

Shark Bay World Heritage Property Strategic Plan 2008–2020



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SHARK BAY

WORLD HERITAGE PROPERTY

STRATEGIC PLAN

2008 - 2020

Shark Bay is a place where World Heritage values are respected by all members of the local community and visitors, where people enjoy their experience, retain an appreciation of the natural and cultural heritage and scientific significance of the Property, and understand the need to protect the natural and cultural values for present and future generations through cooperative management and community involvement whilst allowing for ecologically sustainable activities.

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Department of Environment and Conservation
Perth, Western Australia

Prepared by Paul McCluskey for the Department of Environment and Conservation and Department of the Environment, Water, Heritage and the Arts.



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Front cover photos:

Main image: Big Lagoon, Francois Peron National Park (Rory Chapple/DEC).

Other images, left to right: Shark Bay daisy (Ian Anderson/CALM), Shell Beach (John Cleary), 4WD on Dirk Hartog Island (Rory Chapple/DEC), Zuytdorp cliffs (Rory Chapple/DEC), black & white fairy-wren (Babs & Bert Wells/DEC).

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The draft strategic plan was initially prepared by Ron Shepherd of the former Department of Conservation and Land Management. The final strategic plan was prepared by Paul McCluskey of the Department of Environment and Conservation (DEC) with assistance from Planning Team members including Kelly Gillen, Sue Hancock, Dave Rose, Cheryl Cowell and Clare Anthony. Contributions were provided by several other staff of DEC's Management Planning Unit and staff from the Department's Midwest Region and Shark Bay district. The maps were prepared by Mark Laming, Melissa Robinson and Holly Smith of the DEC's Information Management Branch.

Comment has been provided by Government agencies, local Government authorities that have been identified as having primary or a supporting responsibility for the implementation of the strategic plan including:

- ❖ Department for Planning and Infrastructure
- ❖ Department of Agriculture
- ❖ Department of Environment
- ❖ Department of the Environment, Water, Heritage and the Arts (Commonwealth)
- ❖ Department of Fisheries
- ❖ Department of Indigenous Affairs
- ❖ Department of Industry and Resources
- ❖ Environment Protection Authority
- ❖ Shire of Carnarvon
- ❖ Shire of Shark Bay
- ❖ Tourism Western Australia
- ❖ Western Australian Museum

In addition, comment has been provided by the Conservation Commission of Western Australia and the Marine Parks and Reserves Authority.

Nomenclature

Inclusion of a name in this publication does not imply its approval by the relevant nomenclature authority.

Aboriginal words can be spelt in numerous ways. Spelling should also be seen to encompass all other spellings.

Executive Summary

The Shark Bay World Heritage Property is located 800 kilometres north of Perth on Australia's most westerly point (Map 1). The property encompasses about 22 000 sq km, is 66% marine and has about 1500 km of coastline. Shark Bay was inscribed on the World Heritage List in 1991 on the basis of its "natural heritage" values.

The Strategic Plan for the Shark Bay World Heritage Property provides a planning framework for managing the Property and meeting its international, national and State obligations. The Plan presents the World Heritage Convention requirements and the legislation framework that operates across the Property. The Plan will assist land and marine managers, World Heritage Property committees and community members in understanding the value of World Heritage and their roles and responsibilities in managing the Property.

The purpose of the Strategic Plan is to satisfy Australia's obligations under the World Heritage Convention, to fulfil management planning requirements for the Property in accordance with the Australian World Heritage Management Principles established by Regulation under the Commonwealth's *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), to satisfy the requirements of the 1997 State-Commonwealth Agreement, and to address the protection, conservation and presentation of the World Heritage values of Shark Bay. The Strategic Plan complements other planning documents produced for the Shark Bay area.

The plan is a statement about what all levels of government and the community want the future of the Property to be (the vision statement), and how this can be achieved (goals, objectives and strategies). It provides management direction and guidance for those agencies, organisations, committees and individuals whose actions will determine whether the vision is reached. This includes all those with an interest in the Property; the local people, the wider community, industry, the researchers, educators, governments, and the decision makers.

