SHIRE OF BUSSELTON

21/8/06 Species list not used its incomplete and doesn't appear to have fully recognized planted spp.

DRAFT

FORESHORE MANAGEMENT PLAN
RESERVE 34111, QUINDALUP

NOTE

Pursuant to resolution CO508/268, the Busselton Shire Council has endorsed Site B only for inclusion in the Draft Management Plan for the purposes of community consultation. Both Site A and Site B are shown on the management plan as they were considered during the development of the management plan however, only site B was endorsed for consideration in the management plan during the community consultation phase.

- rehab
- fencing
- access fencing
- fauna survey comm [illegible]
- carparks clearing + corridors
etc..
- vesting ~~[illegible]~~ recreation \change to protect of flora + fauna.

VERSION 3

AUGUST 2005

REPORT NO: 2005/59

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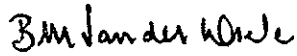
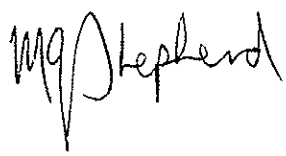
Checked by: Signed: 

Name: Bernadette Van der Wiele Date: 1 August 2005

Approved by: Signed: 

Name: Dr Mark Shepherd Date: 1 August 2005

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Forward

This Foreshore Management Plan (FMP) for Reserve 34111 Quindalup is currently a ***draft*** document. The FMP will be advertised for 28 days from <date> to <date>, during which period the public will be invited to make comment. Comments should be submitted to the Shire of Busselton via post, e-mail or fax to the following address:

Name
Address
Email
Fax

Following the cessation of the advertising period, the draft FMP along with a schedule of any submissions will be referred to Council for determination.

1. INTRODUCTION

1.1 Background

Reserve 34111 is a 'C' Class Reserve located in Quindalup and vested in the Shire of Busselton for the purpose of Recreation. It is approximately 21ha in area and extends parallel to the Geographe Bay coastline and is situated north of Geographe Bay Road in Quindalup, approximately between where Tulloh Street and Robbies Close join Geographe Bay Road (Figure 1). Most of Reserve 34111 is vegetated with natural coastal vegetation, it also contains a dual use path (DUP) that extends along the length of the Reserve on the southern side and a boat ramp in the eastern section with an associated informal gravel car park.

Following a proposal submitted to the Shire of Busselton by the Dunsborough Bay Yacht Club to build a boatshed on Class 'A' Reserve 46 and the community consultation that followed, Council resolved on 27 January 2005 (C0501/020) to initiate the preparation of this Foreshore Management Plan (FMP) for Reserve 34111 Quindalup.

The proposed Dunsborough Bay Yacht Club boatshed is for the purpose of housing sailing boats and equipment. The proposed location for the boatshed on Class 'A' Reserve 46 adjacent to the existing Quindalup boat ramp, associated parking areas, ablution facilities and the Sea Rescue building is considered to be contra to the status and values of Reserve 46 (Figure 1).

Through community consultation undertaken by the Shire of Busselton it was determined that Class 'C' Reserve 34111 (adjacent to Reserve 46 to the west) may be a better location for the Dunsborough Bay Yacht Club boatshed. Council resolved that a FMP should be prepared for Reserve 34111 in order to determine whether building the boatshed on Reserve 34111 is environmentally acceptable, and in line with the purpose of the Reserve and community expectations (Council Resolution C0501/020 is shown in Appendix 1).

1.2 Management Plan Mission Statement

Purpose

The purpose of this FMP is to provide an outline of how the coastal environment of Reserve 34111 can be managed to maintain its environmental values while providing opportunities for the realisation of some of the Reserve's recreational values.

Objectives

The objectives of this FMP are:

1. To identify the natural environmental values of Reserve 34111.

2. To discern management measures to preserve and enhance the environmental values of the Reserve.

3. To identify opportunities for development of recreational facilities, without compromising the environmental values of the Reserve.

Scope

The Scope of the plan is as follows:

- Outline the natural environmental attributes of Reserve 34111.
- Provide a response to the issues raised in Council's resolution (Appendix 1):

  - determine a 12m x 12m site for a yacht club shed (adjoining or near by the professional fishermen's boat ramp);
  - necessary parking, access and public amenities;
  - ensure coastal and environmental issues are addressed; and
  - ensure appropriate consultation is carried out with stakeholders.

- Provide a set of recommendations to ensure sustainable use and management of the reserve.

1.3 Location of Reserve

Reserve 34111 is located north of Geographe Bay Road between Tulloh Street and Robbies Close, Quindalup (Figure 1), abutting Reserve 46 located to the east.

1.4 Vesting and Purpose

Reserve 34111 is currently vested in the Shire of Busselton as a 'C' Class Reserve for the purpose of 'Recreation'.

All proposed uses of a reserve, if they are different to existing uses, must be approved by the vested authority and other departments as prescribed in the Land Act even if that proposed use is consistent with the purpose of the reserve. The proposal to construct a boatshed for a Yacht Club is a significant shift from existing use of the reserve and therefore this management plan is prepared so that the proposed use can be properly assessed.

1.5 Surrounding land uses

As shown in Figure 1, the land on the south side of Geographe Bay Road for the length of the Reserve is residential. There are 17 residential blocks on the northern side of Geographe Bay Road directly adjacent to the Reserve in the western section. There is also a YHA Youth Hostel (formerly a primary school) located on Reserve 12066 (Lot 41) that abuts directly onto the Reserve to the west of the residential blocks. The old dilapidated tennis courts adjacent to the Youth Hostel are located on Reserve 23730 (Lot 16) which also contains some native coastal vegetation. In addition Reserve 24722 (Lot 17), a triangular shaped parcel of land located to the north of the residential blocks

and to the east of the Youth Hostel. Although not technically part of Reserve 34111, all areas to the north of Geographe Bay Road that are Crown Land and in their natural state have been included in this FMP (ie. Reserve 24722 and part of Reserve 23730).

The Elmore Lagoon, a freshwater body of water, is located to the north (or seaward) side of the Reserve boundary at its western edge.

1.6 State Coastal Planning Policy

A *Statement of Planning Policy: State Coastal Planning Policy* (SCPP) (Western Australian Planning Commission, 2001) was released by the Minister for Planning and Infrastructure in April 2003. The SCPP is consistent with the vision, goal, principles, objectives and policies established in the draft Coastal Zone Management Policy for Western Australia and complements the *Statement of Planning Policy: Environment and Natural Resources Policy*, which requires planning strategies and schemes to identify and where appropriate, include provisions for the sustainable use of the coast.

The objectives of the SCPP are to provide for:

- protection, conservation and enhancement in areas of landscape, nature conservation, indigenous and cultural significance;
- public foreshore areas and access to these on the coast;
- the sustainable use of the coast for housing, tourism, recreation, ocean access, maritime industry, commercial and other activities in appropriate areas; and
- the location of coastal facilities and development that takes into account coastal processes including erosion, accretion, storm surge, tides, wave conditions, sea level change and biophysical criteria.

The SCPP includes methods for calculating appropriate setbacks to new coastal development on the Western Australian coastline.

2. DESCRIPTION OF THE ENVIRONMENT

2.1 Topography

Reserve 34111 comprises a long narrow strip of coastal dunes ranging from 30m to 150m in width and is located between the Geographe Bay foreshore and Geographe Bay Road. The western section of the Reserve is relatively level and low lying, containing a shallow, water-filled depression known as 'Elmore Lagoon'. The eastern section of the Reserve contains wider, more established, vegetated dunes (up to 100m wide) in front of the Bayshore Resort. These dunes are higher and undulating.

2.2 Landform and Soils

Geographe Bay is protected from the prevailing southwesterly swell by Cape Naturaliste and by the broad, shallow inner continental shelf. The beaches in Geographe Bay are currently subject to a long-term accretion period (CoastWise, 2001).

The coastal dunes adjacent to the beach are part of the Quindalup Dune System and have been formed from the action of the ocean and wind on the coastal sands. The Quindalup Dune System is composed of calcareous sands which are generally well sorted and comprise white, medium grained rounded quartz and shell debris (Churchward and McArthur, 1980). Along this section of the Quindalup Dune System, the sand is generally unconsolidated but may be weakly cemented in places. In places, the sand has been stabilised temporarily by vegetation.

2.3 Vegetation and Flora

2.3.1 Assessment Methodology

ATA Environmental conducted a flora and vegetation survey on 29 and 30 March 2005. The principal purpose of the survey was to identify the type and condition of the vegetation at the site and compile a preliminary species list. The condition of the vegetation was assessed using the scale of Keighery published in Bush Forever (Government of Western Australia, 2000) and is mapped in Figures 2a and 2b. Keighery's condition rating scale ranges from Pristine (which the vegetation exhibits no visible signs of disturbance) to Completely Degraded (where the vegetation structure is no longer intact and without native plant species). Vegetation on the Reserve ranged from Excellent to Degraded condition. A description of the vegetation condition ratings for those conditions identified during the site visit are outlined below:

Excellent (2)
Vegetation structure intact, disturbance affecting individual species and weeds are non-aggressive species.

Very Good (3)
Vegetation structure altered, obvious signs of disturbance. For example, disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and grazing.

Good (4)
Vegetation structure significantly altered by very obvious signs of multiple disturbance. Retains basic vegetation structure or ability to regenerate it. For example, disturbance to vegetation structure caused by very frequent fires, the presence of some very aggressive weeds at high density, partial clearing, dieback and grazing.

Degraded (5)
Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. For example, disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds, partial clearing, dieback and grazing.

Completely Degraded (6)
The structure of the vegetation is no longer intact and the area is completely or almost completely without native species. These are often described as 'parkland cleared' with the flora comprising weed or crop species with isolated native trees or shrubs.

In addition, the survey was undertaken to identify the presence of any potential significant flora within the study area. It should be noted that the survey was undertaken in March due to the timing of the report. A full survey will need to be undertaken in spring to identify many annual species including potentially significant flora.

2.3.2 Vegetation Complexes

According to Smith (1973), 21 vegetation complexes are recognised in the Busselton and Augusta area, all belonging to five separate series or systems of plant associations. The Quindalup Foreshore Reserve is a part of the Boranup vegetation system, which extends from the Naturaliste-Leeuwin ridge towards the shores of Flinders Bay (Smith, 1973).

Smith (1973) noted that along the coastal sand dunes bordering Geographe Bay between Dunsborough and Busselton and in small sheltered pockets on the west and south coasts such as the Deepdene and south of Milyeanup Swamp, Peppermint grows to more than 10m tall, forming an Open Forest. Where it is most dense the understorey consists of the sedge *Lepidosperma gladiatum*. Along the Geographe Bay coast the understorey consists of *Acacia decipiens, Acacia cochlearis, Acanthocarpus preissii, Anthocercis littorea, Leucopogon australis* and *Lepidosperma gladiatum.*

2.3.3 Vegetation Types and Vegetation Condition

During the site visit in March, ten discrete vegetation types were identified and allocated a condition rating according to the condition scale provided in Section 2.3.1 (Figure 2a & 2b).

These vegetation types are outlined below (NB: * denotes introduced or non-endemic species).

