic factor that has an ongoing impact on the coast. It generates waves, induces water circulation and transports sand. The dominant wind is the south-south westerly sea breeze which blows mainly in summer. This wind is responsible for moving sediment in the surf zone (sand bar) to the beach from where it is blown into the dunes.

In winter, the repeated passage of low pressure systems creates northwest gales. These gales are usually of a shorter duration and generate storm waves. Their main impact is erosion of the beach and movement of sediment into a sand bar in the surf zone. Their impact on sand movement is less dramatic because the sand is usually wet and the duration of the storms is less.

Wind generated by dissipating tropical cyclones can have very dramatic but very short term effects. Such storms can be extremely severe and usually erode beaches dramatically. Cyclone Alby resulted in such erosion in April 1978. Such events are infrequent.

3.4.3 Waves

Ocean events such as storms in the Indian Ocean result in continual swell from the west. Once these swells reach the coast their direction is modified (refracted) into a complex set of patterns by the reefs and the coast.

Superimposed on the swells are locally generated wind waves depending on the seasonal characteristics. Wind waves generate longshore current when they arrive at an angle to the coast and this process causes littoral drift (sediment movement).

Depending on the position of islands and reefs, a series of high and low areas tend to accumulate sediment and the higher energy areas stay open and are swept of sediment.

3.4.4 Tides

The Waroona Coast experiences one astronomic tide per day. The typical daily range is 0.4m although the range in sea level over a year is in the order of 1.0m. Changes in barometric pressure, shelf waves and seasonal variations help to contribute to the range.

3.4.5 Changing Beach Width

The combination of wind and wave direction and intensity results in beaches being eroded and narrow in winter and prograding (growing wider) in summer.

3.4.6 Sediment Transport

As discussed above in Section 5.2, the strong south westerly prevailing winds, together with high energy storm swells impacting on the shore result in an overall south-north movement of sediment. As far as can be determined there has not been any definitive study on the Waroona coast to indicate the volume of sand passing a particular point.

3.4.7 Climatic Cycles that Affect the Coast

As discussed above there are a series of climatic cycles that affect the coast, namely:

- Short term such as Cyclone Alby, a few hours of intense activity and high level of change.
- Season Cycle such as the summer-winter changes that see the removal of sediment and return of the sediment to the beaches.
- Medium Term Cycle such as an 11 year cycle of storms that affect the coast. These are related to wind movement cycles based on meteorological data of wind passing a particular point. These may also be tied into other events such as El Niño.
- Long Term Cycles may also occur, however, records are not accurate enough to identify any definite patterns. (There is a gap in our knowledge between aerial photograph evidence (1942) and radio-carbon dating (500 years) that is virtually unknown).

The medium term (11 year) cycle is of importance to coastal managers on the Western Australian coast because the peaks of this cycle have resulted in widespread damage in 1995, 1984 and 1973. At present we are in a trough and may expect the next peak in 2006. Unfortunately, it is during periods of low intensity (troughs) that some land use decisions are made that are later regretted, such as placing buildings and structures too close to the ocean.

3.4.8 Coastal Hazards

The following coastal processes have been identified as hazardous to beach use and development within the Shire of Waroona coastal zone:

- Storm Erosion
- Rip Currents

Each of these processes, and their impacts on beach use and coastal development are discussed separately below.

▪ Storm Erosion

During significant storm events, strong winds generate high steep waves and an increase in water level known as wind set-up. The lower atmospheric pressure associated with the storm system further draws up the water level. These factors, acting together, allow the waves to attack the higher portion of the beach that is not normally vulnerable. The initial width of the surf zone can be insufficient to dissipate the increased wave energy of the storm waves. The residual energy is often spent in eroding the beach face, beach and sometimes the dunes. The eroded sand is carried offshore with return water flow where it is deposited and forms an offshore bar. Such bars can eventually grow large enough to break the incoming waves further offshore, causing the wave energy to be spent in a wider surf zone.

Following storm events, the beach is steadily rebuilt by onshore sediment transport. Sediment is typically moved back onto the beach by the orbital currents associated with persistent background swell. Swell waves dominate this process, in preference to seas, as their period is longer and hence their orbital currents penetrate deeper into the water column, enabling sediment to be moved at greater depths. Over time, a profile is built up which is in equilibrium with the background swell. At all points along the profile there is a balance between the net force applied to the sediment in the onshore direction by the wave action and the component of gravity acting down the beach profile in the offshore direction. In such a case there would be no net sediment transportation in the cross-shore direction.

Studies of numerous sandy beaches around Australia, and overseas, which are exposed to a wide range of wave energies, tidal regimes and storm surges, indicate the broad ranges of erosion volumes during storm attack reproduced in the table below. Also presented are estimates of shoreline recession associated with these erosion volumes.

Table 1: Storm Erosion Severity and Erosion Volumes

Storm Severity	Erosion Volume (above MSL)
Typical Winter Storms	5 to 25 m ³ /m
Moderate Storms	20 to 50 m ³ /m
Very Severe Storms	40 to 100 m ³ /m
Extreme Storms	100 to 200 m ³ /m

Naturally, if rocky headlands are present then the erosion during storms would be reduced by the stabilising influence of headlands.

▪ Rip Currents

The action of waves breaking against a beach pushes water up against the shore. This results in a return flow of water from the surf zone to the adjacent waters further offshore. Under conditions of relatively low wave energy, this return flow is likely to be diffuse, relatively uniformly along the coast. However, in the presence of moderate to high wave conditions, this return flow is likely to be concentrated in rip currents. The formation of

rips can be exacerbated by features of the sea-bed topography, such as shore-normal bars and gullies associated with beach cusps. In addition, artificial structures can be effective at concentrating both return flow as well as wind-driven flow to form rip currents. In general, shore-normal structures, such as groynes and breakwaters, are more effective in this sense.

It is known that Shire of Waroona beaches experience rip currents throughout the year. This is likely to be most prevalent and severe during winter storms. However, during these times beach use is usually very low, and hence the hazard posed by the rip currents is actually quite small. Rips also form during summer months, particularly when the background swell and the sea breeze are quite strong. These are believed to be stronger where an offshore sand bar persists throughout the majority of summer. The presence of an offshore sand bar is believed to increase the set-up of the water against the shore by the waves, and hence increase the driving force of the rip currents.

As far as hazards to beach users are concerned, the formation of rips during summer are of greatest concern, as this is when exposure is greatest.

3.4.9 Effects of Climate Change

Whilst the link to global warming and associated sea level rise is still largely based on predictive numerical models of the global atmospheric and oceanic processes, there is certainly clear evidence that the amount of carbon dioxide and other "Greenhouse Gases" in the atmosphere has increased steadily over the last century, and is continuing to rise. These general circulation models are currently run on coarse grids and have rather rudimentary treatment of ice melting, cloud cover and albedo feed back links and impacts. Pielke (1991) presents a good review of the scientific uncertainty with the present predictions of the "Greenhouse Effect". Some of the possible impacts on the west coast of Western Australia of Global Warming could be:

- increase in cyclone frequency;
- increase in sea level;
- changes in regional-scale meteorological features that may lead to changes in the wave climate.

The current knowledge about the potential impacts of Global Warming is extremely limited. This has lead many organisations and authorities to take a low key approach to the issue until more definitive proof is available.

The Institution of Engineers, Australia (1991), has put forward suggestions for assessing the impacts of possible climate change on coastal engineering projects. The report is aimed at ensuring that a responsible review of the possible impacts is made. Designs should be robust and minimise future risk. This document does not say that climate change will definitely happen, but that it now seems likely that it may occur, and therefore engineering design should take this risk into consideration.

The issue of possible climate change and resultant effects on coastal processes is quite complex. As the present level of knowledge is somewhat limited, only a relatively simple assessment of the potential impacts of climate change can be made. The impacts of the possible sea level rise associated with climate change are considered in this study.

The Intergovernmental Panel on Climate Change (1995), presents three scenarios for possible changes in the Global Mean Sea Level for the years 2030, 2050 and 2100. These are reproduced in Table 2.

Table 2: Possible Global Sea Level Rise - 1995 Projections

	2030	2050	2100
Low Scenario	0.03 m	0.06 m	0.13 m
Medium Scenario	0.11 m	0.12 m	0.49 m
High Scenario	0.23 m	0.40 m	0.93 m

Source: Intergovernmental Panel on Climate Change, 1995

3.4.10 Summary of Coastal Processes

The following is a summary of coastal processes in the Waroona coastal zone:

- Swell induced onshore transport of sediment in zones of swell wave interference;
- swell induced longshore transport of sediment in the surf zone;
- wind and storm wave induced transport of sediment in the surf zone;
- onshore-offshore cycling of sand between the beach and the bar;
- wind induced inland transport of sediment on the coast exposed to south and southwest; and
- superimposed short term (storms), seasonal and longer term changes that affect the scale and sense of these perennial processes.

3.5 COASTAL VEGETATION

The Waroona coast falls within the Darling District (Drummond sub-district) of the South-West Botanical Province as identified by Beard (1979, 1980). For the purposes of this management plan we will concentrate on the coastal dune vegetation that occurs on the Quindalup Dunes that dominate the Shire of Waroona coast.

The vegetation of the coastal zone contributes considerably to the landscape and conservation values of the area. It provides habitats for the diverse range of fauna, protects the landforms against wind erosion and offers shelter to the urban areas from wind, salt spray and blown sand. The following description of the Quindalup Complex has been taken largely from the Yalgorup National Park Management Plan (1995-2005).

The **Quindalup Complex** is found in a narrow coastal belt averaging 1.5 kilometres in width. The vegetation species closest to the beach can tolerate sand blasting, salt spray, intense glare and summer drought. They often have adaptations such as dense hair layers and thick resinous coatings on their leaves, or are succulents, to cope with the conditions. *Spinifex hirsutus*, a dune building foredune grass, for example, has hair layers on its leaves and the shrub *Scaevola crassifolia*, common on the stabilized dunes, has resinous leaves.

The Quindalup Complex has four age groups with different vegetation associations. The younger group has shrublands dominated by *Acacia rostellifera* and *Olearia axillaris*. In the absence of fire, *Olearia axillaris* usually outcompetes the acacias.

The second youngest group is dominated by heaths or shrublands with *Melaleuca acerosa* being prolific. The two older groups have a broad variety of vegetation types with acacia common but including *Melaleuca acerosa* and *Pimelea ferruginea*. Older dunes have taller woodland vegetation such as *Agonis flexuosa*. *Xanthorrhoea preissii* (Blackboy) are occasionally found on some of the older dunes.

As far as we are able to determine there are no threatened or endangered species in the Quindalup Complex. Where the vegetation cover has been destroyed or disturbed by human activity, revegetation should be undertaken. Disturbed areas may be invaded by exotic plants (weeds) that are introduced from other areas by vehicle contamination. Lumps of mud, containing exotic seeds, falling from under vehicles is one means of proliferation. Also, horse excrement and human pedestrian movement can result in the spread of exotics.

As a general rule we always recommend that local indigenous species are used for vegetation rehabilitation. The following tables (Tables 3 and 4) provide suitable **tree**, **shrubs** and **grass** species.

Table 3: Suitable Tree and Shrub Species for Rehabilitation

Casuarina equisetifolia	Sheoak	New South Wales, cones can be hard to walk on with bare feet
Melaleuca lanceolata	Moonah	Local, should be planted in clumps back partially protected from the wind, Can be used to provide shade when grown
Acacia cyclops	Coastal Wattle	Local, fast growing but relatively short lived
Acacia rostellifera		Local, fast growing but relatively short lived
Acacia saligna		Local, fast growing but relatively short lived, must be protected
Agonis flexuosa	WA Peppermint	Near local, good shade tree when protected from coastal wind
Eucalyptus gomphocephala	Tuart	Tall local tree suitable for protected areas
Callitris preissii	Rottneest Island Pine	Small local tree that requires some protection from coastal wind
Allocasuarina lehmanniana	Dune Sheoak	Small local tree that requires some protection from coastal wind
Dodonea aptera	Coast Hop Bush	Local shrub, grows where some protection from the wind is available
Gyrostemon ramulosus	Corkybark	Local tall shrub or small tree
Spyridium globulosum	Basket Bush	Local shrub, grows where some protection from the wind is available

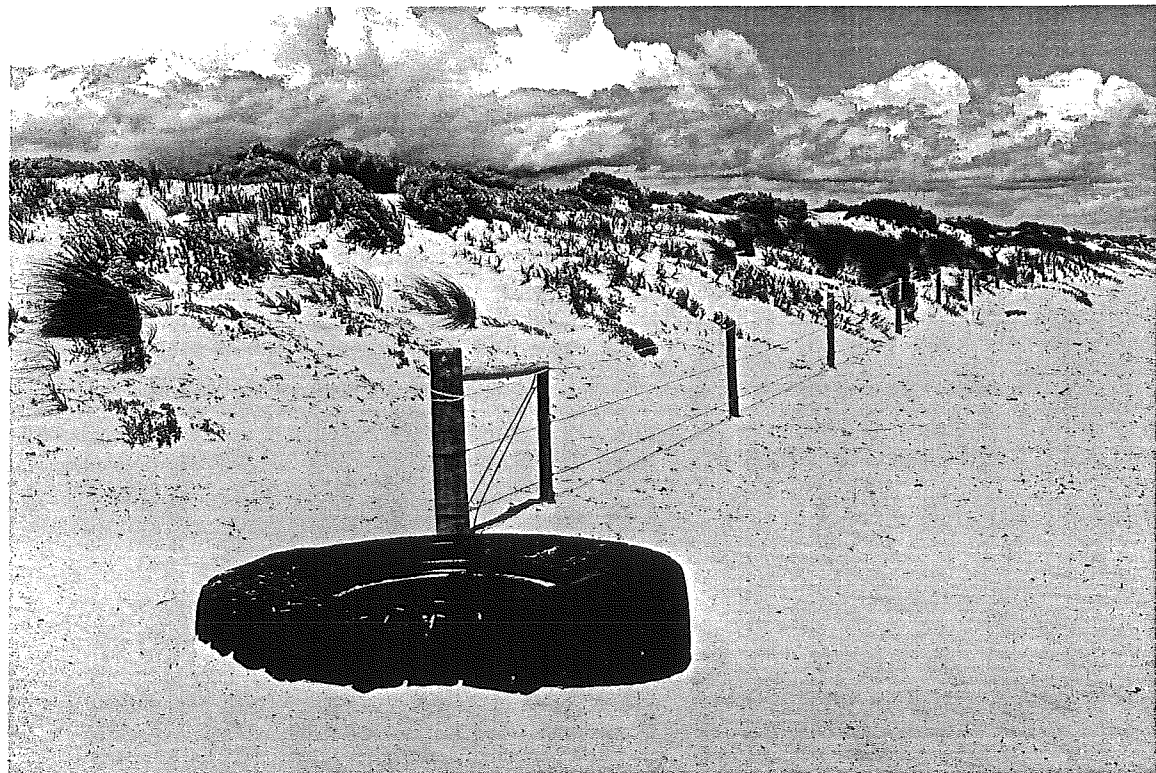
Table 4: Suitable Grass Species for Rehabilitation

Spinifex longifolius	Beach spinifex
Spinifex hirsutus	Sand Spinifex
Lepidosperma gladiatum	Coast sword sedge
Isolepis nodosa	Knotted club-rush

The following coastal weeds are not recommended for rehabilitation; Marram grass (*Ammophila arenaria*), Sea wheat (*Thinopyrum distichum*), Onion weed (*Trachandra divaricata*), Pyp grass (*Ehrharta villosa*) and Sea spurge (*Euphorbia paralias*) (Hussey 'etal', 1997). Also, Victoria Tea-tree should not be encouraged in the Preston Beach townsite.



Photograph 2: Knotted club-rush grass stabilizing a dune at Preston beach



Photograph 3: Bare sandy areas that would be assisted with brushing

3.6 COASTAL FAUNA

There have been no detailed or systematic fauna surveys of the Waroona coast, not even in the Yalgorup National Park. The only information available is some general information from the Yalgorup National Park Management Plan. It is assumed, for the purposes of the foreshore management plan, that the coastal reserves and Quindalup Dunes contain similar fauna as found generally in the Yalgorup National Park and that are discussed generally in the Yalgorup National Park Management Plan.

3.6.1 Mammals

Western Grey Kangaroos (*Macropus fuliginosus*) are well represented in the area. Brush Wallabies (*Macropus irma*) are also present as are small populations of Bandicoots (*Isodon obesulus*) and Chuditch (*Dasyurus geoffroii*). The Brush-tailed Possum (*Trichosurus vulpecula*) and the Echidna (*Tachyglossus aculeatus*) have been seen in the general area. The Water Rat (*Hydromys chrysogaster*) has been seen near the lakes.