The Plan establishes a primary goal that is derived from the World Heritage Convention and is consistent with the management principles listed in the Regulations of the Commonwealth's EPBC Act. The primary goal is: In accordance with Australia's obligations under the World Heritage Convention, to identify, protect, conserve, present and transmit to future generations and, if appropriate, rehabilitate Shark Bay's World Heritage values. In achieving this primary goal, due regard will be given to: allowing for the provision of essential services to the communities within and adjacent to the area; allowing for uses of the area which do not threaten the World Heritage values and integrity; recognising the role of management agencies in the protection of the area's values; and involving the local Shark Bay community in the planning and management of the World Heritage Property.

The key requirements of the primary goal – identify, protect, conserve, present, rehabilitate and transmit – are used to provide the structure of the Strategic Plan. The Plan determines key goal statements for each of these requirements then several objectives for the key goals. Strategies and actions are then listed to meet these objectives. For each action statement, the organisation having primary responsibility is listed as is its priority. Finally the expected outcomes for the each objective are provided.

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1. Introduction

1.1 The Shark Bay World Heritage Property

The Shark Bay World Heritage Property is located 800 kilometres north of Perth on Australia's most westerly point (Map 1). The area was inscribed on the World Heritage list in 1991 on the basis of its outstanding universal natural values. The property encompasses about 22 000 sq km, is 66% marine and has about 1500 km of coastline.

The Shark Bay World Heritage Property contains an outstanding example of the earth's evolutionary history with its microbial communities, including the stromatolites of Hamelin Pool. Significant ongoing geological and biological processes occur in both the marine and terrestrial environments of Shark Bay, including the evolution of the Bay's hydrologic system, the hypersaline environment of Hamelin Pool and ongoing evolution, succession and creation of refugia.

The Wooramel seagrass bank, Faure Sill and associated unique hydrologic structure and the Zuytdorp cliffs are examples of the many superlative natural phenomena or features found in the World Heritage Property. The Property also includes the habitat of a number of threatened species, including five mammals that have their only or major populations in the World Heritage Property. Many other species are endemic or at the limit of their range.

Apart from its World Heritage values, Shark Bay also has significant Aboriginal and European cultural values, as well as other natural values. The Property also has important social and economic values. The Shark Bay World Heritage Property occurs within the Shires of Shark Bay and Carnarvon. Some highly modified enclaves are excluded from the World Heritage Property, namely the town of Denham and environs, Useless Loop saltworks and gypsum leases on Edel Land. The boundary of the property is illustrated in Map 1. A formal description of the boundary, including maps, is provided in the *Agreement between the State of Western Australia and the Commonwealth of Australia on Administrative Arrangements for the Shark Bay World Heritage Property in Western Australia*, 12 September 1997 (referred to as the 1997 State-Commonwealth Agreement, see www.shark.org).