FnTdCmEpShH

Herbland to Open Herbland dominated by *Ficinia nodosa, *Trachyandra divaricata, *Cakile maritima, *Euphorbia paralias* and *Spinifex hirsutus* with occasional *Cyperus*

congestus, Carpobrotus virescens, Lepidosperma gladiatum and **Pelargonium capitatum* over an Open Grassland of **Lagurus ovatus* and **Cynodon dactylon* on sands. This vegetation type is located in the western sections of the Reserve (Figure 2a). There was evidence of disturbance and according to Bush Forever (Government of WA, 2000) the condition was considered to range from Good to Degraded.

AfLOW

Low Open Woodland of *Agonis flexuosa* with occasional *Callitris preissii, Allocasuarina fraseriana* and *Santalum acuminatum* over a Very Open Herbland dominated by *Lepidosperma gladiatum* and *Ficinia nodosa* over a Grassland dominated by **Stenotaphrum secundatum*. This vegetation type occurs on the southwest corner boundary of the Reserve (Figure 2a). There was low evidence of disturbance associated with this vegetation type and the condition was considered to range from Very Good to Good.

JkFnApSqOH

Open Herbland dominated by *Juncus kraussii* subsp. *australiensis, Ficinia nodosa, *Atriplex prostrata* and *Sarcocornia quinqueflora* over a Very Open Grassland dominated by **Cynodon dactylon* on sands. This vegetation type is associated with Elmore Lagoon, the condition ranges from Very Good to Good (Figure 2a).

AfMrLOW

Low Open Woodland of *Agonis flexuosa* with scattered *Melaleuca rhaphiophylla* over a Low Open Shrubland dominated by *Alyxia buxifolia* and *Hardenbergia comptoniana* over a Herbland of *Lepidosperma gladiatum* over a Very Open Grassland dominated by **Stenotaphrum secundatum* on sands. This vegetation type is located east of Elmore Road on the southern boundary of the Reserve (Figure 2a). There was minimal disturbance associated with this vegetation type and it was considered to be in Very Good condition.

AfW

Woodland of *Agonis flexuosa* with occasional *Callitris preissii* over an Open Shrubland of *Acacia cyclops* with occasional *Acacia littorea and Hibbertia cuneiformis* over a Herbland dominated by *Lepidosperma gladiatum* and *Acanthocarpus preissii* over an Open Grassland of **Lagurus ovatus, *Avena fatua* and *Amphipogon turbinatus* on sands. This vegetation type is located in the middle of the Reserve (Figure 2a & 2b). Although there was evidence of disturbance associated with this vegetation type and it was considered to be in Very Good condition.

AfEgLOW

Low Open Woodland of *Agonis flexuosa* with occasional *Eucalyptus gomphocephala* over a Shrubland dominated by *Spyridium globulosum* and *Acacia littorea* with scattered *Acacia cyclops* and *Olearia axillaris* over a Closed Herbland dominated *by Lepidosperma gladiatum* with occasional **Pelargonium capitatum* over introduced annual species. This

vegetation type dominates the eastern section the Reserve, condition ranges from Excellent to Good (Figure 2b).

TdLOS

Low Open Shrubland of *Tetragonia decumbens* with scattered *Acacia cochlearis* over a Herbland dominated by *Spinifex hirsutus*, **Trachyandra divaricata*, **Asphodelus fistulosus* with occasional **Pelargonium capitatum, Cassytha racemosa* and **Cakile maritima* over a Very Open Grassland of **Vulpia myuros* and **Thinopyrum distichum* on sands. This vegetation type is located on the north (seaward) side of community type AfEgLOW along the coast, the condition ranged from Good to Degraded.

MlAfLOW

Low Open Woodland of *Melaleuca lanceolata* and *Agonis flexuosa* over an Open Herbland dominated by *Lepidosperma gladiatum*, **Atriplex prostrata* and **Cakile maritima* over a Very Open Grassland dominated by **Cynodon dactylon* on sands. This vegetation type is located between Elmore Lagoon and the Youth Hostel, the condition is Good (Figure 2a).

PS

Planted **Pinus radiata, *Schinus terebinthifolia, Allocasuarina fraseriana, Melaleuca lanceolata, *Eucalyptus platypus* subsp. *platypus* and **Olea europaea* with *Agonis flexuosa* over an Open Grassland dominated by **Cynodon dactylon* on sands. This vegetation type is associated with the gardens of private residences along the northern side of Geographe Bay Road (Figure 2a). It is predominately comprised of planted, exotic landscape species. This vegetation type is significantly disturbed and is considered to be in a Degraded condition.

PSS

Planted species of **Eucalyptus leucoxylon* subsp. *leucoxylon* **Leptospermum laevigatum, *Melaleuca nesophila, Callitris preissii, *Melia azedarach, *Nerium oleander, *Pinus radiata, Hibbertia cuneiformis, *Lavandula stoechas* and **Pelargonium capitatum* on sands. This vegetation type is associated with the gardens of private residences along Geographe Bay Road (Figure 2a & 2b). It comprised of predominately planted species and a variety of exotic landscape plantings. There was evidence of heavy disturbance and the condition was considered to be Completely Degraded.

2.3.4 Floristic Community Types

Based on floristic data collected during the March 2005 survey, the vegetation types within Reserve 34111 are inferred to be representative of one Floristic Community Type (FCT) (Gibson *et al.*, 1994):

- Floristic Community Type 30b – Quindalup *Eucalyptus gomphocephala* and/or *Agonis flexuosa* Woodlands.

This FCT is not listed as a Threatened Ecological Community (TEC) by English and Blythe (1997) nor does it appear on the Department of Conservation and Land Management (CALM) list of TECs or on the Endangered Community List under the Department of Environment and Heritage's *Environment Protection Biodiversity Conservation Act 1999.*

2.3.5 Flora

A total of 68 plant species were recorded in Reserve 34111 on 29 and 30 March 2005. The total includes three Gymnosperms, 16 Monocotyledons and 49 Dicotyledons. The flora assessment was undertaken at a time when the majority of ephemeral species such as lilies and orchids would not have been recorded as they only emerge in spring. As such the flora list is considered to represent at least 80% of the species likely to occur within the Reserve.

A full list of species recorded in Reserve 34111 is provided in Appendix 2. Of the 68 plant species recorded, 34 (50%) were native and 34 (50%) were introduced or non-endemic plant species. Families with the highest representation of taxa were Poaceae (Grass family – eight taxa; one native and seven introduced), the Asteraceae (Daisy family – six taxa; six introduced) and the Myrtaceae (Myrtle family – eight taxa; four native, four introduced).

Nerium oleander, Melia azedarach, Eucalyptus leucoxylon subsp. *leucoxylon, Eucalyptus platypus* subsp. *platypus, Melaleuca nesophila, Adenanthos cygnorum* and *Grevillea argyrophylla* were recorded in the Reserve and are therefore found to be occurring outside their previously recorded range, as documented by the West Australian Herbarium (2005). It is most likely that these taxa were planted.

2.4 Wetlands

There is one wetland adjacent to Reserve 34111 on the northern (seaward) side; this is locally referred to as Elmore Lagoon due to its proximity to Elmore Road. The boundary of the Reserve excludes the wetland; this is more than likely because the wetland was once part of the ocean (Dunsborough Coast and Landcare (DCALC), 2004).

According to the DCALC (2004) the Elmore Lagoon was originally connected to ocean and was used by small boats as a safe anchorage until 1986. Since then the long term pattern of accretion of the coastline in this area caused the closure of the lagoon from the ocean. A small dune has formed between the lagoon and the ocean preventing seawater from entering the lagoon (except in occasional severe winter storms) (DCALC, 2004). Following this rainwater, runoff and stormwater have gradually diluted the marine pond. There is no detailed information available on the hydrology and salinity of the water in the pond.

Information supplied by the DCALC indicates that the Elmore Lagoon has not dried out completely since it was cut off from the ocean in 2000. Considering this it is possible that water could be seeping into the pond from either groundwater moving towards the ocean or from seawater seeping into the lagoon.

It is known that the Elmore Lagoon is utilised by many bird species (as detailed in Section 2.5 of this report with species listed in Appendix 3).

2.5 Fauna

There is no detailed survey information on the species that inhabit Reserve 34111. However, the vegetation and landform of the Reserve are fairly typical of the Quindalup foreshore and species that are likely to be present can be deduced from those found in nearby areas.

It is likely that the Reserve supports the Western Ringtail Possum (*Pseudocheirus occidentalis*) which favours Peppermint vegetation. The foreshore is important for this species as the Reserves containing Peppermint Trees form a connected corridor along this section of the coast. The Western Ringtail Possum is protected by the Commonwealth *Environment Conservation and Biodiversity Conservation Act 1999* (EPBC Act), it is listed as Vulnerable. It is also protected under the Western Australian *Wildlife Protection Act 1950,* where it is listed as Schedule 1.

It is likely that the Western Ringtail Possum is the only species of significance (that is protected by either the Western Australian *Wildlife Protection Act 1950* or the Commonwealth EPBC Act) that would inhabit Reserve 34111.

Opportunistic observations by DCALC during summer 2003 recorded over 300 birds using Elmore Lagoon. These include both marine and fresh water species (Appendix 3).

The Great or White Egret and the Cattle Egret are listed marine species protected by the EPBC Act (Listed – overfly marine area), however it is not known what type of Egret was (Appendix 3) (there are four species of Egret that could occur in the area). Notwithstanding, Elmore Lagoon would not be considered a crucial habitat for these two species of protected Egret as they are listed as "overfly marine area" and there are other much larger bodies of freshwater in the area such as Toby Inlet.

2.6 Feral Animals

It is likely that some feral animals use Reserve 34111, particularly feral cats, foxes and rabbits inhabiting nearby vegetated reserves. Some of the bird life, particularly juveniles, associated with the Elmore Lagoon is susceptible to feral animal attacks. DCALC observed six dead Swans in 2004 and two to date in 2005. It is possible that these Swan deaths were the result in some instances of feral cat and fox attacks.

3. HUMAN USE ATTRIBUTES

3.1 Historical Land Use

According to Coastwise (2001) archaeological investigations have shown that people occupied the Geographe Bay area at least 47,000 years ago. At the time of European settlement of the area the Geographe Bay foreshore was part of the traditional territory of the Wardandi group. There are presently two Native Title claims that cover the Geographe Bay coastline, namely the Harris Family and South West Boojarah (Coastwise, 2001).

A search of the Register of Aboriginal Sites on the Department of Indigenous Affairs website was conducted on 11 May 2005. There is one site listed that could occur in the western portion of Reserve 34111, called 'Quindalup Camping Ground' (Site ID 20017).

Reserve 34111 and the surrounding area have been in use by non-indigenous settlers for more than 100 years. Quindalup was established in 1866 and was the primary settlement in the region with timber as the main industry. The settlement consisted of a school, post office, police station, store and community hall, only the school remains to the present day. The school was built in 1905 (now used as a YHA Youth Hostel). The school operated until the 1960's when a new school was built in Dunsborough. The school was relocated due to the encroaching sea, not long after this the pattern of accretion started that continues today.

- boat club grounds
- c/park fencing/demarcation
- corridor connectivity

3.2 Recreational Attributes

During the 1990s the Shire constructed a DUP through the western section of the Reserve connecting Quindalup to Dunsborough. Local residents and tourists use it extensively as a walking and cycling path.

