Leeuwin-Naturaliste capes area parks and reserves

management plan 81

2015

Department of Parks and Wildlife

Conservation Commission WESTERN AUSTRALIA

Department of Parks and Wildlife
17 Dick Perry Avenue
Kensington WA 6151

Phone: (08) 9219 9000
Fax: (08) 9334 0498

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Questions regarding this plan should be directed to:

Planning Branch
Department of Parks and Wildlife
17 Dick Perry Avenue, Kensington WA 6151
Locked Bag 104 Bentley Delivery Centre WA 6983

Phone: (08) 9219 9000
Email: planning@dpaw.wa.gov.au

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Front cover photos

Main Cape to Cape Track, Leeuwin-Naturaliste National Park.
Photo – Margaret River Discovery Co

Top left White-bellied frog (*Geocrinia alba*).
Photo – Department of Parks and Wildlife

Top right Calgardup Cave, Leeuwin-Naturaliste National Park.
Photo – Department of Parks and Wildlife

Header photo Boranup Forest, Leeuwin-Naturaliste National Park.
Photo – Department of Parks and Wildlife

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Acknowledgments

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Advice and feedback was provided by the Capes Parks Community Advisory Committee, Department of Fire and Emergency Services, Shire of Augusta-Margaret River, City of Busselton, South West Catchments Council and Cape to Cape Catchments Group as well as several community and recreational groups.

The traditional owners of the Leeuwin-Naturaliste capes area are acknowledged. The department recognises the importance of the cultural and heritage values of the area and looks forward to working closely with Noongar people in managing the parks and reserves covered by this plan.

A special thank you to all those who took the time to make a submission on the draft management plan after it was released for public comment.

Contents

Introduction

1. Overview

This management plan was prepared by the Conservation Commission of Western Australia (Conservation Commission) through the Department of Parks and Wildlife (the department; Parks and Wildlife). It covers 37,421ha comprising six national parks, eight nature reserves, two *Conservation and Land Management Act 1984* (CALM Act) section 5(1)(h) reserves, two timber reserves and parts of State forest, collectively referred to in this plan as the planning area (see Table 1 and Map 1). The plan also proposes additions to the planning area encompassing 2887ha (see Table 2 and Map 1).

The planning area is in the south-western corner of Western Australia, about 250km south of Perth and falls across the three local government areas of Busselton, Augusta-Margaret River and Nannup. It extends 95km along the Leeuwin-Naturaliste Ridge, from Cape Naturaliste in the north to Cape Leeuwin in the south and a further 36km east of Augusta along the Scott Coastal Plain. The reserves range from less than a hectare to more than 21,000ha in size.

The reserves of the Leeuwin-Naturaliste Ridge and Scott Coastal Plain are a celebrated tourist destination. Leeuwin-Naturaliste National Park receives the highest visitation of all national parks in the State, with more than 2,790,000 visits in 2013–14[1]. This can be attributed to its stunning visual landscapes, the opportunities it presents for a range of nature-based recreational and tourism activities, significant natural values[2] (including an extensive karst system, important wetlands, and conservation-significant species and communities), its heritage and cultural values, and easy accessibility. It is for these reasons that there is also a strong community attachment to the planning area.

One of the key features of the planning area is its diverse range of flora species. Photo – Parks and Wildlife

A primary objective of this management plan is to demonstrate a commitment to engage and collaborate with Noongar people in managing the planning area. The plan also sets out how the department aims to engage with the wider community to facilitate a sense of ownership and advocacy toward the planning area. Cross-boundary management with adjoining landholders and other key stakeholders is integral to the successful implementation of this management plan.

The reserves of the planning area are generally linear in shape with a fragmented nature. Away from the coast, they are surrounded by semi-rural residential developments and intensive agricultural practices, primarily vineyards and livestock farming. These factors, along with fire management, introduced species, high visitation and conflicting recreational activities, are key considerations for the plan.

This management plan replaces the *Leeuwin-Naturaliste National Park management plan 1989–1999* (CALM 1989) and is complementary to the *Forest management plan 2014–2023* (Conservation Commission 2013). The planning area is next to areas covered by other management plans, being the *Shannon and D'Entrecasteaux national parks management plan* (DEC 2012b), *Swan Coastal Plain south management plan* (in preparation) and the *Ngari Capes Marine Park management plan 2013–2023* (DEC 2013).

1 Visitor statistics obtained from the department's Recreation and Tourism Information System database. Figures are an estimate based on vehicle count data.

2 For definitions of 'significant flora', 'significant vegetation' (communities) and 'significant fauna', see Environmental Protection Authority (2004a & 2004b).

2. Management plan area

The parks and reserves covered by this management plan are (also see Table 1 and Map 1):

- Leeuwin-Naturaliste National Park
- Yelverton National Park (unofficial name)
- Bramley National Park (unofficial name)
- Forest Grove National Park (unofficial name)
- Scott National Park
- Unnamed national park (Reserve 46400)
- Gingilup Swamps Nature Reserve
- Haag Nature Reserve
- Stockdill Road Nature Reserve (unofficial name)
- Walburra Nature Reserve
- Unnamed nature reserves (Reserve 26065, 42942, 42377 and 15185)
- 5(1)(h) Reserve 44676
- 5(1)(h) Reserve 21751
- Timber Reserve 139/25
- part Timber Reserve 60/25
- part State Forest 56.

This plan also considers more than 2887ha of land proposed to be managed under the CALM Act (see Section 11 - *Tenure*, Map 1 and Table 2).

3. Key values and management issues

Key values

The planning area:

- is part of Australia's only internationally recognised biodiversity hotspot, one of 35 around the world and one of 15 national terrestrial biodiversity hotspots
- is home to at least 131 conservation-significant flora and fauna species, six threatened ecological communities (TECs) and many species that are endemic, locally restricted, disjunct or relictual
- has many species at the limits of their range, including the northern limit for many south coast plant species and the southern limit for several species of the Swan Coastal Plain. Cape Naturaliste is the only place where the jarrah forest meets the coast
- contains a karst system that includes hundreds of caves and speleological features. Several caves support unique subterranean ecological communities of endemic aquatic invertebrate fauna
- contains distinctive wetland habitats, including two nationally significant wetlands and the tributaries of the lower Blackwood River, a candidate wetland system for nomination under the Ramsar Convention on Wetlands
- has regionally significant ecological linkages that provide opportunities for species to migrate across the landscape, which help maintain genetic diversity and mitigate the effects of climate change
- contains fossil deposits of considerable importance in understanding mammal extinction, with Tight Entrance Cave containing a richer and more diverse assemblage of fossil vertebrates than any other Pleistocene deposit in the western half of Australia
- has evidence of occupation by Noongar people 55,000 years ago, including artefacts in Devil's Lair Cave, making it one of the oldest occupation sites in Australia

- contains numerous other Noongar cultural sites of significance, particularly along the coast
- includes cultural heritage and historic sites associated with early colonial settlement and the area's maritime history, such as Ellensbrook Homestead and the Cape Leeuwin, Cape Naturaliste and Foul Bay lighthouses
- is a significant recreation and tourism destination. Leeuwin-Naturaliste National Park is the most popular national park in WA, receiving more than 2,790,000 visits in 2013–14
- presents many opportunities for nature-based recreation such as bushwalking, cycling, birdwatching, horseriding, camping, caving, kayaking, abseiling, rock climbing, fishing, surfing and swimming
- has areas of high scenic quality, including exceptional coastal scenery along the Leeuwin-Naturaliste Ridge
- provides a significant economic benefit to the region through nature-based tourism and commercial opportunities.

Key management issues

Major issues that have the potential to significantly affect the key values of the planning area include:

- a warming and drying climate associated with climate change
- the linear and fragmented shape of the reserves and relative geographic isolation from other areas of remnant vegetation further inland
- altered fire regimes and the threat of bushfire to life and community assets
- disease, primarily *Phytophthora cinnamomi*
- predation and competition from feral and problem animals, especially foxes (*Vulpes vulpes*), cats (*Felis catus*) and pigs (*Sus scrofa*)
- weed invasion
- degradation of waterways and wetlands from contamination, sedimentation and groundwater abstraction
- impacts caused by high levels of visitation, as well as inappropriate and/or insufficiently designed recreational facilities and activities
- impacts from agricultural land use and a growing residential population in the surrounding areas.

A view of the coastline looking onto Conto Beach in Leeuwin-Naturaliste National Park. Photo – Wildblue Helicopters

Management purpose

4. Management directions

Vision

The parks and reserves of the planning area will continue to be part of an internationally recognised biodiversity hotspot and the wide variety of habitats set aside for protection on the Leeuwin-Naturaliste Ridge and Scott Coastal Plain will provide invaluable climate refugia.

The cultural, spiritual and heritage significance of the planning area to Noongar people will be understood and respected. Noongar people will be actively involved in caring for country and will continue to strengthen cultural ties to the land by using the planning area for customary activities.

Leeuwin-Naturaliste National Park will continue to be regarded as one of the primary coastal recreation and tourism destinations in Western Australia, making a significant contribution to the regional economy.

The Leeuwin-Naturaliste capes area parks and reserves will be recognised for their significance in contributing to the way of life, sense of identity and enjoyment of the natural environment by visitors and the local community alike.

This vision, which is derived from community input and reflects the key values of the planning area, will be supported by the implementation of the department's corporate plan (see www.dpaw.wa.gov.au).

Key management directions in the plan are to:

- manage species and communities of conservation significance to preserve the long-term viability of populations
- protect and maintain a wide variety of habitats across the Leeuwin-Naturaliste Ridge and Scott Coastal Plain to reduce the risks posed by climate change
- engage and collaborate with Noongar people in managing the planning area
- allow for and encourage sustainable nature-based visitor activities where they do not compromise natural, cultural or heritage values
- engage with the community to encourage a sense of community ownership of the planning area and ensure support for the management objectives and strategies in this plan.

5. Performance assessment

The Conservation Commission will measure the success of this plan in accordance with section 19(1)(g)(iii) of the CALM Act by using key performance indicators and other mechanisms as appropriate. A set of key performance indicators have been chosen to highlight performance targets for key components of the plan. These indicators are identified throughout the plan and are presented with a performance measure, target and reporting requirement.

The department is required to implement this plan and provide information to the Conservation Commission within the timeframes stipulated for each key performance indicator to enable assessment of the plan's implementation.

6. Legislative framework

The department administers the *Conservation and Land Management Act 1984* (CALM Act), which provides for the management of lands and waters vested in the Conservation Commission and the *Wildlife Conservation Act 1950* (WC Act), which provides for the protection of native flora and fauna within Western Australia. The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), administered by the Federal Government, relates to the protection of nationally listed threatened species and ecological communities, heritage (including Ramsar sites) and key threatening processes.

This management plan conforms to policies of the department and key policies are referred to throughout the document. Some policies may be developed, revised or superseded during the life of the plan. The preparation and/or revision of subsidiary management documents will be guided by the department's Policy 1 – *Department of Parks and Wildlife – key documents*.

The Forest Management Plan 2014–2023 (Conservation Commission 2013) (FMP)[3] provides the overarching planning and management framework for land in the south-west vested in the Conservation Commission, including State forests and conservation reserves. It complements this management plan, ensuring a more comprehensive approach to managing the area.

This management plan provides a summary of operations proposed to be undertaken in the planning area as required under the CALM Act and addresses Commonwealth and international obligations. It also provides guidance for departmental business plans and the preparation of subsidiary management documents which provide more detail for specific areas.

The tributaries of the lower Blackwood River are part of a wetland system that is partially situated within the planning area and proposed to become a Ramsar[4] site.

Desired outcome

Key values will be protected and conserved through the support and implementation of statutory and non-statutory documents.

Management actions

1. Progress the nomination of the tributaries of the lower Blackwood River as a wetland of international importance under the Ramsar Convention on Wetlands.
2. Promote open and cooperative management arrangements between all key stakeholders with legislative management responsibilities within the planning area.

7. Management arrangements with Noongar people

A primary objective of this management plan is to demonstrate a commitment to engage and collaborate with Noongar people in managing the planning area. The CALM Act, along with policy statements 86 – *Aboriginal customary activities* (Parks and Wildlife 2013a) and 87 – *Aboriginal joint management* (Parks and Wildlife 2013b) provide the framework for how the department will liaise with Noongar people in relation to access to undertake customary activities and potential joint management opportunities.

Noongar people have a strong desire to care for country and practise customary activities according to their traditional laws and customs, to be involved in cooperative management of conservation reserves and to strengthen cultural ties to the land. Working with Noongar people to care for the land is essential

3 For more information, see www.conservation.wa.gov.au.

4 The Ramsar Convention is an intergovernmental treaty that provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources.

for the preservation of natural and cultural heritage, as well as to enrich cross-cultural awareness. The involvement of traditional custodians in cooperative management of land managed by the department also provides cultural, spiritual and economic benefits to Noongar people.

The Conservation Commission and the department acknowledge the aspirations of Noongar people to:

- have their traditional rights in country recognised
- conduct customary activities on land managed by the department
- take part in the ongoing planning, decision-making and management of department-managed land.

The *Native Title Act 1993* sets out processes for consultation with native title claimants and native title representative bodies when major public works are undertaken, management plans are prepared, or other work is undertaken. Notwithstanding formal recognition of native title, the department will continue to recognise that Noongar people have strong and enduring interests over department-managed land and desire to continue cultural activities in these areas.

At the time of writing, negotiations were taking place for the settlement of native title over the south-west, which includes a component relating to joint management. This plan will conform to any outcomes arising out of the settlement negotiations and, if necessary, the plan will be amended to incorporate these changes.

Desired outcome

Engage with Noongar people on all aspects of land management.

Management actions

1. Work with Noongar people so their knowledge and cultural values inform and guide management actions.
2. Where consent is given to use traditional knowledge, ensure it is appropriately acknowledged.
3. Foster connection to country by allowing customary activities, consistent with legislation and regulations.
4. Encourage training, employment and economic development opportunities through cooperative management arrangements.
5. Ensure that management adapts to and conforms with legislative or policy changes and native title resolutions.

8. Community involvement and off-reserve management

It is important to engage with the community to gain support for management objectives and strategies, and facilitate a sense of community ownership and advocacy toward the planning area. Public participation has been integral in preparing this plan through feedback obtained during the public submissions phase of the draft management plan and in subsequent meetings and workshops. The Capes Parks Community Advisory Committee has provided advice and feedback on many issues throughout the planning process.

Support from the local community, traditional owners, tourism operators and other park visitors is essential for the successful implementation of this management plan. Volunteer activities not only increase the department's work capabilities and skills base, they also foster communication links and understanding with the community.

Principles for effective and positive neighbour relations are outlined in the department's *Good neighbour policy* (DEC 2007). The successful implementation of this plan cannot be achieved in isolation because

various other land tenures adjoin the planning area. In particular, catchment protection, feral animal control, threatened species protection and fire management need to be approached from a broader integrated land management perspective to achieve management objectives for the planning area. The department works with other land management agencies, neighbours and the local community to achieve effective and coordinated management of cross-boundary issues.

Many threatened species are highly mobile and travel across tenures. For those species that have recovery plans (see Section 13 – *Biological environment*), liaising with landholders is important in implementing recovery actions, especially in increasing awareness of a species conservation status and providing information on how landholders can help in recovery efforts.

Threatened species such as Baudin's cockatoo (*Calyptorhynchus baudinii*) traverse tenures, cooperation with other land managers is essential to maintain habitat. Photo – Margaret River Discovery Co

The department liaises with State Government agencies which have responsibility for, or provide advice on, land-use practices that affect the planning area, including drainage and declared pest species (Department of Agriculture and Food), fire management (Department of Fire and Emergency Services), water resource use (Department of Water) and fisheries management (Department of Fisheries) as well as the Federal Government department responsible for administering the EPBC Act.

Coordinated planning and management with the local government authorities of Busselton, Augusta-Margaret River and Nannup is particularly important given they:

- work with the department (together with the Department of Fire and Emergency Services and local bushfire brigades) to provide cooperative and coordinated firefighting on and near the reserves of the planning area
- manage reserves that are listed as proposed additions to the planning area
- broadly represent the views of the communities within their constituency
- are able to encourage planning and land management practices that complement management of the planning area
- share responsibility for the provision and maintenance of the public road network.

The planning area is within the South West natural resource management (NRM) region which, in partnership with government agencies, Aboriginal groups, land managers and community groups, help deliver Federal Government conservation funding programs. NRM bodies such as the South West Catchments Council and Cape to Cape Catchments Group contribute toward effective management of the planning area, and ongoing interaction with these groups is important in achieving integrated NRM outcomes.

Desired outcome

Encourage and facilitate community ownership of the planning area and community support for the objectives and strategies of this management plan.

Management actions

1. Support and promote opportunities for community involvement in activities that assist in managing the planning area.

2. Liaise with neighbours, local authorities, government agencies and other stakeholders to facilitate effective, coordinated management of cross-boundary issues, for example through the Capes Parks Community Advisory Committee.

9. Administration

The planning area lies within the department's Blackwood District of the South West Region. The day-to-day implementation of this management plan is the responsibility of the District Manager, who will coordinate management within allocated budgets and other resources. Operational management is also supported by staff from the department's South West Region and specialist branches.

10. Term of the plan

This plan will guide management of the planning area for a period of 10 years from the date that a notice is published in the *Government Gazette*. Amendments to the management plan can be made in accordance with section 61 of the CALM Act and if an amendment is necessary, proposed changes will be released for public comment. In the event that the plan is not reviewed and replaced at the end of the 10-year period, this plan will remain in force until a new management plan is approved.

11. Tenure

The planning area consists of 37,421ha of reserves vested in the Conservation Commission and 2887ha of proposed additions that comprise a variety of tenures.

The protection of a wide range of different habitats in a variety of isolated and connected conservation reserves is critical to reduce the risks posed by climate change (Dunlop & Brown 2008) and is a key management direction of this plan. The department will continue to encourage and support private landowners, other land managers and non-government organisations in conserving remnant vegetation on properties outside formal conservation reserves[5] through covenanting and voluntary management schemes (for example the department's Nature Conservation Covenant Program and *Land for Wildlife*, the Department of Agriculture and Food's Agreement to Reserve covenant and the National Trust [WA] covenant).

Nine forest ecosystems[6] occur in the planning area, six of which meet the reservation target of 15 per cent. Three forest ecosystems (Jarrah Blackwood, Jarrah Leeuwin and Jarrah Woodland) are under-represented in formal conservation reserves. The proposed tenure additions will achieve the 15 per cent target for the Jarrah Blackwood and Jarrah Woodland forest ecosystems; however, the target will not be reached for the Jarrah Leeuwin forest ecosystem because most remaining areas of remnant vegetation occur on private property.

Existing reserves

The reserves that make up the planning area are outlined in Table 1 and shown on Map 1. All reserves listed in Table 1 are vested in the Conservation Commission.

5 Formal conservation reserves are those that have an International Union for the Conservation of Nature (IUCN) category of I to IV and include national parks, nature reserves and conservation parks.

6 Forest ecosystems are identified and described at a finer scale than IBRA bioregions. The reservation target for forest ecosystems is 15 per cent of the pre-1750 extent in formal and informal reserves, except for some rare ecosystems where 100 per cent of the extant distribution is the target (Conservation Commission 2013).

Table 1. Reserves vested in the Conservation Commission

Reserve	Name	Purpose	Class	Area (ha)	Comments
47956	Bramley National Park	National park	A	3892	
47673	Forest Grove National Park	National park	A	1379	
30626	Gingilup Swamps Nature Reserve$^{\Delta}$	Conservation of flora and fauna	Other	4325.9	
37010	Haag Nature Reserve$^{\Delta}$	Conservation of flora and fauna	Other	9.3	
44658	Leeuwin-Naturaliste National Park	National park, navigation, communication, meteorology, survey, tourism and conservation	A	0.21	Contains the Cape Naturaliste Lighthouse which is leased to the Geographe Bay Tourism Association
44660	Leeuwin-Naturaliste National Park	National park, tourism, navigation, communication, meteorology and survey	A	0.3	Contains the Cape Leeuwin Lighthouse which is leased to the Augusta-Margaret River Tourism Association
8428	Leeuwin-Naturaliste National Park$^{\Delta}$	National park	A	21,179.7	
14779	Leeuwin-Naturaliste National Park$^{\Delta}$	National park	A	103.6	Amend purpose to 'nature reserve' and allocate a new name
25373	Scott National Park$^{\Delta}$	National park and recreation	A	3272.9	Amend reserve purpose to 'national park' The park boundary should be re-aligned to abut the Scott River
State Forest 56 (part)	Keenan State Forest	State forest	A	10.4	Resolve issues of exotic species and liaise with the Forest Products Commission to incorporate into Bramley National Park
1394	Stockdill Road Nature Reserve	Conservation of flora and fauna	Other	40.5	Amalgamate with Reserve 39465
39465	Stockdill Road Nature Reserve	Conservation of flora and fauna	A	15.9	
Timber reserve 139/25 (DFMP ID 143)	Timber reserve 139/25	Timber reserve	Other	424.4	Proposed forest conservation area

Reserve	Name	Purpose	Class	Area (ha)	Comments
Timber reserve 60/25 (part) (DFMP ID 161)	Timber reserve 60/25	Timber reserve	Other	260.1	Proposed forest conservation area. Incorporate north-west portion as shown on Map 1 into Bramley National Park
21751	Unnamed 5(1)(h) reserve	Recreation and camping	Other	66.3	Incorporate into Leeuwin-Naturaliste National Park
44676	Unnamed 5(1)(h) reserve	Navigation, communication, meteorology, survey and conservation	Other	0.04	Contains the Foul Bay Lighthouse. Incorporate into Leeuwin-Naturaliste National Park
46400	Unnamed national park	National park	A	1571.1	Consolidate into Forest Grove National Park
15185	Unnamed nature reserve	Conservation of flora and fauna	A	9.8	
26065	Unnamed nature reserve	Conservation of flora and fauna	Other	55	
42377	Unnamed nature reserve	Conservation of flora and fauna	Other	50.2	
42942	Unnamed nature reserve	Conservation of flora and fauna	Other	3.8	Incorporate into Gingilup Swamps Nature Reserve
20258	Walburra Nature Reserve[Δ]	Conservation of flora and fauna	A	21.5	
47672	Yelverton National Park	National park	A	729	
Total				37,421.10	

[Δ] Gazetted name

Leeuwin-Naturaliste National Park

The national park consists of a primary reserve, Reserve 8428, plus Reserve 14779 and two smaller reserves that contain the Cape Naturaliste and Cape Leeuwin lighthouses (reserves 44658 and 44660). The seaward boundary of Leeuwin-Naturaliste National Park is the high water mark. Reserve 14779 is separate from the main body of the national park and is proposed to become a nature reserve vested in the Conservation Commission.

The department is aware of the Shire of Augusta-Margaret River's interest in the Kilcarnup portion of Leeuwin-Naturaliste National Park; a parcel of land that was formerly comprised Reserve 8431 (vested in the Shire) and an unvested reserve, which were incorporated into the national park on 30 June 2010. The department will liaise with the Shire on future development proposals associated with Kilcarnup.

As part of an environmental offset for a property development at Injidup, parcels of land formerly identified as lots 5531, 5532, 5545 and 5546 on Plan 36375 were ceded to the State for addition to Leeuwin-Naturaliste National Park pursuant to section 20A of the *Town Planning and Development Act 1928* (now *Planning and Development Act 2005*). These lots were incorporated into Reserve 8428 on 30 June 2010. Former lots 5532, 5545 and 5546 are subject to a restrictive covenant curtailing development without the agreement of the former landowner. Former Lot 5531 is subject to an agreement to consult before any development takes place.

There are three parcels of land that should be excised from the national park to better reflect management arrangements between the department and local government. These are:

- part of the access road and car park for the Gracetown boat ramp, which is managed by the Shire of Augusta-Margaret River and falls partly within the national park
- the area known as the old cricket pitch on Caves Road in Yallingup, which will be excised from the national park and transferred to the City of Busselton
- the stretch of beach immediately next to the Yallingup town site, which will also be excised from the national park and transferred to the City of Busselton.

The National Trust of Australia (WA) manage Ellensbrook Homestead and some of the land surrounding the homestead within Leeuwin-Naturaliste National Park. The department will continue to work with the National Trust to reach agreement on the most suitable management arrangement for the site.

Timber reserves 139/25 and 60/25

Under the FMP it is proposed that timber reserve 139/25 and a portion of timber reserve 60/25 be classified as 'forest conservation area' as shown on Map 1. The remainder of timber reserve 60/25 is either inundated by Ten Mile Brook Reservoir or adjoins Bramley National Park. Given the small size of the latter, it is proposed to be incorporated into the national park.

Proposed additions

Proposed tenure additions are listed in Table 2 and shown at Map 1. All proposed additions have been identified for their conservation values and/or management benefits (such as boundary rationalisation) and are subject to agreement from the current land manager and other stakeholders.

Priority will be given to progressing tenure additions that:

- improve the reservation level for those forest ecosystems that contain less than 15 per cent of the pre-1750 extent in formal conservation reserves
- enhance ecological linkages, consistent with the *South west regional ecological linkages technical report* (Molloy et al. 2009), the *Shire of Augusta-Margaret River local planning strategy* (Shire of Augusta-Margaret River 2011) and the *City of Busselton environment strategy* (Eastern Metropolitan Regional Council 2004)
- contain species of conservation significance or important habitat for species of conservation significance.

Several undeveloped road reserves traverse or lie directly adjacent to the planning area. The department will liaise with the relevant local government authority and Main Roads WA to investigate the possibility of incorporating unnecessary road reserves into the reserves of the planning area. Unless required for public access, such road reserves will be closed and rehabilitated or maintained for management access only. Any road closures will be signposted accordingly.

The aquisition of private property that either adjoins or is an enclave within the planning area may provide more manageable park boundaries or contribute to the protection of key values, and should be considered if the acquisition of such properties becomes an option.

Boranup Sand Patch comprises unallocated Crown land (UCL) 4230 and 320, and Reserve 30656 (vested in the Shire of Augusta-Margaret River for 'quarry lime sand'). Mining in Reserve 30656 is proceeding under authority of the Shire of Augusta-Margaret River (Boranup Limes and Quarry). The Conservation Commission and the department recommend that UCL 4230 and 320, and Reserve 30656 should be consolidated into Leeuwin-Naturaliste National Park, particularly for their high landscape values. The area is recognised in the *Leeuwin-Naturaliste Ridge statement of planning policy* (LNRSPP) (WAPC 1998) as an area of natural landscape significance and in this management plan as landscape management Zone A (see Section 25 - *Visual landscape*). These parcels of land also provide a significant linkage between fragments of national park and support threatened and priority species. Any future reservation will require consultation with the Department of Mines and Petroleum.

In the event that a proposed tenure addition becomes CALM Act-managed land, it will be managed in accordance with this management plan. Other additions will be managed to be consistent with this management plan, or if necessary the plan will be amended to apply to them.

Table 2. Proposed additions

Map ID	FMP ID	Description	Vesting	Purpose	Area (ha)	Comments and recommended changes
Leeuwin-Naturaliste National Park						
11	150	Lot 300 on plan 50242♦ (UCL within the Gracetown town site)	N/A	UCL	258.94	A proposed development at Gracetown is proposed that will see land added to the park
15	158 (part)	PIN 526638, PIN 526684♦ (UCL next to Reserve 13702)	N/A	UCL	15.82	Incorporate into the park
12		Reserve 11983	Unvested	Trigonometrical station	0.40	Incorporate into the park. Access will be maintained
32		Reserve 11984	Unvested	Trigonometrical station	0.40	Incorporate into the park. Access will be maintained
44		Reserve 11985	Unvested	Trigonometrical station	0.37	Incorporate into the park. Access will be maintained
14	158 (part)	Reserve 13702	Unvested	Gravel	1.69	Incorporate into the park
33	198	Reserve 1393	Minister for Water Resources	Access to water	39.77	Incorporate into the park
25	183	Reserve 8437♦^ (Devil's Lair)	WA Museum	Protection and preservation of caves and flora and for health and pleasure resort	299.87	The department's first preference is to incorporate this reserve, excluding the cave entrances, into the park. Should consent not be given by the WA Museum or other stakeholders, a memorandum of understanding will be prepared for the department to manage the reserve on behalf of the WA Museum
42	200	Reserve 19020 (part)	Shire of Augusta-Margaret River	Recreation	38.35	Contains the Hillview Golf Course. Incorporate the portion south of Green Hill Road into the park
1	136	Reserve 24622♦ (part)	City of Busselton WPL 21 years	Public recreation	12.06	Incorporate the portion bound by Yallingup Beach and Valley roads into the park
10	149	Reserve 27618♦ (part)	Shire of Augusta-Margaret River	Recreation	18.14	Incorporate the portion east of Cowaramup Bay Road and north of Gracetown into the park
13	157	Reserve 29482	Unvested	Sand	7.70	Incorporate into the park

Map ID	FMP ID	Description	Vesting	Purpose	Area (ha)	Comments and recommended changes
27	185	Reserve 30656	Shire of Augusta-Margaret River	Quarry lime sand	76.94	This reserve has been identified by the Department of Mines and Petroleum as a strategic lime resource but is recommended for incorporation into the park for its conservation values
2	138	Reserve 36309♦^	Commissioner of Main Roads and City of Busselton	Sand quarry	5.83	Incorporate into the park
18		Reserve 41545 (part)	Shire of Augusta-Margaret River	Recreation	53.91	Incorporate the portion north of the road reserve into the park
21	175	Reserve 43580	Shire of Augusta-Margaret River	Recreation	8.30	Incorporate into the park
22	176	Reserve 50106	Shire of Augusta-Margaret River	Lime quarry	19.10	Incorporate the vegetated portion into the park
8	139	Sussex Location 524	N/A	UCL	6.09	Incorporate into the park
35	199	Sussex Location 737	N/A	Freehold	225.90	Freehold property purchased by the department, to be incorporated into the park
3	137 (part)	Sussex Location 1409*	N/A	UCL	16.49	Incorporate the portions west and north of the swimming beach into the park
4	137 (part)	Sussex Location 1410*	N/A	UCL	8.89	Incorporate into the park
26	184	Sussex Location 4230 (UCL, Lot 4230 on Plan 208941), Lot 320 on Plan 67923 (UCL)	N/A	No purpose	484.68	This area, known as the Boranup Sand Patch, has been identified by the Department of Mines and Petroleum as a strategic lime resource but is recommended for inclusion in the park for its conservation values
Yelverton National Park						
6	141	Reserve 10302^	Unvested	Water	2.02	Incorporate into the park
9	140	Reserve 22996^ (part)	City of Busselton	Recreation and community Purposes	50.77	Incorporate into the park, excluding the portion north-west of Pusey Road and the Wilyabrup Hall and car park
7	142	Reserve 29192♦	Unvested	Sand and gravel	36.91	Incorporate into the park

Map ID	FMP ID	Description	Vesting	Purpose	Area (ha)	Comments and recommended changes
5	141	Reserve 38077^ (part)	City of Busselton	Gravel	21.68	Excluding the area containing the Shire and bushfire brigade infrastructure, incorporate into the park
Bramley National Park						
16		PIN 526698, PIN 526711 (UCL along the Margaret River^)	N/A	UCL	7.45	Incorporate into the park where there is national park on both sides of the Margaret River and where there is UCL on the north side of the river
18	164	Reserve 21073^	Shire of Augusta-Margaret River	Recreation	2.21	Incorporate into the park
19	163	Reserve 23473^ (part)	Shire of Augusta-Margaret River	Sanitary site	5.50	Incorporate the western portion into the park
20	162	Reserve 38542^	Shire of Augusta-Margaret River	Gravel	13.80	Incorporate into the park
17	160	Reserve 38650^ (part)	Shire of Augusta-Margaret River	Recreation	29.52	Incorporate part of the reserve into the park where there is national park on both sides and north of the river where it adjoins the national park
Forest Grove National Park						
23	179 (part)	PIN 528517^ (UCL adjoining reserve 39754 to the north)	N/A	UCL	19.33	Incorporate into the park
24	179 (part), 180	Reserve 39754*^	Shire of Augusta-Margaret River	Public recreation	141.42	Incorporate those portions of the reserve that directly abut the national park into the park. The remaining portion to become a new nature reserve
Scott National Park						
29	207	Reserve 12951♦^*	Shire of Augusta-Margaret River	Water camping and recreation	103.83	Incorporate into the park
28	186	Reserve 30104^	Unvested	Gravel	6.85	Incorporate into the park
30		PIN 527761	N/A	UCL	5.31	Incorporate into the park
Gingilup Swamps Nature Reserve						
41	210	Reserve 9243	Shire of Nannup	Camping	15.01	Incorporate into the reserve
34	211	Reserve 12457*	Unvested	Water	119.17	Incorporate into the reserve

Map ID	FMP ID	Description	Vesting	Purpose	Area (ha)	Comments and recommended changes
31	208, 209	Sussex locations 753, 4973 and PIN 527439♦*	N/A	UCL	315.49	Incorporate into the reserve. This proposal is also recommended in the *Augusta – Walpole coastal strategy* (WAPC 2009)
Proposed nature reserve (Reserve 14779)						
37	203	Reserve 41057	Unvested	Foreshore management and protection	8.92	Incorporate into Reserve 14779 as a class 'A' nature reserve
36	202 (part), 03(part)	Sussex Location 4859 (UCL, Lot 4859 on Plan 217354)	N/A	UCL	4.77	Incorporate into Reserve 14779 as a class 'A' nature reserve
Proposed nature reserve (Reserve 18644)						
39	205 (part)	Reserve 18644	Unvested	Timber for road, board and settlers requirements	186.65	Create a new class 'A' nature reserve
38	205 (part)	Lot 378 on Plan 111287	N/A	UCL	10.79	Include as part of the new class 'A' nature reserve
Proposed nature reserve (Reserve 25211)						
43	206	Reserve 25211♦	Shire of Augusta-Margaret River	Recreation	106.36	Contains the Augusta Shell Bed geoheritage site. Create a new class 'A' nature reserve
Proposed conservation park						
40	204	PIN 531586♦, PIN 11694355, PIN 11694356	N/A	UCL	74.20	Known as Donovan Street bushland. Create a new class 'A' conservation park
TOTAL = 2887.60						

♦ Priority tenure addition – contains species of conservation significance (Parks and Wildlife 2013d)

^ Priority tenure addition – contains an under-represented forest ecosystem

* Priority tenure addition – south-west regional ecological linkage
FMP – Forest management plan 2014–2023
UCL – unallocated Crown land

Desired outcome

The key values of the planning area are protected by providing maximum security of tenure and reserve connectivity.

Objective

Complete all tenure actions for which the department and Conservation Commission are responsible by 2025.

Management actions

1. Implement all tenure recommendations in tables 1 and 2, subject to agreement from the current land manager and other stakeholders.
2. For all reserves vested in the Conservation Commission that are other than class 'A' under the *Land Administration Act 1997*, upgrade to class 'A'.

3. Manage proposed reserve additions that become vested with the Conservation Commission in accordance with this management plan. Other additions not listed in Table 2 will be managed to be consistent with this management plan, or if necessary the plan will be amended to apply to them.
4. Where appropriate, acquire and incorporate other adjacent properties if identified as having high conservation value or management benefits.
5. Incorporate gazetted but unmade roads into existing reserves of the planning area, subject to agreement from relevant stakeholders.
6. Where constructed roads managed by local government occur outside a gazetted road reserve into national park tenure, liaise with the relevant local government to have the road surveyed and the road reserve realigned. For example, Walcliffe Road where it transects Leeuwin-Naturaliste National Park at Prevelly.
7. Excise relevant portions of Leeuwin-Naturaliste National Park at Yallingup and Gracetown and transfer to local government to better reflect management arrangements.
8. Liaise with the National Trust of Australia (WA) to determine and implement the most suitable management arrangements for Ellensbrook Homestead and surrounds.
9. In consultation with traditional owners and the wider community, allocate formal names for those national parks and nature reserves that do not have a gazetted name, as indicated in Table 1.
10. Consider excising land containing communication towers in Leeuwin-Naturaliste National Park and reserving as CALM Act section 5(1)(h) reserves. Should the communication towers no longer be required, the land should be incorporated back into the national park.

Key performance indicator

Performance measure	Target	Reporting requirement
Tenure actions for which the department and the Conservation Commission are responsible	Progress all tenure actions for which the department and Conservation Commission are responsible within ten years from when this management plan is gazetted	Every five years

Managing the natural environment

Key factors influencing management of the planning area's biodiversity values are:

- the linear shape and geographic isolation of parts of the planning area
- adjacent land use
- ongoing communication with, and support from, adjacent landowners or managers, local government, other State Government agencies, NRM groups, traditional owners, educational institutions and community groups
- visitor use.

Protection and conservation of biodiversity in the planning area is a primary objective of this management plan. Off-reserve conservation on adjacent properties and complementary cross-boundary management are important in achieving this objective (see Section 8 – *Community involvement and off-reserve management*).

12. Physical environment

Climate

The planning area falls within the temperate climatic zone of cold winters and mild, warm summers (Bureau of Meteorology 2006) with distinct wet and dry seasons. The coastal setting and high ridge facing the ocean strongly influences rainfall distribution (Semeniuk 1997) across the planning area, with inland reserves such as Forest Grove National Park often receiving considerably more rainfall than coastal sites.