1.2 A Vision for Shark Bay

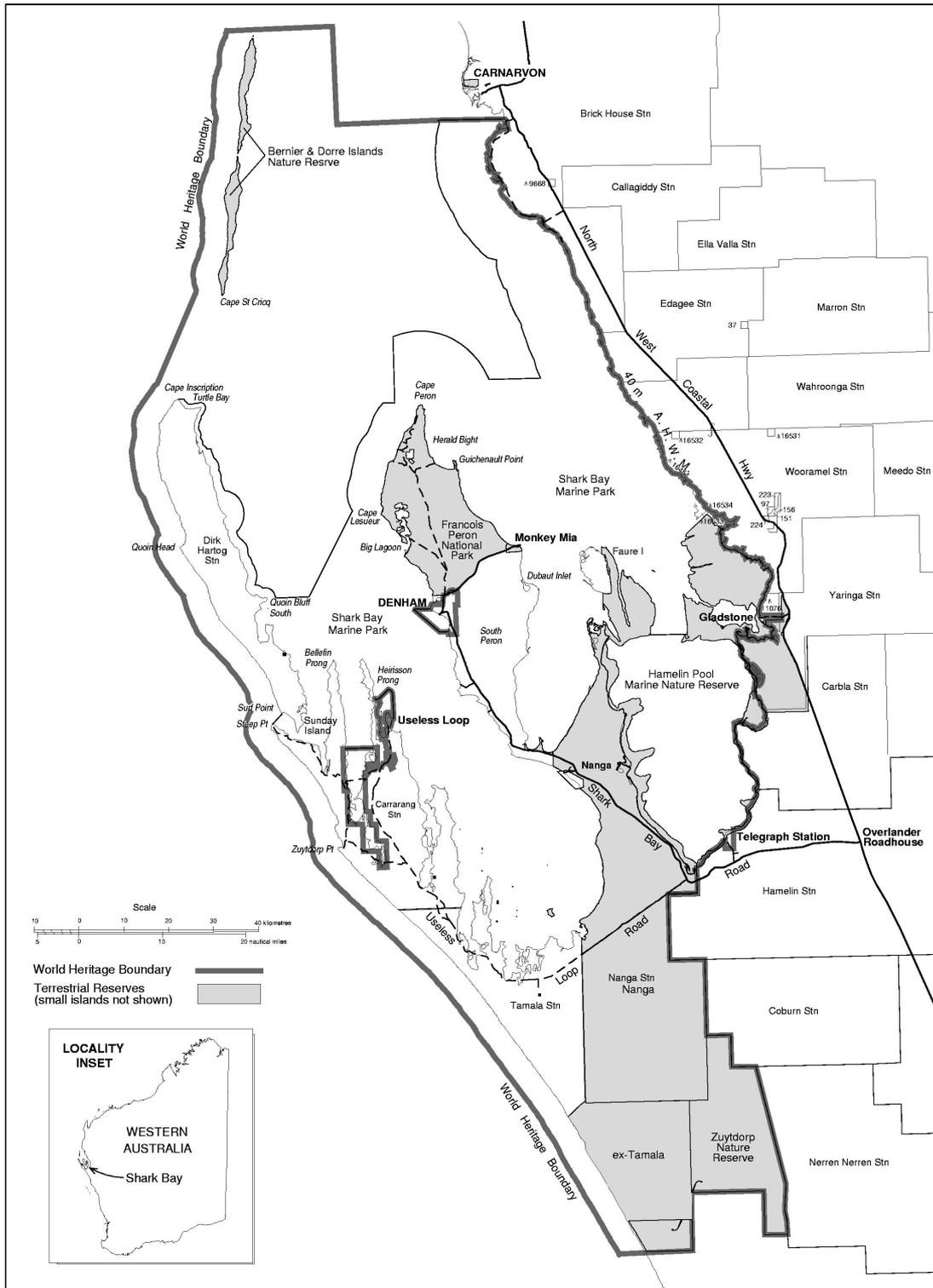
It is essential that the Vision for the Shark Bay World Heritage Property is shared and owned by all members of the community and people with responsibilities in the World Heritage Property. The Vision should reflect the view and desire that all people in the community, and all levels of government, have for the future of the Property. The following vision statement has been developed using contributions from a number of people living and working in the Property.

Shark Bay is a place where World Heritage values are respected by all members of the local community and visitors, where people enjoy their experience, retain an appreciation of the natural and cultural heritage and scientific significance of the Property, and they understand the need to protect the natural and cultural values of the place for present and future generations through cooperative management and community involvement whilst allowing for ecologically sustainable activities.

