Walpole and Nornalup Inlets Marine Park Management Plan 2009–2019

Management Plan No 62

Department of Environment and Conservation
Our environment, our future

MPRA
MARINE PARKS & RESERVES AUTHORITY

WALPOLE AND NORNALUP INLETS MARINE PARK MANAGEMENT PLAN

2009–2019

Management Plan Number 62

Vision

The unique natural biodiversity and aesthetic and cultural values of the marine park will be protected.

The marine park will support sustainable human use for present and future generations, such that:

- *the inlets, rivers and their shores are managed to a condition that is the same or better than today;*
- *the aesthetics and ambience of the marine park are maintained;*
- *people can continue to experience a range of activities, such as fishing, tours and holidays;*
- *the biodiversity of the marine park is monitored and protected;*
- *economic benefits flow to the Walpole community;*
- *there is a substantially raised awareness of the value of the marine park; and*
- *the local community feels ownership of the marine park, participates in management, and feel confident in its long-term protection.*

Prepared by the Department of Environment and Conservation.

Cover photographs courtesy of Alex Bond (top insert) and Tourism WA (centre and bottom inserts)

ACKNOWLEDGMENTS

The Focus Group for the Walpole and Nornalup Inlets Marine Park have devoted considerable time and effort to discussions that provided the basis for the development of this management plan. Their efforts in assisting the Department of Environment and Conservation are gratefully acknowledged. The Focus Group comprised community members from Walpole, Manjimup and Nornalup; government departments and peak bodies:

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The following people have also provided important information and advice, and their assistance is also acknowledged:

- Dr Bob Black (Department of Zoology, University of Western Australia)
- Dr Anne Brearley (Department of Botany, University of Western Australia)
- Ms Eve Bunbury (Department of Fisheries)
- Dr Barry Hutchins (Western Australian Museum)
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The Department of Environment and Conservation planning team comprised Alan Kendrick, Andrew Hill, Leanne Thompson, John Lloyd and Barb Green. Tammie Reid facilitated the Focus Group meetings and Stephen Widjaja, Sonya Stewart, Melissa Mazzella and Christine Shervington also provided assistance. The advice and support provided by Peter Keppel, Peter Bidwell, Mark Virgo, Chris Goodsell, Erica Shedley and Roslyn Burnside from the Department of Environment and Conservation's Warren Region and Frankland District is gratefully acknowledged. Thanks also to Angus Horwood of the Marine Parks and Reserves Authority for his attendance and contributions.

EXECUTIVE SUMMARY

The Walpole and Nornalup Inlets Marine Park (the marine park) was gazetted on 8 May 2009 as a Class A reserve. The *Walpole and Nornalup Inlets Marine Park Management Plan 2009–2019* (the management plan) was formally approved by the Minister for Environment on 10 June 2009. It was prepared on behalf of the Marine Parks and Reserves Authority by the Department of Environment and Conservation[1] and was developed in consultation with the community. The management plan provides the management arrangements for a ten year period.

The marine park is located adjacent to the towns of Walpole and Nornalup on the south coast of Western Australia, approximately 120 km west of Albany, and covers approximately 1,442 hectares. The majority of the area adjacent to the marine park forms part of the Walpole-Nornalup National Park and is vested in the Conservation Commission of Western Australia and managed in accordance with the management plan for the Walpole Wilderness Area and Adjacent Parks and Reserves.

The tranquil waters of the marine park are surrounded by undulating hills and eucalypt forest, support seagrasses and algae, a diverse benthic fauna, at least 40 marine and estuarine fish species and a variety of waterbirds, seabirds and shorebirds. The marine park is geologically complex, forming an estuary consisting of two connected inlets that are permanently open to the sea. The inlet system is fed by the Frankland, Deep and Walpole rivers and is in relatively good condition compared to most other easily accessible estuaries in the region. Because the Walpole and Nornalup inlets are permanently open to the ocean and therefore have marine-like conditions for most of the year, they are biologically diverse compared to other estuarine systems in south-west Western Australia.

The marine park has high social significance. In addition to the rich Aboriginal cultural heritage evident in sites and through stories, it is an accessible and low-risk destination for increasing numbers of tourists and visitors. The nature, wildlife and scenic quality provide a wealth of opportunities for commercial tourism, water sports, nature appreciation and recreational fishing. A major attraction of the marine park is the perception of 'naturalness' and 'remoteness' that can be experienced, particularly in parts of the Nornalup Inlet and the Frankland and Deep rivers.

Key outcomes of the management plan include:

- establishment of a zoning scheme that reflects the Government's support for a multiple-use approach in marine parks to meet community and government aspirations for biodiversity conservation, sustainable use, nature appreciation, scientific study and public enjoyment;
- a suite of strategies across seven management programs to help achieve the management objectives for each ecological and social value;
- a collaborative approach between government agencies, particularly between the Department of Environment and Conservation and the Department of Fisheries;
- the requirements for prioritised and coordinated research and monitoring programs to support adaptive management; and
- a complementary management approach to the adjacent Walpole Wilderness Area.

The implementation of this management plan will be regularly reviewed by the Department of Environment and Conservation and Marine Parks and Reserves Authority to ensure management objectives are being met, and to ensure that the management approach for the marine park remains appropriate to meet these objectives.

[1] *The Department of Environment and Conservation was formed on 1 July 2006 through the amalgamation of the Department of Conservation and Land Management and the Department of Environment. Reference to the Department of Environment and Conservation prior to this date is interpreted to mean the former Department of Conservation and Land Management.*

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1 INTRODUCTION

The coastal environment of Western Australia extends from latitudes 14° to 35° south and ranges from the warm, tropical waters off the Kimberley coast to the cool temperate waters of the Great Australian Bight. The coastline is over 13,000 kilometres in length and comprises about 40 per cent of the continental coastline of Australia. Three major biogeographic zones occur; a *tropical* zone north of North West Cape, a *temperate* zone east of Cape Leeuwin, and a *biological overlap* zone in between. Other major influences on the marine environment of Western Australia are the regular occurrence of severe storms, the low level of freshwater and sediment input to most of the nearshore waters of the State and the high wave energy of the west and south coasts.

The above natural characteristics and influences combine to produce diverse marine ecosystems and habitats. Much of the marine biodiversity of the State is poorly described, particularly along the west and south coasts where many endemic species are likely to occur. The conservation of Western Australia's marine biodiversity is not only important from an intrinsic point of view, but also as the fundamental basis of major recreational, nature-based tourism, fishing and, potentially, pharmaceutical opportunities.

The Western Australian Government is committed to establishing a world-class system of marine parks and reserves throughout the State. This system will preserve representative, as well as special ecosystems in the marine environment and put a formal management framework in place to ensure that the various uses of marine parks and reserves are managed in an equitable, integrated and sustainable manner.

In 1994, the Marine Parks and Reserves Selection Working Group (MPRSWG) released a report identifying over 70 representative and unique areas of Western Australia's coastal waters for consideration as part of a statewide system of marine parks and reserves under the *Conservation and Land Management Act 1984* (CALM Act). Specifically, the MPRSWG recommended that the Walpole and Nornalup inlets and the tidal parts of the Frankland, Deep and Walpole rivers be made a marine conservation reserve "*as a matter of high priority"* in recognition of the high ecological and social values of the system. In September 2003, a community-based Focus Group was formed to assist in developing the *Indicative Management Plan for the proposed Walpole and Nornalup Inlets Marine Park 2006-2016* (the indicative management plan) to guide the conservation and management of the Walpole and Nornalup Inlets Marine Park (the marine park). The Focus Group met five times before finalising its advice to the then Minister for the Environment in September 2004. The indicative management plan was released for a statutory three months public consultation period from 27 August to 1 December 2006. The Focus Group was reconvened in March 2007 to provide further advice on the proposal. After considering the advice of the Focus Group and all submissions the MPRA provided its formal advice to the then Minister for the Environment, after which the *Walpole and Nornalup Inlets Marine Park Management Plan 2009–2019* (the management plan) was finalised.

The management plan provides a detailed description of the ecological and social values of the area and their management objectives, strategies and targets. The goal of the management plan is to facilitate the conservation of the estuarine biodiversity of the area and to ensure that the existing and future pressures on the marine park's values are managed within an ecologically sustainable framework. The management plan also provides mechanisms for the community and visitors to actively participate in the day-to-day management of the marine park.

The management plan should not be viewed in isolation, but as an integral part of a suite of complementary management practices that occur within and adjacent to the marine park. These include management of adjacent terrestrial areas, fisheries management, wildlife protection, industry regulation, pollution control, environmental impact assessment and maritime transport and safety measures, as well as community participation. The management plan has been prepared to complement the management objectives of the adjacent Walpole-Nornalup National Park which is managed as per the management plan for the *Walpole Wilderness Area and Adjacent Parks and Reserves*. In addition, it should be noted that many estuarine species are not permanent residents of the marine park and move in and out of the area during different stages of their lifecycles. The water quality in the marine park may also be affected by activities outside its boundary by land-based activities. It is therefore critical that the management objectives of the environment adjacent to and within the marine park are compatible.

2 LEGISLATIVE AND POLICY CONTEXT

2.1 State context

The Department of Environment and Conservation (DEC) was formed on 1 July 2006 through the amalgamation of the Department of Conservation and Land Management (CALM) and the Department of Environment (DoE). Reference to DEC prior to this date is to be interpreted to mean the former Department of Conservation and Land Management.

In 1997, legislative changes were made to the CALM Act to alter mechanisms by which marine parks and reserves were established, vested and managed. These changes revised statutory consultative protocols for the establishment of marine parks and reserves, provided clear guidance for commercial activities and established the Marine Parks and Reserves Authority (MPRA). In 1998, *New Horizons: the way ahead in marine conservation and management* was released to provide guidance for the establishment and management of marine parks and reserves to protect representative and special marine ecosystems. This State policy embraced a commitment to a high level of public participation in the establishment and management of marine parks and reserves (Government of Western Australia, 1998).

The MPRA is the statutory body in which marine parks and reserves are vested (i.e. legally entrusted). As such, it plays a pivotal role in the development of management plans, establishment of marine parks and reserves and in auditing management effort. The MPRA's audit function is fundamental in ensuring that management of the marine park is achieving stated objectives and targets. The management plan provides the principal framework to enable the MPRA to carry out this function. DEC has primary responsibility for implementation of management plans.

The *Wildlife Conservation Act 1950* (WC Act), which is also administered by DEC, provides legislative protection for flora and fauna across the State's lands and waters. The *Wildlife Conservation Regulations 1970* regulate interaction with fauna and flora through a licensing system. In addition to this, the *Conservation and Land Management Regulations 2002* provide a mechanism to manage human impacts in marine parks and reserves through enforcement and licensing. The Department of Fisheries (DoF) remains responsible for the management and regulation of recreational and commercial fishing and aquaculture in marine parks and reserves in accordance with the *Fish Resources Management Act 1994* (FRM Act). The *Fishing and Related Industries Compensation (Marine Reserves) Act 1997* provides the mechanism by which the holder of an existing authorisation for commercial fishing, aquaculture and/or fish processing may seek compensation if the commercial value of the authorisation is apparently diminished. Events that can give rise to compensation are the establishment of a marine nature reserve, or the classification of an area of a marine park as sanctuary area, recreation area or special purpose area in which commercial fishing activity is deemed incompatible with the purpose of that area.

The *Western Australian Marine Act 1982* and *Navigable Waters Regulations 1958* regulate boating in all State waters. These Acts are administered by the Department of Transport (DoT). The establishment of mooring control areas in marine parks and reserves will be achieved through the *Shipping and Pilotage Act 1967* or other appropriate legislative instrument. DEC will seek appointment of an appropriate 'controlling authority', in accordance with the *Shipping and Pilotage (Mooring Control Areas) Regulations 1983*, to facilitate the management and control of mooring control areas in marine parks and reserves. In addition, any development that may have a significant effect on the environment in or adjacent to a marine park or reserve (e.g. marina, port or jetty) is assessed in accordance with the *Environmental Protection Act 1986* (EP Act) by the Environmental Protection Authority (EPA). DEC has responsibility for the regulation of pollution in marine waters, also under the EP Act.

DEC, as the primary manager of marine parks and reserves, collaborates with other authorities and agencies that have responsibilities for marine and/or coastal areas (refer Table 1) to ensure that various regulatory and management practices are complementary. In some cases, memoranda of understanding (MOU) are developed to facilitate cooperation and promote operational efficiency. For example, in 2005 a MOU was developed between the then Minister for the Environment and Minister for Fisheries to establish principles of cooperation and integration between DEC and DoF in the management of the State's marine protected areas. Under this MOU, DEC works closely with DoF through collaborative operational plans for efficient and effective delivery of the strategies contained within the management plan for which there is overlapping or shared agency responsibility, or mutual interest.

The marine park lies within State territorial waters, which extend three nautical miles seaward of the territorial baseline (generally high water mark). Waters seaward of this limit and extending to the 200 nautical mile limit fall under the jurisdiction of the Commonwealth Government.

2.2 National and international context

At the national level, the conservation of marine biodiversity, maintenance of ecological processes, and the sustainable use of marine resources are addressed by the Intergovernmental Agreement on the Environment. This agreement is implemented through actions developed under national strategies such as the *National Strategy for Ecologically Sustainable Development* (Commonwealth of Australia, 1992), the *National Strategy for the Conservation of Australia's Biological Diversity* (Commonwealth of Australia, 1996), *Australia's Oceans Policy* (Commonwealth of Australia, 1998), and the *Strategic Plan of Action for the National Representative System of Marine Protected Areas: A Guide for Action by Australian Governments* (Australian and New Zealand Environment Conservation Council Task Force on Marine Protected Areas (ANZECC TFMPA), 1999).

The marine park forms part of the National Representative System of Marine Protected Areas (NRSMPA). The NRSMPA is a national system of marine protected areas that contain representative samples of Australia's marine ecosystems. The NRSMPA is being developed cooperatively by government agencies responsible for conservation, protection and management of the marine environment. The primary goal of the NRSMPA is to establish and manage a comprehensive, adequate and representative system of marine protected areas to contribute to the long-term ecological viability of marine and estuarine systems, to maintain ecological processes and systems, and to protect Australia's biological diversity at all levels (ANZECC TFMPA, 1999).

Development of the NRSMPA fulfils Australia's international responsibilities and obligations as a signatory to the Convention on Biological Diversity (United Nations Environment Program, 1994), provides a means of meeting obligations under the Convention on Migratory Species (Bonn Convention) and bilateral agreements for migratory birds with Japan, China and the Republic of Korea (JAMBA, CAMBA and ROKAMBA). In addition, it supports the International Union for the Conservation of Nature's (IUCN) Protected Areas Program that promotes the establishment and management of a global representative system of marine protected areas (ANZECC TFPMA, 1999).

The Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*, which is administered by the Department of Environment, Water, Heritage and the Arts (DEWHA), includes provisions to protect matters of national environmental significance, namely the ecological character of internationally important wetlands, nationally listed threatened species and ecological communities, listed migratory species, the Commonwealth marine environment, the values of world heritage properties, the values of national heritage places, and protection of the environment from the impact of nuclear actions. Species on the threatened list are determined from time to time. Listed migratory species include those listed under the Bonn Convention and bilateral agreements for protection of migratory birds with Japan, China and Republic of Korea. This list also includes a number of cetaceans, the dugong (*Dugong dugon*), the whale shark (*Rhincodon typus*) and the great white shark (*Carcharodon carcharias*). Other listed marine species include seals, marine turtles, sea snakes, crocodiles, seahorses, sea-dragons and pipefish.

Areas of marine parks or reserves (both State and Commonwealth) above the low water mark are defined as 'onshore' places under the Commonwealth *Native Title Act 1993* (NT Act), while areas below low water mark are defined as 'offshore' places. Creation of a marine park or reserve is considered to be a 'future act' under the NT Act and must be validated by meeting certain criteria. For 'offshore' places, the native title representative body and native title holders or claimants must be notified of the Government's intention to create the reserves and provided with the opportunity to make comment. However, for 'onshore' places, native title must be either protected by registration of an Indigenous Land Use Agreement or extinguished by compulsory acquisition prior to the creation of the marine park or reserve.

Table 1: State authorities and agencies with responsibilities in the Walpole and Nornalup Inlets Marine Park

Marine Parks and Reserves Authority	• vesting body for marine conservation reserves; • provides policy advice to the Minister for Environment; and • audits management plan implementation by DEC.
Department of Environment and Conservation	• manages marine parks and reserves vested in the MPRA. This includes: ▪ preparation of management plans; ▪ implementation of management plans; ▪ co-ordination of other agencies' involvement; ▪ implementation of education, public participation and monitoring programs; ▪ wildlife research and management; ▪ management of nature-based tourism; and ▪ ensuring compliance with the CALM Act and WC Act. • ensures integrated management of marine parks and reserves with adjoining mainland and island conservation reserves. • assists the EPA in the process of assessing proposals that may significantly affect the marine environment, including marine parks and reserves; and • administers pollution control legislation.
Department of Fisheries	• manages and regulates commercial and recreational fishing and aquaculture in all State waters including marine parks and reserves, which includes the application of restricted seasons, bag and size limits; • lead role in enforcement of fisheries legislation in marine parks and reserves; and • implements education programs.
Department of Transport[1]	• responsible for all boating regulations including licensing, safety standards, vessel navigation, marker buoys, moorings, jetties and support facilities such as navigation marks, navigation charts and harbour facilities (N.B. mooring controls can be delegated to other agencies); • chairs and supports the State Coordinating Committee which provides the mechanism to coordinate the management of marine pollution incidents; and • responsible for management of vessel navigation and in the development and management of support facilities.
Environmental Protection Authority	• assesses, reports and make recommendations on proposals that may significantly affect the marine environment, including marine parks and reserves.
Department of Water	• responsible for licensing, regulation and allocation of water supplies; and • monitors streams, groundwater quality and flows.
Department of Mines and Petroleum[2]	• administers Acts that control mineral and petroleum exploration and development; and • regulates petroleum and mining industry operations.
Department of Indigenous Affairs	• protects indigenous heritage and culture under the *Aboriginal Heritage Act 1972* (AH Act).
Western Australian Maritime Museum	• protects pre-1900 shipwrecks and artefacts under the *Maritime Archaeology Act 1973*. All shipwrecks over 75 years old are declared and protected under the Commonwealth *Historic Shipwrecks Act 1976.*

[1] Department of Transport was known as Department for Planning and Infrastructure prior to July 2009.
[2] Department of Mines and Petroleum was known as Department of Industry and Resources prior to December 2008.

3 DEFINITION OF THE AREA AND RESERVE TENURE

The marine park was gazetted on the 8 May 2009 as Class A Marine Reserve number 13. The marine park is located approximately 450 km south of Perth on the south coast of Western Australia. It is a discrete estuarine system, comprising both the Walpole and Nornalup inlets and the tidal reaches of the Frankland, Deep and Walpole rivers, covering an area of approximately 1442 ha (Figure 1). The technical description of the marine park's boundary is provided in Appendix III.

All of the Nornalup Inlet and part of the Walpole Inlet are surrounded by the Walpole-Nornalup National Park, which is vested in the Conservation Commission for conservation purposes and managed by DEC. This includes Newdegate (Snake) Island in the Nornalup Inlet. The northern shore of the Walpole Inlet comprises Unallocated Crown Land and Crown Reserve vested in Local Government. The tenure of land adjacent to the marine park is shown in Figure 2.

Marine parks are declared under the CALM Act (Section 13B (1)) which states that a marine park is established *"… for the purpose of allowing only that level of recreational and commercial activity which is consistent with the proper conservation and restoration of the natural environment, the protection of indigenous flora and fauna and the preservation of any feature of archaeological, historic or scientific interest."*

In addition, the CALM Act (Section 6 (6)) states that a marine park *"… includes:*

(a) the airspace above such waters or land;

(b) in the case of waters, the sea-bed or other land beneath such waters and the subsoil below that sea-bed or other land to a depth of 200 m; and,

(c) in the case of land other than waters, the subsoil below such land to a depth of 200 m."

Under the statutory classification of Class A, any amendment to the purpose or boundaries of the marine park requires the approval of both Houses of Parliament. As such Class A provides a high security of tenure. By contrast, the zoning scheme and the management plan can be amended through a formal public consultation process and does not require Parliamentary consideration. This approach provides the flexibility to respond to changing management priorities and community aspirations or new information on the values and uses of the area. Any substantial change to the management plan requires a minimum two month statutory public submission period and relevant ministerial approvals.

4 MARINE PARK SETTING

4.1 Bioregional setting

The marine park is located on the south coast of Western Australia. Under the classification system provided in the Integrated Marine and Coastal Regionalisation of Australia (IMCRA), the marine park is within the Western Australian South Coast Marine Bioregion, which extends from Black Point to Israelite Bay (DEH, 2006). The coastline of this bioregion typically comprises prominent granite headlands with deposits of Pleistocene aeolian limestone and Holocene dunes, and is exposed to heavy swell with few well-protected embayments. The coastal marine and estuarine biota has strong southern Australian affinities, with a significant local endemic component. Sheltered bays typically support seagrasses while sublittoral rocky shores are dominated by kelp. Strongly seasonal rainfall, which is moderate to high in the west of this bioregion, decreases to semi-arid in the east. The numerous estuaries of the bioregion vary widely in size, geomorphology and flow characteristics, with many being closed to the ocean seasonally or for extended periods. For these reasons, estuarine biotas of this bioregion are typically less diverse than the biotas of adjacent marine waters. However, the Walpole and Nornalup inlets is one of the most diverse estuarine systems on the south coast as the system is permanently open to the ocean.

4.2 Geology and geomorphology

The Walpole and Nornalup inlet system is geologically recent, having only attained its present form during the Holocene sea level changes of approximately 7000 years before present (Hodgkin and Hesp, 1998). Like other estuaries in the region, the inlet system was created by the isolation of flooded embayments of relatively old river valleys by the formation of dunes. Subsequent and highly dynamic processes, such as a fall in sea level, longshore drift of coastal sand, the infilling of estuaries with catchment sediments and highly seasonal water flow, have increasingly isolated these estuaries from the ocean. On the basis of these varying influences, estuaries of South-Western Australia may be further classified as being permanently open, seasonally open, normally closed or permanently closed (Hodgkin and Hesp, 1998). The opening and closing regimes of estuaries depend on the degree of exposure of the inlet mouth to onshore sediment transport by swell and the flow characteristics of waterways that enter the system (Ranasinghe and Pattiaratchi, 1999; Ranasinghe *et al*., 1999).

The Walpole and Nornalup inlet system is a basin estuary that formed in association with geologically ancient river channels (Hodgkin and Clark, 1999). Poor quality coal outcrops of Tertiary age occur at sea level along Coalmine Beach, and several shallow shafts have been sunk to test these deposits (Wilde and Walker, 1984). Although having undergone considerable sedimentation since its formation, this system remains one of only three permanently open estuarine systems on the south coast of Western Australia. The inlet entrance remains permanently open due to the high rate of water discharge from the system in winter and the protection from the prevailing wind and swell provided by the adjacent Rocky Head (Hodgkin and Hesp, 1998). The channel takes different routes through the mobile sands and may be several metres deep in some places, but shallows to less than a metre deep where it crosses the beach to the sea.

Along the south-eastern shore of the Nornalup Inlet the dunes are truncated, and sands eroded from the shore have formed wide marginal shoals that slope steeply to the 3-5 m deep central basin (Brearley, 2005). The coastal strip adjacent to the estuary comprises granite headlands, Pleistocene limestone and unconsolidated Holocene dunes that are generally stabilised by vegetation cover. An undulating landscape of forested laterite hills and low-lying peat swamp surrounds the inlet basins and the catchments of the Deep, Walpole and lower Frankland rivers. The Nornalup and Walpole inlets comprise approximately 1300 and 100 ha respectively (Pen, 1997). The Walpole Inlet, about 2 km from west to east and 1 km from north to south, is generally less than 1 m deep except for the dredged boat channels. The southern and north-eastern shores are higher and rocky, while the western and eastern shores where the Walpole and Collier rivers enter are low-lying with sand or swampy land. The Nornalup Inlet is approximately 5 km in length from east to west, 3 km from north to south and about 5 m deep in the central basin. The inlets are connected by a narrow channel around 200 m wide, 1 km long and approximately 2 m deep. The channel is bordered by steep granite hills with rocky shores (Brearley, 2005).

The Frankland/Gordon river system extends for around 400 km to the northeast of the inlet system onto the low relief plains and salt lakes of the Precambrian Western Shield Plateau. This catchment is approximately 6000 sq/km and much of the land in the north has been extensively cleared for cereal cropping, sheep farming and cultivation of vegetables (Brearley, 2005; DoE, 2004). The Deep River, also flowing into the Nornalup Inlet, is around 120 km in length with a predominantly forested catchment of approximately 100 km^2 (Pen, 1997). The Walpole River, discharging into the Walpole Inlet, has a much smaller catchment of approximately 60 km^2. Although generally shallow, both the Frankland and Deep rivers are up to 5 m deep (Hodgkin and Clark, 1999).