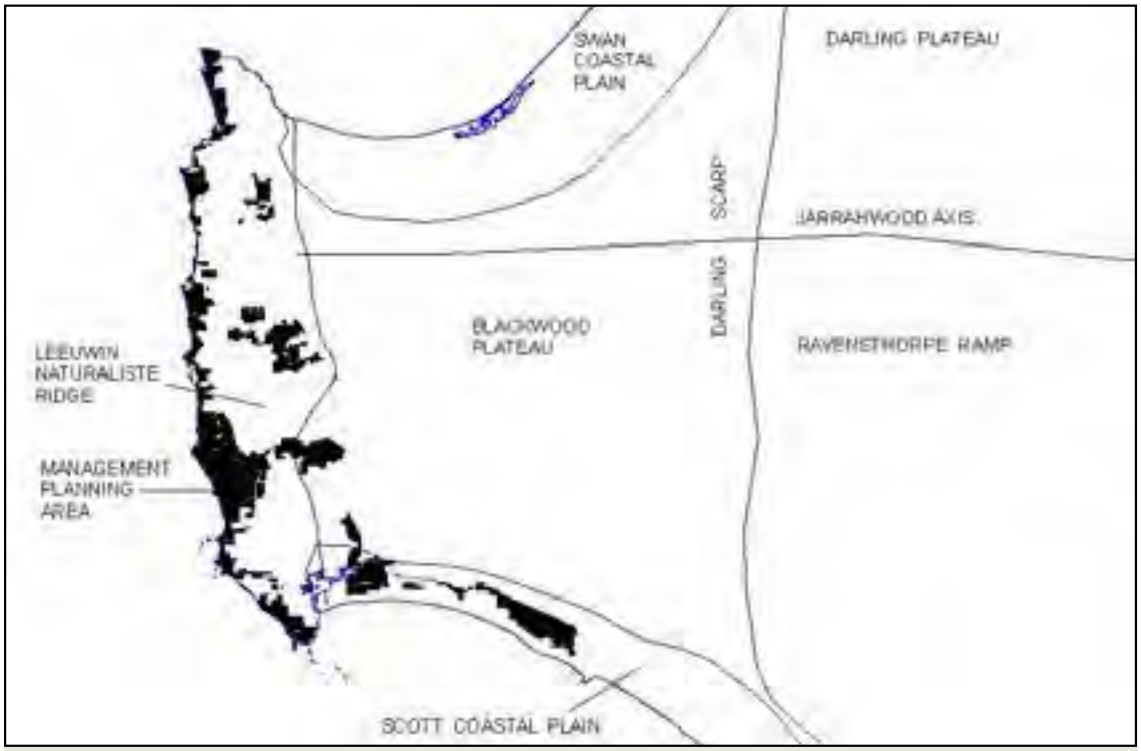
Climatic trends indicate an increase in temperature and decrease in rainfall, which is predicted to continue (Commonwealth Scientific and Industrial Research Organisation and Bureau 2007) and biodiversity of the south-west is at considerable risk of significant loss because of climate change (Intergovernmental Panel on Climate Change 2007). Observed and predicted impacts in the planning area include (Climate Commission 2011):

- a likely increase in the incidence and intensity of bushfires
- a reduction in suitable habitat for climate-sensitive species, exacerbated by highly fragmented landscapes
- altered hydrological regimes, particularly affecting species, communities and biological habitats with specific ecological water requirements such as subterranean ecosystems
- changes in the patterns of migratory bird species
- rising sea levels, impacting on coastal environments.

Geology, landform and soils

The planning area occurs across three major physiographic units—the Leeuwin-Naturaliste Ridge, Scott Coastal Plain (western half) and Blackwood Plateau (south-west corner) (Fig. 1). The general characteristics of these physiographic units are described in Davies (1983), Semeniuk (1997), Diamond (2002), URS (2004) and Tille & Lantzke (1990).

The Leeuwin-Naturaliste Ridge contains most of the reserves in the planning area and extends from Cape Naturaliste in the north to Cape Leeuwin in the south. Its geology is unique in that nowhere else in the State has such an extensive area of limestone associated with granites in a near coastal location (Keighery *et al*. 2011). The ridge has formed from Pleistocene and Holocene dune systems that have calcified over



Physiographic units of the planning area

The entrance to Bride Cave in Leeuwin-Naturaliste National Park is via a circular collapse doline with a diameter of 30m. Photo – Parks and Wildlife

A dog tooth spar crystal in Crystal Cave. Photo – Parks and Wildlife

the base rock, rising up to 200m above sea level (Davies 1983). The coast is dominated by rocky headlands, interspersed with sand or shingle beaches, which in places grade into rock- or boulder-strewn sections. Cliffs of granite, gneiss and Tamala limestone occur intermittently (Davies 1983).

There are several hundred karst features, including dolines, caves, solution pipes, root casts and subterranean drainage channels. The highest concentration of caves occurs in the Boranup area, where there is a supply of water from swamps and small streams to the east. The caves vary in size, with most in good condition and all are irreplaceable features of the landscape. They have developed over a long period of time (Eberhard 2004) and contain important karst features such as straw stalactites and helictites that are fragile because of their structure and slow growth. Sea caves are prevalent along the coast in the Cape Naturaliste area.

The caves on the Leeuwin-Naturaliste Ridge are valuable for other reasons including visual landscape quality (for example, caves exposed at the surface

along the coastline), important subterranean communities, cultural heritage, visitor recreation, education and opportunities to undertake research projects that increase the knowledge of cave ecology and the influence of catchment hydrology. These are discussed in more detail in other sections of this plan.

A cave management advisory committee, facilitated by the department, provides specialist advice about cave management and support for associated research projects.

Management of caves and karst features in the planning area is consistent with Policy Statement 80 – *Protection and management of caves and karst* (Parks and Wildlife 2014a).

Fossils and archaeological specimens have been found in some cave deposits, including evidence of Noongar occupation and remains of extinct marsupials, reptiles and birds. Tight Entrance Cave contains a richer and more diverse assemblage of fossil vertebrates than any other Pleistocene deposit in the western half of Australia (Prideaux *et al*. 2000). Protecting fossil deposits is important because they are key to understanding local (and potentially State and country-wide) biological history and evolution.

The Department of Mines and Petroleum's *Geological survey of Western Australia* coordinates the *Register of state geoheritage sites*[7] including four that are situated in the planning area. These are the exposed granite and gneiss at Bunker Bay, Meekadarabee (limestone) Tufa Barrier, paleosols at Skippy Rock and Hamelin Bay and the Augusta Shell Bed (Pleistocene marine invertebrates) which is in Reserve 25211 (a proposed addition to the planning area).

An aerial photograph of the Margaret River with national park on one side and private property on the other. Photo – Margaret River Discovery Co

Carter (1987) provides more detail on the values of these sites. Other sites containing potential geoheritage values have been identified by Semeniuk (1997).

In restricted areas on the Scott Coastal Plain, there are small ironstone rises consisting of raised knolls with lateritic outcrops and bog iron ore soils that support the Scott River ironstone TEC (see Section 13 – *Biological environment [ecological communities and significant habitats*]).

Hydrology

Seventeen minor watercourses drain the Leeuwin-Naturaliste Ridge and most are in relatively good condition (Hunt *et al*. 2002) including Veryuica Brook, which is the only coastal stream that has completely uncleared riparian vegetation (Pen 1997). Margaret River is the only major permanent watercourse on the ridge and, along with the Scott River, is the only coastal river in the high rainfall zone that flows through jarrah forest. Its catchment area has been greatly altered, especially in the middle to lower reaches next to the Margaret River town site.

The Blackwood River is the largest river, by volume, in the south-west. Its annual discharge is seasonal in nature, being winter dominated, but also maintained in summer through groundwater infiltration from shallow, superficial aquifers, as well as the deeper Leederville and Yarragadee formations (URS 2004,

7 Geoheritage sites contain geological features that are considered to be unique and of outstanding value within Western Australia and have significant scientific and educational values. They offer important insight into the development of the continent and can be used for research or teaching purposes (Worboys n.d.).

Baddock 1995, Gerritse 1996). This contributes to the river's unusual hydrological regime, being fresher in summer than in winter when saline water from the upper catchment is flushed into the river (Mayer *et al*. 2005). From an ecological perspective, the Blackwood River is important for aquatic freshwater species that migrate up the tributaries in summer in search of better riverine conditions.

Excessive disturbance by humans has been identified as a potential threat for the Blackwood River because it prevents use by some fauna species, such as the black bittern (*Ixobrychus flavicollis*) (Australian Nature Conservation Agency[8] 1996). Catchment management of feeder tributaries, such as McLeod Creek and Chapman Brook, is required to protect rare frogs.

The Scott River drains the majority of the Scott Coastal Plain into the Hardy Inlet at its confluence with the Blackwood River. It dries into a series of disconnected riverine pools over summer and provides a diversity of habitats for flora and fauna (V & C Semeniuk Research Group 1996), especially fish (Pen 1997). Other seasonal watercourses in its catchment are poorly defined because of the low relief of the area.

Pen (1997) describes several of the wetland systems found within the planning area. The Scott Coastal Plain, and Scott National Park in particular, has a complex system of wetlands that include sumplands, damplands, permanent lakes, seasonal/intermittent ponds, marshes, swamps and floodplains. These wetlands are highly variable and change rapidly across the landscape because of subtle topographical differences and the influence of ephemeral hydrology. The result is an array of diverse habitats, numerous vegetation types and subtypes and high species diversity with many endemic species. Extensive land clearing around the planning area highlights the importance of all remnant wetlands on the Scott Coastal Plain (particularly for representativeness value) as well as the smaller ponds, lakes, swamps and groundwater-fed springs on the Leeuwin-Naturaliste Ridge (Pen 1997).

In the planning area, there are two nationally significant wetlands (the Gingilup-Jasper wetland system and the permanent Cape Leeuwin system), a seasonally inundated TEC (Scott River ironstone association) and a proposed candidate site for nomination under the Ramsar Convention on Wetlands. The ecological value of these wetlands is discussed in more detail in Section 13 – *Biological environment (ecological communities and significant habitats*).

Ten Mile Brook Reservoir (see Map 2) is an enclave within the planning area and supplies water to the townships of Margaret River, Prevelly, Gnarabup and Cowaramup. There are also three weirs on the Margaret River that used to supply the town site before the construction of the reservoir.

Two estuaries border the planning area. The Hardy Inlet is an ecologically important intertidal area that adjoins the mouth of the Blackwood and Scott rivers. It has high waterbird usage and significant fish populations (Pen 1997). The Margaret River estuary is about 20ha in size and is connected to the ocean during winter and spring via a 500m channel. The estuary retains a buffer of riparian vegetation and is considered to be in a relatively natural condition.

Wetlands on the Scott Coastal Plain, such as this wetland in Gingilup Swamps Nature Reserve, are affected by changes in groundwater levels. Photo – Parks and Wildlife

There is potential for adjacent land clearing and use (agroforestry, agriculture and horticulture) to adversely impact the hydrological integrity of the planning area. Altered surface water drainage patterns, including reduction in stream flow because of the cumulative effects of farm dams on private property, eutrophication and sedimentation are among these concerns as well as

8 Now Department of the Environment (Federal Government)

the effect of climate change (see sections 12 – *Physical environment [climate]* and 14 – *Protecting the natural environment [water quality*]). Recognising this, all surface water catchments along the Leeuwin-Naturaliste Ridge have been proclaimed under the *Rights In Water and Irrigation Act 1914* (RIWI Act).

Groundwater is integrally linked to ecological processes that occur in the planning area. On the Scott Coastal Plain, it largely influences the hydrological regimes of wetlands, rivers and permanently wet tributaries, especially in winter when groundwater rises and rejected recharge inundates surface areas. This in turn influences the occurrence of waterbirds, mammals, frogs and endemic fish species, some of which are of conservation significance. Plant species, including declared rare flora, flora associated with wet, moist or seasonally moist soils, and ironstone TECs are also affected. Abstraction of groundwater on the Scott Coastal Plain has the potential to impact upon these species and communities and is a particular concern.

Groundwater on the Leeuwin-Naturaliste Ridge is limited. Drainage of limestone karst along the ridge is complex, leading to difficulties in determining karst system boundaries. It is thought that cave streams form part of a westward flowing drainage system and are either of groundwater origin or, particularly in the case of temporary streams, a continuation of surface creeks that flow into the karst (English & Blyth 2000). Several springs and freshwater seepages occur at the contact between the coastal limestone and the underlying, impermeable basement rock. These are extremely important from a biological viewpoint because they support rare and specialised biota, of which the distribution and degree of groundwater dependence is not well known.

There is a need to gain a better understanding of the hydrological integrity of cave systems on the ridge and how it influences their ecological functions and processes. However, there is information that indicates a reduction in stream levels (English & Blyth 2000), possibly because of declining rainfall and/or changes in surrounding land use, for example to plantations and viticulture.

Strehlow and Cook (2010), Cape to Cape Catchments Group (2003), URS (2003), Baddock (1995), Gerritse (1996), Diamond (2002) and Semeniuk (1997) contain additional information about the hydrological features of the planning area.

Desired outcomes

The integrity of the physical environment is protected and conserved.

Key values are not detrimentally impacted by climate change.

Objectives

To protect and conserve the physical environment, particularly water-based habitats or habitats supporting water-dependent species or communities (such as wetlands, caves, lakes, springs and river/stream systems and ironstone vegetation communities) and at sites vulnerable to disturbance.

As far as practicable, support the resilience of key values in response to, and mitigate the effects of, climate change.

Management actions

1. Liaise with neighbours or adjacent land managers, government agencies, specialist groups such as the cave management advisory committee, natural resource management groups, traditional owners and the wider community to develop and implement:
    - projects that will help species and communities to better adapt to climate change. For example, expanding the planning area and encouraging the retention of remnant vegetation next to the Leeuwin-Naturaliste Ridge and Scott Coastal Plain to provide important linkages that will allow species to migrate across landscapes
    - a catchment management approach to maintain or improve the state of the physical environment, particularly where its existence and conditions are critical to the survival or distribution of conservation-significant species and communities such as cave fauna, the white-bellied frog (*Geocrinia alba*) and other range-end or restricted species.

2. Limit non-climate threatening processes that are likely to be exacerbated by a warming and drying climate (such as altered hydrology, fire and introduced species) or that primarily affect species and communities vulnerable to climate change.
3. Prevent or minimise adverse impacts upon the physical environment by:
   - evaluating, or seeking opportunities to provide advice on land-use development and resource proposals and responding as appropriate (for example, refer to the Environmental Protection Authority for assessment)
   - assessing sites before any proposed departmental works.
4. Identify caves and other karst features requiring protection and facilitate this as appropriate.
5. Enforce CALM Regulations regarding fossil protection.
6. Promote responsible visitation and improve opportunities for increased visitor awareness and appreciation of the physical environment.
7. Adapt management of the physical environment as new knowledge becomes available.

Key performance indicators

Performance measure	Target	Reporting requirement
Status of karst hydrology and the quantity and quality of water in selected caves, wetlands, springs and creeks	Water quality and quantity in selected caves, wetlands, springs and creeks has either been maintained or improved	Every five years, subject to information provided by the Department of Water
Knowledge of groundwater catchments of cave systems and biological values of selected spring and wetland areas	Groundwater catchments of cave systems and biological values of selected spring and wetland areas are investigated	Every five years

13. Biological environment

Native plants

This section should be read in conjunction with the floristic reports of Gibson *et al*. (2001), Keighery *et al*. (2010) and Keighery *et al*. (2011). These reports were prepared to assist with the production of this management plan, providing the most recent information on native plants that occur within the planning area. Each report has been prepared using herbarium records and field survey results from the database of Lyons *et al*. (2000) and additional field surveys. They all contain a detailed species list of the survey area identifying natives, environmental weeds and species of conservation significance (including declared rare flora, priority-listed species, species at their range end, endemics and disjunct populations). These lists were also cross-checked against the department's NatureMap database (accessed 2013).

Banksia nivea subsp. *uliginosa* is a declared rare flora species that occurs on the Scott Coastal Plain. Photo – Parks and Wildlife

The south-west is internationally recognised as one of the world's 35 biodiversity hotspots because of its exceptionally rich plant diversity, high endemism and the degree to which these values are under threat.

(Conservation International 2014) The Busselton to Augusta area is listed as one of Australia's 15 national biodiversity hotspots. (Australian Government 2009)

The flora of the planning area contributes significantly to this international and national recognition. According to the statistics in Table 1 of Keighery *et al*. (2011), Leeuwin-Naturaliste National Park contains the most native species per hectare of any major national park in southern WA. Overall, the planning area contains 1577 documented native vascular species, representing 198 families. The largest families are Orchidaceae (orchids), Fabaceae (peas and acacias), Myrtaceae (eucalypts and paperbarks), Cyperaceae (sedges), Proteaceae (banksias, grevillea and hakea) and Asteraceae (daisies). The composition of flora species in the planning area is typical of the high rainfall zone of the south-west (Hopper 1979; Lyons *et al*. 2000), and includes 25 per cent of all species known from the Warren and Jarrah Forest bioregions, many of which are geographically restricted to this zone.

Little information exists for non-vascular flora such as mosses and liverworts and other biota such as algae, fungi and lichen that have specifically been recorded in the planning area. However, there are records indicating that a large proportion of the State's known fungi (Hilton 1982; 1988) and moss species (Stoneburner & Wyatt 1996) occur in the south-west.

There are 12 species of rare flora declared under the *Wildlife Conservation Act 1950* in the planning area:

- *Banksia nivea* subsp. *uliginosa*
- Scott River boronia (*Boronia exilis*)
- *Caladenia excelsa*
- *Caladenia lodgeana*
- Dunsborough spider orchid (*Caladenia viridescens*)
- ironstone darwinia (*Darwinia ferricola*)
- *Eucalyptus phylacis*
- *Grevillea brachystylis* subsp. *australis*
- Augusta kennedia (*Kennedia lateritia*)
- *Lambertia orbifolia* subsp. Scott River Plains
- Naturaliste nancy (*Wurmbea calcicola*)
- Diel's currant bush (*Leptomeria dielsiana*) (presumed extinct).

Interim recovery plans exist for Scott River boronia and the Dunsborough spider orchid. Land next to the planning area (for example road verges and reserves) also contains declared rare flora.

There are 85 priority flora species in the planning area (7 x P1, 22 x P2, 32 x P3 and 24 x P4). Of particular significance are *Philydrella pygmaea* subsp. *minima* and *Melaleuca incana* subsp. Gingilup. The only known population of the former is within Scott National Park and the latter is contained within Gingilup Swamps Nature Reserve (Gibson *et al.* 2001). While the majority of declared rare flora are located in Leeuwin-Naturaliste National Park, the highest concentration of priority flora occurs in Scott National Park, which contains 39 species.

Aside from declared rare and priority-listed species, Gibson *et al*. (2001), Keighery *et al*. (2010) and Keighery *et al*. (2011) have described in detail the conservation significance of flora in the larger parts of the planning area (some smaller reserves have not been extensively surveyed to date) and these findings are summarised below.

Leeuwin-Naturaliste National Park contains several geographically significant species. Those that occur in the park but not anywhere else in the planning area are usually associated with beaches, limestone and granite soils. Each of these habitats also supports restricted species (*Calystegia soldanella*, *Banksia*

sessilis var. *cordata* and *Agrostocrinum scabrum* subsp. *littorale* respectively). Ten restricted species have significant disjunct populations in the park and one of those species is priority listed. Thirty-seven range-end species occur, at Cape Naturaliste, Yallingup, Canal Rocks, Moses Rock, Boranup wetlands, Cape Freycinet to Cosy Corner, Cape Leeuwin granites and in freshwater springs and seepages at Devil's Pool. Ten are at their southern extent and the remaining species are at their northern or western extent. Five are priority-listed and another five are disjunct from other populations. Thirteen species are endemic to the Leeuwin-Naturaliste Ridge and some are considered endemic to the park, including two declared rare species – *Kenmedia lateritia* and *Wurbea calcicola*. Another declared rare species *Caladenia excelsa* is endemic to the Leeuwin-Naturaliste Ridge and does not occur in any other conservation reserve. The national park also contains co-occurring closely related taxa, rarely recorded species and widespread species that have distinctive morphological variants of other occurrences elsewhere.

Yelverton National Park and Timber Reserve 139/25 contain intact and diverse wetlands which are nodes for priority flora and range-end species. *Lepyrodia heleocharoides*, *Phlebocarya filifolia*, *Persoonia saccata* and *Thysanotus glaucus* have their southern extents in the national park and are the only significant stands recorded in a conservation reserve (Keighery 1990). Poole Swamp is of exceedingly high conservation value because it has disjunct populations of species that are more characteristic of swamps in the Warren bioregion. The lateritic sands support three geographically restricted species including *Acacia inops*, which is only known from Yelverton. To the east of Yelverton, Haag Nature Reserve is the northern limit for a disjunct population of the Albany pitcher plant (*Cephalotus follicularis*).

Forest Grove National Park has two priority-listed species at their eastern extent that are largely confined to the karri of the Leeuwin-Naturaliste coast. The vegetated creeklines and associated seeps within Bramley National Park contain a variety of geographically significant populations. For example karri is at its north-western extent, two priority-listed species are at their north-eastern extent and the rarely recorded *Centolepis fasicularis* is at its northern extent. The latter species is the only perennial species of this genus in WA (Keighery 2005).

Scott National Park and Gingilup Swamps Nature Reserve contain the largest remnants of vegetation on the western side of the Scott Coastal Plain, which is highlighted as a centre of relictual flora associated with moist habitats such as wetlands, rivers and the base of granite outcrops (Hearn *et al*. 2003b). Also associated with the complexity of wetland habitats is high species richness[9] (Robinson & Keighery 1997) that is considered to be distinct from species of the eastern Scott Coastal Plain and swamps east of Point D'Entrecasteaux (Gibson *et al*. 2001). Many populations that are disjunct from occurrences on the southern Swan Coastal Plain (Robinson & Keighery 1997) and the Albany south coast area occur in these reserves. There are species with restricted distributions that are known to occur near Scott National Park (Marchant & Keighery 1979). *Hypocalymma* sp. *nov.* aff. *cordifolium* and *Aotus carinata* do not occur in any other conservation reserve.

Gibson *et al*. (2001) surveyed Reserve 12951, a camping reserve vested in the Shire of Augusta-Margaret River which is a proposed addition to Scott National Park (see Table 2 – *Proposed additions*). This reserve is highly valuable because it contains 30ha of the Scott River ironstone TEC compared with little occurrence of this community in Scott National Park (Robinson & Keighery 1997). There are many endemics associated with these ironstones (Gibson *et al*. 2000) including *Chordifex isomorphus*, which do not occur in Scott National Park but have been recorded in Reserve 12951 (Meney *et al*. 1996). There are an additional 29 species occurring in the camping reserve that have not been recorded in Scott National Park, including six priority-listed species. Seventy per cent of endemic species on the Scott Coastal Plain occur in Scott National Park and Reserve 12951. Three ironstone species (*Lambertia orbifolia* ssp. Scott Plains, *Melaleuca incana* ssp. Gingilup and *Darwinia ferricola*) have not been documented in Scott National Park or Reserve 12951, but have been found in Reserve 42377, Gingilup Swamps Nature Reserve and on private property.

9 Species richness is the number of species per square kilometre and was based on predictive modelling undertaken for the Comprehensive Regional Assessment.

The Albany daisy (*Actinodium cunninghamii*), is a south coast species which has populations of disjunct occurrence within wetlands of the Scott Coastal Plain and the Swan Coastal Plain near Busselton. Photo – Parks and Wildlife

A floristic survey for Gingilup Swamps Nature Reserve is yet to be undertaken. There is potential for the species richness of this reserve to be even greater than currently recorded, particularly in the upland vegetation, including banksia woodlands.

Mattiske & Havel (1998) identified 48 vegetation complexes in the planning area. Four—Gracetown Karst (Gk), Kilcarnup (KB), Kilcarnup (KEf) and Wilyabrup (Wew)—only occur within the planning area. Twenty-eight vegetation complexes are considered to be poorly represented on department-managed land and are therefore significant to this management plan (see Table 3). Should the proposed tenure additions listed in Table 2 be added to department-managed land, it will collectively improve the representation of 15 vegetation complexes (including six not found in the planning area), with five of the 15 achieving the target of greater than 10 per cent of the vegetation complex in formal reserves.[10] Some vegetation complexes considered to be significant to the planning area are not well studied.

Table 3. Under-represented vegetation complexes

Under-represented vegetation complexes found in the planning area or proposed tenure addition^	Proposed addition collectively improves representation
Blackwood (Bd)	
Blackwood (Bf)	x
Blackwood (Bwy)	x
Cowaramup (C1)	x
Cowaramup (C2)	x
Cowaramup (Cr)	
Cowaramup (Cw1)	x
Cowaramup (Cw2)	x
D'Entrecasteaux (D)	x
D'Entrecasteaux (D5)	x*
D'Entrecasteaux (DE5)^	
D'Entrecasteaux (Dr)^	x*
D'Entrecasteaux (Drd)^	x*
Glenarty Hills (H)	x
Glenarty Hills (Hd)	
Glenarty Hills (Hw)	x
Gracetown (Gv)	x*
Gracetown Karst (Gk)	

10 Vegetation complexes that have less than five per cent of their pre-1750 area in existing or proposed formal and informal reserves; or between five and 10 per cent of their pre-1750 area in existing or proposed formal and informal reserves and less than 15 per cent of their pre-1750 area remaining (Conservation Commission 2013).

Under-represented vegetation complexes found in the planning area or proposed tenure addition^	Proposed addition collectively improves representation
Kilcarnup (KB)	
Kilcarnup (Kef)	
Kilcarnup (KbE)	x
Kilcarnup (Kf)	x
Metricup (M)	x
Metricup (Mv)	x
Nillup (Nw)^	
Scott (Swi)	x
Scott (Sw)^	
Wilyabrup (W2)	x
Wilyabrup (We)	x
Wilyabrup (Wd)^	
Wilyabrup (WEw)	
Wilyabrup (Wr)	x*
Wilyabrup (Ww1)	x
Wilyabrup (Ww2)	x

^ Vegetation complex is found within proposed tenure additions and not the planning area.

* By adding the proposed addition to department-managed land, the target for protecting the vegetation complex in a formal reserve will be reached.

The variety and distribution of plant communities in the planning area coincides with changes in environmental conditions, principally variations in climate, topography, soil type, length of the summer drought and exposure to prevailing winds. For example, salt and wind tolerant low, closed heath occurs all along the Leeuwin-Naturaliste coast and as these conditions decrease, it transitions into taller forests and open woodlands of peppermint, banksia and jarrah, interspersed with disjunct populations of tall open forest dominated by karri. Granite outcrops are present and on the eastern boundary at Boranup there are some important wetland vegetation types.

Karri populations in the planning area occur over limestone soils, in contrast to the main 'karri belt' further east that occurs on soils of granite or gneiss origin. The population of karri at Boranup is separated by more than 10km from the most northern occurrence at Cape Clairault and those of the lower Blackwood River. These populations are biogeographically significant because they define the transition zone between bioregions.

Differences in soils, and to a lesser degree rainfall, along a north-south gradient mean that plant communities (some rare and restricted) vary between Yelverton, Bramley and Forest Grove national parks and Reserve 46400 (they share only 51 per cent of their flora), making each important for conservation. These plant communities represent invaluable remnants of vegetation that were once present throughout the area but are now predominantly cleared, fragmented or degraded.

A rich mosaic of wetland and dune vegetation associations, combined with areas of forest and woodland, dominate the Scott Coastal Plain. Scott National Park is particularly noted for its unusual diversity of vegetation complexes and for preserving woodland typical of the area. Wetland, sedgeland and closed heath associations become more extensive towards Gingilup Swamps Nature Reserve.

Several remnant vegetation corridors have been identified as being significant at a landscape scale. They

connect areas of department-managed land and facilitate the natural movement of wildlife, especially in providing a means of species dispersal to cope with climate change. These include:

- Boranup Forest to Forest Grove National Park and Reserve 46400, which then extends outside the planning area to Blackwood River National Park. This is the main vegetated corridor linking the Leeuwin-Naturaliste coast to the jarrah-marri forest of the Blackwood Plateau
- Cape Naturaliste to Cape Leeuwin, linking coastal vegetation in a north-south direction
- Bramley National Park to Cape Mentelle along the Margaret River
- vegetation linkages along the Scott River connecting Scott National Park and Gingilup Swamps Nature Reserve
- other riverine corridors throughout the planning area.

Strategically important environmental corridors are also recognised in the LNRSPP.

Native animals

The distribution, diversity and abundance of vertebrate fauna in the planning area have declined since colonial settlement (How *et al*. 1987) and there have been several extinctions, mostly of critical weight range[11] mammals and birds that favour long-unburnt coastal heath vegetation. Most mammal populations in the planning area are small and isolated, and nearly all occur in low densities (How *et al*. 1987). Fauna decline is largely attributed to extensive land clearing and fragmentation of reserves, altered hydrological and fire regimes, introduced species (particularly foxes and cats) and climate change. Despite this, the coastal location, variety of landforms and habitats, presence of vegetated corridors and high annual rainfall contributes to an area of high value and priority for fauna conservation. In particular, this area supports many fauna species and populations that are threatened, priority listed, specially protected, migratory, at their range extent, disjunct, relictual, and endemic, including short-range endemics.

Few comprehensive fauna surveys have been undertaken across the planning area. However information gathered from publications referenced in this section and departmental data (NatureMap accessed in 2013) indicate there are at least 29 mammals (including four bat species), 128 bird species, 11 species of frog (all endemic to the south-west), 33 reptile species, nine fish species (of which six are endemic) and 54 invertebrates.

Fifteen threatened species have been recorded in the planning area, including:

- quokka (*Setonix brachyurus*)*
- chuditch or Western quoll (*Dasyurus geoffroii*)*
- brush-tailed phascogale (*Phascogale tapoatafa*)
- Western ringtail possum (*Pseudocheirus occidentalis*)*
- forest red-tailed black cockatoo (*Calyptorhynchus banksii naso*) *
- Baudin's cockatoo (*C. baudinii*)*
- Carnaby's cockatoo (*C. latirostris*)*
- Hutton's shearwater (*Puffinus huttoni*)
- Australasian bittern (*Botaurus poiciloptilus*)
- white-bellied frog (*Geocrinia alba*)*
- Balston's pygmy perch (*Nannatherina balstoni*)
- Western mud minnow (*Galaxiella munda*)
- Cape Leeuwin freshwater snail (*Austroassiminea letha*)
- Margaret River marron or hairy marron (*Cherax tenuimanus*), and
- Dunsborough burrowing crayfish (*Engaewa reducta*)*.

Species denoted by * have a State recovery plan. See the department's website for more information.

11 Mean adult body weight between 35g and 5.5kg.

Early fauna records as well as fossil and anecdotal evidence indicate that the planning area once contained other threatened species such as malleefowl (*Leipoa ocellata*), noisy scrub-bird (*Atrichornis clamosus*), western whipbird (*Psophodes nigrogularis*), rufous bristle-bird (*Dasyornis broadbenti*), western ground parrot (*Pezeporus wallicus flaviventrus*), bilby (*Macrotis lagotis*), Gilbert's potoroo (*Potorous gilbertii*) and woylie (*Bettongia penicillata ogilbyi*). The re-introduction or translocation of species to the planning area is dependent on the viability of habitat (including reserve size, shape and interconnectivity) and the level to which threatening processes, such as predation, can be controlled. Unauthorised fauna releases occur in the planning area and this has the potential to create imbalance in the immediate ecosystem, increasing competition for tree hollows and food as well as possibly introducing disease-causing pathogens.

Populations of the threatened Cape Leeuwin freshwater snail are scattered along the coast in Leeuwin-Naturaliste National Park. Photo – Parks and Wildlife

There are 16 priority fauna species including species that Hearn *et al.* (2003b) identified as being particularly at risk – scorpionfly (*Austromerope poultoni*), a Priority 2 species; barking owl (*Ninox connivens* subsp. *connivens*), a Priority 2 species; and black bittern (*Ixobrychus flavicollis*), a Priority 3 species.

Three species are specially protected – New Zealand fur seal (*Arctocephalus forsteri*), carpet python (*Morelia spilota* subsp. *imbricata*) and peregrine falcon (*Falco peregrinus*). New Zealand fur seal and on occasion elephant seal (*Mirounga leonine*), Antarctic fur seal (*Arctocephalus gazella*) and leopard seal (*Hydrurga leptonyx*) use the coast, particularly the rocky bay and beach at Cape Naturaliste as a haul-out area. Walkers, dogs, vehicles and special events around the Bunker Bay recreation site can disturb the seals and create a visitor safety issue through human interaction with the seals.

Although populations of the peregrine falcon are relatively stable in Australia, the species is still considered endangered on a global scale and is protected under the Convention on International Trade in Endangered Species (CITES) treaty, to which Australia is a signatory. Peregrine falcons are easily disturbed, particularly during the breeding season when they lay eggs in cliff faces or tree hollows.

On the Leeuwin-Naturaliste Ridge, fauna populations persist in refugial habitats that may not be the most favourable to them but are less favourable for predators and other means of native fauna decline (Caughley 1994). Typically these habitats are densely vegetated thickets in river, stream and wetland systems. Subsequently, the ridge acts as a contemporary refuge for several native fauna species and, perhaps most significantly, for some threatened critical weight-range mammals that have populations in decline such as Western ringtail possum, chuditch and brush-tailed phascogale.

The Leeuwin-Naturaliste Ridge is also important because:

- there are many short-range endemics, such as subterranean cave fauna and the Cape Leeuwin freshwater snail. The latter is a Gondwanan relict and one of only three terrestrial species of its type

in WA (Solem et al. 1982). A monitoring program to determine the status of its populations and any possible detrimental effects is being undertaken by the department

- it supports one locally endemic butterfly, the heath ochre (*Trapezites sp. aff. atkinsi*) and another butterfly, the varied haistreak (*Jalmenus inous*), which is at the southern extent of its range at Moses Rock
- it contains two endemic species of burrowing freshwater crayfish that have narrow, non-overlapping ranges – *Enggaeva. similis* and the Dunsborough burrowing crayfish, which is a short-range endemic. The planning area is the only department-managed land where the latter species occurs
- there are coastal wetlands at Quinninup Brook Pools, Devil's Pool and Lake Davies that support waterbirds, including breeding species such as the hoary-headed grebe (*Poliocephalus poliocephalus*), which have not been found breeding in wetlands along the south coast (Jaensch 1992)
- along with Scott National Park, fringing vegetation at the southern end of the ridge provides important roosting habitat for a variety of waterbird species that feed or breed in the adjacent Hardy Inlet.

Scott National Park has limited access which protects important habitat for breeding bird and mammal species by minimising disturbance. Given changing climatic conditions, the national park is an important refuge for fauna because of the variety of habitats (especially wetlands) and potential for reserve connectivity.

Gingilup Swamps Nature Reserve contains important habitat for breeding waterbirds including one of the few known breeding habitats of the Australasian bittern and a vast area of rushland and shrub thickets, especially *Taxandria floribunda*, which are habitat for little bittern (*Ixobrychus minutus*).

The wide variety of flowering species on the Scott Coastal Plain provides a food source for fauna such as honey possum or noolbenger (*Tarsipes rostratus*). Photo – Parks and Wildlife

The coastline of Leeuwin-Naturaliste National Park functions as a mixing place for species at the marine and terrestrial interface, particularly for seabirds. Bridled tern (*Sterna anaethetus*), crested tern (*S. bergii*), red-tailed tropic bird (*Phaeton rubicauda*) and hooded plover (*Thinornis rubricollis*)[12], are all known to nest along the coast. Population changes have been noted in bridled tern, crested tern and red-tailed tropic bird which appear to be trending south, occurring more in the planning area than in their traditional range further north (Hughes 2003). This is possibly because of climate change, a factor that is likely to influence broader changes in avian diversity and abundance. Beach access and disturbance near nesting sites, especially by vehicles and dogs, are significant threats to the successful breeding of coastal bird species.

The planning area has seen changes in bird communities and populations because of habitat modification in the surrounding area. It supports seasonal and permanent inhabitance of species where they haven't been known to occur before, for example bee-eaters and Carnaby's cockatoo. These birds have penetrated the forest from the north via the cleared coastal plain and from the south coast. Several bird species occur as isolated or disjunct populations from those in similar habitats in eastern Australia, such as the white-naped honeyeater (*Melithreptus chloropsis*), spotted pardalote (*Pardalotus punctatus*) and scarlet robin

12 A priority-listed shorebird found almost exclusively within the south of the state. A national recovery plan exists for this species.

(*Petroica multicolor*) (Christensen 1992). Endemic species are present, as are migratory species protected under international agreements (JAMBA, CAMBA and ROKAMBA[13]), which visit the planning area along the coast and inlets.

Forest Grove National Park, Reserve 46400 and McLeod Creek (mainly on private property) contain the critically endangered white-bellied frog, which has contracted from its probable original range by at least 70 per cent to occupy an area of only 1.9 square kilometres. Its remaining habitat forms part of an area proposed for nomination under the Ramsar Convention on Wetlands (see Section 13 – *Biological environment [ecological communities and significant habitats*])(Strehlowand Cook 2010). Unauthorised access and activities along creeklines within its habitat has the potential to impact on successful breeding of this short-range endemic species (for example the use of fertiliser, introduction of weeds and physical disturbance of soil).

Although poorly represented in the south-west, reptile species are distinct when compared with the arid zone and temperate south-east Australia (How *et al*. 1987). Many of the reptiles recorded in the planning area are at their range end, both south and north. This is particularly the case around Margaret River but also at Cape Naturaliste, where reptiles appear highest in diversity (How *et al*. 1987). In general, coastal dunes, flats, swamps and areas of open vegetation support the greatest number of reptile species. By comparison, few are found in karri forest (Christensen *et al*. 1985; Christensen 1992).

The critically endangered white-bellied frog occurs over a small area, which includes parts of the planning area. Photo – Parks and Wildlife

In the planning area, the specially protected carpet python occurs mainly along the Leeuwin-Naturaliste coast. Photo – Margaret River Discovery Co

On a regional scale, the south-west contains the highest percentage (71 per cent) of endemic freshwater fish species in Australia (Department of Fisheries 2002). In the planning area, freshwater fish have been recorded in the Scott River and in small seasonal wetlands on the Scott Coastal Plain, as well as in the Margaret River, Devil's Pool and Lake Davies (Jaensch 1992; Morgan *et al*. 1988; Trayler *et al*. 1996). The lower tributaries of the Blackwood River, such as McLeod Creek and Chapman Brook, are particularly important for these fish species because the waterways are generally in good condition and provide an unusual hydrological regime (see Section 12 – *Physical environment [hydrology]*).

Ecological communities and significant habitats

Conservation of species is not possible without first identifying and maintaining the integrity of the ecological communities and significant habitats that support them. A holistic approach to management – including understanding and responding to the functions, requirements and external influences or sensitivities of these communities or habitats – is critical.

13 Japan-Australia Migratory Bird Agreement (JAMBA), China-Australia Migratory Bird Agreement (CAMBA) and Republic of Korea-Australia Migratory Bird Agreement (ROKAMBA).