1.3 The Desired Future

Shark Bay is one of the world's outstanding marine and semi-arid terrestrial areas. Equally, the community's desired future for Shark Bay is where:

MAP 1. Location of Shark Bay



- ❖ An informed, involved, supportive and committed community is helping to meet Australia's international obligation to identify, protect, conserve, rehabilitate, present and transmit unimpaired the natural and cultural heritage of Shark Bay to future generations.
- ❖ The integrity of the World Heritage Property values is intact and ecological processes are continuing unimpeded, with parts of Shark Bay remaining in a near pristine condition.
- ❖ All levels of the community, government, industry and landholders are working together for the area's protection and enhancement.
- ❖ Management directions are determined through participatory community consultation, taking into consideration, both local people's knowledge and aspirations, the World Heritage Management Principles and the best available scientific information. Where knowledge is inadequate, a precautionary approach will be applied. Management will be based on best practice and local innovation.
- ❖ Management is integrated across marine and terrestrial environments and tenure.
- ❖ Research continues to advance the knowledge and understanding of the World Heritage Property, its values and other values of the area and research is adaptive as new knowledge is acquired.
- ❖ Degraded areas are rehabilitated and threatening influences such as pollutants, introduced plants and animals, fire and human activities are being effectively controlled.
- ❖ Primary production and other industries are continuing in an ecologically, economically, and socially sustainable manner, while ensuring World Heritage values and integrity of the Property are protected.
- ❖ Nature based tourism continues to grow as a major regional economic industry and is providing a significant contribution to the interpretation of the natural, cultural and social values of the Property.
- ❖ The World Heritage Property is presented and interpreted to enhance understanding, appreciation, enjoyment and support of the values.
- ❖ Partnerships between the community, business and government generate the necessary finances to manage and protect the World Heritage values of the Property.
- ❖ The community benefits socially and economically from World Heritage Listing and is proud of what is achieved.

1.4 Why have a Strategic Plan

The purpose of the Strategic Plan is to satisfy Australia's obligations under the World Heritage Convention, to fulfil management planning requirements for the Property in accordance with the Australian World Heritage Management Principles established by Regulation under the Commonwealth's EPBC Act, to satisfy the requirements of the State-Commonwealth agreement, and to address the protection, conservation and presentation of the World Heritage values of Shark Bay. This Strategic Plan is not a statutory document of any agency but rather a guiding document for agencies and the community.

The plan is a statement about what all levels of government and the community want the future of the Property to be (the vision statement), and how this can be achieved (goals, objectives, strategies and expected outcomes). It provides management direction and guidance for those agencies, organisations, committees and individuals whose actions will determine whether the vision is reached. This includes all those with an interest in the Property; the general community, the local people, industry, the researchers, educators, governments, and the decision makers.

A diverse range of people, both Australians and those from international communities, has an interest in commercial or recreational activity in the Shark Bay World Heritage Property. No single Government agency, community group or individual has total responsibility for the Property. Many agencies and different user groups, including all three levels of government, share responsibilities for the Property. This Strategic Plan is designed to develop a partnership between governments and the community, helping them to work together towards a shared future for Shark Bay. It will also provide a management framework designed to ensure the protection, conservation and presentation of the outstanding universal values of the Property.

Individuals and organisations that use resources in Shark Bay need a framework within which they can plan and operate. With a clear idea for the future direction for management of the World Heritage values, the community and industry will have a greater understanding of their role and obligations in respect to the World Heritage Property (see Figure 2 and section 3.3 *Shark Bay Committees*).

This Strategic Plan provides an overview of the specific management requirements for the World Heritage values of Shark Bay. Some of the actions of the Plan are already undertaken by the responsible agencies or organisations. More detailed plans have been, or are being, prepared for reserves (e.g. management plans for conservation reserves), resource utilisation (e.g. fisheries), or specific management issues (e.g. tourism and roading requirements) (see Figure 3 and section 3.5 *Planning Framework*). It is essential that the actions of these plans are consistent with the Strategic Plan where they may impact on, or influence the integrity or presentation of, the World Heritage Values. In order to maintain the Property's values and integrity, it should also be recognised that the 'sustainable carrying capacity' or limits to the extent and type of activities that are carried out need to be established. In addition, it is necessary to identify any activities that will not be compatible with the primary management goal for the Property of identification, protection, conservation, rehabilitation, presentation and transmission to future generations of the Property's outstanding universal values. The Strategic Plan will also give effect to the intent of the *Shark Bay Regional Strategy* (1997) in relation to protecting and managing Shark Bay's World Heritage values.