There are numerous informal beach access paths that cross the Reserve from nearby residences. The beach is used by residents from the surrounding areas and tourists for general beach activities such as swimming, fishing, boating, beach combing and dog walking.

A boat ramp located in the eastern section of the Reserve and referred to as the 'professional fishermen's boat ramp' is used in the main by local professional fishermen to access their boats moored in that part of Geographe Bay. This boat ramp and its associated informal gravel car park are also used by a number of local charter businesses.

Directly north of the professional fishermen's boat ramp is an area of deep sheltered water that is the most popular area for boat moorings in the Dunsborough-Quindalup area of Geographe Bay (Figure 1). According to the Dunsborough Bay Yacht Club the area contains some 80-90 moorings and there can be up to 100 boats moored in the area over the New Year period. There are two transportable toilets located in the car park adjacent to the professional fishermen's boat ramp that currently serve as ablution facilities for this boat mooring area.

The associated car park can hold approximately 22 cars (without trailers) and is often full during the summer months (Grist, R. and D. Pers. comm., 30 May 2005; Fogarty N. Pers. comm., 31 May 2005; Thomas, R. Pers. comm., 31 May 2005). The capacity is often diminished during this critical period due to haphazard parking and trailers obstructing access.

Car parking has recently been prohibited on Geographe Bay Road however no additional parking has been provided in the area resulting in cars and trailers being parked among bushes near to the car park (Grist, R. and D. Pers. comm., 30 May 2005; Thomas, R. Pers. comm., 31 May 2005).

The car park is used by patrons and staff associated with the following purposes:

- whale watching tours (up to 40 people on board);
- deep sea fishermen;
- scuba diving charters;
- boat charter companies (up to 30 people on board); and
- boat owners who moor in Geographe Bay during the summer months and also have a car to drive during their stay.

3.3 Recreational Opportunities – Dunsborough Bay Yacht Club Boatshed

At the request of the Shire of Busselton, a community workshop was conducted by Janet Payton on Monday 25 October 2004. The community groups that attended the workshop were:

- Dunsborough Bay Yacht Club;
- Toby Inlet Catchment Group;
- Quindalup Strip Residents Association;
- Dunsborough Progress Association;
- Busselton/Dunsborough Environment Centre; and
- Dunsborough Coast and Land Care.

Specific sites for the proposed boatshed were discussed and it was decided that the only sites that warranted consideration were Reserve 34111 and neighbouring Reserve 46. The report prepared by Janet Payton summarising the community consultation workshop is included as Appendix 4.

With the exception of the Quindalup Strip Resident's Group all participants agreed that the sites designated within Reserve 34111 could be a suitable location for a boatshed for the Dunsborough Bay Yacht Club.

At a site meeting on 26 April 2005, two possible locations for the proposed boatshed on Reserve 34111 in the Dunsborough Bay Yacht Club's preferred area for the boatshed were identified, these will be referred to as Site A and Site B and are marked on Figure 3b. The reasons Dunsborough Bay Yacht Club have cited these as being their preferred sites are as follows:

- At the community workshop most parties agreed the area was suitable when the site was walked over by the workshop attendees (Fogarty, Noel. Pers. comm., 13 April 2005).
- The open water just east of the professional fishermen's boat ramp and boat mooring area is as suitable for racing GP 14s as the water near the Quindalup boat ramp where races are currently held (Fogarty, Noel. Pers. comm. 13 April 2005).

- It is one of the most elevated areas in Reserve 34111, and it would be high enough to view races from the deck of the proposed boatshed.

- GP14 sailing dinghy's can be launched from the boatshed via the White Sands beach access path to the beach.

- The race control boat and rescue boat can be launched at the existing professional fishermen's boat ramp, which can be accessed from the proposed boatshed through the car park.

- Water and power can be connected to the site via the White Sands beach access track.

- The proposed boatshed will be visible from ocean but will not be visible from Geographe Bay Road due to Peppermint vegetation and height of the dunes thereby protecting visual amenity.

- Boats moored in this area of Geographe Bay can use the amenities associated with the Dunsborough Bay Yacht Club boatshed. The Dunsborough Bay Yacht Club have expressed a commitment to maintain the ablution facilities adjacent to their shed in a similar capacity to how the Sea Rescue volunteers maintain the ablution facilities at the Quindalup boat ramp in Reserve 46.

As part of the process of developing this FMP for Reserve 34111, consultation with the Dunsborough Bay Yacht Club was conducted on 13 April and 26 April 2005. The reasons the Dunsborough Bay Yacht Club have cited for proposing a boatshed in either Reserve 46 or Reserve 34111 and the proposed uses of the boatshed are summarised below:

- The club hosts races in the GP 14 category on Sundays over summer. A GP 14 is a 14 ft open dinghy with a sail that is operated by two people. The club has approximately 15 GP 14's on its register. Races currently take place near the Quindalup boat ramp in Reserve 46, the boats are currently transported to the races by vehicle on trailers. The club would store their GP 14's, two 15-16 ft race support power boats and associated equipment in the proposed shed.

- Beach access is required for the GP 14 boats (GP 14's are on trailers that can be pushed over sand and boats can be launched from the beach) and boat ramp access is required for the race support and safety boats.

- Members of the club would observe the races from the viewing deck of the shed.

- Yearly race competitions are held in Geographe Bay with the Mounts Bay Yacht Club in the GP 14 category and the shed could be used as a base for this competition.
- The club recently hosted the State GP 14 competition in March 2005 and the shed could be used as a base for future competitions.

As previously mentioned the car park associated with the professional fishermen's boat ramp is informal and considered to be inadequate (Section 3.2). The proposed sites selected by the Dunsborough Bay Yacht Club are dependent on the car park being extended in an easterly direction (Figure 3b).

3.4 Coastal Processes Setback

The coastal environment is highly susceptible to degradation and destabilisation without proper management and controlled access. Delineation of a development setback will ensure long term security for developments along the coast and protect the coastal environment while providing for public use and enjoyment of the area. The best way to ensure that coastal areas are protected is to set development back from the coast to create a natural buffer area to protect the dunes and provide space to accommodate a variety of anticipated recreational pursuits and facilities.

Coastal stability is the most important factor in determining the width of a setback necessary to protect development from coastal processes and sea level change. When considering stability, it is necessary to differentiate between long-term erosion or accretionary trends, and the natural short-term variability of a dynamic system.

As previously mentioned (Section 1.6), the Western Australian Planning Commission's Statement of Planning Policy No. 2.6 (State Coastal Planning Policy 2003) provides guidance on the recommended setback distances to new coastal development on the Western Australian coastline. Schedule One of the SCPP outlines the recommended criteria to assess the required setback to provide for the physical coastal processes.

The specific objectives of the SCPP (WAPC, 2003) are to:

- absorb the impact of a severe storm sequence;
- allow for shoreline movement;
- allow for global sea level rise; and
- allow for the fluctuation of natural coastal processes.

For most localities in Western Australia, the assessment of coastal stability is hindered by a lack of long-term data and evidence. It has therefore, become common practice for coastal studies to base stability predictions on shoreline movement plans derived from aerial photographs which indicate past shoreline positions.

The permanent vegetation line and the high water line are plotted for each year using surveying techniques. The individual permanent vegetation lines over the 50-year time span covered by photogrammetry are used to indicate total movement of the vegetation line from which conclusions can be drawn as to the stability of the coastline. The

permanent vegetation line is used as the basis for determining coastal stability, as this is not subject to tidal and barometric fluctuations.

For the general case of development on an undeveloped sandy shoreline such as is found at Quindalup Reserve 34111, the SCPP recommends using the following criteria to calculate the appropriate coastal setback to development:

- S1: Acute short-term erosion resulting from the severe storm sequence, with elevated water levels and an ARI of approximately 100 years.
- S2: Chronic long-term trends in shoreline movement caused by the coastal dynamics of the area. This needs to provide a buffer for the coming 100 years.
- S3: Possible erosion resulting from Climate Change and associated sea level rise in the coming 100 years. The SCPP recommends allowing for a sea level rise of approximately 0.38m.

It is found in the majority of cases that after this assessment is undertaken a total setback of at least 100m from the horizontal setback datum (HSD) is generally applied.

It is quite clear that neither of the sites proposed by the Dunsborough Bay Yacht Club (Sites A and B see Plate 1) meets this standard SCPP setback requirement as they are both located on the seaward side of the permanent vegetation line or in close proximity to it.

The Dunsborough Bay Yacht Club contend that the function required from the proposed boatshed (that is access to the shoreline and viewing races) cannot be satisfied at the 100m general setback distance as prescribed by the WAPC (WAPC, 2003).

According to members of the Dunsborough Bay Yacht Club, Site A is the preferred location for the shed because it is the highest point in the immediate area however as part of the consultation process the members have indicated they would be equally satisfied with Site B.

The major drawback of Site A is the feasibility of constructing vehicular access to the back or side of the shed. There is a significant depression behind Site A that contains Peppermint Trees and it is most likely these trees would be lost due to engineering requirements if the proposed shed were located at Site A.

Site B is located to the west of the White Sands access track where the ground level is relatively uniform and similar to the levels of the existing car park. The footprint of the shed at Site B does not contain any Peppermint Trees, however there are trees adjacent to and behind Site B that would help the shed appear to assimilate into its surrounding environment. The construction of the shed at Site B would result in less clearing of and disturbance to native vegetation.

Both Sites A and B are approximately the same distance from the ocean, however there is always some risk of ocean encroachment, particularly in the event of an extreme winter storm or in an area that may be subject to severe erosion during an erosion cycle.

Based on the limited scientific information available regarding coastal stability in the area and in the absence of a Coastal Stability Assessment having been undertaken by a coastal engineer, neither Site A nor Site B can be considered an appropriate location for the boatshed from an environmental perspective given the known environmental constraints.

3.5 Provision of Coastal Facilities

Access and infrastructure in recreational areas is of high importance both to residents and tourists of the foreshore reserve; however this must be managed in such a way so as to preserve the ecological integrity of the foreshore reserve. Formalising and upgrading access and facilities can sometimes attract increased use of the area that may, without proper and considered management, result in degradation of environmentally sensitive areas. Inappropriate location and design of tourism and recreational facilities also has the potential to adversely impact on the coastal environment.

As part of this Plan, the provision and maintenance of access and infrastructure along the Quindalup foreshore are designed to:

- provide an appropriate level of access whilst preserving the ecological values of the Reserve; and
- facilitate appropriate recreational facilities by assisting in/or providing suitable resources and infrastructure.

3.6 Educational Uses

Reserve 34111 is not currently used for formal educational purposes.

3.7 Heritage and Cultural Values

The heritage and cultural values of Reserve 34111 are described in Section 3.1 of this Plan.

4. MANAGEMENT OBJECTIVES

4.1 Conservation

The management objectives in relation to conservation are as follows:

1. Preserve and enhance native vegetation (fauna habitat) of the Reserve.
2. Minimise landscape modification.

reveg chapter needed
what to target
what to plant
objectives

4.2 Recreation

The management objectives in relation to recreation are as follows:

1. According to Council's resolution (Appendix 1), find a suitable site for a boatshed for Dunsborough Bay Yacht Club in Reserve 34111.