Threatened ecological communities

There are six TECs in the planning area:

- **'Aquatic root mat communities numbers 1 – 4 of caves of the Leeuwin-Naturaliste Ridge'** are listed under the EPBC Act as endangered and endorsed by the WA Minister for Environment as critically endangered. English and Blyth (2008) discuss the values of these four communities that are distinct from each other because of their differing species composition. They contain 64 recorded fauna species including some that are newly discovered, yet to be identified (such as nematodes and rotifers), Gondwanan relicts (some amphipods and the syncarid crustaceans), and species that either appear to be endemic to the cave streams or more specifically confined to a single cave. Changes in the hydrological integrity of these caves is the primary concern, from climate change, over abstraction, contamination, altered drainage patterns or increased uptake by plantation trees . Inappropriate fire regimes, human misuse and plant disease (canker) also have the potential to impact on the survival of the aquatic root mat communities. An interim recovery plan exists for these TECs
- the stromatolitic **'rimstone pools and cave structures formed by microbial activity on marine shorelines'** along the Leeuwin-Naturaliste Ridge is endorsed by the WA Minister for Environment as endangered. Availability of freshwater with stable drainage and flow rates is essential to the survival of this narrowly endemic 'Augusta microbial' community. Human disturbance by pedestrian traffic is also a concern, for example at Quarry Bay
- **'Scott River ironstone association'** is listed under the EPBC Act as endangered and endorsed by the WA Minister for Environment as endangered. This community comprises distinct, seasonally inundated shrubland communities including species that are endemic, restricted, declared rare or priority listed (Gibson et al. 2000). Specific management considerations are required for some taxa that are fire sensitive, susceptible to the impacts of introduced species including dieback caused by Phytophthora species and/or dependent on inundation in the wetter months. An interim recovery plan has been prepared for this community (Luu & English 2004).

A form of the Scott River Ironstone TEC characterised by a layer of sand over loam and underlying ironstone rock. Endemic species in the photograph include *Darwinia ferricola* (declared rare flora), *Aotus carinata* (Priority 4 listed) and *Calothamnus lateralis* var. *crassus* (Priority 3 listed). Photo – Parks and Wildlife

Priority ecological communities

Four Priority 1 ecological communities occur in the planning area (information provided by V. English pers. comm. 2013):

- **'Granite community dominated by the shrubs *Calothamnus graniticus* subsp. *graniticus, Acacia cyclops, A. saligna, Hakea oleifolia*, *H. prostrata* and *Jacksonia furcellata* (Sugar Loaf Rock)'**. This community supports similar dominant species to the Meelup granites but it is geographically separate and has different understorey species. It has been subject to gravel extraction in the past and, given its small size, is vulnerable to physical disturbances especially from visitor access, as the Cape to Cape Track and a road pass through it
- **'Tall closed sedgeland on shallow soils derived from granite gneiss on the Leeuwin-Naturaliste Ridge ('Sedgelands of the Cape Leeuwin Spring')'**. While similar to 'Sedgelands in Holocene dune swales' this community is richer and has different dominant species. It occurs where granite is close to the surface and has areas of shallow acidic soils and peat substrate. Calcareous water and tufa communities occur at the periphery where the granite and limestone substrates meet. Altered hydrology is likely to threaten this community
- **'West Whicher Scarp *Banksia attenuata* woodland (Swan Coastal Plain centred woodlands of grey/white sands community B2)'**. This community is species poor and mostly occurs on private land

- **'Shrublands of near permanent wetlands in creeklines of the Whicher Scarp (Whicher Scarp community G2)'**. Varying combinations of common and uncommon sedges is typical of this community and occasionally there are areas of ironstone. Keighery *et al*. (2008) observed the largest example of this wetland community at Poole Swamp (a proposed addition to Yelverton National Park).

The Whicher Scarp communities are restricted in distribution and differ floristically from each other as well as from other groupings described in Keighery et al. (2008). Mineral leases and dieback are threats to these communities. The only area of this community in reservation is the eastern extent of Yelverton Forest.

Two Priority 2 ecological communities occur in the planning area:

- Rottnest Island tea-tree **'*Melaleuca lanceolata* forests, Leeuwin-Naturaliste Ridge'**. Occurring in small isolated patches along the coast, its open understorey and provision of shade is highly desirable for day-use sites such as car parks, camping and picnic areas, especially at Bunker Bay and Kilcarnup. Its patchy occurrence combined with high disturbance (from development and visitor use) renders the community vulnerable to altered fire regimes, increasing fragmentation, loss of remnants, lack of recruitment, introduced species and soil erosion (Hearn et al. 2003b; Smith 2006)
- **'Low shrublands on acidic grey-brown sands of the Gracetown soil-landscape system'**. This community appears to have a substantially different species composition from other plant communities on the Leeuwin-Naturaliste Ridge (see Smith 2005 for more detail). It is threatened by visitor trampling and possibly dieback caused by *Phytophthora* species.

The planning area has not been extensively surveyed for ecological communities and there is potential for the extent of known ecological communities to increase and other currently unknown ecological communities to be identified.

Significant habitats

The occurrence of karst habitats and granite outcrops in the planning area is broader than the presence of the abovementioned ecological communities and are also recognised as significant habitats. Karst habitats support a diverse subterranean faunal environment, with many species highly dependent on restricted hydrological regimes. Where they are exposed at the surface, they have potential to provide important refuge for other fauna species. Karst habitats, especially caves, are highly vulnerable to physical disturbances (for example vandalism or other forms of direct harm) and physiological disturbances such as altered hydrology.

Habitat provided in caves, such as the lake in Calgardup Cave, is vulnerable to changes in hydrology. Photo – Parks and Wildlife

Small, isolated and disjunct granite outcrop communities are interspersed predominantly in coastal locations throughout Leeuwin-Naturaliste National Park but also within Bramley National Park. The granite outcrops along the coast are unusual because of their association with limestone. Species composition differs between coastal and inland outcrops as well as between outcrops that occur along a north-south gradient, indicating that climatic variation may be an influencing factor.

The granite outcrops in the planning area have refugial qualities as they support a diversity of microhabitats and soil moisture regimes that have allowed disjunct populations from the Darling Plateau granites to persist and speciate. There are several endemic species such as *Kunzea ciliata, Calothamnus* subsp. *graniticus, Kennedia lateritia, Caladenia lodgeana* and *C. nivalis*. Some flora species are also declared rare including *Kunzea ciliata, C. lodgeana* and *Kennedia lateritia*, which is confined to the granites at Cape Leeuwin (Hopper *et al*. 1997; Keighery *et al*. 2011). Granite outcrop communities are fragile habitats, susceptible to mechanical disturbance, introduced species (weeds and disease caused by *Phytophthora* species), grazing, too frequent fire, loss of shrub layer and inappropriate recreational activities.

The planning area contains other habitat types that are important for conservation. One such habitat type is tree hollows established in more than 310ha of old-growth forest within Forest Grove National Park, which provide important fauna habitat. Clearing of this habitat type elsewhere places increased pressure for tree hollows in the planning area. This can lead to competition between native species, such as brushtail possum and a variety of cockatoos, as well as introduced species such as the honeybee (*Apis mellifera*) and laughing kookaburra (*Dacelo novaeguineae*).

Situated partly within the planning area but entirely within department-managed land are permanent and seasonal tributaries associated with narrow floodplains that feed into the lower Blackwood River. This system, which is considered to be nationally significant, has the potential for listing under the Ramsar Convention on Wetlands because it contains:

- a representative, rare, or unique example of a natural or near-natural wetland type found within the appropriate biogeographic region
- vulnerable, endangered, or critically endangered species or TECs
- populations of plant and/or animal species important for maintaining the biological diversity of a particular biogeographic region
- plant and/or animal species at a critical stage in their life cycles, or provides refuge during adverse conditions
- one per cent of the individuals in a population of one species or subspecies of wetland-dependent non-avian animal species.

Significant areas adjacent to the proposed boundary also have important wetland values and there is an opportunity to work with relevant landowners or land managers to incorporate these into the candidate area for nomination. Salinisation is a threat to the system from the upper Blackwood River catchment, while inappropriate fire regimes, on-stream dams, vegetation clearing, introduced plants and feral pigs may reduce the viability of frog populations in the creeks.

Two other nationally important wetlands occur in the planning area – the Gingilup-Jasper wetland system and the permanent wetlands of the Cape Leeuwin system (see Map 2). The Gingilup-Jasper wetland system (1600ha) lies partly within Gingilup Swamps Nature Reserve and partly in the adjacent D'Entrecasteaux National Park. It is considered to be an outstanding example of extensive freshwater lakes, marshes and shrub swamps, is a 'biological reservoir' for freshwater fish, including endemics and has important sanctuary value. It supports extensive areas of *Taxandria floribunda* and *Baumea* wetlands and contains several declared rare and priority flora species as well as eight frog species. Within the planning area this wetland system is subregionally significant for maintaining ecological processes and containing rare or threatened species and ecosystems (Hearn *et al*. 2003b). Even though it is largely buffered (excepting areas next to farmland) from influences that commonly degrade water quality (Pen 1997), the near-pristine condition of the Gingilup-Jasper wetland system has potential to be adversely affected by a number of factors. These include nutrient enrichment, introduced animal species such as fish, rabbits (*Oryctolagus cuniculus*) and pigs, weeds such as pasture grasses, disease-causing pathogens such as *Phytophthora*, and mining activities (Australian Nature Conservation Agency 1996).

The permanent wetlands of the Cape Leeuwin system (20ha) located near Quarry Bay in Leeuwin-Naturaliste National Park provide habitat for the largest of six known populations of the Cape Leeuwin freshwater snail. This swamp system provides specific habitat requirements of permanently moist conditions and stable flow rates. Hydrological maintenance and management of introduced species such as *Typha orientalis* are important for this habitat (Ninox Wildlife Consulting 1994, Clarke 2011).

Smaller, permanent and/or diverse wetlands occur in Yelverton and Leeuwin-Naturaliste national parks that support highly disjunct taxa, priority flora, species at their range end and diverse invertebrate fauna (for example Lake Davies, Boodjidup-Devil's Pool and Quinninup Falls). Intensive land-use changes and altered hydrology are the greatest threats to these areas.

Management actions addressing the causes of habitat loss or degradation (for example environmental weeds, inappropriate fire regimes, disease-causing pathogens, inappropriate recreation activities and alterations to hydrology), or direct species decline (such as predation and competition with introduced and other problem animals) are detailed throughout this plan.

Desired outcome

The biological environment is identified, understood and conserved.

Objective

Continue to identify, understand, conserve and/or restore the composition, structure and function of the biological environment and especially those native species, ecological communities and habitats that are conservation significant.

Management actions

1. Identify the need for, and facilitate, statutory protection of native species, ecological communities and significant habitats.
2. Ensure management of the biological environment is consistent with departmental policy.
3. Identify key threats to the biological environment and manage those threats as outlined in the relevant sections of this management plan (for example hydrology, introduced species, fire management and visitor recreation).
4. Support the development and review of species and community recovery (or interim recovery) plans relevant to the planning area and fund their implementation accordingly.
5. Assess proposed operations and developments for the potential impacts on, native species, ecological communities and significant habitats. Factors to consider include conservation-significant species, the integrity or ecological function of vegetation corridors and the presence of ecologically significant tree hollows.
6. Manage fire according to the relevant section of this plan, giving special consideration to values that are dependent on specific fire regimes, such as TECs and granite outcrops.
7. Liaise with neighbouring land managers or owners to ensure activities on adjoining properties do not adversely impact on the biological environment.
8. Maintain refugial fauna habitats of densely vegetated thickets in river, stream and wetland systems on the Leeuwin-Naturaliste Ridge to help with the recovery of critical weight range mammals.
9. Consider fauna reintroductions and/or translocations as required.
10. Work with and raise awareness within the community to minimise the occurrence, and potentially adverse ecological impacts, of unauthorised fauna releases.
11. Identify and protect active and vulnerable nesting areas of coastal birds such as bridled and crested terns, red-tailed tropic bird and hooded plover by restricting beach access where necessary and practicable, through the use of fencing, signage and community education.

12. Work with Perth Zoo to protect and monitor breeding habitats, and to develop robust and productive captive breeding populations, of threatened fauna species including the white-bellied frog.
13. Allow entry to caves containing aquatic root mat communities only by permit. It is acknowledged that one community does exist in Calgardup Cave and measures will be taken to ensure its protection (for example by prohibiting access close to the root mat community).
14. Wherever practicable, avoid disturbance of populations of Rottnest Island tea-tree, especially the largest and most intact stands.

Key performance indicators

Performance measure	Target	Reporting requirement
The persistence and condition of populations of specially protected fauna or rare flora as identified in relevant recovery plans	No loss or decline of populations of specially protected fauna or rare flora as identified in relevant recovery plans because of management actions	Every five years, or as per recovery plans if applicable
The extent and condition of threatened ecological communities as identified in relevant recovery plans	No loss or decline of threatened ecological communities as identified in relevant recovery plans because of management actions	Every five years, or as per recovery plans if applicable

14. Protecting the natural environment

Physical and chemical processes

Erosion

When the soil surface is disturbed or vegetation is removed, erosion is typically accelerated and can be difficult to reverse. The planning area contains sites that are susceptible to erosion by wind and water, particularly along the coast at dunes, headlands and cliffs where it is exposed to prevailing winds, in areas of high human use or disturbance (recreation and camp sites, roads and tracks), banks of watercourses, in recently burnt areas and where there are extraction pits.

While coastal erosion is a natural process, it can be exacerbated by human activity. Davies (1983) identified several sites in the planning area that require dune stabilisation. This work continues to be undertaken in partnership with Coastcare and Landcare rehabilitation programs, supported by strategic road closures and access management.

Erosion control outside land managed by the department is important in minimising downstream impacts (for example increased sediment flow) on the creeks, rivers, wetlands, and estuarine environments of the planning area.

Acid sulfate soils

The main triggers of acid sulfate soils in the planning area are groundwater abstraction, short-term dewatering and drainage, infrastructure projects that involve soil disturbance and mining and recently burnt peat overlying an iron sulphide layer.

While the Scott Coastal Plain has been identified as an area that contains acid sulfate soils (URS 2004; WAPC 2003), it is not likely that vegetation will be cleared or the soil disturbed. However, the sulfate-enriched groundwater at the Beenup mine site on the Scott Coastal Plain has the potential to discharge

Erosion on vehicle access tracks to the coast pose an ongoing management concern. Photo – Parks and Wildlife

into Scott River and impact on the values of Scott National Park. The Department of Water will limit licensing and any new groundwater abstractions in this area and has identified the need for more investigation, monitoring and management.

Acid sulfate soils potentially occur elsewhere in the planning area, particularly in modern relict wetlands.

Salinity

The risk of salinity in the planning area is generally low, particularly along the Leeuwin-Naturaliste Ridge. However, groundwater observations have indicated that salinity is increasing on shallow soils over granite.

The Blackwood Basin is categorised as having a high risk of increasing salinity fromgroundwater extraction due to the shallow saline watertables. Combined with impacts from surrounding land uses that have already increased salinity levels in the Blackwood River, this could potentially lead to deterioration of the river's unusual and ecologically valuable hydrological integrity (see Section 12 - *Physical environment [Hydrology]*).

In a similar situation, the low topography and shallow watertables around the Scott River has led to its identification as an area at the highest risk from dryland salinity (National Land and Water Resources Audit 2001), although current observations indicate lower salinity levels in the groundwater and soils.

Salinisation in the planning area could have significant effects on groundwater-dependant habitats, such as caves and wetlands, and species such as frogs, aquatic invertebrates, freshwater fish and breeding waterbirds.

Water quality

Altered water quality can lead to deterioration or loss of vegetation and habitats as well as toxicity in species and communities, especially those with highly specific ecological water requirements. The surface water quality of the Leeuwin-Naturaliste Ridge is good, although many sub-catchments experience high nitrogen levels (Hunt *et al*. 2002). Nutrient enrichment in the Scott and Blackwood river catchments has the potential to cause eutrophication of wetland areas on the Scott Coastal Plain, including Gingilup Swamps (Gerritse 1996; Pen 1997). Nutrient (ammonia, nitrogen and phosphorous) concentrations in the Scott River are particularly elevated, and occasionally produce blue-green algae blooms. Increases in sedimentation, acidity and the associated increase in concentrations of bioavailable metals of environmental significance are also a concern.

State Government strategies, guidelines and plans (Department of Environment and Conservation 2012) State Salinity Council 2000; Government of Western Australia 2003; Department of Environment 2003) have been prepared to address salinity, acidification and altered water quality issues (nutrient and metal

concentrations, sedimentation) that could adversely impact on key values within the planning area. The department is supportive of an integrated catchment-scale approach to effectively implement these relevant strategies, guidelines and plans.

Desired outcome

Physical and chemical processes are protected from significant alteration or disturbance.

Management actions

1. Promote and participate in integrated catchment management to prevent modification of physical and chemical processes, in accordance with relevant State Government strategies and guidelines.
2. Prevent or mitigate operations that may adversely modify physical and chemical processes, including exposure of acid sulfate soils at vulnerable sites (for example, in or near Scott National Park and Gingilup Swamps Nature Reserve). Also assess, or encourage others to assess, potentially damaging external development proposals and refer any proposals of concern to the Environmental Protection Authority for formal assessment.
3. Implement erosion control measures (for example rehabilitation, rationalise access, site/track hardening, visitor education) in susceptible areas identified in this plan and where approved activities such as departmental operations and recreational use have potential for ground disturbance.
4. Undertake rehabilitation of riparian vegetation and cave entrances where there has been, or there is the potential for, a build-up of excess nutrient-rich sediments.
5. Work cooperatively with the Department of Water to maintain monitoring of hydrological integrity at selected sites in the planning area, to help identify sustained changes that may require a management response (for example the Blackwood and Scott rivers, surface water along the Leeuwin-Naturaliste Ridge and seasonally inundated areas of the Scott Coastal Plain).

Introduced and other problem species

Introduced species are non-native plants, animals and disease-causing pathogens. They can invade the planning area directly from neighbouring private properties, public areas and adjacent roads or by indirect transportation (for example wind, water, vehicles or contact with humans and animals). Once established, these species can have detrimental impacts upon the natural environment including competition with native species and communities for food, shelter, space, light, water and nutrients, alteration of floristic structure and diversity, loss of habitat, loss of food resources, the creation of imbalances of natural ecosystem processes, the fouling of watercourses and direct harm from predation, trampling or disease.

In some instances, a native species can have similar adverse impacts to introduced species if they are acclimatised (released or escaped from confinement and now living in a wild state) or if their distribution or population becomes unnaturally high, to the detriment of other native species. These species are referred to in this management plan as ‘problem species’.

Management of introduced other problem species is difficult because they typically have one or more of the following characteristics:

- respond well in disturbed areas, for example they are good colonisers and highly resilient to environmental pressures
- reproduce quickly
- spread easily
- often undetectable until established or adverse impacts on the natural environment become evident
- expensive to control or eradicate.

The department has a legal responsibility to manage species declared under the *Biosecurity and Agriculture Management Act 2007* (BAM Act). Documentation and other resources that guide the

department in undertaking this responsibility are discussed in the subsections *Environmental weeds*, *Animals*, and *Disease*.

Environmental weeds

The elongated shape of Leeuwin-Naturaliste National Park gives a huge perimeter-to-area ratio, exposing much of the park to disturbance. This contributes to the introduction and establishment of a large number of environmental weeds (Keighery *et al*. 2011). Forest Grove National Park and Bramley National Park (especially Ten Mile Brook Dam) are also susceptible to significant weed invasion. In the case of Forest Grove National Park this is due to gravel pits used illegally for the dumping of garden waste (Keighery *et al*. 2010). At Bramley National Park, weed invasion occurs at sites of past disturbance from construction of roads and gravel/sand pits and amenity plantings (Keighery *et al*. 2010).

Arum lily is a highly invasive weed that occurs throughout the planning area, including here in Leeuwin-Naturaliste National Park. Photo – Parks and Wildlife

At least 310 species of environmental weed, including eight declared plants are found in the planning area. Of most concern are bridal creeper (*Asparagus asparagoides*), arum lily (*Zantedeschia aethiopica*) and Victorian tea-tree (*Leptospermum laevigatum*).

Bridal creeper occurs in scattered populations throughout Leeuwin-Naturaliste National Park and is being managed using the application of rust as part of an integrated management program. This technique has been successful at Ellensbrook.

Arum lily is established throughout many creeklines and moisture-gaining sites in the planning area, where it excludes native species, particularly at Meekadarabee Cave. It remains a threat and a successful control for this species will continue to be investigated. Preventing the invasion of this weed at Gingilup Swamps Nature Reserve and the creeklines and uplands of Bramley National Park is a high priority.

Victorian tea-tree occurs in localised populations at Injidup and Ellensbrook in Leeuwin-Naturaliste National Park and also in Bramley National Park. Although successful control work has been carried out on some populations, this will need to continue.

Other species of concern include:

- buffalo grass (*Stenotaphrum secundatum*), which is threatening freshwater wetlands in Leeuwin-Naturaliste National Park
- thistle species (*Carduus pycnocephalus, Centaurea melitensis* and *Cirsium vulgare*) that have invaded the granite communities of Leeuwin-Naturaliste National Park
- one-leaf cape tulip (*Moraea flaccid*), which is spreading rapidly, especially around Moses Rock and Cape Naturaliste
- Dolichos sp. at the former Jarrahdene Mill, which is spreading into important frog habitat

- sweet pittosporum (*Pittosporum undulatum*), which has the potential to form dense populations along the Margaret River, displacing the native understorey and limiting regeneration of the overstorey in the Bramley National Park
- *Agapanthus praecox* and *Roldana pentasites*, which are present at an old disturbed settlement site along the eastern boundary of Bramley National Park and should be eradicated
- marram grass (*Ammophila arenaria*) and pyp grass (*Ehrharta villosa*), which have established after historically being used for dune stabilisation
- species trial plots (for example tuart) and pine planted in Leeuwin-Naturaliste National Park when the area was State forest
- species with heritage value at Ellensbrook Homestead – Norfolk Island pine (*Araucaria heterophylla*), flame tree (*Brachychiton acerifolium*) and mulberry (*Morus nigra*). Fig (*Ficus carica*) and Victorian teatree are also present at this site
- scaly sedge (*Cyperus tenuiflorus*), black flag (*Ferraria crispa* subsp. *crispa*), Paterson's curse (*Echium plantagineum*), wild pelargonium (*Pelargonium alchemilloides*), freesias (*Freesia* hybrids) and watsonia (*Watsonia* species).

The department takes into consideration Policy Statement 14 – *Weed management* (Parks and Wildlife 2014b) and its weed prioritisation process (Parks and Wildllife 2013) along with local knowledge to guide the approach and priority setting for control of environmental weeds in the planning area. Because of the number and extent of environmental weeds, the focus for management over the life of this plan will be the containment and eradication of small-sized occurrences of declared and environmental weeds with the aim of protecting high value conservation assets.

Animals

Management of introduced and other problem animals follows a planned and prioritised approach informed by whether or not the species is declared under the BAM Act and the level of threat to conservation-significant species, communities or important habitats.

Species[14] of most concern are all introduced and include:

- fox*# and feral cat#
- feral pig*#
- rabbit*#
- feral honey bee
- fish – redfin perch (*Perca fluviatilis*), mosquito fish (*Gambusia affinis*), rainbow trout (*Oncorhynchus mykiss*), brown trout (*Salmo gairdneri*) and goldfish (*Carassius carpio*)
- fallow deer (Dama dama) and red deer (*Cervus elaphup*)
- smooth marron – endemic to the south-west but introduced in the Margaret River
- yabby (*Cherax albidus*).

Through predation, foxes and feral cats are responsible for the decline of many native species, particularly critical weight range mammals. As part of the department's *Western Shield* program, Baiting typically occurs in the planning area four times a year with additional baiting occurring at private property interfaces. Baiting may also be carried out to protect specific habitats, known populations of threatened animals, or new fauna release sites. The department seeks to maximise this control effort by working strategically and collaboratively with neighbouring land managers.

An increased baiting regime will be considered in:

- Forest Grove National Park and Reserve 46400, which provides an east-west corridor linking to Boranup Forest in Leeuwin-Naturaliste National Park.

14 Species denoted with * are declared under the BAM Act and species denoted with # are recognised as a nation-wide problem and are the subject of threat abatement plans developed through the Federal Department of the Environment.

- strategic locations within Leeuwin-Naturaliste National Park (for example Boranup Forest) that are sizeable and offer conservation benefits.

The presence of feral cats in the planning area is acknowledged and while some trapping does occur, control of feral cats is difficult because of the recurrence of domestic cats originating from adjacent rural and urban areas. At the time of writing, cat baits are being trialled elsewhere in the State as part of the *Western Shield* program and it is possible that during the life of this plan, cat baits will be used in the planning area. It should also be noted that baiting does not benefit all native fauna species and integrated management is required for fauna conservation.

Feral pigs are a problem in many parts of the planning area, including Leeuwin-Naturaliste, Forest Grove and Scott national parks, as well as Gingilup Swamps Nature Reserve and Reserve 46400. Feral pigs can be destructive, particularly around riparian zones where their movements (rooting, wallowing, trampling, tusking or rubbing) can damage vegetation, cause ground disturbance including erosion, hamper native plant regeneration or rehabilitation, encourage weed invasion and spread disease (such as dieback). They also foul watercourses and cause faunal impacts through predation, disturbance of habitat and nesting sites, and removal of food. In the planning area, feral pigs adversely impact conservation-significant species including quokka, quenda (*Isoodon obesulus*), water rat (*Hydromys chrysogaster*) (Freegard 2005) and white-bellied frog. Feral pigs are managed through regular monitoring, baiting and trapping programs.

Rabbits are widespread throughout the planning area, occurring commonly in heath vegetation and coastal dunes of Leeuwin-Naturaliste National Park, and in small populations along boundaries with private property. Their grazing pressure and destabilisation of soil can have significant localised impacts, especially when exacerbated by events such as bushfire. Control measures are used to minimise rabbits where they are found to be impacting on high value conservation assets.

Deer are a problem north of Margaret River and around the Yallingup town site, where grazing pressure is increasing. Red deer are declared animals in WA under the provisions of the BAM Act, and the Department of Agriculture and Food helps with preventing their establishment in the wild. The department carries out control measures when populations are identified.

A fallow deer (*Dama dama*) captured on a motion sensor camera in Bramley National Park. Photo – Parks and Wildlife

Feral honeybees are established throughout most of the south-west and impact on the natural values of the planning area by:

- competing with native fauna for tree hollows as habitat, and floral resources such as pollen and nectar
- altering plant structure, composition and function through interfering with pollination and seed set of native species (due in part to inefficient transfer of pollen or the physical damage to flowers) and increasing seed set in some environmental weeds
- becoming a hazard to visitors, especially at popular recreation sites.

While removal of feral honeybees would have nature conservation and recreation benefits, the feasibility of completely removing them is low, because localised eradication would probably be followed by recolonisation from new swarms invading the area (Gross 2001).

Introducing exotic fish such as trout, mosquito fish, redfin perch and goldfish into local river systems presents a significant threat to native fish and invertebrates through predation and competition for

resources and food. Unlike other introduced fish, trout are unable to successfully breed in rivers and tributaries of the south-west and are consequently stocked for recreational fishing. This occurs in the Margaret and Blackwood rivers. Control of other introduced fish species is limited to activities aimed at increasing community awareness to prevent releases.

While occurring naturally in other river systems of the south-west, it is thought that the smooth marron has been introduced to the Margaret River and it is rapidly displacing the critically endangered hairy marron in the upper reaches of the river (M. de Graaf *pers. comm.*). The department is supportive of the recovery of hairy marron and will help the Department of Fisheries with recovery actions, especially where it is applicable to the planning area.

The burrowing activities of yabbies may alter riverine habitats and they also compete with, or prey upon, aquatic fauna including invertebrate populations of threatened root mat communities. Yabbies may also threaten marron populations through disease (see Section 14 – *Protecting the natural environment [disease]*).

Other introduced animals in the planning area are the black rat (*Rattus rattus*) and house mouse (*Mus musculus*).

Potential problem species include the laughing kookaburra, rainbow lorikeet* (*Trichoglossus haematodus*), galah (*Cacatua roseicapilla*) and eastern long-billed corella (*Cacatua tenurostris*). While management of problem species is complicated by their protection under the *Wildlife Conservation Act 1954*, their current impact on other native species is considered to be minimal.

Domestic animals present a threat to native wildlife, and are discussed in Section 34 – *Domestic animals.*

Disease

Phytophthora cinnamomi causes the disease known as 'dieback'. This disease invades the roots of native plants, often leading to individual tree death and, in many cases, eliminating susceptible and dominant species from the site. This creates dramatic and permanent changes to the structure, composition and function of natural ecosystems, including loss of fauna such as invertebrates, insectivorous animals and those species reliant on tree hollows and dense ground cover.

P. cinnamomi continues to expand throughout the south-west via surface and sub-surface water, or after infected soil and plant material is picked up and transported by vectors such as humans, vehicles and animals.

In the planning area, jarrah forest and woodland as well as the flats, swamps and seasonally inundated areas of the Scott Coastal Plain are a highly susceptible to *P. cinnamomi*. Banksia woodland is especially vulnerable to the disease (Shearer & Dillon 1996), and upland areas of Scott National Park have already been significantly affected. Banksia woodland within Gingilup Swamps Nature Reserve and Leeuwin-Naturaliste National Park are also under threat. Signs of the disease in jarrah forest are particularly evident in timber reserve 60/25.

Areas that contain low scrub on shallow, often-inundated soils over ironstone are considered to be extremely favourable for the spread of the disease. The Scott River Ironstone TEC is at particular risk and most occurrences of the community are thought to be infected to some degree. Declared rare flora, such as Scott River boronia (*Boronia exilis*) and giant spider-orchid (*Caladenia excelsa*) may also be threatened, by direct impacts on the species or associated effects relating to degradation of habitat.

The incidence and impact of *P. cinnamomi* tends to be low in shrubland, woodland and forest on limestone on the coastal fringe (Shearer 1990) as well as in karri forest and coastal dunes.

Management guidelines for *P. cinnamomi* are described in the department's manual *Phytophthora cinnamomi and disease caused by it* (CALM 2003) and Policy Statement 3 – *Management of*

Phytophthora disease (Parks and Wildlife 2014c). It is also listed as a key threatening process under the EPBC Act and a threat abatement plan has been prepared (Department of the Environment 2014).

Emphasis of management will be on reduction of vectored spread and, in particular, reduction in the establishment of new centres of infestation within protectable areas.

Although dieback surveys have been undertaken, they are of limited use for management. This is due to the surveys' age and partial coverage, and the high level of human activity, which has potentially spread the disease over a much greater area than mapping suggests. To accurately determine the extent of *P. cinnamomi* within the planning area, interpretation of more recent aerial photography is required, combined with knowledge of disease occurrence. This will enable probable disease spread and protectable areas to be mapped. On-ground surveys should then be prioritised according to the risk to conservation values such as floristic susceptibility, conservation significance of species, communities and habitats, opportunity for vectored spread (human activity and access) and characteristics of the physical environment that may influence spread (for example soils, hydrology and climate).

Standard hygiene practices apply in uninfected areas and also need to be considered in the preparation of bushfire suppression plans. For areas that are already infested but contain significant residual natural values, ecosystem restoration, phosphite treatment and cryogenic storage of genetic material from threatened native plants may be undertaken.

Armillaria is a root disease caused by the native soil-borne pathogen *Armillaria luteobubalina*. It spreads predominantly by root-to-root contact between healthy and infected plants. Most susceptible hosts (dominant small trees and shrubs) are killed in coastal dune communities, significantly altering vegetation structure and composition and leaving open denuded areas that encourage severe wind erosion (Shearer *et al*. 1997; Shearer 1994) and weed invasion. The highest impact is in regrowth forest and plantations where harvesting and thinning operations provide stumps that *A. luteobubalina* can readily colonise and then infect regrowth saplings and residual trees. The range of species susceptible to the fungus is large and poorly defined, with at least 50 families and more than 200 species, and there is little information on the presence of resistant or tolerant species. Many species that resist infection by *P. cinnamomi* are susceptible to *A. luteobubalina* (Shearer & Tippett 1988; Shearer *et al*. 1997, 1998). The spread of *A. luteobubalina* is managed through appropriate hygiene practices.

There is concern that the eastern states myrtle rust (*Uredo rangeii*) will continue its spread into Western Australia and potentially the planning area over the life of the plan. Information on the impacts of this and other rusts on native plants is limited.

Botryosphaeria ribis and *Cryptodiaporthe melanocraspeda* are two of the most common aerially dispersed canker-causing fungi, and infect plant hosts mainly from the Proteaceae and Myrtaceae families (Shearer 1994). Canker is a concern for species whose roots penetrate the caves and support the root mat TEC's. There is a heightened awareness of peppermint and marri decline in parts of the planning area that is potentially associated with canker. The department is supportive of research to identify and better understand the causes and ecological impacts of these declines and options for management response.

Batrachochytrium dendrobatidis is a fungus that causes chytridiomycosis (more commonly known as 'chytrid') – a disease that can affect amphibians, especially frogs that spend more time in, or near, water where the fungus predominantly occurs. Evidence of the fungus was found in 17 frog species in the southwest, including the specially protected white-bellied frog (D. Roberts *pers. comm.*). The severity of this disease is unclear because many frog species known to be infected continue to be widespread and abundant across the south-west. Other factors, such as loss or disturbance of habitat and increased use of chemicals, may be more important reasons for the decline of some frog species. The infection of amphibians with this fungus is a key threatening process under the EPBC Act, and a threat abatement plan has been prepared.

The freshwater crayfish parasite (*Thelohania* sp.) and porcelain disease caused by *Microsporidiosis* sp. are present in some yabbies. Both invade the muscle tissue of freshwater crayfish, possibly causing death, and there are no treatments available. These diseases may pose a threat to the hairy and smooth marron (*Cherax tenuimanus* and *C. canei*) through transmission from yabbies.

Desired outcome

Key values are not detrimentally impacted by introduced and other problem species.

Objective

Reduce introductions and the spread of existing introduced and other problem species identified in this plan as a priority for control.

Management actions

1. Ensure management of introduced and other problem species is consistent with departmental policy and other management documentation specified within this section (for example Federal threat abatement plans and State strategies).
2. Support the development and review of control plans for introduced and other problem species occurring in the planning area and, in particular, promote and help with the inclusion of the following information as it becomes available:
   - species distribution (past, long existing and new occurrences)
   - biological and ecological information relevant to each species
   - pathways of introduction or spread
   - history of control for each species (method and level of success)
   - standard hygiene practices
   - designated quarantine areas.
3. Undertake mapping to determine the extent of introduced and other problem species.
4. Assess un-infested areas, and rationalise and manage access into them including consideration for closing, realigning, hardening or restricting use of tracks and roads.
5. Implement standard control plans as well as any other project-specific controls when undertaking operations in the planning area that have high potential to spread, or result in the infestation of, introduced and other problem species.
6. Target species according to priority for the planning area. For example bridal creeper, arum lily, Victorian tea-tree and other weed species located in areas of important conservation value.
7. Rehabilitate gravel pits, species trial plots, harvested pine plantations and other recently disturbed sites to reduce weed occurrence.
8. Use native species for dune stabilisation.
9. Retain exotic trees deemed to have heritage value at Ellensbrook Homestead and the tuart trial plots which are suitable as seed banks for rehabilitation elsewhere, provided they pose no threat to adjacent conservation values. When they mature and senesce, replace these species with species that naturally occur within the planning area.
10. Continue baiting as part of the *Western Shield* program and consider increasing baiting regimes at selected sites identified within this section.
11. Continue to conduct baiting and trapping programs for feral pigs, with a focus on protecting the most significant and vulnerable habitats including Scott National Park, Gingilup Swamps Nature Reserve and white-bellied frog habitat.

12. Consider controlled baiting or fencing options to manage rabbit impacts where conservation values are threatened (for example populations of Dunsborough spider orchid).
13. Continue to control the distribution and density of managed hives and, where feasible, feral colonies of honeybees, in high conservation value areas and around recreation sites.
14. Provide advice to the Department of Fisheries and other key stakeholders on trout stocking proposals applicable to the planning area. As part of the assessment process, consider the presence and potential impact upon native species, ecological communities and significant habitats, including the requirement for access and use of the area to undertake recreational fishing.
15. Help the Department of Fisheries with the recovery of the hairy marron as required, particularly where it is applicable to the planning area (such as the lower portion of the Margaret River).
16. Where practicable and identified as a management priority, maintain and restore dieback-infested areas.
17. Liaise with relevant agencies and neighbouring landowners or managers to facilitate effective and coordinated control of introduced and other problem species.

Key performance indicators

Performance measure	Target	Reporting requirement
Number and extent of environmental weed species identified as a priority for control in this section	Decrease in the number and extent of species identified as a priority for control in this section	Every five years
Populations of, and area impacted by, feral pigs	Reduce the number of populations and area impacted by feral pigs	Every five years
Infested areas within protectable areas that are a priority for protection	No new human-assisted infestations of *P. cinnamomi* in protectable areas that are a priority for protection (for example Scott Ironstone TEC)	Every five years

Managing cultural heritage

Heritage values in the planning area are managed in accordance with the *Heritage of Western Australia Act 1990* (Heritage of Western Australia Act), *Aboriginal Heritage Act 1972* (Aboriginal Heritage Act), EPBC Act and the *Australia International Council of Monuments and Sites Burra Charter 1999* (Australia International Council of Monuments and Sites 2000).

Many places may have historic interest but have not been assessed or are not considered significant enough to be listed under legislation. Where identified, these places are entered on the department's Recreation and Tourism Information System (RATIS) database. In the pursuit of best practice in cultural heritage management, information contained in all registers and databases is considered before any management operations are undertaken.

15. Aboriginal heritage

Smith and McDonald (1989) describe the Leeuwin-Naturaliste region as the tribal territory of the *Wardandi* people, who are located between Bunbury and Cape Leeuwin, and the *Pibbelmen* people, who occupy the lower Blackwood River. The *Wardandi* and *Pibbelmen* are two of the 14 different language groups known today as Noongar. Aboriginal cultural history and knowledge of the area is relatively poorly documented and what does exist has largely been written with a Eurocentric focus. This does not mean that such knowledge does not exist among local traditional owners. It is hoped that the Aboriginal cultural value of the planning area can be continually identified and protected.

Historically, the majority of activity by Noongar people is thought to have been concentrated along the Leeuwin-Naturaliste coastline and near-coastal transition zone (Dortch 1984; Lilley 1991). Noongar people migrated seasonally between these coastal areas and its hinterland to use various resources. Most activity was, and still is, near fresh water sources, which were used for camping, hunting, foraging and fishing. There are few historical accounts of Noongar activities in the inland karri and jarrah forest (Dortch & Dortch 2001) because these areas were less occupied, except along larger rivers such as the Blackwood River, and were difficult to access (Hallam 1975). There is even less evidence of Noongar activity on the Scott Coastal Plain, which, ethnographically, is one of the least studied regions in the south-west (Brad Goode & Associates 2003).