1.5 Community Consultation Process

The Shark Bay World Heritage Property must have a function in the life of the wider community. However, human use of the Property presents both a potential threat to, and also opportunity for building support for, the protection of Shark Bay's World Heritage values. This Strategic Plan belongs to all Australians. Community ownership of this plan will maximise community support for protection of the World Heritage values. Ownership by residents of Shark Bay is particularly critical.

It is essential that effective two-way communication between government and the community regarding management of the World Heritage Property is developed. Community consultation is critical to the smooth implementation of the objectives, strategies and actions of this Strategic Plan. The Shark Bay World Heritage Property Community Consultative Committee and the Scientific Advisory Committee both provide valuable input and advice into the management of the World Heritage values. This and other current consultation processes should continue to ensure the community has effective input into management of the property.

This Strategic Plan has been prepared in conjunction with a range of other management plans for the World Heritage Property and with the preparation of the *Shark Bay Regional Strategy* (WA Planning Commission 1997) and *Shark Bay Terrestrial Reserves and Proposed Reserve Additions draft Management Plan* (DEC 2007). The goals and objectives of this Strategic Plan will only be achieved if there is broad community support for them. To this end, community consultation has played a major role in the planning process.

Community advisory committees were established to assist with the preparation of the *Shark Bay Marine Reserves Management Plan 1996-2006* (CALM 1995) and *Shark Bay Terrestrial Reserves Management Plan 2000-2009* (CALM 2000), and a Steering Committee was formed to review the *Shark Bay Region Plan* (State Planning Commission 1988) and to direct the preparation of the *Shark Bay Regional Strategy* (WA Planning Commission 1997). These three Committees were utilised as a forum to discuss the purpose and structure of this Strategic Plan and, thus, provided important input into the development of this plan. Preparation of management plans by the Department of Environment and Conservation is a statutory process under the *Conservation and Land Management Act 1984* (CALM Act) and a minimum two month period for the public to comment on the plans.

CALM held meetings in 1994 with representatives from other government agencies to identify and discuss management issues that had implications for those agencies. A preliminary draft Strategic Plan

was circulated to government agencies and local authorities for comment in August 1995. It was then revised and updated in September 1997 and again in July 2002. Each revision has involved consultation with established committees, government agencies and community stakeholder groups. In 2005-06 the plan was re-formatted to be more consistent with Strategic Plans that have been prepared for other World Heritage Properties in Australia. The draft strategic plan was released for public comment in October 2006 for a period of two months. Resolving issues about petroleum exploration within the World Heritage Property has led to delays in finalising the document.

Early in the planning process a number of consultation activities were undertaken, including:

- ❖ holding public workshops in Denham and Carnarvon to identify issues of concern to the community, and to develop management strategies and directions for the World Heritage Property. Community attitude surveys were also circulated in Denham and Carnarvon.
- ❖ meeting stakeholders (such as pastoralists, commercial fishermen, tourism operators and conservation associations) to identify issues affecting these interest groups and to give feedback on various management options.
- ❖ conducting visitor surveys during the high and low end of the tourist season to gain an understanding of visitor activities, beliefs and expectations. During the planning process approximately 200 questionnaires were returned. In addition, field programs during the peak visitation periods were utilised to advise the public of the planning process and to gain information on public attitudes and desires for the World Heritage Property.
- ❖ circulating several World Heritage Planning Newsletters to keep the community informed of recent developments in the World Heritage Property, raise the profile of specific planning issues and to provide an update on the planning process.
- ❖ preparing the Vision Statement with assistance from both the Shark Bay World Heritage Property Community Consultative Committee and the Scientific Advisory Committee.