2. Provide an appropriate level of facilities and amenities for the public utilising the Reserve without compromising the conservation attributes.

env assessment
CALM minimal clearing
no encroachment
fence
corridor

4.3 Education

The management objectives in relation to education are as follows:

1. Identify any opportunities for education.
2. Investigate the use of interpretive signage at appropriate sites on the Reserve.

4.4 Fire Management

The management objectives in relation to fire are as follows:

1. Ensure any facilities approved for siting on Reserve 34111 have appropriate fire fighting equipment in place.

5. MANAGEMENT PLAN

5.1 Remnant Vegetation

The vegetation of Reserve 34111 is in relatively good condition (with minimal management and protection to date). The majority of the vegetation and the best quality vegetation are located in the eastern half of the Reserve where the vegetation strip is wider and the dunes are older and more stable. The Reserve is crossed regularly with informal beach access paths from the residences located to the south of the Reserve boundary.

Reserve 34111 is sheltered from the prevailing southwesterly winds due to its location in Geographe Bay consequently the informal beach access paths that the public have created are not currently causing any significant destabilisation of the dune structure.

Currently, there are no fences to prevent or discourage pedestrians from walking over the dune vegetation. O the southern side of the Reserve the vegetation is thick and the dunes rise sharply away from the road and DUP in many places, forming a natural barrier. However, on the northern side of the Reserve (adjacent to the beach) the dunes and vegetation are more fragile and susceptible to degradation. Some fencing and/or brushing is considered to be appropriate in this area, particularly around high pedestrian traffic areas such as in front of the resorts and in the area of the professional fishermen's boat ramp. If the car park is extended, some paths to the beach from the car park and proposed Dunsborough Bay Yacht Club boatshed should be formalised and fenced to encourage the retention of the vegetation (and in turn dune structure) on the narrow strip between the car park and the beach. Choice of fencing materials should be chosen to blend in with the environment wherever possible.

Management Recommendations

M1 Retain natural vegetation and landform (dunes) wherever possible.

M2 Localise construction of buildings and car parks in designated areas within the Reserve.

M3 Prevent pedestrian access to sensitive dune vegetation through the installation of appropriate fencing and brushing.

M4 Prevent vehicular access to beach and dunes through the installation of appropriate fencing.

5.2 Elmore Lagoon Wetland

The conservation of the Elmore Lagoon as an avian fauna habitat has been raised as an important issue by the DCALC. The DCALC have a particular interest in the Elmore Lagoon and prepared a draft management plan in 2004 that was submitted to the Shire of Busselton for comment (06/04/2004). In summary, the DCALC (2004) proposed the Elmore Lagoon should be protected as a nature/bird sanctuary. Some of the measures proposed by the DCALC include:

- *no boating or fishing be allowed;*
- *manage weeds appropriately;*
- *stormwater should be excluded to maintain water quality;*
- *breeding habitat for birds should be enhanced (eg. dead trees could be placed on banks of the lagoon to provide shelter for nesting);*
- *appropriate signage should be erected (eg. Prohibiting the feeding of birds; and*
- *access should be managed (eg. Log railing could be erected in places preventing access in some of the more sensitive locations).*

In discussions with the DCALC some other potential management measures proposed include the following (Glencross, Ron. Pers. Comm. 2005):

- creating a deeper channel around the island that appears in the Lagoon at high tide to create a permanent water bird haven;

- implementing measures to prevent dogs that are not on leashes from chasing avian fauna (eg. visual barriers such as re-vegetation between the DUP and the Lagoon); and

- installing a raised boardwalk to allow pedestrian traffic to the beach to take the shortest route without destroying the wetland vegetation (reeds etc).

There is no information available regarding the hydrology of the Elmore Lagoon. According to CoastWise (2001) the Elmore Lagoon has experienced algal blooms, fish deaths and odours. However the DCALC considers that the odours and fish deaths were associated with seaweed breaking down at a time when the lagoon was still connected to the ocean. The DCALC maintain that odour has not been problem since the lagoon was cut off from the ocean by the movement of sand (Glencross, Ron. Pers. Comm. 2005).

Management Recommendations

M5 Investigate installing gross pollutant traps on stormwater pipes at point of entry to the Lagoon.

M6 Erect appropriate signage at strategic points around the Lagoon to discourage bird feeding.

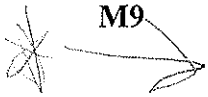
M7 Prohibit further development on the Reserve within 50m of the riparian vegetation surrounding the Lagoon.

M8 Install appropriate fencing or a dense vegetative buffer between the Lagoon and the DUP to increase habitat function and visual amenity of the Lagoon.

5.3 Feral Animals

Anecdotal information provided suggests that juvenile native fauna, particularly in the vicinity of Elmore Lagoon, are being killed by either dogs, foxes or feral cats. Management strategies for feral control may be required. Any sightings by the public of killed or maimed native fauna should be reported to the CALM in the first instance.

Management Recommendations



M9 In consultation with CALM, undertake trapping exercises to eradicate feral animals on an 'as needs' basis.

5.4 Weed Control

The disturbed nature of portions of the Reserve and the surrounding land uses mean that weeds such as grasses will always pose a problem in the management of the Reserve (refer Appendix 2 for introduced weed species). Localised management of these weeds can enhance natural regeneration.

If the Shire of Busselton aims to pursue a weed control program, resources should be focused towards eradicating that introduced species that occur along the Foreshore Reserve having the greatest potential to invade other areas and compete with native species. Such species include *Avena fatua* (Wild Oats), *Cynodon dactylon* (Couch Grass), *Stenotaphrum secundatum* (Buffalo Grass), and *Vulpia myuros* (Rat's tail fescue). It is not considered necessary to remove exotic trees such as *Araucaria heterophylla*, which have established over a long period of time. However, more invasive exotic species such as *Schinus terebinthifolia* (Japanese Pepper) should be considered for removal.

The appropriate methods to eradicate and control major weed species recorded within the Reserve area are outlined below (Scheltema and Harris, 1995; Moore and Wheeler, 2002). Up-to-date information regarding herbicides and application rates should be sought from the Department of Agriculture Western Australia and Geocatch prior to implementing weed control programs.

In the vicinity of Elmore Lagoon wetland proper, herbicide use should be in accordance with the Water and Rivers Commission recommendations contained in 'Herbicide Use in Wetlands' – Water Note WN22 (Water and Rivers Commission, 2001).

Management Recommendations

M10 Implement ongoing weed control within the Reserve according to the appropriate methods with preference given to manual removal of weeds or spot applications.

M11 In the vicinity of Elmore Lagoon, herbicide use should be in accordance with the Water and Rivers Commission 'Herbicide Use in Wetlands'.

TABLE 1
CONTROL METHODS FOR WEED SPECIES

Weed Species	Method	Notes
Wild Oat (*Avena fatua)*	3,4	Easy to control. Use 2L Fusilade per hectare for blanket spraying.
Couch (*Cynodon dactylon)*	3,4	Mainly in highly disturbed areas. Use Roundup Bioactive or other environmentally sensitive herbicide suitable for areas adjacent to water late spring to autumn. Best to spray after fire. Several applications may be necessary.

Weed Species	Method	Notes
Buffalo Grass (*Stenotaphrum secundatum*)	3,4	Mainly in disturbed areas. Spray with Roundup Bioactive in late summer in areas where the grass coincides with native plants.
Rat's tail fescue (*Vulpia myuros*)	3,4	Use 2L Fusilade per hectare for blanket and spot spraying. Alternatively Kerb may be used.
Bridal Creeper (*Asparagus asparagoides*)	1,2,3	Manual control is difficult. Roundup/Glyphosate 360 at 1:100 water when actively growing (July-Sept). Repeat applications are necessary.
Olive (*Olea europa*)	1,2,3	Difficult to control. Spot spray young seedlings with Glyphosate. Older trees (2years+) spot spray with Garlon 600 – 8ml in 5L water. Paint stumps with undiluted Garlon or stump injecting using neat Glyphosate.
Arum Lily (*Zantedeschia aethiopica)*	1,2,3	Glyphosate – 1 in 100 June to Oct. Several applications may be necessary. Can also use Glean/Brushoff. Difficult to dig out in most sites. Spot spray April-Nov when plants are 8-12cm high. Respray 2 months later.
Japanese Pepper (*Schinus terebinthifolia)*	1,2	Seed spread by birds, very difficult to control. Cut down the tree and immediately paint freshly cut surface with Glyphosate, or try Velpar or Garlon. Follow-up treatment is essential. In wetland areas treat when water recedes and plants are not waterlogged. Check for seedlings yearly and remove.

Method of Control:
1. Handweeding, pulling, digging
2. Herbicide wipe, stem injection, cut stump
3. Spot spraying
4. Blanket spraying

5.5 Access

5.5.1 Car Parking

At present, informal car parking is available at two locations: adjacent to the professional fishermen's boat ramp and at the coach pullover adjacent to Elmore Lagoon opposite Elmore Road/Geographe Bay Road intersection. Both car parks are constructed of gravel. No bays within either of the car parking areas are marked.

Provision for additional car parking at the professional fishermen's boat ramp has been identified in this Plan (refer Figure 3b) to accommodate an increased level of beach use associated with the proposed building of the Dunsborough Bay Yacht Club boatshed. Current capacity is approximately 22 cars (without trailers). In addition, it is recommended that the existing car parking area adjacent to Elmore Lagoon be upgraded to accommodate the anticipated increase in foreshore use over time and to reduce dust emissions.

Management Recommendations

M12 Increase the capacity of professional fishermen's boat ramp car park subject to the Dunsborough Bay Yacht Club proposal being approved.

M13 Upgrade the Elmore Lagoon car park to reduce dust emissions.

5.5.2 Beach Access Paths

Access to the beach is currently via informal paths that cross the Reserve (refer Section 3.2). Entry points to beach access paths will be located from the DUP, Geographe Bay Road and car parking areas within the Reserve and will comprise crushed limestone/compressed gravel paths.

All beach access paths will be appropriately aligned to avoid problems of undermining and sand movement by wind action. Sections of paths close to the beach and exit points will be orientated to be perpendicular to the prevailing summer winds to minimise management requirements.

The indicative location of beach access paths is shown in Figures 3a and 3b. The legend on Figures 3a and 3b distinguishes between high use paths to be formalised and low use paths to be monitored.

Management Recommendations

M14 Formalise high usage beach access paths by surfacing with crushed limestone to reduce wear on the track and encourage pedestrians to stay on the path.

M15 Install appropriate fencing and brushing to prevent pedestrians veering off of designated beach access paths.

5.5.3 Dual Use Path

The existing dual use path (DUP) provides a scenic walk and/or cycleway for the public along the landward side of the Reserve.

Minimising disturbance to vegetation and dune form has been addressed in the alignment of the DUP, and as a result, the path meanders according to the topography and avoids areas of good quality vegetation where possible.

The surface and width of the DUP is in keeping with the specifications of the Shire of Busselton. It is recommended that sections of the DUP be fenced to prevent random access into the foreshore reserve.

The indicative location of recommended fencing of the DUP is shown in Figures 3a and 3b.

Management Recommendations

M16 Fence sections of the DUP to prevent random access into the Reserve.