Species that are likely to have been present in the past include the Ring-tail Possum (*Pseudocheirus occidentalis*), the Honey Possum (*Tarsipes rostratus*), the Pigmy Possum (*Cercartetus concinnus*) and the Quokka (*Setonix brachyurus*). Species of bats have also been noted in the general area including Gould's Wattled Bat (*Chalinolobus gouldii*) and the King River Eptesicus (*Eptesicus regulus*).

3.6.2 Birds

There are a large number of birds in the area, especially in the lakes to the east of the coast. The following birds are found in the general area; Emu (*Dromaius novaehollandiae*), the Striated Pardalote (*Pardalotus striatus*) the Rainbow Bee-eater (*Merops ornatus*), Richards Pipit (*Anthus novaeseelandiae*) and four different species of honeyeater.

A Hooded Plover survey of the Waroona district was undertaken in 2000. Hooded Plovers were recorded in the Yalgorup National Park. No evidence of their presence was recorded along the Waroona coast.

3.6.3 Amphibians and Reptiles

Eight frog species, 13 lizard species and 6 snake species are recorded on the WA Museum database for this region.

3.6.4 Coastal Habitats

From the coastal flight photography and the field survey it is apparent that most of the coastal strip is in good condition from an environmental point of view. There are a number of soaks in the chaotic dune terrain that contain fresh water to sustain mammals, amphibians and birds. Even in the central deflation areas, where the terrain is reduced to the winter water table level or distinctive wetland habitat occurs which provides space for frogs, birds and insects. The overall intent of this management plan is to conserve these areas, to keep vehicles out and to protect the sensitive habitats.

3.6.5 Threatened Fauna

The Chuditch (*Dasyurus geoffroii*) is a declared rare (threatened) species that has been

found in the Yalgorup National Park. Additional research is needed to obtain a better understanding of the fauna along the coastal strip.

The beaches and lakes of the Yalgorup National Park are considered to be one of the five major localities of importance to the Hooded Plover.

3.7 LANDSCAPE

The Waroona coast has high quality scenic values. Long stretches of coastal dunes, areas of dune blowouts, steep and irregular slopes and ridges make the Waroona coast one of excellent landscape value (Yalgorup National Park Management Plan). The high dunes covered with low soft-coloured vegetation, alongside white sands of ocean beaches are an outstanding landscape. The diverse vegetation within this scenic area varies from season to season. Most of the coastal heaths and shrubland along the coast are expansive and are generally free of man-made disturbance.

Owing to the high quality of the coastal landscapes any developments need to consider the impact on the landscape. The choice of materials and colours should always be made with the landscape in mind. Limestone and pastel colours such as blues, greens and creams should be used where possible to blend into the predominant colours of the environment.

3.8 CONCLUSIONS

From the foregoing research and analysis it is concluded that:

- 3.8.1 The Waroona coast is a sandy, highly mobile and environmentally sensitive coastline.
- 3.8.2 The Waroona coast experiences swell waves and strong onshore breezes from the south west.
- 3.8.3 The central part of the Waroona coast is accreting and surplus sand is blown into the dunes which migrate to the east.
- 3.8.4 Owing to the south westerly winds there is sediment movement (littoral drift) from south to north.
- 3.8.5 The Waroona coast consists mainly of Quindalup Dunes (Safety Bay Sand).
- 3.8.6 The coastal dunes are calcareous and are not ideal for agricultural purposes.
- 3.8.7 Disturbed sandy coastal areas can be restabilised by using brush to lift the wind and prevent drift.
- 3.8.8 The coast is affected by wind, waves and tides and these combine to create an ever changing environment.
- 3.8.9 The Waroona coast is affected by climatic cycles of short (few hours), seasonal (summer/winter), medium (11 years) and long term.
- 3.8.10 The coast is affected by storm erosion and rip current hazards.
- 3.8.11 Climatic changes attributed to the Greenhouse Effect resulting in rising sea level and increased cyclonic activity and need to be considered in coastal development situations.

-
- 3.8.12** The coastal vegetation is generally in good condition considering the lack of fertility of the soils and the affects of wind and sand movement.
- 3.8.13** The coastal vegetation is relatively fragile and should be treated with care, in particular pedestrian movement and vehicular movement can lead to vegetation damage and coastal degradation.
- 3.8.14** Coastal fauna have not been studied, however, a broad range of mammals, birds, reptiles and amphibians are present. The Chuditch is a declared rare (threatened) species in this general area.
- 3.8.15** The Waroona coast has excellent natural scenic qualities and needs to be managed conservatively.

4. COASTAL LAND USE ASSESSMENT

4.1 INTRODUCTION

The main reason for examining the land uses of the Waroona coast is to develop a comprehensive understanding of how the human uses of the coast have been superimposed on the natural environment. Such knowledge helps to ensure that human use is undertaken in a desirable manner in the future.

4.2 ABORIGINAL HERITAGE

Little has been written on the Aboriginal heritage of the Waroona coast. The following is mainly taken from the Yalgorup National Park Management Plan (1995-2005).

Radio-carbon dating has indicated that Aboriginal occupation in Western Australia has occurred for approximately 40,000 years. The name Yalgorup is derived from the Aboriginal words 'Yalgor' meaning swamp and 'up' meaning place. Vera Novak reported seven occupation sites in the National Park in her report on Aboriginal sites of the Peel-Preston Lakelands (Novak, 1975).

The southwest Aboriginal people are known as the Noongar. A recent study by Richards (1994) on Aboriginal culture and camp sites examined the Yalgorup area. A local identity, Calyute, is believed to have camped in the area north of the National Park. The Winjan Aboriginal Corporation has requested access to the National Park for cultural purposes. Involvement by the Aboriginal community in interpretation and education is being welcomed by CALM as it adds significance to the Parks values.

The area outside the park has not been examined from an archaeological point of view and it is possible that sites exist. Coastal dunes are a common burial area and with high levels of sand movement skeletal material may be uncovered from time to time. It should also be noted that all Aboriginal sites are covered by the Aboriginal Heritage Act (1972-80) whether or not the sites are known. Section 17 of the Act makes it an offence to excavate, destroy, damage, conceal or in any way alter a site without the written approval of the Minister for Aboriginal Affairs.

4.3 SETTLER HERITAGE

The following general account of the Settler History of the Waroona coast is taken from the Yalgorup National Park Management Plan (1995-2005).

Lieutenant William Preston and Lieutenant Surgeon Alexander Collie explored the coast between Cockburn Sound and Cape Naturaliste, in 1829. They came across Lake Preston and Lake Clifton (Snell, 1986).

The general area between Mandurah and Bunbury was settled by means of a large scale land settlement scheme. Five hundred settlers occupied the region between 1829 and 1830 under the leadership of Thomas Peel. This scheme failed.

A second scheme started by the West Australia Company in 1841, failed because the land was considered to be too poor in quality for agriculture (National Trust, 1973).

The Old Coast Road, originally constructed in 1842, was rebuilt by convict gangs in the 1850s. In 1921 the WA Cement Company built a lime kiln on the eastern side of Lake

Clifton. Lime marl was extracted from the lake bed. A railway line was built to Waroona. This venture did not prove economical and was closed a few years later.

A Whittakers Sawmill was constructed adjacent to the Old Coast Road in 1953. Logging of Tuarts and Jarrah trees continued until the mill was closed in 1964.

The history of the Preston Beach area was recorded by Laurie Snell (1986). The official reason for the development of Preston Beach was 'good fishing'. In the early 1950s Joe and Pam Stock, using a kangaroo for burley, caught an excellent catch of herring on a hand line. Others followed including Alf Barker who, in 1953, camped at Duck Pool (on Lake Preston) and caught a memorable haul of fish.

The land at Preston beach was owned by Steve Mitchell. In 1955 a group of Waroona residents formed a syndicate, met with Mitchell and bought 25 acres (10 hectares) from him at two pounds per acre. In 1957 members of the syndicate drew for the first 58 lots. The cost per lot to each member was originally 10 pounds. In 1959 the syndicate ceased and the Drakesbrook Road Board took over the area.

Access to Preston Beach was difficult in the early times. Residents drove across the lake in summer. In winter, when the lake contained water, a series of pegs guided drivers across. When the water reached a depth of 0.9m the crossing was impassable. In 1956 the construction of the causeway commenced. Two bridges were constructed into the causeway to permit water to flow between the lakes.

Alf Barker built the first house at Preston Beach. Originally water came from a 27.5m bore. A windmill pumped the water into a 12,000 gallon tank. Later a well was sunk near the present day beach parking area, where water was found at 1.2 metres. Since the construction of the toilets in that area in the 1970s another bore was drilled some distance away where water was found at 1.83 metres.

The subdivision to the north of the main access road, referred to as the Interwest Development, started in 1973. Electrical power was brought into the area at that time. Telephones were only installed after 1969. The caravan park and golf course started in 1978 but closed down during the recession. They reopened in 1984, the same year that the Preston Beach Progress Association was formed.

4.4 POPULATION

The Western Australian Planning Commission published the report, Western Australia Tomorrow - Population Projections for the Statistical Divisions, Planning Regions and Local Government Areas of Western Australia, in 2000. The projections for the Shire of Waroona and the City of Mandurah are as follows:

Table 5: Population Projections for Waroona and Mandurah

Year	Waroona Population	Percentage Increase	Mandurah Population	Percentage Increase
2001	3,503	-	49,420	-
2006	3,699	5.6	60,554	22.5
2011	3,899	5.4	72,465	19.7
2016	3,999	2.6	84,348	16.4

Source: WA Planning Commission

The Waroona population projection is relatively low, however, the northern neighbour Mandurah is expected to undergo a major surge in growth over the next 15 years of 34,928 people. A full population projection for the Shire of Waroona and the City of Mandurah are provided in Appendix 3. This growth is expected to result in a large amount of recreational impact on the Shire of Waroona coast and Preston Beach in particular.

On the supply side there is a scarcity of dwelling units in the region. The Coastal and Lakelands Planning Strategy indicated that there were only 2,024 dwelling units in the urban (1,544), rural-residential (390) and rural (90) areas of the region. It is anticipated, therefore, that there will be a high demand for further subdivision in the Preston Beach area over the next 15 years.

The caravan park at Preston beach has 66 caravan sites. This is the main tourist opportunity at Preston Beach at present. The Coastal and Lakelands Planning Strategy indicates that a major tourist resort at Preston Beach has been given Local Government support (p73). This presumably refers to the Preston Beach Golf Resort subdivision. The details provided indicate a 188 room resort hotel and other holiday units to R30 density. This development is proposed in the urbanized area.

4.5. REVIEW OF EXISTING FORESHORE MANAGEMENT PLANS

The project brief mentioned the 1990 Management Plan for the Preston Beach Coast (Including Preston beach Townsite) prepared by Forestec Pty Ltd. There was also a previous study by the Coastal Branch of the State Planning Commission prepared in 1988. There have also been a few more recent studies, such as the Yalgorup National Park Management Plan (1995) and the Coastal and Lakelands Planning Strategy (1997), that are relevant to the area and need to be referred to. For the sake of continuity we will start with the earliest.

4.5.1 Preston Beach Draft Coastal Plan

This report was prepared by the Coastal Branch of the State Planning Commission in 1988. The report was prepared for the Coastal Management Co-ordinating Committee as a source document for the Shire of Waroona.

The report contained a detailed examination of the environmental values of the coast and land use issues. It also identified opportunities and constraints and made management recommendations. The only aspect that was lacking was community consultation, an aspect that was not well developed at that time.

It is not clear whether the report was endorsed by the State Planning Commission or the Shire. It does not appear to have been implemented.

4.5.2 Management Plan for the Preston Beach Coast including Preston Beach Townsite

Forestec Pty Ltd prepared this plan in 1990. The scope of the study was narrower than the State Planning Commission study. It examined vehicle access to the beach and the foredune environment; management of the swimming beach and carpark area; management of recreation reserves and provision of recreation facilities in the Preston Beach townsite; management of the environment and implementation. This management plan also makes no mention of community consultation.

The main strength of the Forestec plan was that it devised a simple but effective means of permitting traffic to move south and north along the coast and, at the same time,

restricted vehicles from the beach in the central beachfront area. It should be noted, however, that the full extent of the traffic circle and parking area was not implemented.

The Forestec plan also examined the recreation facilities in the town in some detail. It noted that the existing facilities are relatively undeveloped owing to the fact that the town is used as a holiday place and there is a large absentee population. It was also noted that this would probably change in the future as the town becomes more established with a permanent population.

The control of weeds and feral animals is also dealt with in the Forestec plan. It appears that the management proposals were dependent on further studies that do not appear to have been undertaken and, as a result, the proposals, and in particular rabbit control, does not appear to have been implemented.

The Forestec plan (Figure 5) included an implementation program. It appears that some of the recommendations have been implemented, namely:

- Access routes to the beach,
- New signs and fencing, and
- Redevelop carpark area and landscape and stabilize dunes at the end of Mitchell Road.

Aspects that do not appear to have been implemented are as follows:

- Barbeque rest area at Stables Road,
- The turning circle as a distribution mechanism to the beach access paths and the beachfront parking area, and
- A survey of exotic plants and animals in conjunction with the Agriculture Protection Board.

The Forestec plan also contained planting specifications that appear to be sound. Apart from a comment that new plantings will not need additional water. The suggested species list for planting needs to be extended in that it only includes tree species. Also, the tree species cited are not necessarily suited to the frontal dune areas. Tuart are better suited to the areas behind the dunes and tend to be wind burned if located out of their habitat. The species list needs to include pioneer dune species and grasses that are appropriate frontal dune areas.

4.5.3 Peel Regional Strategy

The Department of Planning and Urban Development prepared the Peel Regional Strategy in 1994. This strategy set out broad regional land uses for the Peel Region. It included a broad land use plan for the Shire of Waroona coast and set the private coastal lands aside for Coastal Amenity.

4.5.4 Yalgorup National Park Management Plan, 1995 - 2005

In 1995 the Department of Conservation and Land Management prepared the Yalgorup National Park Management Plan for the National Parks and Nature Conservation Authority. The Yalgorup National Park includes land areas to the north and east of Preston Beach and also includes some near coastal land in the Shire of Waroona. In addition, road access into Preston Beach and the Waroona coast passes through the Yalgorup National Park and there is a close association between the National Park and the coastal areas of the Shire (Figure 6).

