Shire of Busselton

Geographe Bay

DUNSBOROUGH FORESHORE MANAGEMENT PLAN

ADOPTED JANUARY 2009

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on behalf of the Shire of Busselton.

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EXECUTIVE SUMMARY

The Dunsborough Foreshore Management Plan (DFMP) documents both the current state and values and provides generic principles and specific actions and recommendations in order to guide future management of the Dunsborough Foreshore Reserves between Tulloh Road and Hurford Street. It supports and compliments a number of other plans and reports covering all or part of the area including the Geographe Bay Foreshore Management Plan.

The preparation of the DFMP involved significant community consultation including:

- Promotion through a number of articles and notices in local newspapers;
- Letters distributed to landholders adjoining the foreshore;
- Three consultation sessions held on site;
- Conversations with key stakeholders or residents who were identified as having a specific interest in the area;
- The receipt and consideration of submissions.

The DFMP identifies many significant conservation, recreational and social values associated with the foreshore. Attributes of the foreshore include:

- Patches of good quality low peppermint woodland, remnant vegetation;
- Patches of high value Western Ringtail Possum habitat;
- Dual Use Path and parkland cleared areas that are of high recreational value;
- Foreshore buffer: protecting and minimising the impacts of storm events and coastal erosion;
- Facilitating useage and recreation along and in Geographe Bay; and
- Visual amenity: a scenic backdrop to large parts of Dunsborough.

However, a number of threats exist which if left unmanaged are likely to undermine the specific values of the foreshore. Management recommendations developed following the consideration of submissions and the community consultation phase are summarised in Section 4.3. Some of the more significant recommendations include:

- Changing (and where Unallocated Crown Land exists seek vesting for) the purpose of the reserve to ‘Public recreation and foreshore protection’;
- Addressing the ongoing Dunn Bay Road carpark erosion problems in line with coastal engineering advice;
- Extension and linking up of the Dual Use Path through the full length of the site;
- Giving consideration to the possibility of making portions Bayview Cr between Gifford st and Green St oneway to open up the foreshore and facilitate pedestrian usage and passage;
- Investigating and implementing stormwater improvements through the area;
- Control of perennial and annual grasses invading into the bushland components of the site (shoreward of the DUP);
- Managing isolated outbreaks of a number of priority environmental weed species;
- Undertaking understorey revegetation through a number of areas to provide habitat connectivity, foreshore protection and improved visual amenity;
- Recognition and acknowledgement of the indigenous values and history of the foreshore;
- Supporting and recognising the significant contribution that the local coastcare group, DCALC, makes to the management of the foreshore reserve;
- Promoting and implementing the Reserve Vegetation Protection Policy in order to manage illegal damage to vegetation in the reserve;
- Addressing green waste dumping (predominantly grass clippings) in the reserve;
- Developing a series of interpretive signage covering natural, Aboriginal and European history;
- A number of minor recommendations covering access and infrastructure provision (eg seating, bins, signage etc); and
- The provision of additional toilets to service the Dunn Bay Rd carpark and Banks Avenue carpark and playground within Centennial Park.

1. INTRODUCTION

1.1 BACKGROUND

In October 2001, the Shire of Busselton completed the Geographe Bay Foreshore Management Plan[1] providing an integrated coastal management strategy for Geographe Bay and broad management direction for nine foreshore precincts within Geographe Bay, including what was referred to as the Dunsborough precinct. This document represents the detailed management plan for the Dunsborough precinct.

The planning process for the development of the Dunsborough Foreshore Management Plan (DFMP) involves:

1. Preparation of draft DFMP by the consultant.
2. Draft DFMP reviewed and approved for advertisement by Shire of Busselton.
3. Public advertising of the draft documents and formal community consultation process.
4. Final DFMP prepared after consideration of submissions received.
5. Management Plan adopted by Council and implemented by Shire of Busselton.

1.2 PURPOSE AND SCOPE OF THE MANAGEMENT PLAN

Litoria Ecoservices prepared the plan over a sixteen-week period between March and June 2008, following consultation with local residents, community and agency stakeholders and relevant Shire staff. The DFMP provides detailed site information and management strategies for the area to supplement the broad direction of the Geographe Bay Foreshore Management Plan. The document builds upon the report 'Draft Management Plan, Dunsborough Coastal Reserves, November 2003' produced by the Dunsborough Coast and Land Care (DCALC) Inc which has not been formally adopted by the Shire.

Development of the DFMP involved:

- assessment of the current physical and ecological state of the site including native vegetation, weed burden, erosion-prone areas, pedestrian and vehicular access and recreational usage;
- input from local residents, community and agency stakeholders; and
- development of detailed, prioritised management recommendations for improving and preserving the values of the site.

The purpose of this management plan is to identify management recommendations to maintain and improve the key qualities of the foreshore site, namely:

- recreation values;
- social values;
- conservation values; and
- erosion buffer function.

The objectives are to:

1. facilitate sustainable recreation;
2. maintain and enhance conservation values of the site; and
3. foster community ownership of and responsibility for the foreshore.

Limitations must be acknowledged in relation to the term and timing of the project (for example, outside of peak recreational season). The scope of the works did not include a detailed flora and fauna survey of the site and the season within which the work was undertaken (outside of the winter growing and spring flowering season) may have meant that some species were unlikely to be recorded during the site assessment.

1.3 THE STUDY AREA

This management plan covers the Dunsborough stretch of the Geographe Bay foreshore area between Hurford Street and Tulloh Road, Dunsborough (Figure 1). It is approximately three and a half kilometres in length and for a large part is bounded to the south-west by Geographe Bay Road. It varies in width from approximately 40 to 120 metres.

1.4 LEGISLATIVE AND POLICY FRAMEWORK

A broad range of legislation, as well as local and state government policy and guidelines applies to foreshore areas. Additionally, a number of planning documents exist that are specifically relevant to portions of the Dunsborough foreshore. The following have been considered in the preparation of this plan:

- Geographe Bay Foreshore Management Plan (2001);
- Geographe Bay Foreshore Management Plan, Technical Report (2000);
- The Coastal Planning and Management Manual (2003);
- Shire of Busselton Reserves and Foreshores Local Law;
- Shire of Busselton Community Infrastructure Division Technical Standards and Specifications;
- Busselton District Town Planning Scheme No. 20 (1999);
- State Coastal Planning Policy 2.6;
- Draft Dunsborough Coastal Reserves Management Plan 2003, Dunsborough Coast and Landcare Group;
- Dunsborough Townscape Plan 2002, Shire of Busselton;
- Concept Plan for Dunsborough Foreshore and Seymour Parks 2007, Shire of Busselton;
- Design and Restoration of Dunsborough Town Beach, Project Report Coastcare Project 9845 (2000), GroundLink Planning Consultants;
- Coastal Facilities Asset Management Plan, Cape Naturaliste to Toby Inlet 2006-2026 (2006), Shire of Busselton;
- An Aboriginal Heritage Survey for the proposed landscape enhancements to Dugalup Brook, Dunsborough Foreshore and Seymour Park (2007), Brad Goode & Associates;
- Department of Planning and Urban Development report ‘Recommendation for Coastal Reserves, Building setbacks and Development controls along Geographe Bay’ July 1992;
- Wildlife Conservation Act (1950);
- Leeuwin Naturalist Ridge Statement of Planning Policy 6.1; and
- Environment Protection and Biodiversity Conservation Act (1999).

It should also be noted that the area has been the subject of at least three Coastcare grants with written reports documenting the work undertaken by these projects.

1.4.1 Geographe Bay Foreshore Management Plan

In 2001, the Shire of Busselton in conjunction with Geocatch had the Geographe Bay Foreshore Management Plan prepared. This overarching document covers the Geographe Bay Foreshore area from Dunsborough to Port Geographe and in addition to generic recommendations on foreshore management throughout Geographe Bay, the report provides a small number of recommendations for each foreshore 'precinct'.

Within the Dunsborough precinct the following proposals were provided:

- **Proposal 21:** Small, well managed clusters of native vegetation plantings should be undertaken along the seaward side of Vincent Road and Geographe Bay Road to replace grass. This should be done in a staged manner allowing for the successful management of weeds within each planting cluster. Over time an infill program can be implemented until the entire strip is replaced by appropriate native species. Management of weeds could possibly be achieved by the organisation of street committees who can keep a close watch on emerging species.
- **Proposal 22:** Landscaping on the beachside of new coastal developments should avoid the use of extensive lawns which can be invasive into the dune vegetation and also require high maintenance. Whilst the planting of lawns is necessary to provide areas for recreation, these areas should be reduced in size so as to allow for linked corridors of native vegetation.
- **Proposal 23:** The high incidence of *Lagurus ovatus* (hare's tail grass) in the peppermint forest on the north of Geographe Bay Road is leading to a decline in native species cover and diversity as a result of competition for nutrients and moisture. This grass also renders the coastal forest more susceptible to fire particularly during late summer when the grass is very dry. Photograph 8 (in the Technical Report) shows how dense the cover is in the Siesta Park Reserve. No single, simple solution exists for the control of this plant. The most effective method, as with other weed species, is to achieve a strong cover of native species and this, in turn, relates to the integrated management of the coastal zone.
- **Proposal 24:** The Dunn Bay Road carpark should be redeveloped further back from the existing beach.
- **Proposal 25:** Parallel parking should be provided along Geographe Bay Road on the northern side to provide access to the coastal reserve.
- **Proposal 26:** A dual use path should be constructed in the short term to join existing areas where no road access exists and to be a separate continuous path in the long term.
- **Proposal 27:** A dual use path should be constructed to link Meelup Park to the Dunsborough townsite.
- **Proposal 28:** A boat launching facility, including a ramp and hard standing, at the end of Hurford Street, should be further investigated by the appropriate authorities. It should be noted that the Hurford Street site presents serious constraints to the provision of sufficient infrastructure for a boat ramp, and as a result it is unlikely that this proposal will be implemented.
- **Proposal 29:** Sites for children's play equipment and shade/seating for adult childminders should be selected in the coastal reserve in the vicinity of existing lawns.
- **Proposal 30:** Gas barbeques should be provided in picnic areas to reduce the risk of fire.

1.4.2 UWA Dunsborough Foreshore design process

Prior to and during the preparation of this management plan the Dunsborough Yallingup Chamber of Commerce and Industry (DYCCI) has been coordinating a design process involving UWA undergraduate students under the supervision of their lecturer, covering the Dunsborough town centre including the foreshore adjacent to Dunn Bay Road. The students' brief did not relate directly to a formal planning or Shire process but rather was intended to generate and expose new ideas and concepts for the improvement of the town centre.

While the DYCCI/ UWA process had a much broader scope than purely the foreshore, there is some overlap in the two works and this did lead to some confusion amongst some members of the public regarding the two processes.

It is acknowledged that the DYCCI/ UWA work and other reports recommend some level of 'redevelopment of the Dunn Bay Rd foreshore' area, however, the consideration of development of the foreshore is beyond the scope of this document. Rather this document has assessed the current state of the area in line with the other 3.5km of Dunsborough foreshore and developed broad recommendations relating to the improvement of the conservation and recreational values of the reserve. These recommendations should be considered in light of any future development proposals.

1.5 STAKEHOLDER CONSULTATION

The development of the DFMP builds upon a number of previous community surveys including those undertaken during the preparation of the Design and Restoration of Dunsborough Town Beach (2000) report and the Geographe Bay Foreshore Management Plan 2001.
Consultation undertaken during the preparation of the plan included:

- 'one-on-one' conversations with key stakeholders or residents who were identified as having a specific interest in the area;
- discussions with locals and visitors encountered during site work;
- submissions received by the Shire during the preparation of the plan; and
- individual and group comments received during public consultation sessions held on-site on:
    - Sunday April 20 2008;
    - Saturday May 3 2008; and
    - Thursday May 8 2008.

Adjacent landholders were notified by mail of the consultation sessions and two notices were placed in the "Council for Community" page of the Busselton-Dunsborough Mail and the Busselton–Dunsborough Times. Additional promotion occurred through a number of media articles published during the process and an interview on local ABC radio.

Indigenous representatives were contacted for input and also representatives from the following organisations:

- Department of Environment and Conservation;
- Dunsborough – Coast and Land Care (DCALC) Inc;
- Dunsborough Yallingup Chamber of Commerce and Industry;
- Dunsborough Progress Association;

- Shire of Busselton Environment Reference Group;
- Geocatch; and
- Busselton Dunsborough Environment Centre.

The following tourist accommodation businesses adjoining the foreshore reserve were also contacted with respect to the plan:

- Waterfront Dunsborough;
- Whalers' Cove;
- Dunsborough Beach Cottages;
- Halcyon Bay;
- Geographe Cove Resort; and
- Regency Beach Club Dunsborough.

2. CURRENT STATE AND RECOMMENDATIONS: BIOPHYSICAL FEATURES

2.1 SITE DESCRIPTION, VESTING AND PURPOSE

The Dunsborough foreshore encompasses approximately 32ha of dunal and near-coastal vegetation bordered to the south-west by Geographe Bay Road, Bayview Crescent and short term accommodation. Geographe Bay lies to the north-west, the site adjoins Meelup Region Park to the north-west and the Elmore Street Lagoon and the Quindalup foreshore precinct are to the south-east.

Two streams enter the site, Dugalup and Dandatup Brooks. There are also numerous stormwater outlets feeding into Geographe Bay.

The area covers a number of reserves and areas including:

- Lot No. 48, privately owned and reserved for Recreation;
- Reserve 22965, vested with the Shire of Busselton as 'A' class reserve for Camping & Recreation;
- Reserves 29627, 32231 and 44343, vested with the Shire of Busselton as 'C' class reserves for Public Recreation;
- Vacant Crown Land from Mentor Place north-west to the edge of Meelup Regional Park; and
- Portions of a number of road reserves including Bayview Crescent, Beach Road, North Street, Geographe Bay Road and Vincent Street.

It is recommended that:

- the vested purpose of Reserves 22965, 29627, 44343 and 32231 be changed to "Public recreation and foreshore protection" to more accurately reflect their current roles and values; and
- the Shire seek vesting of the Vacant Crown Land as a 'C' Class reserve for the purposes of "Public recreation and foreshore protection".

2.2 CLIMATE

Located in Western Australia's south-west, the area experiences a Mediterranean climate with hot dry summers and cool wet winters. Busselton has an average annual rainfall of 817 mm with approximately 85% of this rain falling between May and October.

2.3 COASTAL PROCESSES

Geographe Bay generally experiences one tidal exchange per day with tidal movements averaging 0.5m. The passage of low pressure systems and associated northerly winds through the area in winter can generate storm surges with the ability to cause considerable erosion[1]. Typically the area experiences five or six erosive storms each year[1].

The Geographe Bay foreshore is a low energy but dynamic, sandy coastline in the lee of Cape Naturaliste with a relatively unique northerly aspect[1]. A longshore drift from west to east predominates along the Bay. The Geographe Bay coast experiences zones of accretion and erosion but with an overall trend towards accretion since 1941[2]. Due to the

normally low wave energy and subsequent restricted sediment supply, recovery from erosion events can be slow[3].

The seagrass meadows and sandbars just offshore are noted for their contribution to 'bottom resistance' and a resultant reduction in wave impact on the foreshore. In addition the dead seagrass or wrack that accumulates on the shoreline with the winter storms also serves to reduce the wave impact on the foreshore[3]. DCALC are currently contributing to a study occurring into the role sea grass wrack plays within the foreshore.

The Dunsborough foreshore has previously been identified as stable or accreting and many local residents consulted during the preparation of the plan attest to the accumulation of sand through most of the area in recent years.

2.4 GEOLOGY AND GEOMORPHOLOGY

The study area straddles the Dunsborough fault and contains two contrasting geological formations: the sandy Swan Coastal Plain and the granitic Leeuwin Naturaliste ridge.

The south-eastern portion of the site up to Beach Road represents the western most portion of the Swan Coastal Plain, characterised in this location by unconsolidated calcareous sands of Holocene origin attributed to the Quindalup formation.

The remaining portion of the site (west and north of Beach Road) forms part of the Leeuwin Naturaliste ridge or the 'rocky coast' and is characterised by granite outcrops and bays of the Wilyabrup formation.