5.5.4 Fencing

The installation of fencing (from bollards to post and wire mesh fencing) along beach access paths, the dual use path and car parks will assist in protecting the fragile dune landform and vegetation. The installation of fencing in these areas will provide a balance between maintaining the stability of the dunes and retaining the aesthetic value of the

area. The type of fencing is likely to include standard 1m high pine log interspersed with wire mesh, however the specifications will be in keeping with the Shire of Busselton's standard specification.

At the beach end of the access paths the installation of fencing will need to take into account the dynamic nature of the coast. In general, fencing close to the beach within the frontal dunes is often buried due the cumulative effect of inappropriate alignment, lack of maintenance and natural processes. The installation of temporary, transportable fencing to provide the primary function of restricting access is a feasible and practical option. A common and effective method of restricting access to the primary dunes (either parallel to the coast or at the beach end of access paths) is to install tripod type bollards connected by wire mesh which can be moved according to seasonal patterns of shoreline movement and dune development.

Management Recommendations

M17 Install appropriate fencing along beach access paths, the DUP and car parks to protect vegetation and landforms (dunes).

M18 In areas exhibiting signs of degradation, consider installing temporary, transportable fencing to restrict access from the beach across primary dunes.

5.5.5 Signage

The installation of signs within the Reserve will be used to advise of rehabilitation measures undertaken, to request public cooperation, to direct people to pathways and to restrict certain activities.

In addition, public awareness of the value of the wetland and surrounding bushland will be promoted including the current issues affecting effective management of the foreshore area through the provision of signage.

Interpretative signage such as explanations of the natural environment, including descriptio: of native vegetation, native fauna utilising the area and descriptions of work in progress and the reasons for prohibitive measures (such as fires, vehicle access and dog controls) will be used, particularly in the vicinity of Elmore Lagoon.

Management Recommendations

M19 Develop and install consistent signage for directional, interpretative and public safety.

5.6 Other Amenities

5.6.1 Toilets and Showers

Currently two chemi-toilets are provided at the car park associated with the Professional Fishermen's Boat Ramp. In the event of the Dunsborough Bay Yacht Club boatshed being approved, the existing amenities would be insufficient to cater for the increased

demand. It is recommended that an amenity block constructed out of similar material as the proposed boatshed be located on the western side of the proposed Dunsborough Bay Yacht Club boatshed with access via the car park. It is recommended that co-contributions for this facility be sought from the Dunsborough Bay Yacht Club, commercial tour operators, professional fishermen and people with moorings to build community ownership for the amenity.

Management Recommendations

M20 Subject to the boatshed being approved and constructed, design and construct a public toilet facility (including two toilets for both males and females and one disabled access toilet) subject to significant financial contribution from user groups and success with grant submissions.

M21 Subject to the boatshed being approved and constructed, provide a disabled car parking bay with ramp access adjacent to the disabled toilet facility subject to extension of car park and provision of toilet facilities.

M23 Subject to the boatshed being approved and constructed, connect the public toilet facility to reticulated sewer preferably, or alternatively to a Shire approved ATU subject to approval.

5.6.2 Bins

Rubbish facilities are not currently provided at the car parks as a mechanism designed to encourage people to take their rubbish with them.

It is not recommended that rubbish bins be placed on the either the beach or DUP due to the inability/potential damage incurred in trying to provide vehicular access to empty the bins.

Management Recommendations

M23 Monitor the parking area for rubbish dumping and consider providing bins if necessary.

5.7 Interpretation and Education

The DCALC (2004) suggests that the Elmore Lagoon area could be used for educational purposes (eg. for bird watching). As previously stated in this Plan, there is very limited information available regarding the fauna usage, hydrology and stability of Elmore Lagoon and further background research is required in order to make informed decisions relating to potential development of Elmore Lagoon.

Management Recommendations

M24 Provide appropriate signage at Elmore Lagoon to enhance viewers understanding of the flora, fauna, landscape they are looking at and encourage dog owners to restrain their pets on a leash while around the Lagoon.

5.8 Heritage and Culture

The YHA Youth Hostel was originally a primary school and part of the original settlement at Quindalup and it is one of the oldest surviving buildings in the Quindalup area.

Management Recommendations

M25 Install an information plaque on the site of the old Quindalup School near the DUP, to inform pedestrians of the history of the site.

5.9 Fire Risk and Management

According to CoastWise (2001) it is considered that the use of regular burning as a management tool in the coastal zone is inadvisable. Geographe Bay Road currently performs the function of acting as a 10m-wide firebreak between the vegetation and the houses on the landward side of Geographe Bay Road. In the event of a wildfire, access to the majority of the Reserve by fire control vehicles is currently provided by Geographe Bay Road and the DUP.

Management Recommendations

M26 Ensure that access to a water supply for fire suppression purposes is available from fire hydrants located within the road reserves and that they are provided to the relevant standard and agency requirements.

5.10 Provision of Coastal Facilities

The provision of access and infrastructure in recreational areas is of high importance to both residents and visitors of the Quindalup foreshore area. The identification and management of recreational space areas ensures the conservation and maintenance of coastal habitats. The objective of a FMP must ensure that the provision or siting of coastal facilities be managed in such a way as to preserve the ecological integrity of the Reserve over the long-term. Preserving the ecological integrity of the Reserve can only be achieved by facilitating appropriate access and coastal facilities and restricting access or development of coastal facilities that may result in the degradation of coastal habitats.

Management Recommendations

M27 Prior to finalising the siting of <u>any</u> permanent coastal facility, that a coastal engineer undertake a coastal stability assessment to produce a shoreline movement plan. This Assessment will determine the appropriateness or otherwise of permanent coastal facilities being constructed within the foreshore reserve.

6. IMPLEMENTATION

6.1 Community Involvement

There are several community groups that have an interest in Reserve 34111 and the greater Quindalup coastal strip and have expressed an interest assisting the Shire in the management of Reserve 34111:

Elmore Lagoon

The DCALC has expressed an interest in assisting the Shire manage the Elmore Lagoon as an avian fauna haven. The ways in which the group can assist the Shire are as follows:

- re-vegetate the area between the DUP and the lagoon with sedges and some trees (such as Peppermint and *Melaleuca* species); and
- monitor the water quality of the lagoon and record bird usage.

Professional Fishermen's Boat Ramp Development Area

The Dunsborough Bay Yacht Club proposes to build a boatshed to store boats and equipment on either Reserve 34111 or Reserve 46. In the event that the Dunsborough Bay Yacht Club boatshed is approved to be constructed near the professional fishermen's boat ramp and an amenity block adjacent to the Dunsborough Bay Yacht Club boatshed (for the use of the public) is constructed, the Dunsborough Bay Yacht Club have committed to managing those amenities for the Shire in a similar capacity to how the Sea Rescue volunteers manage the facilities at the Quindalup boat ramp located in Reserve 46.

6.2 External Funding Opportunities

In the event that the Shire approves the Dunsborough Bay Yacht Club application for a boatshed the DBYC is to fund the construction of their proposed boatshed and associated facilities and services.

- Agriculture WA may assist in providing chemicals for spraying declared weeds.
- CoastCare may provide assistance with appropriate signage.
- CALM may provide assistance with regard to trapping feral animals and foxes.

6.3 Shire Assistance

In the event that the Shire approves the Dunsborough Bay Yacht Club proposal, the provision of public amenities facility will be necessary because the Dunsborough Bay Yacht Club facility will provide the likelihood of use of the area for extended periods. Funding for this facility should be on a co-contribution basis with funds provided by the Shire, the Dunsborough Bay Yacht Club, commercial tour operators, professional fishermen and people with moorings.

6.4 Life of Plan

Due to the high growth rate of the Quindalup area and the Busselton Shire in general, it is recommended this FMP be reviewed in five years.

6.5 Prioritisation of Works and Allocation of Responsibility

Table 2 outlines the proposed works discussed in this FMP. Please note that the Shire Council of the Shire of Busselton has not yet approved some of these items.

TABLE 2
FORESHORE MANAGEMENT PLAN
OBJECTIVES, MANAGEMENT RECOMMENDATIONS, RESPONSIBILITY, TIMEFRAME AND POTENTIAL FUNDING SOURCES

Objective		Management Recommendation	Responsibility	Priority	Potential Funding Source
5.1 Remnant Vegetation	**M1**	Retain natural vegetation and landform (dunes) wherever possible.	Shire of Busselton	High	Coastcare
	M2	Localise construction of buildings and car parks in designated areas within the Reserve.	Shire of Busselton	High	Shire of Busselton
	M3	Prevent pedestrian access to sensitive dune vegetation through installation of appropriate fencing.	Shire of Busselton	High	Coastcare
	M4	Prevent vehicular access to beach and dunes through installation of appropriate fencing.	Shire of Busselton	High	Coastcare
5.2 Elmore Lagoon	**M5**	Investigate installing gross pollutant traps on stormwater pipes at point of entry to the Lagoon.	Shire of Busselton / DCALC	Medium	
	M6	Erect appropriate signage at strategic points around the Lagoon to discourage bird feeding.	DCALC/ Shire of Busselton	Medium	Coastcare
	M7	Prohibit further development on the Reserve within 50m of the riparian vegetation surrounding the Lagoon.	Shire of Busselton	High	
	M8	Install appropriate fencing or a vegetative buffer between the Lagoon and the DUP to increase habitat function and visual amenity of the Lagoon.	Shire of Busselton In conjunction with community	Medium	Coastcare
5.3 Feral Animal Control	**M9**	In consultation with CALM, undertake trapping exercises to eradicate feral animals on an 'as needs' basis.	Shire of Busselton CALM for technical advice	Low	CALM

Objective		Management Recommendation	Responsibility	Priority	Potential Funding Source
5.4 Weed Control	**M10**	Implement ongoing weed control within the Reserve according to the appropriate methods with preference given to manual removal of weeds or spot applications.	Shire of Busselton In conjunction with community	Medium	Agriculture WA
	M11	In the vicinity of Elmore Lagoon, herbicide use should be in accordance with the WRC 'Herbicide Use in Wetlands'.	Shire of Busselton DoE for technical advice	Medium	
5.5.1 Car Parking	**M12**	Increase the capacity of the professional fishermen's boat ramp car park subject to the DBYC proposal being approved.	Shire of Busselton DBYC	Subject to approval	
	M13	Upgrade the Elmore Lagoon car park to reduce dust emissions.	Shire of Busselton	High	
5.5.2 Beach Access Paths	**M14**	Formalise high usage beach access paths by surfacing with crushed limestone to reduce wear on the track and encourage pedestrians to stay on the path.	Shire of Busselton DCALC	Medium	CoastCare
	M15	Install appropriate fencing and brushing to prevent pedestrians veering off of designated beach access paths.	Shire of Busselton DCALC	Medium	Coastcare
5.5.3 Dual Use Path	**M16**	Fence sections of the DUP to prevent random access to the Reserve.	Shire of Busselton	High	Coastcare
5.5.4 Fencing	**M17**	Install appropriate fencing along beach access paths, the DUP and car parks to protect vegetation and landforms (dunes).	Shire of Busselton	High	Coastcare
	M18	In areas exhibiting signs of degradation, consider installing temporary transportable fencing to restrict access from the beach across the primary dunes.	Shire of Busselton	Low	Coastcare
5.5.5 Signage	**M19**	Develop and install consistent signage for directional, interpretative and public safety.	Shire of Busselton With assistance from community	High	Coastcare