Many archaeological sites are located on the margins of watercourses. These areas were and still are of significance to Noongar people as access ways through the forest and camping sites in traditional times (Brad Goode & Associates 2003). Waterways and wetlands, including the Margaret River and Lake Davies, are associated with the *Waugle* (Brad Goode & Associates 2003). There are also believed to be several graves behind South Point near Gracetown, which are said to be the result of a massacre in early colonial times (Goode 1999).

The Blackwood River, together with its tributaries and pools, represents a cultural boundary between the *Pibbelmen* and *Wardandi* language groups and a migration route, or 'bidi', between inland areas around Nannup and the west coast. There is also evidence to suggest that the mouth of the Blackwood River created an intersection of different tracks through the forest and therefore became a focal point for traditional activities and social interaction (Dortch 1984). Historical camp sites are known along the Blackwood River.

Noongar people could have used caves, such as Devil's Lair[15], as base camps (Smith & McDonald 1989).

15 Devil's Lair is within Reserve 8437 which is a proposed addition to the planning area (see Section 11 – *Tenure*).

Devil's Lair, Rainbow Cave, Tunnel Cave and Witchcliffe Rock Shelter are all important sites along the Leeuwin-Naturaliste Ridge because they contain artefacts, animal remains and intact hearths. More than 1130 artefacts including several stone and bone artefacts, animal remains and engraved stone plaques have been found at Devil's Lair, providing a valuable record of past Noongar life in the Leeuwin-Naturaliste region (Dortch 1984). Artefacts found at the site estimate the first human occupation in the area to be as early as 50,000 years ago, making it one of the oldest and most reliably dated occupation sites in Australia (Dortch & Dortch 2001). The bone tools discovered at Devil's Lair are significant because the preservation of bone tools in Pleistocene sites in Australia is quite rare (O'Connor, Quartermaine & Yates 1995).

Ellensbrook (*Mokidup*) is a significant cultural site to Noongar people. Within the area is Ellensbrook Homestead which holds shared history between Aboriginal people and colonial settlement (see Section 16 – *Other Australian heritage*). Ellensbrook is listed on the Register of Aboriginal Sites for criteria including mythological significance and artefacts.

Ellensbrook, or *Mokidup*, is an important site for Noongar people. Photo – Parks and Wildlife

The planning area contains 38 sites permanently listed on the Register of Aboriginal Sites under the Aboriginal Heritage Act and an additional 16 sites on the interim register. These include numerous artefact sites as well as burial sites, middens, mythological sites, historical sites, ceremonial sites, an engraving site, a man-made structure and painting sites.

As the State register is not a comprehensive listing of all Noongar heritage sites, assessments may be necessary before operations are undertaken that may inadvertently cause damage. Approval under the Aboriginal Heritage Act is required to proceed with any public works[16] that may affect places of significance to Noongar people. Under the *Native Title Act 1993*, native title claimants and representative bodies must be advised before undertaking public works on land vested in the Conservation Commission.

In addition to complying with legislative requirements, management of Noongar cultural heritage within the planning area is guided by the following principles (Australian Heritage Commission 2002):

- protect places and objects of Noongar cultural and heritage significance
- restore, as much as possible, the relationship between Noongar people and their heritage places
- recognise that Noongar people are the primary source of information on the value of, and how best to conserve, their heritage
- ensure Noongar people have a primary and active role in heritage management
- recognise that Noongar people must control intellectual property and other information relating specifically to their heritage
- protect culturally restricted information.

16 A public work may include buildings or fixed structures, roads, railways, bridges, water bores or wells or any major earthwork.

Interpretation of Noongar culture and heritage is important and can be used as a tool to educate visitors and facilitate culturally considerate and appropriate behaviour. Participation of Noongar people in promoting cultural heritage to visitors will be encouraged and facilitated where possible. Participation of Noongar people in the management of the planning area is discussed in Section 7 – *Management arrangements with Aboriginal people*.

Desired outcome

Work with traditional owners to protect and conserve Noongar culture and heritage values in the planning area.

Objective

No disturbance to Aboriginal heritage sites because of management operations without formal approval.

Management actions

1. Ensure Noongar people have a primary and active role in managing their heritage, including the planning and implementation of Noongar culture and heritage education and interpretation activities.
2. Comply with legislation and departmental policy before starting any potentially damaging operations, and where possible prevent damage to culturally significant sites and objects.
3. Protect and maintain cultural heritage according to the CALM Act and Burra Charter.
4. Manage threatening processes (for example fire) and visitor activities to ensure Noongar cultural heritage is not adversely impacted.
5. Work with traditional owners and relevant organisations to improve the protection and conservation of Noongar cultural heritage.
6. With the consent of traditional owners, document Noongar stories about the planning area.

Key performance indicator

Performance measure	Target	Reporting requirement
Disturbance of known or identifiable Aboriginal heritage sites	No disturbance to Aboriginal heritage sites because of management operations without formal approval	Every five years

16. Other Australian heritage

The history of the planning area and broader region mostly relates to maritime exploration, early colonial settlement, forestry operations and shipping activities along the coast.

The Cape Leeuwin Lighthouse is the only place in the planning area that is listed on the Commonwealth Heritage List and afforded statutory protection under the EPBC Act. There are no places listed on the National Heritage list. Five places are listed on the WA 'Register of Heritage Places' database including the Cape Leeuwin Lighthouse and quarters, Cape Naturaliste Lighthouse, the former Wallcliffe house and landscape (across the Margaret River to the 60m contour of Reserve 8428 at Kilcarnup), Ellensbrook (including the homestead, dam and waterfall) and the Cape Leeuwin Waterwheel. A conservation plan has been prepared for all of these places except the Cape Leeuwin Waterwheel.

Several other places not protected under legislation are either interim listed on the Register of Heritage Places or listed on other databases (see introduction to *Managing cultural heritage*). These include Matthew Flinders' Cairn at Point Matthew, *HMAS Nizam* memorial at the Cape Leeuwin Lighthouse, Foul Bay Lighthouse, old settlement debris at Hamelin Bay, the Hamelin Bay gravesite (James A Smith),

the grave at Ellensbrook, Deepdene, Jarrahdene Mill, Canal Rocks footbridge, Collins fire tower, an old bridge in Bramley National Park and former mill and settlement sites in Yelverton National Park. Several sites have been identified for their social value. Nearby to the planning area, these include the Hamelin Bay jetty, Lovespring Anchor, and heritage trails between Busselton and Augusta.

Educating the public by providing interpretation of cultural heritage is important for its management. Interpretive facilities should be provided where appropriate to increase visitor awareness and appreciation of cultural heritage within the planning area.

The chute leading to the Cape Leeuwin Waterwheel is part of a heritage feature near Augusta in Leeuwin-Naturaliste National Park. Photo – Margaret River Discovery Co

Ellensbrook (*Mokidup*)

Ellensbrook (*Mokidup*) is an important cultural heritage site within the planning area. It holds cultural significance for Noongar people (see Section 15 – *Aboriginal heritage*) and also holds an important place in shared history for Aboriginal people and the Europeans that settled in the area. Located in Leeuwin-Naturaliste National Park, Ellensbrook has been recognised for its value by being listed on the Heritage Council of WA's Register of Heritage Places (place no. 00115).

Within the heritage site is the Ellensbrook Homestead. The homestead was established in 1857 by Ellen and Alfred Bussell with the aid of Noongar people. It is significant for its association with the pioneering development of dairy farming and sheep and cattle pastoralism in the Augusta-Margaret River area. The homestead is also historically significant for its shared history with Noongar people working at the homestead and also in its role as the Ellensbrook Farm Home for Aboriginal Children.

The National Trust has restored the homestead, retaining its original character, and is responsible for the ongoing maintenance and management of the homestead and grounds. The department and the Trust have a joint responsibility to manage landscape values and interpretation of the site. In 2004, the Trust also released a conservation plan for the area. The department will be involved in signage and other interpretation at the site (including guided activities), commercial opportunities and the preservation of conservation and landscape values.

Ellensbrook and the nearby Meekadarabee Falls have conservation, aesthetic and cultural values and are popular with park visitors and walkers on the Cape to Cape Track.

Lighthouses

The lighthouses at Cape Leeuwin and Cape Naturaliste were constructed in 1895 and 1904 respectively (Australian Heritage Commission 1989), and are typical examples of lighthouses built during this period. The two lighthouses are relatively intact and particularly important in illustrating the development of remote coastal navigation in Australia and the evolution of lighthouse design. The Cape Leeuwin Lighthouse is especially important because it is Australia's tallest and fifth oldest lighthouse (Laurence *et al*. 1992). At Cape Leeuwin, three lightkeepers cottages were built in 1895 from stone at Quarry Bay and are significant to the establishment and operation of the lighthouse. The cottages also demonstrate a way of life for lightkeepers that is rarely shown today. Similar buildings exist at Cape Naturaliste. In 1967, a lighthouse was built at Foul Bay to replace the Hamelin Island light.

Cape Leeuwin Lighthouse. Photo – Augusta-Margaret River Tourism Association

The lighthouse precincts at Cape Leeuwin and Cape Naturaliste have long been popular as tourist destinations and their buildings are ready-made facilities for interpretation, recreation and community interest. These lighthouses, and the Foul Bay Lighthouse, remain the property of the Australian Maritime Safety Authority for the term of their lease. Consequently, the Authority is responsible for all maintenance and structural issues, except where they relate to use, wear and tear from tourist activity. The Authority is also responsible for public liability risk of the lighthouses and their leased back areas, except for the lighthouse tour arrangements. Any changes to the Cape Naturaliste Lighthouse, and lighthouse and keepers cottages at Cape Leeuwin, including access and site development, should be undertaken in accordance with the Heritage of Western Australia Act and the relevant conservation plans for these areas. Any restoration work at the Cape Leeuwin Waterwheel should give due consideration to protecting the Cape Leeuwin freshwater snail.

Desired outcome

Protect and conserve other Australian cultural heritage.

Objective

No disturbance to other Australian heritage sites because of management operations without formal approval.

Management actions

1. Manage other Australian places of cultural heritage significance according to State and Federal legislation, departmental policy and the Burra Charter.
2. Manage threatening processes (for example fire) and visitor activities to ensure cultural heritage is not adversely impacted.
3. Continue the management arrangements for the lighthouses.
4. Investigate the need to prepare a conservation plan for the Cape Leeuwin Waterwheel and assist the relevant authorities where necessary, including through the provision of nature conservation advice.
5. Progressively update and collate information on cultural heritage places and stories and maintain them on the department's RATIS database.
6. Review as necessary, in consultation with the relevant authorities, places for listing under State and Federal legislation (for example interim-listed places). The cultural heritage management requirements of these places should be considered before undertaking any operations or works with a view to mitigating potential impacts.
7. Incorporate material on cultural heritage in interpretation and education plans.
8. Conduct training when required to maintain expertise of regional and district staff in heritage identification and management.

Key performance indicator

Performance measure	Target	Reporting requirement
Disturbance of known or identifiable other Australian heritage sites	No disturbance to other Australian heritage sites because of management operations, without formal approval	Every five years

Managing visitor use

Managing visitor use in the planning area is guided by the CALM Act and Policy Statement 18 – *Recreation, tourism and visitor services* (DEC 2006b). Management of visitor use focuses on the five national parks of the planning area. Nature reserves have a primary purpose of 'conservation of flora and fauna' and are not available for active recreation.

17. Planning for visitor use

The Leeuwin-Naturaliste capes area parks and reserves are set apart from other natural areas in the southwest because of the area's diverse natural environment, cultural attractions (for example the lighthouses and Ellensbrook Homestead), availability of world-class surfing, and easy access. Leeuwin-Naturaliste National Park is the most popular national park in the State, receiving more than 2.79 million visits in 2013/14. Bramley National Park is also popular, receiving an estimated 33,950 visits in 2013/14.[17] The other reserves of the planning area do not have recorded visitor statistics but are known to receive lower levels of visitation. Visitor numbers are expected to be maintained or increase over the next 10 years because of continued residential growth in the region, its proximity to Perth, and ongoing improvements in transport options to the south-west.

The popularity of the planning area presents several management challenges, and visitor pressures are evident, particularly in Leeuwin-Naturaliste National Park. The capacity of many recreational facilities is being exceeded, resulting in congestion or overcrowding and physical impacts on the environment. To provide for sustainable recreational opportunities while managing impacts on natural, cultural and heritage values, a range of measures have been put in place, including:

- a recreation site hierarchy that recommends the maximum site capacity for all recreation sites in the planning area
- a vehicle access strategy that focuses on maintaining but rationalising public vehicle access, particularly along the coast
- visual landscape management zones and associated guidelines
- a strong emphasis on monitoring and assessing the impacts of visitor use on key values
- the ongoing fostering of partnerships with recreational groups and the wider community.

The scenic drive through the karri trees on Caves Road at Boranup is a popular visitor attraction.
Photo – Parks and Wildlife

A recreation masterplan is being prepared as an internal document that considers detailed recreation planning for the national parks of the planning area. It will be consistent with the management objectives and strategies of this plan.

17 Visitor statistics obtained from the department's Recreation and Tourism Information System on August 2014. Figures are an estimate based on vehicle count data and can include multiple visits from the same visitors.

More than any other part of the planning area, the Boranup section of Leeuwin-Naturaliste National Park experiences the widest range of recreational activities including camping, caving, bushwalking, horseriding, mountain biking and four-wheel driving. This area is also one of the most environmentally sensitive because it contains TECs, karst features and habitat for the critically endangered white-bellied frog. A recreational impact study will be undertaken at Boranup to determine if the area can sustain the intensity and number of activities that occur. Should an activity be found to be detrimentally affecting natural, cultural or heritage values, access to undertake the activity may be rationalised or relocated.

Not all recreation opportunities and facilities need to be provided within the planning area. What is available in the planning area should complement, rather than compete with, those available elsewhere in the region.

Desired outcome

Allow for and encourage a wide range of sustainable, nature-based recreation opportunities and experiences while ensuring impacts on key values are minimised.

Objective

Undertake detailed recreation master planning for the national parks within the planning area.

Management actions

1. Monitor impacts of all recreational activities to ensure natural, cultural and heritage values are not detrimentally affected.
2. Work with other land managers and stakeholders to provide complementary recreation and tourism opportunities and to avoid unnecessary duplication of opportunities within the planning area.
3. Complete a recreation masterplan for the national parks of the planning area.
4. Undertake a recreational impact study at the Boranup section of Leeuwin-Naturaliste National Park.

Key performance indicator

Performance measure	Target	Reporting requirement
Recreation masterplan for the planning area	Complete a recreation masterplan for the national parks of the planning area	Five years from when the final plan is gazetted

18. Visitor Safety

The most common risks to visitor safety relate to slipping and tripping on uneven ground, stolen hazard signs and damaged recreation structures, all of which are attended to by staff during routine maintenance of facilities. The stability of cliff and cave landforms and falling trees and limbs pose more serious risks to visitor safety. Dangerous swimming beaches and high swells while rock fishing are addressed in the *Ngari Capes Marine Park management plan 2013–2023* (DEC 2013).

An ongoing visitor risk management program is implemented in accordance with Policy Statement 53 – *Visitor risk management* (DEC 2011a). The department works with the City of Busselton and Shire of Augusta-Margaret River to provide compatible visitor risk management across tenure boundaries, particularly in relation to signage and risk assessment processes. This work will continue with an emphasis on providing consistent risk management messages across tenures and sharing relevant information about visitor risk.

In the late 1990s, the department sought geotechnical advice on cliff and cave risk along the Leeuwin-Naturaliste coastline which identified several hazardous areas including the Hamelin Bay headland and

Bob's Hollow. The risks associated with these environments will continue to be monitored to detect changes in cliff and cave structure and risk mitigation strategies will be implemented accordingly. Strategies may include fencing, warning signs and, where recommended by geotechnical consultants, removal of small blocks and overhangs.

While the department will continue to minimise risk wherever possible, visitors must accept a certain level of responsibility for managing their own safety when entering natural areas. To this end, the department supports and encourages voluntary compliance with activity-specific codes of safe conduct.

Desired outcome

Minimise the potential for injury and misadventure to visitors in a manner that does not render the environment sterile or unnecessarily diminish visitor use and enjoyment in the process.

Management actions

1. Implement a visitor risk management program, including the regular monitoring of cliff and cave risk areas.
2. Undertake formal risk assessments of all recreation sites and facilities in addition to routine site checks.
3. Provide information (including signs where the hazard may not be obvious) to enable visitors to consider and cater for risks.
4. Promote activity-specific codes of safe conduct as appropriate.
5. Work with the City of Busselton and Shire of Augusta-Margaret River to provide compatible visitor risk management across tenure boundaries.

19. Access

Department-managed roads and tracks that are publicly accessible are outlined in the vehicle access strategy at Appendix 1 and shown on maps 3a and 3b. Key points regarding access include:

- some roads may be sealed for amenity reasons or where the cost to maintain as an unsealed road is unacceptable
- there are few opportunities to build additional roads other than short spur roads to recreation sites
- four-wheel-drive only access will be maintained in some parts of the planning area, to preserve remote qualities
- coastal end-point destinations, including access to beaches, will be provided via spur roads, with parallel access tracks along the coast closed and rehabilitated
- wherever possible, vehicles will be separated from walkers, particularly on the Cape to Cape Track.

Management access is required on tracks that are not open to the public. In some instances, public vehicle access on management-only tracks may be allowed in accordance with permit conditions. For example, access may be granted to Injidup and Deepdene beaches for commercial salmon fishing, or to apiary sites for beekeeping. Unless stated otherwise by signage, management access tracks are open to non-motorised recreational activities such as walkers and cyclists.

Conflict between vehicles and other visitors (for example walkers, cyclists and horse riders) occurs throughout the planning area on dual or multiple-use tracks. In particular, vehicles access parts of the Cape to Cape Track, such as at Cape Clairault and Boranup Forest. While it is necessary in some instances to minimise environmental impacts by having shared vehicle and recreation tracks, where possible vehicle access will be separated from other types of recreational use.

The planning area is sometimes used for search and rescue training including cave and cliff rescues. A written application must be submitted to the department before any training exercise can be carried out

within the planning area. Guidance for managing emergency service training is provided by departmental Policy Statement 54 – *Defence force training on CALM managed lands and waters* (CALM 1996).

Leeuwin-Naturaliste National Park

Vehicle access to the Leeuwin-Naturaliste coastline will be maintained, but rationalised in accordance with the vehicle access strategy at Appendix 1. Access to and along the coast must be carefully managed to protect key values and those parts of the coastline that are sensitive to erosion, particularly the steep foredune systems.

Leeuwin-Naturaliste National Park is largely underlain by limestone which may be susceptible to subsidence. Hazardous areas have been identified and access, including future track or road development, should consider this risk. This management plan rationalises and limits access in hazardous areas, particularly at Boranup where there are numerous tracks and a high density of caves. Frequent outcroppings of cap rock can make access difficult and damage to fragile cliff tops and headlands does occur. Some parts of the national park are unstable or unsafe for vehicle access.

There are few beaches in Leeuwin-Naturaliste National Park that are suitable for motor vehicle use and much of the coastline contains environmentally sensitive species that are easily displaced or damaged (for example hooded plover). Other factors to consider include visitor safety and visual amenity. Motor vehicles are permitted on the beach at (also see maps 3a and 3b):

- Deepdene Beach, south to Turner Brook
- Boranup Beach, via Reserve Road to 1km north of Hamelin Bay
- Joey's Nose and Kilcarnup Beach (but not Sanky and Stingray bays).

Vehicles on Boranup Beach in Leeuwin-Naturaliste National Park. Photo – Parks and Wildlife

In some instances, vehicles and walkers pass through private property to reach coastal recreation sites in the national park, particularly at Wilyabrup Cliffs. This is not desirable and the department will investigate options to realign tracks to recreation sites or negotiate formal access arrangements with adjoining private landholders. In the case of Wilyabrup Cliffs consideration will be given to repositioning the terminal car park and open the existing (but undeveloped) dedicated road, or negotiate a land swap or purchase with the adjoining landholder. Access through the planning area to private property is not supported and arrangements should be made with local authorities to have road reserves dedicated for this purpose.

Cape Clairault is a popular fishing area that has historically been accessed by four-wheel-drive vehicles from Injidup in the north and Quinninup in the south. Access from the north occurred through private

property (Lot 935) and has been closed at the request of the private landholders. Since its closure, the department has been promoting access to Cape Clairault via the southern end (a four-wheel-drive track off Quinninup Road). This presents a detour to those who have enjoyed accessing the Cape from the north. The condition of the track off Quinninup Road is variable, with sandy sections that are difficult to traverse. As the track heads north to Cape Clairault, it becomes a shared track with the Cape to Cape Track. This is not an ideal situation because of potential visitor conflicts. The presence of a priority-listed ecological community (Rottnest Island tea-tree) to the east of the existing four-wheel-drive and walk track presents an issue for realigning access. The department proposes to maintain public access from the north via Injidup Springs and Cape Clairault roads and improve access from the south to terminus parking nodes. The existing vehicle track that is parallel to the coast will be closed between these two nodes. A separate alignment for the Cape to Cape Track will be provided, utilising sections of the closed vehicle track. Four-wheel-drive access from the south will occur via existing tracks (see maps 3a and 3b). The new alignment will avoid fragmenting significant vegetation complexes and ensure the protection of the priority-listed ecological community.

A road in Ridgelands is proposed under the LNRSPP (from Vidler Road to Cape Naturaliste near Eagle Bay/Bunker Bay). This may facilitate the opportunity to connect a spur road to the coast at Three Bears/ Kabbijgup. Current access to this site is along a boundary alignment to the east of Leeuwin-Naturaliste National Park. Should the Ridgelands road be developed, the department will seek to improve access to Three Bears/Kabbijgup where this is cost effective. This may result in the creation of a new, shorter track, an upgrade from the current level of four-wheel-drive access and closure of the existing track.

Access to public beaches for commercial fishing is permitted under licence in accordance with Policy Statement 51 – *Access for commercial fishing through CALM lands* (CALM 1993). Where appropriate, commercial fishermen may be granted limited access to management only tracks or beaches not normally available for public vehicle access during the salmon season. Requests for such access will be considered on a case-by-case basis.

Providing alternative access through Leeuwin-Naturaliste National Park to coastal settlements is one option being considered by the Government of Western Australia, in regard to community safety in the event of a bushfire. The department will assist State Government agencies and local government authorities to identify options and assess the feasibility of providing secondary access into coastal settlements including Prevelly, Yallingup and Gracetown[18] (see Section 25 *Fire management – Managing fire to protect life and community assets*).

Desired outcome

Rationalise and maintain visitor access to provide for a range of visitor needs while protecting key values.

Management actions

1. Retain the roads and tracks outlined at Appendix 1 and shown on maps 3a and 3b for public vehicle access. For all other department-managed roads in the planning area, close and rehabilitate or provide access for management vehicles only.
2. Require all motor vehicles accessing the planning area (including trail bikes and dune buggies) to stay on established roads or tracks and be registered under the *Road Traffic Act 1974*, unless given written lawful authority by the District Manager.
3. Permit public vehicle access to sections of beach in Leeuwin-Naturaliste National Park at Boranup, Deepdene, Joey's Nose and Kilcarnup.
4. Permit vehicle access to beaches not open to the public for people with disabilities and commercial fishermen on a case-by-case basis subject to the approval of the District Manager.
5. Where possible, separate vehicle use from the Cape to Cape Track and other recreational trails.
6. Consistent with the department's *Disability access and inclusion plan* 2012–2017 (DEC 2012a) review existing and proposed facilities in the planning area to determine the possibility of

18 For more information, see www.parliament.wa.gov.au/Hansard/hansard.nsf/(all)/B1BEBF8A2FDEB5D3482579B10022E297/$file/A38%20S1%2020120223%20All.pdf

encouraging greater access for visitors with disabilities. All major recreation sites in the planning area are proposed to be fully accessible.

7. Modify access as required following the identification of protectable areas, if there is an adverse impact on fragile landforms or if it is deemed no longer required.
8. Allow vehicle access by commercial shore-based fishers to beaches and tracks otherwise closed to public vehicle use by way of a licence. Access will be subject to ongoing monitoring of environmental impacts and user conflicts as well as conditions of use being met.
9. Manage vehicle access to provide adequate off-road parking for standard and long vehicles at Bride and WI-16 caves.

20. Visitor activities

Abseiling and rock climbing

All abseiling and rock climbing in the planning area takes place in Leeuwin-Naturaliste National Park.

Under the CALM Act, abseiling can only occur in designated areas. The following sites are designated for abseiling in Leeuwin-Naturaliste National Park:

- Wilyabrup Cliffs (granite-gneiss)
- WI-16 (limestone)
- Brides Cave (limestone)
- Calgardup Cave (limestone)
- Giants Cave (limestone).

Abseilers at Wilyabrup Cliffs in Leeuwin-Naturaliste National Park. Photo – Margaret River Discovery Co

All abseiling sites receive heavy use, resulting in localised environmental impacts such as soil compaction, erosion and loss of vegetation. At limestone abseiling sites, environmental impacts and potential safety issues necessitate significant site hardening and other remedial actions. Impacts on all sites will be monitored and sites may be relocated or closed if impacts become unacceptable. No additional limestone abseil sites will be designated in the planning area.

Unlike abseiling, rock climbing sites do not need to be designated under the CALM Act. However, there are preferred sites where environmental impacts and risk to visitor safety are considered manageable. These sites include:

- Wilyabrup Cliffs (granite-gneiss)
- Cosy Corner (granite-gneiss)
- Moses Rock (granite-gneiss)
- Bob's Hollow (limestone).

Climbing on limestone cliffs is a concern for visitor safety, environmental impact and maintenance reasons. Bob's Hollow is a limestone sea cliff that involves steep technical climbing and hence is limited to experienced climbers. Access to Bob's Hollow is difficult and there is trampling and loss of vegetation at the cliff base, as well as minor visual impacts from bolts and straps. Climbing at Bob's Hollow is permitted at the southern section of the cliff but not encouraged. Retaining four-wheel-drive vehicle access to the site will limit visitor numbers (see Section 19 – *Access*).

Authorised bolts are checked by the department as part of its routine visitor risk management program. The CALM Act Regulations prohibit damage to naturally occurring features, which applies to the unauthorised drilling of bolt holes, gluing bolts, chipping or drilling holds and gluing on holds.

The Climbers' Association of WA (CAWA) has developed two codes of conduct for climbing and bolting respectively[19], which addresses safety, environmental and visual impact considerations. All climbers are required to adhere to these codes of conduct.

Abseiling and rock climbing often occurs as an organised group activity, run by a commercial operator. Operators conducting commercial rock climbing and abseiling must obtain a commercial activity licence, requiring them to meet certain minimum standards of experience and competency in instructors. Organised groups visiting designated sites, as well as recreational abseilers, require a permit under the department's cave and abseil permit system. This system regulates the number of participants/groups and also provides a booking system. Recreational rock climbers do not require a permit.

Vehicle access and parking for groups undertaking abseiling or rock climbing in Leeuwin-Naturaliste National park is inadequate at some sites. Wilyabrup Cliffs is a particular concern, because there is high demand to use the site but no public vehicle access. This issue is addressed in Section 19 – *Access*.

Desired outcome

Provide for abseiling and rock climbing while minimising visitor risk and preventing adverse impacts on key values.

Management actions

1. Manage abseiling and rock climbing according to the cave and abseil permit system, departmental policy and the CALM Act Regulations.
2. Monitor abseil and rock climbing sites with a view to determining sustainable levels of use. Restrictions may be imposed, or the activity modified, if monitoring indicates that there is an unacceptable risk to key values or visitor safety.
3. Provide infrastructure (for example landing areas at rock/cliff bases, gathering areas and take-off ramps) and clearly defined access paths as needed at authorised abseil sites.
4. Remove unauthorised abseil anchors and test and tag authorised glue in anchors as per the relevant Australian Standards.
5. Use signage to alert visitors to the risk of cliff overhangs and rock fall close to climbing and abseil sites.
6. Require climbers to adhere to the CAWA codes of conduct.

Boating

While most boating occurs outside the planning area in Ngari Capes Marine Park and on the Blackwood River, access for boating is often gained through the national parks. In Leeuwin-Naturaliste National Park boat ramps are provided at Canal Rocks and Hamelin Bay, and beach launching is permitted at Kilcarnup. Scott National Park can be accessed by boat at Twinem's Bend and at the Scott River picnic area. Canoes and other non-motorised vessels are launched along the Margaret River and Scott River, although this more commonly occurs outside the planning area.

The boat ramps at Canal Rocks and Hamelin Bay will continue to be maintained by the department. An upgrade is planned for the Hamelin Bay boat ramp, which will increase the site's ability to withstand high levels of use and ensure it is structurally sound. There are alternative boat ramps outside the planning area at Dunsborough, Gracetown, Prevelly and Flinders Bay, as well as ramps into the Hardy Inlet at Molloy Island and Alexandra Bridge.

19 The CAWA code of conduct for climbing can be accessed at www.climberswa.asn.au/cawa/ethics. The code of conduct for bolting and new route development is at www.climberswa.asn.au/cawa/cawa-code-of-bolting-and-new-route-development.

There is a designated waterskiing area on the Blackwood River next to the planning area, 2km north and 1.8km south of Twinem's Bend in Scott National Park. There is a landing area at Twinem's Bend where wave action has resulted in weathering of the timber-retained terraces and subsequent collapse of the riverbank. The site at Twinem's Bend will be maintained and actions undertaken to remediate and stabilise the riverbank.

Canoeing on the Margaret River in Bramley National Park.
Photo – Margaret River Discovery Co

Desired outcome

Facilitate access for boating activities where it is compatible with other recreational activities and the protection of key values.

Management actions

1. Provide access for boating in accordance with departmental policies and other relevant legislation, consistent with the management objectives for Ngari Capes Marine Park.
2. Upgrade the Hamelin Bay boat ramp to improve the site's ability to withstand high levels of use and maintain the Canal Rocks boat ramp at its current capacity.
3. Maintain facilities at Twinem's Bend and remediate damage to the riverbank.
4. Allow beach launching at Kilcarnup, subject to monitoring of impacts on key values and visitor safety.

Bushwalking

There are almost 200km of designated walking tracks in the planning area, all within Leeuwin-Naturaliste and Bramley national parks. The most significant is the Cape to Cape Track however there are also several short walks and loop trails from recreation nodes or town sites. In addition, there are many informal walking opportunities on firebreaks and management access tracks throughout all of the reserves that make up the planning area. Designated walk trails of the planning area are shown in Table 4 and Map 4.

Table 4. Designated walk tracks in the planning area

Walk track	Length (km)	Proposed class
Leeuwin-Naturaliste National Park		
Meekadarabee Falls walk track[#]	2	class 1
Yallingup circuits[Δ]: Wardanup walk track Quenda walk track Torpedo walk track	 5 4 2	class 3
Cape Naturaliste tracks[#]: Whale Lookout walk track Cape Naturaliste loop walk track Bunker Bay loop walk track	 2.4 3.8 3.6	class 3
Turner Spring walk	0.7	

Walk track	Length (km)	Proposed class
Cape to Cape Track *#	135	class 4, except Cape Naturaliste to Sugarloaf Rock, which is class 2 to facilitate access for people with disabilities
Cowaramup Brook walk trail	2	class 4
Calgardup Cave walk trail	0.8	class 4
'Caves' trail between WI 16, Giants and Bride caves	2	class 4
Hamelin Bay walk track		class 4
Bramley National Park		
Ten Mile Brook track# (dual use)	15 (return) additional loops 4.7	class 2
Carters Road trails: Big Brook walk track Old Chimney walk track Pine Tree trail	 3.4 2.7 1.7	class 3

Note: The class of each walk track is based on the track classification system outlined in Policy statement 18-Recreation, tourism and visitor services (DEC 2006b).

* Overnight stay required.

Universal access. See Map 4 for sections of tracks that are available for universal access.

Δ These tracks are from the Yallingup town site and traverse land managed by the City of Busselton. They have been developed in conjunction with the Land Conservation District Committee at Yallingup.

Management of bushwalking will focus on existing walk trails, including maintenance to the appropriate Australian Standard for track classification and signposting. Management will concentrate on the Cape to Cape Track although opportunities will be investigated to develop and maintain walk trails (up to several hours in duration) from major recreation sites and interpretation nodes. Priority will be given to the development of self-guided and loop walks along major tourist routes or linking visitor nodes (for example linking cave and abseil sites). Walk trails providing different levels of accessibility and expertise, including universal access for visitors with disabilities, will continue to be important.

Opportunities to enhance the existing trail network have been identified, including:

- complete the 'caves' walk trail incorporating Bride Cave, Giant's Cave, WI-16, Golgotha Cave and the kiosk at Lake Cave
- trails at Conto Campground that link to the beach and stabilise beach access
- additional walk trails in Boranup Forest
- interpretive trails at Hamelin Bay using existing short and long loops encircling the caravan park.

The Rails to Trails track is outside the planning area (see Map 4), but has the potential to impact on natural values where it transects national park tenure at Boranup, Bramley and Yelverton. The department will maintain involvement with local government and the National Trust (WA) to ensure cross-boundary management issues are addressed and impacts on key values are avoided.

Other walk and cycle trails are available around Margaret River outside the planning area.[20] One of these trails, the Busselton-Augusta Heritage Trail, passes through Reserve 46400, which supports the critically endangered white-bellied frog. If at any stage the trail is to be upgraded, consideration should be given to realigning the trail to minimise any potential impacts on frog habitat.

20 Walk and cycle trails around the Margaret River area are provided by the Shire of Augusta-Margaret River such as the Margaret River Heritage trails, which comprise three short walks from Rotary Park; the Busselton-Augusta heritage trail and the Prevelly cycle/walk trail.

Cape to Cape Track

The Cape to Cape Track is the premier walk trail along the Leeuwin-Naturaliste coastline, winding 135km from Cape Naturaliste to Cape Leeuwin. The track takes five to seven days to walk and is one of only two long distance walk tracks in the south-west of WA. To the north, a 3.5km section of the track from Cape Naturaliste to Sugarloaf Rock has been developed to a higher standard to accommodate disabled and elderly visitors and higher visitor use. To the south, the track will remain less developed to maintain a more remote experience.

The Cape to Cape Track crosses the Margaret River where it meets the ocean, and when the river mouth is open in winter and spring, it can be difficult and dangerous to cross. An alternative route is available, although it is a detour of about 10km. Options are being considered in consultation with the Friends of the Cape to Cape Track to facilitate a safe crossing during the wetter months. Other brook and creek systems along the track may also be impassable during the winter months (for example Wilyabrup Brook and Gunyulgup Brook). In these cases, the department will investigate options to facilitate access.

Walkers enjoying the Cape to Cape Track. Photo – Augusta-Margaret River Tourism Association

At Quarry Bay, there are five occurrences of the Augusta microbial TEC that lie within the path of the Cape to Cape Track. Of particular concern are narrow beach sections of the track where it is possible for walkers to tread directly on active parts of the community. There are several options to facilitate walkers while protecting the TEC, such as realigning part of the track and educating visitors about the need to keep to defined paths. A key consideration for any future works is to ensure water flow and quality is not affected, which the TEC depends on for survival.

A major issue for the Cape to Cape Track is preventing conflict between walkers and four-wheel-drive vehicles using the track, especially between Cape Clairault and Quinninup, Redgate and Bob's Hollow and at Boranup Forest. Wherever possible, the two activities will be separated with priority given to walkers. Another concern is maintaining access where the track traverses other tenures, which occurs at most of the coastal settlements. The department will liaise with local government authorities and the Friends of the Cape to Cape Track to ensure complementary management of the track across tenures.

A strategic plan is being developed by the department for the Cape to Cape Track. This plan will guide the sustainable management and future development of the track and will be informed by this management plan and the recreational masterplan (see Section 17 – *Planning for visitor use*).

Desired outcome

Maintain and enhance the trail network to provide a range of bushwalking experiences while not adversely impacting on key values.

Management actions

1. Maintain the network of walk trails indicated on Map 4 and develop these to the class indicated in Table 4. Inappropriately located or unauthorised walk trails will be relocated, or closed and rehabilitated.
2. Expand the 'caves' loop trail and investigate other opportunities to expand the existing trail network in the planning area.

3. Investigate options to provide safe crossings of the Margaret River and other minor watercourses in consultation with the Friends of the Cape to Cape Track.
4. Protect the Augusta microbial TEC where it coincides with the Cape to Cape Track.
5. Liaise with local government and the Friends of the Cape to Cape Track to ensure complementary management of the track where it traverses other tenures.
6. Ensure the more remote southern sections of the Cape to Cape Track have minimal infrastructure.
7. Where possible, separate walkers and four-wheel-drive users on the Cape to Cape Track, with priority given to walkers.
8. Provide up-to-date track information (especially at Cape Naturaliste and Cape Leeuwin lighthouses) and publicise walk trails by marking them on park literature.
9. Develop and implement a strategic plan for the Cape to Cape Track.
10. Maintain involvement with the National Trust (WA) and local government in the planning and development of the Rails to Trails track where it transects the planning area.

Caving

The values and sensitivity of karst features (see sections 12 – *Physical environment* and 13 – *Biological environment*) and safety issues associated with caving mean that visitor use must be carefully managed. The focus will be on site management and direct regulation of use, primarily through controlling cave access.

Access to caves is managed in accordance with the department's cave management classification system outlined in Policy Statement 18 – *Recreation, tourism and visitor services* (DEC 2006b) and is also consistent with Policy Statement 80 – *Protection and management of caves and karst* (Parks and Wildlife 2014a). There are four categories of caves ranging from 'tourist cave' to 'restricted access'. Unless classified otherwise, all caves are considered 'restricted access' until an assessment has been made of the values and level of risk.

The use of 'adventure' and 'restricted access' caves is facilitated through the department's cave and abseil permit system which monitors impacts and controls visitor numbers[21] to maintain cave values and visitor experience. Impacts are monitored on a priority basis at all caves open to visitation, guided or self-guided. Monitoring is also required to identify illegal visitation to restricted caves. The visitor impact monitoring program for caves open to visitation will continue with input from karst management specialists, including volunteers who can help with condition monitoring.