2.5 TOPOGRAPHY

The topography of the site differs between the two geological formations and is strongly influenced by streams which drain the coastal plain and are partially impounded by the Quindalup dune system forming small wetlands behind the shoreline. Through much of the site these streams have been altered and formalised through the constructed stormwater system[1].

East of the Dunsborough fault, the Quindalup portion of the study area is characterised by low coastal dunes generally less than 3m in height. It generally consists of a beach, intertidal zone and low incipient foredune, followed by a wide area (up to 70m) of undulating low dunes with shallow intervening swales, rising to a low foredune and swale. In some areas this topography is complimented by the addition of wet depressions identified by large remnant melaleucas behind the foredune and interdunal wetlands of coastal sword sedge and knotted club rush.

North of the fault, the rocky coast is dominated by small granite outcrops at the waterline punctuated by small sand-filled bays. This stretch generally contains narrower beaches rising steeply from the high tide mark, with a narrower foreshore reserve before infrastructure and development (primarily roads and housing) interrupts the natural topography.

2.6 SITE VEGETATION

2.6.1 Existing Vegetation

Vegetation is an important factor in coastal planning and management due to its role in buffering against coastal erosion, enhancing the appeal of the area, creating a 'sense of place' and the inherent conservation values of native flora. Dune and foreshore vegetation is easily damaged by pedestrian and other traffic, and protection and careful management is necessary where potential for vegetation damage exists.[3]

Figures 2A-H show vegetation aspects of the study area.

Site vegetation across the length of the site is best described in three distinct portions:

- the sandy coast, extending from Tulloh Street to Beach Road,
- the rocky coast, stretching from Beach Road to Hurford Street; and
- the streams (Dugalup Brook and Dandatup Brook), which intersect the sandy coast yet contain riparian vegetation distinctly different from the bulk of the coast.

Sandy coast

Across this portion of the coast, vegetation grades from an open or closed herbland at the incipient foredune, through open coastal heathland around the foredune zone, to low peppermint woodland in the backdune and intertidal slack zone. Through much of this stretch of the coast a parkland cleared area exists between the DUP and Geographe Bay Road.

The open or closed herbland is dominated by introduced species such as sea rocket* (*Cakile maritima*), rose pelargonium* (*Pelargonium capitatum*), sea spurge* (*Euphorbia paralias*), and marram grass* (*Ammophila arenaria*), but some native species such as hairy and beach spinifex (*Spinifex hirsutus and Spinifex longifolius*) also exist.

(note: * denotes weed species)

The coastal heathland area contains the weed species from the incipient foredune herbland along with rose pelargonium* (*Pelargonium capitatum*) and dune onion weed* (*Trachyandra divaricate).* It contains a mixture of native species such as rigid wattle (*Acacia cochlearis*), shark's tooth wattle (*Acacia littorea*), coastal wattle (*Acacia cyclops*), WA peppermint (*Agonis flexuosa*), coastal sword-sedge (*Lepidosperma gladiatum*), knotted club rush (*Ficinia nodosa*) and berry saltbush (*Rhagodia baccata* subsp. *baccata*).

The low peppermint woodland unit is characterised by a canopy of WA peppermint *(Agonis flexuosa*) with a shrub layer dominated by basket bush (*Spyridium globulosum*), coastal beard-heath (*Leucopogon parviflorus*), berry saltbush (*Rhagodia baccata* subsp *baccata*) and rigid wattle (*Acacia cochlearis*). Other common species include coastal sword-sedge (*Lepidosperma gladiatum*), shark's tooth wattle (*Acacia littorea*), native rosemary (*Olearia axillaris*), prickle lilly (*Acanthocarpus preissii*) and native wisteria (*Hardenbergia comptoniana*). Common weed species of this unit include couch* (*Cynodon dactylon*), kikuyu* (*Pennisetum clandestinum),* other lawn grasses, soursob* (*Oxalis pes-caprae*), *Oxalis depressa**, rose pelargonium* (*Pelargonium capitatum*), dune

onion weed* (*Trachyandra divaricate*), hare's tail grass* (*Lagurus ovatus*) and arum lily* (*Zantedeschia aethiopica*).

A parkland cleared strip often exists between the low peppermint woodland and Geographe Bay Road. This consists primarily of WA peppermints but also with occasional swamp paperbarks (*Melaleuca rhaphiophylla*) identifying low points or old stream beds.

Stream coast

The stream coast is very similar to the sandy coast as described above, however, it is generally more degraded and has Dugalup and Dandatup Brooks running through the reserves.

These waterways have been subject to revegetation efforts by DCALC with primary fringing species including: seas rush (*Juncus krausii*), knotted club rush (*Ficinia nodosa*), swamp paperbark (*Melaleuca rhaphiophylla*) saltwater paperbark (*Melaleuca cuticularis*), coastal sword-sedge (*Lepidosperma gladiatum*) and rigid wattle (*Acacia cochlearis*). The fringing areas are subject to significant weed encroachment including kikuyu* (*Pennisetum clandestinum),* buffalo grass* (*Stenotaphrum secundatum*) and rose pelargonium* (*Pelargonium capitatum*).

Rocky Coast

The vegetation through the thin foreshore along the bulk of the rocky coast is highly degraded and dominated by introduced species. The seaward edge of the vegetation is dominated by species such as sea rocket* (*Cakile maritima*), rose pelargonium* (*Pelargonium capitatum*), sea spurge* (*Euphorbia paralias*), dune onion weed* (*Trachyandra divaricata*) and also knottted club rush (*Ficinia nodosa*). While some native species including thick-leaved fan-flower (*Scaevola crassifolia*), coastal sword-sedge (*Lepidosperma gladiatum*), berry saltbush (*Rhagodia baccata* subsp. *baccata*), coastal wattle (*Acacia cyclops*), shark's tooth wattle (*Acacia littorea*), WA peppermint (*Agonis flexuosa*) and marri (*Corymbia calophylla*) are found within the steep bank/dune area, the narrow often parkland cleared area landward of this strip is dominated by weed species, namely kikuyu* (*Pennisetum clandestinum),* rose pelargonium* (*Pelargonium capitatum*), buffalo grass* (*Stenotaphrum secundatum*) and couch* (*Cynadon dactylon*).

2.6.2 Tree Health and Plant Pathogens

Given the calcareous soils making up the majority of the site (and the limited vegetation within the non-calcareous soils), Phytophthora dieback is highly unlikely to impact on the vegetation of the site or represent a significant management consideration. However, two other issues relating to tree health and plant pathogens are particularly pertinent.

Over recent years isolated clusters of WA peppermints from Bunbury through to Augusta have experienced significant unexplained decline and even death. While there are a number of potential causes, scientists are concerned that these previously resilient and common species may be susceptible to a larger and much broader decline. Concern has been raised with respect to fungal species associated with the decline and as such, significant research into the phenomenon is commencing. A number of declining

peppermints were observed particularly within the parkland cleared areas of the site and while not currently cause for alarm, the prevalence of peppermint decline should be closely monitored.

Marris within the region have also been the subject of significant decline and concern in recent time due to the impact of the marri canker fungus (*Quambalaria coryecup).* This canker, which is believed to be fatal, was evident in many of the marris present through the rocky coast and other individuals were also impacted by wounds sustained due to their proximity to the Old Dunsborough boatramp, or the surrounding carparks. It is recommended that these trees be inspected by a qualified arborist with respect to their safety and management/ recovery, and that remaining healthy trees be protected from impacts.

While management treatments for both peppermint and marri decline are still in the early stages of research, one measure to assist in prevention is to minimise the damage to bark and roots from compaction which can be achieved by surrounding trees with native understorey. This needs to be considered through Old Dunsborough where significant large old trees are under threat.

2.6.3 Weed Burden

Weeds are a common element within coastal bushland and reserves and have the potential to seriously undermine the conservation values of the area. Weed management in any situation needs to be strategic in order to ensure limited resources have the maximum benefit and to ensure weed control does not have detrimental impacts on other site values. This is particularly so with respect to coastal situations where many weed species are prevalent; for example, rose pelargonium and sea rocket prevail across most of the Geographe Bay coast and in the absence of healthy native vegetation serve a valuable role stabilising and colonising dunes.

While the site contains patches of very good quality vegetation, in places introduced and weed species form a significant component of site vegetation. A number of species represent a significant threat to the conservation values of the foreshore and as such, several species or areas represent a moderate to high priority for control or close monitoring, namely:

- An isolated but fruiting specimen of **ground or basket asparagus** (*Asparagus aethiopicus)* (formerly *A. densiflorus*). This species, which is considered the most prolific asparagus species after bridal creeper[5], has not previously been recorded on the Geographe Bay coast on Flora base[6].
- **Arum lily** (*Zantedeschia aethiopica*) has been the subject of significant control effort on the part of DCALC members particularly through Reserve 22965 and is now reduced to low levels but still scattered through large areas of the site. It is important not to let this declared and serious environmental weed return to its previous extent.
- Isolated patches of **butterfly bush** (*Polygala myrtifolia*) represent a priority due to their potential invasiveness and in order to consolidate existing eradication efforts by DCALC.
- Isolated **Brazilian pepper** (*Schinus terebinthifolia*) represents a priority due to the low numbers present and the potential for this species to invade moist coastal sites in the region.

- **Bridal creeper** (*Asparagus asparagoides*) occurs within the site but the current biological control agents are significantly reducing the potential of this species to impact bushland- monitoring only is recommended;
- **Wavy gladioli** (*Gladiolus undulatus*) is becoming an increasingly high priority weed throughout the region;
- Although not evident at the time of the site assessment, **black flag** (*Ferraria crispa*) is understood to occur in one location and is a high priority for control due to its rapid spread and difficulty to control.

In addition to these specific weed priorities, the incursion of perennial grasses such as buffalo grass* (*Stenotaphrum secundatum*), couch* (*Cynadon dactylon*) and kikuyu* (*Pennisetum clandestinum*) and annual grasses such as bearded oat* (*Avena barbata*), into the edge of areas of otherwise good native vegetation is common through much of the site. The incursion of weedy grass species into good quality coastal vegetation has the potential to seriously and progressively degrade the conservation and amenity values of the vegetation and should also be addressed as a priority. Other grasses such as hare's tail grass* (*Lagurus ovatus*) are common throughout much of the site but are considered less of a priority for control.

The DUP through much of the eastern portion of the site provides an effective weed barrier between the landward landscaped/ parkland cleared recreation area and the shoreward bushland areas. The current management of the DUP, in particular the practice of mowing or otherwise maintaining a 0.5-1m wide cleared strip on the bushland side of the path represents a regular disturbance and provides ideal conditions for weeds to establish and progressively degrade the adjacent bushland. In order to maximise the benefit of having the DUP as a physical weed barrier, this practice needs to be altered and native groundcovers allowed to establish up to the edge of the path.

Appendix 2 summarises relevant weed control methods.

2.6.4 Unauthorised Damage to Vegetation

There are numerous reports and evidence of damage to native vegetation occurring within the study area. This includes physically cutting down and lopping of trees, and injection of herbicide into trees and spraying of understorey species. Illegal damage to vegetation represents a significant threat to foreshore vegetation along most of the Geographe Bay foreshore including Dunsborough. Ensuring that the management of native vegetation within the study area occurs in accordance with the Shire's policies is critical in preserving the values of the area; decisions regarding the maintenance and management of vegetation must occur in the interest of the area as a whole and with consideration of all foreshore users.

Any work involving damage to native vegetation within the foreshore area should only be undertaken by the Shire. Local landholders should contact the Shire to ensure that legitimate issues requiring attention can be assessed and where necessary acted upon.

The Shire has recently adopted a policy (Policy 240: Reserves Vegetation Protection) detailing the way in which unauthorised damage to vegetation in foreshore areas will be handled in the event that the detailed evidence required for prosecution (ie admissions of guilt or eye witness accounts) are not forthcoming. The signage provision under this

policy has recently been applied within the site between Gifford Street and Nicholas Court.

2.6.5 Revegetation

While the focus of restoration actions within this plan is the promotion of natural regeneration through reducing disturbance and judicious weed control, a few small stretches have been identified for revegetation based on the degraded nature of the areas in question, the need to link existing vegetation and the amenity and stabilisation value provided by native vegetation.

It is recommended to use native understorey (low growing) species for most of the plantings.

Through the parkland cleared areas it is also recommended to gradually (over a number of years) supplement existing plantings of WA peppermint in order to plan for the succession of older, damaged and diseased plants and also to increase canopy connectivity to improve the habitat value of the parkland cleared areas for the Western Ringtail Possum. The specific locations of these plantings need to take into account the maintenance of some more open areas for active recreation. This may be achieved by cluster planting.

Understorey Planting

Figure 2 identifies the priority areas for understorey revegetation over the next few years. The identified areas have either relatively bare ground available for planting into, may require minor weed control in spots or lines prior to planting, or, may require effective control of lawn species. In general, widespread weed control is not considered appropriate until native species are well established.

Species to make up the core of these plantings would include**:

- Berry saltbush (*Rhagodia baccata*)
- Rigid wattle (*Acacia cochlearis*)
- Coastal wattle (*Acacia cyclops*)
- Prickle lily (*Acanthocarpus preissii*)
- Knotted club rush (*Ficinia nodosa*)
- Shark's tooth wattle (*Acacia littorea*)
- Coastal sword-sedge (*Lepidosperma gladiatum*)
- Thick-leaved fan-flower (*Scaevola crassifolia*)
- Coastal daisybush (*Olearia axillaris*)
- Basket Bush (*Spyridium globulosum*)

**Appendix 1 identifies a broad range of species appropriate for use in revegetation plantings.

It is recommended that plantings be advertised in the local paper.

2.7 NATIVE FAUNA AND FERAL ANIMALS

It was beyond the scope of this report to conduct a detailed assessment of the fauna inhabiting the site. However, opportunistic records and sightings of mammals, reptiles and birds were made during the site assessment.

The **Western Ringtail Possum** (*Pseudocheirus occidentalis*) (WRT), or Nguara, is resident throughout much of the site with scat and dreys evident through the good condition peppermint low woodland at the eastern end of the site and the parkland

cleared areas through Centennial Pak and in front the resorts between Geographe Bay Rd and Vincent St. The WRT, once widely distributed throughout the south-western forests of Western Australia is now almost exclusively restricted to coastal areas of peppermint woodlands and peppermint/ tuart associations between Bunbury and Albany.

The species is now recognised and protected under the Commonwealth Environment Protection and Biodiversity Conservation Act and the Western Australian Wildlife Conservation Act as Vulnerable (to extinction) and Threatened (Schedule 1 – fauna that is rare or likely to become extinct) respectively. The fact that this listed species is found within the study area is of high conservation significance and reinforces the importance of maintaining the good condition of the peppermint low woodland which forms the species' primary habitat within coastal areas and managing the parkland cleared areas to maintain and enhance their habitat value for WRT without compromising the amenity and recreational values of these areas.

The Shire Foreshore Reserves have previously been identified as representing some of the last opportunities to establish or maintain east-west faunal corridors along the Shire. Whilst WRT currently utilise the urban and developed areas adjacent to the foreshore reserve it is high likely that the habitat value of these areas will diminish with further in fill development and densification of urban Dunsborough and that the foreshore reserves will become more important both in terms of habitat value and providing connectivity between populations and habitat. Given the recognition of the WRT under both Commonwealth and State threatened species legislation, there is good justification for enhancing the habitat value of the site for this species.

Specific recommendations to help achieve these objectives include:

- Low level ongoing successional planting of Peppermints through the above mentioned parkland cleared areas to plan for the replacement of old, diseased or declining trees and to provide trees of a range of age classes and increased canopy connectivity. Where views have the potential to be impacted by this, planting roughly within the 'sight lines' lines of existing trees can minimise the impact of this significantly;
- Creation of small 'landscape islands' of dense native understorey around some existing clusters of Peppermints within the parkland cleared areas as good practice towards the prevention of Peppermint decline and maintenance damage to the base of the trees. Coastal Sword sedge amongst others is ideally suited to this situation and other sedge and rush species can be utilised in low winter damp depressions;
- Facilitate fauna movement between Centennial Park and Dugalup Brook by incorporating a continuous link of native understorey vegetation and, where appropriate, nodes of WA Peppermints. Concept landscape designs for foreshore area to incorporate vegetation linkages in landscaping of the foreshore.
- Considering the use and close monitoring of rope linkages to enhance canopy connectivity;
- On going awareness raising conveying the significance of the species its threats and management measures.