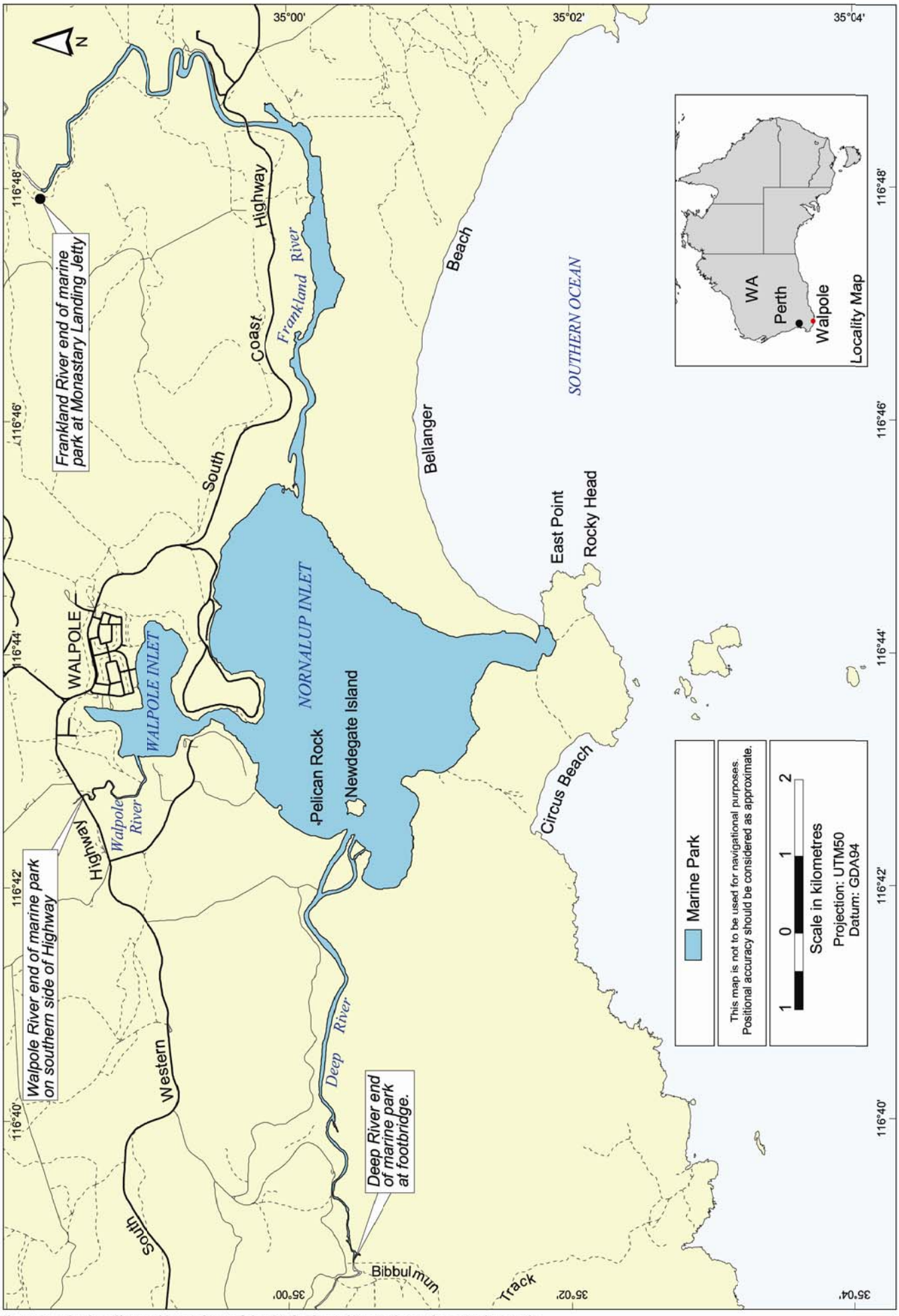

Figure 1: The locality and boundary of the Walpole and Nornalup Inlets Marine Park.

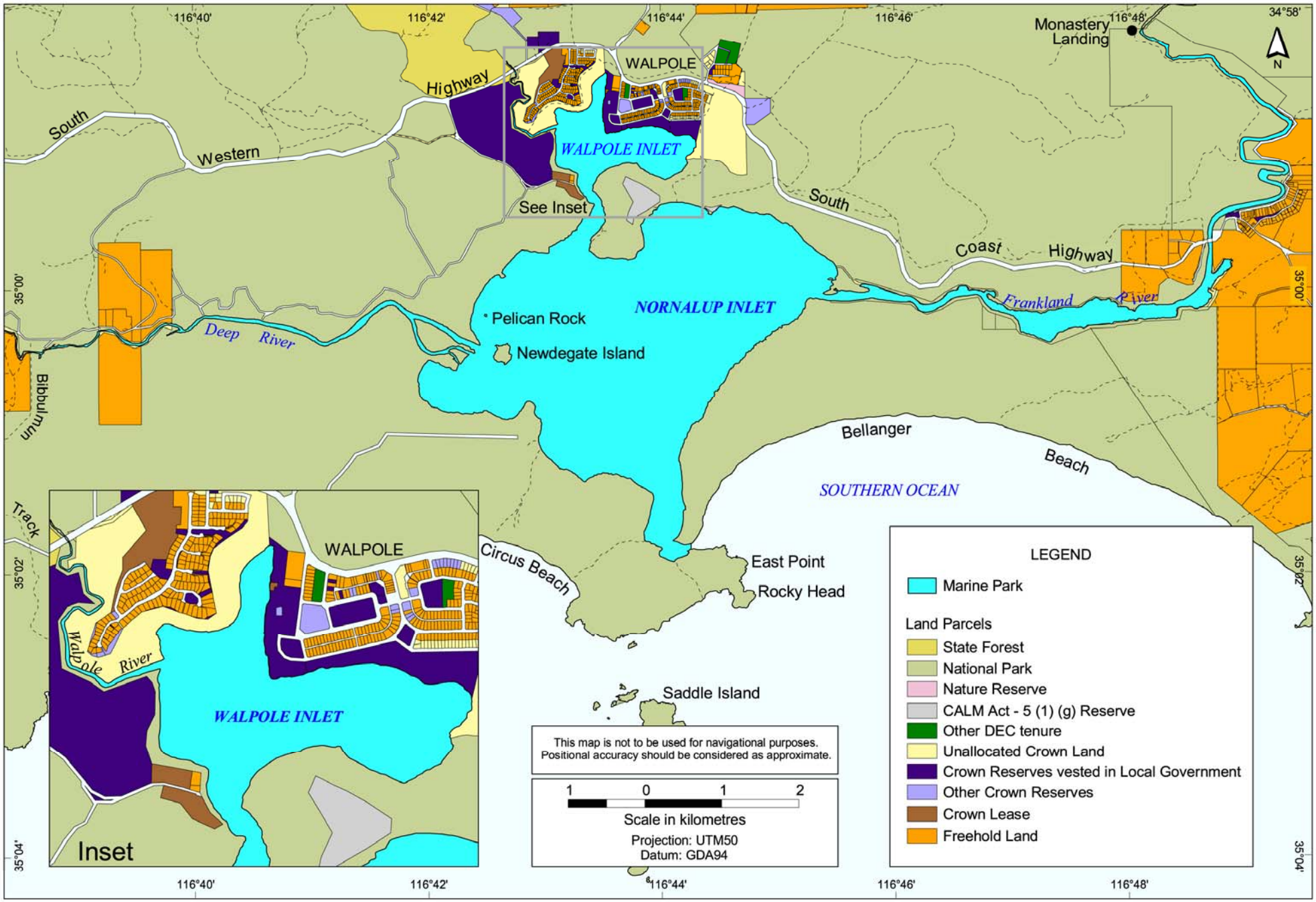

Figure 2: Tenure adjacent to the Walpole and Nornalup Inlets Marine Park.

4.3 Climate

The lower south-west of Western Australia has a Mediterranean climate with mild to moderately hot dry summers with cool evenings. Winters are typically cool and wet and are punctuated by periodic winter fronts bearing strong winds and rainfall. Mean minimum and maximum temperatures vary between 12 and 24°C in summer and six and 15°C in winter (DoE, 2004). Annual rainfall in Walpole is approximately 1300 mm and is strongly seasonal, with highest falls occurring between May and August (Hodgkin and Clark, 1999). Annual rainfall decreases rapidly to the north of the inlet system, with the north-eastern extremity of the catchment receiving less than 500 mm. Annual rainfall can vary greatly from year to year and within a year. For example, in 1996 rainfall was 1478 mm but in 2001 only 1081 mm (Brearley, 2005). In recent decades, a slight but consistently decreasing trend in annual rainfall has been apparent in the region around the inlet system, which has amounted to a reduction of around 200 mm since the 1950s (Brearley, 2005; Hodgkin and Clark, 1999).

4.4 Hydrology

During summer months the inlet system is essentially marine (i.e. salinity close to 36 parts per thousand (ppt)) and tidal, although tidal amplitudes are dampened by 40 per cent due to limited exchange through the narrow inlet mouth. At these times the Frankland, Deep and Walpole rivers are tidal for around 12, six and one km respectively. Although both the Frankland and Deep rivers flow all year, about 80 per cent of this discharge occurs during the winter and spring (i.e. from June to October) with negligible flow during summer, except for infrequent floods in the upper Frankland River (Brearley, 2005). Hence, the inlets undergo pronounced seasonal variations in water turbidity, salinity and temperature, and may be subject to distinct episodes of erosion and deposition during periods of peak flow (Hodgkin and Clark, 1999).

During the winter months a halocline (i.e. where water separates into distinct layers due to different salinities) typically forms throughout the estuary system. In the Nornalup Inlet, freshwater of generally 10 ppt or less flows over salty water which usually remains greater than 30 ppt in deeper parts of the inlet. Winter salinities in Walpole Inlet are usually lower than Nornalup Inlet (Brearley, 2005). This stratification breaks down in early summer due to wind driven mixing. During the summer months, saline water gradually extends up the rivers with deeper parts of the Frankland River to the head of the estuary (approximately 12 km) reaching salinities of 30 ppt with a layer of lower salinity water flowing over the surface (Brearley, 2005). During winter, if the river is not completely flushed, the layer of salt water in the deeper parts may persist. The marine waters also penetrate the Deep River for a distance of six km in summer although there may be an abrupt halocline between the bottom saltier water and the surface layer of fresh water. This stratification typically results in low oxygen concentrations near the bottom of the water column as opposed to the well oxygenated conditions generated by waves stirring the open inlet (Brearley, 2005).

The water temperature of the Nornalup Inlet is approximately 20-22°C during summer, while the surface temperature in winter of approximately 12-17°C is several degrees colder than deeper waters. River water temperatures exhibit greater variation and may reach 28°C by the end of the summer (Hodgkin and Clark, 1999).

The inlet system is relatively well flushed as it has a high net inflow of water relative to basin volume. The system is also subject to irregular and occasionally large flood events, the last major instance of which was in January 1982 (DoE, 2004). During these periods of high river discharge, visibility in the inlet system diminishes due to the presence of tannin-stained water, the dark colour of which may be an important factor in reducing algal growth. In contrast, water clarity gradually increases during the summer months with the influx of clear sea water. The change in colour may, however, not only be due to dilution with sea water but due to the light mediated breakdown of the organic compounds (Brearley, 2005).

4.5 Ecology

Because estuaries are subject to wide, often seasonal changes in physical conditions such as salinity, temperature, currents and turbidity, they typically support a relatively low diversity of organisms compared to most marine ecosystems (Edgar, 2001). However, as estuaries can provide a rich source of nutrients derived from surrounding catchments, tolerant species can occur in very high densities. Additionally, estuarine biota is strongly influenced by the frequency and duration of exchange with the ocean (Hodgkin, 1978; Young and Potter, 2002). However the diversity of organisms may diminish markedly if the estuary mouth closes for an extended period (Hodgkin and Clark, 1990a).

Shorelines of the Walpole and Nornalup inlet system comprise rocky shores, sandy beaches and a variety of vegetation assemblages. Karri (*Eucalyptus diversicolor*) and low eucalypt forest commonly grow to the shoreline on hillsides, while assemblages dominated by peppermint (*Agonis flexuosa*) or *Oxylobium heterophyllum* occur

in low-lying areas. *Juncus* and *Melaleuca* dominate shorelines of the Walpole Inlet and at the mouths of the Frankland and Deep rivers (Semeniuk, in press) (Figure 3). Riparian vegetation includes eucalypt forest and dense tea-tree thickets dominated by *Agonis parviceps* or *Homalospermum firmum* (Semeniuk, in press). While several shallow backwaters occur along the lower Frankland River, the ecological significance of these areas is poorly understood. Unlike many other estuaries in the region, the inlets do not have significant areas of intertidal swamp or mudflat. Low-lying areas adjacent to the river mouths do, however, become seasonally inundated during periods of high freshwater discharge.

The inlet system is biologically diverse compared to most estuaries in south-west Western Australia because it is permanently open to the ocean and maintains marine-like conditions for most of the year (Hodgkin and Clark, 1999). The inlet basins, which are dominated by mud and sand flats with some rocky shallows (Figure 4), support ephemeral seagrasses, such as *Heterozostera, Halophila* and *Ruppia,* and numerous species of algae. Polychaetes, crustaceans and molluscs dominate the relatively rich benthic invertebrate fauna, while approximately 40 mostly marine fish species commonly occur in the inlets (Potter and Hyndes, 1994; Hodgkin and Clark, 1999). Larger fishes that breed in the inlets and/or lower rivers include black bream (*Acanthopagrus butcheri*) and cobbler (*Cnidoglanis macrocephalus*) (Neira and Potter, 1994).

The relatively deep waters of the Nornalup Inlet provide further habitat for a variety of marine species, such as sharks, that are not common in other estuaries of the region. A diverse assemblage of waterbirds, shorebirds and seabirds, including ospreys (*Pandion haliaetus*) and white-bellied sea eagles (*Haliaeetus leucogaster*), inhabit the wide range of marine, estuarine and terrestrial habitats in and adjacent to the inlet system (Birds Australia, 2001b).

4.6 Social setting

Estuaries were highly significant hunting and gathering areas for Aboriginal communities of south-western Australia (Dortch, 1999). The presence of middens (places where shells, other food debris and other associated tools have accumulated over time), artefact scatters and fish traps on the shores of the inlet system and in the surrounding region provides evidence that Aboriginal groups have used the area extensively for camping and fishing (Dortch *et al*., 1984; Dortch, 1992).

The first substantial use of the inlets occurred following the settlement of Albany in 1826 when Nornalup Inlet was used as a base for sealers hunting New Zealand fur seals (Fernie and Fernie, 1989). However, the outstanding scenic beauty of the inlets was quickly recognised. The diary of William Nairne Clark records his passage through the entrance one evening in February 1841:

> "*The swell of the ocean was heavy outside, but we easily swept over the bar, got into deep water as smooth as a millpond, and moored the boat to a tree by the river bank. I cannot describe my sensations on entering this beautiful river during the gloom of night. A sense of awe mingled with pleasure was chiefly predominant."*

Although coastal areas of the region were used to graze cattle from about 1870 to 1900, the first permanent settlers close to the inlet system were the Bellanger brothers, who arrived in 1909. Despite intense pressure to develop the area for timber production and agriculture, 920 acres of land adjacent to the Frankland River were reserved for conservation in 1910. Remarkably, this reservation was initiated following a visit to the inlets region by a ministerial party headed by James Mitchell, the then Minister for Lands and Agriculture, who were there to assess prospects for timber production and farming.

The present Walpole townsite was first settled under the Land Settlement Scheme in 1930, and was gazetted in 1933. Tourism developed in and around the inlets during the 1920s, although access remained difficult until the Denmark to Nornalup railway opened in 1929 (Fernie and Fernie, 1989). Since the development of road access, the inlets have remained an accessible and low-risk destination for increasing numbers of tourists and visitors seeking family holidays, commercial tourism activities, water sports and recreational fishing. During World War II, United States servicemen flew flying boats to the inlets during periods of rest and recreation leave.

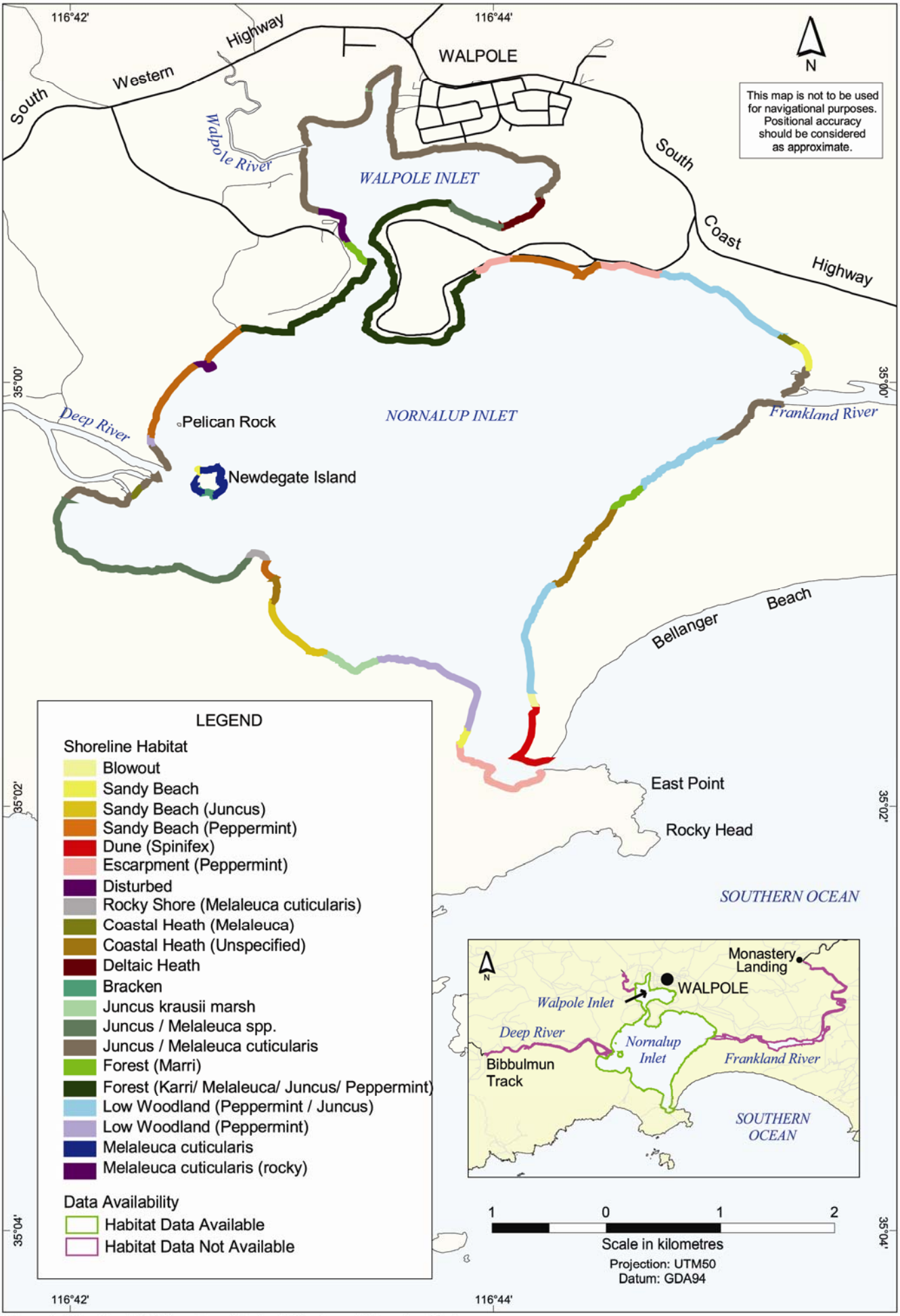

Figure 3: Shoreline habitats adjacent to the Walpole and Nornalup inlets.

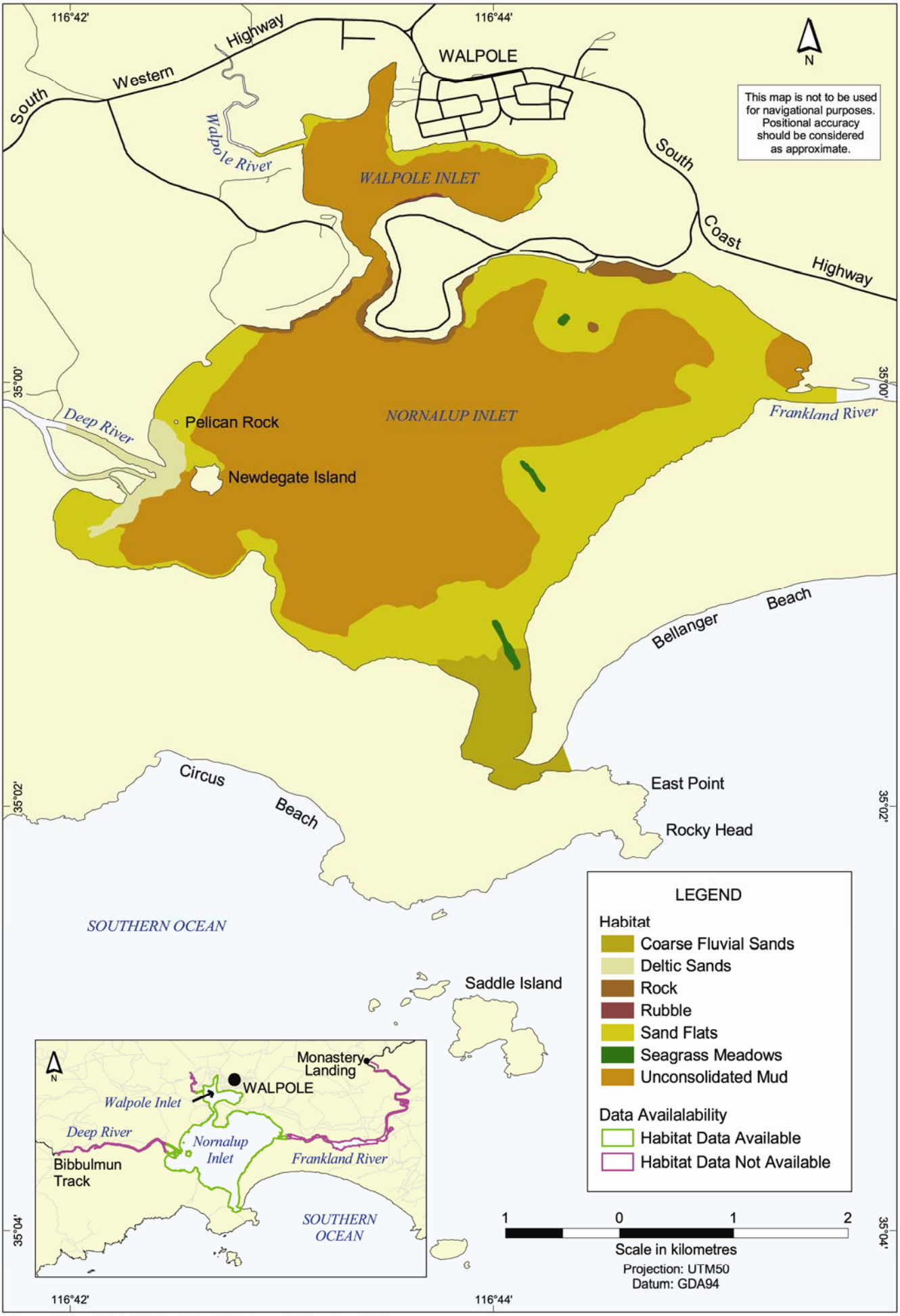

Figure 4: Benthic habitats of the Walpole and Nornalup inlets.

Tourism and recreation largely support the present day Walpole economy. Tourist facilities exist in Walpole, Nornalup and other locations, such as Rest Point and Coalmine Beach, adjacent to the inlets and rivers. A major attraction for commercial tourism in the inlet system is the lack of development and sense of isolation and remoteness that can be found, particularly in the Nornalup Inlet and substantial sections of the Frankland and Deep rivers. The value of the marine park as a commercial tourism destination is further enhanced by its close proximity to other high profile nature-orientated tourist attractions, such as the Bibbulmun Track, the Tree-Top Walk and the Walpole Wilderness Area. Current commercial tourism in the inlet system includes boat tours and houseboat hire, as well as kayak tours, dinghy hire and guided fishing. Many boat users utilise the inlet entrance to access adjacent marine waters. The inlet system is an important recreational fishing destination, where popular target species include black bream, King George whiting (*Sillaginodes punctata*) and blue-spot flathead (*Platycephalus speculator*). Catch and release black bream fishing competitions have been held in the inlet system in recent years. With two brief exceptions, from 1919-21 and 1944-46, the inlet waters have not been commercial fished inlets since 1911 (Fernie and Fernie, 1989). Shore-based commercial fishing for Australian salmon (*Arripis truttaceus*) occurs between February and April in ocean waters adjacent to the Nornalup Inlet, and a camp for this purpose is established on the shore of the inlet entrance. Catches are transported across the Nornalup Inlet by barge and are loaded onto road transport at a landing on the Deep River.

5 MANAGEMENT PLAN MODEL

5.1 A 'best-practice' approach to management

In 1997, a working group of the ANZECC undertook a benchmarking best-practice project to review the status of management of protected areas across natural resource management agencies in Australia. The ANZECC working group identified criteria that they considered critical for natural resource management, which were included in a best-practice model outlined in the report *Best Practice in Performance Reporting in Natural Resource Management* (Meredith, 1997). In 2000, a taskforce of the IUCN World Commission on Protected Areas developed a management effectiveness framework (Hockings *et al.,* 2000). This framework is now being used widely around Australia and overseas to help guide and structure management approaches and performance reporting.