Objective		Management Recommendation	Responsibility	Priority	Potential Funding Source
5.6.1 Toilets and Showers	**M20**	Subject to the boatshed being approved and constructed, design and construct a public toilet facility (including a minimum of two toilets for both males and females and one disabled access toilet) subject to significant financial contribution from user groups and success with grant submissions.	Shire of Busselton	Subject to approval	Prof. Fishermen DBYC Mooring users
	M21	Subject to the boatshed being approved and constructed, design and construct a disabled car parking bay with ramp access adjacent to the disabled toilet facility subject to extension of car park and provision of toilet facilities.	Shire of Busselton	High	Prof. Fishermen DBYC Mooring users
	M22	Subject to the boatshed being approved and constructed, connect the public toilet facility to reticulated sewer preferably or alternatively to a Shire approved ATU subject to approval.	Shire of Busselton	High	Prof. Fishermen DBYC Mooring users
5.6.2 Bins	**M23**	Monitor the parking area for rubbish dumping and consider providing bins if necessary.	Shire of Busselton	Low	
5.7 Interpretation and Education	**M24**	Provide appropriate signage at Elmore Lagoon to enhance viewers understanding of the flora, fauna, landscape they are looking at and encourage dog owners to restrain their pets on a leash while around the Lagoon.	Shire of Busselton in conjunction with the DCALC GeoCatch	High	Coastcare
5.8 Heritage and Culture	**M25**	Install an informative plaque on the site of the old Quindalup School near the DUP to inform pedestrians of the history of the site.	Shire of Busselton	Low	Heritage Com-mission
5.9 Fire Risk and Management	**M26**	Ensure that access to a water supply for fire suppression purposes is available from fire hydrants located within the road reserves and that they are provided to the relevant standard and agency requirements.	Shire of Busselton FESA	Subject to approval	

Objective		Management Recommendation	Responsibility	Priority	Potential Funding Source
5.10 Provision of Coastal Facilities	**M27**	Prior to finalising the siting of <u>any</u> permanent coastal facilities, that a coastal engineer undertake a coastal stability assessment to produce a Shoreline Movement Plan. This Plan will determine the appropriateness or otherwise of permanent coastal facilities being constructed within the foreshore reserve.	Shire of Busselton/ Proponent	Subject to approval	

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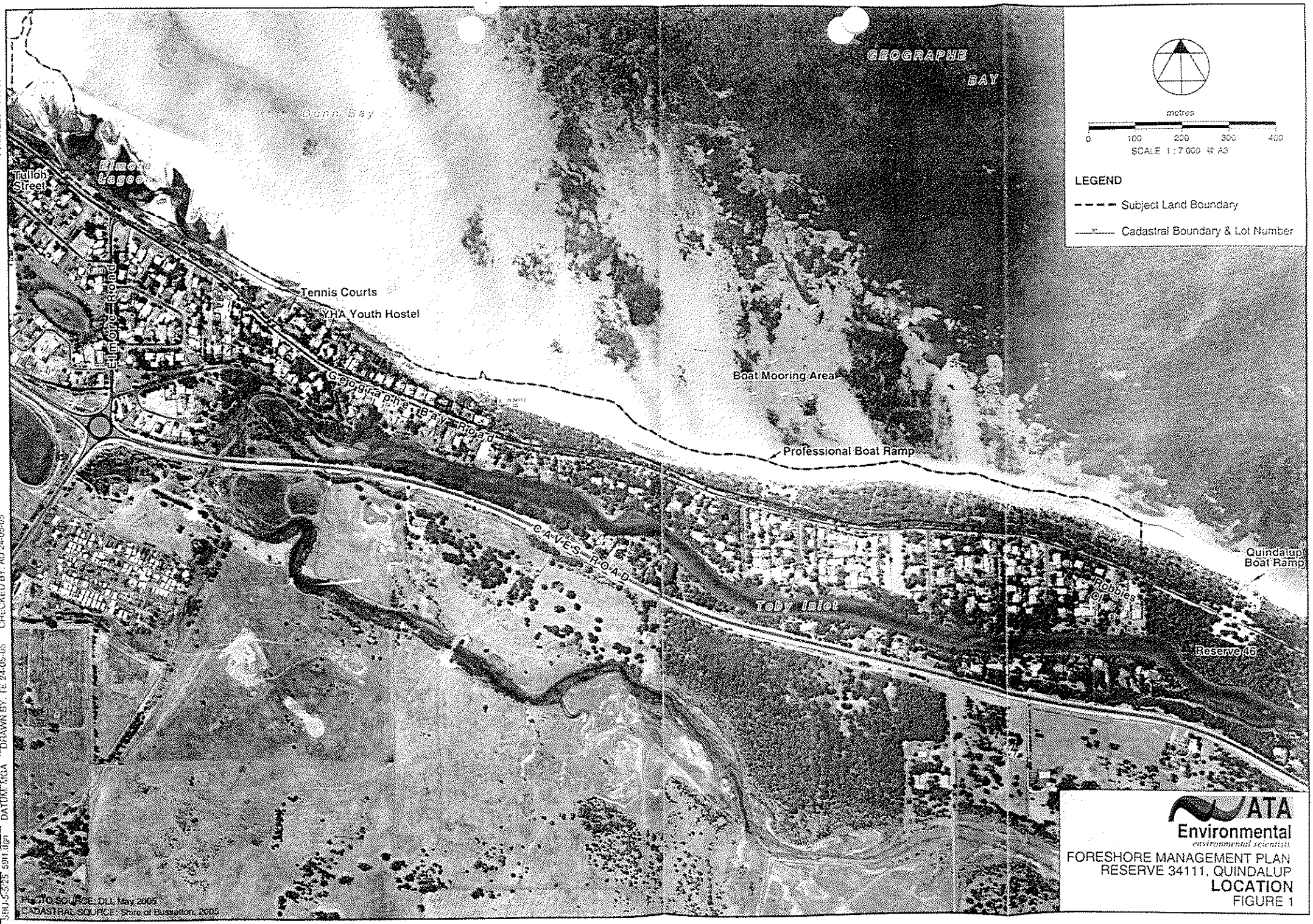
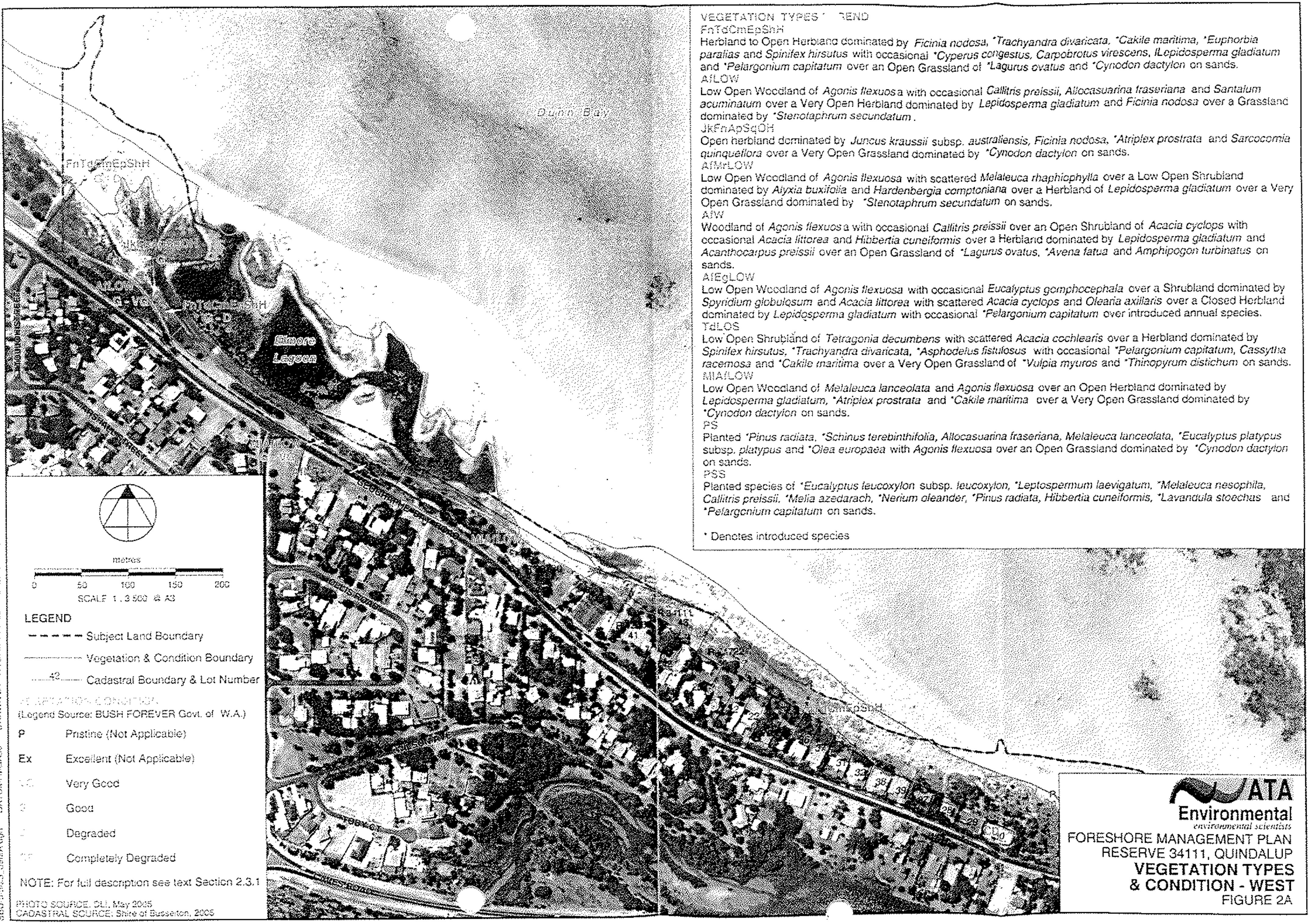
FIGURES


GEOGRAPHE BAY
Dunn Bay
Lagoon
Tulloh Street
Tennis Courts
YHA Youth Hostel
Geographe Bay Road
Boat Mooring Area
Professional Boat Ramp
CAVES ROAD
Quindalup Boat Ramp
Robbes Creek
Reserve 46
metres
0 100 200 300 400
SCALE 1:7,000 @ A3
LEGEND
Subject Land Boundary
Cadastral Boundary & Lot Number
ATA Environmental
environmental scientists
FORESHORE MANAGEMENT PLAN
RESERVE 34111, QUINDALUP
LOCATION
FIGURE 1
PHOTO SOURCE: DLI, May 2005
CADASTRAL SOURCE: Shire of Busselton, 2005



VEGETATION TYPES LEGEND

FnTdCmEpShH
Herbland to Open Herbland dominated by *Ficinia nodosa*, **Trachyandra divaricata*, **Cakile maritima*, **Euphorbia paralias* and *Spinifex hirsutus* with occasional **Cyperus congestus*, *Carpobrotus virescens*, *Lepidosperma gladiatum* and **Pelargonium capitatum* over an Open Grassland of **Lagurus ovatus* and **Cynodon dactylon* on sands.