Evidence (diggings) of **Quenda or Southern Brown Bandicoot** (*Isoodon obesulus*) was observed during the site assessment particularly through the sandy coast portion of the site. Despite suffering a reduced range since the introduction of the fox, this species is

widespread on the coastal plain of the south-west where dense native understorey supports a diversity of plant species. Anecdotal reports suggest increasing occurrences in recent years in response to fox baiting. The species is listed under the Western Australian Wildlife Conservation Act as a *Priority 5: Taxa in need of monitoring (conservation dependant)* and represents an important conservation value for the site.

In addition to WRT and Quenda, a range of forest and coastal birds, frogs, lizard and snake species utilise the site.

Rabbits were identified on site during the site assessment. Although they do not currently appear to be significantly impacting on native vegetation in the area, revegetation through this area will need to consider the impact of the rabbit population and utilise tree bags and stakes. The heavy use of the area by young children and domestic animals limits the use of traditional control methods such as 1080 baiting or Pindone baiting.

Given the minimal current impact of rabbits on the foreshore itself and the inability to undertake traditional baiting, monitoring of the current population and its impact is recommended. In the unlikely event that the population becomes a significant management issue in the future, potential control options include:

- The introduction of a myxomatosis-infected rabbit into the colony;
- Baiting with RCD (Calicivirus); and
- Capture of rabbits, injection with RCD (Calicivirus) and re-release.

It should be noted that these methods really need to be considered within the broader context of the rabbit problem within the local area and should be planned with a much broader area in mind than just this site.

Foxes are identified to be present in many adjoining foreshore areas of Geographe Bay and may utilise the site. However, given that no signs were recorded during the site assessment and long-term residents and tourism operators did not report fox sightings, they are not considered likely to represent a significant issue. Residents should be encouraged to report fox sightings in the area in order to ascertain if management is warranted in the future. It is noted that feral and/or wandering domestic **cats** are highly likely to utilise the site and pose a significant threat to WRT. Domestic **dogs** are known to impact WRTs on private land adjacent to the reserve and are likely to impact on WRT within the reserve. Trapping is considered the most appropriate way of addressing any cat or fox issues that may arise within this coastal, urban setting. Any feral animal trapping will be undertaken by qualified contractors or Shire staff, possessing a Regulation 17 *Licence to Take Fauna for Scientific purposes* under the *Wildlife Conservation Act 1950*. This will minimise any associated risks to native fauna.

Increased education and public awareness of the threat to WRT posed by domestic cats and dogs is also required.

2. 8 FIRE MANAGEMENT

The Geographe Bay Foreshore Management Plan[1] identifies fire as a low risk throughout the Dunsborough foreshore, that can be managed through standard fire protection procedures. It is identified that standard Shire policy and practice does not support prescribed burns in foreshore areas and this appears to be appropriate management practice for the Dunsborough stretch of foreshore.

2.9 EROSION

It was beyond the scope of this report to investigate long-term erosion risks or threats, or to address the need for major coastal works in relation to sand capture. The majority of the foreshore did not show signs of serious erosion at the time of the site assessment and it is understood that other than some isolated locations this stretch of the Bay does not currently experience significant erosion problems.

It is noted however, that many residents noted the serious impacts of Cyclone Alby and other major storms in the past and that much of the coast is vulnerable to the impacts of large storm events and that these take many years or decades to rebuild.

The latest Intergovernmental Panel on Climate Change (IPCC) Report on Climate Change (cited by Hick[8]) predicts sea level rises of between 0.18 and 0.59 m by 2090 (with additional rises possible depending on ice sheet movements). Recent monitoring of Fremantle sea level has shown rises of 20cm since 1915 at a rate of 1.38mm/year with the past 30 years showing an average rise of approximately 3.0mm/year.

Predicted sea level rise in the coming decades has the potential to seriously impact on the existing shoreline and while this prospect warrants broad consideration beyond the scope of this report, it adds justifications to efforts to enhance and stabilise the foreshore area.

Two identified erosion hotspots within the study area include the Dunn Bay Road carpark and the informal carpark at the end of Hurford Street.

The Dunn Bay Road carpark has been the topic of much debate and annually causes erosion along its shoreward edge and to the bank to the east. Many residents noted that the erosion occurred into a range of fill layers including gravel, resulting in the redistribution of gravel and rocks over a large stretch of beach to the east, impacting on the amenity of some of the best swimming beaches in the area. Erosion at the western and eastern ends of the carpark were noted during the site assessment. This issue was identified as a priority by the Geographe Bay Foreshore Management Plan (by relocating the carpark back from the Shore) and remains a recurring issue.

It is understood that the Shire of Busselton supports in principle the removal of the Dunn Bay Road car park, subject to the location and funding for replacement parking being finalised. The Shire is currently preparing a Car Park Strategy for Dunsborough that will investigate these issues in more detail.

The second hotspot is the Hurford Street carpark which is suffering minor erosion along its shoreward edge and requires minor stabilisation works and barriers placed to keep vehicles to the hardstand area.

Vegetation is identified as essential to the long-term stability of the coastline and implementation of the revegetation recommendations detailed in Section 2.6.2 will aid in the long term stabilisation of the foreshore area.

2. 10 DRAINAGE AND STORMWATER MANAGEMENT

A number of drains and stormwater outlets pass through the site and discharge stormwater from adjoining residential, resort or commercial areas into Geographe Bay. Given the sensitivity of Geographe Bay, the quality of stormwater leaving the site is of the utmost importance. It was beyond the scope of this report to assess stormwater management in detail, however, it is noted that:

- A recent report commissioned by Geocatch and the Shire provided some detailed recommendations in relation to the management of the Grove Street and Tulloh Street subcatchments. These recommendations should be implemented as appropriate.
- Recent monitoring by DCALC has identified two outlets (Regency Resort Bubble Up outlet and the Dunn Bay Road outlet) as having elevated nutrient levels. These results are of concern and further monitoring and investigation into the source of the high levels and into appropriate treatment measures to mitigate the problem are recommended.

It is noted that a number of the drainage lines within the foreshore reserve have experienced revegetation providing some vegetative filtering of stormwater, including:

- Dandatup outfall,
- Dugalup Brook;
- Drain between Burt Court and Gifford Road
- Grove Street outlet drain; and
- Tulloh Street outlet drain.

3. CURRENT STATE AND RECOMMENDATIONS: HUMAN USE ATTRIBUTES

3.1 INDIGENOUS HERITAGE

The Geographe Bay foreshore area has been used extensively by Nyungar people with their occupation of the region dating back at least 47 000 years[1]. As such, protection and enhancement of Indigenous values associated with the foreshore area is considered critical.

As part of the preparation of this report, a search of the Department of Indigenous Affairs Register of Aboriginal Sites was conducted. This highlighted two registered sites of Aboriginal Heritage (21426 and 21243) which potentially stretch into the study area and it is acknowledged that many significant sites are not yet formally registered and found on the system.

Although it was beyond the scope of this report to undertake a detailed Aboriginal Heritage survey, representatives of the two Native Title claimants over the Geographe Bay coastline (the South West Boojarah and Harris Family) were consulted individually and in-person in order to try to identify areas of significance that may require specific management under the DFMP. A site visit with Vilma Webb from the South West Boojarah claim identified two additional heritage sites within the study area including:

- Fish traps inside Point Daking; and
- Fish traps adjacent to the end of Hurford Street (it is noted that stone flakes and artefacts were also identified just west of the study site in this vicinity).

It was also noted during this site visit that Dandatup Brook (upstream from the foreshore reserve) believed to be a burial site.

While no major earthworks are proposed for the study area, if any significant earthworks are to be undertaken as part of future management, Indigenous representatives should be informed (as per the State and Commonwealth Heritage Acts and the Native Title Act 1993).

Significant potential exists for raising awareness of aboriginal values and use of the foreshore areas of Geographe Bay (strictly with permission of local elders) in interpretive signage for the site.

3.2 RECREATIONAL USE

The recreational values of the site are important and form a key consideration in the management of the area. The site is readily and frequently accessed by local residents and visitors. The study area is utilised for:

- Walking, cycling and exercising
- Promenading
- Fishing
- Swimming, snorkelling and other water pursuits, including kitesurfing, windsurfing
- Events and weddings, markets etc
- Children's play
- Boating and sailing
- Dog exercise
- Beach activities
- Bird, whale and wildlife watching/ appreciation
- BBQ gatherings
- Lookout/ scenic appreciation

These uses are generally well catered for and the Dunsborough foreshore reserves are highly valued and appreciated by the community.

The foreshore near Dunn Bay Road acts as an integral event facility and this use needs to be maintained in any future planning. This include the retention of open areas and access to the beach front for large crowds, adequate toilets, power, water, parking and linkage to Seymour Park.

3.3 FACILITIES AND INFRASTRUCTURE

3.3.1 Pedestrian and Bicycle Access

Pedestrian and bicycle access is facilitated by the dual use pathway (DUP) which runs most of the length of the study area. This path accommodates access by people with disabilities and using mobility aids. It is popular with locals for exercising, socialising and commuting and with visitors for appreciating Geographe Bay. There is a gap in the DUP within the study area and it is proposed to extend the DUP from the Point Dalling boatramp to the car park at the intersection of Bayview Crescent and Hurford Street.

The DUP is a bitumen surface and in general is in good order and requires little maintenance. It is identified that at some stage in the future, in order to safely accommodate the volume and nature of traffic utilising the DUP, widening to 3m may become necessary. However, this should only be considered following an assessment of the entire DUP and it is beyond the scope of this report to comment on this aspect. It is recommended, however, that should widening of the DUP occur, wherever possible this should occur to the roadside of the existing path.

It is noted that some areas of the DUP are overgrown with foliage and/ or significant tree branches which may pose a safety hazard particularly for cyclists.

Figures 3A-H show the major beach access paths.

The majority of the site is well-serviced with major beach access tracks running from adjacent streets or parkland cleared areas to the beach and waters edge. There are not many informal tracks through the area and few require closure in order to preserve the values of the coastal reserves.

In order to manage access to the beach, a number of wooden steps down to the beach in the northern portion of the site between the Dunn Bay carpark and Meelup Park are recommended. Some ‘funnel’ fencing either side of the steps may be required to clearly identify these access points and to direct beach users towards these points where safe, easy access is provided.

<u>Existing Fencing</u>
Only the area between the Burt Court end of Geographe Bay Road and Vincent Street is fenced. This provides good protection to the vegetation through this area and is working well. The southern half of this requires some maintenance and repair.

Fencing is not considered to be justified through the majority of the site other than some small portions of fencing associated with areas of understorey revegetation along the Vincent Street foreshore and also some minor fencing around the Centennial Park playground area and the Banks Avenue carpark in order to focus pedestrian traffic to the established beach accessways.

Additional continuous bollards are recommended to guide and facilitate verge parking at the following locations:

- adjacent to Vincent Street;
- along the northern end of Gifford St, and
- adjacent the Pimelea Parade pedestrian access to Geographe Bay Road.

Some small sections of post and rail fencing around the north side of Point Daking is recommended where the DUP runs adjacent to some steep and dangerous dropoffs.

Crossovers

An improved 'crossover' over the drain which runs parallel to Geographe Bay Road between Gifford Street and Burt Court is recommended in order to ensure safe, dry access for everyone.

Bicycles

Given the high usage of the area by cyclists and a current lack of bike racks along the stretch, it is recommended that the Shire provide bike racks at key locations eg. Dunn Bay carpark area, Centennial Park (Banks Avenue carpark) and Old Dunsborough boat ramp.

3.3.2 Vehicle Access and Parking

Geographe Bay Road adjoins and runs parallel to the foreshore reserve through the eastern half of the site. During the course of the consultation period, many residents expressed concerns in relation to Geographe Bay Road including the high level of traffic use, the speed of vehicles travelling on it and concerns for safety and amenity. It is understood that the Shire has previously identified these issues as a priority for action and is currently seeking funding in order to commence the design of upgrades.

Similar concerns were raised with respect to Bayview Crescent, in particular the portion running along the foreshore. It is recommended that the possibility of making Bayview Crescent one-way between Gifford Road and Green Street be considered. This would address community concerns, accommodate the proposed extension of the DUP and create a wider, pedestrian-friendly foreshore.

Formal car parking areas are provided at regular intervals along the length of the study area:

- Tulloh Street: a grassed car parking area with space for approximately 20 cars. This area is considered sufficient given the large provision of formal and informal parking spaces nearby.
- Centennial Park (Banks Avenue): this gravel carpark provides parking for approximately 20 cars amongst and under a number of peppermint trees. While formalising this carpark would allow for more parking, it would compromise the character of the area and is not currently recommended.
- Centennial Park (Chester Way): this formal bitumen carpark north of Chester Way accommodates approximately 20 cars and is considered adequate.
- Dunn Bay Road: The formal bitumen carpark at the end of Dunn Bay Road provides for 27 car spaces and supports numerous other facilities within the locality. However, it is subject annually to ongoing erosion and an ongoing

source of gravel to beaches downdrift. This carpark requires attention. The Shire supports in principle its relocation back from the shoreline, subject to the location and funding for replacement parking being finalised. The Shire is currently preparing a Car Park Strategy for Dunsborough that will investigate these issues in more detail.

- Point Daking: This isolated portion of Bayview Crescent formally accommodates 2 cars. In addition, high usage of the very narrow, parkland cleared foreshore for carparking at this point is evident. The recommendation to locate the DUP through this stretch means parking will be excluded from the verge/ foreshore and additional verge parking is proposed along Vincent Street.
- Blackhurst Park: this major parking area immediately south of the foreshore area accommodates about 30 cars. The carpark has a number of marri trees within the bitumenised stretch which are in very poor health and need assessment by an arborist.
- Dunsborough Boatramp: Parking accommodates approximately 20 cars and approximately 10 cars with boat trailers. This carpark services the Old Dunsborough boatramp and represents a significant node for recreational foreshore use in this section.
- Hurford Street: This relatively informal carpark accommodates up to four vehicles and has some minor erosion issues. Bollards and stabilisation measures are required.

Informal verge parking is also possible and encouraged along most of Geographe Bay Road and proposed for Vincent Street. There does not appear to be a significant need for additional formal carparking along the site and no new carparks are recommended.

It was noted that vehicles appear to have gained access over the dune area north-west of Tulloh Street. Vehicle access to the beach and dunes through the stretch (other than at the boatramp) is illegal. Revegetation and brushing of this area is recommended to prevent unauthorised vehicle access.

3.3.3 Facilities

The study area contains two public amenities blocks located at:

- Centennial Park (middle carpark); and
- Blackhurst Park (just south of the Old Dunsborough boatramp).

The next nearest public amenities block on the foreshore is located approximately 2km east of the study area at the McDermott Street boatramp. It was raised in the community consultation that the Banks Avenue carpark and associated picnic tables, BBQs, summer beach hire facilities and recently expanded playground represent a major recreational node particularly with children and that ideally a toilet should be located in this vicinity.

If an additional toilet/ public amenities block was to be situated within this locality then one potential spot maybe at the end of Banks Avenue in order to minimise the impact on adjoining Geographe Bay Road properties. It is acknowledged that a toilet already exists some 370m north west of this location but the high use of the Banks Avenue carpark area already (or in the very near future) will warrant an additional toilet.

Additionally, it appears illogical that there is not a toilet located in very close proximity to the foreshore at Dunn Bay Road given that this is the highest use area within the Dunsborough Foreshore and that usage is likely to increase significantly as the town's population grows. It is recommended that a toilet be considered for this site in the near future (although if any redevelopment or relocation of the carpark occurs then it may be wise to undertake these projects simultaneously).

Mural art is suggested for the toilet buildings, for example at Blackhurst Park with the possibility of schools involvement in the project and there is significant potential for community art to be incorporated into the parkland cleared portions of the foreshore between Gifford St and Grove St.