There are measures that will continue to be used to manage the use of popular caves, including:

- liaison with the Caves Management Advisory Committee (CMAC), speleological groups and speleologists
- implementation of the cave and abseil permit system
- gating of cave entrances
- installation of track marking
- provision of cave leadership training through the Cave Leader Accreditation program
- location of cave management staff onsite at Calgardup Cave to provide information and manage the permit system. Facilities at Calgardup and Giants caves have arrested significant site impacts and improved visitor experience.

21 Visitor numbers are determined by the physical form of the cave, its size, values and past history and the number of visitors that can be supervised by accredited leaders. Visitation limits may also vary from cave to cave depending on specific management objectives.

Site management is required at the more popular caves to control erosion and compaction (in the cave and at cave entrances), the accidental breakage of speleothems and to minimise damage to surface vegetation. The protection of vegetation around cave entrances is important in preventing run-off and slowing water flow into the caves, which may then lead to detrimental impacts on sensitive cave fauna and flora species, and speleological values.

In some cases the provision of boardwalks and defined pathways, appropriate parking, re-routing of track markers or other appropriate infrastructure (steps, ramps, safety rails, seating) is required. Access to caves may need to be restricted if acceptable solutions cannot be identified and the department may close or otherwise restrict public use where such use is resulting in unacceptable damage to caves, speleothems or cave flora and fauna.

Giants Cave in Leeuwin-Naturaliste National Park.
Photo – Parks and Wildlife

Desired outcome

Provide a range of caving opportunities in Leeuwin-Naturaliste National Park.

Objective

Allow caving where impacts on key values can be managed.

Management actions

1. In consultation with CMAC and caving groups, classify and manage caves according to the department's cave management classification system.
2. Allow public access to caves of the planning area through the cave and abseil permit system. Public use may be prohibited or otherwise restricted where such use is resulting in unacceptable damage to caves (for example to cave speleothems or cave flora and fauna).
3. Provide pedestrian trails and other basic infrastructure where there are safety concerns or a significant risk of erosion and compaction.
4. Track mark all 'adventure' caves and some restricted access caves.
5. Require all visitors and staff to adhere to the department's caving code of practice when accessing the caves of the planning area.
6. Implement a visitor impact monitoring program for all caves open to visitation.
7. Provide interpretive information, above and below ground, to enhance visitor experience and to increase awareness of cave values, conservation efforts and safety requirements.
8. With assistance from speleological groups and individuals, maintain a confidential and up-to-date inventory of all caves and major karst features to protect them from access by unauthorised visitors.

9. Work with other stakeholders to ensure the most efficient cave management practices are in place.

Key performance indicator

Performance measure	Target	Reporting requirement
Vegetation around 'tourism' and 'adventure class 1' caves	No increase in the area of devegetation around 'tourism' and 'adventure class 1' cave entrances	Every five years
Damage to speleological features, cave flora or fauna in caves where restricted use permits apply	In caves where restricted use permits apply, no damage to speleological features, cave flora or fauna attributable to caving activities.	Every five years

Cycling

The planning area, in particular Bramley and Leeuwin-Naturaliste national parks, are popular for mountain biking. Provided cycling is confined to roads and trails that are appropriately located, designed and maintained, impacts on key values can be minimised.

The CALM Act Regulations and Policy Statement – 18 *Recreation, tourism and visitor services (2006b)* stipulate how cycling is to be provided for and managed on department-managed land. In the planning area, cycling is permitted on public roads, vehicle tracks and shared paths.

Cyclists on Ten Mile Brook Track in Bramley National Park. Photo – Augusta-Margaret River Tourism Association

A working group consisting of representatives from the department, the Department of Sport and Recreation, WestCycle, local government and mountain bike groups will develop a south-west masterplan for mountain biking, which includes the planning area. This master plan will be informed by the *State mountain bike strategy* (in preparation) and the accompanying sustainability framework for trail development in WA. It is anticipated that the Margaret River town site and Bramley National Park will be identified as a trail hub in the masterplan. Any sites proposed for trail development will be subject to an assessment of impacts on natural, cultural and heritage values. Consideration will also be given to the pre-existing and potential use of the area for other recreational activities. Should suitable sites be identified within the planning area for designated mountain biking trails, the department will work with stakeholders including local riding groups to undertake site-specific planning and development that includes identifying external funding opportunities.

Until the masterplan is finalised, mountain biking can continue at sites within the planning area that have a pre-existing use, subject to no new trails or structures being built. Should the masterplan determine these sites as being unsustainable, the activity will be phased out while alternative sites are developed.

The department will continue to monitor the impacts of cycling and the development of unauthorised trails. Should the impacts on natural, cultural or heritage values be deemed to be immediately unacceptable or a risk to visitor safety is identified, trails may be closed without notice. The department will communicate the reasons for trail closures with riders.

Desired outcome

The planning area provides a range of sustainable cycling opportunities that have minimal impact on key values.

Management actions

1. Permit cycling on public roads, vehicle tracks and shared paths in the planning area. Shared paths will be signposted accordingly.
2. Liaise with the Department of Sport and Recreation, local government and mountain bike groups to develop a mountain biking masterplan for the south-west of WA, including the planning area. The masterplan will identify sites within the planning area where designated trails may be developed.
3. Should sites in the planning area be identified for designated mountain biking trails, liaise with stakeholders including local riding groups to undertake site-specific planning and development, including identification of external funding opportunities.
4. Until the masterplan is finalised allow for mountain biking at sites with a pre-existing use, subject to no new trails or structures being built.
5. Monitor the impacts of cycling and modify or restrict the activity if impacts on natural, cultural or heritage values become unacceptable or a significant risk to visitor safety is identified.

Day use

There are around 70 day-use sites in the planning area, most of which are located in Leeuwin-Naturaliste and Bramley national parks (see Table 5 and maps 5a and 5b). Given the number of day-use sites already in the planning area, management will focus on improving existing sites rather than developing new sites.

Table 5. Day-use sites in the planning area

Major[1]	Medium[2]	Minor[3]
Bunker Bay	Big Rock	South Point
Cape Naturaliste	Rusden picnic area	Canal Rocks rotary lookout
Sugarloaf Rock	Kabbijgup/Three Bears	Mitchell Rocks
Canal Rocks	Rabbit Hill (Yallingup)	Cape Clairault
Ellensbrook Homestead	Wyadup	Quinninup Dune
Redgate Beach	Injidup Beach	Quinninup Falls
Calgardup Cave	Moses Rock (northern day-use area)	Bob's Hollow
Hamelin Bay	Gallows	Hooley Road
Cape Leeuwin	Guillotines	North Point (Boranup Beach)
	Cowaramup Bay lookout	Grace Road
	Lefthanders	Foul Bay
	Ellensbrook Beach	Elephant Rock
	Conto Spring	Other Side of the Moon
	Giants Cave	Moses Rock (southern day-use area)
	Boranup day-use site	Wilyabrup Beach
	Cosy Corner	Wilyabrup Cliffs
	Waterwheel	Gnoocardup
	Windmills	Joey's Nose
	Torpedo Rock	Kilcarnup
	Skippy Rock	Redgate North
	Carters Road	Scott River picnic area

Major[1]	Medium[2]	Minor[3]
	Twinem's Bend	Boranup lookout
		Sand Patches
		North Point (Gracetown)
		Merchant Rock
		Round Rock
		The Point
		South Beach
		Quarry Bay
		WI 16
		Bride Cave (WI 24)
		Yallingup Reef car park
		Unnamed sites

[1] Major day-use areas comprise, or can be developed to include, more than 30 individual car bays and may provide boat access and parking for long turning vehicles.
[2] Medium day-use areas comprise up to 30 individual car bays and may provide boat access.
[3] Minor day-use areas comprise up to 15 individual car bays.

There are several management issues associated with the range and number of day-use sites, including:

- congestion and overcrowding in peak periods
- visitor numbers exceeding site capacity in many instances
- access to sites through other land tenures
- because of changing visitor use or visitor demographics, site design and facilities in some areas are no longer appropriate
- ageing facilities and in some cases a lack of facilities to meet current and predicted needs
- inappropriate site use (for example unauthorised camping) and vandalism
- visitor safety at some sites
- visitor impacts on natural and cultural values as well as impacts on visual landscape quality.

The recreation masterplan being prepared for the planning area (see Section 17 – *Planning for visitor use*) will address many of the issues identified above by assessing site capacity and identifying development opportunities. The department will liaise with local government, community groups and other stakeholders to identify opportunities to improve existing facilities and provide additional facilities outside the planning area.

Boranup Lookout, a day-use site in Leeuwin-Naturaliste National Park. Photo – Parks and Wildlife

Desired outcome

Visitors are able to enjoy a range of day-use sites throughout the planning area that prevent impacts on key values.

Management actions

1. Focus on improving the quality of existing sites listed in Table 5 to enhance site capability and meet increased/changing visitor expectations.
2. Prioritise site redevelopment according to the level of threat to key values and visitor risk.

3. Liaise with local government authorities, community groups and other stakeholders to identify opportunities to improve existing day-use sites and develop additional sites next to the planning area.

Domestic animals (dogs and cats)

Under the CALM Act, dogs are prohibited in national parks, conservation parks and nature reserves unless a specific area has been designated for the activity. The exceptions are guide dogs and special cases determined by the department (for example specially trained animals for management, search and rescue, or security purposes). In these circumstances dogs are permitted in all areas.

In accordance with the CALM Act Regulations, dog exercise areas will be advertised through signage. In any dog exercise area, dogs must be kept on a leash at all times and faeces must be removed by the owner. Visitors must comply with the *Dog Act 1976*.

Dog exercise areas will be designated in Bramley National Park on existing tracks and firebreaks around the Margaret River town site. Dogs may be permitted in inland parts of Leeuwin-Naturaliste National Park, however dogs will not be permitted on beaches because the impact on key natural values and risk to park visitors is considered unacceptable. Also, there are suitable dog exercise areas on beaches outside but close to the planning area.

In accordance with the CALM Act Regulations, cats are excluded on all land managed by the department.

Desired outcome

Protect native fauna and visitors from the impacts of dogs and cats.

Management actions

1. Prohibit dogs in the planning area except on designated trails, with a focus on Bramley National Park. Guide dogs are permitted at all times and specially trained dogs will be permitted on a case-by-case basis, as determined by the department.
2. Publicise areas where dogs are permitted through signage and other means as appropriate.
3. Provide information explaining departmental policy about allowing dogs on land managed by the department.
4. Prohibit domestic cats from being brought into the planning area.
5. Liaise with local government on providing and advertising alternative dog exercise areas close to the planning area.

Fishing and marroning

Shore-based fishing is a popular recreational activity in Ngari Capes Marine Park, next to Leeuwin-Naturaliste National Park. Inland, fishing mainly occurs in the Blackwood River and Hardy Inlet. In general, fishing occurs outside the planning area, however access to undertake the activity is through national park tenure (see Section 19 – *Access*).

While shore-based fishing is an important recreational activity, uncontrolled access by vehicles and pedestrians can lead to littering, vegetation loss, soil compaction and erosion of fragile coastal and riverine areas. A major issue with salmon fishing is the denuding of dune vegetation caused by fishers driving off-road and along the beach. At peak times, car parks (formal and informal) become congested and are sometimes used as overnight camp sites, causing conflicts with other visitors and site degradation. Semi-remote fishing that attracts anglers to minor coastal recreation sites can also become a problem because of inadequate facilities. In areas of high visitation, appropriate site design is needed to manage demand. These issues will be addressed in the recreation masterplan (see Section 17 – *Planning for visitor use*).

In the planning area the most popular sites for marroning are along the Blackwood and Margaret rivers in Forest Grove and Bramley national parks as well as Reserve 46400. Marroning can detrimentally impact the natural environment, particularly through the loss of riparian vegetation at riverbank locations and the creation of informal paths to the river. This is particularly evident along the Margaret River during marron season.

Desired outcome

The impacts of fishing and marroning are minimised.

Management actions

1. Liaise with the Department of Fisheries to monitor the impacts of marroning and restrict access where impacts become unacceptable.

Horseriding

Recreational horseriding is permitted in the planning area where impacts are manageable and where the activity does not impact on key values. Under the CALM Act Regulations, tracks and trails available for horseriding will be signposted, with signs including details of conditions of entry.

Recreational horseriding will be permitted on designated tracks within the zones shown on maps 5a and 5b at Yallingup, Gracetown and Boranup in Leeuwin-Naturaliste National Park as well as within zones in Bramley National Park. Horseriding in Boranup will be permitted on the west side of Caves Road to protect habitat of the critically endangered white-bellied frog that occurs on the eastern side of the road. Tracks will be designated in consultation with riders and signposted accordingly. Other areas may be designated for horseriding, however the focus will be on the zones outlined above.

In designating tracks for recreational horseriding, consideration needs to be given to:

- the location of species of conservation significance and TEC's, as well as habitat for species of conservation significance (for example white-bellied frog)
- the environmental sensitivity of the area and its ability to sustain the activity, including the potential to spread weeds or disease
- the location of Aboriginal heritage sites and other sites of importance to Noongar people
- the current and potential use of the area for other recreational activities
- access for vehicles and horse floats.

Recreational horseriding on beaches in the planning area is not permitted, however consideration will be given to locations where the impacts can be managed. There are no suitable beaches in the planning area where horses can be driven in, so access will be gained from riding in from locations inland. Particular consideration needs to be given to damage caused by riding horses through dunes to access the beach and potential impacts on nesting sites for migratory and breeding shorebirds.

The level and intensity of horseriding will be monitored and the department may relocate or close designated tracks at any time should the impacts on natural, cultural or heritage values be found to be unacceptable or a risk to visitor safety identified. The reasons for track closures will be communicated to riders. Any tracks designated for horseriding may be available for other recreational activities.

The training and exercising of racehorses is considered a commercial activity undertaken for private financial benefit, which provides limited or no benefit to the park or park users. Therefore the training and exercising of commercial racehorses will not be permitted in the planning area.

Desired outcome

Provide opportunities for horseriding where the environment can sustain its long-term use and where

there are no impacts on key values.

Management actions

1. In consultation with horse riders, permit horseriding on designated trails in the zones shown on maps 5a and 5b. Trails may be designated in other areas however the zones will be the focus for recreational horseriding in the planning area.
2. Monitor the impacts of recreational horseriding and relocate or close designated trails where they present a risk to key values or visitor safety.
3. Investigate opportunities to designate selected beaches for horseriding.
4. Publicise designated horseriding trails through signage and other means as appropriate. Signage will include details of conditions of entry.
5. Prohibit the training and exercising of commercial racehorses in the planning area.

Overnight stays

There are three vehicle-based campgrounds in the planning area (Conto, Point Road and Boranup campgrounds) all in Leeuwin-Naturaliste National Park. There are also five walk-in camp sites along the Cape to Cape Track, as well as commercially operated campgrounds at Hamelin Bay Caravan Park and Wharncliffe Mill. Table 6 and maps 5a and 5b show the department-managed campgrounds in the planning area.

Table 6. Department-managed campgrounds in the planning area

Major[1]	Medium[2]	Minor[3]
Conto Campground	Boranup Campground	Point Road Campground Camp sites along the Cape to Cape Track

[1] Major camping areas comprise more than 20 individual sites and may also include additional group camping sites, where up to 25 people can be accommodated on a single site.
[2] Medium camping areas comprise up to 20 individual sites.
[3] Minor camping areas comprise up to 10 individual sites.

All sites are popular and operate at capacity during peak periods. The main camping area is Conto Campground which has 110 sites (including group sites) and highly developed facilities. Point Road and Boranup campgrounds are small and basic with 10 and six sites respectively. Vehicle-based camping facilities will not be provided in the northern part of the park because of the availability of privately run caravan and camping facilities in the area and a lack of suitable sites.

The combination of physical site capacity, a desire to maintain natural visitor experiences and the capacity of the department to manage existing sites dictate that the overall capacity for camping facilities in the planning area is reached. To this end, the department will focus on improving or relocating existing camp grounds before developing new sites.

The facilities at Point Road require upgrading, because poor design and usage issues are contributing to site degradation. For example, soil compaction caused by vehicles has resulted in the decline of several peppermint trees. The site will be redesigned, including the realignment of Point Road to bypass the camping bays.

Boranup Campground will be relocated to a more approriate location within the Boranup Forest area. Factors that make the current site less suitable include its small size[22], the proximity to traffic along Boranup Drive and the distance from primary recreation activities (caving, abseiling and walking). These factors will be taken into consideration when choosing a new and more suitable site.

22 The capacity of the Boranup Forest camp site is limited because of the physical and environmental characteristics of the site such as the slope, soils, aspect and vegetation types. These factors are the primary reasons for its small size.

Conto Campground is a popular site for camping in the planning area. Photo – Parks and Wildlife

Opportunities for camping are provided for walkers of the Cape to Cape Track at Mt Duckworth, Moses Rock, Ellensbrook, Point Road and Deepdene. There is no formal camp site between Point Road and Hamelin Bay and camping is ad hoc. To bridge this distance, an additional walk-in camp site may be developed.

Remote camping refers to camp sites where facilities are generally not provided and which may only be accessible by foot. In Boranup Forest and other locations in Leeuwin-Naturaliste National Park, remote camping occurs regularly. Remote camping is primarily undertaken by commercial operators and non-commercial groups, who provide a range of outdoor and environmental education programs associated with activities such as caving, rock climbing, abseiling and walking.

Remote camping can have low environmental impacts, especially if bushcare ethics are followed (for example Leave No Trace). However, sites may not be located in the most environmentally or culturally appropriate areas, and consequently are not sustainable. Left unmanaged, such sites can have high environmental impacts and may pose a safety risk to visitors. Clearing of vegetation to accommodate camping, the lack of formal facilities, and pollution emanating from general rubbish and toilet waste are common problems experienced at remote camp sites. The impacts of this activity are exacerbated when unmanaged groups are involved. Even for managed groups, there is a requirement for the department to monitor such use.

Consistent with the CALM Act Regulations, remote camping is permitted by commercial operators and other groups in Leeuwin-Naturaliste National Park by way of lawful authority. The regulations enable approval for camping in areas that do not have designated camp sites. Approval may be given for a specified period and will be subject to strict conditions. Restrictions on group size and the frequency of use may apply.

Areas for remote camping will be selected based on the following criteria:

- capacity to cope with the predicted use
- protection of natural, cultural and heritage values
- risk to water quality
- conflicts with other recreational users
- maintenance of visitor safety.

The frequency and number of large groups camping in Leeuwin-Naturaliste National Park is increasing to the detriment of the natural values of the national park and the enjoyment of other park users, particularly on the Cape to Cape Track. In consultation with commercial operators and other stakeholders, the department will establish limits on the number of groups and the number of participants within a group that can camp at particular sites in the planning area at any one time.

Unauthorised camping in non-designated areas occurs throughout the planning area, particularly in coastal car parks. Under the CALM Act Regulations, camping without lawful authority is prohibited in non-designated areas.

Desired outcome

Provide appropriately designed camping opportunities that minimise environmental and other impacts and conflicts between users.

Management actions

1. Permit camping in the designated sites shown on maps 5a and 5b and improve sites according to visitor needs and to manage impacts on key values.
2. Reduce environmental impacts such as soil disturbance and tree decline by realigning Point Road to bypass the camp site.
3. Develop a new and more suitable campground in the Boranup Forest area to replace the current Boranup Campground.
4. Give consideration to developing an additional walk-in camp site on the Cape to Cape Track between Point Road and Hamelin Bay.
5. Allow remote camping in the planning area by way of lawful authority under the CALM Act Regulations.
6. In consultation with commercial operators and other stakeholders, establish limits on the number of groups and numbers within a group that can use a particular camp site at any one time, particularly along the Cape to Cape Track.
7. Monitor visitor impacts at all camping areas and adapt management as required.

Paragliding and hang-gliding

There are three sites along the coast in Leeuwin-Naturaliste National Park that are used for gliding, at Rabbit Hill, Conto Cliff and Injidup Beach. Site improvement works may be required at Conto Cliff and Rabbit Hill to improve access and site sustainability.

The department will liaise with hang-gliding and paragliding groups to investigate opportunities to upgrade existing sites. As demand for the activity is low, no new sites will be developed in the planning area.

Desired outcome

Allow safe flights over the planning area without adversely impacting on the key values and other park visitors.

Management actions

1. Allow paragliding and hang-gliding at Conto Cliff, Rabbit Hill and Injidup Beach in Leeuwin-Naturaliste National Park.
2. Liaise with paragliding and hang-gliding groups to formalise the launch sites at Conto Cliff and Rabbit Hill to ensure they remain sustainable in the long term.

Sand boarding

The sensitivity of the Leeuwin-Naturaliste coastline means there are no suitable sand boarding sites in the planning area. The activity itself plus the ascent of the dune is destructive on vegetation and can be expensive to rehabilitate. Sand boarding occurs in Leeuwin-Naturaliste National Park, mostly at the blowout at Injidup Point, which was originally caused by wind erosion. Rehabilitation has been initiated at the site although grazing by rabbits and trampling by recreational use have hampered these efforts.

Desired outcome

Protect dune systems from the impacts of sand boarding.

Management actions

1. Prohibit sand boarding within the planning area.
2. Provide information explaining why sand boarding is prohibited.

Surfing and swimming

Surfing and swimming opportunities that are available along the Leeuwin-Naturaliste coastline are a primary attraction to the region. While these activities occur in the adjacent Ngari Capes Marine Park, access points and facilities are located within the planning area and consequently it is appropriate that the activity is considered in this plan.

As visitor pressures increase at many sites, the need for defined access paths, provision of facilities (for example toilets and additional lookouts) and adequate parking at surfing sites as a means of preventing environmental degradation is growing. Rationalising the provision of these facilities is required and will be addressed in the recreation masterplan (see Section 17 – *Planning for visitor use*).

Sheltered, white sandy beaches and protected bays along the Leeuwin-Naturaliste coastline provide excellent swimming opportunities. Bunker Bay, Yallingup Lagoon, Injidup Beach, Gracetown, Kilcarnup, Prevelly, Gnarabup, Redgate (north and south), Hamelin Bay, Cosy Corner, Quarry Bay and Flinders Bay are particularly popular. Swimming is also popular in the Margaret River.

There are some beaches that are not appropriate for swimming because of large swells, rips and difficult conditions. Warning signs are in place in these locations to inform visitors of the risks. Overcrowding and car park congestion at some swimming areas is also a concern during peak periods.

Swimming is prohibited in the Ten Mile Brook reservoir protection zone, which surrounds the reservoir, and is only permitted at designated sites within the catchment (upstream of the dam). Swimming is allowed where the Margaret River foreshore adjoins farmland.

Desired outcome

Facilitate access for surfing and swimming where the impacts are manageable and the risk to public health and visitor safety is acceptable.

Management actions

1. Maintain the number of recreation sites that facilitate surfing and swimming.
2. Provide appropriate facilities at surfing and swimming sites, particularly where competitive surfing events take place.
3. Channel pedestrian traffic at surfing sites by providing defined access paths where appropriate.
4. Provide information to visitors about the environmental impacts and safety risks associated with surfing and swimming.

21. Information, interpretation and education

Information about the planning area is available through park signage, print media, the department's website, social media and park rangers. Information is also widely available from many external sources including tour operators and the tourism industry. The delivery of consistent and accurate information is important and the department provides advice, resources and training to tour operators and other information providers to help them reinforce the department's messages to visitors. It is a requirement for tour operators to actively promote the values of the planning area which are the subject of their operations

and to attend training workshops if requested. The department will incorporate these requirements into future commercial lease agreements at major sites (for example at the lighthouses and Hamelin Bay).

Interpretation will focus on three primary themes:

- *Landscapes* – explore a landscape of ancient granites, overlain by limestone and sculpted by rivers, creeks, subterranean waters and coastal processes
- *Seascapes* – discover a varied seascape of granites interspersed with sandy bays and beaches of seagrasses, limestone reefs and associated marine life
- *Peoples* – learn about Noongar culture and heritage. Wonder at the evidence of Dutch, French and English exploration through to colonial settlement and contemporary land use.

The diversity and number of recreation sites in the planning area provides many opportunities to experience these primary themes. The planning area has been divided into interpretive zones and the interpretation of primary themes will be displayed at the more developed sites within and next to the planning area (see Table 7).

Table 7. Primary interpretive themes expressed at specific sites

Primary theme	Interpretive zone	Major sites for interpretation
Landscapes • granite outcrops • limestone and karst features of the Leeuwin-Naturaliste Ridge • caves • rivers, creeks and springs • jarrah, marri and karri forest	The valley and jarrah forest	Margaret River town site* Prevelly Park* Rusden Picnic Area
	The caves	CaveWorks* Conto Campground Calgardup, Mammoth*, Lake*, Jewel* and Ngilgi* caves
	Blackwood River	Augusta*
Seascapes • granite, algae and kelp • limestone features • sandy bays and seagrass • reefs and corals • islands	The bay The surf and coastal processes The oceans, including islands	Cape Naturaliste Canal Rocks, Yallingup* Cape Leeuwin (including the waterwheel) Hamelin Bay Augusta*
Peoples • Noongar (traditional, historic, contemporary) • exploration (marine and land) • colonial history • contemporary land use and lifestyles • the people of today	The people	• Wardandi Cultural Centre* • Ellensbrook Homestead • Gracetown* • Margaret River town site*
	The karri forest	• Hamelin Bay • Boranup Forest (proposed new day-use site)

* The site is outside the planning area. Interpretation will be encouraged to be consistent with the messages being delivered within the planning area.

Mass tourism requires the development of facilities and services that can overwhelm local uses and the local experience, including special interests such as surfing, fishing, boating and caving. These activities are usually undertaken in less developed settings and are not promoted at major sites to ensure they remain sustainable in meeting the niche market. Such sites will primarily be free of interpretive signage and provide only essential information for visitor safety and environmental management purposes. Personal communication with special interest and local visitors can direct them to the right place for a particular activity.

Educating the public is key to protecting nesting shorebird species such as Hooded Plover. Photo – Parks and Wildlife

Guided interpretive experiences are occasionally conducted by department staff as resources allow or special needs arise. They are also provided by commercial tour operators with guides, community groups and other agencies.

Desired outcome

Promote community awareness and appreciation of key values and generate support for management activities.

Management actions

1. Provide information to visitors on the key values and issues relevant to the planning area, such as visitor safety, wildlife interactions and appropriate activities and visitor behaviour.
2. Interpret the primary themes of the planning area at the sites shown in Table 7.
3. Encourage interpretation outside the planning area to be consistent with the themes in this management plan.
4. Consider interpretation along trails where appropriate to the track class.
5. Ensure that the tourism industry has relevant and factual interpretive material by developing a local tourism industry network and providing professional development and training opportunities.
6. Incorporate the promotion of key values into future commercial lease agreements at major interpretive sites.
7. Develop, or continue to provide, facilities for tour guides at Conto Campground, Cape Leeuwin and Cape Naturaliste lighthouses, Calgardup Cave and Ellensbrook.
8. Consult with the Director of the Geological Survey of WA in compiling interpretive geological information.

22. Special events

Requests are often made to undertake special events in the planning area. Generally these involve large groups of people who require suitable access and adequate facilities, such as parking and toilets. Applications for special events will be assessed on a case-by-case basis and may be permitted in the planning area subject to approval from the department and other relevant authorities, consistent with policy statements 18 – *Recreation, tourism and visitor services* (DEC 2006b) and 68 – *Management of events and organised group activities* (Parks and Wildlife 2014d).

If an event is considered a commercial operation, a commercial operations licence is required. This requires consultation with the Conservation Commission and approval by the Minister for Environment. Proponents seeking to hold events in the planning area should allow sufficient time for this consultation to occur. Events should use existing facilities, roads and tracks.

At the completion of an event, proponents are required to remove any temporary fixtures or facilities, rehabilitate disturbed areas and remove signage.

Desired outcome

Allow for special events in the planning area so long as impacts on key values can be managed and conflict avoided with other park users.

Management actions

1. Assess special events on a case-by-case basis and permit them where the event is consistent with departmental policy.
2. Where events are considered to be a commercial operation, require that a commercial operator's licence is obtained.
3. Require event proponents to remove any temporary fixtures or facilities constructed for the event, rehabilitate disturbed areas and remove any signage.
4. Audit and assess events on their completion to help with future management.

23. Commercial operations

Commercial concessions help meet the demand for high quality recreation and tourism facilities and services, while providing financial contributions that help with the costs of managing the resource. A commercial concession is a right granted by way of a lease or licence and Policy Statement 18 – *Recreation, tourism and visitor services* (DEC 2006b) governs conditions for commercial concessions. All commercial concessions require approval by the Minister for Environment.

Leases

There are nine leases in the planning area, all within Leeuwin-Naturaliste National Park (see Table 8).

Table 8. Leases in the planning area

Lease No.*	Lessee	Purpose
1866/100	National Trust Fund of Australia (WA)	Warden's residence, Ellensbrook
2208/100	Hamelin Bay Resort Pty Ltd	Caravan park, chalet
1915/100	Shire of Augusta-Margaret River, WA Police, Department of Fire and Emergency Services, Department of Fisheries, St John Ambulance and the department. This is a jointly owned facility	Communications site
2047/100	Telstra Corporation Ltd	Mobile communications
2099/100	Optus Communications Pty Ltd	Communication site, equipment hut
2194/100	Augusta-Margaret River Tourism Association Inc.	Development and operation of the Cape Leeuwin Lighthouse Precinct
2196/100	Geographe Bay Tourism Association	Development and operation of the Cape Naturaliste Lighthouse Precinct
2098/100	Vodaphone Network Pty Ltd	Equipment hut
2398/100	Synergise Pty Ltd (Wharncliffe Mill)	Operate Wharncliffe mill for tourism services

* A licence associated with facilities at Cape Leeuwin has also been issued for the operation of a hydroacoustic station.

The Cape Naturaliste and Cape Leeuwin lighthouses are part of Leeuwin-Naturaliste National Park and the Foul Bay Lighthouse is vested with the Conservation Commission as a CALM Act section 5(1)(h) reserve. The properties are leased back to the Australian Maritime Safety Authority to permit continued operation of lighthouse facilities. Under the lease back arrangements, the Authority issued a licence to the department's Director General to conduct commercial tours of the Cape Naturaliste and Cape Leeuwin lighthouses. The department has granted sub-licences to the Geographe Bay Tourism Association and

Augusta-Margaret River Tourism Association respectively to undertake this activity. Each association also has a lease to develop and operate the lighthouse precincts (for example the cottages and buildings), which are located near each lighthouse but outside the lease back areas. These areas are to be developed as accommodation and/or tourism facilities. Under the lease, each Association is required to upgrade the lighthouse according to Building Code of Australia standards. The department expects that the current management arrangement in the lighthouse precincts will continue.

There are two huts in Boranup Forest used by speleological groups, which are managed under an interim tenancy agreement. The department recognises the invaluable work and research undertaken by speleological groups and encourages this to continue. The huts do not meet relevant Australian standards for design and the facilities need upgrading. The department will liaise with the speleological groups to formalise lease arrangements for the huts that includes a requirement to ensure the huts meet minimum standards, with works and associated costs being met by the groups.

Licences

In accordance with the CALM Act, all tour operators conducting commercial activities on conservation reserves are required to obtain a licence. This enables the department to monitor and regulate access and use of lands and waters under its control, and ensure that the key values of these areas are maintained.

There are 148 operators licensed (T class) to operate in the planning area, although not all use the area. Most operators run vehicle-based tours in Leeuwin-Naturaliste National Park, stopping at developed recreation sites. The most popular activities include bushwalking, camping, mountain biking, canoeing and caving. The *Commercial operator handbook – terrestrial* (DEC 2011a) provides guidance on additional conditions attached to T class licences within Leeuwin-Naturaliste National Park. The handbook also outlines general conditions for tour operators in national parks and conservation parks.

Desired outcome

Extend the range of services and recreational experiences available through the involvement of private enterprise and ensure that commercial tourism activities are compatible with other management objectives.

Management actions

1. Evaluate proposals for licences and commercial tourism leases according to departmental policy.
2. Ensure all commercial operations operate under a lease, licence or permit agreement with appropriate conditions.
3. Liaise with speleological groups using the two huts in Leeuwin-Naturaliste National Park to develop a formal lease arrangement that includes a requirement to upgrade the buildings to meet the relevant Australian Standard.
4. Encourage and provide incentives for tour operators to acquire quality assurance through industry accreditation and qualification programs.

24. Visual landscape

Visual landscape management in the planning area is guided by the department's visual landscape management system, the LNRSPP and, in one instance, the Heritage of Western Australia Act. For adjoining land managed by the department, the provisions of the FMP apply.

The reserves on the Leeuwin-Naturaliste Ridge have significant visual landscape values and the LNRSPP recognised this by identifying the protection of visual landscapes as of paramount importance.

The visual landscape qualities across the planning area have been classed as high, moderate or low, based on criteria of diversity, uniqueness, prominence and naturalness of landform, vegetation and waterform (CALM 1994). Table 9 provides a description of the high and moderate visual landscape qualities.

The view from Boranup Lookout in Leeuwin-Naturaliste National Park. Photo – Parks and Wildlife

Table 9. Visual landscape qualities of the planning area

Landscape type	High visual quality	Moderate visual quality
Landform	Irregular coastline of Leeuwin-Naturaliste National Park, emphasised by distinctive rock outcroppings (e.g. Canal, Sugarloaf Skippy and Gull rocks), steep slopes, bays (e.g. Bunker, Cowaramup and Foul bays), inlets and cliffs (e.g. coastal cliffs south of Moses Rock)	Rounded hills and ridges with some dissection that are surrounded by landforms of a similar nature
	Ridges and dune formations of distinctive height and/or configuration which provide obvious contrast to landform patterns in the surrounding area (e.g. Cape Mentelle Ridge, dune domes at Cosy Corner and dunes north of Redgate Road)	Dune formations of uniform height and configuration
	Limestone features including caves (e.g. Lake and Mammoth caves), dolines and fault lines	Regular coast edges without bays, inlets, promontories or cliffs
	Coastal dunes with steep and irregular slopes or sand blown edges such as Boranup Sand Patch and Injidup Point	Areas of gently sloping land with less distinct drainage patterns
	Coastal landscapes with natural elements (e.g. Capes Hamelin, Leeuwin, Naturaliste, Clairault and Mentelle; promontories at Cosy Corner, Canal Rocks and areas south of Cape Mentelle)	Broad or shallow valleys and tributaries that are not distinctively defined by adjacent landforms

Landscape type	High visual quality	Moderate visual quality
Landform (cont'd)	Well defined valleys, dissected slopes and/or lateral irregular tributaries, such as the Blackwood River and Wilyabrup Brook valleys	Minor rock outcroppings
	Isolated peaks or hills with distinctive form and visual dominance	
	Granite domes or outcrops	
	Undulating and steeply sloping terrain of distinctive shape and abrupt appearance	
Vegetation	Distinctive vegetation patterns and attractive diversity in species, density, age, height and growth habit (e.g. abrupt transition from heath to woodland or combinations of forest, woodland and sedgeland species)	Patterns evident in land cover but lacking uniqueness or distinction relative to surrounding vegetation
	Pockets or unique stands of specimen vegetation which become focal points because of isolation, unusual form, position in the landscape or canopy variation (e.g. karri in Boranup Forest)	Expanses of uniform vegetation with some variation in colour, texture or pattern
	Plant groups which display seasonal colour or unusual forms, distinguishing them from their surroundings	Transition between coastal to forest vegetation lacks distinction
	Wind-shaped, gnarled or dwarfed vegetation unusual in form, colour or texture (e.g. coastal heath)	Open forest and woodland with natural openings and species mix that offers dome visual diversity
	Gradual and naturally appearing transitions between other land uses (such as agriculture), with forested land	Remnant areas of naturally appearing streamline and roadside vegetation exhibiting some structural diversity and colour
Waterform	Major permanent rivers (e.g. Margaret, Blackwood and Scott rivers). Streams with changing flow characteristics and features such as waterfalls	Seasonal wetlands, intermittent watercourses with unchanging flow characteristics
	Permanent river pools, wetlands (e.g. those of the Scott Coastal Plain) and waterholes in intermittent watercourses	Reservoirs with some natural characteristics
	Lakes and wetlands with dominant natural characteristics (e.g. Lake Davies)	
	Estuaries (e.g. Hardy Inlet, Margaret River, Calgardup and Wilyabrup estuaries), swamps and seasonal wetlands (e.g. those of Scott National Park)	

Based on CALM (1994, 1997).

The access and visitor use strategies in this management plan support rationalising access to coastal and river nodes, the sealing of some roads, defining car parks, and providing or realigning to contours walking access to minimise impacts on visual landscape values.

Former gravel pits, previous disturbance at recreational sites, and areas alongside sensitive travel routes are priorities for visual landscape management. The department will encourage powerlines in the planning area to be located underground (for example at Hamelin Bay, Cape Leeuwin Lighthouse and Yallingup) or where possible, screened through revegetation.

Visual landscape management zones take into account visual landscape qualities, the level of visibility or seen area and public sensitivity. Specific guidelines for each zone are outlined in the department's visual landscape management guidelines. The visual landscape management zones guide recreation planning, resource use and management operations in the planning areaand are shown at Map 6 with a description of each zone at Table 10.

Table 10. Visual landscape management zones

Zone	Description	Management priority
Zone A	Areas of high scenic quality and rare landscape character which have moderate to high public exposure/sensitivity and some areas not assessed with moderate scenic quality but with high public exposure/ sensitivity	High
Zone B	Areas of low to moderate scenic quality and high public exposure/ sensitivity and areas of high scenic quality or rare landscape character which have low public exposure/sensitivity	Moderate
Zone C	All remaining areas with few or no elements of particular scenic quality and only low to moderate public exposure/sensitivity	Moderate

Most of Leeuwin-Naturaliste, Scott and Forest Grove national parks and Reserve 46400 are classified as Zone A, reflecting a landscape rich in naturalness, diversity, components of high visual quality and areas with high levels of public use and sensitivity.

The viewshed from the former Walcliffe House, which includes Wallcliffe Cave and extends across the Margaret River to the 60m contour of the Kilcarnup portion of Leeuwin-Naturaliste National Park, is registered under the Heritage of Western Australia Act. The department must comply with the provisions of the Act with respect to protecting visual landscape values over the registered area.

Because of the sensitivity of visual landscapes along the Leeuwin-Naturaliste Ridge, all development proposals with the potential to impact on visual landscape values will be assessed to determine the requirement for a formal visual impact assessment. Seascapes (views from the ocean) are most important in near-shore waters close to boat ramps, which is where the majority of recreational boating occurs. These areas will be taken into account when considering development proposals.

Desired outcome

Protect and enhance visual landscape values in the planning area.