AfLOW
Low Open Woodland of *Agonis flexuosa* with occasional *Callitris preissii*, *Allocasuarina fraseriana* and *Santalum acuminatum* over a Very Open Herbland dominated by *Lepidosperma gladiatum* and *Ficinia nodosa* over a Grassland dominated by **Stenotaphrum secundatum*.

JkFnApSqOH
Open herbland dominated by *Juncus kraussii* subsp. *australiensis*, *Ficinia nodosa*, **Atriplex prostrata* and *Sarcocornia quinqueflora* over a Very Open Grassland dominated by **Cynodon dactylon* on sands.

AfMrLOW
Low Open Woodland of *Agonis flexuosa* with scattered *Melaleuca rhaphiophylla* over a Low Open Shrubland dominated by *Alyxia buxifolia* and *Hardenbergia comptoniana* over a Herbland of *Lepidosperma gladiatum* over a Very Open Grassland dominated by **Stenotaphrum secundatum* on sands.

AfW
Woodland of *Agonis flexuosa* with occasional *Callitris preissii* over an Open Shrubland of *Acacia cyclops* with occasional *Acacia littorea* and *Hibbertia cuneiformis* over a Herbland dominated by *Lepidosperma gladiatum* and *Acanthocarpus preissii* over an Open Grassland of **Lagurus ovatus*, **Avena fatua* and *Amphipogon turbinatus* on sands.

AfEgLOW
Low Open Woodland of *Agonis flexuosa* with occasional *Eucalyptus gomphocephala* over a Shrubland dominated by *Spyridium globulosum* and *Acacia littorea* with scattered *Acacia cyclops* and *Olearia axillaris* over a Closed Herbland dominated by *Lepidosperma gladiatum* with occasional **Pelargonium capitatum* over introduced annual species.

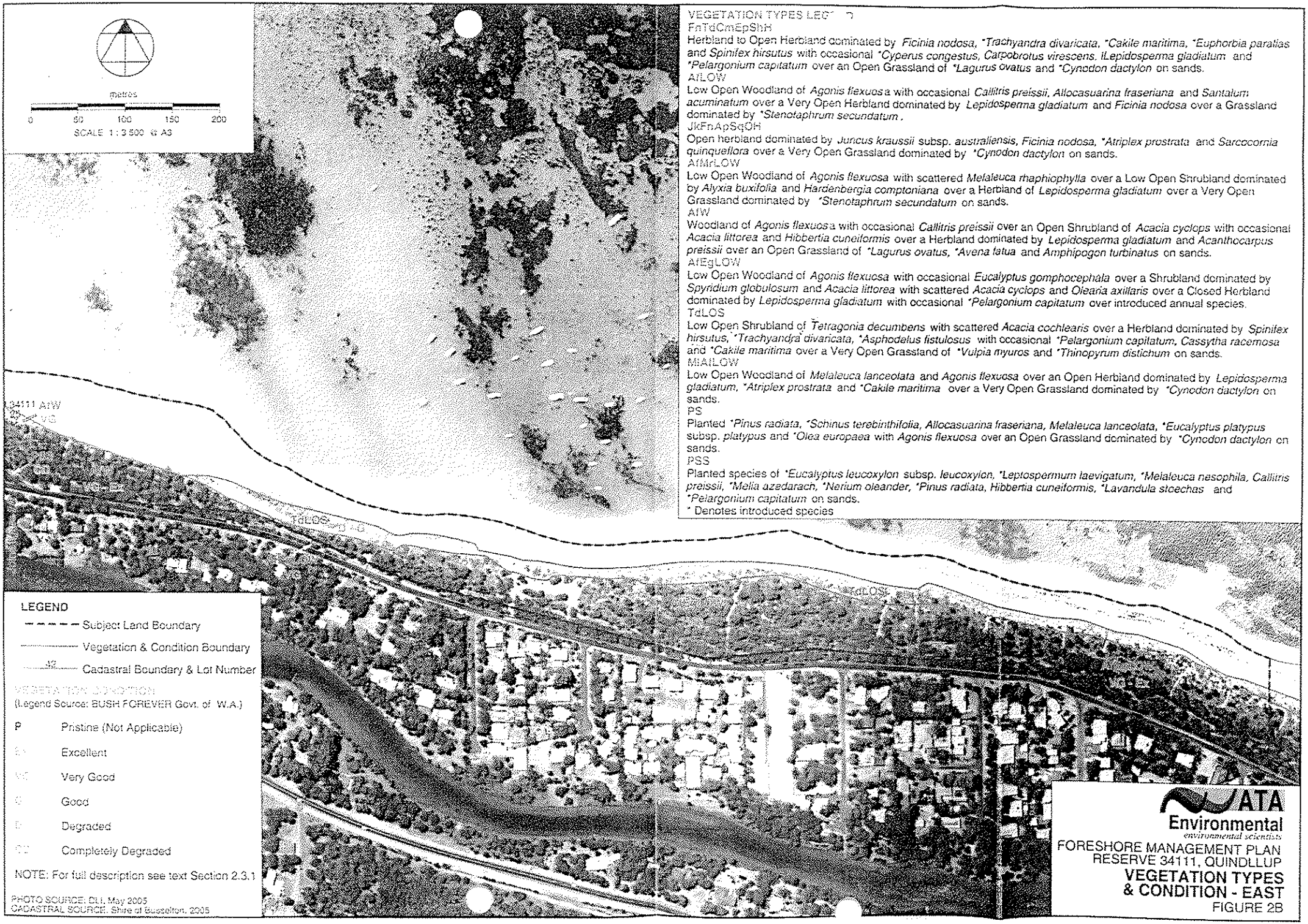
TdLOS
Low Open Shrubland of *Tetragonia decumbens* with scattered *Acacia cochlearis* over a Herbland dominated by *Spinifex hirsutus*, **Trachyandra divaricata*, **Asphodelus fistulosus* with occasional **Pelargonium capitatum*, *Cassytha racemosa* and **Cakile maritima* over a Very Open Grassland of **Vulpia myuros* and **Thinopyrum distichum* on sands.

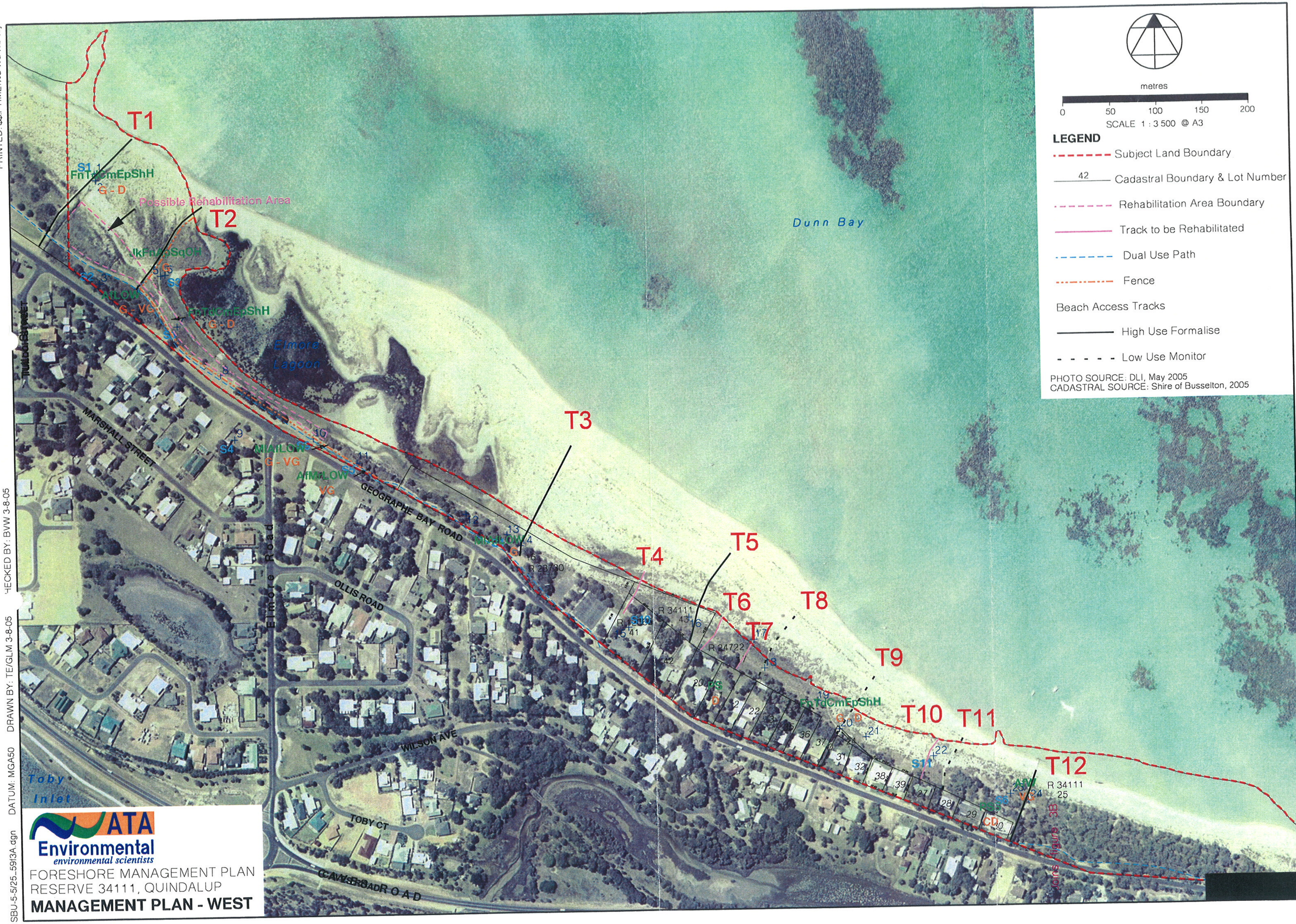
MlAfLOW
Low Open Woodland of *Melaleuca lanceolata* and *Agonis flexuosa* over an Open Herbland dominated by *Lepidosperma gladiatum*, **Atriplex prostrata* and **Cakile maritima* over a Very Open Grassland dominated by **Cynodon dactylon* on sands.

PS
Planted **Pinus radiata*, **Schinus terebinthifolia*, *Allocasuarina fraseriana*, *Melaleuca lanceolata*, **Eucalyptus platypus* subsp. *platypus* and **Olea europaea* with *Agonis flexuosa* over an Open Grassland dominated by **Cynodon dactylon* on sands.

PSS
Planted species of **Eucalyptus leucoxylon* subsp. *leucoxylon*, **Leptospermum laevigatum*, **Melaleuca nesophila*, *Callitris preissii*, **Melia azedarach*, **Nerium oleander*, **Pinus radiata*, *Hibbertia cuneiformis*, **Lavandula stoechas* and **Pelargonium capitatum* on sands.