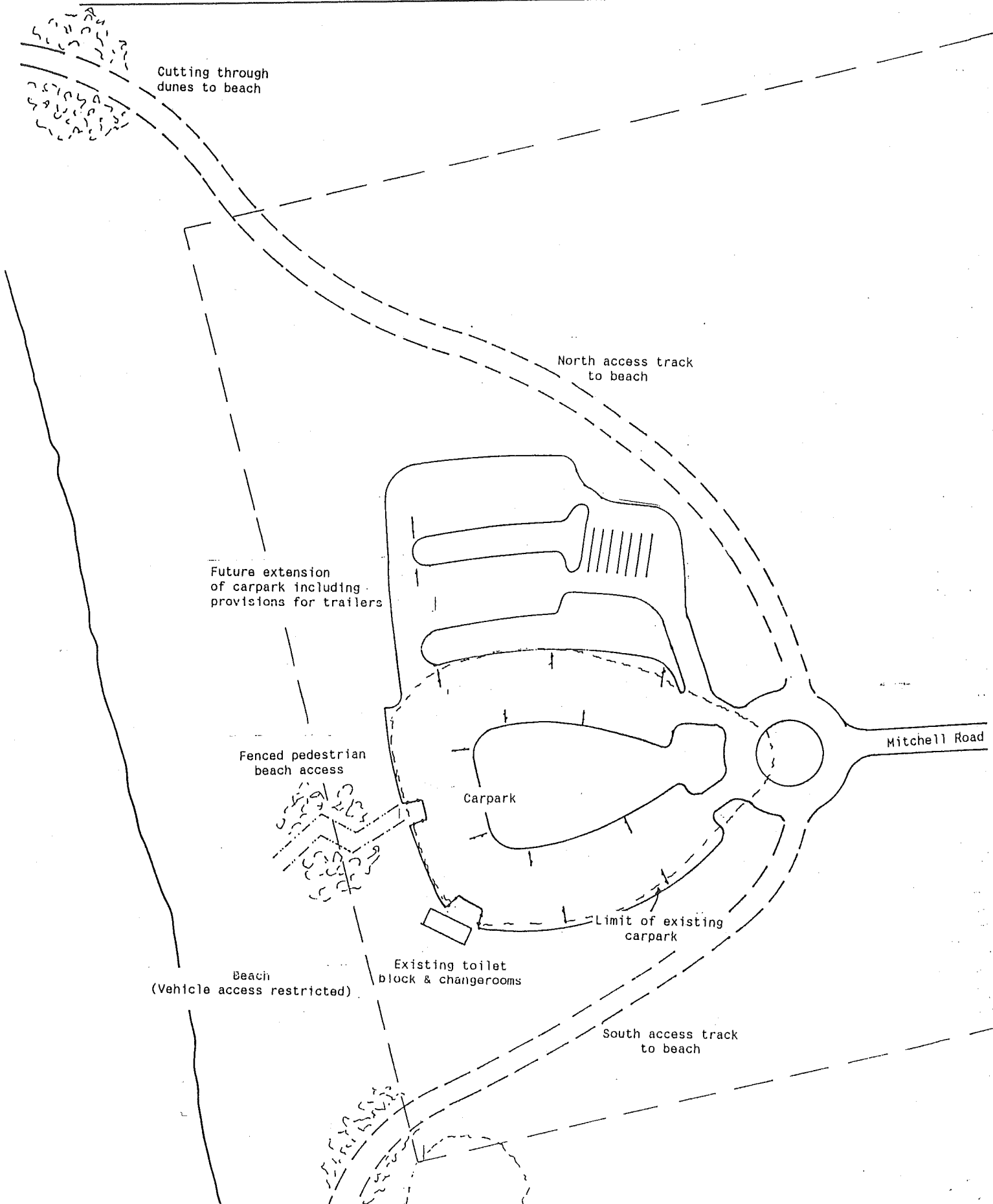


Figure 5: Forestec Pty Ltd Plan for the Beachfront.
Source: Forestec Pty Ltd, 1990 (Scale 1:700)

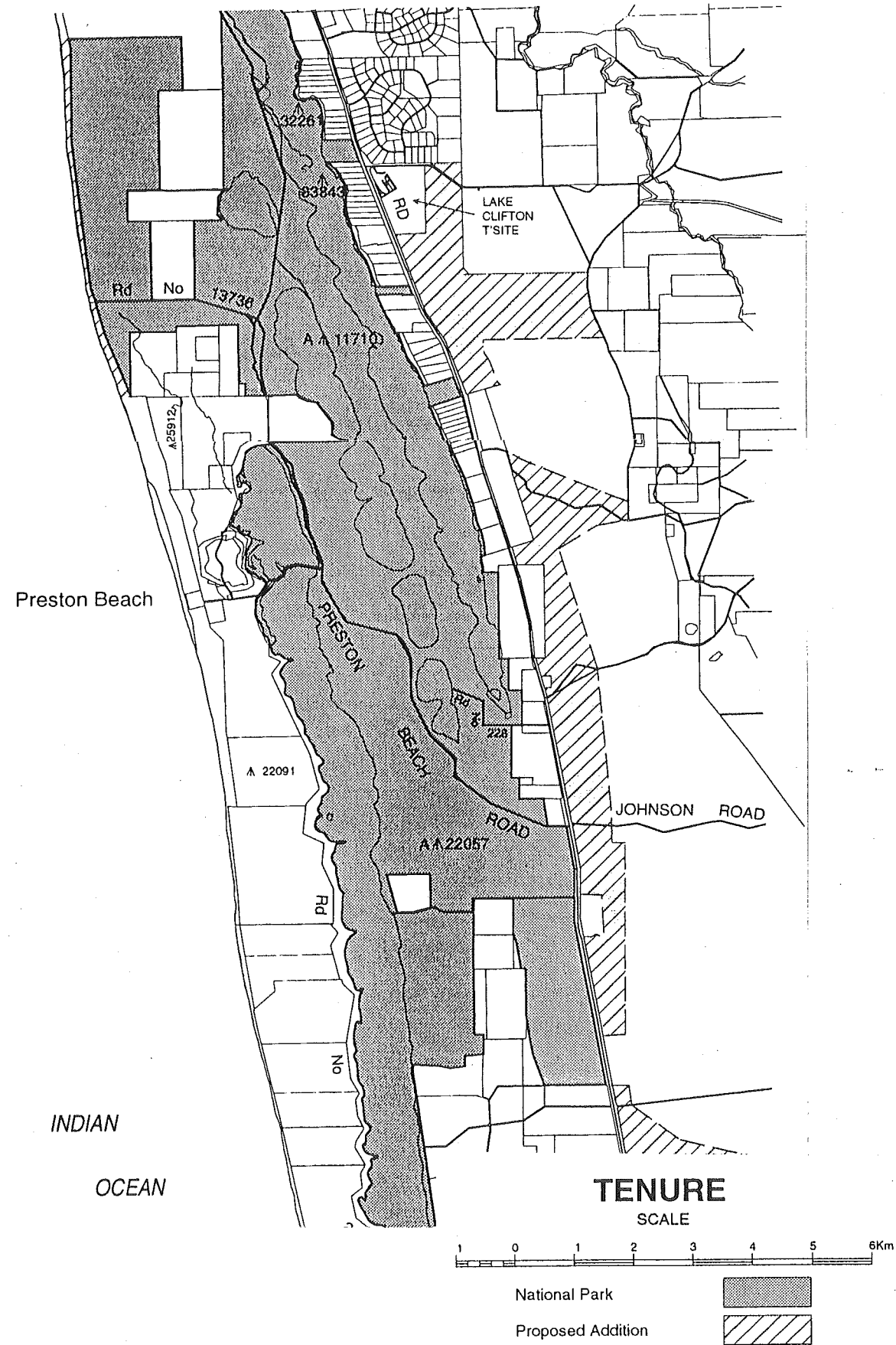


Figure 6: Yalgorup National Park
Source: CALM, 1995

Overall, the Yalgorup National Park Management Plan contains a wealth of environmental and management information that is of value to the management of the Shire's coast. In many respects the research undertaken for the preparation of the management plan has completed some of the knowledge gaps identified in the Forestec plan. For example, the assessment of exotic plants and fauna in the Yalgorup National Park Management Plan has provided answers to the questions posed in the Forestec plan.

4.5.5 Coastal and Lakelands Planning Strategy

The Western Australian Planning Commission prepared the final Coastal and Lakelands Planning Strategy in 1999. It provides a Structure Plan that covers the entire Shire of Waroona coast. The Preston Beach townsite is Urban and the coastal reserves are indicated as Other Reserves (Conservation and Recreation). The Yalgorup National Park occupies a large area of the coast north of Preston beach. The land in the south of the Shire is set aside for Rural 2 (Multiple Use, Grazing and Horticulture) (Figures 7 and 8).

The report examines the Waroona coast in detail and sets out strategies for particular sectors, namely; Preston Beach North Sector and Preston Beach to Myalup Sector (Appendix 1). In addition, the plan sets out proposals for reserves and Management in the Preston Beach area.

4.6 PRESTON BEACH GOLF RESORT

The Preston Beach Golf Resort is a planned and approved golf course estate on land to the north of the existing townsite (Figure 9). The development includes an estimated 391 dwellings, a commercial area, a hotel/motel, golf course and clubhouse and public open space (including an oval) (The Planning Group, 1999).

The proposed development will generate pressure on the coast. At present there is one planned beach access path to serve the subdivision. It is considered that a second beach access path may be needed in the future to ensure that random access does not lead to dune degradation.

4.7 CURRENT BEACH MANAGEMENT

The Waroona coast is presently managed by the Shire of Waroona. Works such as clearing sand off the beach access path and the vehicle tracks is undertaken by the Shire. The Shire also maintains the toilets, carpark and picnic area.

The Preston Beach Progress Association and, more recently, the Preston Beach Coastcare Group have undertaken rehabilitation of areas where the vegetation has become degraded through human use. It is evident that this rehabilitation work has been successful and that the area is generally well managed.

A voluntary ranger scheme has been in operation during the peak season. This arrangement is staffed by concerned residents of Preston Beach. The community is concerned that this voluntary ranger group has no power to fine or take action against offenders. It may be possible for the voluntary rangers to undertake some police training and be registered as Law Enforcement Officers as has been done in other Shires such as the Shire of Busselton.

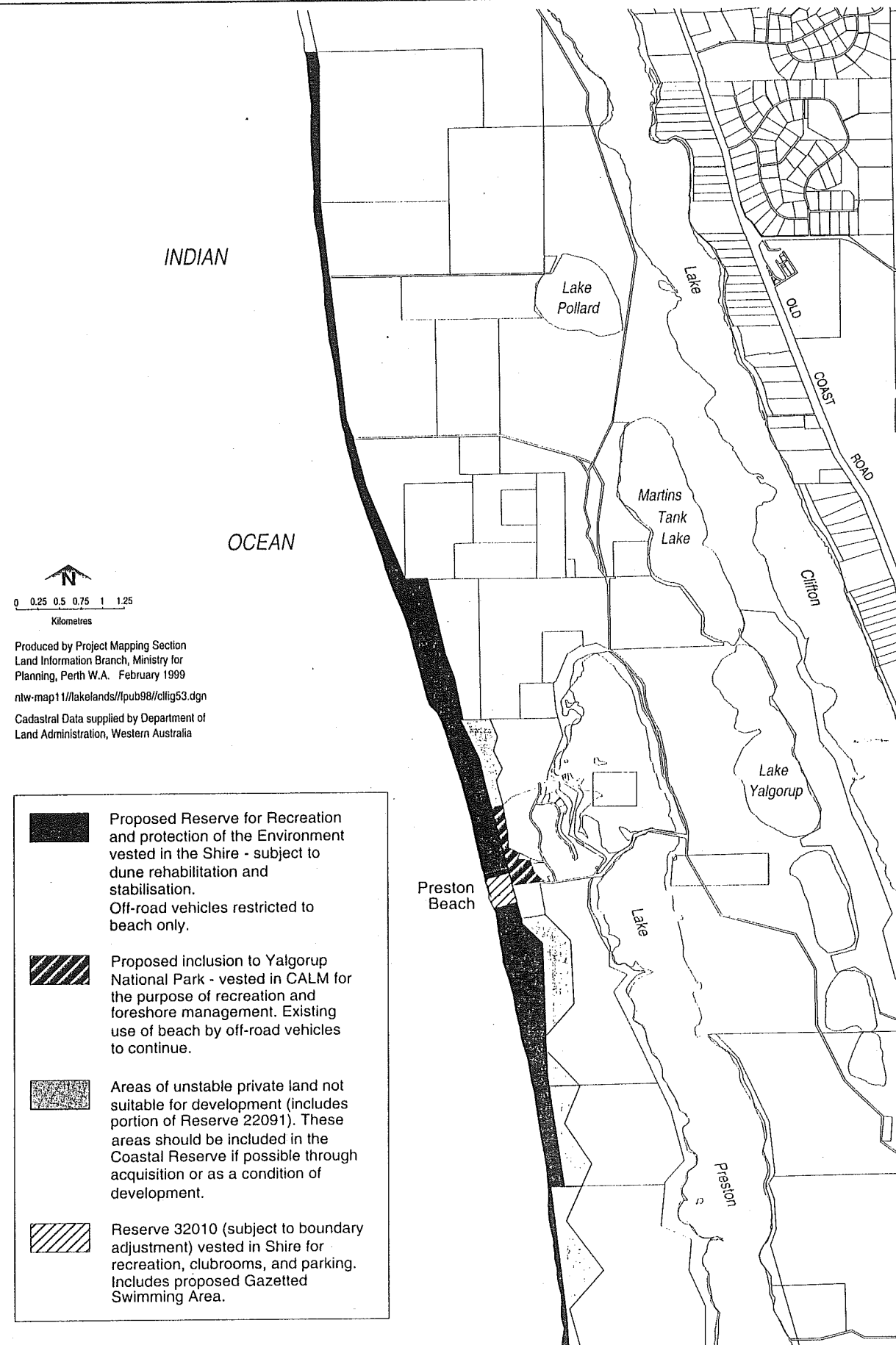


Figure 7: Waroona Coast, Proposed Reserves and Management.