Management actions

1. Apply departmental policy, adhere to the LNRSPP and follow the landscape guidelines set out in Table 10 for each visual landscape management zone.
2. Ensure visual landscape management, including seascapes, is considered for any development or management activities within the planning area and for timber harvesting in adjacent or nearby State forest (for example Margaret Plantation).
3. Provide advice and make submissions where appropriate, to government agencies and local government authorities regarding subdivision and development referrals and other visual landscape planning matters that may impact upon the planning area.
4. Rehabilitate former gravel pits, site disturbance in recreation areas and sites along sensitive travel routes.

5. Regularly review the visual landscape management zones for the planning area to ensure they take into account developments that take place within and adjacent to the planning area (for example future realignment of parts of the Cape to Cape Track).
6. Encourage utilities and services (for example telephone and powerlines) to be located underground and where this is not possible, screen using rehabilitation techniques.
7. Comply with the provisions of the Heritage of Western Australia Act with respect to the viewshed from the former Wallcliffe House.

The view from Redgate Beach looking north. Photo – Parks and Wildlife

Fire management

Management of fire is integral to the department's activities and is a core management responsibility.[23]

The desired outcomes for fire management in the planning area are to:

- reduce the threat of bushfire to life and community assets through the development and implementation of bushfire risk mitigation strategies
- maintain and enhance biodiversity through the appropriate application of prescribed fire and by minimising landscape-scale bushfires
- work collaboratively with key stakeholders to identify and implement fire management strategies and promote the development of cross tenure fire management schemes on land adjoining the parks and reserves of the planning area
- work with traditional owners to protect sites of cultural and heritage significance
- increase knowledge through research, operational experience and monitoring and adapt management practices accordingly.

Implementation of this plan will be consistent with recommendations in *Appreciating the Risk: Report of the Special Inquiry into the November 2011 Margaret River Bushfire* (Keelty 2012), *A Shared Responsibility: the Report of the Perth Hills Bushfire February 2011 Review* (Keelty 2011) and commitments made by State Government in a statement made by the Premier of Western Australia on 23 February 2012.[24]

At the time of publication, the department is undertaking a review of fire management which includes consideration of the 2011 and 2012 reports prepared by Mr Mick Keelty AO. This management plan will comply with any changes to bushfire management practices and procedures, and if necessary the plan will be amended to reflect such changes.

To achieve the fire management objectives in this management plan, a level of flexibility must be accepted to enable the continual adoption of best practice management techniques.

Three zones of fire management have been identified (see maps 7a and 7b):

- asset protection areas
- strategic protection areas
- biodiversity areas.

The priority for asset protection areas and strategic protection areas is the protection of human life and community assets. Where possible, mitigation measures will be applied in a way that does not compromise biodiversity

Bushfire at Conto in Leeuwin-Naturaliste National Park in 2005. Photo – Parks and Wildlife

23 For more information about the department and fire management, visit www.dpaw.wa.gov.au/management/fire.

24 The Hansard transcript of the Premier's statement is at www.parliament.wa.gov.au/Hansard/hansard.nsf/(($all))/B1BEBF8A2FDEB5D3482579B10022E297/$file/A38%20S1%2020120223%20All.pdf

values. However, where life and community asset protection coincides with high biodiversity values, and it is not possible to achieve multiple objectives, priority will be given to the protection of life and community assets.

Where possible, asset and strategic protection areas will align with easily identifiable boundaries. The boundaries of these areas may require modification to adjust to operational boundaries on the ground or because of tenure additions. Flexibility to modify these boundaries is required to maintain the level of protection and intent of this plan. Land-use changes and population growth described in the LNRSPP have been considered in determining these boundaries.

The department incorporates the guidance contained in its fire policies and this management plan in its burn program planning process which identifies areas in each of the department's regions for the application of prescribed fire in the coming three years. Burn programs are updated twice a year and the public are given an opportunity to view the proposed prescribed burn areas and provide feedback.

There is a significant bushfire threat across all land tenures on the Leeuwin-Naturaliste Ridge and Scott Coastal Plain. Managing the threat of bushfire in the south-west, particularly through the use of prescribed fire, is complex for a range of reasons including:

- a mix of land tenures and land-use types, often with undefined on-ground boundaries (rural, residential and natural areas)
- a high degree of rural-urban interface with natural lands
- the fragmented nature of the planning area, especially Leeuwin-Naturaliste National Park, with a high perimeter-to-area ratio
- the growing impact of declining rainfall and drier climatic conditions affecting the landscape, increasing the risk of catastrophic fire conditions and impacting the ability to manage and control fire
- the popularity of the area as a tourist destination
- potential impacts of mitigation strategies on small business, particularly in the tourism and viticultural industries
- the variety of coastal, wetland and forest vegetation types
- internationally recognised conservation values
- almost year-round exposure to strong coastal winds and the effects of the maritime environment on the weather.

Prescribed burning is an important strategy for bushfire mitigation in strategic and asset protection areas, however it may not always be achievable because of the complexities described above. In some cases, other complementary mitigation strategies such as mechanical fuel management may be more appropriate to ensure an adequate level of protection. While having a primary objective of biodiversity management, prescribed burning in biodiversity areas is also integral to strategic and community protection objectives through management of fuel loadings across landscapes.

Mechanical fuel management involves the modification of vegetation to provide containment lines and low fuel zones to help with the implementation of prescribed burning, and which also assist in the event of a bushfire. The most commonly used forms of mechanical fuel management in the planning area are parkland clearing and scrub rolling or scrub slashing.[25] Parkland clearing is generally used immediately around town sites while scrub rolling or scrub slashing can be applied in asset and strategic protection areas, strategic firebreaks, burn boundaries and other areas as required. The potential damage of a prescribed burn escape or the enlargement of a bushfire can outweigh the impacts of mechanical fuel management techniques.

25 Scrub rolling comprises the flattening of vegetation with a heavy machine and scrub slashing involves cutting the stems of woody vegetation with a slashing machine, usually fairly close to the ground. These techniques leave the base of the vegetation intact so it can resprout after treatment. Scrub rolling and scrub slashing greatly reduce fire behaviour compared with intact vegetation. Scrub rolling is employed on some prescribed burn boundaries to ensure the containment and security of the burn and scrub slashing can be used to create semi-permanent strategic firebreaks or to reduce fuel zones around high value assets. Both techniques are reversible, contain erosion and are less visually intrusive than firebreaks devoid of all vegetation.

Department staff undertaking a prescribed burn in the planning area. Photo – Parks and Wildlife

The location of proposed mechanical fuel management areas in the planning area is shown on maps 7a and 7b. For operational reasons and to enhance overall effectiveness of bushfire mitigation strategies in the planning area, the location of mechanical fuel management areas may be changed or additional mechanical fuel management areas may be constructed. Should other forms of mechanical fuel management become available they will be investigated for use in the planning area.

While consideration is always given to environmental, visual, cultural and heritage values through an impact assessment process, mechanical fuel management techniques do result in some impacts on park values. The visual impacts of mechanical fuel management areas are minimised wherever possible using landscape management techniques.

Traditional owners wish to be more involved with fire management in the planning area, including the application of prescribed burns and protection of sites of cultural and heritage significance. In particular, traditional owners would like to see prescribed fire applied according to traditional techniques and seasons. The department will continue to work collaboratively with traditional owners in managing fire in the planning area.

25. Managing fire to protect life and community assets

A bushfire threat analysis undertaken for the planning area[26] identified an extreme threat around the town sites of Yallingup, Gracetown, Margaret River and Dunsborough, conservation reserves close to rural-residential areas and at Calgardup, Giants and Jewel caves (DEC 2006a). Other high risk areas include Augusta and bushland around coastal settlements such as Prevelly and Gnarabup.

Table 11 shows the community assets identified in and around the planning area that have been considered in the bushfire threat analysis, and defines acceptable outcomes in the event of a bushfire.

26 The bushfire threat analysis is consistent with the accepted framework for risk assessment in Australia (ISO 31000:2009 – Risk Management). Variables in the analysis such as fuel age may change over time and hence only provides an assessment of risk at the time of analysis. Consequently, the analysis process is used as a guide and department expertise and experience is necessary to formulate long-term risk mitigation strategies.

Table 11. Life and community assets in and around the planning area

Life and community assets	Acceptable outcome
Firefighter and public safety	No loss of life or serious injury
Town sites of Dunsborough, Yallingup, Gracetown, Margaret River and Augusta and settlements of Injidup, Carbunup, Cowaramup, Prevelly, Gnarabup, Rosa Brook, Witchcliffe, Karridale and Kudardup Semi-rural urban developments close to remnant bushland that lack adequate refuge areas (e.g. Molloy Island[27] and rural settlements near Gracetown and Yallingup)	No loss of life or serious injury Minimal loss of community assets and minimal disruption to local communities
Critical infrastructure and lifelines including key access roads and bridges, pipelines, water supply facilities, pump stations, communication infrastructure (e.g. towers at Mt Duckworth and Boranup Hill), transmission lines, substations and the seismic sensor at Cape Leeuwin	Minimal and short-term impacts on infrastructure and minimal disruption to local communities
Built infrastructure including Hamelin Bay Caravan Park, Conto Campground, Ellensbrook Homestead, Leeuwin Waterwheel, Wharncliffe Mill, Cape Leeuwin, Cape Naturaliste and Foul Bay lighthouses and associated infrastructure Other built assets including tourist infrastructure associated with the caves managed by the tourism associations (e.g. CaveWorks Discovery Centre)	No loss of life or serious injury to visitors and minimal asset loss Minimal disruption to regular activities and impact on historical values and infrastructure
Recreation sites, tracks and trails, especially high-use sites at the Conto, Point Road, and Boranup campgrounds and the Cape to Cape Track	No loss of life or serious injury Physical infrastructure may be lost, but is replaceable
Adjacent plantations, golf courses, vineyards and private property	Minimal loss and minor effects on productive potential in the medium term
Research sites and fire exclusion reference areas that require protection from bushfire because of their long-term research values	Minimal loss of investment in research if experiments are fire sensitive
Natural assets including significant vegetation complexes, specially protected fauna, threatened flora, TECs, significant habitats and landscape values	Impact of bushfire on these assets may cause short- to medium-term loss but regeneration, translocation or rehabilitation is possible
Aboriginal and other Australian heritage sites	No loss of Aboriginal or other Australian heritage
Water supply areas such as the Ten Mile Brook catchment area	Short-term effects on potable water quality and quantity
Apiary sites	Short-term impacts on production capacity and hives
Community routine and business continuity	Minimal disruption to regular activities and continuity of normal business

27 Molloy Island has limited access and the onus is on the Shire of Augusta-Margaret River and residents to implement self-protection measures. A fire response and evacuation plan has been developed for Molloy Island by the shire and Department of Fire and Emergency Services and the island is included in local emergency management arrangements.

There are significant areas of remnant vegetation on properties next to the planning area that pose a threat to life and community assets if not managed appropriately (see Map 8). Effective bushfire threat mitigation requires active and complementary management across all land tenures. There are several areas where fire management on adjoining properties needs to be undertaken (for example north of Gracetown between Cullen, Cowaramup Bay and Caves roads, Prevelly/Gnarabup and other areas of residential development). In such areas, the department manages a small proportion of the land covered with remnant vegetation but the risk to community assets is high.

Many recreation sites in the planning area receive high visitation which presents a need to manage the risk to human life in the event of a bushfire. This risk may be exacerbated by terminated access points, a lack of refuge (for example some sections of the Cape to Cape Track) and poor access for suppression and evacuation. Site-specific emergency response plans will be developed for all major recreation sites within the planning area (see tables 5 and 6). These plans will address issues such as site management, access, evacuation procedures and park closures. The department will also work closely with the Department of Fire and Emergency Services, WA Police and local government to develop and implement procedures aimed at maintaining visitor safety on extreme and catastrophic fire days.

All lessees operating tourism or accommodation sites in the planning area will be required to maintain emergency response plans as part of future lease arrangements. Sites include the lighthouses at Cape Leeuwin and Cape Naturaliste, the Hamelin Bay Caravan Park and Wharncliff Mill.

Education, liaison and community involvement

Increasingly, people and facilities are located closer to or within forested and coastal areas, exposing them to the risk of bushfire. This is especially so in the highly fragmented Leeuwin-Naturaliste National Park where most of the park interfaces with agricultural land, vineyards, tree plantations, rural subdivisions and settlements. In many cases, private property next to the planning area contains significant areas of remnant vegetation that may be burnt infrequently. This highlights the need to work collaboratively with key stakeholders in identifying and implementing complementary cross tenure fire management strategies. Local government authorities, the Department of Fire and Emergency Services, utility managers and private landholders have a shared responsibility with the department to mitigate the impacts of bushfire. Close engagement with all stakeholders will continue to ensure effective fire management across jurisdictions.

Engaging with the public is vital to ensure a high level of community awareness of fire, the use of mitigation strategies and fire suppression operations. In the Conservation Commission's *Position Statement No. 1: Fire management* (Conservation Commission, 2011), it encourages the State Government, private sector and the department to invest in public awareness and education programs so that community members gain an improved understanding of fire management issues and needs. The department will assist the Department of Fire and Emergency Services and local government in communicating these important messages and will also make information readily available about its own fire management practices. Through on-ground staff and signage, park visitors will be made aware of the importance of personal bushfire safety, including campfire restrictions and potential sources of ignition.

The City of Busselton, Shire of Augusta-Margaret River and Shire of Nannup, with input from the Department of Fire and Emergency Services and the department, are required under *WESTPLAN Fire* (State Emergency Management Committee 2013) to develop tenure-blind bushfire risk management plans for all land in their respective local government areas, including the planning area. The department will work closely with the Department of Fire and Emergency Services and local government to ensure fire management aligns with mitigation strategies in bushfire risk management plans.

The *Planning for bushfire protection guidelines* (Government of Western Australia 2010) provides guidance for minimising the impact of fire on new development proposals. Under these guidelines, local government is responsible for ensuring adequate fire protection measures are implemented on private

property. The department will promote these guidelines as a minimum requirement when providing comment on all applications for subdivisions next to the planning area and encourage a high level of fire protection and preparedness on all adjoining lands. Wherever practical, the department will also adhere to the principles of building protection within these guidelines in managing built assets within the planning area.

Managing access

Where possible, public access and recreation sites have been designed to minimise the impact of bushfire on visitors and limit the sources of ignition. A strategic access network within the planning area will be maintained that comprises public and strategic access roads and tracks. A road and track maintenance program will continue to be implemented that considers potential impacts on natural, cultural, heritage and recreation values.

Where possible, fires will be contained within management units defined by existing roads and tracks, rather than by constructing new firelines. Where temporary fire access tracks or firelines are constructed during suppression activities, they will be rehabilitated after the fire event.

Cave (karst) systems increase the risk of subsidence and therefore present a safety risk, especially for firefighters using heavy machinery for suppression activities. Hazard maps that identify this risk will be regularly reviewed and kept up to date and, where possible, the most current technology will be used to improve mapping and accuracy. Should karst features be identified beneath existing access tracks, the level of risk will be assessed and tracks may be closed and/or relocated.

Providing alternative access through Leeuwin-Naturaliste National Park to coastal settlements is one option being considered by State Government to improve community safety in the event of a bushfire. The department will assist State Government agencies and local government authorities to assess risk, identify options and assess the feasibility of providing secondary access into coastal settlements including Prevelly, Yallingup and Gracetown.[28]

Asset protection areas

Asset protection areas are located immediately around key community assets and will be managed with a priority for the protection of life and the particular asset. This will be achieved by maintaining reduced fuel levels and an adequate fire response capacity in collaboration with local government, the Department of Fire and Emergency Services and local bushfire brigades. Key components of management for asset protection areas are to:

- ensure adequate access and egress for vehicles
- ensure access to water for firefighting purposes
- use protection measures such as prescribed burning and mechanical fuel management techniques
- develop bushfire response plans in conjunction with other stakeholders
- actively promote programs aimed at ensuring a high level of community awareness about the threat of bushfire and the need to implement complementary mitigation techniques across tenures.

Asset protection areas in the planning area are outlined in Table 12.

28 For more information, see www.parliament.wa.gov.au/Hansard/hansard.nsf/(all)/B1BEBF8A2FDEB5D3482579B10022E297/$file/A38%20S1%2020120223%20All.pdf

Table 12. Asset protection areas in the planning area

Asset protection area	Management actions and considerations
Cape Naturaliste and Cape Leeuwin lighthouse precincts	The Cape Naturaliste and Cape Leeuwin lighthouse precincts (reserves 44658 and 44660) contain high-value infrastructure and experience high visitation. Surrounding areas also contain biological assets that require protection (e.g. the Cape Leeuwin wetland system and a *Wurmbea calcicola* population). Site-specific fire and emergency response plans for the lighthouse precincts will be included in future lease arrangements. This includes a requirement for bushfire mitigation measures to be established and maintained by the lease holders/ managers.
Mount Duckworth	This area is directly next to a rural-residential development and is undergoing rehabilitation after a history of grazing by livestock. Rehabilitation works will take fire risk into account. Consideration will be given to the potential for development in adjacent areas as provided for in the LNRSPP (WAPC 1998), potential helicopter landing points and visual impacts of bushfire mitigation techniques.
Yallingup	The Yallingup asset protection area surrounds the town site and contains cultural and biological values which need to be taken into account (e.g. Yallingup Brook and tea-tree landscape features). A range of mitigation strategies will be used including prescribed burning and mechanical fuel management. Bushfire mitigation measures should be established and maintained by the managers of Ngilgi Cave. The size of this area allows flexibility in the segments to be burnt, enabling biodiversity and asset protection objectives to be achieved. Parkland clearing may be extended immediately around the fringe of the town site and there is the potential for an additional strategic firebreak to the south of the town site. The department has joint obligations in this area with the City of Busselton, the Department of Fire and Emergency Services and private landholders. A Bushfire Ready Action Group has been established that aims to promote understanding of bushfire threat and encourage local residents to protect their properties against bushfire.
Gracetown/ Ellensbrook	The tenure south and east of Gracetown is predominantly national park, with several fire access tracks. This asset protection area includes the Ellensbrook Homestead, caretaker's cottage and surrounds, in which the National Trust has an interest. Prescribed burning and mechanical fuel management will be used in this area to mitigate the bushfire threat. Burn cells will be broken up into various fire intervals and the sequencing of burns will accommodate corridors for fauna movement. The asset protection area excludes the most northern occurrence of karri, which will be managed for biodiversity conservation. The national park occupies only a small proportion of the land to the north of Gracetown, mostly as a narrow coastal strip between Cullen and Cowaramup Bay roads. The land to the north is predominantly private property containing large areas of remnant vegetation which presents a potential bushfire threat to Gracetown. The responsibility to mitigate this threat rests with the Shire of Augusta-Margaret River, the Department of Fire and Emergency Services and private landholders.

Asset protection area	Management actions and considerations
Prevelly/Gnarabup	Significant development exists in Prevelly and Gnarabup. Mechanical fuel management will be applied as a primary bushfire mitigation technique, complemented by prescribed burning. There are a range of complex factors that make prescribed burning difficult to implement in this area including the mix of tenures and vegetation types, exposure to coastal winds and practicalities in applying fire. The Shire of Augusta-Margaret River, together with the Department of Fire and Emergency Services and private landholders have responsibility for addressing the bushfire threat in the developed areas of Prevelly and Gnarabup. The department is a stakeholder for the adjoining national park.
Conto Campground, Giants and Calgardup caves	Emergency response plans will be prepared for all department-managed major recreation sites. The plans will consider access and egress, fuel management, building protection and evacuation procedures.
Hamelin Bay	Prescribed burning complemented by mechanical fuel management will be applied as the primary bushfire mitigation technique. This will be complemented by onsite fire preparedness. A requirement for an emergency response plan will be incorporated into future lease agreements for the caravan park.
Augusta	This asset protection area includes department-managed land north and west of the town site. Prescribed burning complemented by mechanical fuel management will be applied to protect fringing development around the Augusta town site. The Shire of Augusta-Margaret River, Department of Fire and Emergency Services and private landholders have a shared role to play in bushfire mitigation in this area, given the high proportion of private property surrounding the town site.
Bramley/Margaret River town site	A range of mitigation strategies will be applied to mitigate the threat of bushfire to the Margaret River town site. Where possible, prescribed burning will be applied in a manner that maintains the integrity of the river corridor for fauna movement and to minimise weed invasion. The entire river corridor will not be burnt in a single prescribed burn. Potential fire runs along the river will be mitigated by implementing strategic breaks and burning sections of the river foreshore. One fire exclusion reference area is contained within the asset protection area and will be managed to protect its research value. Burning to enhance the water supply of Ten Mile Brook Dam is a secondary factor to asset protection and biodiversity conservation.

While not an asset protection area, consideration will be given to constructing a slashed break on the southern side of the Smiths Beach development to complement self-protecting measures that are required for the proposed new development.

Strategic protection areas

Strategic protection areas are designed to complement asset protection areas in providing protection from bushfires in rural and residential areas as well as to mitigate potential bushfire runs in north-south and

east-west directions along the Leeuwin-Naturaliste Ridge and Scott Coastal Plain (Table 13 and maps 7a and 7b). Like asset protection areas, strategic protection areas are managed to maintain reduced fuel levels and minimise the impact of bushfire on life and key community assets as well as biological assets. This requires consideration of the fuel age in adjoining biodiversity zones and other lands, and recognises that it may not be necessary to consistently maintain low fuels in strategic protection areas next to recently burnt vegetation. Prescribed fire may not be applied to all strategic protection areas and mechanical fuel management may be the preferred bushfire mitigation technique or may be used to complement and/or facilitate prescribed burning.

A high priority for all strategic protection areas is the maintenance of roads and tracks for vehicle access and egress, and access to water for firefighting purposes.

To maintain flexibility, the location of the strategic protection area at Sugarloaf Road is not fixed and an alternative location may be selected on a rotational basis. In this case, the same fire protection objectives will be met. The location of the strategic protection area at Sugarloaf Road will only be relocated temporarily and for biodiversity, visual amenity and practical reasons.

Table 13. Strategic protection areas in the planning area

Strategic protection area	Management actions and considerations
Sugarloaf Road	Prescribed burning and mechanical fuel management will be applied to reduce the risk of bushfire impacting on biological assets at Cape Naturaliste. This area has also been selected because it adjoins the Sugarloaf Rock recreation site and the Cape to Cape Track. An alternative area to achieve strategic protection is available to the south.
Boranup	Prescribed burning and mechanical fuel management will be used to reduce the risk of bushfire escaping or entering Leeuwin-Naturaliste National Park and to reduce the risk of potential bushfire runs in north-south and east-west directions. The location of the strategic protection area provides protection to populations of white-bellied frog in Forest Grove National Park and Reserve 46400 and avoids high density cave locations. Karri vegetation is in strategic protection areas and biodiversity areas to ensure the entire karri population in Boranup is not burnt in a single event. East of Caves Road, a strategic protection area between frog populations will mitigate potential bushfire runs in a north-south direction.
Hill View	Prescribed burning will be the primary technique to reduce the risk of bushfire impacting on high-value infrastructure and biological assets.
Reserve 46400	Prescribed burning will be the primary technique to reduce the risk of potential bushfire runs along the Blackwood River impacting on populations of white-bellied frog in Reserve 46400 and Forest Grove National Park.
Reserve 18644	This reserve is a proposed addition to the planning area. If it is transferred to the Conservation Commission, bushfire mitigation techniques will be applied to prevent potential bushfire runs in east-west and north-south directions.

26. Managing fire to conserve and enhance biodiversity

The complexity of fire behaviour and ecology means there will continue to be some risks relating to the anticipated response of ecosystems to fire (planned and unplanned). Fire managers recognise this risk but also understand that it is not a valid reason to avoid taking action to protect biodiversity, life and community assets from inappropriate fire regimes. Actively applying prescribed fire in a managed way can achieve benefits for biodiversity that outweigh the risks and that, over time, contribute to a better understanding of ecosystems.

This management plan proposes to manage biodiversity across all three zones (biodiversity, asset and strategic protection areas), however specific areas have been identified where the conservation of biodiversity is the main priority for fire management. In some specific areas there is a desire to exclude fire (for example fire exclusion reference areas[29]). In other areas it is necessary to apply a specific fire regime to facilitate the persistence of particular species (see maps 7a and 7b).

In the planning area, the threat of bushfire to significant biological assets will be reduced by:

- ensuring a mosaic of fuel-age classes across landscapes or a system of fuel-reduced buffers, specifically managed to reduce fuels around biological assets. This is particularly important for Forest Grove National Park and Reserve 46400, where bushfire would have detrimental impacts on populations of the critically endangered white-bellied frog
- periodically undertaking fuel reduction burns in Gingilup Swamps Nature Reserve to mitigate potential east-west bushfire runs from burning the entire reserve. This will also enhance the conservation of the peat swamps. This area has a history of intense, large-scale bushfires burning the entire reserve
- integrating fire management with D'Entrecasteaux and Blackwood River national parks.

Biodiversity areas

Biodiversity areas comprise the majority of the land to which this plan applies. This management plan uses an adaptive approach to fire management in biodiversity areas, which in the long-term seeks to devise, implement and monitor a range of ecologically appropriate fire regimes. This approach is also consistent with the Conservation Commission's *Fire Management Position Statement* (Conservation Commission 2011).

The department accepts the varied management influences and priorities that apply to biodiversity areas, and that these influences and priorities require the application of fire to:

- promote biodiversity
- protect biodiversity values from damage by landscape-scale fires
- protect values next to the park
- add to a system of strategic low fuel buffers at the landscape level.

Fire management regimes in biodiversity areas will consider:

Vital attributes and life histories[30] of fire regime-specific species and communities

While many species and communities are resilient to a range of fire intensities and fire regimes, some depend on a particular combination of fire interval, season and intensity for their persistence (Burrows & Wardell-Johnson 2003; Burbidge 2003; Friend & Wayne 2003). These fire regime-specific species and communities are typically associated with less flammable parts of the landscape such as rock outcrops,

29 Fire exclusion reference areas have fire deliberately excluded to provide opportunities for scientific study on the effects of different fire regimes on the environment. The fire management objective is to protect these areas from bushfire to allow opportunities for research and monitoring.

30 Vital attributes and life history traits are critical characteristics of plants and animals that determine their ability to survive different fire regimes.

Natural regeneration after bushfire at the Boodjidup section of Leeuwin-Naturaliste National Park. The first photo was taken five months after a fire, the second photo a further 12 months later. Photos – Parks and Wildlife

riparian zones, valley floors and wetlands (especially those with peat substrates). Knowledge of the vital attributes and life histories of fire regime-specific species and communities informs how and when to use fire to protect or manage these communities.

Particular consideration is given to the wetlands of the Scott Coastal Plain, coastal dune and heath vegetation along the Leeuwin-Naturaliste Ridge and riparian zones along the Margaret, Scott and Blackwood rivers and their tributaries. Fire management guidelines have been prepared to accommodate the needs of fire regime-specific communities in the planning area (for example granite outcrops, peat swamps, coastal heath woodlands and watercourse reeds and rushes).

About 50 per cent of vegetation communities in the planning area have fire response data, and an analysis of this data indicates that a minimum of six to seven years between fire events at a point in the landscape may be required post germination in Leeuwin-Naturaliste, Yelverton, Bramley and Forest Grove national parks. The southern part of Scott National Park (south of Milyeannup Coast Road) may require an inter-fire period of eight years.

The wetlands of the Scott Coastal Plain require specific fire regimes to maintain biodiversity. Photo – Parks and Wildlife

Gingilup Swamps Nature Reserve is largely dominated by resprouting plants with juvenile periods of just over five years. To develop genetic diversity, these species require the opportunity to produce a sufficient seed store between fire events. Research on resprouting *Restionaceae* genera indicates that a minimum of eight to 15 years between fire events post germination may be required for a viable seed store for many of these species.

Conservation of fire regime-specific species will be achieved by the regular application of low intensity fire that results in a fine-grained spatial mosaic of post-fire intervals and successional stages of vegetation and habitat.

Cave environments are particularly susceptible to changes in hydrology. Fire regimes that are detrimental in the long term to either the quantity

or quality of water following a fire need to be considered as part of cave management. As yet there is little definitive information on the effects of fire on the hydrology of cave ecosystems, particularly the endangered aquatic root mat communities. However, it is recognised that the effects of fire may be catchment specific.

Vital attributes and life histories of threatened species and communities

Protecting threatened species and communities from big, intense bushfires and using planned fire to maintain habitat quality and regenerate threatened plants is fundamental to ongoing biodiversity conservation. Fire management guidelines have been prepared for a range of threatened and conservation-significant species that occur in the planning area including the white-bellied frog, Carnaby's and Baudin's cockatoo, quokka, honey possum and western ringtail possum. As a general principle, no isolated or sole population of a threatened species or community should be impacted upon by a single fire event where the consequences of fire are unknown.

The impact of fire on waterbird habitat is considerable in *Taxandria floribunda* thickets found in Gingilup Swamps Nature Reserve, since these plants appear to be killed by fire and regeneration occurs slowly from seedlings (Jaensch 1992). These thickets may take five to 10 years to reach a height and density that is suitable for waterbird breeding (for example for the Australasian bittern). Therefore, prescribed burning that is too extensive or frequent should be avoided in wetlands where these habitats occur. The loss of entire *Taxandria floribunda* thickets throughout the Gingilup-Jasper wetland system would have significant effects on waterbird fauna.

Creating and maintaining a diversity of post-fire vegetation ages (seral stages) across each Landscape Conservation Unit[31]

A mosaic of vegetation and habitats representing a range of fire intervals, intensities, seasons and scales provides habitat heterogeneity of different ages which benefits biodiversity at the landscape scale (Burrows 2008). The most stable form of relationship between landscapes and seral stages is one that approximates a negative exponential fuel-age distribution (Burrows & Abbott 2003; Burrows 2008). Consideration needs to be given to the functioning of ecosystems in fragmented landscapes because objectives at the landscape scale may not apply to these areas.

Fire management and the development of ecologically based fire regimes within the planning area takes into account all available knowledge and will adapt to new knowledge gained through research, monitoring and experience, including unforeseen events such as bushfires. The planning area provides an ideal opportunity to study the effects of fire in a forested and fragmented landscape. To improve this knowledge, fire may be planned and used to deliver specific research outcomes.

Fire exclusion reference areas are designated according to a set of strict criteria[32], where fire is excluded to ensure long-unburnt sites are available for scientific research and monitoring purposes. There are six fire exclusion reference areas within the planning area (see maps 7a and 7b). The fire exclusion reference area in Gingilup Swamps Nature Reserve will be reviewed to determine if there is a more suitable location where it can be better protected from bushfire.

Desired outcomes

Reduce the threat of bushfire to life and community assets.

Maintain and enhance biodiversity.

31 Diversity and variability in fire regimes at the landscape scale helps maintain biodiversity (Burrows and Abbott 2003). Management of fire at this scale is based on landscape conservation units that are derived by amalgamating vegetation complexes according to their burning characteristics (Mattiske and Havel 2004).

32 For more information, visit www.dpaw.wa.gov.au and search 'fire exclusion reference area'.

Communicate with neighbours, the community, traditional owners and other stakeholders about fire management and the importance of bushfire mitigation management across tenures.

Work with traditional owners to protect sites of cultural and heritage significance.

Increase knowledge through research, operational experience and monitoring, and adapt management practices accordingly.

Objectives

No loss of life or serious injury and minimal loss of community assets attributable to the application of prescribed fire.

Emergency response plans completed for all major department-managed recreation sites in the planning area.

No loss of known populations of threatened species or TECs attributable to the application of fire management strategies.

Management actions

1. Establish and maintain asset protection areas and strategic protection areas by implementing the management actions shown in tables 12 and 13.
2. Manage public access and maintain roads, tracks and water sources used for fire management.
3. Apply and maintain the burn program planning process for the planning area, using the zoning system in this plan and relevant fire management policies, principles and guidelines.
4. Work closely with local government, Department of Fire and Emergency Services, Western Australian Planning Commission, local bushfire brigades, neighbouring landholders, communities and other authorities to encourage cooperative arrangements, ensure appropriate community protection from fire, and encourage new subdivisions adjoining the planning area to include fire protection measures commensurate with the level of bush fire hazard.
5. Promote public education and awareness of the department's fire planning and management, the effects of fire on the natural environment, the need to prevent bushfires, and the safety and survival of people and property.
6. Work with traditional owners in managing fire in the planning area, including the application of prescribed fire and protection of sites of cultural and heritage significance.
7. Develop site-specific emergency response plans for major recreation sites in the planning area.
8. Support the development of bushfire mitigation and response plans for the department leases in the planning area.
9. Regularly review and update hazard maps for karst areas to ensure firefighter safety and improve bushfire suppression options.
10. Work with Department of Fire and Emergency Services, WA Police and local government to devise and implement procedures aimed at maintaining visitor safety on extreme and catastrophic fire days.
11. Assess known populations of threatened species and TECs after prescribed burns for impacts.
12. Apply fire to prevent extensive bushfire in Gingilup Swamps Nature Reserve, Forest Grove National Park and Reserve 46400. Integrate management with D'Entrecasteaux and Blackwood River national parks.
13. Review the location of the fire exclusion reference area in Gingilup Swamps Nature Reserve with a view to relocating it to an area more easily protected from bushfire.

Key performance indicators

Performance measure	Target	Reporting requirement
The impact of prescribed fire on life and community assets	No loss of life and minimal loss of community assets attributable to the application of prescribed fire (see Table 11)	Annually
Emergency response plans for department-managed major recreation sites	Complete emergency response plans for all department-managed major recreation sites in the planning area	Five years from when the plan is gazetted
The persistence of threatened species and TECs	No loss of known populations of threatened species or TECs attributable to the application of fire management strategies	Every five years

Managing resource use

27. Mineral and petroleum exploration and development

Mining in WA is administered by the Department of Mines and Petroleum through the granting of tenements. The holders of tenements are required to meet certain conditions to retain exploration and development rights, which include the requirement that all development projects undergo environmental, heritage and native title assessments. Exploration and development proposals that may cause a significant impact on key values must be referred to the Environmental Protection Authority for an environmental impact assessment. Actions that can potentially have a significant impact on matters of national significance[33] may also require approval under the EPBC Act.

While legislation provides a process for industry to apply for access to undertake mining and petroleum exploration and development in the planning area, the department, the Conservation Commission and the Minister for Environment consider applications for access and development on a case-by-case basis. Cases where access and/or development would be incompatible with protecting the planning area's key values will be identified as early as possible in the assessment process and the department will work with industry and decision-making authorities to ensure impacts are avoided or minimised to acceptable levels.

Parts of the planning area have been identified as having potential for sand, silica and gravel deposits (Bureau of Resource Sciences & Geological Survey of Western Australia 1998). There are many tenements over the planning area and areas of past mining. The latest information on tenements can be found on the Department of Mines and Petroleum's Tengraph database (see www.dmp.wa.gov.au).

Mineral and petroleum exploration and development can have significant impacts on the values of the planning area, particularly in karst environments, Scott ironstone communities and other areas sensitive to hydrological change, visual landscape alterations and cultural heritage. Given the high conservation significance of these areas, the threats posed by mining activities are of notable consequence. If approved, exploration and mining activities are subject to conditions that will ensure impacts on all conservation values are minimised.

Titanium minerals have been mined from the Beenup deposit near Scott National Park. Mining operations concluded in 1999 and the site has been decommissioned and rehabilitated. The department has a particular interest in the success of these activities and other treatments at the Beenup mine site, due to the potential impacts of sulfate-enriched groundwater, predicted to discharge into Scott River, adjoining Scott National Park. The company responsible for managing the Beenup mine site will not be relinquished of its responsibility for potential impacts until it has adequately demonstrated that any residual liability toward the environment is acceptable to government.

Basic raw materials

It is the department's preference that basic raw materials are sourced from outside the planning area. When this is not feasible, consideration will be given to accessing basic raw materials from within the planning area on the basis it is for use within that boundary. Quarrying should not be permitted in poorly represented vegetation complexes, areas at risk of subsidence or areas containing caves, visual landscape management zone A, environmentally sensitive areas listed under the *Environmental Protection (Environmentally Sensitive Areas) Notice 2005* or in areas protectable from *P. cinnamomi*. Basic raw materials may be required for management activities within the planning area, consistent with management objectives (for example the construction and maintenance of recreation areas and access

33 Under the EPBC Act, matters of national significance include nationally listed threatened species and ecological communities.

tracks); however, it is likely that these demands can be met outside department-managed land.

Lime sand is being quarried from the Boranup Sand Patch (UCL 4230 and 320, and Reserve 30656). These parcels of land are proposed additions to Leeuwin-Naturaliste National Park (see Section 11 – *Tenure*).

Desired outcome

Impacts of mineral and petroleum operations and extraction of basic raw material on key values are minimised.

Management actions

1. Work with the Department of Mines and Petroleum and the Environmental Protection Authority to evaluate proposed mineral and petroleum operations that may impact upon the planning area and seek to avoid or minimise these impacts.
2. Ensure that any areas disturbed by mineral and petroleum operations are rehabilitated in accordance with the conditions of the mining or exploration tenement or approval documentation, as well as departmental rehabilitation standards and guidelines.
3. Rehabilitate areas disturbed by basic raw material extraction in accordance with departmental policies and undertake post-rehabilitation monitoring and evaluation to ensure compliance.
4. Ensure that all mineral and petroleum operations and basic raw material extraction adhere to departmental disease hygiene practices.

28. Utilities and services

This management plan provides for continuation of existing utility and service arrangements. However, any new utilities or services need to be located appropriately to minimise impacts on the area's key values, including visual amenity. To limit these impacts, the department prefers that utility infrastructure that is not servicing the planning area itself be situated outside the area. When this is unavoidable, the use of already degraded areas or pre-existing corridors is preferred, as is co-location with existing infrastructure.

If at any stage utilities and services are no longer required, the infrastructure will be removed and the land rehabilitated.

There is a range of utilities found within the planning area. These include communication towers (which are managed under a commercial lease arrangement), powerlines, water pipes and a hydrostatic station for nuclear detection which is operated under a special agreement licence.

Desired outcome

Impacts of utilities and services on key values are minimised.

Management actions

1. Seek to locate proposed utility or service developments in existing utility corridors or in already degraded areas where possible. Oppose proposed utility or service developments that are considered to have unacceptable impacts on ecological, cultural or aesthetic values.
2. Work with relevant agencies and proponents to minimise ecological (and other) impacts where the development is approved by the department (for example underground powerlines).
3. Ensure the responsible management of environmental issues associated with the provision and maintenance of utilities and services, particularly in relation to disease hygiene.