These best-practice approaches and principles have implications for management planning and outcome-based management plans and have been embedded into the development and structure of this outcome-based management plan. The identification of specific ecological and social values, objectives, strategies, performance measures and management targets outlined in Section 9 of this management plan reflect an outcome-based best practice approach from which the effectiveness of management can be assessed. The management plan provides for a more objective and effective approach to implement management strategies, facilitate performance assessment, clarify management effectiveness, and provide for adaptive management responses across seven key management programs. Section 9 outlines the performance assessment and reporting aspects in more detail.

The conservation of marine and estuarine biodiversity and sustainable management of human activity in the marine environment of Western Australia is achieved through a number of mechanisms that include the establishment of marine conservation reserves, regulation of fisheries, environmental impact assessment, pollution control and maritime safety regulations. These mechanisms complement each other in their implementation and assist in attaining a best-practice management model.

In the context of this management plan, ecological values are the physical, chemical, geological and biological attributes of an area and represent a structurally complex array of relationships between plants and animals interacting in the estuarine environment.

Ecological values include:

- species or communities that have special conservation status (e.g. endangered or rare species);
- species or communities that are identified as significant within the reserve;
- key structural components of the ecosystem (e.g. seagrass and macro-algae reef communities);
- species endemic to the reserve;
- exploited species and communities (e.g. targeted fish populations); and
- key physical and chemical components of the ecosystem (e.g. geomorphology and water quality).

Social values are the cultural, aesthetic, recreational and commercial attributes of the area. These attributes relate to how people value and enjoy a range of recreational and commercial opportunities in the marine and estuarine environment. Social values are integrated into management outcomes while seeking to maintain a level of activity which is consistent with the proper conservation and restoration of the natural environment, the protection of indigenous flora and fauna and the preservation of features of archaeological, historic or scientific interest.

The strategic objectives of the marine park need to be defined operationally in a management context to provide for the implementation of the management plan. Seven management programs are identified in the management plan in which all strategies can be assigned for operational implementation. Section 7 outlines each management program and provides the overarching program strategies. The specific strategies for each of the identified ecological and social values are detailed in Section 8. Appendix II provides an operational schedule to guide the implementation of the management plan's strategies across the seven management programs over a 10 year period.

5.2 Determining management priorities

A pro-active and precautionary approach to conserving marine and estuarine biodiversity is used to determine management priorities. A risk assessment is undertaken by considering the likelihood of existing and potential pressures affecting the ecological and social values and their associated ecological and social consequences. The

relative level of risk posed by existing and/or potential pressures on the values of the marine park can be assessed by considering the following factors:

- the *biological intensity* of the pressure – pressures that impact lower trophic levels (i.e. primary producers such as seagrasses and macroalgal communities) are often of greater concern than pressures on higher trophic levels;
- the *temporal* scale of the pressure – ongoing pressures are generally of greater management concern than pressures that are short-lived;
- the *spatial* scale of the pressure – pressures that occur over a large area are often of greater management concern than localised pressures;
- the *social consequence* – acknowledges that different pressures have different social and political consequences. A high socio-economic/political consequence is often of greater management concern; and
- the *probability* of a pressure occurring within the timeframe of the management plan.

It is therefore necessary to determine how each value is, or is likely to be, affected by existing or future pressures. The ecological values and the major uses of the area are well known. However, the short-term and long-term cumulative ecological effects of pressures are not fully understood. For the purposes of developing management priorities, pressures on the values are confined to current pressures and those likely to occur during the life of the management plan and considered to be manageable within a marine park context. By definition, this excludes global pressures such as climate change. The vision and strategic objectives of the management plan (Section 6) provide the longer term outcomes to be achieved.

The strategies for the marine park focus on managing pressures while providing opportunities for use and enjoyment consistent with the management plan's objectives. Impacts on the ecological values can be direct effects such as damage to seagrass habitats by indiscriminate anchoring or impacts on fish stocks due to fishing. Indirect effects on the marine park's values may arise from activity such as littering, inappropriate sewage disposal and downstream effects of activities such as introduction of pests from ballast water discharge or nutrient enrichment from catchment-based activity. With a projected rise in users of the marine park in the next decade, the pressures on the ecological and social values of the marine park will increase and potential conflicts between users will need to be managed.

Management Objectives
Management objectives are presented for each value in Sections 7 and 8 and identify **what** the primary aims of management are. They also reflect the statutory responsibilities required by the CALM Act for marine parks and reserves. The management objectives for each value provide broad direction to management in relation to protecting or managing the value from existing or likely future pressures.

Management Strategies
Management strategies provide direction on **how** the management objectives will be achieved. The management programs provide the overarching strategies to guide implementation of strategies developed for each ecological and social value. All strategies have been prioritised as high (**H**), medium (**M**) or low (**L**) to provide an indication of their relative importance. A number of management strategies within each management program, and those which provide development and operational works guidance, considered to be critical to achieving the strategic objectives of the management plan (Section 6), are presented as key management strategies (**H-KMS**). This categorisation is also given to ecological and social value strategies where implementation is considered critical for plan implementation.

Performance measures
Performance measures are **indicators of management effectiveness** in achieving the marine park's objectives and targets. Performance measures should be quantitative, representative and, where possible, simple and cost-effective. The management plan usually contains generic performance measures (e.g. often diversity and abundance/biomass). Specific performance indicators will be developed during the design and implementation of monitoring programs. Performance measures for indirect (e.g. nutrient enrichment impacts on seagrass meadows) and direct (e.g. mooring impacts on seagrass meadows) impacts should focus on surrogate (e.g. changes in phytoplankton biomass and species composition) and direct (e.g. changes in seagrass biomass) measures of the value, respectively. These will be developed during the early phase of the implementation of the management plan.

In regard to the *active* social values (i.e. those social values that have the potential to negatively affect the

ecological values of the marine park) the performance assessment approach incorporates information on the status and level of the human activity. This information is important in monitoring human activity to assist in determining trends in use, and in assessing impacts of these on the ecological values of the marine park.

Management targets

Management targets represent the **end points of management**. Targets should be measurable, time bound and expressed spatially. Ecological targets will be set as either the 'natural state' or some acceptable departure from the 'natural state'. The long-term targets provide specific benchmarks to assess the success or otherwise of management action within the life of the management plan. The short-term target, where identified, provides a rehabilitation milestone and is used when the condition of the value is well below the desired condition (i.e. the long-term target). Where no short-term target is identified, it is considered that the condition of the value is close to or at the desired condition and, as such, the long-term target applies. The targets for *active* social values (e.g. marine nature-based tourism, recreational fishing and recreational water sports) are process-based and are generally stated as '*Implementation of management strategies within agreed timeframe'*. This ensures that strategies for the social values are implemented in accordance with the management objectives.

Key performance indicators

Key performance indicators (KPIs) are a **measure of the overall effectiveness** of management in relation to the strategic objectives of the marine park. KPIs relate specifically to the management targets for key ecological and social values and reflect the highest conservation (from biodiversity and ecosystem integrity perspectives) and management (social) priorities of the MPRA, DEC and the community. KPIs are a key element of the MPRA audit process (Section 10).

6 VISION AND STRATEGIC OBJECTIVES

6.1 Vision

The vision statement for the marine park represents the community's aspirations for the conservation, use and management of the marine park and will provide a broad direction for future management.

The unique natural biodiversity and aesthetic and cultural values of the marine park will be protected.

The marine park will support sustainable human use for present and future generations, such that:

- *the inlets, rivers and their shores are managed to a condition that is the same or better than today;*
- *the aesthetics and ambience of the marine park are maintained;*
- *people can continue to experience a range of activities, such as fishing, tours and holidays;*
- *the biodiversity of the marine park is monitored and protected;*
- *economic benefits flow to the Walpole community;*
- *there is a substantially raised awareness of the value of the marine park; and*
- *the local community feels ownership of the marine park, participates in management, and feel confident in its long-term protection.*

6.2 Strategic objectives

The objectives of the marine parks and reserve system are to:

- preserve representative as well as special ecosystems in the marine and estuarine environment; and
- put a formal management framework in place to ensure the various uses of marine parks and reserves are managed in an equitable, integrated and sustainable manner.

Within the context of Government policy and the CALM Act, the strategic objectives for the marine park are to:

Conservation

- maintain and enhance the marine and estuarine biodiversity;
- maintain ecological integrity (i.e. key ecosystem structure and function);

Science and education

- promote education, nature appreciation (through recreation and tourism opportunities) and scientific research;

Public participation

- promote community involvement in the management of the marine park;

Recreational uses

- facilitate, manage and where appropriate, assist in the management of recreational activities within an equitable and ecologically sustainable framework; and

Commercial uses

- facilitate, manage and where appropriate, assist in the management of commercial activities within an equitable and ecologically sustainable framework.

The strategic objectives of the marine park cannot be achieved in isolation from other statutory and non-statutory management measures both within and external to the marine park. The management of the marine park must thus be seen as part of a complementary suite of management practices including management of adjacent terrestrial areas, fisheries management, wildlife protection, pollution control, environmental impact assessment and maritime transport and safety measures, as well as community cooperation and participation.

7 MANAGEMENT PROGRAMS

The vision, strategic objectives, management targets and management objectives outlined in Sections 6-8 provide the framework for the development of specific management strategies designed to conserve the ecological and social values. These strategies are implemented within seven management programs:

- management frameworks;
- education and interpretation;
- public participation;
- patrol and enforcement;
- management intervention and visitor infrastructure;
- research; and
- monitoring

7.1 Management frameworks

The development of management frameworks is essential to ensure effective long-term management of the marine park. They consist of the legal, financial, human and administrative activities required to establish and maintain an appropriate framework for marine management. They also include the establishment of zoning and mooring schemes, preparation of planning schemes and other activities not covered by the other management programs.

For administrative purposes, DEC is divided into regions which in turn are made up of districts. The marine park is within the Warren Region and operational responsibility for implementation of the management plan and its management programs rests with the Frankland District. The Frankland District has management infrastructure and staff at Walpole. DEC's Marine Policy and Planning Branch has a strategic role in assisting Regional and District offices in the management of marine parks and reserves. A number of other specialist DEC branches provide support, direction and assistance in relation to such areas as wildlife management, licensing of tourism operations and research and monitoring.

The marine park contributes to the NRSMPA. The objective of the State's marine park and reserve system and the NRSMPA is to build a system of marine protected areas that will be:

- *comprehensive* – include marine protected areas in all the major bioregions of Australia;
- *adequate* – include marine protected areas that are of appropriate size and configuration to ensure the conservation of biodiversity and the integrity of ecological processes; and
- *representative* – include the flora, fauna and habitats that are representative of the bioregion.

Management objectives	1. To implement the statutory management framework for the marine park. 2. To implement collaborative initiatives for the management of the marine park.
Management program strategies	1. Gazette classified waters notice under the CALM Act (DEC) **(H-KMS)**. 2. Gazette an order under the FRM Act to prohibit commercial fishing in the marine park (DoF, DEC) **(H-KMS)**. 3. Develop and implement joint and collaborative operational plans (DEC, DoF,DoT) **(H).** 4. Ensure the setting of conditions for new developments and operations are consistent with the management objectives and targets for ecological and social values (DEC, MPRA, EPA, DoF, LG, DMP, DoT, TWA) **(H).** 5. Ensure that proponents of development proposals or activities with the potential to impact on the marine park's values conduct appropriate compliance monitoring programs (DEC, MPRA, EPA, DoF, DMP, DoT) **(H)**. 6. Ensure the provision of necessary information to the MPRA for audit processes (DEC, DoF) **(H).** 7. Ensure appropriate licences and permits are provided where necessary (DEC, DoF) **(H).** 8. Liaise with and provide advice to agencies and stakeholders, where necessary, to ensure the protection of ecological and social values (DEC) **(H).** 9. Map the ecological and social values of the marine park that are highly sensitive to oil and chemical spills and ensure this information is accessible to the State Committee for Combating Marine Oil Pollution (DEC) **(H)**. 10. Develop and implement codes of practice with user groups, where necessary, to encourage responsible use of the marine park (DEC) **(M)**.
Target	Implementation of management strategies within agreed timeframes (Appendix II).

7.1.1 Development of a zoning scheme

The implementation of an appropriate zoning scheme is an important strategy for both the conservation of marine and estuarine biodiversity and the management of human use in the marine park. The partial or total restriction of extractive activities in representative habitats is a key strategy in the long-term maintenance of biodiversity values in the marine park. Specifically, the establishment of zones in which extractive activity is not permitted usually plays a key role in the protection of representative areas of important habitats such as intertidal reef communities, macroalgae (subtidal) reef communities and seagrass communities. As well as providing a measure of management 'insurance', these zones provide areas where natural processes can be studied relatively free of significant human influence. These zones also provide the opportunity to improve the understanding of the marine park's key ecological processes and to obtain critical baseline data to compare against areas of the marine park where extractive activities are permitted and/or where environmental impacts may be occurring. The zoning scheme assists in separating conflicting uses and provides for specific activities such as for commercial and recreational activities, scientific study and nature appreciation.

Section 13B of the CALM Act requires marine parks be zoned as one or a combination of specific management zones, i.e. sanctuary, recreation, special purpose or general use zones, which are formally established as classified areas under Section 62 of the CALM Act. Changes to the zoning of the marine park during the life of the management plan can occur after meeting the statutory public consultation requirements and acquiring relevant Ministerial approvals. Therefore, zoning can be a flexible management tool that can accommodate evolving use of the marine park during the duration of the management plan.

Sanctuary zones provide for the maintenance of environmental values and are managed for nature conservation by excluding human activities that are likely to adversely affect the environment. They are used to provide the highest level of protection for vulnerable or specially protected species and to protect representative habitats from human disturbance so that marine life can be seen, appreciated and studied in an undisturbed or largely undisturbed state. Passive recreational activities which do not compromise the maintenance of environmental values may be permitted but extractive activities including fishing and traditional fishing and hunting are not. Commercial tourism operations (such as for nature-based tours) are permitted where they do not conflict with other uses and will be regulated under the CALM Act. Sanctuary zones also provide areas for education and scientific study.

Recreation zones provide for conservation and compatible recreational activities, including recreational fishing. Commercial fishing, pearling, aquaculture and petroleum exploration and production are not permitted in these zones.

Special purpose zones are managed for a particular priority purpose or use, such as a seasonal event (e.g. wildlife breeding or whale watching) or a particular type of activity (e.g. surfing). Uses that are incompatible with the specified priority purpose are not permitted in these zones.

General use zones are all areas in the marine park not included in sanctuary, recreation or special purpose zones. Conservation of natural values is still the priority in general use zones, but activities such as sustainable commercial and recreational fishing, aquaculture, pearling and petroleum exploration and production are permitted provided they do not compromise the ecological values of the marine park.

The development of the zoning scheme was guided by a number of key principles.

- the zoning scheme should include a system of comprehensive, adequate and representative no-take or sanctuary areas for marine biodiversity conservation and for ecological 'insurance' via increased resilience against natural and human disturbances. They should include the major marine communities;
- the zoning scheme should provide areas relatively free of significant human impact for research and monitoring, nature appreciation and education;
- the precautionary principle should be applied, which means that a lack of scientific certainty about the location, size or number of no-take areas does not prevent the establishment of no-take areas;
- the importance of maintaining both ecological and social values;
- that, wherever possible, the placement of zones to achieve the management objectives should be done so as to minimise impacts on the existing social values;
- that community support is critical to achieving the strategic objectives; and
- the zoning scheme should be simple for the public to understand and therefore comply with any restrictions.

7.1.2 Zones in the Walpole and Nornalup Inlets Marine Park

The zoning scheme for the marine park was derived primarily through a consultative process with stakeholders including representative bodies, interest groups and community members, recreational fishers and a community based Focus Group. The zoning scheme recognises the high recreational value placed on the area by the community.

Sanctuary and special purpose zones were considered during the planning process for the marine park however were not considered necessary due to a number of factors:

- the typically variable hydrological conditions that occur in the inlet system means that numerous marine species opportunistically colonise the marine park only when conditions are appropriate and even mobile estuarine species, such as black bream, may move between the rivers, inlets and even the ocean depending on environmental conditions;
- the simple basin structure of the inlets contributes to the fact that particular parts of the inlet system cannot yet be distinguished as being, for example, highly productive or consistently supporting particular concentrations of flora and/or fauna;
- a significant proportion of existing and potential threats to the marine park derive from human activities in lands and catchments that surround the inlet system and the small size of any sanctuary zones created in the inlet basins could not be isolated from these impacts;
- in recognition of the importance of the area as a recreation and tourism destination for the local and broader communities, particularly recreational fishing; and
- the creation of special purpose or sanctuary zones would not significantly contribute to the management objectives of the marine park during the life of the management plan.

A single recreation zone for the marine park has been established to ensure the various recreational uses of the marine park are managed in an equitable, integrated and sustainable manner ensuring ecological values are protected. It is recognised that scientific knowledge of the inlets is incomplete, and that some important sites such as fish spawning areas may be identified in future and may require additional spatial protection.

The activities permitted in the marine park are outlined in Table 2.

Table 2: Permitted uses in the Walpole and Nornalup Inlets Marine Park.

PERMITTED USE **[IMPORTANT: Ensure cross-referencing with permitted use provisions]**	**Recreation Zone**
RECREATIONAL USE	
Recreational boating (motorised and non-motorised)	Yes [b, c]
Water skiing	Yes [b, c]
Parasailing	Yes [b, c]
Freestyling[h] on motorised vessel	Yes [b, c]
Snorkelling and diving	Yes
Swimming	Yes
Nature-appreciation	Yes
Aquarium/specimen shell collecting	Yes [a]
Crabbing	Yes [a]
Line fishing	Yes [a]
Netting	No [a]
Animal exercising	No [j]
Spearfishing[g]	No [a]
COMMERCIAL USE	
Charter vessel – fishing, nature-based tourism	Yes [a, b, c, d, e]
Commercial vessel transit	Yes [b, c]
Aquaculture	No
Commercial fishing	No
Commercial specimen shell collecting	No
Mineral and petroleum exploration and development	No
OTHER USE	
Minor marine infrastructure (e.g. moorings, navigation infrastructure)	Yes [b, c, d, e]
Major marine infrastructure and development (e.g. groynes, revetment, artificial reefs, jetties, subsurface cabling, piping)	Assess [b, c, d e]
Anchoring	Yes [b, c]
Research	Yes [e]
Education	Yes
Stormwater disposal	Assess[f]
Dredging and dredge spoil dumping	Assess[f]
Discharge of boat sewage	No
Wildlife feeding	No
PERMITTED USE PROVISIONS	

a Subject to licence requirements or provisions of the *Fish Resources Management Act 1994* and *Fish Resources Management Regulations 1995.*

b Subject to the *Western Australian Marine Act 1982* and *Navigable Waters Regulations 1958.*

c Restrictions on vessel type, speed etc. and anchoring may be introduced in consultation with the community and major users where boating and/or surface water sports are impacting on the ecological and/or social values of an area.

d Subject to the licence/provisions under the *Conservation and Land Management Act 1984, Conservation and Land Management Regulations 2002, Wildlife Conservation Act 1950* and *Wildlife Conservation Regulations 1970.*

e Licence required from DEC and/or DoF.

f Subject to the *Environmental Protection Act 1986.*

g Includes the use of pointed objects such as speargun, harpoon, Hawaiian sling or gidgee (with or without compressed air).

h Freestyling is defined as using personal watercraft in a manner that is characterised by high speed and erratic or irregular driving such as wave jumping, driving in a circle or other pattern and/or weaving or diverting.

j Authorisation may be provided at the discretion of the DEC District Manager in liaison with the local government.

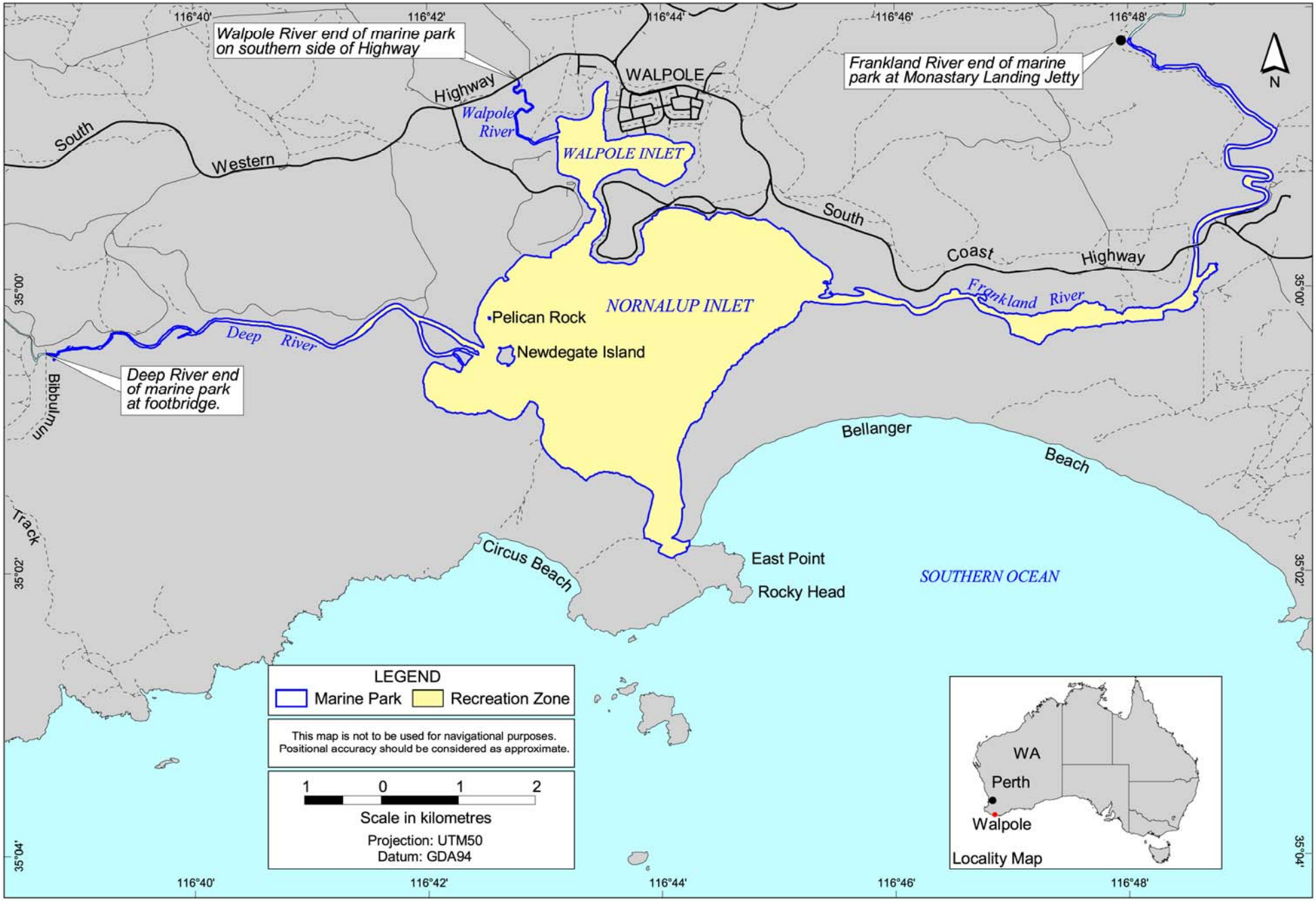

Figure 5: Zoning in the Walpole and Nornalup Inlets Marine Park.

7.2 Education and interpretation

Developing community support for the marine park is critical to the effective implementation of marine park management and protection of the area's values. The level of public acceptance and support for management controls directly relates to the level of understanding of the values of the marine park and the reasons for the regulation of activities. The desired outcome of education is to increase public awareness and understanding of conservation and management issues in the marine park and the marine environment in general. In a local sense, this increased understanding will help to develop a real sense of community ownership will which subsequently lead to better protection of the ecological and social values. Initially, education programs will focus on providing information on the creation of the marine park and new restrictions on activities as a result of the implementation of zoning and other management strategies. Ongoing education programs will be required and a range of education and interpretive infrastructure (e.g. walk or dive trails and interpretive signs) will be considered where appropriate.

Management objective	To enhance community understanding of, and support for, the marine park and marine conservation through education and interpretation programs.
Management program strategies	1. Develop and implement an education and interpretation program designed to raise community awareness of: • the importance of ecological and social values; • appropriate behaviours to avoid or reduce human impacts, particularly fishing, and to ensure public safety; and • zoning and other restrictions (DEC) **(H-KMS).** 2. Where appropriate, implement education and interpretation programs in collaboration with external organisations (DEC) **(H).** 3. Ensure education and interpretation programs complement, and integrate with terrestrial programs for adjacent reserves (DEC) **(H).** 4. Distribute appropriate education and interpretive materials to individuals, community groups, clubs, schools and customers and staff of commercial operations (DEC, DoF) **(H)**. 5. Provide work experience and voluntary placement opportunities, where possible, to facilitate education through direct involvement in operational management (DEC, DoF) **(M).** 6. Provide talks and briefings about the marine park's values and management to user groups as necessary (DEC) **(M)**.
Targets	1. 50 per cent of visitors aware of the existence of the marine park, its values and the restrictions applying to the area within three years of gazettal. 2. 90 per cent of visitors aware of the existence of the marine park, its values and the restrictions applying to the area within ten years of gazettal. 3. Implementation of management strategies within agreed timeframes (Appendix II).

7.3 Public participation

Public participation in management can help generate the community support that is critical for effective implementation of the management plan. An important early step in the administration of the marine park is the establishment of a community-based Management Advisory Committee (MAC) to build upon the partnership between the local community and government by actively engaging the community in marine park management. The MAC will be formally established and its main function will be the provision of advice and assistance to DEC and the MPRA. This will provide an ideal forum for information sharing as well as an avenue for dissemination of information to the public. For example, local stakeholders would be able to raise issues with DEC, the MPRA or the Minister for Environment in matters relating to the marine park's management, administration, zoning, conflicts in usage and any other management-related issues that arises during the life of the management plan.