Source: WAPC, 1999

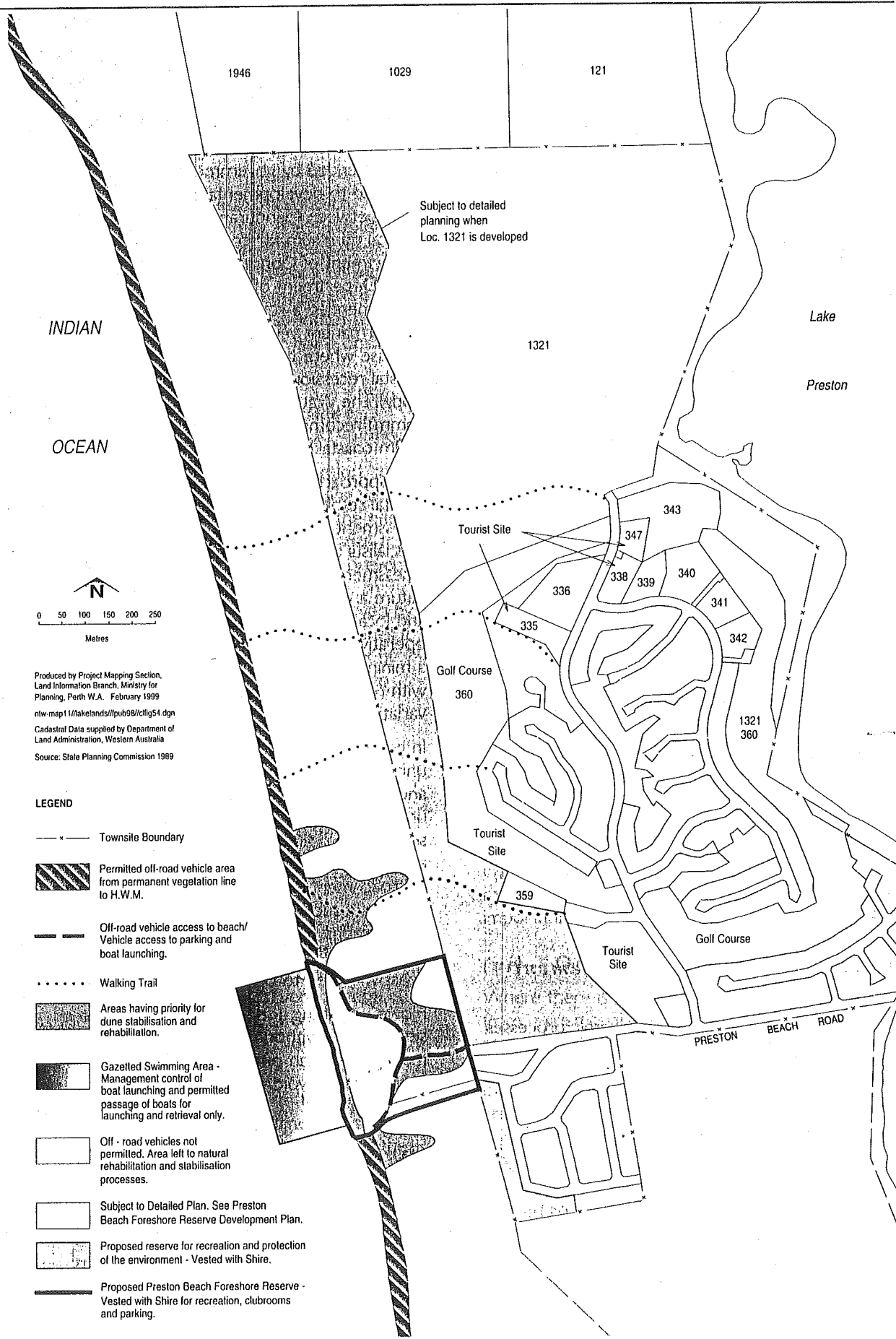


Figure 8: Preston Beach, Proposed Reserves and Management
 Source: WAPC, 1999

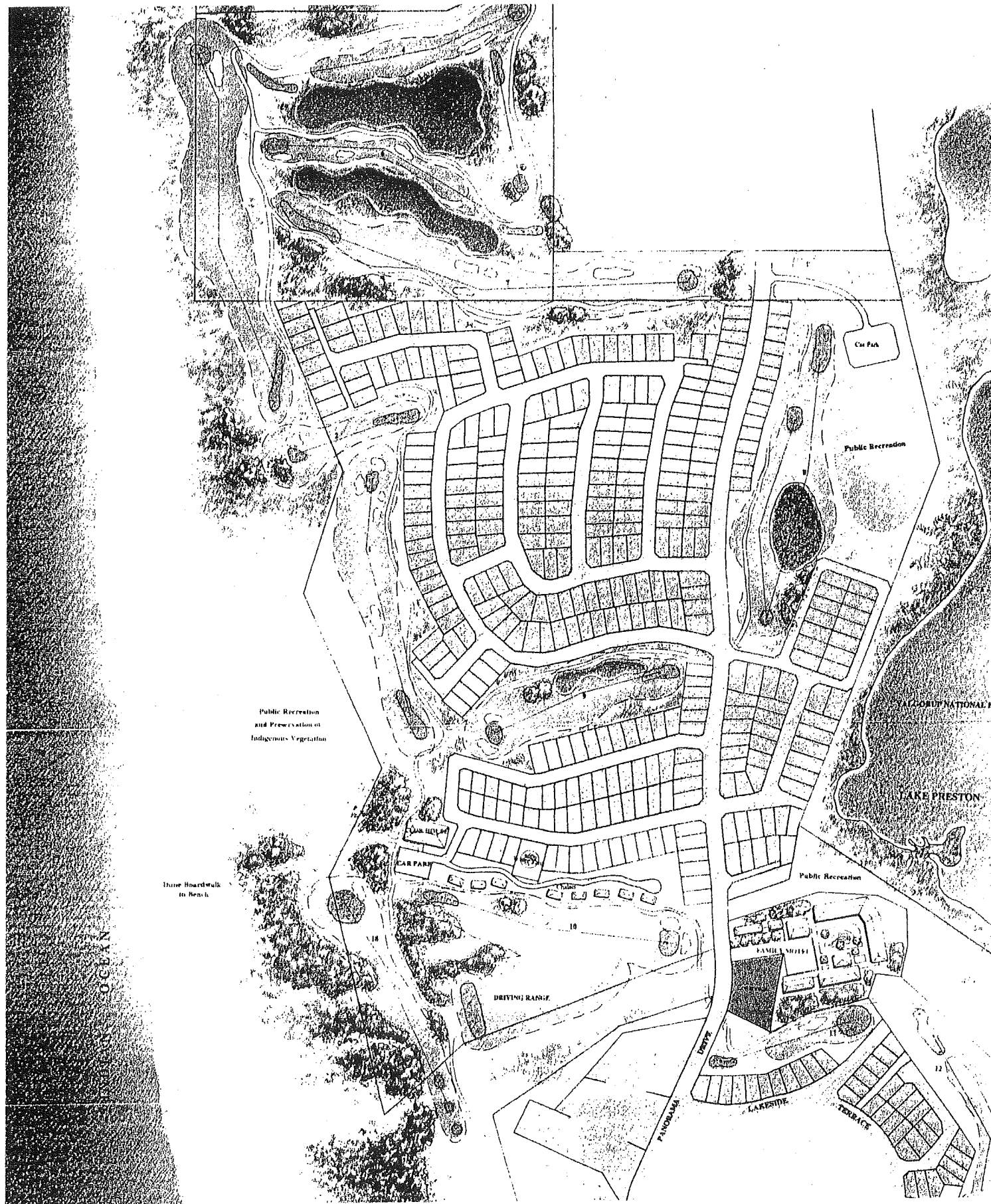


Figure 9: Preston Beach Golf Resort, Site Plan
Source: The Planning Group, 1999 (Scale 1:6,600)

4.7.1 Beach Access and Parking

The present beach access and parking arrangements at Preston Beach are as follows:

- The parking and picnic area is setback behind the foredunes because they are relatively unstable and because they provide some shelter from the strong prevailing wind.
- Two vehicular beach access tracks leave from this parking area to the south and north. Vehicles are permitted to drive on the beaches to the south and north of the central node.
- The central recreation node is intended for family beach activities and excludes vehicles and fishing. This arrangement appears to work well and ensures a safe environment for family beach activities, however, some fishing may be permitted between markers.

Our main comments on the present arrangements are as follows:

- The southern beach access track is oriented directly into the prevailing wind and this results in beach sand being blown along the track. This is a relatively unstable situation and could be improved by realigning the track to enter the beach to the northeast.
- The places where the north and south beach access tracks converge is not the best from a traffic management point of view. The original plan was a good one in that it proposed a turning circle with the entry road, parking area and two access tracks. Unfortunately this plan was not implemented.
- The current picnic area is very small and although it has become established it could be enlarged and improved. Some modifications are proposed, in Section 6, to increase the size of the picnic area and to relocate some of the parking further east.

Preston Beach is currently the only two wheel drive beach access node on the Waroona coast. There is, however, the opportunity to provide additional access via Reserve 22091 to the south of Preston beach. It would be possible to provide a picnic area and beach access at this point. The Preston Beach Progress Association is currently opposed to this area being opened up. It should, however, be considered as an option to be reviewed in the future.

Similarly, it is possible to provide two wheel drive access to the coast north of Preston Beach via the Yalgorup National Park. There is an existing limestone road that provides access close to reserve R11710. This is another option that would need to be investigated with Conservation and Land Management in the future.

4.7.2 Public Safety

The fact that vehicles are able to drive relatively long distances to the south and north of Preston Beach brings up the aspect of beach safety. If emergencies occur in remote areas it is relatively difficult to provide assistance to them. It is suggested that a safety code be devised to appeal to beach users to follow. This, together with emergency contact numbers, could be posted on a notice board adjacent to the north and south access roads to remind beach users of the public safety issues. Leaflets, including a list of emergency numbers, could also be made available for people traveling north and south.

4.7.3 Beach Amenities

During the Field Survey the remains of a beach shelter were observed. Such amenities are difficult to locate on a beach owing to storm erosion and the changing summer and winter beach sand levels. Shade structures on beaches have generally been unsuccessful. It is therefore suggested that beach users bring their own shade in the form of cabanas, umbrellas or informal tarpaulin structures. It is preferable not to construct any permanent structures along the beach.

Other amenities such as toilets, barbeques and picnic areas are better located away from the beach. These are well located behind the dunes at Preston Beach.

4.7.4 Information / Education

It is suggested that an information/education shelter be constructed near the parking area/picnic area to inform residents and visitors about the values of the natural environment, to provide a map for visitors and to provide a 'code of conduct' for beach users.

4.7.5 Signs

Too many signs can be a form of visual pollution and this is not proposed. A few signs in key places, however, can provide good advice and can be used to protect the environment. Signs placed at strategic places along the remote areas of coast requesting vehicle users to keep out of the dunes may be effective in protecting the environment.

The best and most effective signs we have seen were used on the Onslow coast in the 1980s. They were signs that took a humorous approach to requesting people to do the right thing. These signs were protected by the local residents rather than being vandalized or removed, because they appealed to their better nature.

4.7.6 Litter on the Beach

Litter left on the beach can spoil the quality of the beach and reduce the recreational experience and value. The best approach is to request beach users to remove their own litter and rubbish and take it back to their homes to be disposed of via the Shire's rubbish removal service. Alternatively, a large bin could be located near the parking area for people to throw their rubbish away once they come back from the beach. Bins should always be closed with a lid to discourage animals from fossicking for food and to minimize the spread of litter.

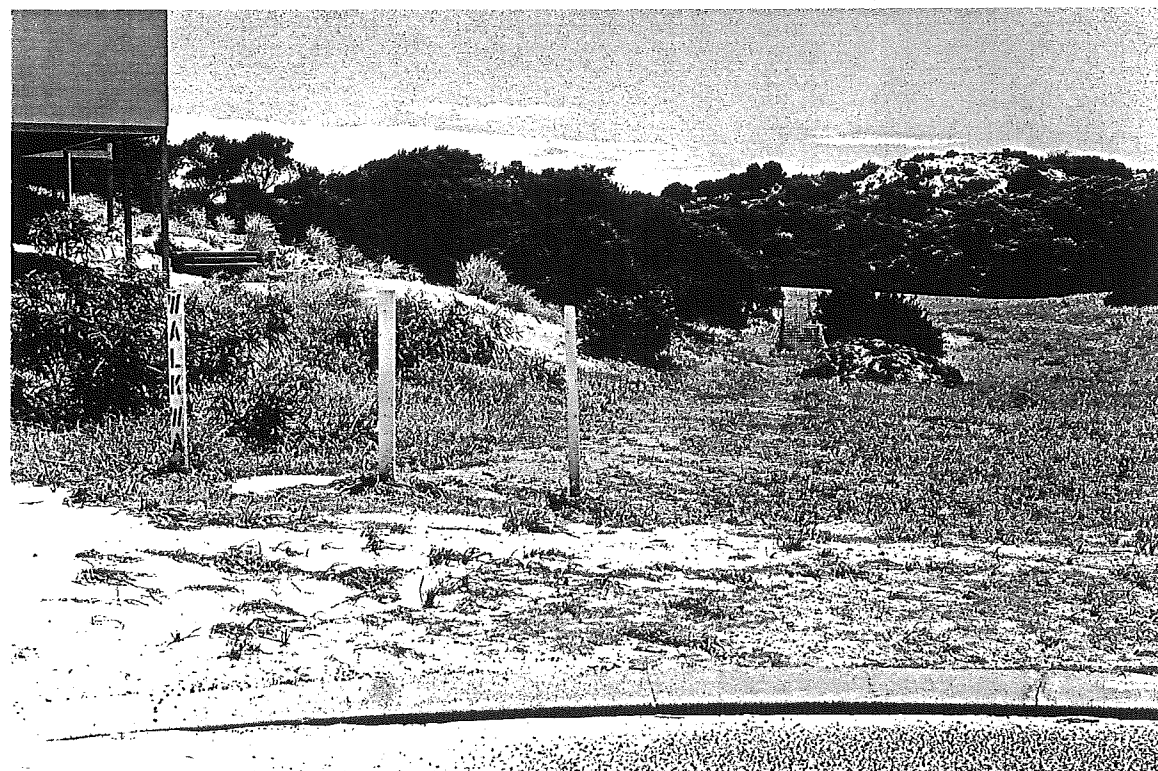
4.7.7 Beach Access Paths

There is presently random beach access from the Preston Beach residential areas. As time goes by and resident numbers increase the random access will lead to environmental degradation and possibly to dune blowouts. For this reason it is proposed that formal beach access paths be constructed. They should be fenced and bare sand areas around the paths should be brushed so as to prevent sand drift occurring. It is our opinion that at least two beach access tracks should be provided for the new Stage 2 development.

4.8 CONCLUSIONS

The foregoing assessment of the land use came to the following conclusions:

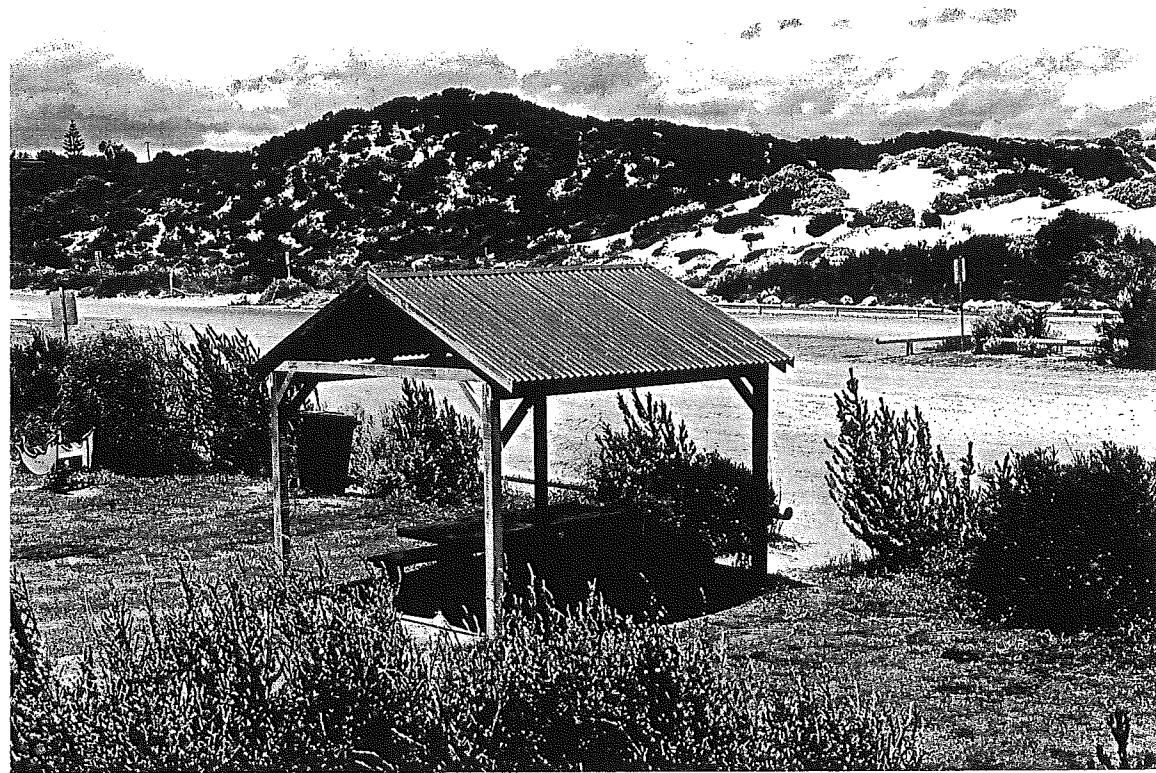
- 4.8.1 Little is known about the Aboriginal heritage of the Waroona coast. It is considered likely that Noongar people inhabited the area before it was settled. The coastal dunes are often used as burial sites but no recorded findings of skeletal material has occurred.
- 4.8.2 The Waroona coast has a well documented heritage since European settlement.
- 4.8.3 Population projections for the Shire of Waroona indicate a low growth rate between the present and 2016. The City of Mandurah, however, on the northern boundary is expected to have a large population increase and that will apply considerable pressure to the Waroona coast.
- 4.8.4 A few foreshore management plans have been prepared for the Waroona coast in the past. Some of the previous recommendations have been implemented but some still need to be implemented.
- 4.8.5 Regional planning projects have in the past made recommendations for the Waroona coast. Generally these recommendations have been positive to the natural environmental qualities. Recommendations to transfer coastal reserves, presently managed by the Shire, to CALM for inclusion in the Yalgorup National Park, have not been acceptable to the Shire.
- 4.8.6 There are plans to develop a Golf Course Resort estate to the north of the present townsite. One beach access path has been designed and it is suggested that a second path may be needed by the time the development is completed.
- 4.8.7 The current beach management was assessed and found to be generally in good condition. It was concluded that the southern vehicular beach access could be improved, that an improved vehicle distribution pattern could be achieved and that a larger picnic/recreation area should be constructed. Also, public safety considerations need to be addressed, beach shelters are difficult to manage, an information/education shelter would be good and that the area needs to be well sign-posted. The main pedestrian beach access path needs to be maintained, litter needs to be managed and Lot 84 has potential for short term tourist accommodation.



Photograph 4: Part of the existing planned walkway from Bouvard Place to the beach.



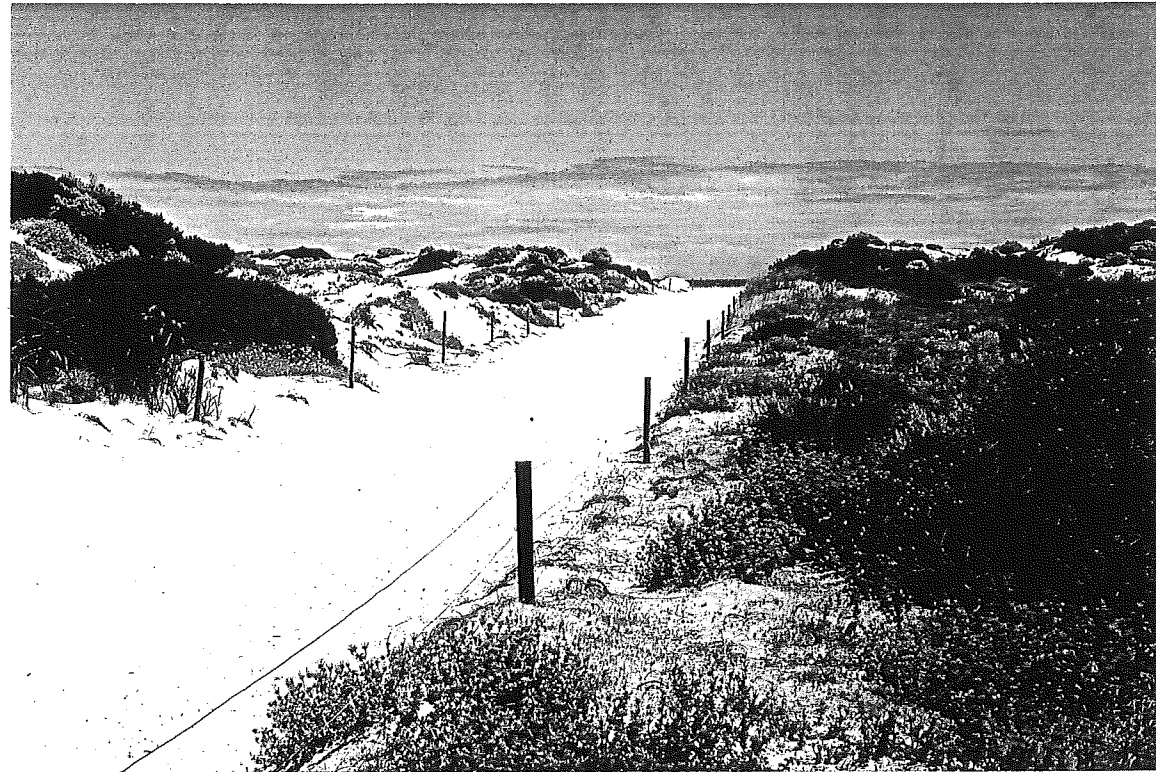
Photograph 5: Bare sand areas through which the planned pedestrian path will pass.