4. Ensure the removal of infrastructure and rehabilitation of land after utilities and services are no longer required.
5. Ensure that land disturbed by utility service development and maintenance is adequately rehabilitated at the expense of the parties responsible for the development.

29. Beekeeping

There are 13 apiary sites within the planning area at the time of publication, with 11 sites located in Leeuwin-Naturaliste National Park and two within Bramley National Park. There are three sites within Sussex locations 753, 4973 and Reserve 12457 (proposed additions to Gingilup Swamps Nature Reserve). The apiary sites in the planning area and its proposed additions are used by apiarists for the access they provide to flowering species such as jarrah, marri, karri and peppermint.

To determine the compatibility of beekeeping with the planning area's key values, an assessment will be conducted at the time of renewal of the apiary site permit. It should be consistent with the department's Policy Statement 41 – *Beekeeping on public land* (CALM 2004) (under review) and the *General conditions for using apiary authorities on Crown land in Western Australia* (Parks and Wildlife 2013c). Criteria such as proximity to threatened flora and ecological communities, weeds, disease risk areas and recreation sites will be considered during the assessment.[34]

Desired outcome

The impacts of beekeeping and introduced honeybees on key values are minimised.

Management actions

1. Manage beekeeping consistent with Policy Statement 41 – *Beekeeping on public land* (under review) and the *General conditions for using apiary authorities on Crown land in Western Australia*.
2. At the time of an apiary site permit renewal, determine the compatibility of beekeeping with the area's key values.
3. Prohibit beekeeping from reserves where there is no historical use.
4. Liaise with beekeepers, advisory bodies such as the Beekeepers Consultative Committee, and the Department of Agriculture and Food to ensure the most efficient and sustainable use of sites.

30. Forest produce

Forest produce[35] may be taken from the planning area with a licence granted under section 99A of the CALM Act, provided it is:

- to remove exotic trees (for example pines or exotic eucalypt species), honey, beeswax or pollen (by apiary site permit, see Section 29 – *Beekeeping*)
- used for therapeutic, scientific or horticultural purposes
- for essential works.

Essential works include those that are required to establish or re-establish access to land or to provide a firebreak (for example after a storm with fallen trees blocking access). Forest produce that is taken in connection with essential works can be sold or used by the department for management activities.

Some parts of timber reserves 139/25 and 60/25 (proposed tenure additions) are identified as proposed forest conservation areas and are not available for timber harvesting, but may be available for other forest produce uses.

34 For more information on beekeeping on department-managed land, see www.dpaw.wa.gov.au/beekeeping.

35 Forest produce includes trees, parts of trees, timber, sawdust, chips, firewood, charcoal, gum, kino, resin, sap, honey, seed, beeswax, rocks, stone and soil as per section 3 of the CALM Act.

Illegal firewood collection is a problem in the planning area, particularly in Yelverton, Forest Grove and Bramley national parks. Firewood collection is not permitted within nature reserves, national parks and conservation parks. Illegal firewood collection will be an ongoing issue because of the increasing population in surrounding areas and a lack of appropriate areas of State forest suitable for firewood collecting close to towns such as Margaret River. There are firewood collection areas in the Blackwood District outside the planning area. Information on the location of these firewood collection areas can be obtained from the department's Busselton office or online at the department's website.

Desired outcome

Prohibit the removal of forest produce except where it is in accordance with the CALM Act.

Management actions

1. Permit the taking or removal of forest produce in accordance with licence and associated conditions issues by the department for:
   - therapeutic, scientific or horticultural purposes
   - the removal of exotic trees; honey, beeswax or pollen (by apiary site permit)
   - essential works.
2. Prohibit the removal of any native forest product for commercial use from the planning area.
3. Continue to prohibit firewood collecting and use public education to reduce illegal collection of firewood within the planning area.

31. Water resources

Water resource use is regulated under the *Rights In Water and Irrigation Act 1914* (RIWI Act) which is administered by the Department of Water, the agency responsible for the protection and management of water resources. Under the RIWI Act, proponents are required to obtain a licence from the Department of Water to extract water within the Busselton-Capel or Blackwood groundwater proclamation areas from the Cape to Cape North, Cape to Cape South, Geographe Bay rivers, Lower Blackwood River surface water areas and from the Margaret River and its tributaries. Such licences specify the volume and conditions under which water may be taken. Conditions typically cover measurement and monitoring responsibilities of the licensee and specify constraints to ensure environmental impacts are acceptable and downstream flow regimes are maintained to meet ecological and social water requirements.

Under the CALM Act, the department may issue a water removal permit to proponents seeking to extract water from land vested in the Conservation Commission. These permits can place conditions on the proposed abstraction of water, and where infrastructure for water abstraction is necessary a lease may also be required.

Water supply

Water sources used for public drinking water supply are protected under the *Country Areas Water Supply Act 1947*. There are two proclaimed public drinking water source areas in the planning area; the Margaret River Catchment Area and the Leeuwin Springs Catchment Area.

Water from the Margaret River Catchment Area is used to supply the town sites of Margaret River, Prevelly, Gnarabup and Cowaramup. The part of this public drinking water supply area that extends into the planning area has been classed as a Priority 1 Protection Area (see Map 2). It is also protected with a Reservoir Protection Zone upstream of the reservoir. Guidance for drinking water protection is provided in the *Margaret River Catchment Area (including Ten Mile Brook Catchment) drinking water source protection plan* (Department of Environment 2005).

Water is abstracted from the Leeuwin Springs Catchment Area (on freehold land owned by the Water Corporation, outside the planning area). Within the planning area, this catchment area has been classified as a Priority 1 Protection Area (see Map 2). Guidance for drinking water protection is provided in the *Leeuwin Spring Catchment Area and Fisher Road Water Reserve drinking water source protection plan* (Department of Water 2007). In 2006, the Water Corporation noted that there had been considerable declines in the outflow at Leeuwin Spring, the level of the swamp to the west and the level of Leeuwin Spring Weir, possibly because of a sequence of poor winters over the previous five years. The Leeuwin Spring is subject to strict environmental flow requirements and there is uncertainty about the sustainability of the source given the potential for more climate variability (Department of Water 2007). To protect vegetation communities, the habitat of the Cape Leeuwin freshwater snail and water supply to the Augusta microbial TEC, it is the department's position that commercial water abstraction from the site cease.

Recreation in these catchment areas is guided by Operational Policy 13 *Recreation within public drinking water source areas on Crown land* (Department of Water 2012); see Section 19 – *Access* for more information.

The Cape Naturaliste Lighthouse is supplied with groundwater from a bore in Leeuwin-Naturaliste National Park. The department is committed to supplying water to existing facilities, as per the lease agreement, although additional demand may place a strain on existing supplies. The department will investigate options to extend the scheme supply at Bunker Bay to the lighthouse facilities and monitor the impact of current use. If this is not suitable, investigations may be required to determine the extent of the groundwater supply, its quality and options for additional bores.

Caves House, Ngilgi Cave and the caravan park at Yallingup extract water from a nearby spring at Yallingup Brook in Leeuwin-Naturaliste National Park. The department recognises this longstanding arrangement and will formalise the arrangements to supply water to these areas, giving due consideration to potential environmental impacts. Foremost in the investigations will be the option to connect to the nearby scheme water supply. Alternatively, extraction may be approved by way of a lease agreement under the licensing provisions of the RIWI Act. Should a lease be issued, a water removal permit stipulating conditions to mitigate environmental impacts will be required. A lease agreement will also be subject to the proponent(s) undertaking an environmental assessment of the site which demonstrates the sustainability of extracting water.

Water is supplied to other facilities such as the lighthouse at Cape Leeuwin and Rusden Picnic Area, which are supplied with treated water from Augusta and Ten Mile Brook Reservoir respectively. Camp sites along the Cape to Cape Track, Conto Campground, Conto ranger accommodation, facilities at Giants and Calgardup caves and the Ellensbrook caretaker's house are all supplied with untreated rainwater. This water should be tested to ensure it meets health requirements. In other areas (for example Canal Rocks), water for toilet facilities is obtained from nearby springs.

The Yarragadee groundwater aquifer is acknowledged as an important water source asset. Abstraction from this water source should give adequate consideration to the protection of the planning area's key values.

Desired outcome

Minimise the impact of water resource use on key values.

Management actions

1. Work with the Department of Water to ensure minimal impacts on the planning area's key values because of water resource use.
2. Allow access to the planning area to extract water where it is consistent with the CALM Act and potential adverse impacts can be prevented or sufficiently mitigated.

3. Where a licence is issued by the Department of Water under the RIWI Act, follow legislative requirements and departmental policy in assessing and approving water removal permits under the CALM Act.
4. Investigate options to extend the scheme supply at Bunker Bay to the Cape Naturaliste Lighthouse. If this is not suitable, the groundwater supply will be investigated for additional bores. This will be subject to adverse impacts being sufficiently mitigated.
5. Promote alternative options to supply water to Caves House, Ngilgi Cave and the caravan park at Yallingup.
6. Liaise with the Department of Water and the Water Corporation to ensure that ecological water requirements are maintained along the Margaret River and at the spring at Cape Leeuwin.
7. Ensure compliance with drinking water source protection plans.

Research and monitoring

Research and monitoring are important components of management and are necessary for the successful implementation of this management plan. This plan allows for adaptive management through a continual review of management activities in light of new knowledge arising from research and monitoring.

Broad direction for research and monitoring priorities in the planning area is provided by the department's Science Division in *A strategic plan for biodiversity conservation research 2008–2017* (DEC 2008) and the nature conservation plan for the South West Region. In addition, direction is provided by species recovery plans, knowledge gaps identified by Hearn *et al.* (2003a) and Hearn *et al*. (2003b) and other gaps identified in the preparation of this management plan.

Department staff undertaking native fauna trapping surveys in the planning area. Photo – Parks and Wildlife

Wherever possible, the department will support volunteers, educational institutions and other organisations to undertake research and monitoring in the planning area. Table 14 contains a summary of research priorities that relate specifically to the planning area.

Table 14. Research priorities for the planning area

Subject	Research priorities

Physical environment (climate, geology, landform and soils, and hydrology)	• determine the impact of climate change on biodiversity and in particular the vulnerability of climate-sensitive species and communities
	• identify potential geoheritage sites
	• improve understanding of hydrological and hydrogeological processes, including:
	  • the extent of cave and spring catchments
	  • maintenance of hydrological integrity
	  • identification of ecological water requirements – particularly conservation-significant species and communities and important water-based habitats such as the aquatic root mat communities, Augusta microbial community and Scott River ironstone association

Biological environment (native plants, native animals, ecological communities and significant habitats)	• undertake extensive surveys where the floristics are not well known (e.g. non-vascular flora, granite outcrops, wetland vegetation, upland vegetation and transitional zones) or where only broadscale mapping has been done
	• monitor foot traffic on the Augusta microbial communities at Quarry Bay to determine any detrimental impacts
	• continue to research and/or monitor the extent, conservation significance and ecological requirements/habitat conditions of:
	  • native plants and vegetation communities
	  • coastal fauna species, including the hooded plover
	  • the white-bellied frog
	  • invertebrates of the karri forest and subterranean fauna
	  • the Cape Leeuwin freshwater snail
	  • conservation-significant ecological communities and habitats
	• undertake regular and systematic monitoring that will detect early changes in native species populations, or the condition of ecological communities or significant habitats
	• better understand the role of Leeuwin-Naturaliste National Park in the conservation of critical weight range mammals

Protecting the natural environment (physical and chemical processes, introduced and other problem species)	• work with the Department of Water to maintain monitoring of hydrological integrity at selected sites within the planning area to help in identifying sustained changes that may require management response (e.g. the Blackwood and Scott rivers, the surface water along the Leeuwin-Naturaliste Ridge and seasonally inundated areas of the Scott Coastal Plain) • continue to monitor selected sites for new environmental weed infestations • regularly monitor for feral pigs at selected sites • continue on-ground surveys of *P. cinnamomi* in the planning area • undertake and/or support research that provides information relevant to control plans for introduced and other problem species • monitor marri and peppermint decline

Subject	Research priorities
Fire	• determine best practice fuel management for coastal heath, including a consideration of alternatives to prescribed burning • gain a better understanding of the impact of fire on the regeneration of coastal heath and refine strategies to conserve biodiversity while protecting coastal community assets • research the relationship between altered fire regimes, weed invasion, acid-sulfate and organic-rich soils (e.g. wetlands of the Scott Coastal Plain), hydrogeology (particularly groundwater recharge) and hydrology and the subsequent influence on biodiversity • continue to monitor fire exclusion reference areas • investigate the impact of fire on threatened frog species and the development of specific fire regimes for these species
Cultural heritage	• record oral histories and knowledge (where appropriate) of traditional Noongar custodians and seek their views on issues associated with park management
Visitor use	• complete a recreational impact study at the Boranup section of Leeuwin-Naturaliste National Park to determine how the area can best sustain the range of recreational activities undertaken there • create profiles on visitors to the planning area, the level of use of recreation sites, patterns of usage and visitor perceptions/expectations • define the 'levels of acceptable change' within the planning area, such that recreational use does not negatively impact on the natural, cultural or heritage values of the area. In particular, establish acceptable limits of disturbance within caves (especially publicly accessible caves) and abseil sites • determine the success of interpretation strategies in directing visitors to major sites
Resource use	• support research on the impact of beekeeping on native flora and fauna within natural ecosystems of the south-west

Desired outcomes

Knowledge of key values and threats to these values is increased and management is adapted accordingly.

Support research and monitoring projects in the planning area, particularly projects that are consistent with the priorities listed in Table 14.

Management actions

1. Conduct integrated research and monitoring programs that facilitate management, with a focus on the priorities identified in Table 14, meeting key performance indicators and other department research priorities.
2. Where possible, encourage and support volunteers, external agencies and individuals where their research contributes directly with the priorities listed in Table 14, to departmental objectives or the implementation or auditing of this plan.
3. Continually review management practices in light of new knowledge obtained through research and monitoring, and adapt management practices accordingly.
4. Ensure Noongar people are informed of research and monitoring programs, particularly those that may take place in areas known to be of cultural or heritage importance.
5. Ensure information gained through research, monitoring and experience is available to managers and in regional and district office libraries/databases, and is kept up to date.

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Appendix 1. Vehicle access strategy

Motor vehicle access to the planning area has been categorised into the following:

- 2WD sealed (public access suitable for all motor vehicles)
- 2WD unsealed (public access suitable for all motor vehicles)
- four-wheel drive (public access on unsealed roads suitable only for four-wheel-drive motor vehicles and trail bikes). Non-motor vehicle access for walkers and mountain bikes is permitted
- management only (access for management purposes only). Access for walkers is permitted
- closed (closed to all vehicles).

Roads and tracks shown in maps 3a and 3b will remain open to the public. Any roads or tracks not shown on these maps or listed in this appendix may be temporarily or permanently closed or restricted to management access only.

Road/track	Current level of access	Future management and comments
Leeuwin-Naturaliste National Park		
Bunkers Bay Road	Open – 2WD sealed	Open – 2WD sealed
Cape Naturaliste Road	Open – 2WD sealed	Open – 2WD sealed
West Coast Road	Open – 2WD unsealed	Open – 2WD unsealed
Track to Gull Rock	Open – 2WD unsealed	Open – 2WD unsealed
Track to Sandpatches	Open – four-wheel drive	Open – 2WD unsealed
Tracks north and parallel to Sugarloaf Road	Open – four-wheel drive	Close – for conservation reasons. Tracks rarely used
Track to Three Bears/ Kabbijgup	Open – four-wheel drive	Open – four-wheel drive. Access along the Cape to Cape Track will be prohibited. Should subdivisions be approved adjoining the park, access may be upgraded
Tracks north, south and parallel with track to Three Bears/Kabbijgup	Open – four-wheel drive	Close – tracks are overgrown and duplicates existing track to Three Bears/Kabbijgup
Track to Rabbit Hill	Open – 2WD sealed	Open – 2WD sealed
Tracks in Yallingup Ranger house block	Close – Management only	Management only
North-south track from Yallingup cricket pitch	Open – four-wheel drive	Close – track duplication
Tracks adjoining Smiths Beach	Close– Management only	Management only

Road/track	Current level of access	Future management and comments
North and south access to Injidup Point	Proposed to be closed but still accessible by four-wheel drive	Close – access from the north is steep and from the south there are conflicts with the Cape to Cape Track and potential TEC. The Point is prone to erosion and is being rehabilitated. It can be accessed on foot via the beach. Coastal four-wheel drive access can be gained further south
Track to Quinninup Dune	Open – four-wheel drive	Open – four-wheel drive but control access to Quinninup Dune by terminating the car park at the edge of the dune
Moses Rock Road North	Open – 2WD unsealed	Open – 2WD unsealed
Moses Rock Road South	Open – 2WD unsealed	Open – 2WD and seal below existing sealed hill
Tracks south of Moses Rock South	Open – four-wheel drive	Rationalise and close where required. Tracks remaining open will be four-wheel drive
Biljedup Beach Road	Open – four-wheel drive	Open – four-wheel drive
Tracks from Biljedup block to the coast	Open – four-wheel drive	Management only. Track traverses private property and conflicts with the Cape to Cape Track
Juniper Road (to Guillotines)	Open – four-wheel drive	Open – four-wheel drive
Track north of Juniper Road	Open – four-wheel drive	Close and rehabilitate – track does not lead to a destination and is rarely used
Track north from Cowaramup Bay Road	Open – Management only	Management only
Track to North Point Cowaramup	Open – 2WD unsealed	Open – Redevelop and seal
Tracks south-east of Gracetown	Management only	Management only but rationalised to avoid track duplication
Track to Lefthanders and Big Rock	Open – 2WD sealed and unsealed	Open – 2WD sealed
Ellen Brook Road (includes Ellensbrook Beach)	Open – 2WD sealed	Open – 2WD sealed
Track north of Ellen Brook Road	Open – four-wheel drive	Close – track is overgrown and not required for management
Tracks between Gnoocardup and Ellensbrook Homestead	Open – four-wheel drive	Management only because of conflict with Cape to Cape Track
Boundary track north of Gnoocardup	Open – four-wheel drive	Close – duplicates management track to the west
Track to Joeys Nose	Open – four-wheel drive, closed at the car park	Open – four-wheel drive
Tracks in Kilcarnup	Open – four-wheel drive	Open – four-wheel drive. Rationalise four-wheel-drive access to the coast ensuring fragile limestone and dune areas are not compromised

Road/track	Current level of access	Future management and comments
Track to the east of Blackboy Hollow block	Open – four-wheel drive	Management only and close the most eastern track to avoid duplication
Road to Redgate North car park	Open – 2WD unsealed	Open – 2WD unsealed
Tracks on perimeter of Redgate block	Open – four-wheel drive	Management only
Calgardup Road	Open – 2WD unsealed	Open – 2WD unsealed
Track east of Caves Road to Calgardup Road	Open – four-wheel drive	Close – no strategic purpose and duplicates other tracks
Bobs Hollow Road	Open – four-wheel drive	Open – four-wheel drive
North-south track between Bob's Hollow and Conto roads	Open – four-wheel drive	Management only
Tracks west of Caves Road to Bob's Hollow	Open – four-wheel drive	Close – no strategic purpose and duplicates Bob's Hollow Road
Forest Grove Road	Open – 2WD sealed	Open – 2WD sealed
Conto Road	Open – 2WD	Open – 2WD. Prioritise sections for sealing
Track to Conto Road/ Cape Freycinet	Open – 2WD sealed to Conto Campground and unsealed to Cape Freycinet	Open – 2WD sealed to Conto Campground. Unsealed to Cape Freycinet
Point Road	Open – four-wheel drive	Open – four-wheel drive. Realign the road around the camping area
Georgette Road	Open – four-wheel drive	Open – four-wheel drive
Hooley Road	Open – four-wheel drive	Open – four-wheel drive
Formation Road	Open – four-wheel drive	Open – four-wheel drive from Hooley Road to Boranup Drive
Boranup Drive	Open 2WD	Open 2WD
Boranup Beach Road	Open – four-wheel drive	Open – 2WD unsealed. Upgrade to cope with medium site status
Anchor Road	Open – four-wheel drive	Open – four-wheel drive to maintain access to the coast from Caves Road
Arumvale Road	Open – four-wheel drive	Open – four-wheel drive to maintain access between Boranup Beach and Grace roads
Grace Road	Open – four-wheel drive	Open – 2WD unsealed. Upgrade to cope with medium site status
Davies Road	Open – four-wheel drive	Close – track duplicates other tracks. The track will remain open for walkers of the Cape to Cape Track
Trig Road	Open – four-wheel drive	Close – other than Boranup Beach to Grace roads
Other roads between Conto and Grace roads (Love-Spring, Brozie, Donovan roads)	Open – four-wheel drive	Management only or closed. Close to avoid track duplication, to separate vehicles from walkers/cyclists, for cave protection and because of subsidence hazard

Road/track	Current level of access	Future management and comments
Tacks east of Caves Road (including Bruce, Jarrahdene, Loop Ring, Boulter)	Open – 2WD unsealed	Management only or closed to protect the white-bellied frog
Reserve Road	Open – four-wheel drive	Open – four-wheel drive to access Hamelin Bay beach
Tracks south of Reserve Road	Open – four-wheel drive	Close – not a strategic access road
Tracks north of Hamelin Bay Road	Management only	Management only
Hamelin Bay Road West	Open – 2WD sealed	Shire road – not part of the planning area. Negotiate with the Shire to realign the road around the caravan park leased area
Tracks south of Hamelin Bay	Open – four-wheel drive	Open – four-wheel drive. Close one track.
Cosy Corner Road	Open – 2WD unsealed	Open – 2WD unsealed
Foul Bay Lighthouse Track	Management only	Close – proposed to become the Cape to Cape Track
Foul Bay	Open – 2WD unsealed	Open – 2WD unsealed
Elephant Rock Track	Open – four-wheel drive	Open – four-wheel drive
Tracks east and west of the Cape to Cape Track and south of Hillview Road	Open – four-wheel drive	Close – Not a strategic access road and no destination point. Conflict with Cape to Cape Track
Quarry Bay Road	Open – 2WD unsealed	Open – 2WD sealed
Skippy Rock Road (Leeuwin Scenic Drive)	Open – 2WD unsealed	Open – 2WD unsealed
Track to Skippy Rock	Open – 2WD unsealed	Open – 2WD unsealed
Challis Road	Open – 2WD sealed	Open – 2WD sealed
Tracks south of Challis Road	Open – 2WD sealed	Management only
Bramley National Park		
Roads east of Margaret Plantation and south of Osmington Road (Middle, Swing and Gray roads)	Open – four-wheel drive	Open – four-wheel drive. Access to Margaret River. All other tracks and roads east of Margaret Plantation and south of Osmington Road will be management only, closed or rehabilitated because of conflicts with trail users, reservoir protection and/or track duplication
Track to Rusden Picnic Area	Open – 2WD unsealed	Open – 2WD unsealed
Tracks east of Bussell Highway and south of the Margaret Plantation	Open – four-wheel drive	Rationalise to one four-wheel-drive track and close others to maintain integrity of the walk/cycle trail

Road/track	Current level of access	Future management and comments
Roads north of Margaret Plantation and east of Bussell Highway (Lynn, Plot and Creek roads)	Open – four-wheel drive	Close – rehabilitate because of illegal camping. The tracks have no strategic purpose
Roads north of Margaret Plantation and west of Bussell Highway (O'Neil and Norm roads)	Open – four-wheel drive	Management only or close because of illegal camping and firewood collection
Roads south-west of Carters Road (Gan, Mott and Umberto roads)	Open – four-wheel drive	Close – rehabilitate because of illegal camping, firewood collection and rubbish dumping. The area is steep and at risk of erosion and contains sensitive granite outcrops. The area is accessible for walking
Tracks in the Ten Mile Brook reservoir protection zone (e.g. S.E.C, Rev, Walton and Nelson roads)	Open – 2WD unsealed and four-wheel drive	Management only or closed because of water catchment protection
Neilson Road	Open –2WD unsealed	Management only because of erosion and little use
Tracks south of Rosa Brook Road (including Walton, Jones and Lang roads)	Open – 2WD unsealed and four-wheel drive	Management only, closed or designated bridle trail. Illegal firewood collection and rubbish dumping occurs and these roads offer no strategic access
Yelverton National Park		
North-south track from Farm Road to Yelverton Road and Yelverton Road to Carter Road	Open – 2WD unsealed	Open – 2WD unsealed
Tracks between Yelverton Road and the western boundary	Open – four-wheel drive	Close – to prevent through-traffic from Yelverton to Pusey roads
Boundary tracks (other than listed above)	Open – four-wheel drive	Management only or closed because of the risk of spreading *P. cinnamomi*. These tracks are not well used
Forest Grove National Park and Reserve 46400		
All tracks (including Holland, Hinton, Furniss, Mullin, Lee roads)	Open – 2WD unsealed and four-wheel drive	Close – close unnecessary tracks/roads to protect white-bellied frog populations and retain management only tracks for monitoring and fire management
Scott National Park		
Track to Scott River Picnic Site	Open – 2WD unsealed	Open – 2WD unsealed

Road/track	Current level of access	Future management and comments
Other tracks	Open – four-wheel drive and 2WD unsealed	Management only or closed because of high conservation values, the risk of spreading *P. cinnamomi* and seasonally restricted access. Twinem's Bend can be accessed by boat
Gingilup Swamps Nature Reserve		
All tracks	Open – four-wheel drive	Management only but rationalised to avoid track duplication. This area has high conservation values

Note: Several roads pass through the planning area as scenic drives (e.g. Boranup Drive and Caves Road), access to coastal recreation sites (e.g. Sugarloaf, Yallingup Beach, Smiths Beach, Canal Rocks, Cape Clairault, Cowaramup Bay, Ellen Brook, Redgate, Hamelin Bay West roads) or local and regional transport roads (e.g. Bussell Highway, Bullant Drive and Thornton, Abbys Farm, Tanah Marah, Carter, Wallis, Rosa Brook, Rosa Glen, Warner Glen, Scott River, Milyeannup Coast, Vlam, Hillview roads). These roads are not included in the above table as they are not part of the planning area and are managed by local government authorities or Main Roads WA. Most of these roads are sealed and likely to remain in their current condition over the life of this plan. The department undertakes maintenance of some of these roads.

LNNP = Leeuwin-Naturaliste National Park

Map 1. Tenure

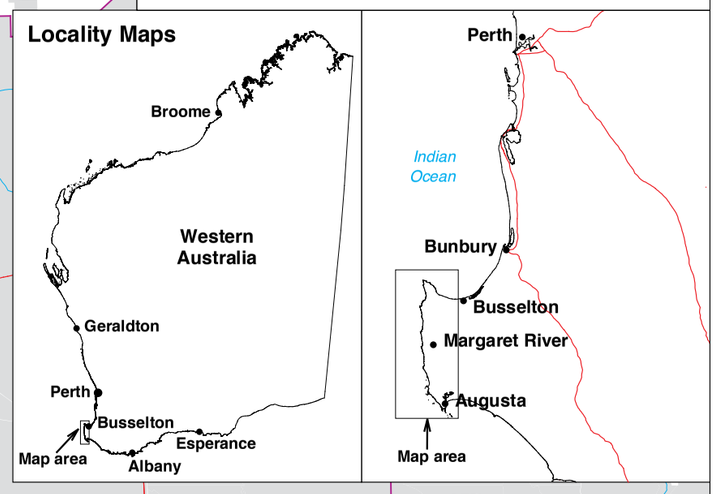
Legend

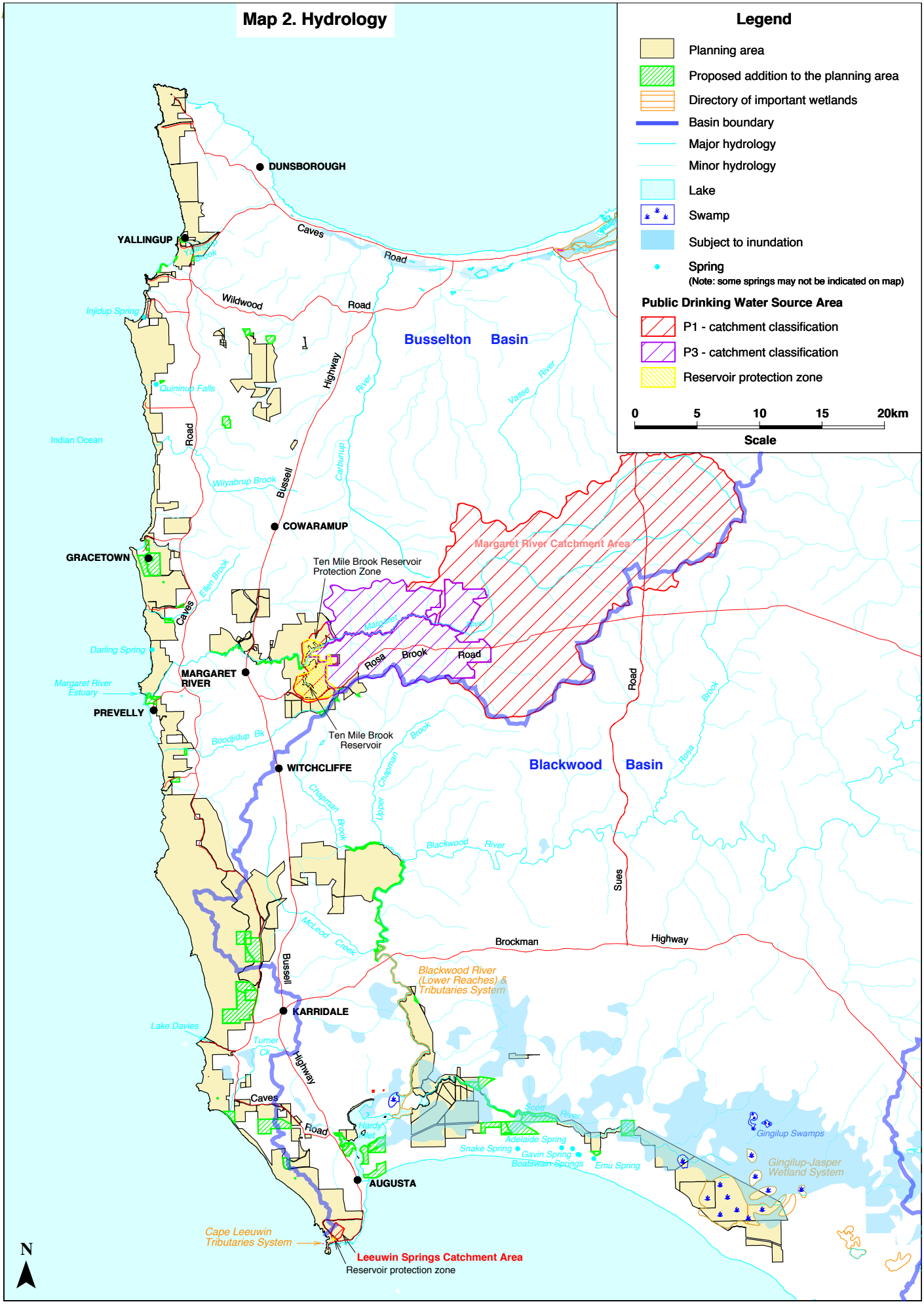
- Planning area boundary
- DPaW region boundary
- Road
- Local government authority boundary
- National park
- Nature reserve
- CALM Act section 5(1)(h) reserve
- State forest; timber reserve
- Other crown reserve
- Unallocated crown land
- Unmanaged reserve
- DPaW managed land outside the planning area
- Ngari Capes Marine Park
- Proposed addition
- Proposed forest conservation area
- 1 Map ID (see Table 2)