Management objective	To facilitate on-going community participation in the management of the marine park.
Management program strategies	1. Develop and implement a public participation program for the marine park which encourages community involvement through a range of opportunities such as monitoring programs (DEC, DoF) **(H- KMS)**. 2. Establish and maintain a MAC (DEC) **(H-KMS)**. 3. Liaise with South Coast NRM and SWCC to assist with the determination of their investment priorities for the marine environment, particularly in relation to marine park management (DEC) **(M).** 4. Maintain a database of community participation (DEC) **(M).**
Target	Implementation of management strategies within agreed timeframes (Appendix II).

7.4 Patrol and enforcement

This management plan details a range of strategies relating to the management of particular human activities, and the effectiveness of these strategies will be dependent on compliance by users. While users typically comply with management regulations when they understand why such controls have been implemented, there is always a need to monitor the level of compliance and take action to stop inappropriate or illegal behaviour. To achieve this, an appropriate level of 'on water' presence by DEC and DoF will be necessary in the marine park.

In 2005 a MOU was developed between the then Minister for the Environment and Minister for Fisheries to establish principles of cooperation and integration between DEC and DoF in the management of the State's marine protected areas. This MOU ensures collaborative operational plans are developed by DEC and DoF to ensure efficient and effective delivery of a range of programs where there is overlapping, shared agency responsibility or mutual interest, which includes patrol and enforcement activities.

Management objective	To maximise public compliance of regulations related to the on-going management of the marine park.
Management program strategies	1. Develop and implement a collaborative patrol and enforcement program to ensure compliance with zoning restrictions, permitted uses and other regulations (DEC, DoF, DoT) **(H-KMS).** 2. Encourage voluntary compliance and peer enforcement of regulations. (DEC, DoF, DoT) **(H)**. 3. Facilitate cross-authorisation of Government enforcement officers as appropriate (DEC, DoF, DoT) **(H-KMS)**. 4. Ensure marine park users, including researchers comply with appropriate permits (DEC, DoF) **(M).**
Target	Implementation of management strategies within agreed timeframes (Appendix II).

7.5 Management intervention and visitor infrastructure

Intervention comprises direct management actions required to achieve conservation outcomes while providing opportunities for visitor use and enjoyment. These can be either proactive (i.e. preventative) or reactive (i.e. restorative) management strategies. Intervention includes provision of visitor facilities to reduce site disturbance and environmental impacts, rehabilitation of degraded areas and risk management.

Although the majority of the marine park is in relatively good condition, there are areas that have suffered localised disturbance from human use. Anecdotal evidence from current visitors to the marine park suggests there are areas of shoreline degradation, possible depletion of some bivalve species, sediment contamination and accumulations of litter. It is likely that human use of the marine park will increase in the future. An increase in visitor numbers may require additional facilities to be provided so as to protect the ecological values from human disturbance (e.g. moorings) and to enhance visitor experience (e.g. interpretative signage). The level of use of the marine park and the areas which come under the highest visitor pressure will be monitored and consideration given to provision of visitor facilities, where appropriate.

Given increasing visitation to the area and the need to maintain the opportunity for sustainable recreational opportunities, there may be the need to further develop recreation sites adjacent to the marine park. The management plan for the Walpole Wilderness Area and Adjacent Parks and Reserves identifies a spectrum of visitor management settings for the adjacent lands. These settings guide DEC when determining what sort of recreational development is appropriate in various natural settings and ensures that areas are not subject to incremental development.

Public boat launching facilities exist at Rest Point, the town jetty area, Swarbrick, Coalmine Beach and Nornalup. When developments are proposed within the marine park they are subject to the environmental impact assessment requirements of the EP Act and consideration by DEC and the MPRA in the context of this management plan. During the life of this management plan there may be proposals for the installation and construction of infrastructure associated with tourism operations, recreation or public works. These could be major developments such as marine refuelling stations or sewerage pipelines, or minor works such as the installation of moorings or navigation markers. The nature of the development will determine the appropriate level of assessment.

Moorings/Anchoring

Moorings may be either public or private. Public moorings within the marine park are managed by DEC while private moorings are licensed and managed by Department of Transport (DoT) and imply exclusive rights to an area. If not installed and maintained correctly, moorings may cause irreversible environmental damage to seagrass beds. Policy Statement No. 59 *Mooring Policy* for marine parks and reserves (CALM and MPRA, 2002) aims to:

(i) minimise the detrimental impacts of uncontrolled mooring and anchoring;
(ii) enhance user safety, access and equity in relation to moorings; and
(iii) provide a framework to accommodate present and future mooring usage patterns.

The Mooring Policy also states that DEC will seek to designate all marine parks and reserves as 'mooring control areas' under the *Shipping and Pilotage Act 1967* or other legislative mechanism. Development and implementation of a mooring and anchoring plan is a priority action of the management plan. The mooring and anchoring plan will identify areas in which moorings and anchoring are acceptable and/or necessary from an environmental, equity and safety perspective. Existing moorings in inappropriate locations may be required to be removed or relocated at the owner's expense. Applications for new moorings will be assessed on a case-by-case basis, and will need to meet the criteria established in the Mooring Policy, which includes mooring design specifications and being consistent with the mooring plan.

At this stage, with the exception of boating channels, there are no areas in the marine park that have been identified where moorings would not be permitted. However, given the limited number of sheltered areas in the marine park, the number of moorings may be capped if pressure for new moorings persists. At the time of publication, there are a number of registered moorings, with the majority of these being licenced to a commercial tour company.

Dredging/Mechanical Sand Movement

It is important to allow natural coastal processes governing sand movement in the marine park to continue to function without mechanical intervention wherever possible. In the event that dredging, sand removal or sand

nourishment may become necessary the situation will be assessed according to its necessity and impact on the ecological and social values of the marine park. In the first instance, dredging will be discouraged unless undertaken to ensure established navigation channels are maintained and that boat launching facilities remain functional.

Navigation Infrastructure
It is imperative that use of coastal waters remains safe for recreational and commercial vessels. Navigation markers are necessary infrastructure to aid this use in some areas. DoT is responsible for the introduction, maintenance and management of navigation markers; however consideration will need to be given to the protection of the ecological and social values of the marine park if new infrastructure is proposed.

Groyne Construction/Beach Revetment
Some areas of the inlet consist of a mobile sediment system. Should it be deemed necessary to establish a groyne or beach revetment, consideration by DEC and the MPRA would be necessary to ensure the ecological and social values of the marine park are not impacted. In some instances, this type of work may require formal assessment by the EPA as per the requirements of the EP Act.

Jetty Structures
In general, jetty structures are licensed by the DoT under the *Marine and Harbours Act 1981.* There are currently 35 private jetties in the marine park, all of which are licenced by DoT. There are also four public jetties: a small jetty at the mouth of the Nornalup Inlet; the Swarbrick jetty; the Town jetty and the Nornalup boat ramp jetty. Currently the Swarbrick jetty, Town jetty and Nornalup boat ramp jetty are licensed to, managed and maintained by the relevant local government authority. The jetty at the mouth of the Nornalup Inlet is an unlicensed jetty maintained by a local tour company. The inclusion of the public jetties in the marine park means that DEC will assume responsibility for their management. DEC will work with local government to determine appropriate management arrangements for these jetties. No additional private jetties will be permitted in the marine park where there is an unacceptable risk or impact to shoreline vegetation and/or if it will constrain public access. Jetty structures may require ongoing maintenance during their life. Maintenance works will be required to have minimal impact on ecological values and management strategies may be required to be developed to assist in avoiding or mitigating impacts.

Bridge maintenance/construction
Bridges in the Walpole area are maintained and constructed by the DoT in the majority, and by local governments in some instances. All construction and maintenance work relating to bridges will be required to have minimal impact on the ecological values of the marine park consistent with the requirements of this management plan, and management strategies may be required to be developed to assist in avoiding or mitigating impacts.

Visitor Risk
Visitor risk management is an important focus for DEC. As visitation to the marine park is likely to increase during the life of the management plan, an ongoing visitor risk management program will be undertaken to identify potential hazards and measures implemented to minimise these. Risks to visitors are managed under the framework of DEC's Policy Statement No. 53 *Visitor Risk Management Policy*.

Management objectives	1. To manage and remediate, where appropriate, existing human impacts on the ecological and social values of the marine park. 2. To provide facilities to enhance visitor enjoyment and minimise environmental impacts to, the marine park. 3. To take reasonable steps to minimise visitor risk where possible in the marine park.
Management program strategies	1. Ensure management related signage is installed as soon as possible after gazettal of the marine park (DEC, DoF) **(H-KMS)**. 2. Gazette the marine park as a mooring control area or use alternative legislative mechanism to manage moorings (DEC, DoT) **(H-KMS)**. 3. Develop a mooring and anchoring plan for the marine park, with appropriate consultation, which identifies areas in which moorings and anchoring are acceptable and/or necessary from environmental, equity and safety perspectives, including an assessment of the capacity of each area (DEC, DoT) **(H)**. 4. Manage existing moorings and assess new moorings in accordance with the DEC/MPRA Mooring Policy No. 59 and the approved mooring plan (DEC, DoT) **(H)**.

	5. Gazette restricted anchoring areas where an unacceptable level of damage to ecological values is occurring or is likely to occur (DEC, DoT) **(H)**. 6. Liaise closely with coastal managers in regard to coastal management practices, such as sand by-passing, sand nourishment (input and outtake) and sea wrack removal which occur adjacent to the marine park boundary (DEC, LG, DoT) **(H)**. 7. Determine the nature, spatial requirements and compatibility and potential environmental impacts of all water sports and develop a long-term sustainable water sport strategy, which could include separation of incompatible water sport activities (DEC) **(H)**. 8. Contribute to, and lead where appropriate, detailed recreation and site planning for areas of current or anticipated high use and/or for sensitive sites in consultation with major users (DEC) **(H)**. 9. Perform regular assessments for visitor risks in the marine park (DEC) **(H).** 10. Implement measures to reduce or remove visitor risks identified during regular assessments (DEC) **(H)**. 11. Liaise with local government to determine appropriate management arrangements for public jetties in the marine park (DEC) **(H)**. 12. Prohibit the construction of new jetties where it is assessed that there is an unacceptable risk to or impact upon shoreline vegetation and/or constrains public access to the shoreline (DEC, DoT) **(M)**. 13. Develop management protocols and arrangements under which mechanical sand movement and/or sea wrack removal may be permitted within the boundaries of the marine park. (DEC, LG) **(M)**. 14. Ensure boat launching facilities are not impeded by excessive accumulation of natural materials such as sea wrack or sand within marine park boundaries (DEC) **(M)**. 15. Maintain awareness of the introduction, maintenance or management of bridges, navigation or other maritime infrastructure (DEC, DoT) **(M)**. 16. Implement a program of routine inspection, maintenance and reporting on infrastructure condition (e.g. zone markers, signage) in the marine park (DEC) **(M)**. 17. Identify degraded areas in the marine park, assess rehabilitation options and implement, where appropriate (DEC) **(M)**. 18. Provide an appropriate level of visitor infrastructure, based on monitoring of human use patterns (DEC, LG) **(M)**. 19. Until the development of a long-term water sport strategy, ensure that no more than seven non-commercial live-aboard vessels that are staying for more than two nights are present in the marine park at any time (DEC) **(M)**. 20. Designate areas for animal exercising if considered appropriate (DEC) **(L)**.
Target	Implementation of management strategies within agreed timeframes (Appendix II)

7.6 Research

An increased understanding of the natural and social environment is critical for effective management, and a comprehensive research program will provide background information on the environment of the marine park, as well as an understanding of what is 'natural' as a benchmark for future monitoring. Considerable scope exists in the marine park for research that will establish the natural state of key ecological values and processes, and research programs should, ideally, be designed to fill key gaps in current knowledge that are relevant to management. Licences under the *Conservation and Land Management Regulations 2002* may be required to conduct research within the marine park.

Management objectives	1. To obtain an appropriate understanding of the biodiversity and key ecological and social processes within the marine park. 2. To promote ecological and social research that improves knowledge of the marine park and provides the technical basis for management decisions.
Management program strategies	1. Develop and progressively implement a coordinated and prioritised research program focusing on key ecological and social values, processes and issues of the marine park (DEC, DoF) **(H-KMS**). 2. Communicate the prioritised research program to appropriate research organisations (DEC, DoF) **(H-KMS)**. 3. Maintain a database of research information relevant to the management of the marine park e.g. human use patterns, wildlife presence (DEC, DoF) **(H-KMS)**. 4. Facilitate ecological and social research in the marine park conducted by research, academic and educational institutions, by providing financial and logistical assistance, where possible (DEC, DoF) **(H)**. 5. Develop partnerships with stakeholders and the community to implement research programs (DEC, DoF) (**H**). 6. Share research outcomes with interested stakeholders, where appropriate (DEC, DoF) **(H)** 7. Encourage marine park users to contribute to research programs (DEC, DoF) **(M)**
Targets	1. Establishment of priority baselines against which changes can be measured. 2. Implementation of management strategies within agreed timeframes (Appendix II).

7.7 Monitoring

Monitoring the state of the estuarine environment is essential to measure the effectiveness of management of the marine park. Monitoring enables the early detection of detrimental impacts and thereby provides the trigger for corrective management action before ecological and social values of the marine park become significantly degraded. Where changes have occurred and remediation measures have been implemented, a monitoring program should determine the rate of recovery of an affected area or value.

A marine science program will be progressively implemented by DEC to coordinate and help deliver the research and monitoring strategies of the management plan as part of a statewide initiative to improve the delivery of research and monitoring requirements within marine parks and reserves. Programs will focus on monitoring of key ecological and social values against their management targets. These are identified as the KPIs in the management plan. Where required, short term management targets may need to be developed or further refined to reflect meaningful interim steps in achieving the longer term management targets and marine park objectives. The marine science program will also progressively define and use appropriate performance measures, or surrogates, to monitor the values of the marine park to measure whether the objectives of the management plan are being achieved. DEC will deliver these programs in collaboration with DEC's Regional and District staff who are responsible for day-to-day management of the marine park, DoF, and through external providers such as the Commonwealth Scientific and Industrial Research Organisation, Australian Institute of Marine Science and universities.

Management objective	To monitor key ecological values at risk and human usage to provide a basis to adapt and improve management of the marine park.
Management program strategies	1. Develop and progressively implement a coordinated and prioritised ecological and social monitoring program for the marine park, including community-based monitoring programs, with a particular emphasis on MPRA and DEC audit requirements (DEC, DoF) **(H-KMS)**. 2. Monitor changes in key values in the marine park against adequate baselines (DEC) **(H-KMS)**.
Target	Implementation of management strategies within agreed timeframes (Appendix II).

8 MANAGEMENT OF ECOLOGICAL AND SOCIAL VALUES

8.1 Ecological values

Ecological values are the physical, geological, chemical and biological characteristics of an area. Ecological values are significant in terms of their biodiversity (i.e. representative, rare or unique) and ecosystem integrity role. Ecological values also have a social significance because many social values are functionally dependent on the maintenance of ecological values. Set out below is information on specific ecological values, their management objectives, strategies and targets. These specific strategies should be considered in the context of the generic strategies in Section 7, particularly in the case of education and interpretation, research, and monitoring.

8.1.1 Geomorphology

Ecological value	*A geologically complex lagoonal estuarine system comprising three significant rivers and two connected inlets that are permanently open to the ocean.*

Background	The Walpole and Nornalup inlet system has a complex geomorphology, having attained its present form only during the Holocene period (i.e. 6000-8000 years ago) when rising sea levels flooded the geologically ancient valleys of the Deep and Frankland rivers (Hodgkin and Hesp, 1998; Hodgkin and Clark, 1999). Coastal dune formation then increasingly isolated the estuary system from the ocean, such that exchange with the sea is now restricted to a narrow and shallow, though permanently open, entrance to the Southern Ocean. This channel remains permanently open due to its orientation, which is protected from prevailing south-west winds and swells, and a relatively high volume of freshwater discharge (Hodgkin and Hesp, 1998). Landforms adjacent to the inlet system comprise Precambrian granites, Pleistocene limestones and unconsolidated Holocene dunes close to the coast with undulating laterite hills and low-lying peaty swamps further inland. The accumulation of river sediments over time has resulted in the Walpole Inlet being now only approximately 1 m deep, while the Nornalup Inlet has a deeper central basin of 4-5 m in depth. The rate of this deposition is sufficiently slow that depths appear not to have changed significantly between 1912 and 1985 (Hodgkin and Clark, 1999). Wave-driven erosion and deposition has formed wide sandy shallows in the Nornalup Inlet, where deltaic sands have also accumulated to form shoals at the mouths of the Deep and Frankland rivers. Active areas of erosion and deposition, such as the constantly changing ocean channel and eroding shoreline cliffs on the northeast side of the Nornalup Inlet, highlight the dynamic nature of this estuarine system. Similarly, it is notable that the entrance channel, which is currently about 1 m deep, is now much shallower than the 10-12 feet (approximately 3-4 m) recorded by William Nairne Clark in 1841. In contrast to numerous other estuaries in south-western Western Australia, the Walpole and Nornalup inlet system is largely unmodified. Given the nature of current activities in the marine park, there are no major pressures on the geomorphology of the system. While concerns have been raised about shoreline erosion caused by wake from powerboats, especially in the lower Frankland River, quantifying this impact in relation to natural processes, such as flood events, can be difficult. Boating channels have been dredged in the Walpole Inlet and through the shallow deltas of the Frankland and Deep rivers in the Nornalup Inlet, and must be occasionally deepened to maintain boat access (Hodgkin and Clark, 1999). Concerns have been expressed that exotic marram grass, which has been planted to stabilise dunes near the inlet entrance, may act to disrupt natural processes of sand movement and hence may be contributing to sedimentation of the channel. Proposed improvements to the Knolls picnic site aim to prevent and rehabilitate shoreline erosion caused by unmanaged visitor access (CALM, 2003). Management with regard to geomorphology in the marine park will comprise educating visitors about the geological history and naturally dynamic processes of erosion and deposition that occur in the inlet system, as well as seeking to rehabilitate areas of localised shoreline erosion. The significance of geomorphology should be emphasised in liaison with relevant agencies when development proposals in the area are assessed. Research on geological processes will be undertaken as required. Vessel channels may require additional dredging to maintain access during the life of this management plan.
Current status	While the geomorphology of the marine park is naturally dynamic, it is generally undisturbed apart from localised areas as a result of boat channels, shoreline infrastructure and erosion.

Existing and potential uses and/or pressures	• Physical disturbance from:
	  ▪ the installation of jetties and boat ramps;
	  ▪ dredging of boat channels;
	  ▪ anchoring/mooring; and
	  ▪ installation of navigational markers.
	• Shoreline erosion, including that caused by boat wake.
	• Possible disturbance of natural erosion and deposition processes caused by exotic marrum grass adjacent to the inlet mouth.

Current major pressures	None.
Management objectives	1. To ensure the seabed's structural complexity and the geomorphological processes of the marine park are not significantly altered by future human activities. 2. To ensure that coastal landforms within the marine park are not significantly altered by future human activities.
Management strategies	1. Refer to management program strategies in Section 7. 2. Identify areas where coastal erosion from recreational use is occurring, including boat wake impacts on shorelines (DEC, DoT) **(M)**. 3. Manage access and use of coastal areas in and adjacent to the marine park where impacts are identified and rehabilitation is required (DEC) **(M)**. 4. Initiate research to increase knowledge of sedimentation processes associated with the Nornalup entrance channel, including whether any reef or other stable bars have been disturbed or altered in or near the entrance channel (DEC, research institutions) **(M)**.

Performance measures	1. Area of inlet or riverbed disturbance (ha). 2. Area of shoreline disturbance (ha).	**Desired trends**	1. Constant or negative. 2. Constant or negative.
Short-term target	To be developed as required.		
Long-term targets	1. No change in seabed structural complexity as a result of human activity in the marine park; and 2. No change in coastal landforms as a result of human activity in the marine park.		

8.1.2 Water quality (KPI)

Ecological value	*Water quality of the inlet system is generally good and is essential to the maintenance of a healthy estuarine ecosystem.*

Background	Waters of the inlet system are essentially marine during the summer months, the waters of the Deep and Walpole rivers are fresh and the Frankland River is saline (Brearley, 2005). The Frankland and Deep rivers are tidal for approximately 12 and 6 kilometres respectively, while the smaller Walpole River is tidal only over a short distance. Freshwater discharge from these rivers is strongly seasonal, with about 80 per cent occurring between June and October (Hodgkin and Clark, 1999). This hydrological regime creates pronounced changes in salinity, temperature and turbidity of water in the inlet system throughout the year (see Section 4.4). The upper Frankland/Gordon catchment is extensively cleared and degraded. As a result, salinity is increasing in the Frankland River and brackish water enters the Nornalup Inlet. In contrast, both the Deep and Walpole river catchments retain at least 80 per cent of vegetation and the rivers are in near pristine state. The Deep River has also been given a 'Wild River' status by Australian Heritage Commission and DEWHA in recognition of its near pristine state (South Coast Regional Initiative Planning Team, 2004). The Deep River catchment extends north of the inlet system to the vicinity of Lake Muir and the water derived from this system is fresh and low in nutrients. The catchment of the Walpole River, which provides drinking water to the town of Walpole, is partially used for grazing and dairy production and also contains a closed landfill site (Waters and Rivers Commission, 2000). Early records of the nutrients collected during 1970s Fisheries Department surveys indicate that nutrients were low in river and estuary waters (Brearley, 2005). Samples of river water collected in 1995-1996 showed similar low nutrient concentrations, although the amount of nitrate was higher in the Frankland River than the Deep River (Brearley, 2005). Since 1999, DoW, funded by the Natural Heritage Trust (NHT), has carried out routine water quality monitoring every three months at eight monitoring sites in the inlets (Brearley, 2005). Temperature, salinity, dissolved oxygen, turbidity, phytoplankton and nutrients are sampled in the Walpole Inlet (2 sites), the channel between the inlets (1 site) and in the Nornalup Inlet (5 sites) (DoE, 2004). DEC and the Walpole and Nornalup Inlet Systems Advisory Committee (WANISAC) have also undertaken water quality monitoring in the Walpole River. Sampling has revealed that most of the nutrients show marked seasonal changes, and vary from year to year depending on flows (Brearley, 2005). Although nutrient levels are also elevated in the upper Frankland/Gordon rivers, these are diminished in the lower river and nutrient discharge into the Nornalup Inlet is currently low. This is probably due to dilution caused by freshwater input as the river enters the coastal high rainfall zone and nutrient processing by healthy riparian vegetation along the lower river. The presence of relatively higher nutrient levels in waters of the Walpole Inlet compared to the Nornalup Inlet may be a consequence of less flushing in this part of the inlet system, the re-suspension of nutrients held in shallow sediments and nearby unsewered residential properties (Brearley, 2005; DoE, 2004). Since 1999, the Water Corporation has operated a wastewater treatment plant on the north side of the South Coast Highway near Walpole, which replaced septic systems in the town. While treated effluent is currently disposed of in infiltration trenches, this system is being upgraded and at the time of printing, a number of options for the disposal of treated wastewater are being investigated. The town of Nornalup uses septic tanks to dispose of sewage. Sewage discharge from vessels has the potential to increase nutrient levels and to cause health problems due to elevated bacterial levels. While the impact of sewage discharge from vessels will vary considerably from place to place and seasonally as a consequence of environmental parameters (e.g. water circulation) and human usage patterns (e.g. number of vessels). The *Strategy for Management of Sewage Discharge from Vessels into the Marine Environment* details controls on sewage discharge. This strategy, which was adopted by the Government in 2004, details a framework for the implementation of controls of sewage discharge from boats through designation of high risk areas where discharge is prohibited or where only treated sewage can be discharged from vessels. The strategy outlines a number of guidelines but allows some flexibility in applying the zones in marine parks and reserves.

	The basis of this strategy is that three zones will apply in State coastal waters; • Zone 1 – no discharge; • Zone 2 – discharge only using approved treatment systems; and • Zone 3 – open for discharge of untreated vessel sewage. Due to the probable limited dilution and dissipation of sewage in the inlets, the entire marine park will be designated as Zone 1, a 'no discharge zone'. Most vessels operating in the area are relatively small trailer boats and sewage discharge is likely not occurring. Sewage disposal from house boat operations are addressed by DoW's State-wide Policy 7 (Waters and Rivers Commission, 2001). The greatest pressure on water quality in the marine park is contamination caused by the discharges of toxicants* and physical and chemical stressors† from proximate sources, such as townships, tourist facilities, light industrial areas, waste disposal sites and wastewater treatment plants. Reduced water quality in the catchments that feed the inlet system represents a significant potential pressure on water quality in the marine park. A closed landfill site in the Walpole River catchment, for example, has caused groundwater contamination. In addition, the significance of agricultural chemical contamination in the rivers is not well understood, and accidental chemical spills must also be recognised as a significant potential threat to water quality in the marine park. Management to maintain the water quality of the marine park will focus on continued monitoring and developing knowledge through research.
Current status	Water quality in the marine park is generally satisfactory, apart from minor elevated nutrient levels in the lower Frankland River. The impact of chemical toxicants* is poorly understood.