Photograph 6: Shade shelter in the existing picnic area.



Photograph 7: Area that could be used for rerouting northern vehicle access track and parking.



Photograph 8: Southern vehicle access track.



Photograph 9: Northern vehicle access track.

5. COMMUNITY CONSULTATION

5.1 VISIONS WORKSHOP

A visions workshop was held at the Preston Beach Community Centre at 10am on Sunday 14 October 2001. The workshop was attended by approximately 40 people. The agenda for the workshop was as follows:

- Opening by Mrs Valerie Heath of the Preston Beach Progress Association.
- Brief background by Rory O'Brien of **CoastWise**, Coastal Planning and Management.
- Small group discussions relating to the values, concerns and visions for the Waroona coast.
- Large group feedback and discussion.

Table 6 is a summary of the main points that came out of the small group discussions and that were written up as part of the large group feedback.

The main points to emerge from the attendees in terms of **values** related to the relative remoteness, the peaceful environment, the recreation opportunities, the natural surroundings, good community spirit and the low level of commercial intrusion.

The main points to emerge from the attendees in terms of **concerns** related to the need for urban services and inputs that are standard in large urban areas, namely; limited parking, improved rubbish collection, need for rangers, need beach shelters, footpaths, boat ramp, first aid post, disabled access, beach recreation facilities and sheltered swim area. Most of these will make Preston Beach more like any other coastal area and less remote.

The main points to emerge from the attendees in terms of **visions** related to providing more services to make Preston Beach more urban, namely; groyne, reticulate golf course, provide viewing platform, wheelchair access, fulltime ranger, cycleways, increased parking and shade shelters.

5.2 QUESTIONNAIRE SURVEY

5.2.1 Discussion of Survey Responses

In order to provide as broad a range of residents and absentee landowners, an opportunity to contribute to the planning, a questionnaire survey was sent to all residents and was placed in the Waroona Community Newspaper (Appendix 2). In total 35 completed questionnaires were received back by the end of November 2001. The questionnaires were analysed and a full report is set out (Appendix 3). The main aspects to emerge from the questionnaire survey are as follows:

Question 1: Normal place of residence?

The largest number of respondents were from absentee landowners living in Perth.

Question 2: How often visit coast?

Most of the respondents visit Preston Beach 'several times a year'.

Question 3: Mode of transport?

The most frequently used vehicles to access the beach are 4WDs.

Table 6: Consolidated results of Community Vision Workshop held at Preston Beach on Sunday 14 October 2001

VALUES	CONCERNS	VISIONS
<ol style="list-style-type: none"> 1. Fishing 4WD access to the beach 2. Peaceful Environment 3. Clean pollution-free environment 4. Children play area, fishing and vehicle-free 5. No boat ramp 6. Crime-free 7. Surrounded by National Park 8. Wildlife abundant 9. Close to Perth 10. Non-commercial 11. Non thoroughfare, no traffic 12. No hotel, no antisocial behaviour 13. Ranger patrols 14. Community minded 15. Sunsets 16. Local services, shop, essentials 17. Good co-operation with Waroona Shire (low rates) 18. Low land values 	<ol style="list-style-type: none"> 1. Limited car parking at beach 2. \$50 fine inadequate for riding/driving in dunes 3. Rubbish collection inadequate 4. Volunteer rangers powers inadequate 5. Commercial property development 6. No beach shelters/shade 7. Vandalism 8. Footpaths and street trees inadequate 9. Close 4WD on beach 10. Development - boat ramp 11. No First Aid in beach area 12. No disabled access 13. Lack recreation facilities at beach 14. 2WD trail bikes, ban, damage to dunes 15. Sea rescue - notice only 16. Rubbish on beach 17. Lack of sheltered swim area 18. Camping in dunes (south & north) 19. Local government co-operation 	<ol style="list-style-type: none"> 1. Groyne proposal (boat launch/swim area/oval) 2. Restrict access sand dunes 3. Reticulated Golf Course 4. Viewing platform boardwalk - wheelchair access 5. Fulltime ranger, authority 6. Ambulance post - nursing (4WD for beach) 7. More cycleways around area 8. Increase parking capacity 9. Exclude commercial activities 10. Maintain closed beach section 11. More shade shelters and trees 12. Set speed limit on beach 13. Status quo, more of same 14. No groyne, no boat ramp 15. Make phone nos of ranger/emergency available at beach 16. Network walking paths 17. Tuarts - dying - revegetate

Question 4: Coastal activities?

The most frequent forms of recreation are; beach fishing, walking, swimming, sunbathing and relaxation.

Question 5: What like about Waroona coast?

The things that people like about the Waroona coast are similar to the **values** identified during the visions workshop. The most frequently referred to are; the relative isolation, the naturalness, the peace and quiet, and the lack of sophistication.

Question 6: What don't like?

The things that the respondents do not like have been divided up into several categories. The most frequently mentioned aspects fell into the category of **amenities** with **administration** and **access** issues an equal second. There were also some aspects that are beyond the scope of the study to resolve.

Question 7: Improvements would like to see?

The **improvements** that the respondents would most like to see were divided up into a number of categories. The most frequently mentioned categories are **environment** with **amenities** a close second. There were also some improvements indicated that are beyond the scope of the study to resolve.

Question 8: General comments?

The **general comments** were divided into a number of categories. The most frequently mentioned were **environmental** with **administration** second. There were a number of comments relating to issues that are beyond the scope of the study to resolve.

5.2.2 Issues Arising from the Questionnaire Survey

The following **issues** will be discussed in more detail:

- **Vehicles on beach:** It is generally agreed that driving vehicles on the beach does not damage the beach. Damage may be done, however, at the back of the beach where dune vegetation may be destroyed, hence leading to degradation. Vehicles should also be used responsibly on the beach. A beach is a recreation area where people relax - it is not a highway.
- **Sandy walkways to beach:** Preston Beach is a more sandy environment than most owing to excess sand coming ashore. The dunes are wider and more unstable than most places. Sand-free access can be provided on raised walkways but such structures are extremely expensive and may be beyond the financial capabilities to provide.
- **Lack of shade shelter:** Beach sand changes continually and providing fixed structures in a changing environment generally leads to difficulties. Generally, around Western Australia shade shelters are provided in stable back beach areas such as Floreat Beach. The general trend is to encourage beach users to take their

own shade in the form of cabanas, umbrellas or other fabric shelters. For those using 4WDs on the beach tarpaulins are also an option.

- **Gravel carpark should be bitumen:** Bitumen carparks are being promoted less frequently in coastal areas in recent times. They are expensive, absorb heat and can burn bare feet. From a landscape point of view crushed limestone is being preferred as it blends better into the environment.
- **Beach too rough:** The roughness of the surf is a function of incoming ocean swells, degree of reef protection and slope of beach. These are natural environmental aspects that vary from time to time. In some places Local Governments are turning to the construction of paddling pools for small children. Such pools could be provided fairly inexpensively in beachfront areas. They do, however, raise safety and liability questions that need to be addressed. For this reason they have not been recommended at Preston Beach.
- **Reticulate golf course:** Golf courses require extremely high volumes of water and tend to lower the water table in areas from where the water is taken. This can result in loss of trees as the water table declines. An example of this is at Port Kennedy where pumping of water for the golf course has led to general vegetation degradation. If such a proposal is to proceed a detailed assessment of impact should be considered.
- **Provision for the disabled:** Provision for the disabled is a worthwhile objective. In some areas this is relatively easy to achieve. Preston Beach is not an easy place to provide disabled access owing to the distance from the parking area to the beach. An elevated boardwalk would be extremely expensive and would incur high maintenance costs. As this is the preferred option by the community we have included a boardwalk as a recommendation.

5.3 SUBMISSIONS

Following the invitation for written comments three submissions were received. The main issues mentioned in the submissions are as follows:

5.3.1 Submission No 1

We would like to see a reef or artificial bank just offshore to provide a safe swimming area for our grandchildren, or, a few artificial pools at about high tide which could be used for the same purpose.

Comment:

The construction of a suitable reef as proposed might be possible but would require considerable research and design inputs. Usually such structures are based on an existing limestone reef to gain stability. In a coastal environment such as Preston Beach where there is a great deal of sand coming ashore a reef structure may rapidly fill with sand.

The concept of a pool is one that has been successfully used in the appropriate places. For example, there is a paddling pool at Cottlesloe Beach. It is, however, sheltered behind the groyne and is above the high tide level. This concept may be better located to the east of the dunes.

5.3.2 Submission No 2

- With reference to beach access for disabled persons, the Shire of Capel have investigated a moon-buggy type of vehicle to transport disabled people to the beach.
- Sand boarding is a potential concern at Preston beach. This is an illegal activity.
- Beach access paths from the Preston Beach townsite need to be planned to prevent random access degradation.
- Will you be supplying the costs for the recommendations?

Comments:

Dot Point 1: The Capel proposal of a 'moon buggy' or assistance from residents with 4WD vehicles may be a better option than trying to construct a boardwalk.

Dot Point 2: Sand boarding 'per se' is an illegal activity because it generally leads to dune degradation.

Dot Point 3: Beach access paths will be planned as part of the present project.

Dot Point 4: We will indicate cost estimates for the proposals.

5.3.3 Submission No 3

The third submission consists of a 22 page updated report titled, "Preston Beach: Vision for the Future". The report deals with Preston Beach, coastal attractions, less attractive features, most valuable asset (community), the coastline, voluntary rangers, sand dune blowouts, coastal dune ecology, dune conservation, driving on the beach, estimates of vehicle numbers and visitors, a beachfront proposal, boat ramp fees, photographs and annexures.

The proposal for the beachfront (Figure 11) includes the following; large bitumen carpark, 150 metre groyne, oval, playground, picnic area, boat ramp, ramp management, lighting, beach access, commercial fishing, glass bottom boat, beach excursions, boat moorings and possible future marina.

Comment:

The analytical section of the report contains a number of aspects that we agree with, namely; the coastal dunes are natural, dune blowouts are not necessarily caused by 4WD vehicles, wind moves sand and builds dunes, coastal vegetation stabilizes sand dunes and controls sand drift, vehicles can not harm beaches and vehicles can destabilize sand dunes. We agree with the conclusion that vehicles should be permitted to use beaches for picnics and fishing.

The beachfront proposal, however, needs a considerable amount of further research and investigation. The aspects that we are concerned about are as follows:

- The parking area is too close to the beach (it penetrates too deeply into the coastal dune system and may be vulnerable to storm attack).

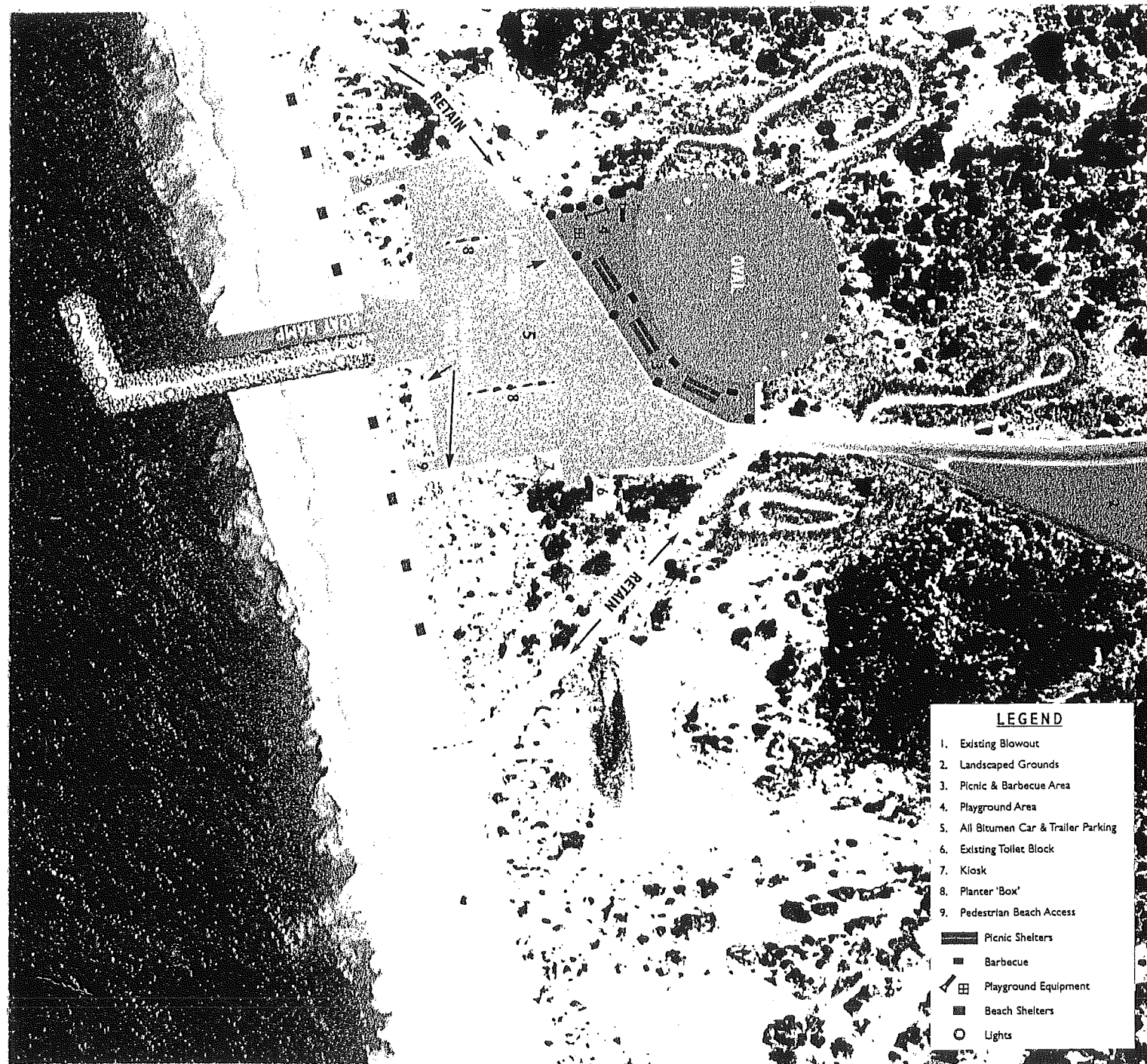


Figure 10: Proposed Groyne, Boat Ramp and Public Recreation Plan.
 Source: Mr K Munns, undated (No scale on original plan)

- Limestone walls will not stop the sand blowing onto the carpark. (The best way of controlling sand is by means of dunes and vegetation).
- The groyne will need to be fully researched by a Coastal Engineer. A study is about to commence at Binningup in the Shire of Harvey to determine the feasibility of a similar structure there. We contacted Mr Peter Kay (one of the Shire Engineers) who confirmed the above.

Groynes usually accumulate sand on the side that littoral drift approaches from (in this case the south) and are eroded on the leeward side (north). The beach on the northern side could be lost, thereby reducing access onto the northern beaches and probably damaging the foredune:

We suggest that a decision on this aspect should wait until the results of the Binningup study are published.

- The oval and picnic areas would be highly exposed to the strong prevailing wind. We recommend that the oval be relocated to the eastern side of the town and that small sheltered picnic areas be constructed in stable areas near the coast.
- The beach shelters proposed are in a location that is affected by rises and falls in sand level and would need continual maintenance. We therefore recommend that they are not constructed.

5.4 FOLLOW-UP MEETING

A follow-up meeting was held at the Preston Beach Community Centre at 1.00pm on 9 December 2001. The meeting was well attended. Twenty five people recorded their names.