2. Background

2.1 What is World Heritage?

2.1.1 World Heritage Convention

The term World Heritage is applied to sites of outstanding universal natural or cultural significance that are included on the World Heritage List.

The Convention concerning the Protection of the World Cultural and Natural Heritage (referred to as the World Heritage Convention) was adopted by the United Nations Educational, Scientific and Cultural Organisation (UNESCO) (see Appendix 1 for list of Abbreviations) in 1972 and came into force in 1975. The aim of the Convention is to promote co-operation among nations to protect natural and cultural heritage that is of such universal value that its conservation is a concern for all people. In 1974, Australia became one of the first countries to ratify the Convention and remains a strong supporter of its aims.

The greatest number of countries to sign an individual convention on conservation has signed the World Heritage Convention. As a signatory to the Convention, nations recognise that they have a duty to ensure the identification, protection, conservation, presentation and transmission to future generations of the cultural and natural heritage situated within their territory. Under the terms of the Convention, a World Heritage List of properties having outstanding universal value has been established. Only parties that are signatories to the Convention (i.e. national governments) may nominate a World Heritage Property.

The Convention provided for the establishment of an Intergovernmental Committee for the Protection of the Cultural and Natural Heritage of Outstanding Universal Value (called the World Heritage Committee) within UNESCO, to oversee the implementation of the Convention. The tasks of the Committee include determining whether areas nominated by parties are placed on the World Heritage List, monitoring and receiving reports on the management of properties on the World Heritage List, considering requests for international assistance (including funding) with management of World Heritage Properties, and providing support to properties which, at the request of the relevant State party, are included in a 'list of World Heritage in Danger'.

Australia has an international obligation to protect and conserve World Heritage values of properties listed under the World Heritage Convention. The text of the Convention and its Operational Guidelines can be found on the internet at the UNESCO website (see <http://whc.unesco.org/>).

2.1.2 International Obligations

The World Heritage Committee has no powers to manage or influence management of listed properties. However, management should be in accordance with the duties and obligations of each signatory nation to the World Heritage Convention and as presented in the 38 Articles of the Convention. International obligations are described in Article 5 of the Convention:

World Heritage Convention Article 5 – International Obligations

“To ensure that effective and active measures are taken for the protection, conservation and presentation of the cultural and natural heritage situated on its territory, each State Party to this Convention should endeavour, in so far as possible, and as appropriate for each country:

- a) to adopt a general policy which aims to give the cultural and natural heritage a function in the life of the community and to integrate the protection of the heritage into comprehensive planning programs;
- b) to set up within its territories, where such services do not exist, one or more services for the protection, conservation and presentation of the cultural and natural heritage with an appropriate staff and possessing the means to discharge their functions;
- c) to develop scientific and technical studies and research and to work out such operating methods as will make the State capable of counteracting the dangers that threaten its cultural or natural heritage
- d) to take appropriate legal, scientific, technical, administrative and financial measures to ensure the identification, protection, conservation, presentation and rehabilitation of this heritage; and
- e) to foster the establishment or development of national and regional centres for training in the protection, conservation and presentation of the cultural and natural heritage and to encourage scientific research in this field.”

The Convention states the requirements of Educational Programmes (Article 27 and 28) with an obligation to strengthen appreciation and respect of the Property’s World Heritage values particularly through educational and information programs and keep the community broadly informed about the condition of the World Heritage values of the Property. The Convention also establishes reporting requirements (Article 29) of States Parties on the legislative and administrative provisions that have been adopted and the actions taken in applying the Convention.