Existing and potential uses and/or pressures	• Discharges of toxicants* and physical and chemical stressors† including:
	  ▪ accidental spillage of oil, fuel and other chemicals (e.g. boating and land-based sources);
	  ▪ urban stormwater runoff;
	  ▪ catchment runoff (e.g. fertilisers and other chemicals, refuse disposal sites, diversion of saline drainage channels into waterways);
	  ▪ treated wastewater and sewage; and
	  ▪ light industrial effluent (e.g. from townsites, recreation and/or tourist facilities).
	• Reduce water flows (e.g. for irrigation or human consumption).
	• Litter.

Current major pressures	None.
Management objective	To maintain levels of water quality that provide for a healthy ecosystem.
Management strategies	1. Refer to management program strategies in Section 7. 2. Determine appropriate baseline measures from which changes in water quality can be measured (DEC) **(H-KMS)**. 3. Continue existing water quality monitoring programs in the marine park and surrounding waterways and catchments where appropriate (DEC, DoW, Water Corporation, LG, South Coast NRM, SWCC) **(H-KMS).** 4. Establish a collaborative approach in seeking to minimise catchment and urban-based inputs that have the potential to effect the marine parks water quality (DEC) **(H).** 5. Enforce controls on the discharge of sewage from vessels in the marine park (DoT, DEC) **(H)**. 6. Maintain a pollutant inputs database for the marine park (DEC) **(M)**.

Performance measures	1. Nutrients: *Chlorophyll a* and inorganic nitrogen concentration in water. 2. Toxicants: concentration in water. 3. Pathogens: faecal coliform concentration in water.	**Desired trend/s**	1. Constant or negative. 2. Constant or negative. 3. Constant or negative.

	4. Litter: mass (kg) of litter at selected monitoring sites.		4. Negative.
Short-term target	To be developed as required.		
Long-term target	Maintain or improve water quality from a relevant baseline level, except for designated areas where a different level of acceptable change is approved by the appropriate government regulatory authority.		

[*] *toxicants* are chemical contaminants that have the potential to exert toxic effects at concentrations that might be encountered in the environment due to human activity (modified from ANZECC and Agriculture and Resource Management Council of Australia and New Zealand (ARMCANZ), 2000).

[†] *physical and chemical stressors* is used here to describe a number of naturally-occurring physical and chemical stressors that can cause degradation of the marine environment when ambient values are too high or too low as a result of human activity (modified from ANZECC and ARMCANZ, 2000).

8.1.3 Sediment quality (KPI)

Ecological value	*The sediments of the inlets are largely undisturbed and essential to the maintenance of a healthy estuarine ecosystem.*

Background	Sediments of the Walpole and Nornalup inlets are diverse and reflect the recent geological history of the system. The inlet basins and lower rivers largely comprise deep deposits of organically enriched mud that has been carried downstream from surrounding catchments (Hodgkin and Clark, 1999). In contrast, the extensive marginal shoals of the Nornalup Inlet are composed of firm sand and the entrance channel sediments comprise unconsolidated carbonate-rich sands of low organic content. In the deepest parts of the Nornalup Inlet the sediment consists of sand and clay silts, and the bottom of the Walpole Inlet is covered with fine organic material. There are fine sediments with high concentrations of organic material and nutrients near Newdegate Island, the channel between the inlets and in Walpole Inlet. Sediments near the channel to the ocean and near the Frankland River inflow are coarser with low concentrations of organic matter and nutrients, indicating that they may be reworked by the stronger water movements in these areas (Brearley, 2005). Sediment processes in the inlet system are very dynamic. Flood events may cause major deposition and/or erosion of, for example, riverbanks, while the northern shore of the Nornalup Inlet comprises a cliff-face shoreline that is actively eroding from wind-generated wave action. Uncontaminated sediments are important for the maintenance of healthy ecosystems as they support invertebrate communities, which are an important trophic resource for numerous animals such as fishes and birds. The South Coast NRM and SWCC, through liaison with Government and the community, coordinate the delivery of NHT funding for natural resource management. Regional strategies developed by these groups reflect the environmental management aspirations of their region. Their investment plans details the specific suites of activities designed to address regional, State and national natural resource management priorities identified in the regional strategies. Relevant priorities identified in the regional strategies include monitoring the impacts of land use changes and the establishment of reference sites. There are some indications of pollutants above background concentrations in the Walpole Inlet and channel near Newdegate Island, however the source of these is unknown (Brearley, 2005). Sediment contamination may derive from townsites or tourist facilities (e.g. stormwater runoff or nutrient leaching), work areas (e.g. jetties etc.), boat ramps (e.g. concentration of pollutants from boats) or agricultural sources (e.g. fertilisers and other chemicals). Current impacts of this kind are most likely to be low-level and/or localised in occurrence. The catchment of the Walpole River, for example, contains a closed landfill site that has caused groundwater contamination in the past. In addition, accidental chemical spills from land-based facilities or road transport must be recognised as a significant potential threat to sediment quality in the marine park. Management to maintain the sediment quality of the marine park will focus on developing knowledge through monitoring and research. Guidelines and capacity will be developed to prevent and/or contain possible chemical spills that could enter the inlet system. A pollutant inputs database will also be developed and maintained for the marine park.
Current status	While detailed knowledge of sediment quality is lacking, it is likely to be satisfactory apart from some areas with minor and/or localised disturbance.
Existing and potential uses and/or pressures	• Discharges of toxicants* and physical and chemical stressors† including: ▪ accidental spillage of oil, fuel and other chemicals (e.g. boating and land-based sources); ▪ urban stormwater runoff; ▪ catchment runoff (e.g. fertilisers and other chemicals, refuse disposal sites); and ▪ treated wastewater and light industrial effluent.
Current major pressures	None.
Management objective	To maintain levels of sediment quality that provide for a healthy ecosystem.
Management strategies	1. Refer to management program strategies in Section 7. 2. Determine appropriate baseline measures from which changes in sediment quality can be measured (DEC) **(H-KMS)**.

	3. Implement a sediment quality monitoring program in the marine park (DEC, DoW, LG, South Coast NRM, SWCC) **(H-KMS)**. 4. Establish a collaborative approach in seeking to minimise catchment and urban-based inputs that have the potential to effect the marine park's sediment quality (DEC) **(H)**.

Performance measures	1. Metals and metalloids: concentration. 2. Organic compounds: concentration. 3. Nutrients: concentration.	**Desired trends**	1. Constant or negative. 2. Constant or negative. 3. Constant or negative.
Short-term target	To be developed as required.		
Long-term target	Maintain or improve sediment quality from a relevant baseline level, except for designated areas where a different level of acceptable change is approved by the appropriate government regulatory authority.		

[*] *toxicants* are chemical contaminants that have the potential to exert toxic effects at concentrations that might be encountered in the environment due to human activity (modified from ANZECC and ARMCANZ, 2000).

[†] *physical and chemical stressors* is used here to describe a number of naturally-occurring physical and chemical stressors that can cause degradation of the marine environment when ambient values are too high or too low as a result of human activity (modified from ANZECC and ARMCANZ, 2000).

8.1.4 Macroalgae, seagrass and other primary producers

Ecological value	*A variety of macroalgae and seagrass species, which are important primary producers and refuge areas for invertebrates and fishes, occur in the inlets.*

Background	Although a variety of aquatic plant species occur in the Walpole and Nornalup inlets, they are naturally sparse and their abundance and distribution varies depending on prevailing environmental conditions (Hodgkin and Clark, 1999). Many are marine species that have a low tolerance of seasonal freshwater discharge. A survey in 2003 identified 15 species of algae in the inlets, including *Polyphysa, Cystoseira, Cladomorpha, Cladophora, Gracilaria, Enteromorpha, Zosterocarpus* and *Chaetomorpha*, however, none of these were abundant (Brearley, 2005; Hyndes and Lavery, Edith Cowan University, unpublished data). The green alga *Polyphysa* (also known as *Acetabularia calyculus*) grows attached to dead shells and rocks (Brearley, 2005). The brown alga *Cystoseira trinodis* also grows attached to rocks in the channel between the inlets (Brearley, 2005). The seagrasses *Ruppia megacarpa*, *Heterozostera tasmanica*, *Halophila decipiens* and *Halophila ovalis* also occur in the inlets. These are short-stemmed ephemeral species that typically grow rapidly and commonly occur in estuaries. The seeds of *R. megacarpa*, for example, will only germinate in low salinity water (DoE, 2003). These seagrasses do not form the large, dense and stable meadows that are common to inshore marine waters in Western Australia. Several *H. tasmanica* meadows, the location or persistence of which may not be stable over time, were identified on shallow sand flats along the eastern shore of the Nornalup Inlet during 2003 (Figure 4), while low densities of *R. megacarpa, H. ovalis* and *H. decipiens* were also widely distributed on eastern sand-flats, rubble and rocky substrates. *R. megacarpa* also grows on the shallow sandbanks near the Deep River and is often covered with algal epiphytes such as *Polysiphonia*. The deeper part of the central basin contains black, organic mud and the dark tannin stained waters are too dark for plant growth (Brearley, 2005). The distribution and abundance of aquatic plants in the lower Frankland, Deep and Walpole rivers is not well understood. Nevertheless, it is recognised that aquatic plants play an important ecological role in the inlet system by processing nutrients and providing food and shelter for other organisms. There are no significant pressures on aquatic vegetation currently recognised in the inlet system, although a range of green algae species typically occur in the shallower, higher nutrient waters of the Walpole Inlet. Previously high densities of *R. megacarpa* have occurred in the Walpole Inlet, and were most likely caused by eutrophication from proximate agricultural sources which have now been removed. This seagrass species grows and dies off very rapidly in response to changes in nutrient levels and prolific growth is a good indicator of eutrophication (DoE, 2003). Algal blooms, probably caused by eutrophication, occurred in the inlets during the late 1950s. *Chaetomorpha linum* and *C. aurea* were abundant in 1973-1974 and *Cladophora* sp. were abundant on the muddy sands in 1976 (Brearley, 2005). In 1976, living algae covered a layer of dying and dead algae 10-20cm thick over black deoxygenated ooze in 1-2 m of water (Brearley, 2005). Similar elevated nutrient impacts during the 1970s and 80s resulted in the presence of floating mats of *Enteromorpha intestinalis* and *Chaetomorpha billardieri* in the shallow areas of the Walpole Inlet (Hodgkin and Clark, 1999). Management of aquatic plants will place emphasis on monitoring the diversity, abundance and distribution of species in the marine park and research should be initiated, as required, to facilitate specific management needs.
Current status	Macroalgae and seagrass communities are generally undisturbed. However the state of communities in the lower rivers is poorly understood.
Existing and potential uses and/or pressures	• Eutrophication from proximate (e.g. townsite, recreation and/or tourist facilities) or catchment sources. • Introduced species.
Current major pressures	None.
Management objective	To gain an increased understanding of the role of macroalgae, seagrasses and other primary producers in the marine park to facilitate long-term management.

Management strategies	1. Refer to management program strategies in Section 7. 2. Initiate research programs to determine the types of primary producers and their role and to quantify the floral and faunal diversity and natural variability of macroalgal and seagrass communities in the marine park (DEC) **(M)**.

Performance measure	To be developed as required.	**Desired trend**	To be developed as required.
Short-term target	To be developed as required.		
Long-term target	To be developed as required.		

8.1.5 Invertebrates (KPI)

Ecological value	*There is a diverse invertebrate fauna, dominated by polychaetes, crustaceans and molluscs.*

Background	The diversity of invertebrates in estuaries is typically low as few organisms can tolerate the typically wide seasonal variation in environmental conditions, such as temperature, salinity and turbidity (Edgar, 2001). Species that are adapted to such environments however, can occur in very high densities. More invertebrate species inhabit the Walpole and Nornalup inlets compared to most other estuaries of south-west Western Australia because the entrance is permanently open, and marine-like conditions prevail for much of the year (Hodgkin and Clark, 1999). Polychaetes, crustaceans and molluscs dominate this fauna. The polychaete *Capitella capitata* is abundant throughout the estuary and a number of small gastropod snail species such as *Taeta preissii, Assiminea* and *Hydrococcus brazieri* can be found in the fringing rushes (Brearley, 2005). Typical estuarine bivalves such as the mussel (*Xenostrobus pulex*), the trough shell (*Spisula trigonella*) and *Arthritica semen* occur near the Frankland River entrance and *Soletellina donacioides* are also notably abundant within the inlets (Brearley, 2005). Larger prawns *Metapenaeus dalli*, *Palaemonetes serenus,* and *Leander* sp., the blue swimmer crab (*Portunus pelagicus*) and mud burrowing crab (*Cyclograpsus audouini*) are also found in the inlets (Brearley, 2005). Within the system, a greater diversity of invertebrates occurs in the Nornalup Inlet compared to the Walpole Inlet, with a greater diversity on sand-flats compared to deeper muddy basin habitats (Hodgkin and Clark, 1999; Hyndes and Lavery, Edith Cowan University, pers. comm.). Both the diversity and abundance of invertebrates in the inlets are likely to diminish during winter months (Hodgkin and Clark, 1999). The fauna of the tidal rivers is less well understood. Invertebrates may be filter feeders, grazers or active predators, and are important consumers of organic material that grows in or is transported into the inlets. Similarly, they form the diets of numerous larger species, such as fishes and birds. No significant pressures on invertebrates are currently recognised in the marine park, although some species, such as the blue swimmer crab (*Portunus pelagicus*) and cockles, are collected for food or bait in the inlets. Concerns exist about the current rarity of some previously abundant bivalve species, such as the cockle (*Katelysia scalarina*) and oyster (possibly *Ostrea angasi*) (S. Slack-Smith, Western Australia Museum, pers. comm.), although it is currently unknown if this is primarily the result of natural or human-induced processes or both. While this cockle species is collected for bait in the inlets, populations at Albany in Western Australia have, for example, exhibited large changes in abundance between 1978 and 1999 that may have resulted from variations in the recruitment of pelagic early life stages (Peterson *et al*., 1994; W.R. Black, University of Western Australia, pers. comm.). This example highlights the need for greater knowledge of the ecology and biology of invertebrate species in the marine park. Monitoring and developing a greater understanding of the diversity, distribution, ecology and biology of species will form the basis of managing invertebrates in the marine park. Species subject to fishing pressure will be managed on a sustainable basis by DoF under the FRM Act.
Current status	The available data for most species indicates that populations are generally stable, however anecdotal evidence indicates that populations of targeted species have been reduced.
Existing and potential uses and/or pressures	• Recreational fishing. • Disturbance by infrastructure development. • Introduction of marine pests. • Aquaculture developments.
Current major pressures	Unknown at this time.
Management objectives	1. To manage targeted invertebrate species for ecological sustainability in the marine park. 2. To ensure non-targeted invertebrate species are not significantly impacted by recreational fishing in the marine park.
Management strategies	1. Refer to management program strategies in Section 7. 2. Identify invertebrate species that require protection from recreational fishing in the marine park and seek to implement appropriate management (DEC, DoF) **(H)**.

Performance measures	1. Diversity. 2. Biomass.	**Desired trends**	1. Constant. 2. Constant or positive.
Short-term target	To be developed as required.		
Long-term targets	1. No loss of invertebrate diversity as a result of human activity in the marine park. 2. No loss of non-targeted invertebrate species biomass [Ø] as a result of human activity in the marine park. 3. Abundance and size composition of non-targeted invertebrate species to be at natural [Ω] levels. 4. Management targets for targeted invertebrate species to be determined in consultation with DoF and stakeholders.		

[Ø] In this context a loss or change in 'abundance' or 'biomass' excludes losses of a minor, transient or accidental nature.

[Ω] 'Natural' in this context refers to the abundance that would occur in areas that are undisturbed and/or unexploited by human activities

8.1.6 Finfish (KPI)

Ecological value	*Approximately 40 marine and estuarine finfish species commonly inhabit the inlet system.*

Background	The abundance and distribution of fishes in estuaries of south-western Western Australia varies between species and is closely linked to seasonal freshwater discharge patterns and opening and closing regimes (Potter and Hyndes, 1999). About 70 per cent of fishes that regularly enter estuarine waters are marine species whose presence is irregular and usually confined to marine waters close to the estuary mouth (Potter *et al*., 1990). Penetration of these species into the estuary will depend on the prevalence and duration of marine-like conditions. A smaller proportion (around 15 per cent) of species, typically mullets, gerreids, terapontids and whitings, opportunistically enter estuaries as juveniles when seasonal openings permit, where they exploit opportunities to forage and evade predators. These species do not usually breed in estuarine waters and commonly leave the system during periods of high freshwater discharge. Less than 10 per cent of the fish species found in estuaries in the south-west of Western Australia breed and complete their life cycles in these habitats, although these typically small species, such as gobids, atherinids (or hardyheads) and syngnathids, often occur in very high densities (Potter *et al*., 1990; Potter and Hyndes, 1999). Hardyheads (*Leptatherina wallaceii, Atherinosoma elongata* and *L. presbyteroides*) together with the goby *Gavonigobius lateralis* are of notable abundance, accounting for over 90 per cent of the individuals found in shallow water communities (Brearley, 2005). Approximately 40 fish species commonly occur in the Walpole and Nornalup inlet system. However the fish fauna is less diverse than comparable estuaries such as the Peel-Harvey or Swan on the lower west coast (Brearley, 2005; Potter and Hyndes, 1994). Unlike some other south-west estuaries, the Walpole and Nornalup inlets (and the nearby Wilson Inlet) are not as important as juvenile habitats for marine fishes as estuaries on the lower west coast (Potter and Hyndes, 1994; Ayvazian and Hyndes, 1995). The larvae of thirty six species of fish have been recorded throughout the estuary, with estuarine species accounting for 99 per cent of the total abundance (Brearley, 2005). The larval assemblage in the two basins of the inlets is dominated by the southern anchovy (*Engraulis australis*), the blue spotted goby (*Pseuodogobius olorum*) and the long finned goby (*Favonigobius lateralis*) collectively account for more than 95 percent of the total in the two inlets (Brearley, 2005). Larvae of the hairy pipefish (*Urocampus carinirostris*) and the blenny *Parablennis tasmanianus* are also abundant in the estuary system (Brearley, 2005). Black bream, cobbler and blue-spot flathead are among the few relatively large species that breed in the inlet system (Neira and Potter, 1994). The striped trumpeter (*Pelates sexlineatus*), classed as a marine opportunist, is one species that may actually spawn within the inlet. The larger sizes of King George whiting, mullet, striped trumpeter and herring found within the inlets, when compared to fish recruited to the lower west coast, indicates that spawning areas are a greater distance from south coast estuaries and that spawning may occur in the large marine embayments and fringing limestone reefs of the lower west coast (Brearley, 2005). Only one truly anadromous fish (i.e. which moves from the sea to spawn in freshwater), the pouched lamprey (*Geotria australis*), occurs in the south-west and is most abundant in waterways between the Margaret and Denmark Rivers (Morgan *et al*., 1996). Among the most primitive of living fishes, lampreys have a jawless mouth that is modified to form a circular suction disc and a cartilaginous skeleton (Gomon *et al*., 1994). Ammocoetes (larval lampreys) are known to occur in the Deep and Walpole rivers where they burrow into shaded organically enriched substrates for over four years before migrating to the ocean (Morgan and Beatty, 2003). WANISAC has surveyed movement of pouched lamprey at the water supply weir on the Walpole River. Walpole and Nornalup inlet system are considered highly significant for recreational fishing, which is a significant drawcard for the local tourism industry. Fishing occurs throughout the inlet system and popular target species include black bream, King George whiting, blue-spot flathead and herring (*Arripis georgianus*). Pink snapper (*Pagrus auratus*) has also been recorded in Nornalup Inlet (Brearley, 2005). While current knowledge of fish in the inlet system is greatest for commonly exploited species (Sarre and Potter, 1999 and 2000; Sarre *et al*., 2000;

	Norriss *et al*., 2002), research has also been carried out on broader fish communities (Neira and Potter, 1994; Potter and Hyndes, 1994). Fishes are ecologically significant as consumers of plants, invertebrates and other fish, and as prey for larger fish species and numerous waterbirds, including cormorants (*Phalacrocorax* spp.), ospreys (*Pandion haliaetus*) and white-bellied sea eagles (*Haliaeetus leucogaster*). The current major pressure on fishes in the marine park is recreational fishing. While the inlet system is closed to commercial fishing, recreational fishing pressure in Walpole-Nornalup has increased substantially in recent years and current information on fish communities has not been documented (Brearley, 2005). Anecdotal evidence suggests that illegal fishing practices, such as the taking of undersize fish and use of nets, does occur. The introduction of exotic fishes could exert pressure on native species by acting as predators, competing for spatial and/or trophic resources or introducing disease (Helfman *et al*., 1997). A probable sighting of carp was made in the Walpole River in early 2004. Species subject to fishing pressure will be managed on a sustainable basis by DoF under the FRM Act. Long-term management of the fish communities in the inlet system will require regular monitoring, ecological and biological research. Education of fishers will be an important focus.
Current status	Fish populations are considered to be stable, however populations are not currently monitored.
Existing and potential uses and/or pressures	• Recreational fishing. • Introduced marine pests. • Disease. • Degradation of critical habitats.
Current major pressures	Recreational fishing.
Management objectives	1. To manage targeted finfish species for ecological sustainability in the marine park. 2. To ensure non-targeted finfish species are not significantly impacted by recreational fishing in the marine park.
Management strategies	1. Refer to management program strategies in Section 7. 2. Implement an appropriate monitoring program to assess the nature, level and potential impacts of human activities on finfish populations in the marine park (DEC, DoF) **(H-KMS)**. 3. Identify finfish species that require protection from recreational fishing in the marine park and seek to implement appropriate management (DEC, DoF) **(H)**. 4. Initiate research to identify the diversity and abundance of finfish and important nursery, spawning and aggregation sites (DEC, DoF) **(M).**

Performance measures	1. Diversity. 2. Biomass.	**Desired trends**	1. Constant. 2. Constant.
Short-term target	To be developed as required.		
Long-term targets	1. No loss of finfish diversity as a result of human activity in the marine park. 2. No loss of non-targeted finfish species biomass [Ø] as a result of human activity in the marine park. 3. Abundance and size composition of non-targeted finfish to be at natural [Ω] levels. 4. Management targets for targeted finfish species to be determined in consultation with DoF and stakeholders.		

[Ø] In this context a loss or change in 'abundance' or 'biomass' excludes losses of a minor, transient or accidental nature.

[Ω] 'Natural' in this context refers to the abundance that would occur in areas that are undisturbed and/or unexploited by human activities

8.1.7 Sharks and rays

Ecological value	*The inlet system supports a variety of shark and ray species.*

Background	Sharks and rays are cartilaginous fish (their skeletons are composed of cartilage) that are usually live-bearing and typically produce relatively small numbers of young (Last and Stevens, 1994). Sharks and rays also have typically slow growth and for these reasons they are particularly susceptible to human-induced pressures (Pogonoski *et al*., 2002). Potter and Hyndes (1994) recorded the smooth hammerhead shark (*Sphyrna zygaena*), southern shovelnose ray (*Aptychotrema vincentiana*), black stingray (*Dasyatis thetidis*), eagle ray (*Myliobatis australis*) and gummy shark (*Mustelus antarcticus*) from the Walpole and Nornalup inlets, among which the latter two species were particularly abundant. Gummy sharks are confined to the outer basin of the Nornalup Inlet where salinity is the highest (Brearley, 2005). The eagle ray is more widely distributed within the Nornalup Inlet than in the Walpole Inlet or the Frankland River, where it has only been recorded during summer when salinity is greater than 23 ppt (Brearley, 2005). It is likely that these shark and ray species commonly inhabit this estuarine system because of the permanently open entrance, which creates marine-like conditions in the inlets for much of the year, and because the Nornalup Inlet is relatively deep compared to other estuaries. These abundant species are not strictly estuarine, but opportunistically or randomly inhabit estuarine waters. Notably, the inlets appear to act as a habitat for immature gummy sharks (Lenanton *et al*., 1990; Potter and Hyndes, 1994). While these shark and ray species are widely distributed, most are poorly understood (Cavanagh *et al*., 2003). Gummy sharks are fished commercially in oceanic waters, while other species, including southern shovelnose rays, are caught as by-catch. Rays are benthic feeders and are commonly seen foraging for crustaceans and molluscs on shallow flats, while gummy sharks and smooth hammerhead sharks feed mainly on molluscs, fish and cephalopods (Gomon *et al*., 1994; Edgar, 2000). The smooth hammerhead shark is listed as low risk/near threatened by the IUCN (IUCN, 2007). The current major pressure on sharks and rays in the inlet system is recreational fishing. Tourism interactions, which are based on habituated feeding, represent a potential pressure on rays at Rest Point. Species subject to fishing pressure will be managed on a sustainable basis by DoF under the FRM Act. Regular monitoring, ecological and biological research, and educating visitors about the ecological significance of sharks and rays in the marine park will be important aspects of long-term management.
Current status	The ecology and biology of most sharks and rays in the marine park are poorly understood. While anecdotal evidence suggests that some populations are stable, none are regularly monitored.
Existing and potential uses and/or pressures	• Recreational fishing. • Disease. • Introduced marine pests. • Degradation of critical habitats. • Habituated feeding through tourism contact.
Current major pressures	None.
Management objective	To gain an increased understanding of shark and ray species in the marine park to facilitate long-term management.
Management strategies	1. Refer to management program strategies in Section 7. 2. Implement an appropriate monitoring program to assess the nature, level and potential impacts of human activities to shark and ray species in the marine park (DEC, DoF) **(H)**. 3. Identify shark and ray species that require protection from recreational fishing in the marine park and seek to implement appropriate management (DEC, DoF) **(H)**.