The consultant presented a summary of the draft report. This included an overview of the environmental factors, the land use aspects, community consultation and concluded by discussing the recommendations and the proposed foreshore plan.

After the presentation the assembled community members raised the following concerns:

- The proposed option for providing disabled access was of concern to a disabled community member. A boardwalk was preferred.
- Concern was expressed that not all the ratepayers were notified of the meeting. It was therefore decided to place copies of the draft report at the shop and the library for community comment until the end of January 2002.
- The possibility of developing a jetty was discussed. Some people thought that it should be included in the report as an option.
- There was some discussion about the proposed kiddies paddling pool in the picnic area and the need for good management.

The meeting ended at approximately 3.00pm.

6. MANAGEMENT RECOMMENDATIONS

6.1 INTRODUCTION

The Waroona coast is fairly unique in that it has large amounts of sand being deposited over a 10 kilometre stretch and strong on-shore winds that have blown the sand inland to form foredunes, deflation hollows and parabolic blowouts. As a result, the Waroona coast is one of the most fragile areas on the Western Australian coast, at present, and needs to be managed more carefully than most.

The ever increasing pressure from people using the coast for fishing and 4WD along the coast is expected to increase more rapidly in the future. The use of vehicles on the beach is environmentally sustainable, however, the big temptation is to drive into the dunes and cause irreparable damage. This is the main management aspect north and south of Preston Beach.

The study brief called for three district coastal sectors, namely; north of Preston Beach, Preston Beach and south of Preston Beach. As the management recommendations for the coast south and north of Preston Beach are virtually the same, we therefore propose to make two sectors, namely; the intensive use sector at Preston Beach and the remote sector, south and north of Preston Beach.

Based on the goals, objectives and principles and informed by the analysis and consultation with residents, the following are the planning and management recommendations for the Waroona coast.

6.2 GENERAL RECOMMENDATIONS

6.2.1 Introduction

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

6.2.2 Revegetation and Weed Management

The quality of the vegetation along the Waroona coast is generally good. Some areas contain a relatively natural system and others have some exotic vegetation. 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.

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

Recommendation 2: *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.*

Recommendation 3: *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 near Preston Beach 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. Refer to AgWA Coastal Rehabilitation Manual by Oma 'et al'.

Recommendation 4: *Degraded dune areas near Preston Beach should be fenced and covered with brush to discourage pedestrian traffic, to lift the wind off the sand and to promote seed germination and revegetation.*

6.2.3 Fauna Habitats and Feral Animal Control

Foxes and Cats 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.

Recommendation 5: *A program to eradicate feral animals from particular areas should be developed by 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.*

6.2.4 Beach Access

Owing to the ongoing accretion of the coast to the north and south of Preston Beach and the resulting high volumes of sand that are blown inland, it is proposed that hard structures, such as buildings and parking areas, are set back approximately 100 metres to prevent dune erosion and structures being swamped by sand drifts.

Recommendation 6: *Parking facilities should be set back from the beach on stable land. Parking areas should be separated from the active foreshore by a managed 100 metre dune buffer.*

6.2.5 Boat Launching

Owing to relatively high coastal energy on the coast to the north and south of Preston Beach, it is only possible to launch boats over the beach during calm surf conditions. The opportunity to construct a boat launching structure may be possible following detailed assessment by a Coastal Engineer and would need to be approved by the Department for Planning and Infrastructure, Marine Division.

Recommendation 7: *Boat launching facilities at Preston Beach should be maintained as low key for the foreseeable future or until adequate funds are available to undertake a detailed Engineering assessment.*

6.2.6 Recreation Activity

The Waroona coast is 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 fishing, swimming and paddling. The beach areas are used for games, sunbathing, picnics, walking, jogging, fishing and paddling.

Recommendation 8: *Recreational activities should be given a high priority as a beach use along the Waroona foreshore.*

6.2.7 Fire Management

Recommendation 9: *The use of fires along the coast for picnics should continue to be prohibited. Personal gas barbeques should be encouraged in order to further reduce the risk of fire spreading to surrounding coastal vegetation.*

Recommendation 10: *In the event of a fire, people should be discouraged from entering the affected area so that vegetation cover is replaced as soon as possible.*

6.2.8 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 Waroona foreshore. There was some litter in high usage areas but these were well supplied with rubbish bins and they appeared to be well used.

Recommendation 11: *The Shire's staff should continue the rubbish collection in order to ensure the maintenance of a litter free coastal environment.*

Recommendation 12: *A sign should be erected at each of the main beach vehicular entry points requesting beach users to remove rubbish and dispose of it through existing rubbish removal services.*

6.2.9 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 Waroona foreshore.

Recommendation 13: *A system of signs for the coast in the Shire should be prepared along with locational guidelines so as to ensure that they enhance the landscape rather than detract from it.*

6.3 RECOMMENDATIONS FOR THE PRESTON BEACH SECTOR

6.3.1 Introduction

The Preston Beach sector is located adjacent to the Preston Beach township and caters for the highest number of beach users on the Waroona coast. This sector is located partly on Reserve 32010/5099 that has an area of 7.58ha and reserve 41 776/5601 that has an area of 286.62ha. This entire sector is part of an accreting coast that is subject to parabolic dune blowouts and deflation hollows. For this reason this sector is extremely fragile and needs to be managed conservatively (Figures 12 and 13).

Recommendation 14: *The Preston Beach sector is extremely fragile and should be managed conservatively.*

6.3.2 Dune Stabilisation

Most of the dune blowouts on the Waroona coast are natural and it is not worth considering stabilizing them on the basis of effort or cost. There are a few particular unstable areas adjacent to the town that should be managed so as to prevent them becoming more unstable and developing additional sand drifts that may inundate private property, roads and public amenities.

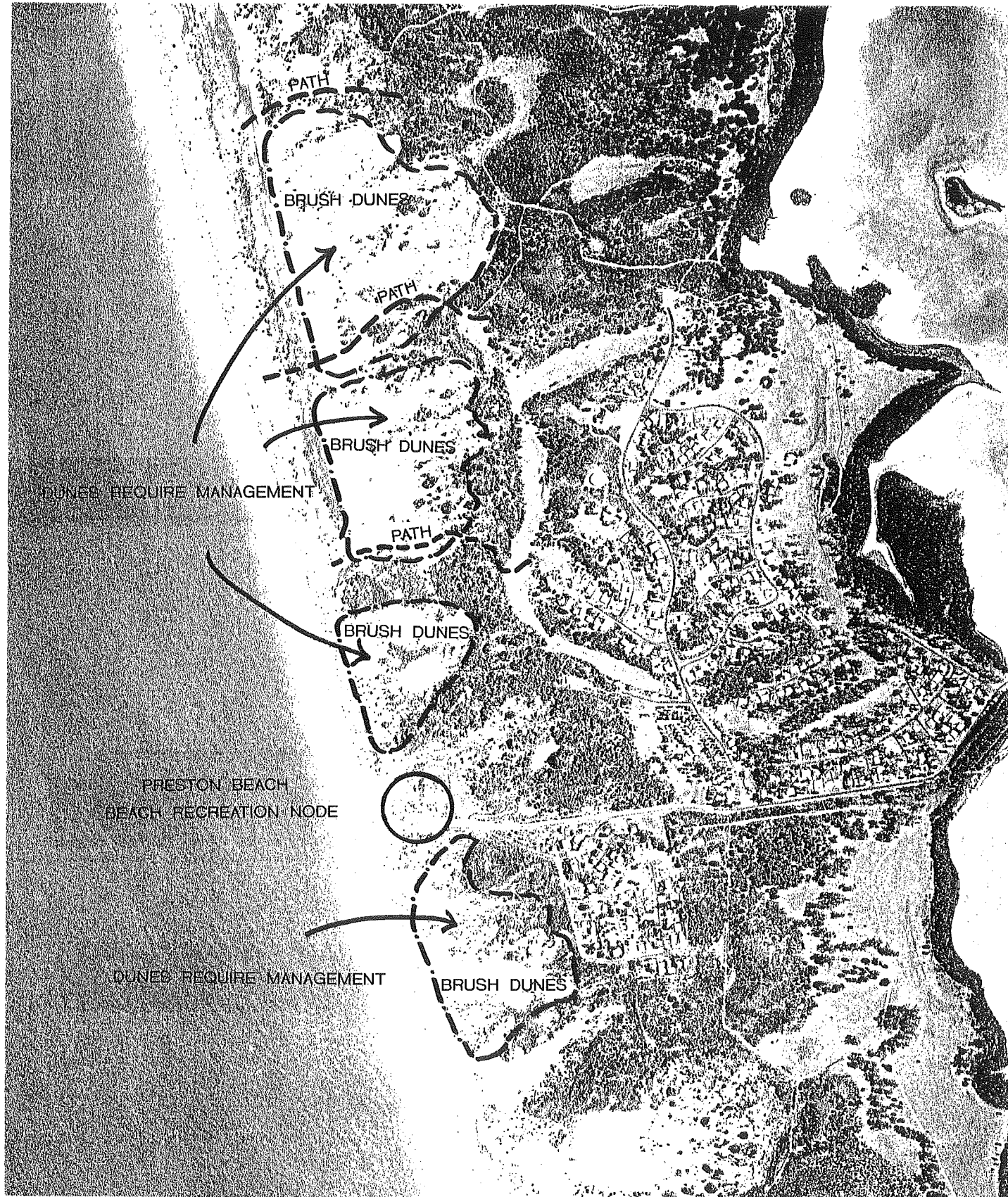


Figure 11: Waroona Coast Recommendations
Source: Dept of Land Administration photograph (Scale 1:11,500)

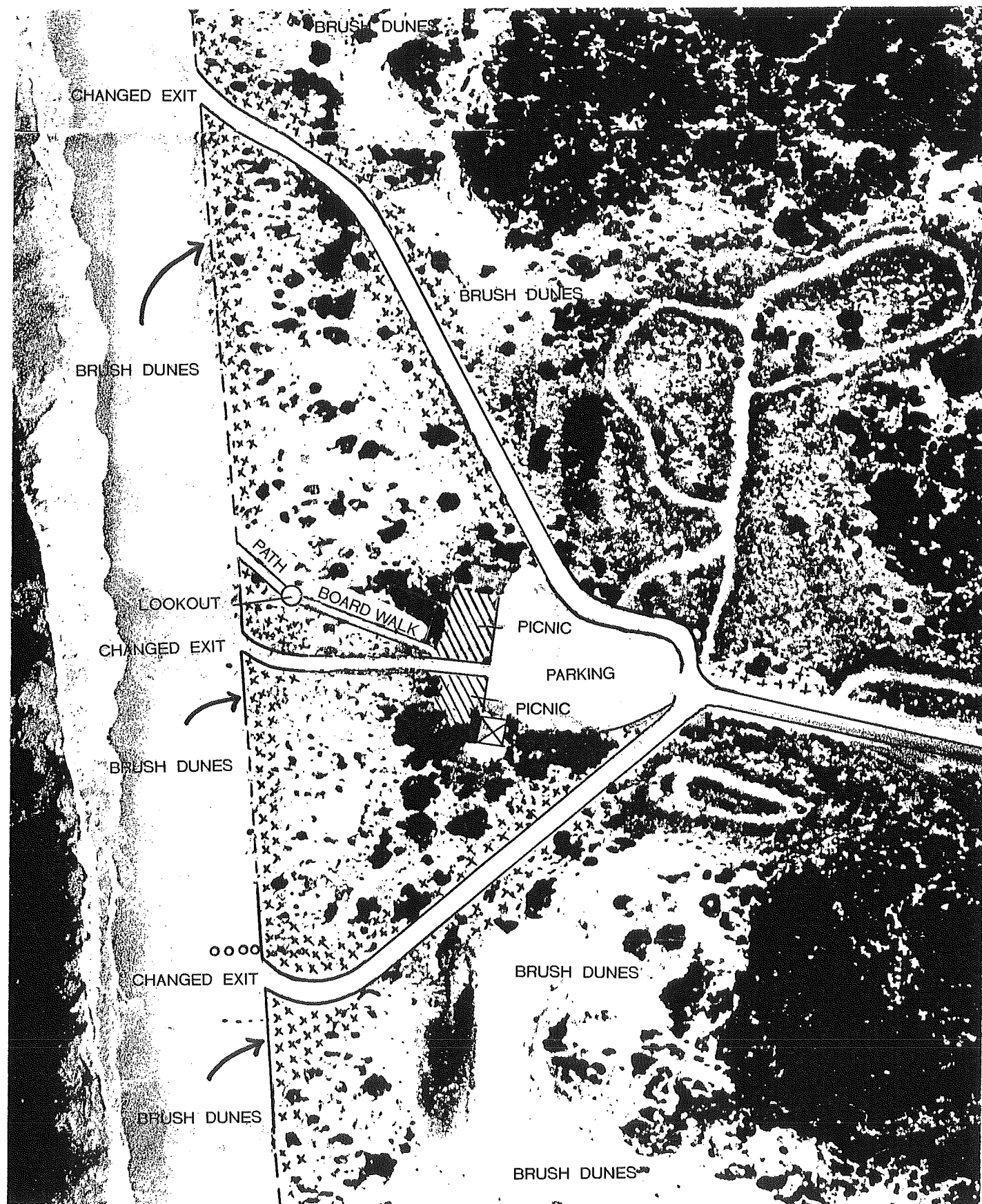


Figure 12: Preston Beach Recommendations (Scale 1:2,300)

Recommendation 15: *Parabolic blowouts adjacent to the town and amenities should be managed. The recommended management is to prevent pedestrians and vehicles from entering them. If funds and adequate labour can be mobilized, brush the dunes in the same way as the deflation hollow north of Mitchell Road was treated).*

6.3.3 Parking/Picnic Area

The parking/picnic area at Preston Beach is well set back from the beach owing to coastal accretion and excess sand making the coastal foredunes potentially unstable. The parking area appears to be large but we are informed that it is filled to capacity in peak season. The picnic area is relatively small and has the potential to be increased in size.

Recommendation 16: *The parking area should be retained in roughly its present position with additional parking spaces provided on the northern side.*

Recommendation 17: *The picnic area should be increased in size (as shown on Figure 12) and trees should be planted for shade.*

6.3.4 Pedestrian Beach Access

The present beach access path is generally longer than would be recommended, however, this is considered necessary because of the instability of the foredune area. Access paths are also needed from the Preston Beach townsite. At least one path is proposed from the end of Bouvard Place and two from the new Preston Beach Golf Resort.

Recommendation 18: *Beach access paths should be constructed from the end of Bouvard Place and two future paths should be designed into the new Preston Beach Golf Resort to the north of the existing townsite (Figure 11). These paths should be fenced and the edges brushed to ensure sand drift does not occur.*

Recommendation 19: *The existing pedestrian path to the beach from the parking area should be maintained in its present form. The opening onto the beach will need regular maintenance to clear excess sand and the dune areas adjacent to the path, especially to the south of the beach entry, need to be brushed to encourage vegetation cover.*

Recommendation 20: *The existing path should be maintained and should be regularly managed to clear excess sand and the dune areas adjacent to the beach exit should be regularly brushed to increase vegetation cover.*

6.3.5 Vehicular Beach Access

The present vehicular beach access system generally works well, however, there are a few aspects that could be improved, namely; the separation system on Mitchell Road and the alignment of the southern access. The southern beach access road faces directly into the prevailing wind. This tends to funnel sand along the road and is contrary to good coastal management principles.

Recommendation 21: *The general vehicular beach access system should be maintained but should be improved by creating T intersections to distribute traffic safely between the southern beaches, the parking area and the northern beach access. The southern beach access should be realigned to prevent sand being blown directly along the road.*

6.3.6 Beach Recreation

The present system of separating out the family beach recreation uses from the 4WD oriented activities to the north and south is generally good but could be improved. There could be more detailed separation of uses on the beach, namely; swimming areas (first checking that there are no rips) and fishing areas (for those who do not have 4WD vehicles) and no vehicles.

Recommendation 22: *The general beach recreation between the southern vehicle beach access and the northern vehicle beach access should be maintained with vehicles excluded and other activities such as swimming and fishing permitted in particular areas.*

6.3.7 Disabled Access

The Preston Beach coast is extremely sandy and the cost of providing and maintaining a disabled access would be extremely costly. The boardwalk is, however, the preferred option requested by the community.

Recommendation 23: *A boardwalk should be constructed from the parking area to the beach.*

6.3.8 Dog Exercising

People who own dogs regard them as family and some provision needs to be set aside for this activity. It was considered that an area be set aside for this use. Community feedback is that a separate dog beach is not warranted in the short term.