Seating is provided at most street ends and/or major access ways. It is currently lacking from the following major access tracks and installation is recommended:

- along the Bayview Crescent foreshore;
- through the resort portion of the Dunsborough foreshore; and
- between the DUP and the grassed Tulloh Street carpark.

These locations would represent priorities for providing new seating within the study area in order to encourage and support the use of the foreshore and are consistent with the focus of infrastructure at street ends.

Seating on or around the incipient foredune at the ends of beach access tracks was suggested during the consultation and should be considered where there is a low risk of coastal erosion and loss of infrastructure.

The Dunsborough foreshore is fortunate in having significant grassed areas with good shade provided by parkland cleared peppermints and as such shade structures are not required. Shade structures on the beach are considered inappropriate due to the potential for damage during storm events. Cover over BBQ areas and or picnic tables may warrant consideration particularly around the Old Dunsborough boatramp/ Blackhurst Park and Centennial Park (Banks Avenue Carpark). Barbeques and picnic tables are located at nodes within the site. High demand warrants additional picnic facilities at Blackhurst Park.

Beach showers are provided at a number of locations and it is recommended that water conservation be promoted and water saving devices be installed at these locations.

3.3.4 Rubbish and Dog Waste

During the assessment of the area, a moderate amount of litter was observed adjacent to the DUP through parts of the site. Particular hotspots were:

- immediately north of the Dunsborough boatramp; and
- in front of the accommodation places between Burt Court and Vincent Street.

Some of this litter was obviously quite old and it does not appear to be the case that large amounts of rubbish are being dropped through the study area. Nevertheless, a clean up is recommended either as part of 'Clean Up Australia' day in March each year, or to coincide with the Capes Beach Clean Up held in October annually, or as part of 'Friends of' group activity.

Rubbish bins are currently provided and maintained by the Shire of Busselton's Parks and Gardens staff, through much of the site. However, it is recommended that these existing bins be supplemented with new bins at:

- Hurford Street;
- the foreshore in front of the resorts between Burt Crt and Vincent Street; and
- Tulloh Street carpark.

Dog waste bags are located intermittently along the site and correspond well with the designated dog exercise areas. Used bags can be disposed of in rubbish bins which are located in the vicinity.

The dumping of green waste (normally lawn clippings) was evident at a number of sites throughout the study area. Particular problem areas for this were:

- the foreshore adjacent to the northern portion of Bayview Crescent; and
- in front of the accommodation establishments between Burt Court and Vincent Street.

Green waste dumping, while sometimes undertaken with good intentions, degrades bushland by introducing new weed species into the area, increasing nutrient status of soils (which promotes weed growth over natives) and directly impacts on the visual amenity of the area. It is highly likely that this practice has significantly contributed to the presence of weedy perennial grasses within the bushland component of the foreshore through much of the area. The message needs to be reinforced to the community that the dumping of green waste in bushland and foreshore reserves is inappropriate and prohibited. In order to try to avoid the need for additional regulatory signage in the foreshore area, it is recommended that the Shire advise (by letter) households adjacent to the hotspots, of this issue.

3.3.5 Signage and Lighting

Currently signs are scattered throughout the study area, ranging from regulations and prohibited activities to liability advices. Multiple signs are located around key access nodes such as the Dunsborough boatramp. Several of the signs are old, faded or fallen over and as such are ineffective and an eyesore. It is recommended to remove and where necessary replace these.

Virtually no interpretive signage exists along the three and half kilometre study area and the conservation, recreational and heritage values of the area can be significantly enhanced and promoted via the installation of interpretive signage along the DUP. It is recommended that a short series of interpretive signs be developed, covering flora and fauna facts, aboriginal cultural history (in consultation with local elders), marine coastal processes, threatened species etc. This series could be expanded upon and utilised throughout other relevant stretches of the DUP.

At present, lighting along the DUP within the study area is very limited. Any consideration of lighting needs to consider the entire length of the DUP and not just this precinct. Lighting of the DUP would be problematic, with significant cost and maintenance issues, lightpole location issues in relation to the dynamic foreshore system, liability and safety issues and impact on nocturnal species all needing to be carefully considered. It is not currently considered necessary to install lighting along the DUP

within the study area although it is likely that this may be considered in conjunction with any redevelopment proposals around Dunn Bay Road.

It is understood that DCALC are in the process of instigating a project involving numbering and identifying the beach access paths.

4.0 MANAGEMENT ACTIONS

4.1 INTRODUCTION

Management actions have been developed based on the stated objectives, site assessment, literature reviews and stakeholder consultation, and then grouped according to the four key qualities of the foreshore: recreational, social, conservation and erosion values/ functions. They have been identified as high, medium or low priority and many of the recommendations meet more than one of the three stated objectives. Guiding principles provide the overarching framework and rationale behind the selection and prioritisation of the specific management actions.

4.2 GUIDING PRINCIPLES

4.2.1 Recreation

- Recognise 'recreation' as a designated purpose and a priority value of the study area. As per the Geographe Bay Foreshore Management Plan, 'recreational activities should be given a high priority as a beach use along the Geographe Bay Foreshore'[1].
- Residential development in the locality means the usage of the study area will increase over time and management must address the associated pressures.
- Existing informal tracks and beach access paths to be closed where there are clear signs of damage or degradation.
- There are sufficient beach access tracks in place, negating the need to create any new paths.
- Public vehicle access (outside of designated carparks and boatramps) is not considered appropriate in the study area.
- Signs and maps should be utilised at strategic points to direct movement through the foreshore and to enhance the recreational experience. They should enhance the landscape rather than detract from it.
- Safe access should be facilitated along and to the DUP, including for disabled users.

4.2.2 Social/ Community

- Recognise the importance of local ownership of the area, and the associated sense of place and pride, which contribute to a stronger sense of community and a sense of responsibility for the area.
- Recognise the concern for, and interest in, the area expressed by local residents and provide ongoing opportunities for involvement in foreshore management.
- Recognise the long-term significance of the Geographe Bay Foreshore to the Nyungar people.
- Recognise the opportunity and value for people to recreate in and experience the natural coastal environment.
- Recognise the constraints on financial and other resources available to the Shire of Busselton to manage the foreshore, and encourage collaborative actions and community involvement.
- Recognise the significant contribution that the existing Coastcare group (Dunsborough Coast and Landcare, DCALC) makes to the management of, community ownership of and involvement in the area.

4.2.3 Conservation

Weed Management

- Weed management should as a general rule start in areas of good condition and work outwards towards heavily infested/ degraded areas.
- Site and soil disturbance should be minimised as it promotes further weed growth.
- The rate of native plant regeneration should determine the rate of weed removal.
- Weed management should focus primarily on priority weeds not yet extensively established within the site and with the greatest potential to degrade the site.
- Recognise that preventing weeds entering the site is one of the most effective and efficient methods of weed control.
- Recognise that weed species can have positive benefits on the site (eg foredune stabilisation).

Revegetation

- Natural regeneration is favoured over revegetation. However, replanting and revegetation is appropriate in degraded areas in order to re-establish native vegetation.
- Revegetation should only utilise locally native species and stock of local provenance. Species appropriate for revegetating the relevant zones are identified in Appendix 2. It is noted that the Geographe Community Landcare Nursery can supply native species of local provenance if pre-arranged and ordered.
- Revegetation will generally require the use of plant protection devices (ie tree bags), due to the potential impacts of rabbits on-site and the harsh coastal environment of the foreshore.
- Planting should be scheduled to coincide with winter rainfall (ie May – September) in order to increase survival rates and minimise on-going maintenance.
- Planting activities should be coordinated and guided by someone with appropriate bush regeneration skills in order to ensure appropriate placement and density for each species at each site.

Fauna

- The area provides significant habitat for a range of fauna species including the Western Ringtail Possum and Quenda. Any proposed management of the area needs to consider the potential impacts on and requirements for fauna, in particular the Western Ringtail Possum.
- Recognise the potential of feral fauna, namely foxes and rabbits, to impact on the conservation and recreation values of the site.

Fire

- In accordance with general Shire practice within foreshore areas, prescribed burning is not recommended within the study area.
- Open fires are inappropriate for the site and are prohibited under Shire by-laws.

4.2.3 Coastal Erosion

- While erosion is not a widespread concern for the area it is considered appropriate to vegetate and stabilise dunes as protection against large storm events and changing coastal conditions including predicted sea level rise.
- Isolated erosion issues around the Dunn Bay Road carpark and the Hurford Street carpark need specific attention some of which goes beyond the scope of this report.

4.3 RECOMMENDED ACTIONS

		MANAGEMENT ACTIONS	Priority
GENERAL	G1	Change the vested purpose of Reserves 22965, 29627, 32231 and 44343 to "Public Recreation and foreshore protection" to more accurately reflect the values and desired management intent of the area.	M
	G2	Seek vesting of the Vacant Crown Land as 'C' class reserve for the purpose of "Public Recreation and foreshore protection".	M
	G3	Acknowledge and note the significant Aboriginal sites located within the area and incorporate into any future management considerations.	H
CONSERVATION	C1	Eradicate isolated ground/ basket asparagus population south-east of Banks Ave.	L
	C2	Continue annual arum lily control between Tulloh St and Vincent St.	H
	C3	Monitor spread of athel pines/tamarisk from existing trees near Highview Rd. Where necessary control.	M
	C4	Replace the pepper trees in front of the resort properties north of Burt Crt with WA peppermints.	H
	C5	Eradicate the isolated patches of butterfly bush between Tulloh St and Banks Ave.	L
	C6	Remove the isolated Brazilian pepper tree from just north-west of Tulloh St.	H
	C7	Undertake wavy gladioli control between Dunn Bay Rd and Hurford St.	M
	C8	Continue black flag control just north-west of Tulloh St.	H
	C9	Eradicate the isolated patches of Victorian tea tree.	H
	C10	Monitor the bridal creeper population and the impact of the bio-control.	H
	C11	Control perennial and annual grasses invading bushland on the foreshore side of the DUP between Tulloh and Vincent St.	H
	C12	Promote the Reserve Vegetation Protection Policy (and the associated signage) as a deterrent for further illegal vegetation damage in the area.	H
	C13	Promote the appropriate procedure for applying for vegetation removal for legitimate reasons.	H
	C14	Undertake understorey revegetation of areas identified on Figures 2A-H (Refer to Section 2.6.4).	M
	C15	Undertake low level ongoing successional planting of WA peppermints in parkland cleared areas.	H
	C16	Facilitate fauna movement between Centennial Park and Dugalup Brook by incorporating a continuous link of native understorey vegetation and, where appropriate, nodes of WA Peppermints. Concept landscape designs for foreshore area to incorporate vegetation linkages in landscaping of the foreshore.	H
	C17	Monitor Western Ringtail Possum and Quenda numbers within key areas of the reserve.	M
	C18	Considering the use and close monitoring of rope linkages to enhance canopy connectivity within parkland cleared areas	M
	C19	Monitor peppermint decline in the area.	H
	C20	Assess marri trees through the rocky coast for safety and management.	H
	C21	Educate residents about the menace of foxes and feral or wandering cats.	L
	C22	Undertake trapping of foxes and feral cats as required. Trapping will be undertaken by qualified contractors or Shire staff, possessing a Regulation 17 *Licence to Take Fauna for Scientific purposes* under the *Wildlife Conservation Act 1950*.	L

	C23	Investigate, monitor and address elevated nutrient levels in identified stormwater outlets and implement actions as per Shire/ Geocatch/ DCALC reports.	H
RECREATION	R1	Extend the DUP from Point Dalling to the car park at the intersection of Bayview Crescent and Hurford Street to ensure its continuation throughout this section of the Geographe Bay foreshore.	H
	R2	Consider making Bayview Cr between Gifford St and Green St one-way, in order to address traffic issues, accommodate the extension of the DUP and create a more pedestrian-friendly foreshore.	H
	R3	Undertake tree maintenance/ pruning where overgrown foliage represents a hazard to DUP users.	M
	R4	Formalise beach access ways near Vincent St, as per Figure 3C.	M
	R5	Formalise beach access way opposite Pimelia Parade as per Figure 3H.	M
	R6	Repair beach access steps as per Figure 3A.	M
	R7	Install beach access steps and 'funnel' fencing at locations between Dunn Bay Road and Hurford St. as per Figure 3.	H
	R8	Monitor the development of any new informal beach access tracks through the area, and discourage use/ close.	M
	R9	Repair fencing north of Burt Court (Figure 3D, 3E).	M
	R10	Construct fencing around revegetation area at Vincent St, around Centennial Park playground and to direct pedestrians to specific access ways (particularly those near Banks Ave).	M
	R11	Construct fencing/ install bollards along steep edges at Point Daking and along Bayview Cres (Fig 3A).	M
	R12	Install bollards/ fencing to delineate verge parking along Vincent St.	M
	R13	Assess and manage marri trees at carpark at Blackhurst Park.	M
	R14	Modify signage on Geographe Bay Rd near Burt Ct to allow for verge parking and to promote the 'dead-end'.	L
	R15	Remove and replace worn/ damaged signage along the foreshore.	L
	R16	Improve the pedestrian crossovers over the drain at the beach accessways north of Gifford Rd .	M
	R17	Consider installation of bike racks at carparks at Dunn Bay Rd, Centennial Park (Banks Ave) and Old Dunsborough boat ramp.	M
	R18	Install waterwise shower devices and signage or logos at all showers in the area.	L
	R19	Install seating at the following points: along the Bayview Cr foreshore, in front of the resort accommodation between Burt Court and Vincent St, and between the Tulloh St carpark and the DUP.	M
	R20	Provide additional rubbish bins at Hurford St, in front of the resort accommodation between Burt Court and Vincent St, and at Tulloh St carpark.	M
	R21	Undertake initial cleanup of identified litter hotspots so as to maintain amenity.	M
	R22	Consider mural art project for Blackhurst Park toilet block .	M
	R22	Consider installation of toilets at Banks Ave carpark and Dunn Bay Rd foreshore.	M
	R23	Send letter to residents adjacent to green waste dumping locations, advising them of the impact and illegality.	H

EROSION	E1	Address the erosion and beach degradation issues associated with the Dunn Bay Rd carpark in accordance with appropriate coastal engineering advice and recommendations.	H
	E2	Undertake stabilisation and erosion control works at the Hurford St carpark in accordance with engineering recommendations. This should include continuous bollards to limit the extent of vehicle traffic.	M
SOCIAL	S1	Support and assist the 'Dunsborough Coast and Landcare' group (DCALC) in their important role of involving the community in coastal issues and in the implementation of a range of aspects of this management plan.	H
	S2	Develop a series of coastal interpretive signs to be placed along the DUP in the Dunsborough Foreshore.	H

Priorities: L = low, M= medium, H = high

REFERENCES

1. CoastWise (2001). *Geographe Bay Foreshore Management Plan.* Prepared for the Shire of Busselton and the Geographe Catchment Council.

2. Samson, GC. (1982). *Proposals for Coastal Management at East Busselton.*

3. CoastWise (2000). *Geographe Bay Foreshore Management Plan: Technical Report.* Prepared for the Shire of Busselton and the Geographe Catchment Council.

4. Keighery, BJ. (1994). *Bushland Plant Survey: A guide to plant community survey for the community.* Wildflower Society of Western Australia (Inc.), Nedlands.

5. National Asparagus Weed Management Committee (2007) 'Can you recognise Asparagus Weeds' Brochure.

6. 'Florabase'(viewed June 2008): http://florabase.calm.wa.gov.au/

7. Brown, K. and Brooks, K. (2002). *Bushland Weeds: A practical guide to their management.* Environmental Weeds Action Network (Inc.), Greenwood.