Performance measures	1. Diversity. 2. Biomass.	**Desired trends**	1. Constant. 2. Constant or positive.
Short-term target	To be developed as required.		
Long-term targets	1. No loss of shark and ray diversity as a result of human activity in the marine park. 2. No loss of non-targeted shark and ray species biomass [Ø] as a result of human activity in the marine park. 3. Abundance and size composition of non-targeted sharks and rays to be at natural [Ω] levels. 4. Ecologically sustainable management targets for targeted shark and ray species biomass to be determined in consultation with DoF and stakeholders.		

[Ø] In this context a loss or change in 'abundance' or 'biomass' excludes losses of a minor, transient or accidental nature.

[Ω] 'Natural' in this context refers to the abundance that would occur in areas that are undisturbed and/or unexploited by human activities

8.1.8 Shorebirds and seabirds

Ecological value	*The varied habitats of the inlets, rivers, adjacent forest and coastal areas support numerous shorebirds and seabirds.*

Background	The inlet system and surrounding district provide a diverse mosaic of aquatic and terrestrial habitats that include forests, heathland, swamps and coastal areas. Approximately 150 bird species are known to inhabit this diverse landscape (Birds Australia, 2001a and 2001b), including numerous shorebirds and seabirds. These include swans, ducks, grebes, swamphens, moorhens, coots, cormorants, herons, egrets, ibis, pelicans, whimbrels, sandpipers, stints, oystercatchers and plovers. Gulls and terns are abundant in the area, and shearwaters, gannets and albatross may also be observed. The main raptors associated with inlet waters are ospreys and white-bellied sea eagles. The presence of these large predatory birds, which mainly feed on fish, is a major attraction for commercial tourism in the inlet system. Like many other estuaries, the permanent waters of the inlet system provide important habitat for bird species that migrate seasonally from drying ephemeral inland wetlands (Raines *et al*., 2000; Kingsford and Norman, 2002). Birds are likely to be significant predators of invertebrates and fishes in the inlet system. All bird species are protected under the WC Act. The hooded plover (*Thinornis rubricollis*) nests on beaches of south-western Australia, which makes it particularly susceptible to disturbance as human use of coastal regions continues to increase (Raines, 2002). The species is listed as near threatened by the IUCN (IUCN, 2007) and Birds Australia have developed the *Hooded Plover Management Plan for Western Australia*. They undertake annual monitoring as part of the management plan with the support of DEC. Although only transient visitors to the area (Birds Australia, 2001b), the Indian yellow-nosed albatross (*Thalassarche carteri*) and Hutton's shearwater (*Puffinus huttoni*) are listed as endangered (IUCN, 2007). The major pressure on birds in the marine park and on the adjacent shores is disturbance by people, dogs, boats and vehicles. Areas where such disturbance may occur include shallow banks on the western side of Nornalup Inlet near 'the peppermints' which is a feeding area for black swans, tidal flats along the eastern channel leading to the inlet entrance and Pelican Rock, which is a nesting and roosting site for some bird species. Shorebirds that nest and/or roost in easily accessible and/or high use areas, such as beaches, are particularly vulnerable to disturbance. To minimise potential disturbance, dogs will be prohibited within the marine park however where appropriate, dog permitted areas may be gazetted to facilitate use by the local community e.g. at Swarbrick jetty or at Rest Point. This will also ensure consistency with regulations in the surrounding national park. The management of shorebirds and seabirds will primarily seek to increase visitor awareness of the ecological significance of birds in the marine park, and to minimise or prevent disturbance, especially in the proximity of nesting and roosting areas. Populations of shorebirds and seabirds in these areas will be monitored.
Current status	Populations of most species of shorebirds and seabirds are considered stable.
Existing and potential uses and/or pressures	• Physical disturbance by people, dogs, boats and vehicles, especially in accessible and/or high use areas in and adjacent to the marine park. • Predation and competition by feral animals, especially of nests. • Degradation of critical habitats. • Entanglement (e.g. litter). • Habituated feeding.
Current major pressures	Physical disturbance by people, dogs, boats and vehicles, especially in accessible and/or high use areas in and adjacent to the marine park.
Management objective	To ensure that shorebirds and seabirds are not significantly impacted by physical disturbance from people, dogs, boats and vehicles.
Management strategies	1. Refer to management program strategies in Section 7. 2. Map shorebird and seabird foraging, breeding and roosting areas of the marine park (DEC) **(H)** 3. Manage human access to areas that are significant sites for shorebirds and seabirds (e.g. breeding, feeding, roosting) if necessary (DEC) **(M)**. 4. Implement a monitoring program to assess the nature, level and potential impacts of human activities on shorebirds and seabirds in the marine park (DEC) **(M)**.

	5. Investigate the food requirements of shorebirds and seabirds and relate to prey availability in the marine park where regular foraging occurs (DEC) **(L).**

Performance measures	1. Diversity. 2. Abundance. 3. Number of reported shorebird and seabird injuries and deaths per year.	**Desired trends**	1. Constant. 2. Constant or positive. 3. Negative.
Short-term target	To be developed as required.		
Long-term targets	1. No loss of shorebird or seabird diversity as a result of human activity in the marine park. 2. No loss of shorebird or seabird abundance[Ø] as a result of human activity in the marine park.		

[Ø] In this context, a loss or change in abundance excludes losses due to accidents. Minor or transient losses are unacceptable.

8.1.9 Sandy beaches and shoreline vegetation

Ecological value	*The sandy beaches and shoreline vegetation of the inlet system are of high ecological and social importance to the marine park.*

Background	The inlet system has a complex and diverse shoreline of beaches, rocky shores and fringing vegetation comprising a variety of plant communities (Figure 3) that are integral components of the ecological and scenic values of the marine park. Although generally outside the marine park, riparian vegetation also plays an important role in stabilising shorelines and filtering sediments and land-derived chemicals. Retention of riparian vegetation is therefore important to ensure the maintenance of the marine park's ecological values. Only two sandy beaches, both of which are located in the Nornalup Inlet, are accessible by vehicle. Coalmine Beach is adjacent to developed tourist and recreation infrastructure, including the Coalmine Beach Caravan Park and Walpole Yacht Club, while Sandy Beach has only low-key access and visitor facilities. These beaches are popular recreation areas. Along the hillsides fringing the Walpole-Nornalup channel, the south-western shore of the Nornalup Inlet, and along the Deep and Frankland rivers, stands of karri (*Eucalyptus diversicolor*), red tingle (*E. jacksonii*) and yellow tingle (*E. guilfoylei*) dominate the tree line (Brearley, 2005). The lower sandy ridges are covered with *Banksia* woodland, while the low ground consists of paperbark (*Melaleuca*) woodlands and swamps with sedges and rushes. A low shrub community occupies the areas near the mouths of the rivers and near Walpole (Brearley, 2005). It is dominated by the yellow-flowered pea shrubs (*Oxylobium heterophyllum* and *Jacksonia horrida*), bottlebrush (*Beufortia* sp.), wattle (*Acacia pulchella* and *Astartea fascularis*), kangaroo paw (*Anigozanthus* sp.), zamia palm (*Macrozamia riedlei*), grass trees (*Xanthorrhea preissii*) and sword sedge (*Lepidosperma gladiatum*, *Euphorbia* sp.). Swamp cedars (*Agonis juniperina*) occur near the boat ramp (Brearley, 2005). A rush plant community dominated by sea rush (*Juncus krausii*) occurs around the estuary. This is often narrow due to the steep slopes around the inlets (Brearley, 2005). Where the ground is flatter, species of sedge and grass such as bare twig rush (*Baumea juncea*), Mediterranean marram grass (*Ammophila arenaria*) and *L. gladiatum* grow behind the *Juncus* community. The introduced salt water couch or seashore paspalum (*Paspalum vaginatum*) also occurs in these areas (Brearley, 2005). The sand spit at the bar is colonised by marram grass (*Ammophila arenaria)*, dune cabbage (*Arctotheca populifolia*) and the native club rush (*Ficinia nodosa*). Other species including *Leucopogon parviflorus, O. axillarus, Acacia littorea* and the sedge *L. gladiatum* dominate the more stable dune vegetation (Brearley, 2005). Unlike other estuaries in the region, the Walpole and Nornalup inlets do not have significant areas of inter-tidal habitat, such as samphire marshes or mudflat (Hodgkin, 1978; Hodgkin and Clark, 1990a and 1990b). Low-lying areas, and particularly those adjacent to the river mouths, however, do become seasonally inundated during periods of freshwater discharge. While the shoreline vegetation of the Nornalup Inlet is largely undisturbed except in the vicinity of Coalmine Beach, significant disturbance has occurred around the Walpole Inlet, in particular adjacent to Walpole townsite and Rest Point (DoE, 2004). Significant weed infestation has occurred in riparian vegetation of the Walpole foreshore, and weed species include grasses such as *A. arenaria*, *A. popufolia*, bracken and dodder (*Cassytha* sp.) (Walpole Townscape Committee, 1996; Brearley, 2005). Riparian vegetation of the lower Frankland, Deep and Walpole rivers is generally intact, although degradation has occurred on the Nornalup foreshore of the Frankland River. Through initiatives of the local and regional natural resource management groups, fencing and rehabilitation programs have been undertaken on private land upstream from the marine park. The diverse riparian vegetation of the lower Walpole River reflects a range of different landforms, such as silted channels, levees and floodplain (Semeniuk, in press). Inlet beaches are a discrete habitat type that is utilised by fauna such as shorebirds. Riparian vegetation has an important ecological function in maintaining the environmental health of

	waterways and estuaries by, for example, processing nutrients, stabilising shorelines and providing habitat for wildlife (Pen, 1997). Although the beaches and shoreline vegetation of the inlet system fall outside the boundary of the marine park, most of these areas adjacent to the inlets and lower rivers are within the Walpole-Nornalup National Park. The shoreline of the northern half of the Walpole Inlet is either Unallocated Crown Land or Crown Reserve vested in Local Government (Figure 2), which is currently managed by the Shire of Manjimup. Natural resource management groups such as South Coast NRM, SWCC and the Walpole-Tingdale Land Conservation District Committee have undertaken riparian focused projects including surveys of riverine areas and fencing and rehabilitation programs. The most significant management issues with regard to sandy beaches and shoreline vegetation are clearing for development, degradation by inappropriate or unmanaged use such as trampling or 4WD access and invasion by pest species. These values, which lie adjacent to the boundary of the marine park, will be managed by ensuring integrated management of adjacent lands, such as the terrestrial Walpole-Nornalup National Park. Educating visitors and collaborating with relevant agencies, such as the Shires of Manjimup and Denmark, will be important to successfully manage these areas.
Current status	Sandy beaches and shoreline vegetation are generally undisturbed apart from specific areas such as around towns and other tourist infrastructure (e.g. Coalmine Beach and Sandy Beach), where there are varying levels of disturbance.
Existing and potential uses and/or pressures	• Degradation from physical disturbance (e.g. boat wake, unmanaged shore access by vehicles and people). • Clearing. • Weeds. • Litter.
Current major pressures	• Degradation caused by, for example unmanaged shore access by vehicles and people and boat wake. • Weeds.
Management objective	To ensure that flora and fauna associated with beaches and shoreline vegetation is not significantly degraded by unmanaged access by vehicles, people, boat wake or weeds.
Management strategies	1. Refer to management program strategies in Section 7. 2. Ensure an integrated approach to management of the interface between the Walpole-Nornalup National Park and the marine park (DEC) **(H)**. 3. Seek to protect riparian vegetation from impacts associated with human use (DEC) **(M)**.

Performance measure	Shoreline disturbance (length).	**Desired trend**	Constant or negative.
Short-term target	To be developed as required.		
Long-term target	No further significant degradation of sandy beaches or shoreline vegetation caused by human impacts.		

8.2 Social Values

Social values are those cultural, aesthetic, recreational and economic characteristics for which an area is significant or well known. These can include heritage, commercial and recreational usage, science and education. Striking a balance between protecting the marine environment for current and future generations and facilitating ongoing recreational and commercial opportunities is the primary purpose of the management plan. It should be noted that DEC's Policy Statement No. 18 *Recreation, Tourism and Visitor Services* provides a framework for the "provision of world class recreation and tourism opportunities, service and facilities for visitors to the public conservation estate while maintaining in perpetuity Western Australia's natural and cultural heritage". Recreation and tourism will be managed in light of this policy. Set out below is information on specific ecological values, their management objectives, strategies and targets. The generic strategies in Section 7 also apply to each of these individual values.

8.2.1 Aboriginal Culture

Social value	*The inlet system and surrounding lands have a rich Aboriginal heritage that is evident in sites and through stories.*

Background	Estuaries were likely to have been significant hunting and gathering areas for Aboriginal communities in south-western Australia (Dortch *et al*., 1984; Dortch, 1999). The Aboriginal people originally occupying the area, the Minang or literally 'Southerners' or South People, referred to the area as No-Nor-Nup, the place of the Norne (black snake) (Brearley, 2005). Archaeological evidence of Aboriginal occupation in this region, comprising artefact scatters and to a lesser extent burials, quarries, scarred trees, middens (places where shells, other food debris and other associated tools have accumulated over time) and stone arrangements, commonly occur adjacent to lakes, rivers and wetlands (Water Authority of Western Australia, 1995). Aboriginal groups are likely to have camped in coastal areas for extended periods as part of seasonal movements in the region that were based on resource availability, and archaeological sites may represent occupations that a ranged from ephemeral to long-term. While Aboriginal archaeological sites near the Walpole and Nornalup inlet system include middens, artefact scatters and fish traps on the inlet shore and in the surrounding region, this record has probably been obscured by geologically recent changes in sea level and landscapes (Dortch, 1992). Despite disruptions to traditional life, Aboriginal people seek to retain social, spiritual and personal bonds with their traditional lands. The inlets are important sites for Aboriginal people and they aspire to have access to the marine park to maintain cultural customs on their traditional lands. All Aboriginal sites registered or otherwise are protected under the AH Act and the Department of Indigenous Affairs (DIA) has statutory responsibility for the management of these sites. The Depot, Newdegate (Snake) Island and Coalmine Beach are registered as being sites of Aboriginal significance under Section 38 of the AH Act. A native title claim, the Single Noongar Claim, which exists over the inlets region, is currently awaiting determination. Public awareness of Aboriginal culture associated with the inlet system is generally low, although information is provided by tourism operators. In the absence of appropriate education and interpretation, the potential exists for incidental damage to occur to cultural sites. Management strategies include the involvement of Aboriginal people in the management of the marine park. The establishment of a Park Council is one option that will be explored to facilitate joint management of adjacent terrestrial reserves (CALM, 2005). The management of Aboriginal heritage within the marine park will aim to minimise or prevent human-induced degradation of cultural sites. Considerable potential exists for developing cultural heritage education and interpretation to raise visitor awareness of local Aboriginal history and heritage.
Requirements	• Protection of Aboriginal heritage sites. • Recognition of cultural and traditional activities. • Provision of access for cultural and traditional activities. • Collaborative involvement of Aboriginal people in planning and management of the marine park.
Management	1. To ensure that, in collaboration with local Aboriginal people and the relevant management

objectives	authorities, human activities do not significantly impact on sites of significance to Aboriginal people in the marine park. 2. To involve local Aboriginal people in the management of the marine park. 3. To raise awareness and knowledge of Aboriginal relationships with the marine environment.
Management strategies	1. Refer to management program strategies in Section 7. 2. Engage local Aboriginal people to provide ongoing advice for marine park management (DEC, DIA, SWALSC) **(H-KMS)**. 3. Promote the significance of the inlet and river environments for Aboriginal people in regard to physical and spiritual connections (DEC, DIA, SWALSC, TWA) **(H)** 4. Monitor known Aboriginal heritage sites to determine their condition and seek to implement appropriate management as necessary (DIA, DEC) **(M)**. 5. Encourage and assist research on Aboriginal heritage, including recording oral histories, to facilitate long-term management (DEC) **(M)**.

Performance measure	To be developed as required.	**Desired trend**	To be developed as required.
Short-term target	To be developed as required.		
Long-term target	Maintenance of Aboriginal heritage in or associated with the marine park.		

8.2.2 Colonial heritage

Social value	*The inlet system and surrounding lands have a rich colonial heritage that is evident in sites and through stories.*

Background	The first regular non-Aboriginal use of the inlets occurred following the settlement of Albany in 1826, when an area on the shore of the Nornalup Inlet was used as a base for sealers (Fernie and Fernie, 1989). The first permanent settlers close to the inlet system were the Bellanger brothers who arrived in 1909, although seasonal cattle grazing occurred in these coastal areas from about 1870 to 1900. During these early years of settlement, the inlets were typically accessed by sea. In October 1903, the 15 m wooden steamer *Escort* was wrecked close to the inlet entrance with a cargo of supplies (Marshall, 1991). This exposed wreck now lies close to East Point (McCarthy *et al.*, 1992), which is outside the marine park boundary. No significant shipwrecks are currently known to exist within the inlet system. While the district surrounding the inlets was primarily developed for timber, dairy and beef production (Horwitz and Wardell-Johnson, 1996), an area adjacent to the Frankland River was reserved for conservation in 1910 (Fernie and Fernie, 1989). The present Walpole townsite was first settled under the Land Settlement Scheme in 1930, and was gazetted in 1933. Despite early difficulties of access, tourism developed in and around the inlets during the 1920s. Improvements in road access lead to an increasing significance of the inlets as an accessible and low-risk destination for tourists and visitors seeking family holidays, commercial tourism activities, boating and recreational fishing. During World War II, United States servicemen attached to Fleet Air Wing 10, which operated PBY Catalina flying boats from Crawley on the Swan River, used the inlets as a landing area during rest and recreation leave. The *Heritage of Western Australia Act 1990* provides for the protection of cultural heritage, including the State Register of Heritage Places. Public awareness of the rich colonial heritage associated with the inlet system is generally low, although information is provided by tourism operators. In the absence of appropriate education and interpretation, the potential exists for incidental damage to occur to historical sites. The management of colonial history and heritage within the marine park will aim to minimise or prevent human-induced degradation of heritage sites. Considerable potential exists for developing heritage education and interpretation to raise visitor awareness.
Requirements	• Protection of colonial heritage and historical sites. • Recognition of cultural value.
Management objectives	1. To ensure that human activities do not significantly impact on historical sites in the marine park. 2. To increase awareness of colonial heritage within the local community and among visitors.
Management strategies	1. Refer to management program strategies in Section 7. 2. Monitor known colonial historical sites to determine their condition and seek to implement appropriate management as necessary (WAM, DEC) **(M)**. 3. Encourage and assist research on colonial heritage, including recording oral histories, to facilitate long-term management (DEC) **(M)**.

Performance measure	To be developed as required.	**Desired trend**	To be developed as required.
Short-term target	To be developed as required.		
Long-term target	Maintenance of colonial heritage.		

8.2.3 Marine nature-based tourism

Social value	*The inlets are an important marine nature-based tourism destination for activities such as tours, houseboats, wildlife viewing, canoeing and exploring.*

Background	The diversity of wildlife and undeveloped and easily accessible terrestrial, estuarine and coastal scenery associated with the inlet system makes the marine park a very popular marine nature-based tourism destination. The value in this regard is further enhanced by the proximity of other popular nature-orientated attractions, such as the Bibbulmun Track, the Tree-Top Walk and the Walpole Wilderness Area. A major attraction for marine nature-based tourism is the lack of development and sense of isolation and remoteness that can be found, especially in the Nornalup Inlet and the Frankland and Deep rivers. In addition the ability to see iconic fauna, such as ospreys and white-bellied sea eagles, in an undisturbed and natural setting is highly attractive.. Visitor numbers to the Walpole Tourist Bureau has grown from approximately 17,000 to 84,000 during the decade up to 2001. This was probably largely in response to opening of the high-profile Tree-Top Walk in the nearby 'Valley of the Giants'. While this rate of increase has subsequently slowed, international tourism to Western Australia is expected to double over the next decade (Western Australian Tourism Commission, 2003). Tourist visitation to Walpole is strongly seasonal, with most occurring between September and April. Marine nature-based tourism associated with the inlet system is a major component of the local economy. The major marine nature-based tourism businesses that currently operate on the inlets offer boat tours and houseboat hire. The boat tours operate from jetties adjacent to the town jetty in Walpole and visit the inlet mouth or Frankland River over 2.5 to 4 hours. Houseboat Holidays currently offer houseboats for hire, and have a number of registered moorings located around the inlets and the lower Frankland River. Sea kayak tours also operate on the inlets during summer months, and dinghies may be hired from Rest Point during peak holiday season. In addition, canoe hire operates from Nornalup on the lower reaches of the Frankland River. Tourism Western Australian is responsible for promoting tourism infrastructure and product development (Western Australian Tourism Commission, 2003). Vessels engaged in marine nature-based tourist activity on the inlet system require a license from DoT, which is based on their size and the type of activity being undertaken. Holders of DoF licenses for aquatic ecotourism, fishing tour and restricted fishing tour activities in the South Coast Region are also permitted to operate in the inlets. Fishing tour licenses entitle holders to operate fishing charters in adherence to recreational fishing regulations. Information on DEC licensing arrangements that apply to tourism operations in marine parks and reserves is presented in Appendix IV. There are currently no significant management issues relating to marine nature-based tourism in the marine park, and the current marine nature-based tourism operators contribute significantly to protecting the inlet system by fostering environmental awareness and understanding. However, the limited size of the inlet system may create management issues in the future should use of the area significantly increase. For example, strategies may be required to separate marine nature-based tourism from other incompatible water sports, such as water skiing and the use of jet skis. Similarly, should the number of commercial operators continue to increase, tourism activity itself could eventually have a negative impact on other values of the marine park. If required in the future, sustainable limits on the number of marine nature-based tourism operators may need to be determined. Proposals for new marine nature-based tourism operations would be assessed with regard to their possible impact on the ecological and social values of the marine park. Policy Statement No. 18 *Recreation, Tourism and Visitor Services* will help guide the management of visitors, provision of infrastructure and associated activities such as nature appreciation and education through the life of the management plan. Marine nature-based tourism will be managed to be consistent with maintaining the ecological and social values of the marine park. Management will also focus on maintaining the values that sustain marine nature-based tourism, and providing assistance to maintain a viable marine nature-based tourism industry in the marine park.
Requirements	• High water quality. • Healthy estuarine communities. • Clean coastal areas.

	• High aesthetic quality, including serenity and quiet, of the estuarine environment. • Provision of 'undisturbed' areas for nature appreciation. • Equitable access to the natural values of the marine park. • Appropriate infrastructure and facilities.
Management objectives	1. To manage marine nature-based tourism in a manner that is consistent with maintaining the marine park's values. 2. To maintain the ecological and social values of the marine park that are important to the marine nature-based tourism industry.
Management strategies	1. Refer management program strategies in Section 7. 2. Ensure equitable access for marine nature-based tourism in appropriate areas of the marine park (DEC) **(M)**. 3. Conduct information exchange workshops and interpretation training for marine nature-based tourism operators (DEC, DoF) **(M)**

Reporting	To be developed as required.
Target	Implementation of management strategies within agreed timeframes (see Appendix II).

8.2.4 Recreational fishing

Social value	*The inlets are a very popular destination for shore and boat-based recreational fishing for species such as black bream, King George whiting and blue-spot flathead.*

Background	The popularity of recreational fishing has increased in Western Australia during the last decade, and this trend is expected to continue in line with population growth (DoF, 2000). Major estuaries, including the Walpole and Nornalup inlet system, Wilson Inlet and the Albany Harbours, are key south coast recreational fishing locations (Fletcher and Santoro, 2007). Surveys of 296 recreational fishing groups conducted by DoF from December 2002 to November 2003 revealed that when compared with other south coast estuaries, the Walpole and Nornalup inlets experienced the highest recreational fishing effort (26,163 fisher days) (Smallwood and Sumner, 2007). The combination of accessibility and sheltered waters make the inlet system a very popular destination for shore and small boat-based anglers, as well as anglers from houseboats. During its recreational fishing survey, DoF recorded that recreational anglers caught 22 different species, with black bream being the most common species targeted by shore and boat-based anglers, as well as anglers from houseboats (Smallwood and Sumner, 2007). Approximately 25,000 black bream were kept by boat-based anglers, approximately 1,300 by shore-based anglers and over 300 by anglers on houseboats from December 2002 to November 2003 (Smallwood and Sumner, 2007). King George whiting, Australian herring and blue-spot flathead are among the major species targeted, although a range of other inshore marine fishes are also caught. In recent years, catch and release bream fishing competitions have also taken place in the inlet system. Fishing activity occurs throughout the system and DoF studies indicate that peak activity occurs during summer with the highest levels of fishing effort for both boat and shore-based angling being recorded (Smallwood and Sumner, 2007). The annual effort for shore-based and boat-based fishers was estimated at 26,163 fisher days with fishers from houseboats contributing an additional 750 fisher days (Smallwood and Sumner, 2007). Recreational fishing in the inlet system is of high social significance to the local and broader communities, and is of local economic importance as a major attraction for tourists visiting the district. During the 2002-2003 DoF recreational fishing census, approximately 29 per cent of shore-based anglers were visitors from interstate or overseas, 26 per cent from regional Western Australia, 18 per cent from the Perth Metropolitan Area, and 27 per cent of shore-based anglers were local (Smallwood and Sumner, 2007). In contrast, only 2 per cent of boat-based anglers were visitors from interstate or overseas. The highest proportion of this user group, making up approximately 37 per cent, was visitors from regional Western Australia (Smallwood and Sumner, 2007). Local anglers and anglers from the Perth Metropolitan Area comprised approximately 30 per cent each of the total proportion of boat-based anglers (Smallwood and Sumner, 2007). Recreational fishing is managed by DoF under the FRM Act and using a variety of management strategies, such as daily bag limits, possession and trip limits, legal sizes, gear restrictions and spatial and/or temporal closures (DoF, 2000). As a result of the South Coast Recreational Fishing Review, new recreational fishing bag and size limits for the area between Black Point east of Augusta and the Western Australia/South Australia border were implemented by DoF on 1 January 2006 (DoF, 2005). These changes to legislation, which for example reduced the bag limit of black bream by 60 per cent, are likely to have a significant effect on recreational catch. Management arrangements for recreational fisheries may be further reviewed and additional restrictions may be applied if there are sustainability concerns for fish stocks. Potential management issues with regard to recreational fishing in the marine park are the depletion of target species and/or the ecological impacts of depleting particular species, such as impacting 'trophic cascades' (Shurin *et al*., 2002). In particular, black bream which is the most popular targeted species in the inlets, are resident estuarine species and may be susceptible to over-exploitation in particular systems (DoF, 2001). As recreational fishing in the area is likely to increase, habitat degradation from, for example, trampling sensitive vegetation to gain shoreline access and pollution from outboard engine oils, may become important management issues.