Recommendation 24: *Dogs should be permitted on the beach on the understanding that dog excrement be removed and disposed of by dog owners.*

6.3.9 Information/Education

Information and some education on the natural environmental qualities of the Waroona coast would assist in beach users doing the right thing. An information/education board would assist in this process. Such a board could also contain emergency phone numbers and directions to the nearest phone.

Recommendation 25: *An information/education shelter should be constructed in a central area such as the carpark to inform people about the management, environmental safety, emergency numbers and nearest public telephone.*

6.3.10 Signs

A good sign system needs to be established so as to direct people and inform people but should not become clutter in the landscape.

Recommendation 26: *A system of signs for Preston Beach should be developed so as to direct and inform people but not detract from visual values.*

6.3.11 Litter

Litter detracts from the visual quality of a beach. A system of rubbish removal from the area needs to be maintained by the Shire. Beach users should be encouraged, by means of signs, to take their rubbish home for disposal.

Recommendation 27: *A rubbish removal system from the parking/picnic area should be continued and this should be backed up with the expectation that beach users remove their own rubbish and take it home for disposal.*

6.4 RECOMMENDATIONS FOR THE SOUTHERN AND NORTHERN BEACH SECTORS

6.4.1 Introduction

The southern and northern beach sectors are similar in that they comprise access along the beach that is backed by a fragile foredune system. The following are the main recommendations for these sectors:

Recommendation 28: *The driving of 4WD vehicles and trail bikes on the northern and southern beaches should be permitted on the understanding that vehicles should not disturb dune vegetation on the back of the beach or enter the dunes for any purpose.*

6.4.2 Dune Stabilisation

The dunes along these sectors are fragile and potentially unstable. Signs need to be placed at regular intervals to remind beach users not to drive into the dunes.

Recommendation 29: *Signs reminding people not to enter into the dunes should be erected at each entry point to the southern and northern coastal sectors.*

6.4.3 Litter

All litter and rubbish from beach users in these sectors need to be removed by the beach users. Signs need to be erected to remind people. These can be included in the signs recommended in Section 6.4.2 above.

Recommendation 30: *All litter and rubbish generated in the northern and southern beach sectors should be removed by the beach users and taken home. Signs to this effect should be erected at regular intervals (500 metres).*

6.4.4 Additional Coastal Access

With the ongoing growth of population in the region and the increasing number of vehicles, particularly two wheel drive vehicles, additional coastal access points should be identified with CALM in the future.

Recommendation 31: *Additional coastal access points should be identified with CALM possibly in the vicinity of Reserve 11710 in the north. Additional access in the south may be possible via Shire controlled R 22091.*

6.5 RECOMMENDATIONS FOR IMPLEMENTATION

6.5.1 Coastal Management Committee

The undertaking of this project has highlighted the need for co-ordinated coastal management in the Shire.

Recommendation 32: *The Shire should consider the possibility of forming a Coastal Management Committee to work together with the Preston Beach Progress Association and the Preston Beach Coastcare group.*

7. IMPLEMENTATION STRATEGY

7.1 INTRODUCTION

The implementation of the proposals set out in the Waroona Foreshore Management Plan will involve a considerable amount of work over many years. Once the priority issues have been identified and programmed, they will need to be costed and budgeted. If some of the proposals generate income, they should be identified at an early stage to assist in the funding of other proposals.

7.2 PRIORITIES

Priorities have been categorised as follows:

- Short term (S) - within next financial year
- Medium term (M) - within next 5 years
- Long term (L) - unspecified
- Ongoing (O) - ongoing

7.3 RECOMMENDATIONS, PRIORITIES AND COST ESTIMATES

7.3.1 General Recommendations

Recommendations	Priorities	Cost Estimates
✓ Recommendation 1: <i>Pedestrian and vehicular access paths onto the beach should be clearly fenced and signposted to prevent general deterioration of vegetation in their vicinity.</i>	M	\$3,000
Recommendation 2: <i>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>	O	--
Recommendation 3: <i>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.</i>	S	--
✓ Recommendation 4: <i>Degraded dune areas near Preston Beach should be fenced and covered with brush to discourage pedestrian traffic, to lift the wind off the sand and to promote seed germination and revegetation.</i>	L	\$10,000
Recommendation 5: <i>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.</i>	M	\$5,000

<p>Recommendation 6: <i>Parking facilities should be set back from the beach on stable land so that the parking installations do not suffer damage. Parking areas should be separated from the active foreshore by a managed 100 metre dune buffer.</i></p>	S	--
<p>Recommendation 7: <i>Boat launching facilities at Preston Beach should be maintained as low key for the foreseeable future or until adequate funds are available to undertake a detailed Engineering assessment..</i></p>	L	--
<p>Recommendation 8: <i>Recreational activities should be given a high priority as a beach use along the Waroona foreshore.</i></p>	M	--
<p>Recommendation 9: <i>The use of fires along the coast for picnics and barbeques should be discouraged and personal gas barbeques should be encouraged in order to further reduce the risk of fire spreading to surrounding coastal vegetation.</i></p>	S	--
<p>Recommendation 10: <i>In the event of a fire people should be discouraged from entering the area so that vegetation cover is replaced as soon as possible.</i></p>	S	--
<p>Recommendation 11: <i>The Shire's staff should continue the rubbish collection in order to ensure the maintenance of a litter free coastal environment.</i></p>	O	--
<p>Recommendation 12: <i>On more inaccessible beaches signs should be erected requesting beach users to remove rubbish and dispose of it through existing rubbish removal services.</i></p>	5	\$15,000

7.3.2 Recommendations for the Preston Beach Sector

Recommendations	Priorities	Cost Estimates
<p>Recommendation 13: <i>A system of signs for the coast in the Shire should be prepared along with locational guidelines so as to ensure that THEY enhance the landscape rather than detract from it.</i></p>	O	\$5,000
<p>Recommendation 14: <i>The Preston Beach sector is extremely fragile and should be managed conservatively.</i></p>	O	--
<p>Recommendation 15: <i>Parabolic blowouts adjacent to the town and amenities should be managed. The recommended management is to prevent pedestrians and vehicles from entering them. If funds and adequate labour can be mobilized, brush the dunes in the same way as the deflation hollow north of Mitchell Road was treated.</i></p>	O	\$5,000

<p>✓ Recommendation 16: The parking area should be retained in roughly its present position with additional parking spaces provided on the northern side.</p>	S	\$10,000
<p>✓ Recommendation 17: The picnic area should be increased in size (as shown on Figure 12), trees should be planted for shade.</p>	S	\$30,000
<p>Atty Modif Recommendation 18: Beach access paths should be constructed from the end of Bouvard Place and two future paths should be designed into the new Preston Beach Golf Resort to the north of the existing townsite. These paths should be fenced and the edges brushed to ensure sand drift does not occur.</p>	S	\$10,000
<p>Recommendation 19: The existing pedestrian path to the beach from the parking area should be maintained in its present form. The opening onto the beach will need regular maintenance to clear excess sand and the dune areas adjacent to the path, especially to the south of the beach entry, need to be brushed to encourage vegetation cover.</p>	S	\$5,000
<p>Recommendation 20: The existing path should be maintained and should be regularly managed to clear excess sand and the dune areas adjacent to the beach exit should be regularly brushed to increase vegetation cover.</p>	O	\$3,000
<p>Recommendation 21: The general vehicular beach access system should be maintained but should be improved by creating T intersections to distribute traffic safely between the southern beaches, parking area and northern beaches. The southern beach access should be realigned to prevent sand being blown directly along the road.</p>	S	\$15,000
<p>Recommendation 22: The general beach recreation between the southern vehicle beach access and the northern vehicle beach access should be maintained with vehicles excluded and other activities such as swimming and fishing permitted in particular areas.</p>	S	--
<p>Recommendation 23: A boardwalk should be constructed from the parking area to the beach.</p>	S	\$50,000
<p>Recommendation 24: Dogs should be permitted on the beach on the understanding that dog excrement be removed and disposed of by dog owners.</p>	S	--
<p>✓ Recommendation 25: An information/education shelter should be constructed in a central area such as the carpark to inform people about the management, environmental safety, emergency numbers and nearest public telephone.</p>	M	\$10,000
<p>Recommendation 26: A system of signs for Preston Beach should be developed so as to direct and inform people but not detract from visual values.</p>	S	\$5,000

Recommendation 27: <i>A rubbish removal system from the parking/picnic area should be continued and this should be backed up with the expectation that beach users remove their own rubbish and take it home for disposal.</i>	S	--
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7.3.3 Recommendations for the Southern and Northern Beach Sectors

Recommendations	Priorities	Cost Estimates
Recommendation 28: <i>The driving of 4WD vehicles and trail bikes on the northern and southern beaches should be permitted on the understanding that vehicles should not disturb dune vegetation on the back of the beach or enter the dunes for any purpose.</i>	O	--
✓ Recommendation 29: <i>Signs reminding people not to enter into the dunes should be erected at each of the entry points to the southern and northern coastal sectors.</i>	S	\$4,000
✓ Recommendation 30: <i>All litter and rubbish generated in the northern and southern beach sectors should be removed by the beach users and taken home. Signs to this effect should be erected at regular intervals (500 metres).</i>	S	--
Multy T-nsst 3-ndy Recommendation 31: <i>Additional coastal access points should be identified with CALM possibly in the vicinity of Reserve 11710 in the north. Additional access in the south may be possible via Shire controlled R 22091.</i>	M	--

7.3.4 Recommendations for Implementation

✓ Recommendation 32: <i>The Shire should consider the possibility of forming a Coastal Management Committee to work together with the Preston Beach Progress Association and the Preston Beach Coastcare group.</i>	S	--
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The above cost estimates total \$180,000 and should be funded through Coastcare grants and State and Shire resources, over several years.

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APPENDIX 1

COASTAL SECTORS FROM THE COASTAL AND LAKELANDS PLANNING STRATEGY

Preston Beach North Sector

Preston Beach North Sector

This sector consists of freehold lots separated into three nodes, two of which are enclosed on three sides by national park. The southernmost node adjoins the northern boundary of Preston Beach townsite. A cluster style development has been proposed for the central node.

The *Yalgorup National Park Management Plan (1995)* proposes retention of Preston Beach North Road, which gives access to the central node. The management plan designates the park strip abutting that road as recreation, and proposes full vehicle access to within walking distance of the beach, with four-wheel drive access for the remainder. In these circumstances, a parking area to "local" standard would be appropriate.

Legal access to the two northern nodes is by way of road No. 228 through to White Hill Road, for most of its length through national park. The management plan envisages closure of this road. This cannot properly occur while it provides legal access to properties. The road, presently a partly unconstructed track, passes through significantly critical areas of Lake Clifton frontage and remnant vegetation.

Any development of the nodes would require upgrading of road access to full public road standard. Freehold subdivision in this sector into small lots is not considered appropriate because of the potential impact on the National Park. If subdivision is considered for approval, it should be on the basis of site density - one site per 10ha, with lot variation to reflect environmental considerations or strata-titled clusters. Figure 6.1 illustrates the principles involved.

Tourist, recreational and resort development for short-stay holiday accommodation should, subject to assessment of all environmental factors and impact on the National Park or coastline, be considered for approval. Subdivision should be restricted to that necessary for these permitted developments, including strata-titling.

Development density overall (strata residential, chalets, motel rooms, caravan sites) should not exceed one per 10ha, with an upper limit of 100 units in any one short-stay residential development. Road access between the two southern nodes through the narrow separating park area should be considered, allowing a direct link to Preston Beach. This road access could be at, or close to, the limit of full vehicle access referred to earlier.

Preston Beach Myalup Sector

Preston Beach to Myalup Sector

The sector consists of a single line of lots between the coast and Lake Preston. The lots range in size between 40ha (Loc 560) and 300ha (Loc 1280).

A considerable portion of each lot (up to one-third in some instances) is subject to dune blowouts in an eroding coastal environment, forming a continuous barrier along the entire length of the sector. This area of mobile dunes, together with certain other vulnerable landforms has been used to define a coastal hazard line. Areas of the Vasse landform occupy the foreshore of Lake Preston.

Some residential uses, and minor areas of clearing or parkland clearing exist, located principally on the Vasse landforms and on the more moderate slopes of the Quindalup dunes. Other land uses are a multiple-occupancy development on Pt Loc 698, and a strata-titled residential estate on Lot 100. This latter, in the northern sector of the lot, equates to a density of one dwelling unit per 2ha. It has been suggested that the density is too high in this sensitive environment, and that one unit per 5ha could be more appropriate if strata-titled residential development is considered for the area in the future.

Legal road access to holdings is provided by Road No. 233, Lake Preston Road, which occupies the immediate foreshore of Lake Preston.

South of Preston Beach townsite, access to holdings is by way of an unformed access track through Loc 1321, Reserve 22091 and Loc 1280.

From Myalup northward, an unsealed formation of trafficable standard is substantially within the road reserve to the northern boundary of Lot 100, and provides access to the facility for water-based recreational activities on the southern part of Lake Preston.

From Lot 100 northwards to Loc 1147, an unformed access track is substantially not in the road reserve, but through the freehold locations. Construction of a public road for these locations in the sector north of Lot 100, if located within the formal road reserve, would result in massive destruction of the fringing vegetation of Lake Preston, resulting in unacceptable deterioration of the lake environs and the lake itself as part of the National Park.

Any development north of Lot 100 would require provision for adequate public road access, and this should not be constructed in the existing reserve for Road No. 233.

Development in any form, other than for the existing uses, should provide a new access/tourist road on a suitable alignment, as proposed in Figure 6.2.

A new road alignment will require further study, based on consideration of the landform/soil conditions, and comprehensive environmental assessment. It is desirable that should construction of the road occur it will be in association with development proposals.

Subdivision into small freehold lots should not be permitted. Residential development and future tourist/holiday development, when considered appropriate, should:

- be at a density not greater than one unit (strata-title residential unit, chalet, motel unit, caravan site) per 5ha of site area;
- provide adequate environmental assessment, including conditions of local groundwater flow;
- include measures for dune stabilisation;
- preclude direct beach access except for pedestrian access where this can be achieved in an environmentally acceptable and stable manner;
- provide appropriate additions to the foreshore of Lake Preston.

That part of Road Reserve No. 233 which occupies foreshore land across the southern end of Lake Preston, and which is not occupied by the road formation, should be closed and incorporated into the National Park. Lake Josephine, which is located between the southern end of Lake Preston and Myalup Beach Road, is identified in the Strategy for inclusion in the park. The lake is an attractive wetland and forms a natural extension of the Lake Preston environment.

APPENDIX 2

QUESTIONNAIRE

- What locality do you live in?

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- How often do you use the beach?

Daily	Weekly	Fortnightly	Monthly
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- How do you travel to the beach?

Walk	Cycle	Car	Bus
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- What are your main recreational activities at the beach?

Swimming	Sunbathing
Fishing	Dog Exercising
Walking	Picnicking

Other.....

- What do you like about the Waroona coast?

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- What don't you like about the Waroona coast?

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.....

- Are there any changes you would like to see along the Waroona coast?

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.....

- Do you have any general comments about the Waroona coastal environment?

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.....
.....

APPENDIX 3

SHIRE OF WAROONA
FORESHORE MANAGEMENT PLAN

Questionnaire Results

1.	Where is your normal place of residence?			
	Perth	20	Brunswick	1
	Preston Beach	8	Dwellingup	1
	Waroona	2	Yarloop	1
	Merredin	1		
2.	How often do you visit the coast of the Shire of Waroona coast/Preston Beach?			
	Several times a year	17		
	Weekly	7		
	Monthly	7		
	Daily	5		
	Annually	0		
3.	How do you get to the Shire of Waroona coast/Preston beach?			
	4 WD vehicle	21		
	Road only/2 WD vehicle	15		
	Walk	6		
	Cycle	0		
4.	What things do you use the Shire of Waroona coast/Preston Beach for?			
	Beach fishing	30	4 wheel driving	14
	Walking	26	Dog exercising	8
	Swimming	26	Surfing/bodyboarding	6
	Sunbathing/relaxation	24	Boat fishing	3
	Picnicking	17	Off-road vehicles (eg 3-wheelers)	0
	Other	Viewing wildflowers		
		Bushwalks		
		We visit our property		
		Sharing with friends and visiting family		

5. What do you like about the Shire of Waroona coast/Preston Beach?

- 4WD access to where you can swim. Fish and relax on the beach
- Taking relatives and friends to beach for recreation
- Watching the glorious sunsets, whales.
- Clean environment, can drive along beach to various fishing spots
- It allows beach access by 4WD to enable the aged, those disabled and small children beach recreation such as picnicking, swimming, beach fishing and family gatherings
- Isolation, natural park, the beach walks, the golf course.
- The closeness to Perth, natural surroundings, holiday atmosphere
- Clean beach, peaceful, beach access, forest walks
- Peaceful atmosphere with no drunks and loud mouths
- People are friendly
- Fairly safe for family
- General lifestyle
- Not developed, not heavily visited
- Star watching, bird life
- Good fishing, safe area for children, 4 WD access , condition of parking area.
- Seclusion, laid back quiet little town
- Open vistas
- Lack of through traffic.
- Beautiful beaches, relaxing lifestyle
- Peace, quiet, closeness to town.
- The beach foremost and the bushland, golf, etc and general peace of the area
- 4WD access to remote fishing spots
- Has had a facelit, new facilities and access from Yarloop
- Peace and solitude - away from the City.
- It has a country (rather than a suburban) feel about it, the beach, National Park.
- Quiet, undeveloped nature, National Park and wildlife, relaxation, peace and tranquility, friendly locals.
- Good fishing and a long beach to drive on.
- Close to Waroona township - not too many people there.