8. Hick,P. (2007) *Some Oceanic and Estuarine Implications of Sea Level Change in the Peel Region*. Abstract viewed May 2008 at: http://www.coastalmanagement.com/abstracts_combined.pdf

APPENDIX 1: SPECIES LIST

Species	Common Name	Occurrence
Acacia cochlearis	Rigid Wattle	C*
Acacia cyclops	Coastal Wattle	I*
Acacia littorea	Shark's Tooth Wattle	I*
Acacia saligna	Orange Wattle/ Kudjong	D*
Acanthocarpus preissii	Prickle Lilly	I*
Agonis flexuosa	Peppermint	D*
Atriplex isatidea	Coast Saltbush	R*
Carpobrotus virescens	Coastal Pigface	R*
Ficinia nodosa (formerly Isolepis)	Knotted Club Rush	C*
Hibbertia cuneiformis	Cutleaf Hibbertia	I
Phyllanthus calycinus	False Boronia	I
Anthocercis littorea	Prickle Lily	I
Myoporum insulare	Boobiala	I
Hardenbergia comptoniana	Native Wisteria	R*
Lepidosperma gladiatum	Coastal Sword-sedge	I*
Leucopogon parviflorus	Coastal Beardheath	R
Melaleuca lanceolata	Rottnest Teatree	I
Meleleuca rhaphiophylla	Swamp Paperbark	I
Melaleuca cuticularis	Saltwater Paperbark	I
Meleleuca huegelii	Chenille Honeymyrtle	R
Pimelea argentea	Silver-leaved Pimelea	C
Olearia axillaris	Coastal Daisybush	R*
Rhagodia baccata subsp. Baccata	Berry Saltbush	I*
Santalum acuminatum	Quandong	I*
Scaevola crassifolia	Thick-leaved Fan-flower	I*
Spinifex hirsutus	Hairy Spinifex	C
Spinifex longifolius	Beach Spinifex	C
Sporobolus virginicus	Marine Couch	I
Spyridium globulosum	Basket Bush	I
Templetonia retusa	Cockie's Tongue	R

D - Dominant C - Common I - Isolated patches R - Rare
*** Recommended revegetation species for this zone.**
Note: This list is not intended to be comprehensive but rather indicative and useful for planning and implementing revegetation and weed control efforts.

APPENDIX 1 continued: SPECIES LIST

Species	Common Name	Occurrence
INTRODUCED/WEED SPECIES		
Amaryllis belladonna	Easter Lily	R
Ammophila arenaria	Marram Grass	C
Arctotheca calendula	Capeweed	C
Arctotheca populifolia	Dune Cabbage	I
Asparagus aethiopicus	Ground or Basket Asparagu	I
Asparagus asparagoides	Bridal Creeper	C
Avena barbata	Wild Oats	C
Cakile maritima	Sea Rocket	C
Cynodon dactylon	Couch	I
Dimorphotheca ecklonis	Veld Daisy	C
Euphorbia paralias	Sea Spurge	D
Ferraria crispa	Black Flag	I
Gazania linearis	Gazania	C
Gladiolus undulatus	Wavy Gladioli	I
Lagurus ovatus	Hare's Tail Grass	I
Limonium spp.	Sea Lavender	R
Narcissus spp.	Jonquils	R
Pelargonium capitatum	Rose Pelargonium	D
Pennisetum clandestinum	Kikuyu	C
Pittosporum undulatum	Sweet Pittosporum	R
Schinus terebinthifolia	Brazilian Pepper Tree	R
Stenatophrum secundatum	Buffalo Grass	I
Tamarix aphylla	Athel Pine/ Tamarisk	R
Tetragonia decumbens	Sea Spinach	C
Trachyandra divaricata	Dune Onion Weed	C
Zantedeschia aethiopica	Arum Lily	C

D - Dominant C - Common I - Isolated patches R - Rare

Note: This list is not intended to be comprehensive but rather indicative and useful for planning and implementing revegetation and weed control efforts.

APPENDIX 2: METHODS OF WEED CONTROL

Species	Nature of Infestation	Some suggested methods of management and control*
Arum Lily *Zantedeschia aethiopica*	Isolated	Spray/wipe with Metsulfuron methyl 1g/10L water plus wetting agent.
Athel Pine/ Tamarisk *Tamarix aphylla*	Isolated	Cut and paint immediately with neat Glyphosate. Remove any material holding seed.
Blackflag *Ferraria crispa*	Isolated	Hand removal/ spot spray with Metsulfuron methyl 0.2g/15L + glyphosate 1%
Buffalo Grass *Stenotaphrum secundatum*	Scattered	Spray with 1% Glyphosate or Fusilade 8ml/L plus wetting agent; repeat 2-3 times over the growing season.
Couch *Cynodon dactylon*	Scattered	Spray with 1% Glyphosate or Fusilade 5ml/L plus wetting agent, in late spring/summer; repeat in autumn.
Dune Onion Weed *Trachyandra divaricata*	Widespread	Wipe with 50% Glyphosate solution before flowering.
Gazania spp.	Widespread	Spray with 1% Glyphosate.
Kikuyu *Pennisetum clandestinum*	Widespread	Spray with 1% Glyphosate or Fusilade 10ml/L plus wetting agent; repeat 2-3 times over the growing season.
Rose Pelargonium *Pelargonium capitatum*	Widespread	Hand-pull isolated plants removing the entire stem, spot spraying with Metsulfuron methyl 5g/ha + Pulse.
Soursob *Oxallis pes-caprae*	Scattered	Spot spray with 0.2g/15L plus wetting agent or 1% Glyphosate.
Veld Daisy *Dimorphatheca ecklonis*	Common	Spray with 1% Glyphosate.
Victorian Teatree *Leptospermum laevigatum*	Isolated	Cut and paint immediately with neat Glyphosate. Remove cut material to safe location as branches hold seed for a long period.
Wavy Gladioli Gladiolus undulatus	Isolated	Spot spray with Metsulfuron methyl 0.2g/15L + glyphosate 1%.

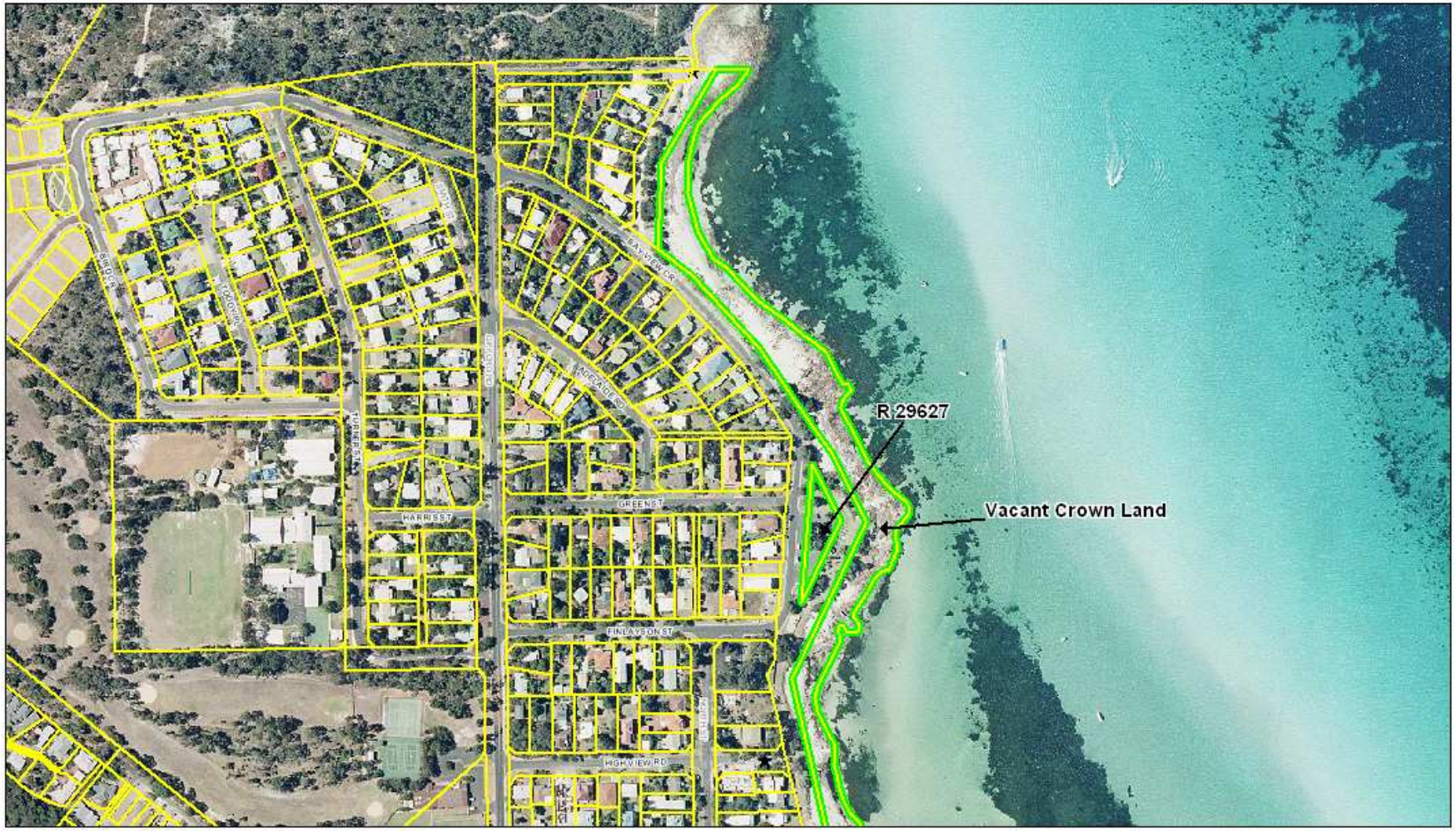
***Notes: 1.** Management methods are adapted from those suggested within *Bushland Weeds: A practical guide to their management*.[7]

2. Before commencing, check that the suggested methods are still currently recommended and that the chemical is registered for the intended purpose.

3. Only appropriately trained, qualified and equipped people should undertake chemical control and it is recommended that chemical use within the study area only occur under the supervision of or by appropriately trained Shire of Busselton staff or by a qualified contractor.