	Management of recreational fishing in the marine park will entail collaboration with DoF to ensure that fishing for targeted species is ecologically sustainable. Emphasis will be placed on education, patrol and enforcement to ensure compliance with fishing regulations and research.
Requirements	• High water quality • Maintenance of key habitats e.g. nursery and spawning areas. • Equitable access to fishing grounds. • Maintenance of sustainable targeted fish stocks. • Maintenance of recreational fishing experience. • Appropriate infrastructure and facilities.
Management objectives	1. To ensure that, in collaboration with DoF, recreational fishing in the marine park is managed in a manner consistent with maintaining the marine park's values. 2. To maintain the ecological and social values of the marine park that are important to recreational fishing. 3. Collaborate with the community and DoF in maintaining quality recreational fishing opportunities in the marine park.
Management strategies	1. See management program strategies in Section 7. 2. Identify species that will be protected from recreational fishing and provide the necessary legislative protection to achieve this (DEC, DoF) **(H).** 3. Examine the effects and evaluate the sustainability of recreation fishing, including monitoring catch/effort, and review management controls as required (DEC, DoF) **(H).** 4. Ensure equitable access for recreational fishing in appropriate areas of the marine park (DEC) **(M).** 5. Participate in the review of management arrangements for recreational fisheries (DEC, DoF) **(M).**

Reporting	To be developed with DoF.
Target	Implementation of management strategies within agreed timeframes (see Appendix II).

8.2.5 Recreational water sports

Social value	*The inlets are a popular destination for a diverse range of water sports.*

Background	The Walpole and Nornalup inlets are a popular destination for boating and other water sports due to their easy access by major roads, sheltered waters and high scenic values. The inlets also provide users with access to the adjacent ocean through the permanently open entrance. While trailer powerboats are the most prevalent craft, the inlets are also used for canoeing, sailing, jet skiing and water skiing. Anecdotal evidence indicates that water sport activity is highest during summer holiday periods. High use areas include the channel between the inlets, the lower Frankland River and the inlet mouth. The Frankland and Deep rivers are popular for canoeing, and Canoeing Western Australia are working with DEC to develop canoeing opportunities on the inlets, which is guided by the Warren Region Draft Paddling Management Strategy. The Walpole Yacht Club is located at Coalmine Beach on the Nornalup Inlet. Vessel channels have been dredged in the Walpole Inlet and the deltas of the Frankland and Deep rivers (Hodgkin and Clark, 1999). Vessel launching facilities of varying quality are located at Walpole, Rest Point, Coalmine Beach and Nornalup, while small dinghies and canoes can be launched at other shoreline access points (e.g. Isle Road). Two public jetties are located at Walpole (town and Swarbrick) and one at the Nornalup boat ramp. Approximately 35 private jetties are located in the Walpole and Nornalup inlets and on the Deep and Frankland rivers, particularly adjacent to Nornalup. The Walpole Yacht Club jetty at the eastern end of Coalmine Beach was demolished for safety reasons during 2004. Water sport activities are a highly valued recreational activity among locals and visitors to the inlet system. Commercial water sport operations on the inlets are associated with commercial tourism (see Section 8.2.3). Commercial fishing catches are transported across the inlets from Bellanger Beach adjacent to the inlet mouth to a road access point on the Deep River. DoT is responsible for commercial and recreational vessel regulations including boat licensing, safety standards, navigation markers and the licensing of moorings and jetties. Mooring controls can be delegated to other management agencies. The Shires of Manjimup and Denmark currently manage public boat launching facilities, while the public jetties will managed by DEC. Proposed improvements to water sport facilities adjacent to the Walpole Yacht Club include upgrading the jetty and boat ramp, relocating trailer parking away from the shoreline, and improving the general appearance (CALM, 2003). The facilities at Rest Point include a jetty and boat ramp. Any proposals for modifications to existing facilities or new developments would be subject to assessment and approval by DEC, MPRA, DoT and EPA as appropriate. Boating is prohibited adjacent to the Coalmine Beach swimming area, and vessels are limited to eight knots in the Walpole Inlet, the channel between the inlets, the rivers (Frankland, Deep and Walpole) and adjacent to the Knolls and the Coalmine Beach boating exclusion zone. Water skiing is only permitted in designated areas, and at the time of printing this management plan, it is not permitted in the inlets as a water ski area has not been gazetted. Water skiing, as defined by the *Navigable Waters Regulations 1958* is being towed behind a motor boat by skis or any other apparatus (including for example, a sea biscuit), at more than eight knots. Sustainable houseboat management is addressed by the DoW's State-wide Policy 7 (Waters and Rivers Commission, 2001). The most significant current management issues with regard to water sports in the marine park are the enforcement of existing regulations and the separation of incompatible activities in a waterway that is of limited size. Speeding in particular is perceived to be a management issue, while water skiing and the use of personal water craft can disturb wildlife and disrupt the peace and quiet that is highly valued by canoeists and houseboat users. To manage these activities, strategies of this management plan include working with DoT to gazette an appropriate water ski area in Nornalup Inlet, subject to environmental assessment and consultation with users. In addition, freestyle jet skiing will be monitored and additional controls may be implemented if required. Within the life of this management plan, increasing numbers of vessels have the potential to negatively impact the ecological and social values of the marine park. Overcrowding for example may diminish the perceptions of 'peace and quiet', 'naturalness' and 'remoteness' that

	are integral aspects of the aesthetic value of the inlet system (see Section 8.2.6). In this context, while few private non-commercial live-aboard vessels currently use the inlet system, their presence is anticipated to increase. Vessel channels dredged in the Walpole Inlet appear to accumulate algae that rot, releasing stored nutrients which promote further algal growth leading to problems of eutrophication (Brearley, 2005). Areas once isolated are now visited more frequently by adventurers in canoes, who make overnight camps in, and may impact on, the riparian vegetation, increasing the risk of fire outbreaks (Brearley, 2005). Management of water sports in the marine park will primarily involve ensuring compliance with vessel regulations through education and enforcement. Speed and area restrictions may be necessary where particular types of water sports are shown to be incompatible with roosting or nesting waterbirds or other types of user activities. Additional speed controls are recommended for the entrance channel for visitor safety reasons. To protect aesthetic and natural values and prevent overcrowding, visitors with non-commercial live-aboard vessels that intend to stay more than two nights in the marine park must apply to DEC to do so. The number of non-commercial live-aboard vessels of any kind spending more than two nights in the marine park will not exceed seven vessels at any time, however this may be reviewed in consultation with the community during the life of the management plan if these restrictions are not appropriate. The discharge of sewage from any vessels is not permitted in the marine park (see Section 8.1.2). DEC is currently developing a policy to guide event management in marine and terrestrial parks and reserves in Western Australia.
Requirements	• High water quality. • High aesthetic quality of the estuarine environment. • Equitable access to the natural values, in appropriate areas. • Separation of incompatible activities. • Appropriate infrastructure and facilities.
Management objectives	1. To ensure recreational water sports are managed in a manner that is consistent with maintaining the marine park's values. 2. To maintain the ecological and social values of the marine park that are important to those participating in recreational water sports. 3. To manage recreational water sports in a manner that minimises conflict between marine park users.
Management strategies	1. Refer to management program strategies in Section 7. 2. Gazette an appropriate water ski area in Nornalup Inlet, subject to environmental assessment and consultation (DoT, DEC) **(H).** 3. Gazette an eight knot speed restriction at the entrance to the Nornalup Inlet (DoT, DEC) **(H)**. 4. Seek to designate vessel speed restrictions for wildlife protection and/or for safety requirements (DEC, DoT) **(M)**.

Reporting	To be developed as required.
Target	Implementation of management strategies within agreed timeframes (see Appendix II).

8.2.6 Aesthetics (scenery, peace and quiet, remoteness) (KPI)

Social value	*The scenery of the inlet system is distinctive in Western Australia, and the lack of development, particularly in the Nornalup Inlet and lower rivers, provides a strong sense of remoteness.*

Background	Outstanding aesthetic qualities are created by the undulating landscape of the Walpole district and the fact that the inlets and lower rivers are predominantly surrounded by national park. The inlet system itself provides a diverse visual landscape of tranquil waters, meandering rivers, forested hillsides, heathland and wild coastal scenery. The recognition of highly valued aesthetics led to the creation a conservation reserve on the Frankland River as early as 1910 (Fernie and Fernie, 1989). Pivotal to the aesthetics of the inlet system is the 'peace and quiet' and sense of 'remoteness' and 'naturalness' that can be experienced by visitors, particularly in the Nornalup Inlet and the lower reaches of the Frankland and Deep rivers. Such aesthetics are enhanced by the lack of intrusive infrastructure development in these areas, and the presence of iconic wildlife in a natural setting. The aesthetics of the inlet system are highly valued by locals and visitors to the area, and are an important asset for commercial tourism. DEC Policy No 34 *Visual Resource Management of Lands and Waters Managed by DEC*, aims to ensure that all uses of lands and waters managed by DEC are carried out in a way that sustains the beauty of the natural environment. Maintaining the visual quality of landscapes is a major management objective of the Walpole Wilderness Area (including the Walpole-Nornalup National Park), and visual landscape zones are specified in the management plan for the Walpole Wilderness Area and Adjacent Parks and Reserves. Adjacent to the marine park, DEC is undertaking improvements to visitor facilities at Coalmine Beach and the Knolls, which include removing some visually intrusive infrastructure (CALM, 2003). Most visitors to the marine park will appreciate aesthetics as a combination of the natural setting, perceived isolation with relatively few people and the absence of infrastructure. While current levels of activity and development in the inlet system are not perceived to significantly compromise aesthetics, overcrowding, excessive noise and inappropriate infrastructure development could easily do so. It is acknowledged that aesthetic perceptions are subjective, and may differ between different visitors and over time. As visitation to the marine park increases, there will always need to maintain aesthetics while not unnecessarily restricting access. Management of aesthetics in the marine park will focus on educating visitors, monitoring visitation, and gauging user perceptions. As visitation increases, it may be necessary to liaise with stakeholders and the community to develop sustainable levels of visitation and use.
Requirements	• Tranquillity and quiet. • Generally uninterrupted coastal and estuarine vistas. • Sensitively designed and located infrastructure.
Management objectives	1. To ensure the aesthetics of the marine park are not degraded by human activities. 2. To minimise visual intrusions on vistas in and adjacent to the marine park.
Management strategies	1. Refer to management program strategies in Section 7. 2. Identify the key characteristics and spatial extent of major vistas and aesthetics of the marine park (DEC) **(H).** 3. Liaise with tourism operators, the MAC and other visitors to identify management targets for visitation and/or limits on visitation to particular areas of the marine park where aesthetics are highly valued (DEC) **(H-KMS)**. 4. Seek to integrate the preservation of key vistas into gazetted town planning schemes and/or planning policies (DEC, LG) **(M).**

Performance measure	Spatial extent of major vistas. Human-induced noise.	**Desired trend**	Constant: Positive Constant: Negative
Short-term target	To be developed.		
Long-term target	No significant loss of aesthetics as a result of human activity in the marine park.		

8.2.7 Research opportunity

Social value	*The diverse habitats and communities and largely undisturbed nature of the inlet system provides excellent opportunities for scientific research.*

Background	As a largely unmodified and undegraded estuarine system, the marine park represents an important current and potential resource for scientific research. While the flora and fauna of the inlet system has largely been documented (Potter and Hyndes, 1994; Hodgkin and Clark, 1999; Birds Australia 2001a and 2001b), considerable knowledge gaps exist. For example, potential exists for research on the biology and ecology of many species, such as invertebrates and primary produces, and on environmental processes such as nutrient dynamics across the terrestrial/aquatic interface. Importantly, numerous temporal patterns of biological variation in the system are not well understood. In addition, despite the long history of human use and occupation in the area, very little social research has been carried out in the marine park. A good understanding of physical processes, the ecology and biology of organisms and patterns of human use are a fundamental requirement for effective management. In a broader context, such research would contribute to the management of other estuarine systems. All research within the marine park requires the appropriate research permit issued under the CALM Act, WC Act or the FRM Act. While most scientific research programs are relatively benign, care must be taken to ensure that research is carried out in an ethical and sustainable manner. Potential also exists for conflict between researchers and other user groups. Management will seek to provide equitable access to ethical and sustainable research opportunities that will enhance the understanding of the inlet system at all levels. Research programs in the marine park should preferentially fill key gaps in existing knowledge. Scientific research will be permitted in all areas of the marine park subject to the granting of an appropriate permit.
Requirements	• Equitable access to the marine park for ecological and social research opportunities. • Identify and communicate physical, biological and social research opportunities that are relevant to managing the marine park to appropriate research organisations.
Management objective	To ensure the value of the marine park for scientific research is not diminished as a result of human activity.
Management strategies	1. Refer to management program strategies in Section 7.

Reporting	To be developed.
Target	Implementation of management strategies within agreed timeframes (see Appendix II).

8.2.8 Educational resource

Social value	*The inlet system and surrounds comprise a variety of largely undisturbed landscapes and biota, as well as rich Aboriginal and colonial heritage, which represents a diverse and accessible educational resource.*

Background	The Walpole and Nornalup inlet system represents a valuable educational resource as it is easily accessible by sealed roads, is in close proximity to accommodation and town facilities, and is largely undeveloped. The significance of the marine park as an educational resource is highlighted by the fact that most other similar sized or larger estuaries in the south-west of Western Australia are substantially modified and/or degraded by catchment impacts or due to their location adjacent to significant urban centres. While schools, universities and commercial tourism operators currently use the inlet system as an educational resource, there is potential for this use to be increased. Public education about the inlet system through active participation would greatly assist management of the marine park by enhancing awareness of conservation and management issues and engendering affinity and respect for the estuarine environment. While most educational programs are benign, care must be taken to ensure that such activity is carried out in an ethical and sustainable manner. The potential for conflict between educational and other user groups must also be recognised. Management will seek to provide equitable access to ethical and sustainable educational opportunities that will enhance the understanding of the inlet system at all levels. Educational use will be permitted in all areas of the marine park.
Requirements	• Educational and interpretative material to be made available to the local and broader communities. • Equitable access to the marine park for educational opportunities.
Management objectives	1. To promote and provide educational opportunities which are consistent with maintaining the values of the marine park. 2. To ensure that educational activity is ethical and ecologically sustainable.
Management strategies	1. Refer to management program strategies in Section 7. 2. Ensure research and monitoring outcomes are communicated, where appropriate, and contribute to education programs (DEC, DoF) **(H)**. 3. Support local schools that wish to develop a marine education program relating to the marine park (DEC) **(M)**. 4. Ensure educational programs are conducted in an ethical and ecologically sustainable manner (DEC) **(M)**.

Reporting	1. Number of people accessing the marine park for educational purposes to increase. 2. Visitor knowledge regard the marine park to increase
Target	Implementation of management strategies within agreed timeframes (see Appendix II).

9. AUDITING AND REVIEWS

Progress in implementing the management plan and in assessing management effectiveness against the stated objectives will be periodically reviewed through a formal process. Management targets of selected key ecological and social values of the reserves are used as *key performance indicators* of management effectiveness. The KPIs reflect both the conservation priorities and the management imperatives of the MPRA, DEC and the community. The KPIs for the reserves will be the management targets for *water quality*, *sediment quality, invertebrates, finfish and aesthetics.*

9.1 Annual review by the Department of Environment and Conservation

The prioritised strategies outlined in Sections 7 and 8 of the management plan will be implemented through the annual works programs of DEC's South West Region. DEC's South West Region will also prepare an annual review of management plan implementation for the MPRA's consideration. Key parts of the annual review will include: the identification of issues affecting implementation; progress in implementing the management plan strategies; and the condition of ecological and social values against performance measures and targets.

9.2 Audit by the Marine Parks and Reserves Authority

The MPRA is responsible for assessing the implementation of management plans and is guided by an Audit Policy. The MPRA will examine the annual reviews prepared by DEC's South West Region, together with those for other WA marine parks and reserves, and prepare an annual audit report. The MPRA will also assess implementation of the management plan on a periodic basis (e.g. mid-term) and prior to the statutory 10-year review of the plan. Assessments will be based on the preceding annual reviews and input from stakeholders regarding the management of the marine park.

9.3 Revision of the management plan

This management plan will guide management of the marine park for a period of 10 years, or until such time as a statutory revision is undertaken and a new management plan prepared. The CALM Act specifies that in the event of such a revision not occurring by the end of the plan's specified lifespan, the plan will remain in force in its original form unless it is revoked by the Minister for Environment or a new plan is approved. Full public consultation will occur at the time of a revision and prior to a new management plan being submitted to the MPRA and the Minister for Environment for approval.

9.4 Links with state of the environment reporting

The Western Australian State of the Environment Report, which has been published in 1992, 1998 and 2007, is designed to communicate credible, timely and accessible information about the current condition of the environment to decision makers and the community. The reports discuss objectives, indicators, overall condition, key findings and suggested responses for marine and terrestrial ecosystems. Relevant marine issues covered by this framework include the degradation of the marine environment, marine contamination, introduced marine species and emerging issues (such as marine debris). The audit process for WA's marine parks and reserves as described above is broadly consistent with the State of the Environment reporting framework (EPA, 2007).

9.5 Links with national environment reporting

At a national level, there are two major reporting mechanisms relevant to marine conservation reserves. These are the national State of the Environment Report and the performance assessment framework for the NRSMPA. The national State of the Environment Report, which has been published in 1996, 2001 and 2006, is prepared by an independent committee to provide an assessment of the Australian environment (Australian State of the Environment Committee, 2006). A range of performance assessment criteria are being developed to assess whether the goals of the NRSMPA are being achieved. The audit process for this plan is broadly consistent with the performance assessment criteria being developed for the NRSMPA.

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Shipping and Pilotage (Mooring Control Areas) Regulations 1983
Western Australian Marine Act 1982
Wildlife Conservation Act 1950
Wildlife Conservation Regulations 1970

12 APPENDICES

Appendix I: List of acronyms

AH Act	*Aboriginal Heritage Act 1972*
ANZECC	Australia and New Zealand Environment and Conservation Council
ARMCANZ	Agricultural Resource Management Council of Australia and New Zealand
CALM Act	*Conservation and Land Management Act 1984*
CALM	Department of Conservation and Land Management (now DEC)
CAMBA	China-Australia Migratory Bird Agreement
DEC	Department of Environment and Conservation
DEWHA	Department of Environment, Water, Heritage and the Arts (Commonwealth)
DIA	Department of Indigenous Affairs
DoE	Department of Environment
DoF	Department of Fisheries
DMP	Department of Mines and Petroleum
DoT	Department of Transport
DoW	Department of Water
EOI	expression of interest
EP Act	*Environmental Protection Act 1986*
EPA	Environmental Protection Authority
FRM Act	*Fish Resources Management Act 1994*
H	high priority management strategy
H-KMS	key management strategy
IUCN	International Union for the Conservation of Nature
JAMBA	Japan-Australia Migratory Bird Agreement
KPI	key performance indicator
L	low priority management strategy
M	medium priority management strategy
MAC	Management Advisory Committee
MOU	memorandum of understanding
MPRA	Marine Parks and Reserves Authority
MPRSWG	Marine Parks and Reserves Selection Working Group
NHT	Natural Heritage Trust
NRSMPA	National Representative System of Marine Protected Areas
NT Act	*Native Title Act 1993*
ppt	parts per thousand
ROKAMBA	Republic of Korea-Australia Migratory Bird Agreement
SCNRM	South Coast Natural Resource Management (formerly South Coast Regional Initiative Planning Team (SCRIPT))
SWCC	South West Catchment Council
TFMPA	Task Force of Marine Protected Areas
WANISAC	Walpole and Nornalup Inlet Systems Advisory Committee
WC Act	*Wildlife Conservation Act 1950*

Appendix II: Operational schedule to guide implementation of management strategies for Walpole and Nornalup Inlets Marine Park by management program

Majority of action to be completed within this timeframe
Action to be completed on an ongoing basis.

TABLE 1. Management Frameworks operational schedule.

MANAGEMENT FRAMEWORKS		Year									
		1	2	3	4	5	6	7	8	9	10
MANAGEMENT PROGRAM STRATEGY	**Gazette classified waters notice under the CALM Act (DEC) (H-KMS).**										
Ecological Value strategies	None										
Social Value strategies	None										
MANAGEMENT PROGRAM STRATEGY	**Gazette an order under the FRM Act to prohibit commercial fishing in the marine park (DoF) (H-KMS).**										
Ecological Value strategies	None										
Social Value strategies	None										
MANAGEMENT PROGRAM STRATEGY	**Develop and implement joint and collaborative operational plans (DEC, DoF, DoT) (H).**										
Ecological Value strategies	• *Ensure an integrated approach to management of the interface between the Walpole-Nornalup National Park and the marine park (DEC) (H).*										
Social Value strategies	None										
MANAGEMENT PROGRAM STRATEGY	**Ensure the setting of conditions for new developments and operations are consistent with the management objectives and targets for ecological and social values (DEC, MPRA, EPA, DoF, LG, DMP, DoT, TWA) (H).**										
Ecological Value strategies	None										
Social Value strategies	None										
MANAGEMENT PROGRAM STRATEGY	**Ensure that proponents of development proposals or activities with the potential to impact on the marine park's values conduct appropriate compliance monitoring programs (DEC, MPRA, EPA, DoF) (H).**										

MANAGEMENT FRAMEWORKS		**Year**									
		1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Ecological Value strategies	None										
Social Value strategies	None										
MANAGEMENT PROGRAM STRATEGY	**Ensure the provision of necessary information to the MPRA for audit processes (DEC, DoF) (H).**										
Ecological Value strategies	• *Maintain a pollutant inputs database for the marine park (DEC) (M).*										
Social Value strategies	None										
MANAGEMENT PROGRAM STRATEGY	**Ensure appropriate licences and permits are provided where necessary (DEC, DoF) (H).**										
Ecological Value strategies	None										
Social Value strategies	None										
MANAGEMENT PROGRAM STRATEGY	**Liaise with and provide advice to agencies and stakeholders, where necessary, to ensure the protection of ecological and social values (DEC) (H).**										
Ecological Value strategies	• *Establish a collaborative approach in seeking to minimise catchment and urban-based inputs that have the potential to affect the marine park's sediment quality (DEC) (H).*										
Social Value strategies	• *Participate in the review of management arrangements for recreational fisheries (DEC, DoF) (M).* • *Seek to integrate the preservation of key vistas into gazetted town planning schemes and/or planning policies (DEC, LG) (M).*										
MANAGEMENT PROGRAM STRATEGY	**Map the ecological and social values of the marine park that are highly sensitive to oil and chemical spills and ensure this information is accessible to the State Committee for Combating Marine Oil Pollution (DEC) (H).**										
Ecological Value strategies	None										
Social Value strategies	None										
MANAGEMENT PROGRAM STRATEGY	**Develop and implement codes of practice with user groups to encourage responsible use of the marine park (DEC) (M).**										
Ecological Value strategies	None										
Social Value strategies	None										

TABLE 2. Education and interpretation operational schedule

EDUCATION AND INTERPRETATION		**Year**									
		1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
MANAGEMENT PROGRAM STRATEGY	**Develop and implement education and interpretation programs designed to raise community awareness of:** • **the importance of ecological and social values, especially KPI values;** • **appropriate behaviours to avoid or reduce human impacts, particularly fishing, and to ensure public safety; and** • **zoning and boundaries of the marine park (DEC) (H-KMS).**										
Ecological Value strategies	None										
Social Value strategies	• *Promote the significance of the inlet and river environments for Aboriginal people in regard to physical and spiritual connections (DEC, DIA, SWALSC, TWA) (H).* • *Ensure research and monitoring outcomes are communicated, where appropriate, and contribute to education programs (DEC, DoF) (H).* • *Support local schools that wish to develop a marine education program relating to the marine park (DEC) (M).* • *Ensure educational programs are conducted in an ethical and ecologically sustainable manner (DEC) (M).*										
MANAGEMENT PROGRAM STRATEGY	**Where appropriate, implement education and interpretation programs in collaboration with external organisations (DEC) (H).**										
Ecological Value strategies	None										
Social Value strategies	None										
MANAGEMENT PROGRAM STRATEGY	**Ensure education and interpretation programs complement, and integrate with terrestrial programs for adjacent reserves (DEC) (H).**										
Ecological Value strategies	None										
Social Value strategies	None										
MANAGEMENT PROGRAM	**Distribute appropriate education and interpretive materials to**										

EDUCATION AND INTERPRETATION		**Year**									
		1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
STRATEGY	**individuals, community groups, clubs, schools and customers and staff of commercial operations (DEC, DoF) (H).**										
Ecological Value strategies	None										
Social Value strategies	None										
MANAGEMENT PROGRAM STRATEGY	**Provide work experience and voluntary placement opportunities, where possible, to facilitate education through direct involvement in operational management (DEC, DoF) (M).**										
Ecological Value strategies	None										
Social Value strategies	None										
MANAGEMENT PROGRAM STRATEGY	**Provide talks and briefings about the marine park's values and management to users groups as necessary (DEC) (M).**										
Ecological Value strategies	None										
Social Value strategies	None										

TABLE 3. Public participation operational schedule.