* Denotes introduced species


metres
0 50 100 150 200
SCALE 1 : 3 500 @ A3
34111 AtW
YC
TdLOS
TdLOS
TdLOS
LEGEND
Subject Land Boundary
Vegetation & Condition Boundary
Cadastral Boundary & Lot Number
VEGETATION CONDITION
(Legend Source: BUSH FOREVER Govt. of W.A.)
P Pristine (Not Applicable)
Excellent
Very Good
Good
Degraded
Completely Degraded
NOTE: For full description see text Section 2.3.1
PHOTO SOURCE: DLI, May 2005
CADASTRAL SOURCE: Shire of Busselton, 2005
VEGETATION TYPES LEG
FnTdCmEpShH
Herbland to Open Herbland dominated by Ficinia nodosa, *Trachyandra divaricata, *Cakile maritima, *Euphorbia paralias and Spinifex hirsutus with occasional *Cyperus congestus, Carpobrotus virescens. iLepidosperma gladiatum and *Pelargonium capitatum over an Open Grassland of *Lagurus ovatus and *Cynodon dactylon on sands.
AtLOW
Low Open Woodland of Agonis flexuosa with occasional Callitris preissii, Allocasuarina fraseriana and Santalum acuminatum over a Very Open Herbland dominated by Lepidosperma gladiatum and Ficinia nodosa over a Grassland dominated by *Stenotaphrum secundatum .
JkFnApSqOH
Open herbland dominated by Juncus kraussii subsp. australiensis, Ficinia nodosa, *Atriplex prostrata and Sarcocornia quinqueflora over a Very Open Grassland dominated by *Cynodon dactylon on sands.
AfMrLOW
Low Open Woodland of Agonis flexuosa with scattered Melaleuca rhaphiophylla over a Low Open Shrubland dominated by Alyxia buxifolia and Hardenbergia comptoniana over a Herbland of Lepidosperma gladiatum over a Very Open Grassland dominated by *Stenotaphrum secundatum on sands.
AtW
Woodland of Agonis flexuosa with occasional Callitris preissii over an Open Shrubland of Acacia cyclops with occasional Acacia littorea and Hibbertia cuneiformis over a Herbland dominated by Lepidosperma gladiatum and Acanthocarpus preissii over an Open Grassland of *Lagurus ovatus, *Avena fatua and Amphipogon turbinatus on sands.
AfEgLOW
Low Open Woodland of Agonis flexuosa with occasional Eucalyptus gomphocephala over a Shrubland dominated by Spyridium globulosum and Acacia littorea with scattered Acacia cyclops and Olearia axillaris over a Closed Herbland dominated by Lepidosperma gladiatum with occasional *Pelargonium capitatum over introduced annual species.
TdLOS
Low Open Shrubland of Tetragonia decumbens with scattered Acacia cochlearis over a Herbland dominated by Spinifex hirsutus, *Trachyandra divaricata, *Asphodelus fistulosus with occasional *Pelargonium capitatum, Cassytha racemosa and *Cakile maritima over a Very Open Grassland of *Vulpia myuros and *Thinopyrum distichum on sands.
MlAtLOW
Low Open Woodland of Melaleuca lanceolata and Agonis flexuosa over an Open Herbland dominated by Lepidosperma gladiatum, *Atriplex prostrata and *Cakile maritima over a Very Open Grassland dominated by *Cynodon dactylon on sands.
PS
Planted *Pinus radiata, *Schinus terebinthifolia, Allocasuarina fraseriana, Melaleuca lanceolata, *Eucalyptus platypus subsp. platypus and *Olea europaea with Agonis flexuosa over an Open Grassland dominated by *Cynodon dactylon on sands.
PSS
Planted species of *Eucalyptus leucoxylon subsp. leucoxylon, *Leptospermum laevigatum, *Melaleuca nesophila, Callitris preissii, *Melia azedarach, *Nerium oleander, *Pinus radiata, Hibbertia cuneiformis, *Lavandula stoechas and *Pelargonium capitatum on sands.
* Denotes introduced species
ATA Environmental
environmental scientists
FORESHORE MANAGEMENT PLAN
RESERVE 34111, QUINDLLUP
VEGETATION TYPES & CONDITION - EAST
FIGURE 2B



T1
T2
T3
T4
T5
T6
T7
T8
T9
T10
T11
T12
Possible Rehabilitation Area
Dunn Bay
Elmore Lagoon
Toby Inlet
GEOGRAPHE BAY ROAD
MARSHALL STREET
Elmore Road
OLLIS ROAD
WILSON AVE
TOBY CT
CAVES ROAD
R 28730
R 34111
R 24722
R 34111
metres
0 50 100 150 200
SCALE 1 : 3 500 @ A3
LEGEND
Subject Land Boundary
42 Cadastral Boundary & Lot Number
Rehabilitation Area Boundary
Track to be Rehabilitated
Dual Use Path
Fence
Beach Access Tracks
High Use Formalise
Low Use Monitor
PHOTO SOURCE: DLI, May 2005
CADASTRAL SOURCE: Shire of Busselton, 2005
ATA Environmental
environmental scientists
FORESHORE MANAGEMENT PLAN
RESERVE 34111, QUINDALUP
MANAGEMENT PLAN - WEST

PRINTED: $$FTIME %a %d %b %y

HECKED BY: BVW 3-8-05

DRAWN BY: TE/GLM 3-8-05

DATUM: MGA50

SBU-5-5/25...5913A dgn

PRINTED: $$FTIME %a %d %b %y

metres

0 50 100 150 200

SCALE 1 : 3 500 @ A3

LEGEND

- Subject Land Boundary
- 42 Cadastral Boundary & Lot Number
- Rehabilitation Area Boundary
- Track to be Rehabilitated
- Dual Use Path
- Fence
- Existing Car Parking Area
- Possible Car Park Extension (Retaining mature trees where possible)
- Existing Transportable (Chemical) Toilet Block

Beach Access Tracks

- High Use Formalise
- Low Use Monitor

NOTE
Pursuant to resolution CO508/268, the Busselton Shire Council has endorsed Site B only for consideration in the Draft Management Plan during the community consultation phase.

Dunn Bay

Boat Mooring Area

R 34111
25

T13 T14 T15 T16 T17 T18 T19 T20 T21 T22 T23 T24 T25 T26 T27 T28 T29 T30 T31

Professional Boat Ramp

Possible Rehabilitation Area

'Site A'

Site B'

Possible Car Park Extension

Existing access road

GEOGRAPHE BAY ROAD

CAVES ROAD

McDermott St

Holiday Villas

Geographe Cl

Bayshore Resort

Stone St

PINE CT

WHATMAN STREET

LAGOONA PL

Robbies Cl

Toby Inlet

CAVES ROAD

Joins figure 3A

PHOTO SOURCE: DLI, May 2005
CADASTRAL SOURCE: Shire of Busselton, 2005

ATA Environmental
environmental scientists

FORESHORE MANAGEMENT PLAN
RESERVE 34111, QUINDLLUP
MANAGEMENT PLAN - EAST
FIGURE 3B

CHECKED BY: AD/BVW 2-8-05
DRAWN BY: TE/GLM 2-8-05
DATUM: MGA50
SBU-5-5/25_5913B.dgn

APPENDIX 2
QUINDALUP RESERVE No. 34111 FLORA LIST

* Denotes Introduced (weeds) and non-endemic species.

Family	Genus/Species	Common Name
GYMNOSPERMS		
ARAUCARIACEAE	**Araucaria heterophylla*	Norfolk pine
CUPRESSACEAE	*Callitris preissii*	Rottnest Island pine
PINACEAE	**Pinus radiata*	Radiata pine
MONOCOTYLEDONS		
ASPHODELACEAE	**Trachyandra divaricata*	Dune onion weed
CYPERACEAE	*Baumea juncea*	Bare twigrush
	**Cyperus congestus*	Dense flat-sedge
	Ficinia nodosa	Knotted club rush
DASYPOGONACEAE	*Acanthocarpus preissii*	Prickle lily
HAEMODORACEAE	*Conostylis aculeata* subsp. *gracilis*	Prickly conostylis
JUNCACEAE	*Juncus kraussii* subsp. *australiensis*	Snogerup
	Juncus pallidus	Pale rush
POACEAE	*Amphipogon turbinatus*	
	**Avena fatua*	Wild oat
	**Cynodon dactylon*	Couch grass
	**Lagurus ovatus*	Hare's tail grass
	Spinifex hirsutus	Hairy spinifex
	**Stenotaphrum secundatum*	Buffalo grass
	**Thinopyrum distichum*	Sea wheat
	**Vulpia myuros*	Rat's tail fescue
DICOTYLEDONS		
AIZOACEAE	*Carpobrotus virescens*	Coastal pigface
	Tetragonia decumbens	Sea spinach
ANACARDIACEAE	**Schinus terebinthifolia*	Japanese pepper
APIACEAE	**Hydrocotyle bonariensis*	

Family	Genus/Species	Common Name
APOCYNACEAE	**Nerium oleander*	
	Alyxia buxifolia	Dysentery bush
ASTERACEAE	**Arctotheca populifolia*	Dune arctotheca
	**Conyza sumatrensis*	
	**Gazania linearis*	Gazania
	**Hypochaeris glabra*	Smooth catsear
	**Pseudognaphalium luteoalbum*	Jersey cudweed
	**Ursinia anthemoides*	Ursinia
BRASSICACEAE	**Cakile maritima*	Sea rocket
CASUARINACEAE	*Allocasuarina fraseriana*	Sheoak
CHENOPODIACEAE	*Atriplex ?cinerea*	Grey saltbush
	**Atriplex prostrata*	Hastate orache
	Rhagdia baccatta	Berry saltbush
	Sarcocornia quinqueflora	Beaded samphire
	Threlkeldia diffusa	Coast bonefruit
DILLENIACEAE	*Hibbertia cuneiformis*	Cutleaf hibbertia
EPACRIDACEAE	*Leucopogon parviflorus*	Coast Beard-heath
EUPHORBIACEAE	**Euphorbia paralias*	Sea spurge
	Phyllanthus calycinus	False boronia
GERANIACEAE	**Pelargonium capitatum*	Rose pelargonium
LAMIACEAE	**Lavandula stoechas*	Spanish lavender
LAURACEAE	*Cassytha racemosa*	Dodder laurel
MELIACEAE	**Melia azedarach*	White cedar
MIMOSACEAE	*Acacia cochlearis*	Rigid wattle
	Acacia cyclops	Coastal wattle
	Acacia littorea	
	Acacia rostellifera	Summer scented-wattle
	Acacia saligna	Orange wattle
MYRTACEAE	*Agonis flexuosa*	Peppermint
	Eucalyptus gomphocephala	Tuart
	**Eucalyptus leucoxylon* subsp. *leucoxylon*	Blue gum
	**Eucalyptus platypus* subsp. *platypus*	Moort

Family	Genus/Species	Common Name
	**Leptospermum laevigatum*	Coast teatree
MYRTACEAE (Cont)	*Melaleuca lanceolata*	Rottnest teatree
	**Melaleuca nesophila*	Mindiyed
	Melaleuca rhaphiophylla	Swamp paperbark
OLEACEAE	**Olea europaea*	Olive
OROBANCHACEAE	**Orobanche minor*	Lesser broomrape
PAPILIONACEAE	*Hardenbergia comptoniana*	Native wisteria
PLANTAGINACEAE	**Plantago lanceolata*	Ribwort plantain
POLYGONACEAE	*Muehlenbeckia adpressa*	Climbing lignum
PROTEACEAE	**Adenathos cygnorum*	Common woollybush
	**Grevillea argyrophylla*	Silvery-leaved grevillea
RHAMNACEAE	*Spyridium globulosum*	Basket bush
SANTALACEAE	*Santalum acuminatum*	Quandong