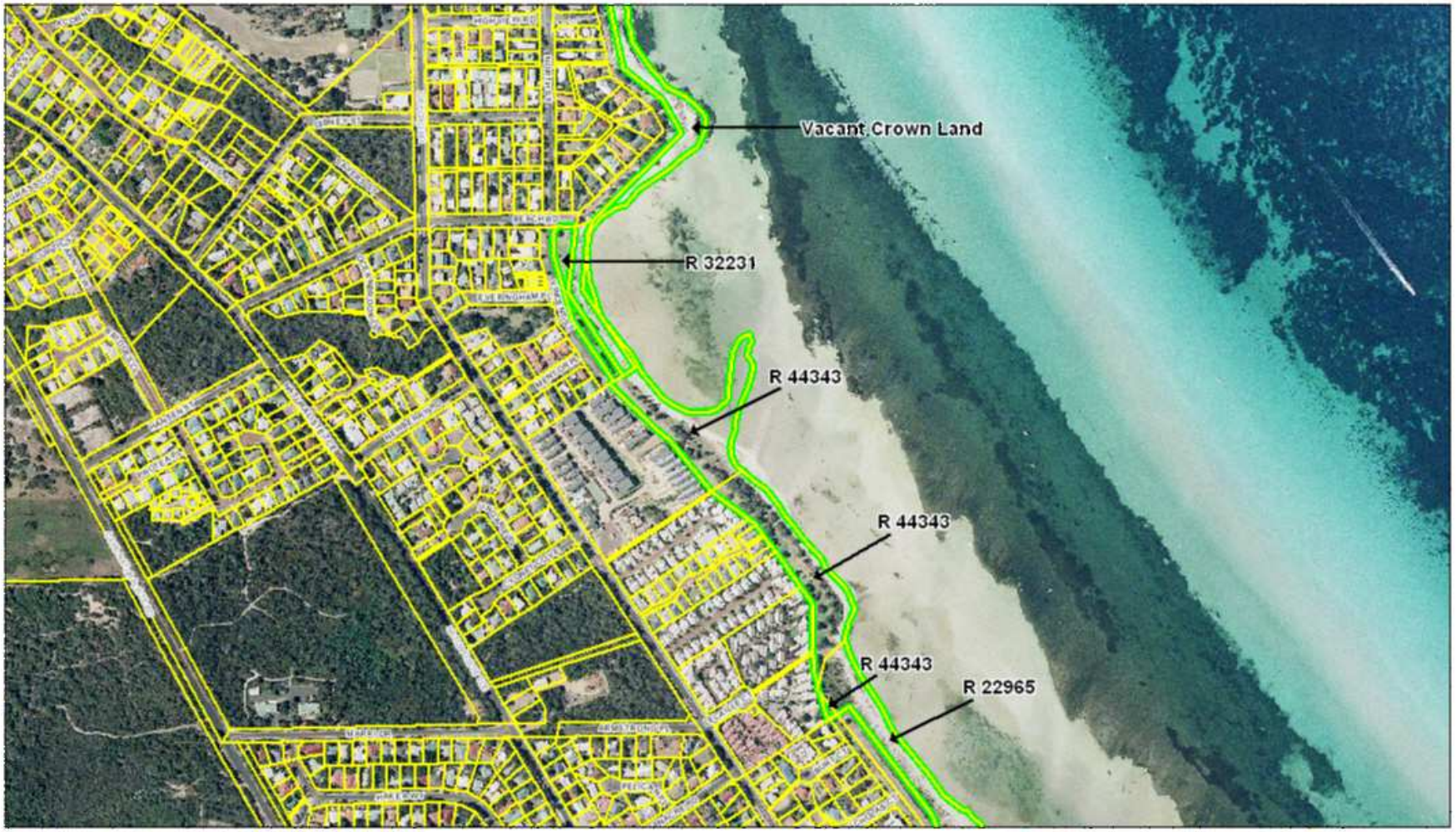
Dunsborough Foreshore Management Plan

Figure 1A: Study Area



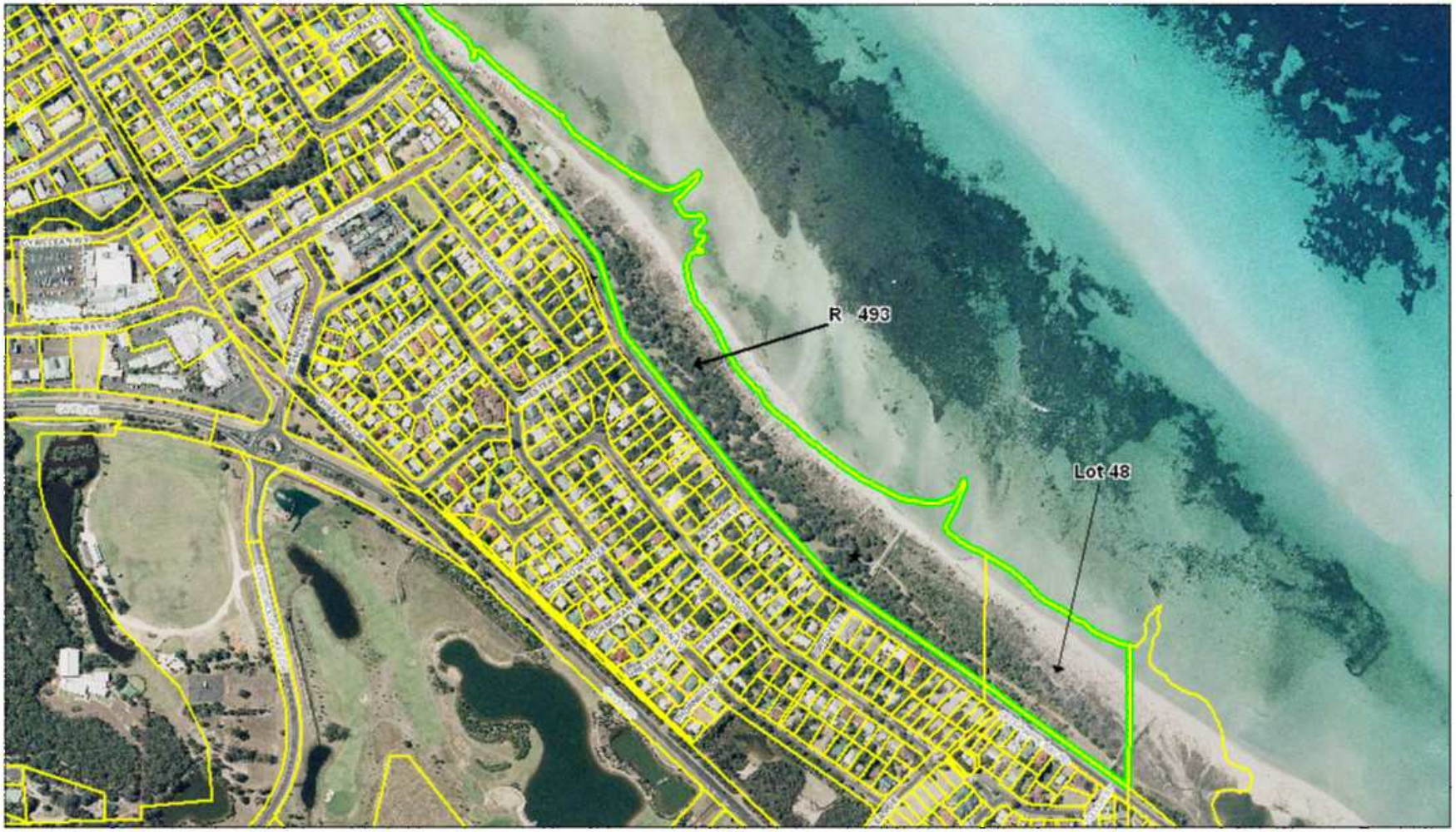
Dunsborough Foreshore Management Plan

Figure 1B: Study Area



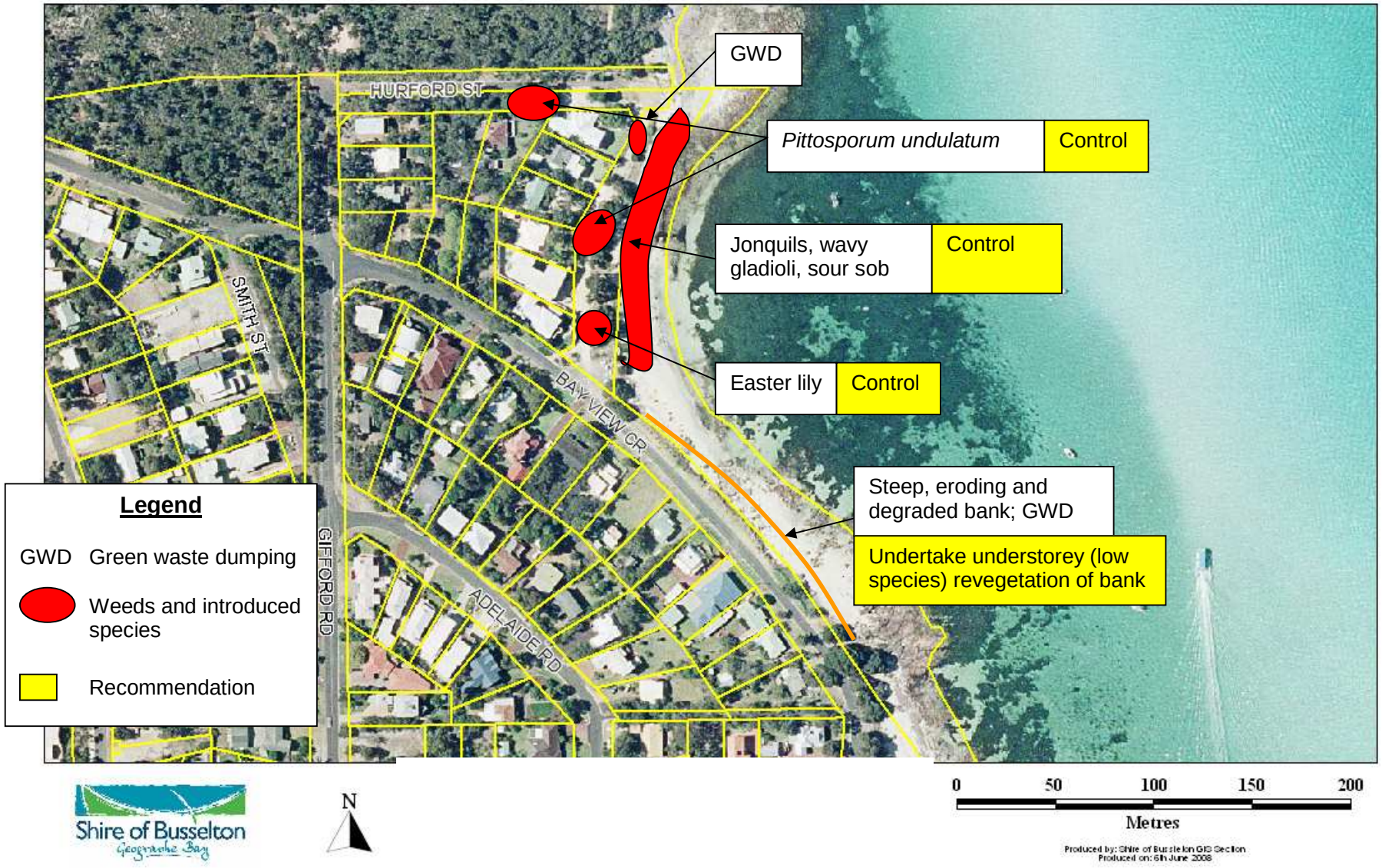
Dunsborough Foreshore Management Plan

Figure 1C: Study Area



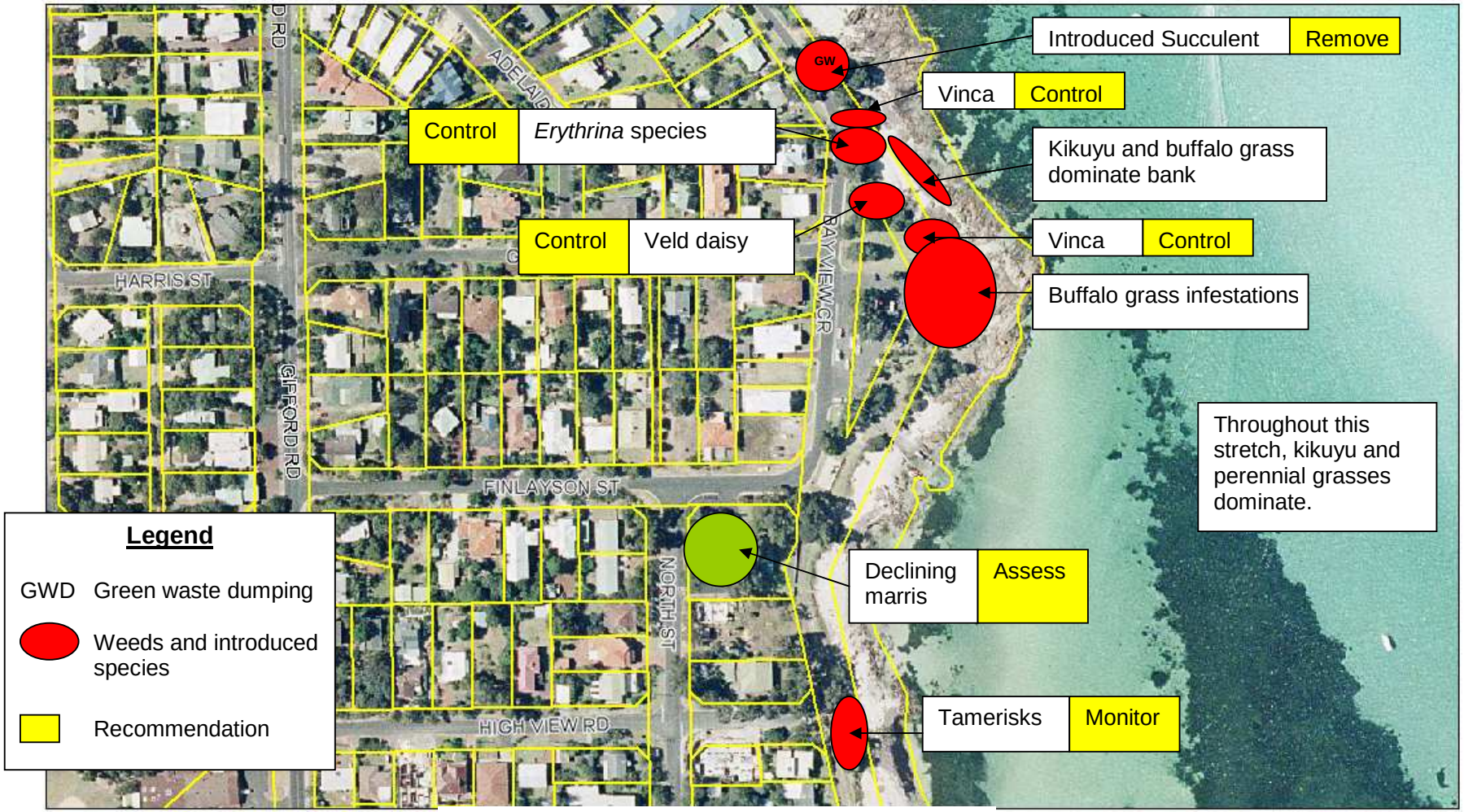
Dunsborough Foreshore Management Plan

Figure 2A: Vegetation Issues and Recommendations



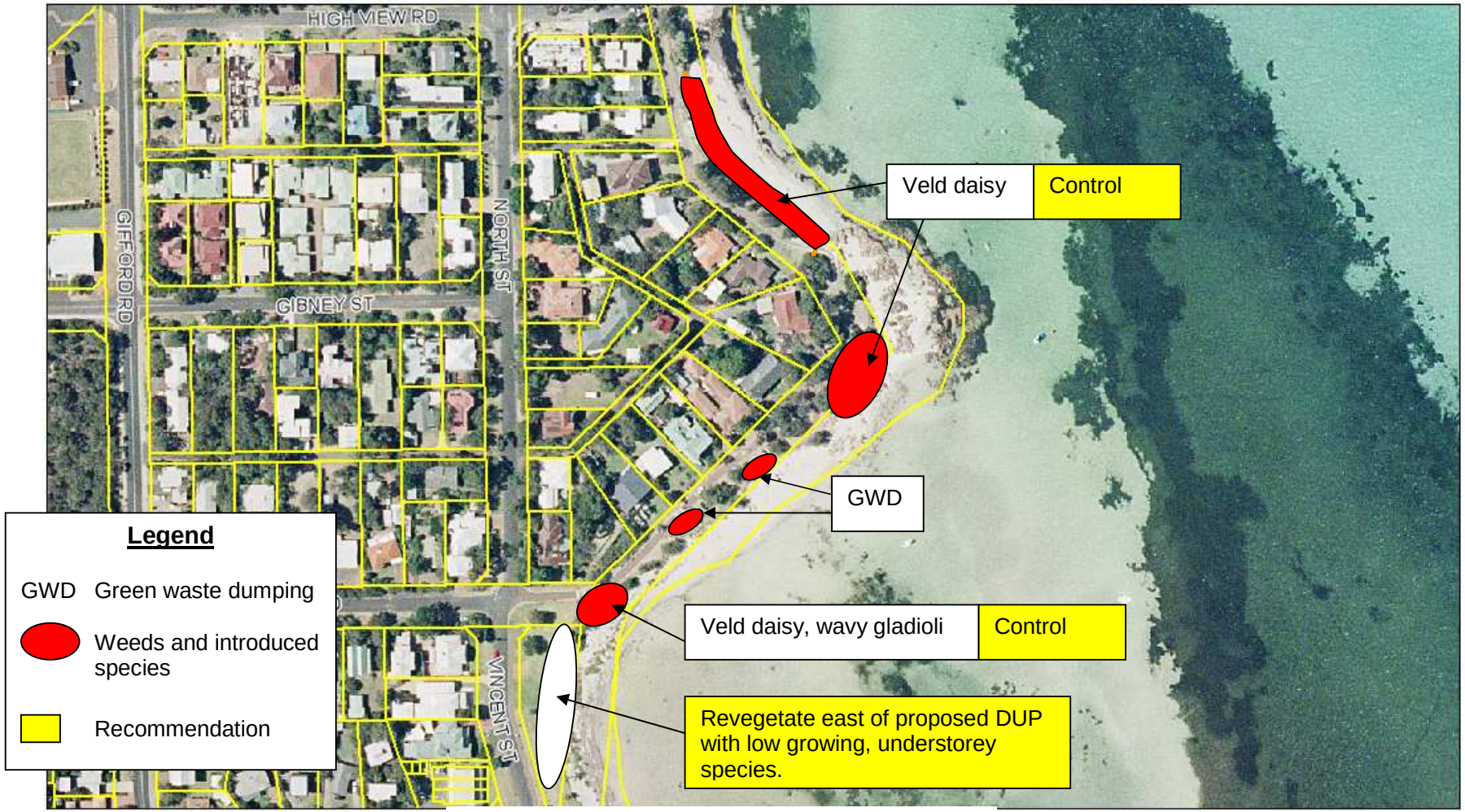
Dunsborough Foreshore Management Plan