PUBLIC PARTICIPATION		**Year**									
		1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
MANAGEMENT PROGRAM STRATEGY	**Develop and implement a public participation program for the marine park which encourages community involvement through a range of opportunities including monitoring programs (DEC, DoF) (H-KMS).**										
Ecological Value strategies	• *Establish a collaborative approach in seeking to minimise catchment and urban-based inputs that have the potential to effect the marine parks water quality (DEC)* ***(H).***										
Social Value strategies	• *Conduct information exchange workshops and interpretation training for marine-nature based tourism operators (DEC, DoF) (M)*										
MANAGEMENT PROGRAM STRATEGY	**Establish and maintain a MAC (DEC) (H-KMS).**										
Ecological Value strategies	None										
Social Value strategies	• *Engage local Aboriginal people to provide ongoing advice for marine park management (DEC, DIA, SWALSC) (H-KMS).*										
MANAGEMENT PROGRAM STRATEGY	**Liaise with South Coast NRM and SWCC to assist with the determination of their investment priorities for the marine environment, particularly in relation to marine park management (DEC) (M).**										
Ecological Value strategies	None										
Social Value strategies	None										
MANAGEMENT PROGRAM STRATEGY	**Maintain a database of community participation (DEC) (M)**										
Ecological Value strategies	None										
Social Value strategies	None										

TABLE 4. Patrol and enforcement operational schedule.

PATROL AND ENFORCEMENT		**Year**									
		1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
MANAGEMENT PROGRAM STRATEGY	**Develop and implement a collaborative patrol and enforcement program to ensure compliance with zoning restrictions, permitted uses and other regulations (DEC, DoF, DoT) (H-KMS).**										
Ecological Value strategies	• *Enforce controls on the discharge of sewage from vessels in the marine park (DoT, DEC) (H).*										
Social Value strategies	None										
MANAGEMENT PROGRAM STRATEGY	**Encourage voluntary compliance and peer enforcement of regulations (DEC, DoF, DoT) (H-KMS).**										
Ecological Value strategies	None										
Social Value strategies	None										
MANAGEMENT PROGRAM STRATEGY	**Facilitate cross-authorisation of Government enforcement officers as appropriate (DEC, DoF, DoT) (H-KMS).**										
Ecological Value strategies	None										
Social Value strategies	None										
MANAGEMENT PROGRAM STRATEGY	**Ensure marine park users, including researchers, obtain and comply with appropriate permits (DEC, DoF) (H).**										
Ecological Value strategies	None										
Social Value strategies	None										

TABLE 5. Management intervention and visitor infrastructure operational schedule

MANAGEMENT INTERVENTION AND VISITOR INFRASTRUCTURE		Year									
		1	2	3	4	5	6	7	8	9	10
MANAGEMENT PROGRAM STRATEGY	**Ensure management related signage is installed as soon as possible after gazettal of the marine park (DEC, DoF) (H-KMS).**										
Ecological Value strategies	None										
Social Value strategies	None										
MANAGEMENT PROGRAM STRATEGY	**Gazette the marine park as a mooring control area or use alternative legislative mechanism upon gazettal of the marine park (DEC, DoT) (H-KMS).**										
Ecological Value strategies	None										
Social Value strategies	None										
MANAGEMENT PROGRAM STRATEGY	**Develop a mooring plan for the marine park, with appropriate consultation, which identifies areas in which moorings are acceptable and/or necessary from environmental, equity and safety perspectives, including an assessment of the capacity of each area (DEC, DoT) (H).**										
Ecological Value strategies	None										
Social Value strategies	None										
MANAGEMENT PROGRAM STRATEGY	**Manage existing moorings and assess new moorings in accordance with the DEC Mooring Policy No. 59 and the approved mooring plan (DEC, DoT) (H).**										
Ecological Value strategies	None										
Social Value strategies	None										
MANAGEMENT PROGRAM STRATEGY	**Gazette restricted anchoring areas where an unacceptable level of damage to ecological values is occurring or is likely to occur (DEC) (H)**										
Ecological Value strategies	None										
Social Value strategies	None										
MANAGEMENT PROGRAM STRATEGY	**Liaise closely with coastal managers in regard to coastal management practices, such as sand by-passing, sand nourishment (input and outtake) and sea wrack removal which occur adjacent to**										

MANAGEMENT INTERVENTION AND VISITOR INFRASTRUCTURE		Year									
		1	2	3	4	5	6	7	8	9	10
	the marine park boundary (DEC, LG, DoT) (H).										
Ecological Value strategies	None										
Social Value strategies	None										
MANAGEMENT PROGRAM STRATEGY	**Contribute to, and lead where appropriate, detailed recreation and site planning for areas of current or anticipated high use and/or for sensitive sites in consultation with major users (DEC) (H).**										
Ecological Value strategies	None										
Social Value strategies	None										
MANAGEMENT PROGRAM STRATEGY	**Perform regular assessments for visitor risks in the marine park (DEC) (H).**										
Ecological Value strategies	None										
Social Value strategies	None										
MANAGEMENT PROGRAM STRATEGY	**Implement measures to reduce or remove visitor risks identified during regular assessments (DEC) (H).**										
Ecological Value strategies	None										
Social Value strategies	None										
MANAGEMENT PROGRAM STRATEGY	**Prohibit the construction of new jetties where it is assessed that there is an unacceptable risk to or impact upon shoreline vegetation and/or constrains public access to the shoreline (DEC) (M).**										
Ecological Value strategies	None										
Social Value strategies	None										
MANAGEMENT PROGRAM STRATEGY	**Develop management protocols and arrangements under which mechanical sand movement and/or sea wrack removal may be permitted within the boundaries of the marine park (DEC, LG) (M).**										
Ecological Value strategies	None										
Social Value strategies	None										
MANAGEMENT PROGRAM STRATEGY	**Ensure boat launching facilities are not impeded by excessive accumulation of natural materials such as sea wrack or sand within marine park boundaries (DEC, LG) (M).**										

MANAGEMENT INTERVENTION AND VISITOR INFRASTRUCTURE		**Year**									
		1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Ecological Value strategies	None										
Social Value strategies	None										
MANAGEMENT PROGRAM STRATEGY	**Maintain awareness of the introduction, maintenance and management of bridges, navigation or other maritime infrastructure (DEC, DoT) (M).**										
Ecological Value strategies	None										
Social Value strategies	None										
MANAGEMENT PROGRAM STRATEGY	**Implement a program of routine inspection, maintenance and reporting on infrastructure condition (e.g. markers, signage) in the marine park (DEC) (M).**										
Ecological Value strategies	None										
Social Value strategies	None										
MANAGEMENT PROGRAM STRATEGY	**Identify degraded areas in the marine park, assess rehabilitation options and implement, where appropriate (DEC) (M).**										
Ecological Value strategies	• *Identify areas where coastal erosion from recreational use is occurring, including boat wake impacts on shorelines (DEC, DoT) (M).* • *Manage access and use of coastal areas in and adjacent to the marine park where impacts are identified and rehabilitation is required (DEC) (M).* • *Initiate research to increase knowledge of sedimentation processes associated with the Nornalup entrance channel, including whether any reef or other stable bars have been disturbed or altered in or near the entrance channel (DEC, research institutions) (M).* • *Seek to protect riparian vegetation from impacts associated with human use (DEC) (M).*										
Social Value strategies	None										
MANAGEMENT PROGRAM STRATEGY	**Provide an appropriate level of visitor infrastructure, based on monitoring of human use patterns (DEC) (M).**										
Ecological Value strategies	• *Manage human access to areas that are significant sites for shorebirds and seabirds (e.g. breeding, feeding, roosting) if*										

MANAGEMENT INTERVENTION AND VISITOR INFRASTRUCTURE		Year									
		1	2	3	4	5	6	7	8	9	10
	necessary (DEC) (M).										
Social Value strategies	• *Ensure equitable access for marine nature-based tourism in appropriate areas of the marine park (DEC) (M).*										
MANAGEMENT PROGRAM STRATEGY	**Determine the nature, spatial requirements and compatibility and potential environmental impacts of all water sports and develop a long term sustainable water sport strategy, which could include separation of incompatible water sport activity (DEC) (H).**										
Ecological Value strategies	None										
Social Value strategies	• *Gazette an appropriate water ski area in Nornalup Inlet, subject to environmental assessment and consultation (DEC, DoT) (H).* • *Gazette an eight knot speed restriction at the entrance to the Nornalup Inlet (DoT, DEC) (H).* • *Ensure equitable access for recreational fishing in appropriate areas of the marine park (DEC) (M).* • *Seek to designate vessel speed restrictions for wildlife protection and/or safety requirements (DEC, DoT) (M).*										
MANAGEMENT PROGRAM STRATEGY	**Until the development of a long-term water sports strategy, ensure that nor more than seven non-commercial live-aboard vessels that are staying for more than two nights are present in the marine park at any time (DEC) (M).**										
Ecological Value strategies	None										
Social Value strategies	None										
MANAGEMENT PROGRAM STRATEGY	**Designate areas for animal exercising if considered appropriate (DEC) (L).**										
Ecological Value strategies	None										
Social Value strategies	None										

TABLE 6. Research operational schedule

RESEARCH		Year									
		1	2	3	4	5	6	7	8	9	10
MANAGEMENT PROGRAM STRATEGY	**Develop and progressively implement a coordinated and prioritised research program focusing on key ecological and social values, processes and issues of the marine park (DEC, DoF) (H-KMS).**										
Ecological Value strategies	• *Determine appropriate baseline measures from which changes in water quality can be measured (DEC) (H-KMS).* • *Determine appropriate baseline measures from which changes in sediment quality can be measured (DEC) (H-KMS).* • *Identify invertebrate species that require protection from recreational fishing in the marine park and seek to implement appropriate management (DEC, DoF) (H).* • *Identify finfish species that require protection from recreational fishing in the marine park and seek to implement appropriate management (DEC, DoF) (H).* • *Identify shark and ray species that require protection from recreational fishing in the marine park and seek to implement appropriate management (DEC, DoF) (H).* • *Map shorebird and seabird foraging, breeding and roosting areas of the marine park (DEC) (H).* • *Initiate research programs to determine the types of primary producers and their role and to quantify the floral and faunal diversity and natural variability of macroalgal and seagrass communities in the marine park (DEC) (M).* • *Initiate research to identify the diversity and abundance of finfish and important nursery, spawning and aggregation sites (DEC, DoF) (M).* • *Investigate the food requirements of shorebirds and seabirds and relate to prey availability in the marine park where regular foraging occurs (DEC) (L).*										
Social Value strategies	• *Liaise with tourism operators, the MAC and other visitors to identify management targets for visitation and/or limits on visitation to particular areas of the marine park where aesthetics are highly valued (DEC) (H-KMS).* • *Identify species that will be protected from recreational fishing and provide the necessary legislative protection to achieve this (DEC,*										

RESEARCH		**Year**									
		1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
	DoF) (H). • *Identify the key characteristics and spatial extent of major vistas and aesthetics of the marine park (DEC) (H).* • *Encourage and assist research on Aboriginal heritage, including recording oral histories, to facilitate long-term management (DEC) (M).* • *Encourage and assist research on colonial heritage, including recording oral histories, to facilitate long-term management (DEC) (M).*										
MANAGEMENT PROGRAM STRATEGY	**Communicate the prioritised research program to appropriate research organisations (DEC, DoF) (H-KMS).**										
Ecological Value strategies	None										
Social Value strategies	None										
MANAGEMENT PROGRAM STRATEGY	**Maintain a database of research information relevant to the management of the marine park e.g. human use patterns, wildlife presence (DEC, DoF) (H-KMS).**										
Ecological Value strategies	None										
Social Value strategies	None										
MANAGEMENT PROGRAM STRATEGY	**Facilitate ecological and social research in the marine park conducted by research, academic and educational institutions, by providing financial and logistical assistance, where possible (DEC, DoF) (H).**										
Ecological Value strategies	None										
Social Value strategies	None										
MANAGEMENT PROGRAM STRATEGY	**Develop partnerships with stakeholders and the community to implement research programs (DEC, DoF) (H).**										
Ecological Value strategies	None										
Social Value strategies	None										
MANAGEMENT PROGRAM STRATEGY	**Share research outcomes with interested stakeholders, where appropriate (DEC, DoF) (H)**										
Ecological Value strategies	None										

RESEARCH		**Year**									
		1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Social Value strategies	None										
MANAGEMENT PROGRAM STRATEGY	**Encourage marine park users to contribute to research programs (DEC, DoF) (M).**										
Ecological Value strategies	None										
Social Value strategies	None										

TABLE 7. Monitoring operational schedule

MONITORING		**Year**									
		1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
MANAGEMENT PROGRAM STRATEGY	**Develop and progressively implement a coordinated and prioritised ecological and social monitoring program for the marine park including community-based monitoring programs, with a particular emphasis on MPRA audit requirements (DEC, DoF) (H-KMS).**										
Ecological Value strategies	• *Continue existing water quality monitoring programs in the marine park and surrounding waterways and catchments where appropriate (DEC, DoW, Water Corporation, LG, South Coast NRM, SWCC) (H-KMS).* • *Implement a sediment quality monitoring program in the marine park (DEC, DoW, LG, South Coast NRM, SWCC) (H-KMS).* • *Implement an appropriate monitoring program to assess the nature, level and potential impacts of human activities on finfish populations in the marine park (DEC, DoF) (H-KMS).* • *Implement an appropriate monitoring program to assess the nature, level and potential impacts of human activities to shark and ray species in the marine park (DEC, DoF) (H).* • *Implement a monitoring program to assess the nature, level and potential impacts of human activities on shorebirds and seabirds in the marine park and (DEC) (M).*										
Social Value strategies	• *Monitor known Aboriginal heritage sites to determine their condition and seek to implement appropriate management as necessary (DIA, DEC) (M).* • *Monitor known colonial historical sites to determine their condition and seek to implement appropriate management as necessary (WAM, DEC) (M).* • *Examine the effects and evaluate the sustainability of recreation fishing, including monitoring catch/effort, and review management controls as required (DEC, DoF) (H).*										
MANAGEMENT PROGRAM STRATEGY	**Monitor changes in key values within the marine park against adequate baseline data (DEC, DoF) (H-KMS).**										
Ecological Value strategies	None										
Social Value strategies	None										

Appendix III: Technical description of the Walpole and Nornalup Inlets Marine Park

Class 'A' Marine Reserve No. 13

Walpole and Nornalup Inlets Marine Park:

That part of Western Australian waters that are contained within and bounded by a line commencing on the southern low water mark shoreline of the Deep River at longitude 116º38'37.6" east and extending —

(a) north along longitude 116º38'37.6" east to the northern low water mark shoreline of the Deep River;
(b) then generally easterly along the northern low water mark shoreline of the Deep River to the western boundary of unallocated Crown land adjacent to Nelson Location 1239;
(c) then north along the boundary of that Crown land to the high water mark shoreline of the Deep River;
(d) then generally easterly along the high water mark shoreline of the Deep River to the eastern boundary of unallocated Crown land adjacent to Nelson Location 7576;
(e) then south along the boundary of that Crown land to the low water mark shoreline of the Deep River;
(f) then generally easterly and northerly along the low water mark shorelines of the Deep River, Nornalup Inlet, Walpole Inlet and the Walpole River to the southern boundary of the South Coast Highway;
(g) then generally north easterly along the southern boundary of the South Coast Highway to the eastern low water mark shoreline of the Walpole River;
(h) then generally southerly, easterly and northerly along the low water mark shorelines of the Walpole River, Walpole Inlet, Nornalup Inlet and Frankland River to Monastery Landing at the intersection of the low water mark shoreline of the Frankland River and latitude 34º58'11" south;
(i) then east along latitude 34°58 11 south to the eastern low water mark shoreline of the Frankland River;
(j) then generally southerly, westerly, south westerly and easterly along the low water mark shorelines of the Frankland River and Nornalup Inlet to longitude 116º44'15" east;
(k) then south along Longitude 116º44'15" east to the southern low water mark shoreline of the Nornalup Inlet;
(l) then generally westerly, north westerly and westerly along the low water mark shorelines of the Nornalup Inlet and Deep River to the boundary of unallocated Crown land adjacent to Nelson Location 7576;
(m) then south along the boundary of that Crown land to the high water mark shoreline of the Deep River;
(n) then generally westerly along the boundary of the high water mark shoreline of the Deep River to the western boundary of unallocated Crown land adjacent to Nelson Location 1293;
(o) then north along the boundary of that Crown land to the low water mark shoreline of the Deep River;
(p) then generally westerly along the boundary of the low water mark shoreline of the Deep River to the point of commencement,

excluding and part of Western Australian waters that is —

(q) within unallocated land on an island and landward of the high water mark; or
(r) within allocated land on an island; or
(s) within allocated Crown land encompassing the South Coast Highway.

NOTES:

1. All geographic coordinates are expressed in terms of the Geocentric Datum of Australia 1994 ("GDA94").
2. "Western Australian waters" means all waters –
    a. that are within the limits of the State; or
    b. that are "coastal waters of the State".
3. "coastal waters of the State" has the meaning given to that term in the *Off-shore (Application of Laws) Act 1982* section 2.
4. Low water mark means the ordinary low water mark at spring tides.
5. High water mark is the ordinary high water mark at spring tides as defined in the *Land Administration Act 1997* section 3.

Appendix IV: Information on commercial operations licensing in relation to the Walpole and Nornalup Inlets Marine Park.

The purpose of commercial operations licensing in marine parks and reserves is to ensure the conservation and cultural values of these areas are effectively managed and conserved. Under the CALM Act, a licence provides the legal authority to undertake commercial activity(s) on DEC managed lands and/or waters. Most licensed activities are related to tourism. A licence holder cannot have exclusive access or use of Crown Land. Licences are granted where the activity is of a transient nature or involves no permanent infrastructure within the reserve boundary, while leases are granted for the occupation of a specific area, such as a caravan park.

Close to 370 businesses are currently licensed to operate on DEC-managed estate, and two types of licence exist:

T Class or unrestricted licence
This is issued when there is no current restriction on the number of operators carrying out a particular type of activity in a given reserve. This licence costs $300 annually together with a $50 application fee, and management is set by general licence conditions. About 90 per cent of licensed businesses currently have T Class licences, which includes some of the State's largest and longest established tour operators.

E Class or restricted licence
This licence is used when the number of operators or the area or type of activity must be limited, usually because of environmental, management or risk constraints. The E Class licence fee is negotiated on a case-by-case basis, and may comprise a flat fee, a per head fee or a percentage of gross turnover. As there is often high demand for these licences, they are allocated via a publicly advertised competitive Expression of Interest (EOI) process, which is a process that is consistent with the State Supply Guidelines. Whale shark interaction tours in the Ningaloo Marine Park, for example, are managed under the E Class licence system. Only 15 licences are currently issued because of the limited knowledge of tourism impacts on the fish, as recommended by a Wildlife Management Program developed especially for this activity. As demand for the licences far exceeds their availability, the EOI process is the most equitable method of allocation.

Both T and E class licences can be issued for periods of up to five years (the licence period) and can be renewed for a further period of up to five years (the renewal period). T Class licences are normally granted for 12 months, but longer terms (three to five years) can be given subject to achieving particular levels of accreditation through recognised schemes (currently National Tourism Accreditation Program (NTAP), Eco Certification Program (ECP, formerly NEAP) or Green Globe International). In the case of one, three or five year T Class licences, renewal is a straightforward administrative process as long as the activity remains unrestricted and the operator has complied with licence conditions.

Most E Class licences are granted for five years and then renewed for another five years. After this, the licence is required to go through another EOI process. This is done because an E Class licence confers a competitive advantage to operate within a community-owned conservation reserve in what would otherwise often be a highly competitive environment. The allocation of competitive licences to operate on community-owned lands and waters must be fair, open and equitable. Similarly, when a business holds a Government contract for a certain period, that business has to re-tender in an open and competitive process for the same contract when it expires.

DEC licences are not transferable, and cannot be sold, rented, leased or hired to another person. If a licence holder wishes to sell a business that wholly or partially operates under a DEC licence, sale should be subject to the purchaser obtaining a licence. For a T Class licence, the purchaser simply applies for new licence in their name. In the case of an E Class licence, the purchaser will need to apply for a replacement licence. As part of the application, they will need to demonstrate suitable experience and qualifications to operate under the licence. Subject to a positive assessment and Ministerial approval, a new licence will be granted with the same terms and expiry date as the original.

Under the *Conservation and Land Management Regulations 2002*, DEC can only refuse to renew a licence if there has been a contravention of the licence conditions, a conviction under the CALM Act or the WC Act or associated regulations, the licence was obtained by fraud or misrepresentation, it is in the interests of the protection, management or control of DEC land or assets on DEC land, the protection of people using DEC land or the conservation, protection or proper management of fauna or flora. Particular concessions are made with respect to pre-existing tourism operations in marine parks and reserves. Where a commercial operation has been established in an area that subsequently is declared a conservation reserve, the commercial operators will be required to be licensed in accordance with the CALM Act and Regulations. An assessment will be made as to

whether the types of licences granted for the new reserve will be T Class (unrestricted) or E Class (restricted). This may be in accordance with the requirements of the management plan or an assessment by the DEC.

In the case of a T Class (unrestricted) licence being appropriate for a particular activity in the new reserve, all operators will be required to apply for and will be granted a T Class licence if it is determined that this is appropriate. Those who already hold a T Class licence for conducting commercial tourism on other DEC-managed land, such as an existing National Park, can simply add the new reserve to their existing licence at no additional cost. Where it has been determined that for environmental, management or for the protection of life, property or the environment, the number of licences should be restricted, E Class (restricted) licences will be allocated as follows:

- Where the restriction on the number of licences to be allocated is equal to or greater than the number of commercial operators who can demonstrate historical and sustained conduct of the activities prior to the declaration of the reserve, then the existing operators will be offered first refusal for the opportunity of an E class licence. Should the existing operators not take up all the available licences, any unused licensing capacity would be allocated through a publicly advertised EOI process.
- Where the restriction on the number of licences is exceeded by the number of existing operators who can demonstrate historical and sustained conduct of the activities prior to the declaration of the reserve, the licences would be allocated through a competitive process amongst those existing operators.
- Where, at a later date, it is determined that a T Class licence should become a restricted E Class licence, a licence holder who can demonstrate a history of operation prior to the declaration of the reserve would be allocated the opportunity for an E Class licence without the requirement to apply through a competitive process.

There are currently approximately six tourism businesses that operate with differing levels of involvement in the marine park. Several of these businesses already hold T Class licences as they currently operate in existing DEC-managed conservation reserves, including the Walpole-Nornalup National Park. As there is currently no competition among businesses for similar types of tourism in the inlets, it is anticipated that T Class licences would be appropriate in the marine park. For those operators that currently hold this type of licence for another reserve, the marine park would be added to their existing licence. Operators who do not currently hold this licence would apply for it. This process mostly involves the applicant demonstrating that the equipment used to conduct the activity is legal (e.g. DoT survey for a vessel) and that the applicant holds adequate public liability insurance for the activity. If in future, the number of tourism operators wanting to establish in the marine park exceeds a pre-determined ‘sustainable limit’ for that particular activity (i.e. boat tours or houseboats etc), then an E Class licence system would be introduced. Should this occur, the pre-existing operator's policy would then allow for the historic operators to apply for an E Class licence for five years with a five year renewal (i.e. 2 x five-year licences) without the need to be involved in the initial EOI process.

During planning for the proposed inlets marine park, community consultation has identified a range of important ecological and social values that are to be maintained should the marine park be gazetted. While commercial tourism is one of these values, it was also recognised that too much tourism activity could potentially have an impact on other values. This is especially so given the limited size of the inlet system. For example, while aesthetic values such as ‘peace and quiet’ and perceptions of ‘remoteness’ and ‘naturalness’ are also highly valued by the community and the current tour operators and their clients, these values could be diminished by the presence of too many other vessels in the future.

Successful management of the marine park will seek to find a balance that will preserve all of these values in perpetuity, and this could mean limiting the number of tour operators in the future. In this regard, policies that restrict business competition can only be applied where this is consistent with the principles of the National Competition Policy. In the case of this marine park, this would most likely occur only to ensure ecological sustainability. This is presently the case, for example, for whale shark interaction tourism in the Ningaloo Marine Park. While community consultation during planning for the marine park has provided broad direction on this issue, it is anticipated that any actual limits on the numbers of tour boats that can operate in the marine park would be determined in discussions between existing operators, DEC and a community-based MAC that would be established to enable community participation in on-going management of the marine park.