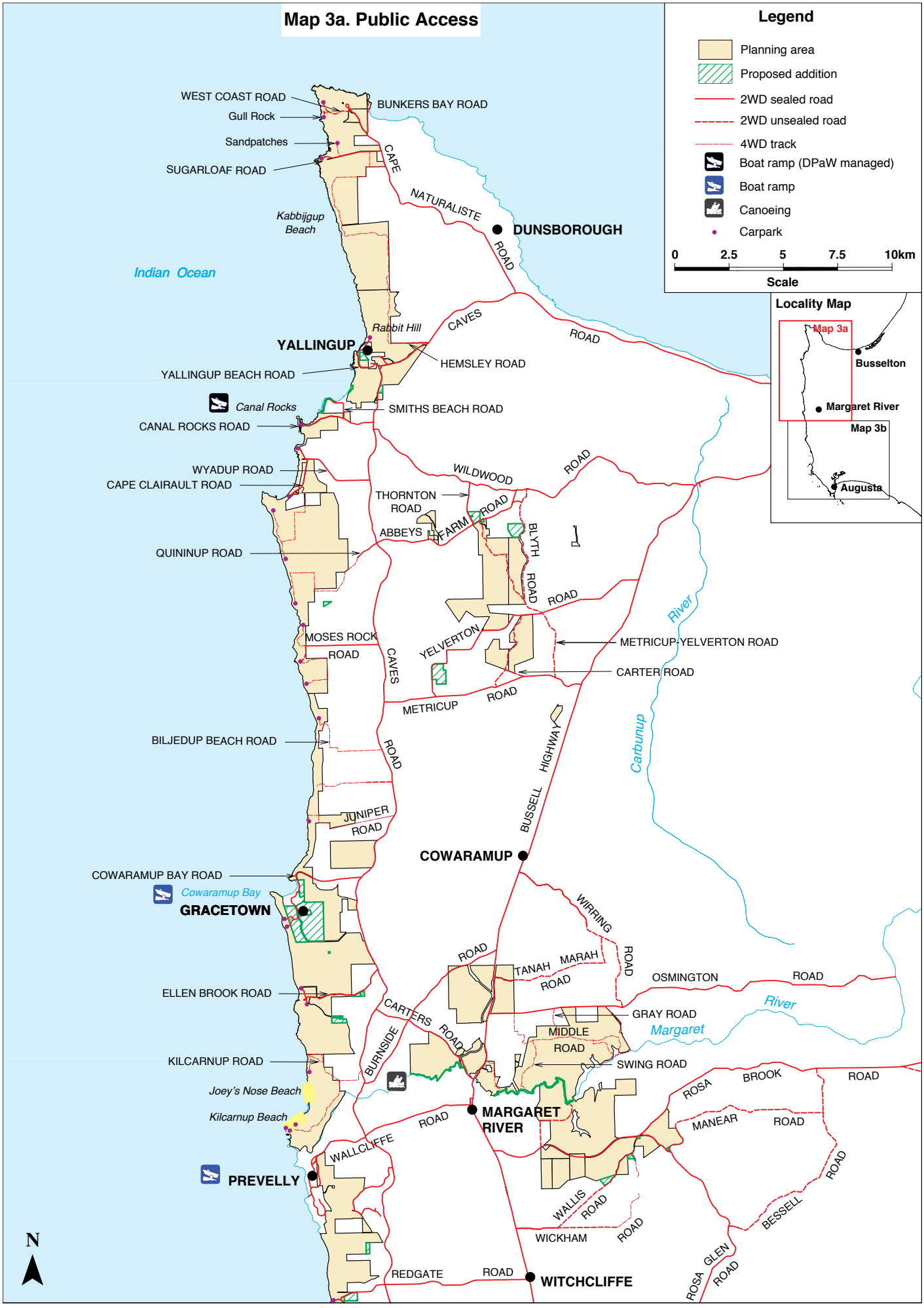
0 5 10 15 20km

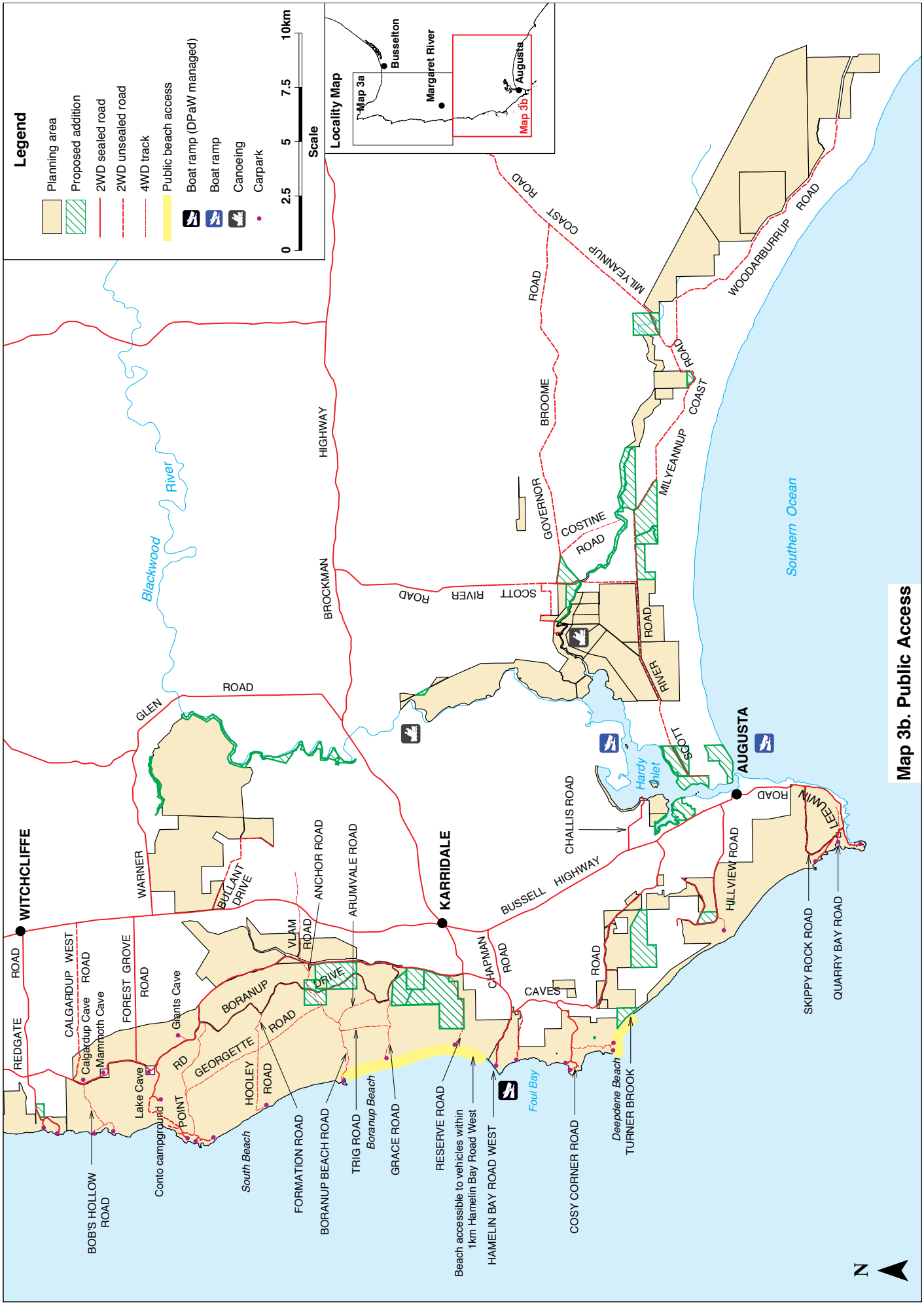
Scale

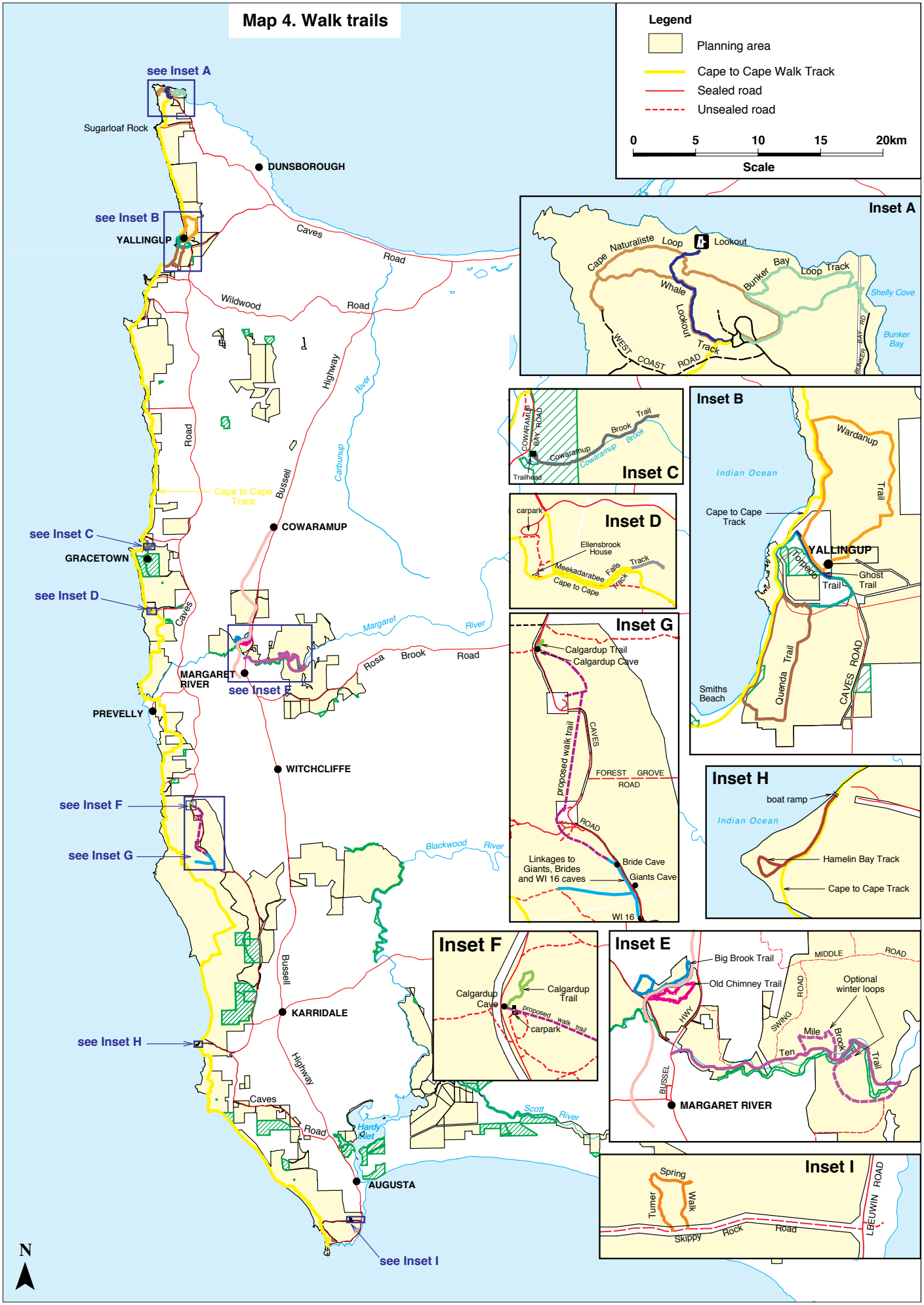
Locality Maps

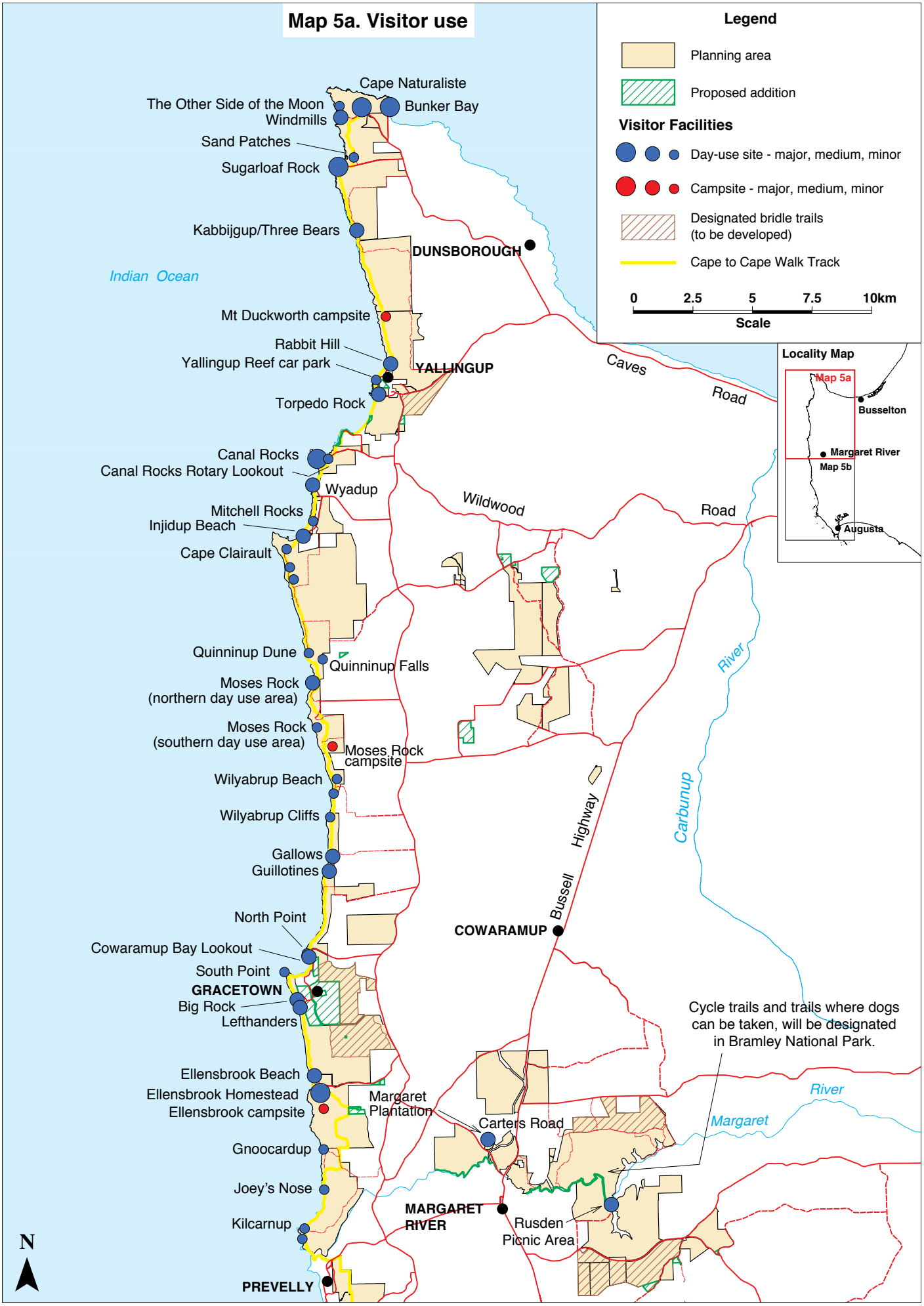


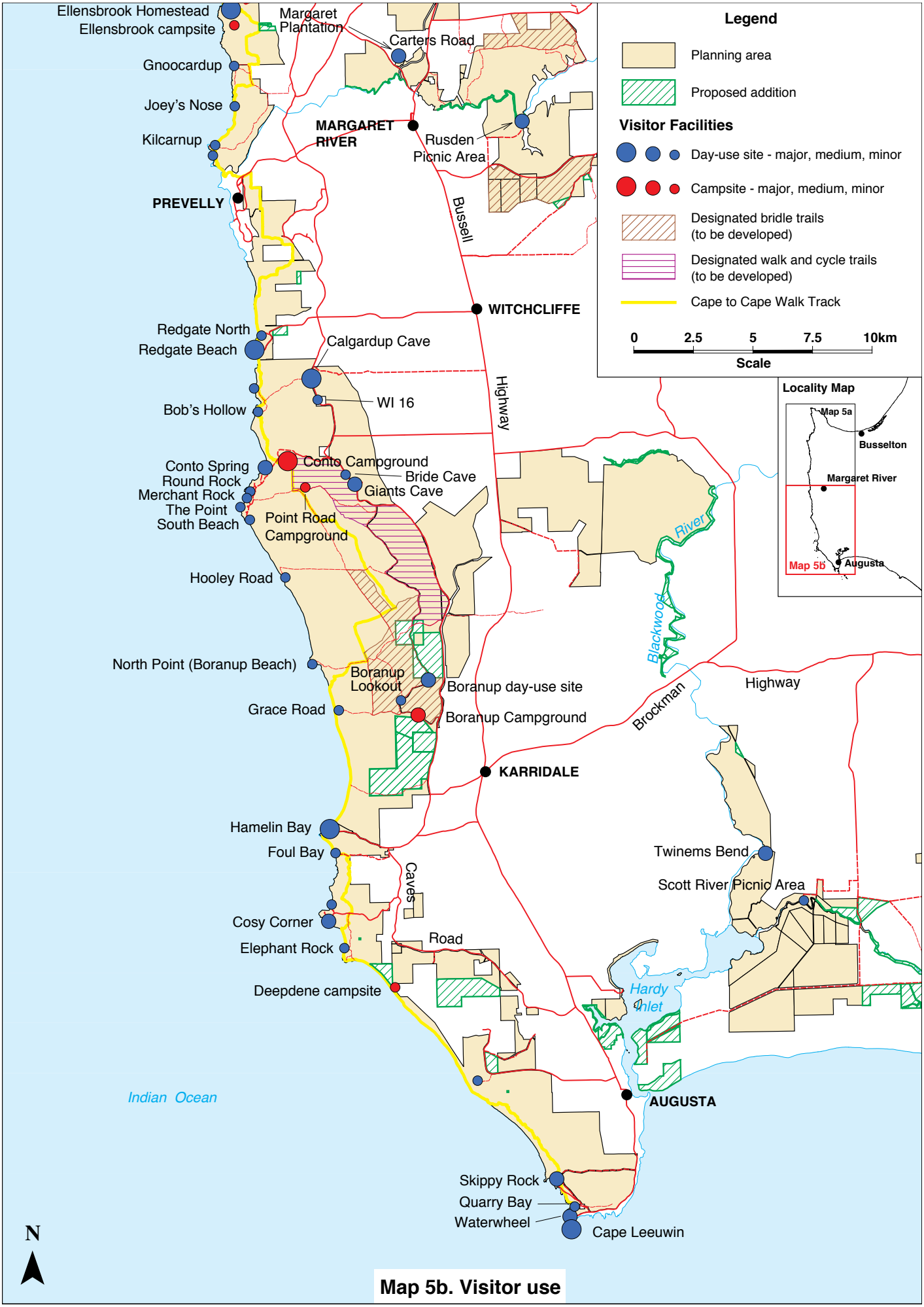

Map 2. Hydrology
Legend
Planning area
Proposed addition to the planning area
Directory of important wetlands
Basin boundary
Major hydrology
Minor hydrology
Lake
Swamp
Subject to inundation
Spring
(Note: some springs may not be indicated on map)
Public Drinking Water Source Area
P1 - catchment classification
P3 - catchment classification
Reservoir protection zone
0 5 10 15 20km
Scale
DUNSBOROUGH
YALLINGUP
Caves Road
Wildwood Road
Injidup Spring
Quininup Falls
Indian Ocean
Busselton Basin
Highway
Vasse River
Carbunup River
Wilyabrup Brook
Bussell Highway
COWARAMUP
GRACETOWN
Ellen Brook
Caves Road
Darling Spring
Margaret River Estuary
MARGARET RIVER
PREVELLY
Margaret River Catchment Area
Ten Mile Brook Reservoir Protection Zone
Rosa Brook Road
Ten Mile Brook Reservoir
Boodjidup Bk
WITCHCLIFFE
Blackwood Basin
Chapman Brook
Upper Chapman Brook
Blackwood River
Sues Road
Brockman Highway
McLeod Creek
Blackwood River (Lower Reaches) & Tributaries System
KARRIDALE
Lake Davies
Turner Ck
Caves Road
Hardy Inlet
Scott River
Adelaide Spring
Snake Spring
Gavin Spring
Boatswain Springs
Emu Spring
Gingilup Swamps
Gingilup-Jasper Wetland System
AUGUSTA
Cape Leeuwin Tributaries System
Leeuwin Springs Catchment Area
Reservoir protection zone
N


Map 3a. Public Access
Legend
Planning area
Proposed addition
2WD sealed road
2WD unsealed road
4WD track
Boat ramp (DPaW managed)
Boat ramp
Canoeing
Carpark
0 2.5 5 7.5 10km
Scale
Locality Map
Map 3a
Busselton
Margaret River
Map 3b
Augusta
WEST COAST ROAD
Gull Rock
Sandpatches
SUGARLOAF ROAD
BUNKERS BAY ROAD
CAPE NATURALISTE ROAD
DUNSBOROUGH
Kabbijgup Beach
Indian Ocean
Rabbit Hill
YALLINGUP
CAVES ROAD
HEMSLEY ROAD
YALLINGUP BEACH ROAD
Canal Rocks
SMITHS BEACH ROAD
CANAL ROCKS ROAD
WYADUP ROAD
CAPE CLAIRAULT ROAD
WILDWOOD ROAD
THORNTON ROAD
FARM ROAD
ABBEYS
BLYTH ROAD
QUININUP ROAD
MOSES ROCK ROAD
CAVES ROAD
YELVERTON
METRICUP-YELVERTON ROAD
CARTER ROAD
METRICUP ROAD
Carbunup River
BILJEDUP BEACH ROAD
BUSSELL HIGHWAY
JUNIPER ROAD
COWARAMUP
COWARAMUP BAY ROAD
Cowaramup Bay
GRACETOWN
WIRRING ROAD
TANAH MARAH ROAD
OSMINGTON ROAD
ELLEN BROOK ROAD
CARTERS ROAD
GRAY ROAD
Margaret River
MIDDLE ROAD
BURNSIDE
SWING ROAD
KILCARNUP ROAD
Joey's Nose Beach
Kilcarnup Beach
MARGARET RIVER
ROSA BROOK ROAD
MANEAR ROAD
WALLCLIFFE ROAD
PREVELLY
WALLIS ROAD
WICKHAM ROAD
BESSELL ROAD
REDGATE ROAD
WITCHCLIFFE
ROSA GLEN ROAD
N


Legend
Planning area
Proposed addition
2WD sealed road
2WD unsealed road
4WD track
Public beach access
Boat ramp (DPaW managed)
Boat ramp
Canoeing
Carpark
Scale
0
2.5
5
7.5
10km
Locality Map
Busselton
Margaret River
Augusta
Map 3a
Map 3b
Map 3b. Public Access
WITCHCLIFFE
KARRIDALE
AUGUSTA
Blackwood River
Southern Ocean
Hardy Inlet
Foul Bay
South Beach
Boranup Beach
Deepdene Beach
Conto campground
Lake Cave
Giants Cave
Calgardup Cave
Mammoth Cave
REDGATE ROAD
CALGARDUP WEST ROAD
FOREST GROVE ROAD
WARNER GLEN ROAD
BULLANT DRIVE
ANCHOR ROAD
ARUMVALE ROAD
VLAM ROAD
BORANUP DRIVE
BORANUP ROAD
GEORGETTE RD
HOOLEY ROAD
POINT
BOB'S HOLLOW ROAD
FORMATION ROAD
BORANUP BEACH ROAD
TRIG ROAD
GRACE ROAD
RESERVE ROAD
Beach accessible to vehicles within 1km Hamelin Bay Road West
HAMELIN BAY ROAD WEST
COSY CORNER ROAD
TURNER BROOK
CHAPMAN ROAD
CAVES ROAD
BUSSELL HIGHWAY
CHALLIS ROAD
HILLVIEW ROAD
LEEUWIN ROAD
SKIPPY ROCK ROAD
QUARRY BAY ROAD
SCOTT RIVER ROAD
BROCKMAN HIGHWAY
GOVERNOR BROOME ROAD
COSTINE ROAD
MILYEANNUP COAST ROAD
WOODARBURRUP ROAD
N

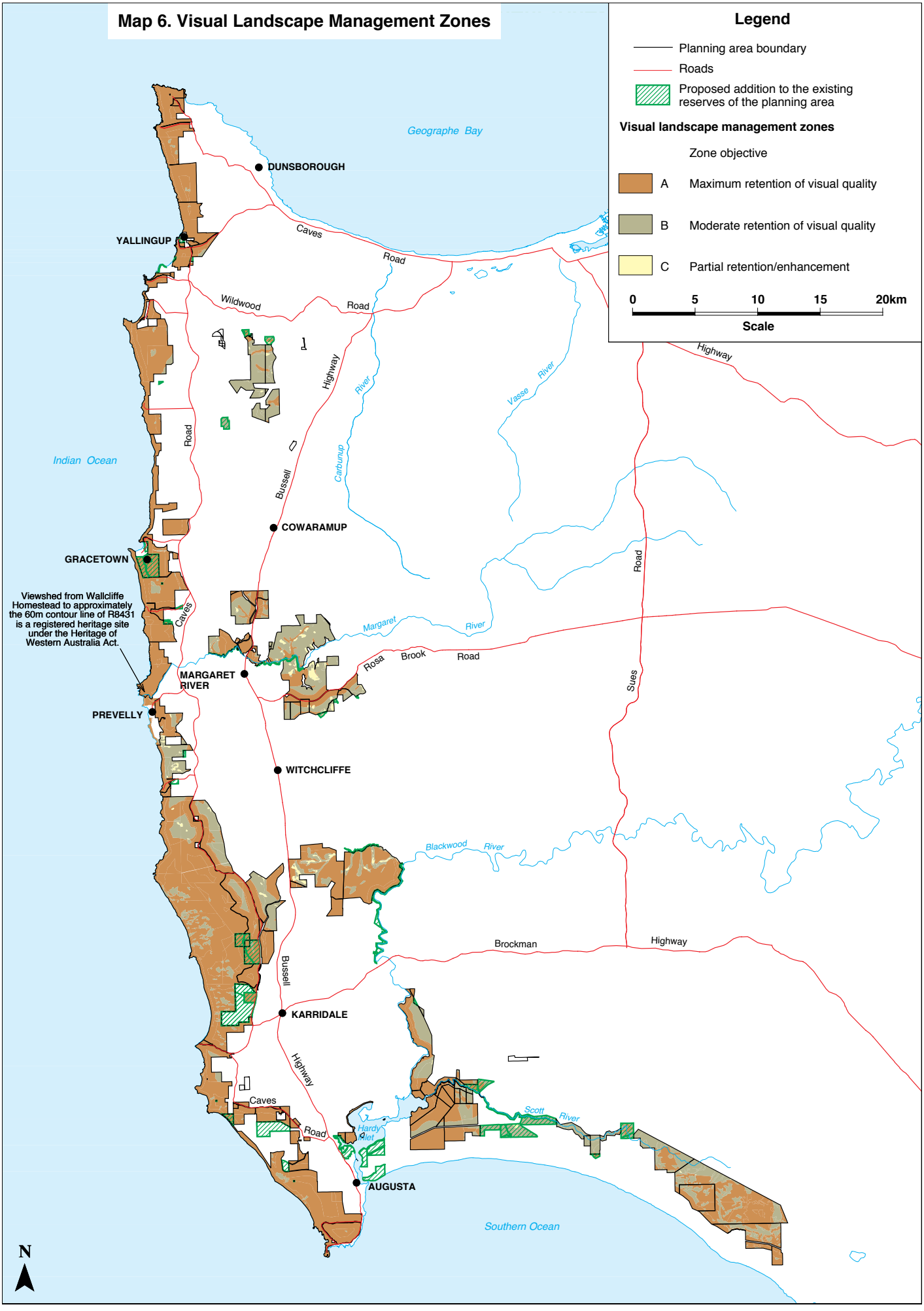

Map 4. Walk trails
Legend
Planning area
Cape to Cape Walk Track
Sealed road
Unsealed road
0 5 10 15 20km
Scale
see Inset A
see Inset B
see Inset C
see Inset D
see Inset E
see Inset F
see Inset G
see Inset H
see Inset I
Sugarloaf Rock
DUNSBOROUGH
YALLINGUP
COWARAMUP
GRACETOWN
MARGARET RIVER
PREVELLY
WITCHCLIFFE
KARRIDALE
AUGUSTA
Caves Road
Wildwood Road
Bussell Highway
Carbunup River
Margaret River
Rosa Brook Road
Blackwood River
Scott River
Hardy Inlet
Cape to Cape Track
N
Inset A
Cape Naturaliste Loop
Lookout
Bunker Bay Loop Track
Whale Lookout Track
WEST COAST ROAD
Shelly Cove
Bunker Bay
Inset B
Wardanup Trail
Indian Ocean
Cape to Cape Track
YALLINGUP
Ghost Trail
Quenda Trail
CAVES ROAD
Smiths Beach
Inset C
COWARAMUP BAY ROAD
Cowaramup Brook Trail
Trailhead
Inset D
carpark
Ellensbrook House
Meekadarabee Falls Track
Cape to Cape
Inset G
Calgardup Trail
Calgardup Cave
proposed walk trail
CAVES
FOREST GROVE ROAD
Linkages to Giants, Brides and WI 16 caves
Bride Cave
Giants Cave
WI 16
Inset H
boat ramp
Indian Ocean
Hamelin Bay Track
Cape to Cape Track
Inset F
Calgardup Cave
Calgardup Trail
proposed walk trail
carpark
Inset E
Big Brook Trail
Old Chimney Trail
MIDDLE ROAD
Optional winter loops
HWY
SWING ROAD
Mile Brook Trail
Ten
BUSSELL
MARGARET RIVER
Inset I
Spring Walk
Turner
Skippy Rock Road
LEEUWIN ROAD

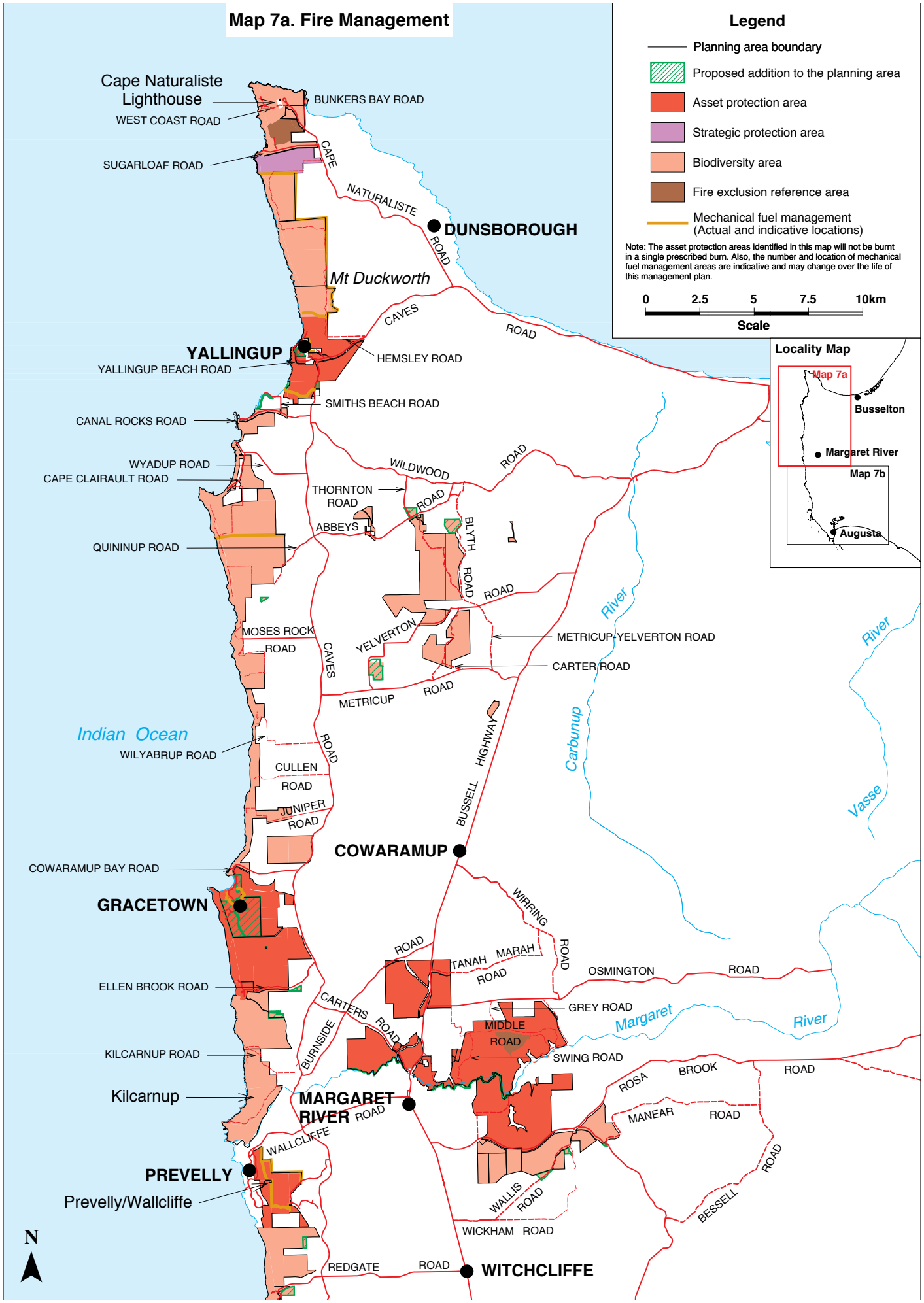

Map 5a. Visitor use
Legend
Planning area
Proposed addition
Visitor Facilities
Day-use site - major, medium, minor
Campsite - major, medium, minor
Designated bridle trails (to be developed)
Cape to Cape Walk Track
0 2.5 5 7.5 10km
Scale
Locality Map
Map 5a
Busselton
Margaret River
Map 5b
Augusta
Cape Naturaliste
The Other Side of the Moon
Windmills
Bunker Bay
Sand Patches
Sugarloaf Rock
Kabbijgup/Three Bears
DUNSBOROUGH
Indian Ocean
Mt Duckworth campsite
Rabbit Hill
Yallingup Reef car park
YALLINGUP
Torpedo Rock
Caves
Road
Canal Rocks
Canal Rocks Rotary Lookout
Wyadup
Wildwood
Road
Mitchell Rocks
Injidup Beach
Cape Clairault
Quinninup Dune
Quinninup Falls
Moses Rock
(northern day use area)
Moses Rock
(southern day use area)
Moses Rock campsite
Wilyabrup Beach
Wilyabrup Cliffs
Gallows
Guillotines
North Point
Cowaramup Bay Lookout
South Point
GRACETOWN
Big Rock
Lefthanders
COWARAMUP
Bussell
Highway
River
Carbunup
Cycle trails and trails where dogs can be taken, will be designated in Bramley National Park.
Ellensbrook Beach
Ellensbrook Homestead
Ellensbrook campsite
Margaret Plantation
Carters Road
River
Margaret
Gnoocardup
Joey's Nose
MARGARET RIVER
Rusden Picnic Area
Kilcarnup
PREVELLY
N

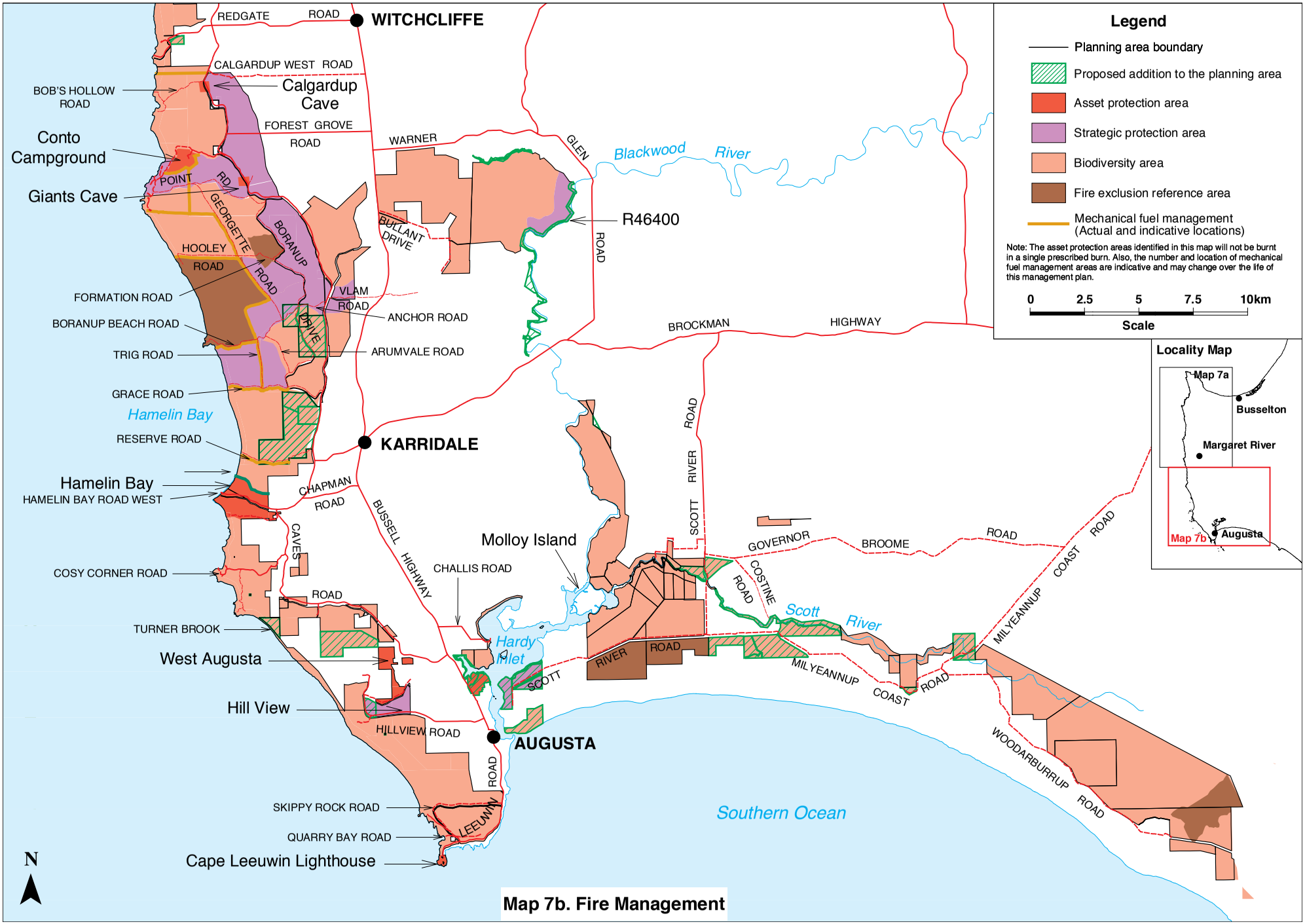


Map 5b. Visitor use

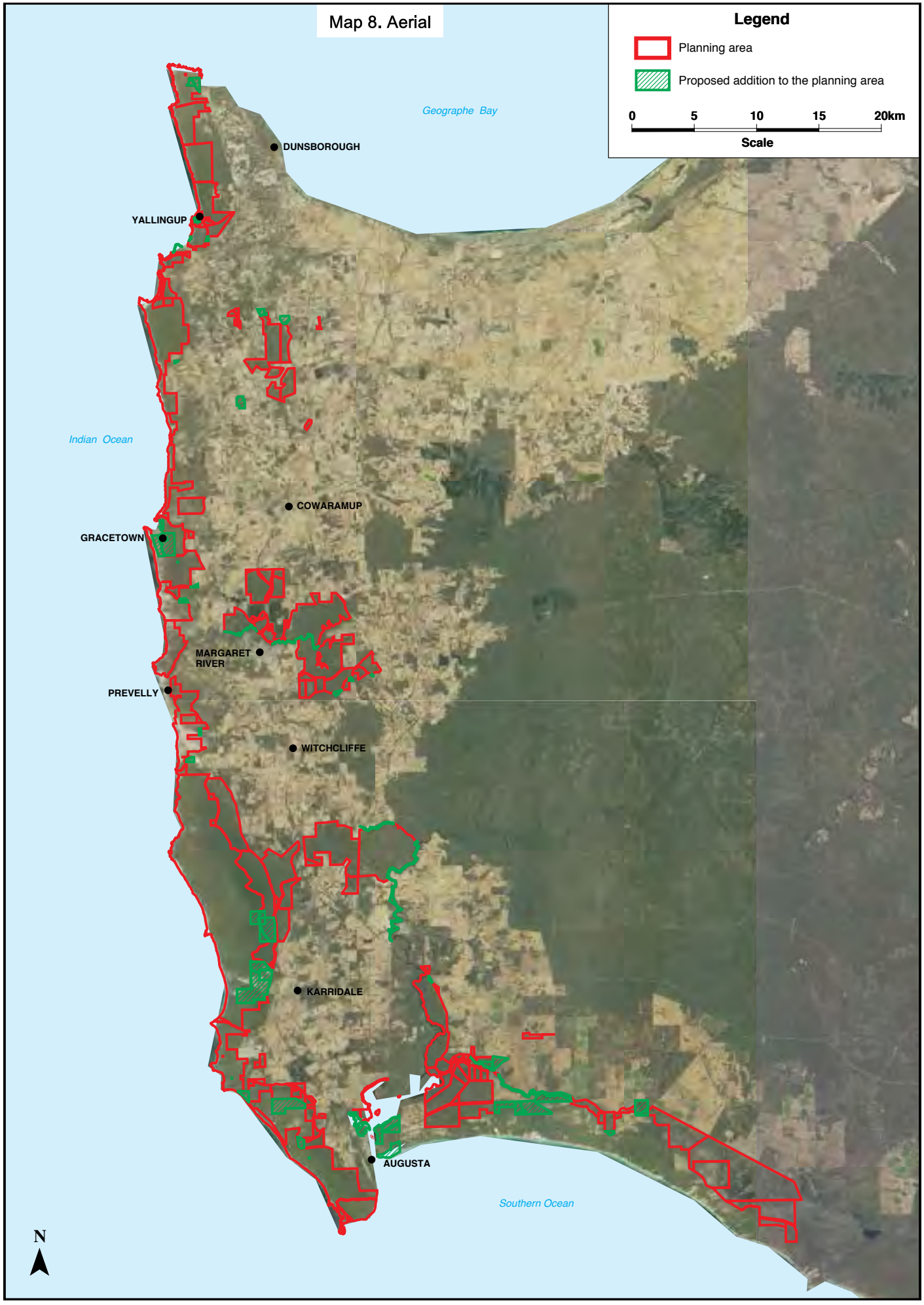
Map 6. Visual Landscape Management Zones




Map 7a. Fire Management
Legend
Planning area boundary
Proposed addition to the planning area
Asset protection area
Strategic protection area
Biodiversity area
Fire exclusion reference area
Mechanical fuel management (Actual and indicative locations)
Note: The asset protection areas identified in this map will not be burnt in a single prescribed burn. Also, the number and location of mechanical fuel management areas are indicative and may change over the life of this management plan.
0 2.5 5 7.5 10km
Scale
Locality Map
Map 7a
Busselton
Margaret River
Map 7b
Augusta
Cape Naturaliste Lighthouse
BUNKERS BAY ROAD
WEST COAST ROAD
SUGARLOAF ROAD
CAPE NATURALISTE ROAD
DUNSBOROUGH
Mt Duckworth
CAVES ROAD
YALLINGUP
YALLINGUP BEACH ROAD
HEMSLEY ROAD
SMITHS BEACH ROAD
CANAL ROCKS ROAD
WYADUP ROAD
CAPE CLAIRAULT ROAD
WILDWOOD ROAD
THORNTON ROAD
ABBEYS
BLYTH ROAD
QUININUP ROAD
MOSES ROCK ROAD
YELVERTON CAVES ROAD
METRICUP-YELVERTON ROAD
CARTER ROAD
METRICUP ROAD
Indian Ocean
WILYABRUP ROAD
CULLEN ROAD
JUNIPER ROAD
BUSSELL HIGHWAY
COWARAMUP
COWARAMUP BAY ROAD
GRACETOWN
WIRRING ROAD
TANAH MARAH ROAD
OSMINGTON ROAD
ELLEN BROOK ROAD
CARTERS ROAD
GREY ROAD
MIDDLE ROAD
BURNSIDE ROAD
SWING ROAD
KILCARNUP ROAD
Kilcarnup
MARGARET RIVER
ROSA BROOK ROAD
MANEAR ROAD
WALLCLIFFE ROAD
PREVELLY
Prevelly/Wallcliffe
WALLIS ROAD
BESSELL ROAD
WICKHAM ROAD
REDGATE ROAD
WITCHCLIFFE
Carbunup River
Vasse River
Margaret River
N



Map 7b. Fire Management


Map 8. Aerial
Legend
Planning area
Proposed addition to the planning area
0 5 10 15 20km
Scale
Geographe Bay
DUNSBOROUGH
YALLINGUP
Indian Ocean
COWARAMUP
GRACETOWN
MARGARET RIVER
PREVELLY
WITCHCLIFFE
KARRIDALE
AUGUSTA
Southern Ocean
N