Figure 2B: Vegetation Issues and Recommendations



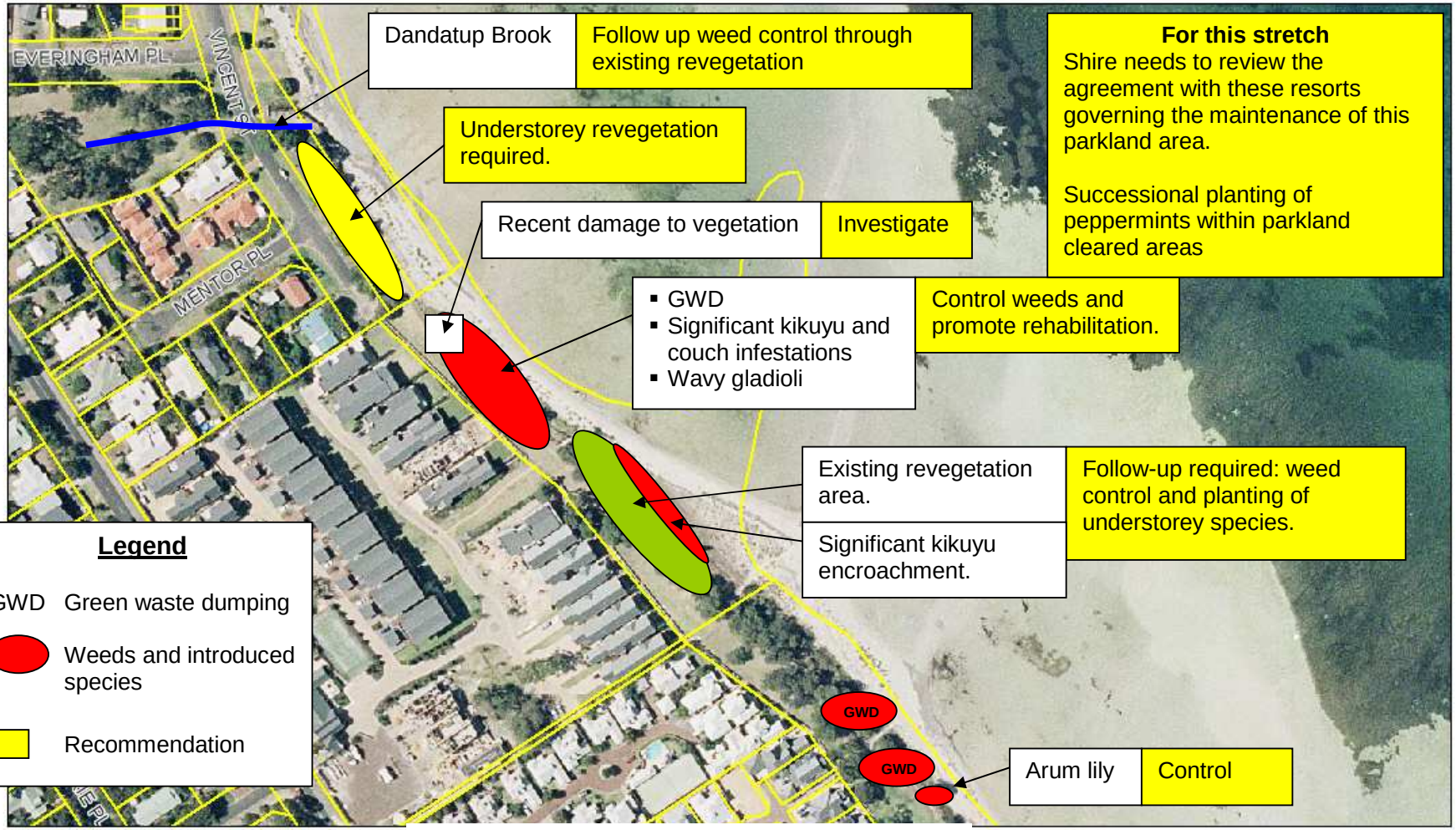
Dunsborough Foreshore Management Plan

Figure 2C: Vegetation Issues and Recommendations



Dunsborough Foreshore Management Plan

Figure 2D: Vegetation Issues and Recommendations



Dunsborough Foreshore Management Plan

Figure 2E: Vegetation Issues and Recommendations

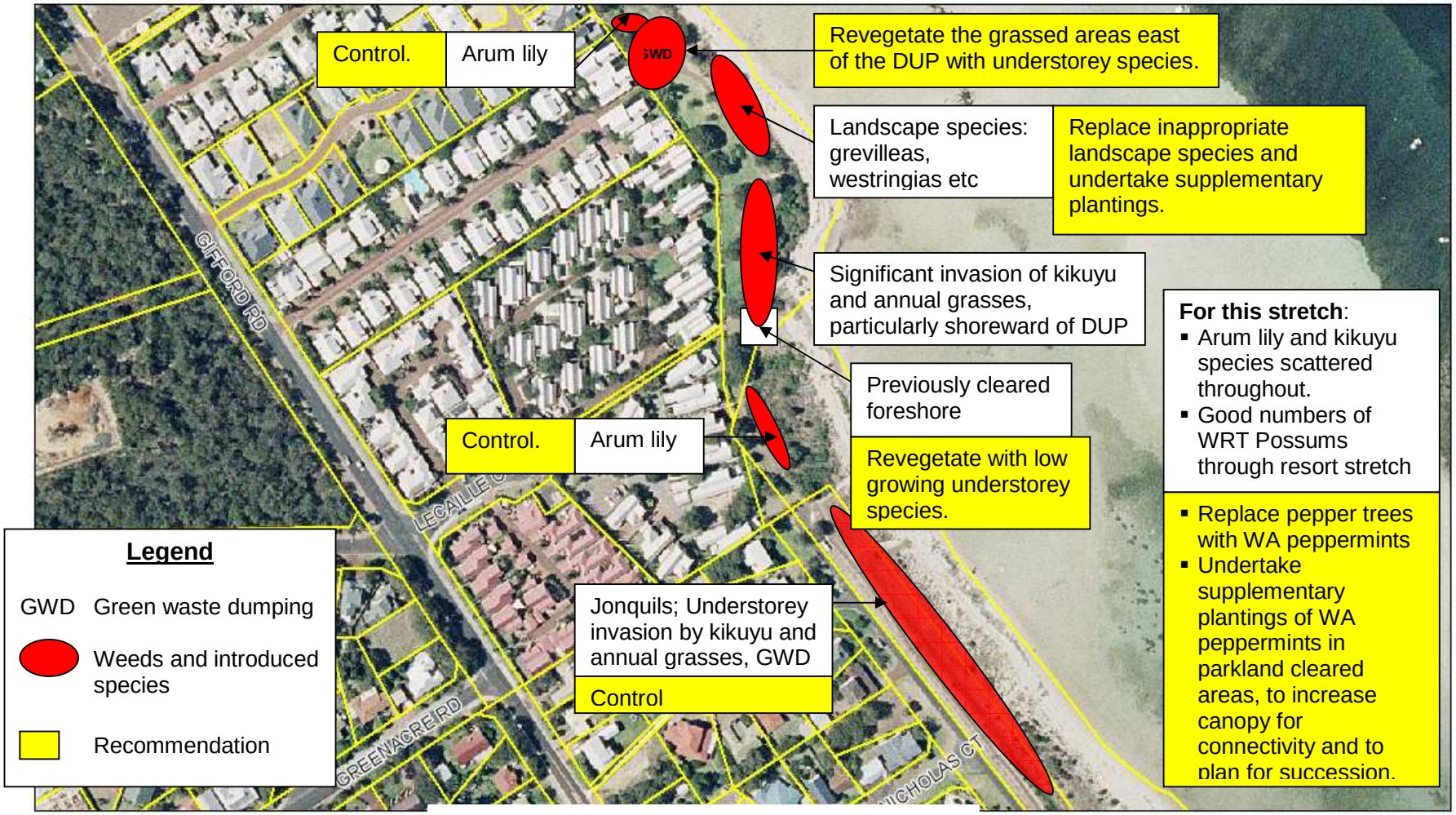


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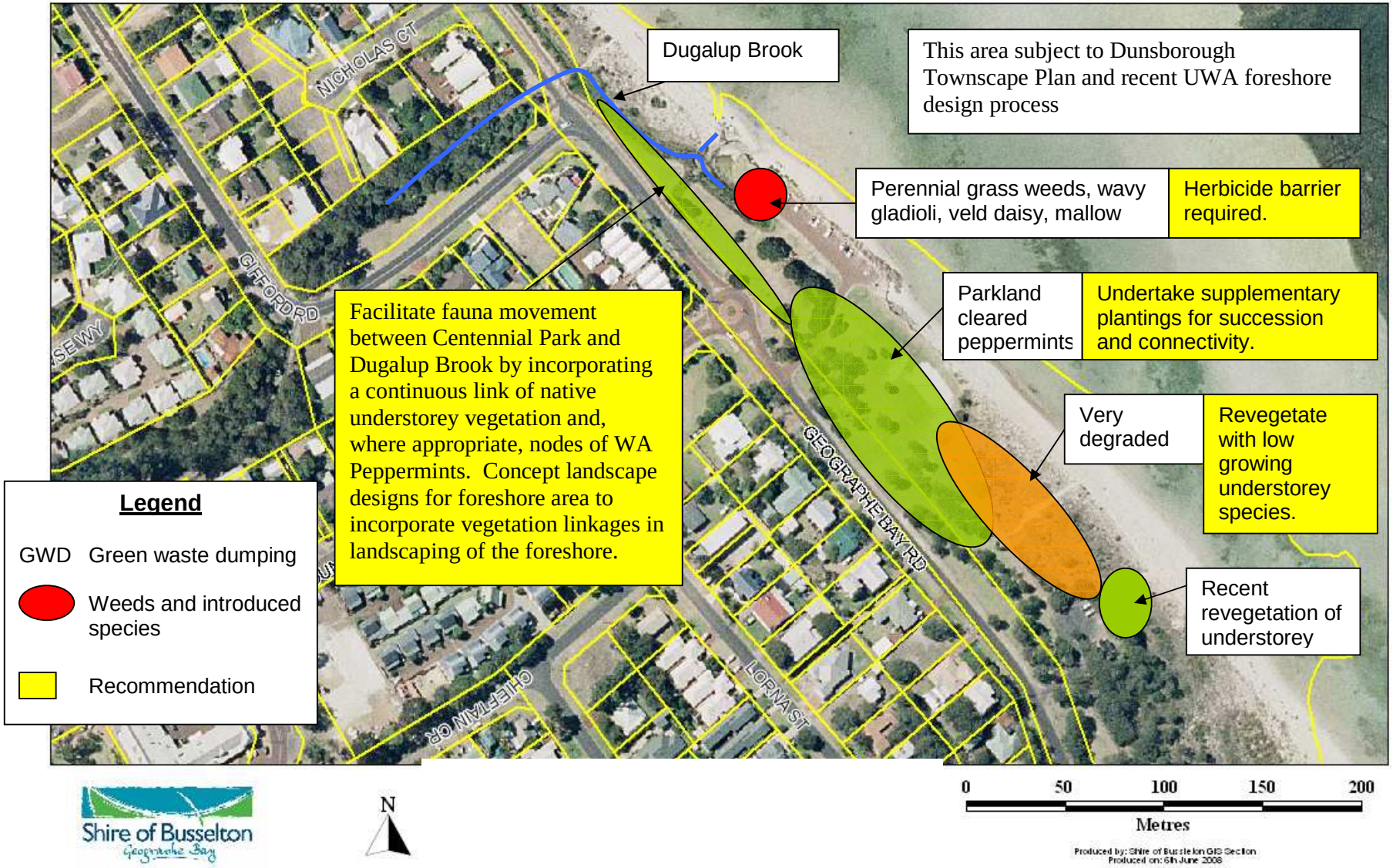
Figure 2F: Vegetation Issues and Recommendations