6.	What don't you like about the Shire of Waroona coast/Preston Beach?
6.1.	<p>Amenities:</p> <ul style="list-style-type: none"> • Dogs off leads and urinating on my car tyres • Lack of walkways to the beach (other than through sand) • Lack of shade shelter • No decent large park, no swing • No decent public tennis courts (caravan park one in poor condition) • Uncontrolled dogs, litter left on beach by fisherpeople and 4WD and bikes in dunes • People fishing in the beach area • Not in favour of beach groyne plus boat ramp. • No disabled access, no beach shade, no lifesavers. <p>Administration:</p>
6.2.	<ul style="list-style-type: none"> • Lack of signage outlining 'do's and don't's" • Lack of substantial fines for people camping, driving or cycling in dunes. Minimum fine should be \$1,500, presently \$50, people still camping on dunes. • More ranger presence especially to prevent fishing in swimming area • The rate at which the Shire rates are increasing, with no or little improvement to the facilities • That they are considering a large resort which will change the whole relaxing lifestyle into just another suburbia - would cause damage to coastline • The potential the Shire has to close the beach to 4WDs.
6.3.	<p>Access:</p> <ul style="list-style-type: none"> • Motor cycles traveling at excessive speed on beach, beach being torn up, sandhills being damaged • Perception that beach will be closed to 4WD vehicles • Minority groups trying to close the beach or restrict beach usage by attempting to place levy on 4WD • Gravel carpark should be bitumen • Noise and speed of dirt motor bikes on beach and some 4WD vehiclesLack of police attention on long weekends • Fishing in prohibited areas making it unsafe for small children in the water • Inexperienced 4WD drivers, no boat ramp, beach being cut up from towing boats. • 4WDs on beaches, long weekends (yobbo element), too many 4WDs. • Possibility of road between lake and golf course.
6.4.	<p>Environment:</p> <ul style="list-style-type: none"> • Untidy fishermen leaving rubbish on beach • People camping in dunes and destroying vegetation • Pseudo intellectuals claiming recreational use is destabilising the beach • Rubbish left on beach (plastic bags, fishing line, large rusty hooks) • Rubbish left on beach by visitors and their abuse of the sand dunes.
6.5.	<p>Recreation:</p> <ul style="list-style-type: none"> • Lack of boat launching facilities • Jet skiers becoming a nuisance
6.6.	<p>Beyond Scope:</p> <ul style="list-style-type: none"> • Still haven't caught a mullaway • Too many kangaroos and kangaroo ticks. • Vandalism, the dying trees • Beach too rough.

7.	Are there any changes you would like to see along the Shire of Waroona coast/Preston beach?
7.1.	Environment: <ul style="list-style-type: none"> • Possibly more 'No Entry' signs from beach to sand dunes. • More dune stabilization south of carpark • Awareness campaign re littering on beach • Like to see proposed development proceed but, at the same time, care of the environment should be paramount • More planting of trees especially Tuarts Increase By-law fines from \$50 to \$1000 or more • Cull kangaroos, get rid of tics • Stop beach erosion • No more development, more cleanups, busy bees. • Leave as is.
7.2	Amenities: <ul style="list-style-type: none"> • Some shade facilities nearer the beach • Reticulate the golf course • Like to see a park near the beach • Boat Launching facility • More picnic space, kiosk • Development of a groyne or similar to provide sheltered area of beach. • Marina for safe launching of small boats. • A small groyne, boat ramp, small jetty to discourage 4WD.
7.3	Access: <ul style="list-style-type: none"> • Decent access signs - "Strictly no camping", "No driving in sand dunes" • Easy access for everybody, more shade on beach, gazebo type shade/eat structures, lifesaver station. • Separate allocated area for motorbikes • Road licensed vehicles only, speed limit 20km either side of swimming area • Ban 4WDs from beach as they denigrate the dunes and environment (exception for disabled).
7.4	Administration: <ul style="list-style-type: none"> • Increase By-law fines from \$50 to \$1000 or more • Offending party also pays call out or overtime of Shire Ranger. • Continued public awareness on "Do's and Don't's" through Shire Rates notice. • Prosecutions instead of just warnings to offenders • Provision for disabled
7.5	Recreation: <ul style="list-style-type: none"> • Ban motor bikes, jet skis, 4WD's • Sporting facilities this side of carpark
7.6	Beyond Scope: <ul style="list-style-type: none"> • Need to protect Tuart forest • Do not want another "Dunsborough" - keep place nice and quiet. • Cut down dead trees for safety • I'd like to see a walking track around Preston Lake.

8.	Do you have any general comments about the Shire of Waroona coast/Preston Beach?
8.1	<p>Environment:</p> <ul style="list-style-type: none"> • Excellent conservation. Any consideration of banning 4WDs onto the beach will no doubt have a large negative impact on locals and holiday makers. This recreational pastime is a major drawcard for the area. • I am an animal lover but there are far too many kangaroos in Preston Beach. Every time we come here we always get ticks on us and then have trouble removing them. Otherwise it is a lovely place and the people are very friendly and nice. When we retire would love to settle here - minus the ticks. • Problems with dying Tuart trees - need regular burns by CALM. Tuart tree replanting along Preston Road - try planting Tuarts in low areas near beach carpark. • What used to be beautiful beach is being spoilt by a few. The volunteers who beautify the approaches are doing a great job. • Please keep this pristine environment and improve it for environmental rather than perceived gains • Good beach, quite long enough for bathers and fishermen and 4WDs - leave it alone. • Some carefully designed bushwalks with appropriate signs and information on the environment.
8.2	<p>Administration:</p> <ul style="list-style-type: none"> • Shires of Waroona and Harvey to collaborate approach with other communities, eg, Myalup, Binningup and Tims Thicket. Development of Preston beach foreshore involves all ratepayers of Shire of Waroona, not just Preston Beach residents. • The voluntary rangers have made some excellent inroads into patrolling and beach and dunes. They should be expanded in conjunction with the Shire Ranger. Law and order on the beach is not that difficult to control • Would like to see provision made for disabled who don't have 4 WDs and perhaps some sporting facility this side of carpark together with kiosk and more picnic space. • Better lighting at the intersection of Preston beach turn off from Old Coast Road. Also overhead lighting at intersection of Mitchel and Panorama Drive. • Introduction of Fisheries, facelift all good - keep up good work. • Please no large developments ! • Issue permits to responsible people for beach access. Failing to follow speed rules or damaging dunes results in loss of permit. This should be displayed on windscreen.
8.3	<p>Amenities:</p> <ul style="list-style-type: none"> • Would like to see provision made for disabled who don't have 4 WDs and perhaps some sporting facility this side of carpark together with kiosk and more picnic space. • Parking area should be sealed with obstructions installed to prevent people driving recklessly. • The carpark and approach areas need to be more inviting.
8.4	<p>Access:</p> <ul style="list-style-type: none"> • I am deeply concerned that the beach may be closed to 4WD vehicles. The actions of a very small group of people (not residents or ratepayers) may be impacting on the majority of people who do the right thing. Substantial fines and Ranger/Police patrols will alleviate this. Shire should prosecute every offender. Ranger should be able to prosecute. • Absolutely must continue to allow 4WD access.
8.5	<p>Beyond Scope:</p> <ul style="list-style-type: none"> • We think it is nice as it is, a pity we can't come over more often. • We choose Preston beach as a small community with a relaxed friendly atmosphere away from the city and would like to see it stay that way as we plan to live there. We have a block in Panorama Drive. • The reason we chose to live at Preston beach was because of the way it is now. We don't want to see it developed into another project like so many others around Perth. Why spoil something which

is totally perfect the way it is. Once people come with their boats it will only invite all sorts of trouble and change for the worse. Preston beach is crime free at the moment - let's keep it that way.

- It's great as it is.

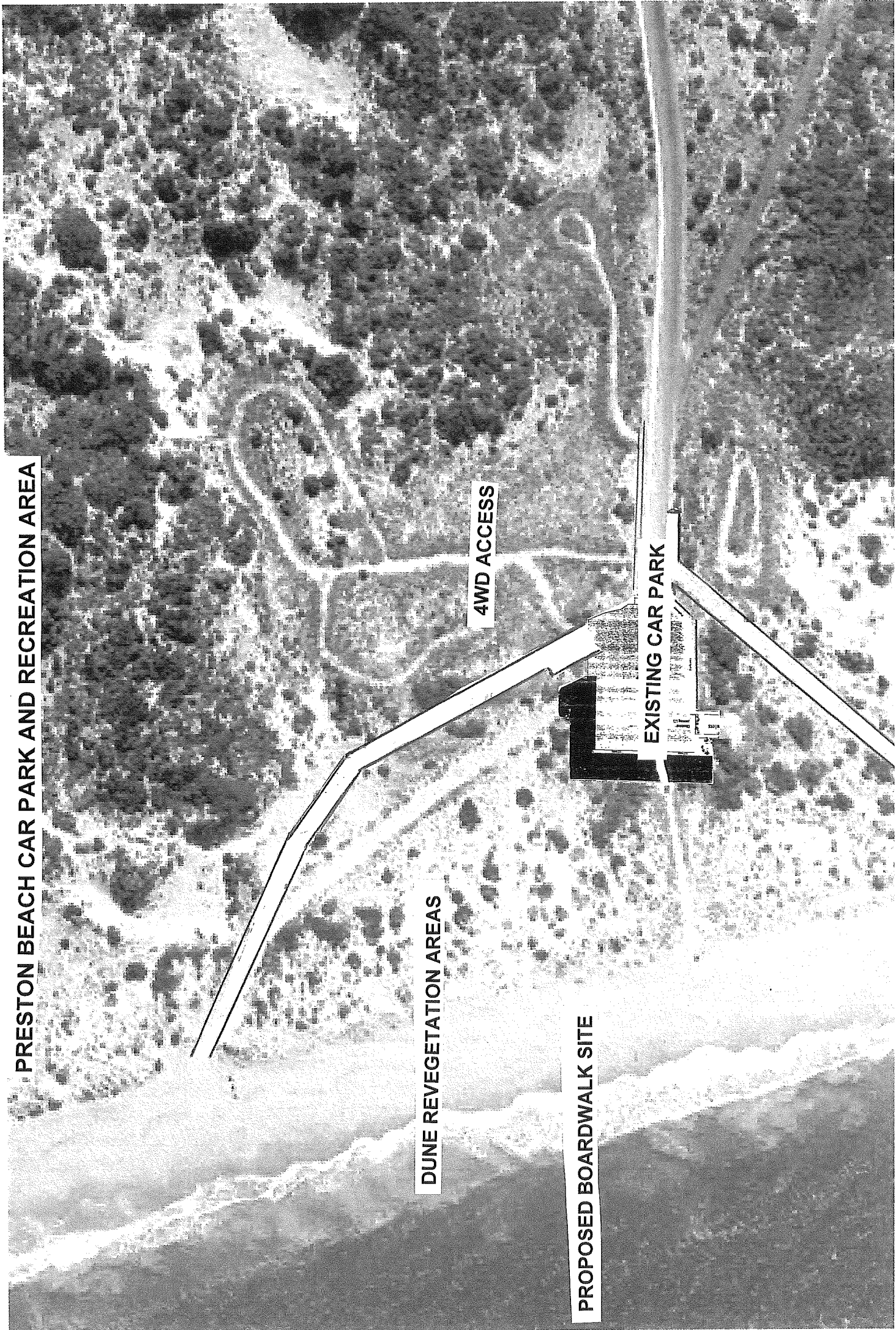
PRESTON BEACH CAR PARK AND RECREATION AREA

DUNE REVEGETATION AREAS

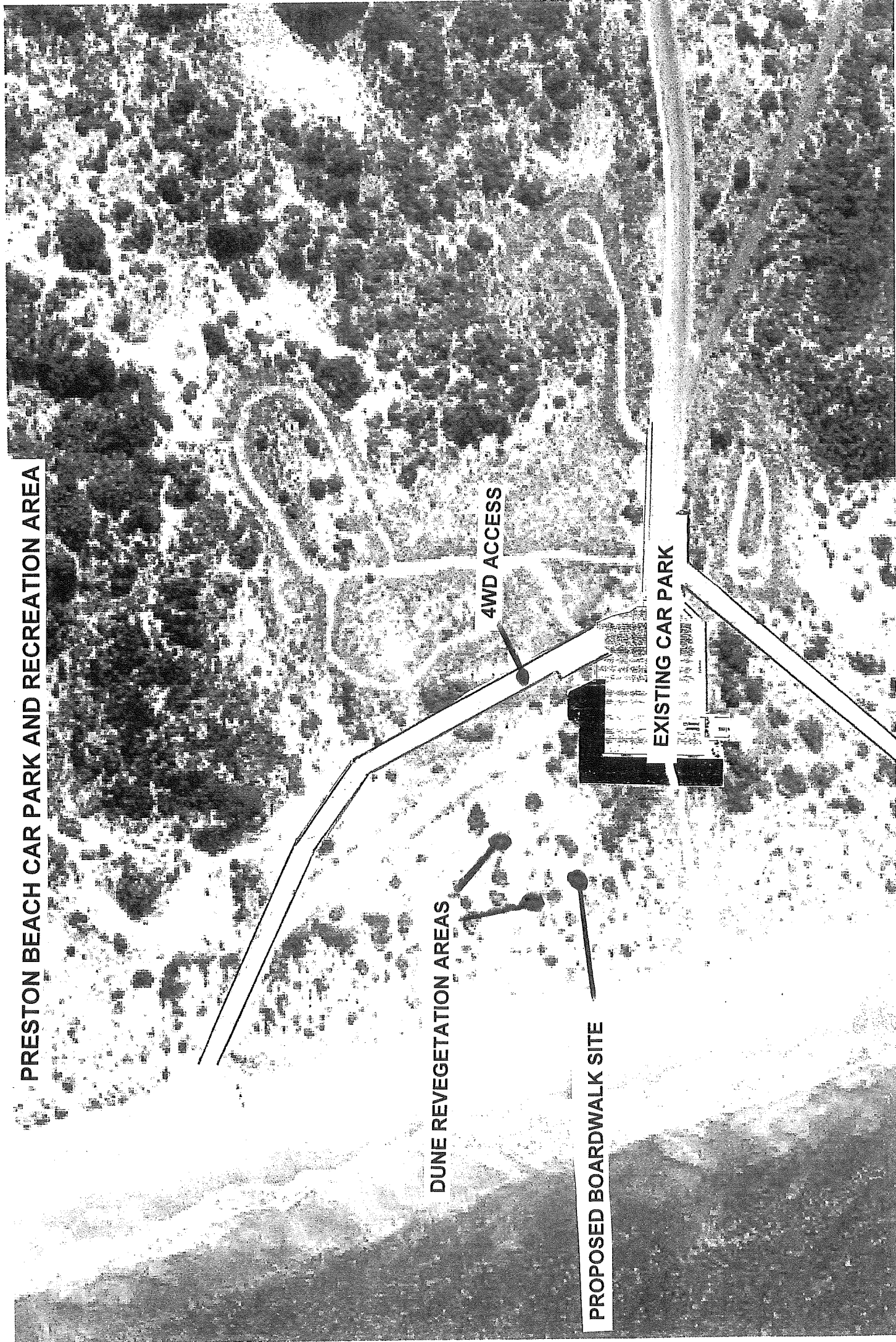
4WD ACCESS

PROPOSED BOARDWALK SITE

EXISTING CAR PARK



PRESTON BEACH CAR PARK AND RECREATION AREA



DUNE REVEGETATION AREAS

4WD ACCESS

PROPOSED BOARDWALK SITE

EXISTING CAR PARK