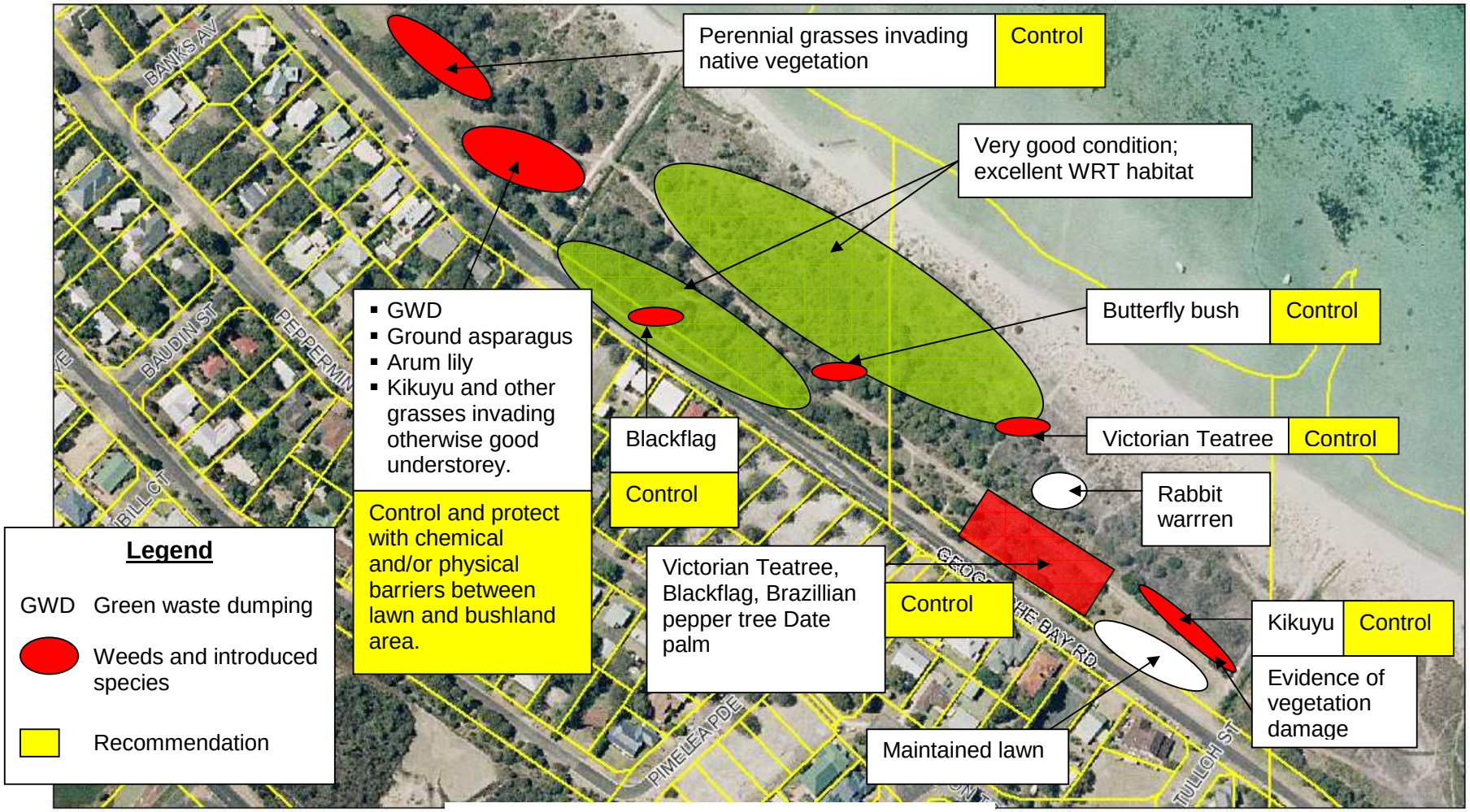


Dunsborough Foreshore Management Plan

Figure 2G: Vegetation Issues and Recommendations

Dunsborough Foreshore Management Plan

Figure 2H: Vegetation Issues and Recommendations



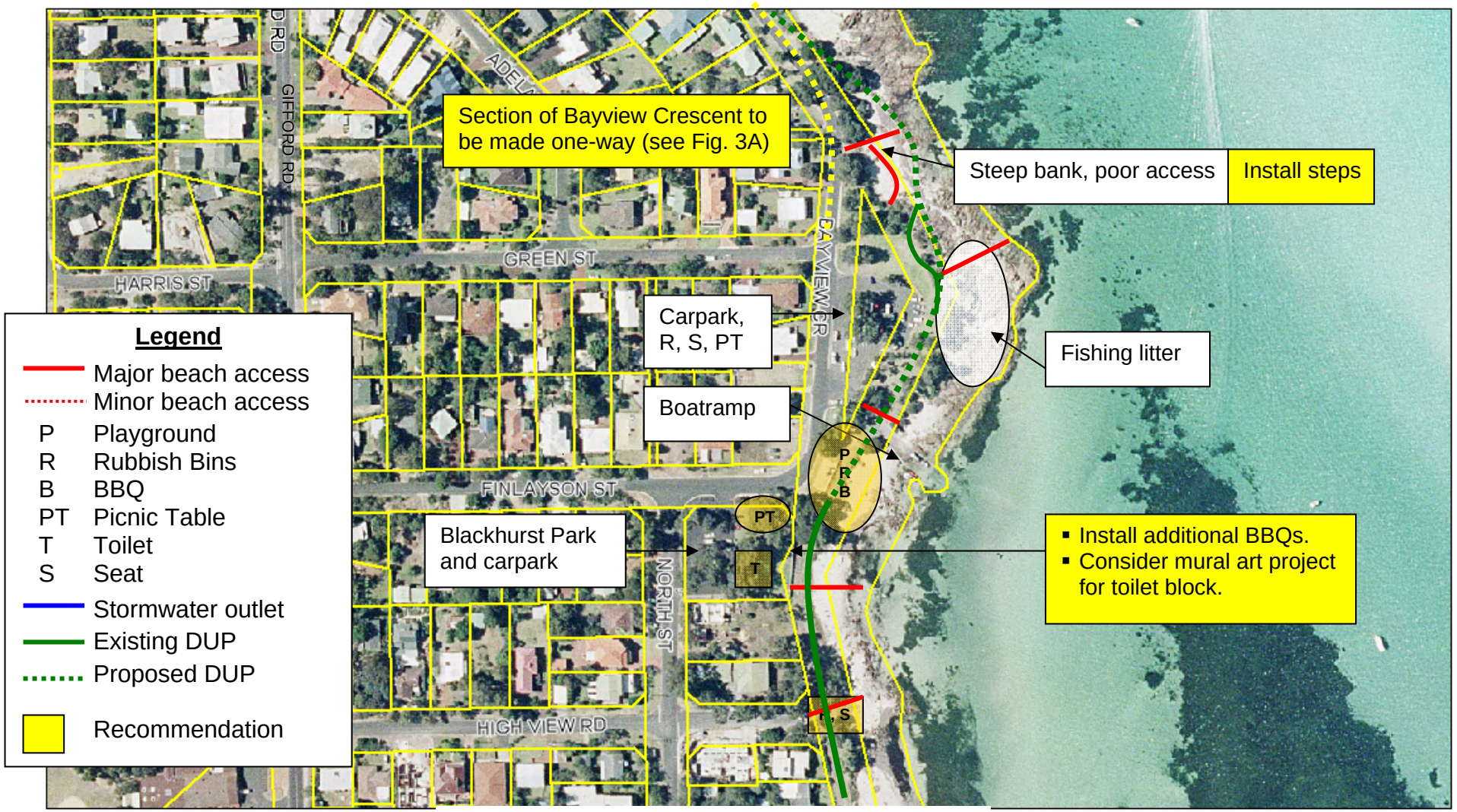
Dunsborough Foreshore Management Plan

Figure 3A: Access and Facilities - Issues and Recommendations

Shire of Busselton
Geographe Bay

Dunsborough Foreshore Management Plan

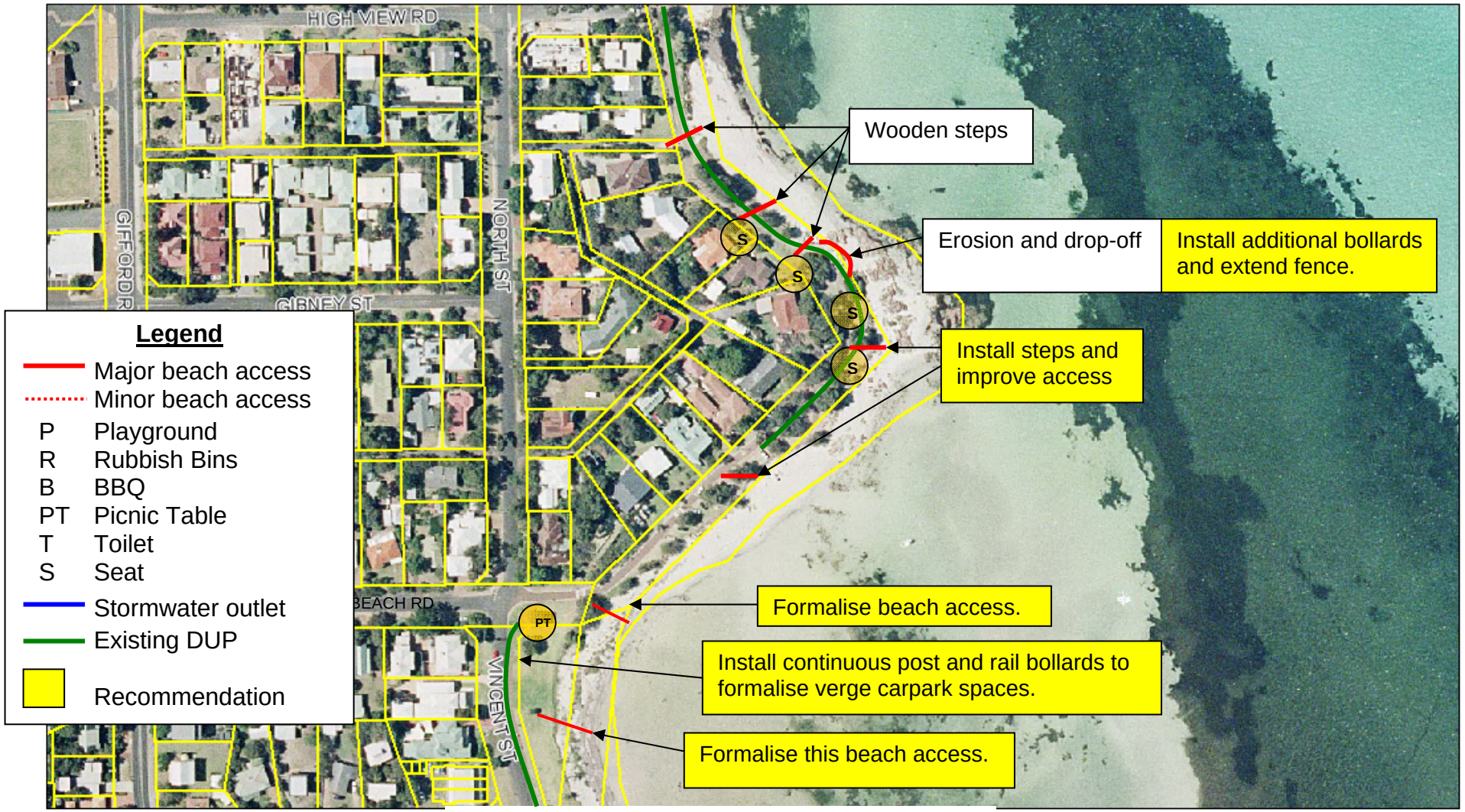
Figure 3B: Access and Facilities - Issues and Recommendations



Shire of Busselton
Geographe Bay

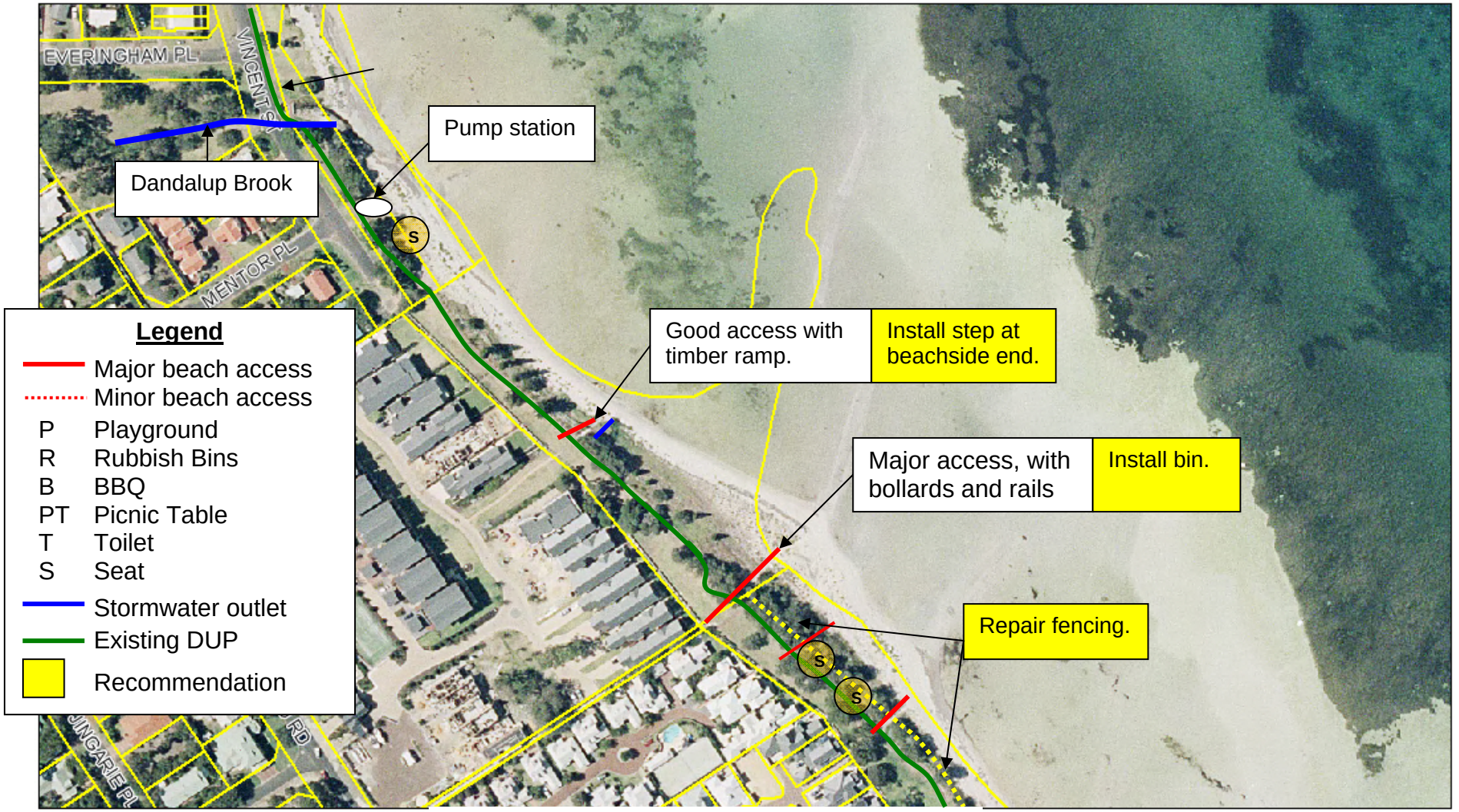
Dunsborough Foreshore Management Plan

Figure 3C: Access and Facilities - Issues and Recommendations



Dunsborough Foreshore Management Plan

Figure 3D: Access and Facilities - Issues and Recommendations



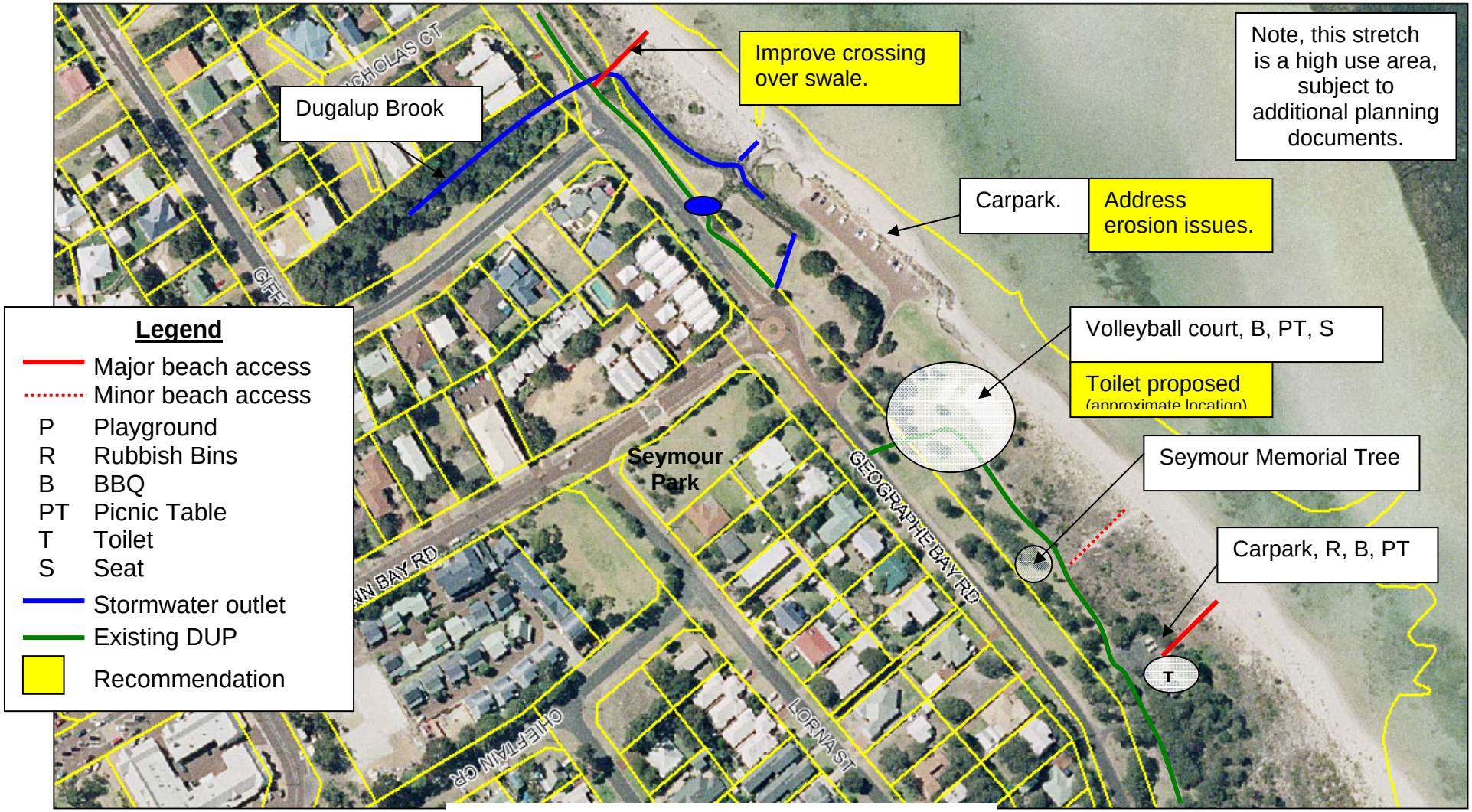
Shire of Busselton
Geographe Bay

Dunsborough Foreshore Management Plan

Figure 3E: Access and Facilities - Issues and Recommendations

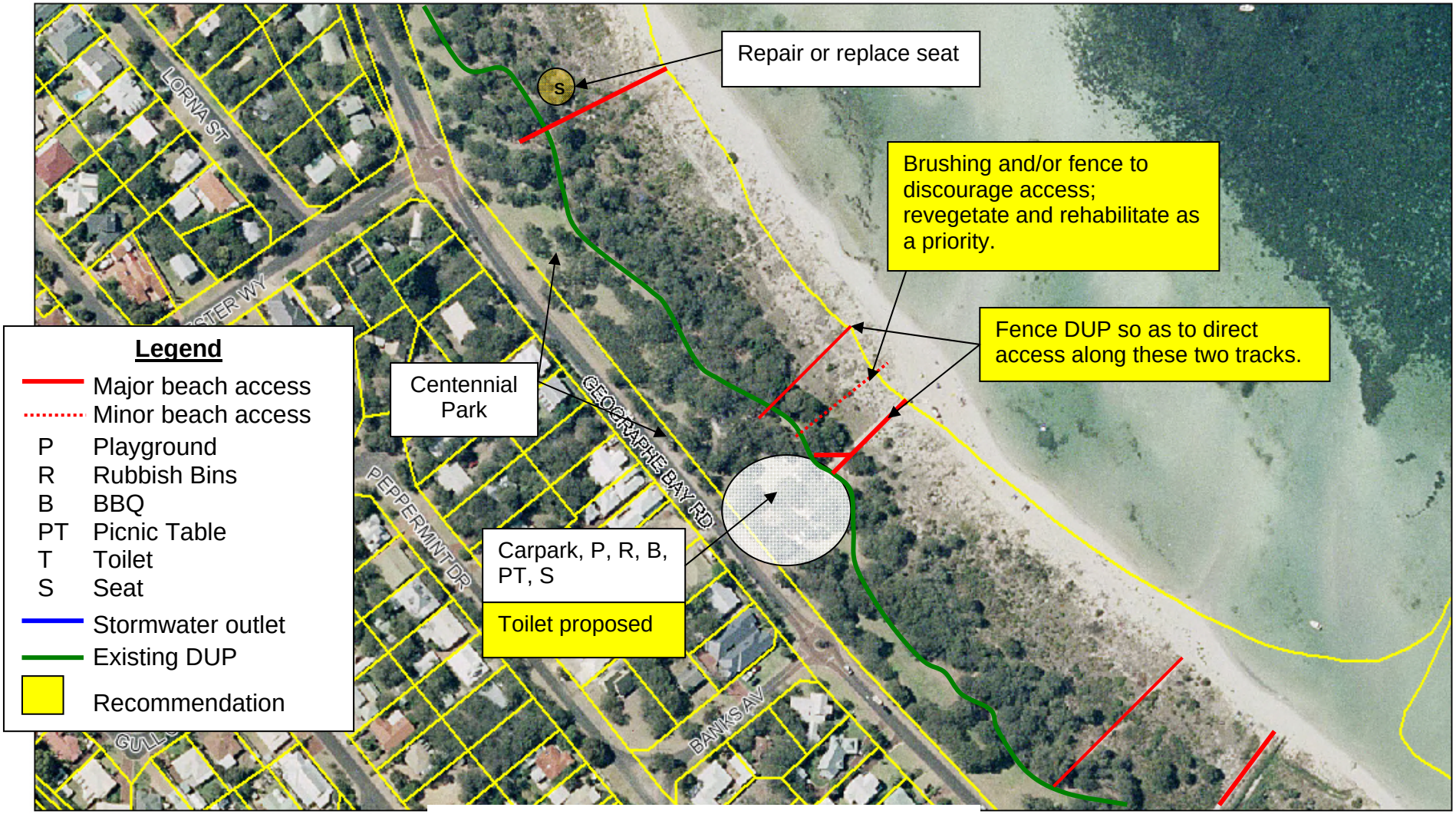
Dunsborough Foreshore Management Plan

Figure 3F: Access and Facilities - Issues and Recommendations



Dunsborough Foreshore Management Plan

Figure 3G: Access and Facilities - Issues and Recommendations



Shire of Busselton
Geographe Bay

Dunsborough Foreshore Management Plan

Figure 3H: Access and Facilities - Issues and Recommendations

Shire of Busselton
Geographe Bay