As a signatory of the World Heritage Convention, Australia has a duty to identify, protect, conserve, present and transmit to future generations and, if appropriate, rehabilitate the World Heritage values of properties inscribed on the World Heritage List. Australia’s primary management objectives for World Heritage Properties derived from the general obligations under the World Heritage Convention are to:

- ❖ protect, conserve and present the World Heritage values of the Property;
- ❖ integrate the protection of the Property into a comprehensive planning program;
- ❖ give the Property a function in the life of the Australian community;
- ❖ strengthen appreciation and respect of the Property’s World Heritage values particularly through educational and information programs;
- ❖ keep the community broadly informed about the condition of the World Heritage values of the Property; and
- ❖ take appropriate scientific, technical, legal, administrative, and financial measures necessary for achieving these foregoing objectives.

In achieving these primary objectives, due regard is given to:

- ❖ ensuring the provision of essential services to communities within and adjacent to the Property;
- ❖ allowing provision for use of the Property which does not threaten the World Heritage values and integrity;
- ❖ recognising the role of current management agencies in the protection of the Property’s value; and,
- ❖ involving the local community in the planning and management of the Property.

2.1.3 World Heritage Criteria

World Heritage Convention Article 2 – Definition of Natural Heritage:

- (i) natural features consisting of physical and biological formations or groups of such formations, which are of outstanding universal value from the aesthetic or scientific point of view;
- (ii) geological and physiographical formations and precisely delineated areas which constitute the habitat of threatened species of animals and plants of outstanding universal value from the point of view of science or conservation;
- (iii) natural sites or precisely delineated natural areas of outstanding universal value from the point of view of science, conservation or natural beauty.

2.1.4 Shark Bay in Context

Shark Bay was inscribed on the World Heritage List on 13 December 1991 on the basis of its “natural heritage” values. As at January 2007 there were, globally, 162 World Heritage sites listed on the basis of only natural heritage values, with a further 24 sites listed on the basis of both natural and cultural heritage values. These include some of the world’s most significant and well known natural areas such as Sagamantha National Park (Mt Everest, Nepal), Serengeti National Park (Tanzania), Victoria Falls (Zimbabwe/Zambia), Canadian Rocky Mountains Parks, and Everglades and Yosemite National Parks (USA) (see <http://whc.unesco.org/>).

At the time of listing, Shark Bay was Australia’s tenth and Western Australia’s only World Heritage Property and was one of just 11 places globally to satisfy all four of the natural criteria for World Heritage listing. Other places that have satisfied all four natural criteria include Galapagos Islands (Ecuador), Mt Cook and Fiordland National Parks (New Zealand), Yellowstone, Grand Canyon and Great Smoky Mountains National Parks (USA), Tasmanian Wilderness and the Great Barrier Reef. As at January 2007, there were just 16 sites globally to satisfy all four natural criteria.

In addition to Shark Bay there are now sixteen other Australian World Heritage Properties (Figure 1): Great Barrier Reef, Kakadu National Park, the Willandra Lakes Region, the Lord Howe Island Group, the Tasmanian Wilderness, the Central Eastern Rainforest Reserves, Uluru-Kata Tjuta National Park, the Wet Tropics of Queensland, Fraser Island, the Australian Fossil Mammal Sites (Riversleigh and Naracoorte), Macquarie Island, the Heard and McDonald Island Group, the Greater Blue Mountains area, Purnululu National Park, Royal Exhibition Building and Carlton Gardens and Sydney Opera House (see www.environment.gov.au).

2.2 Shark Bay’s World Heritage Values and Integrity

2.2.1 Values

A detailed description of the natural values and justification for World Heritage listing is contained in the nomination document for the Shark Bay World Heritage Property. The information provided in the nomination reflected the state of knowledge at the time of preparation in 1990, however, in some instances this has been superseded by new knowledge. A brief summary of the values is provided below.

Criterion 1: Outstanding examples representing the major stages of the earth’s evolutionary history.

- Stromatolites and microbial mats of Hamelin pool
- Hamelin Pool and L’haridon Bight and Holocene deposits

Criterion 2: Outstanding examples representing significant ongoing geological process, biological evolution and man’s interaction with his natural environment.

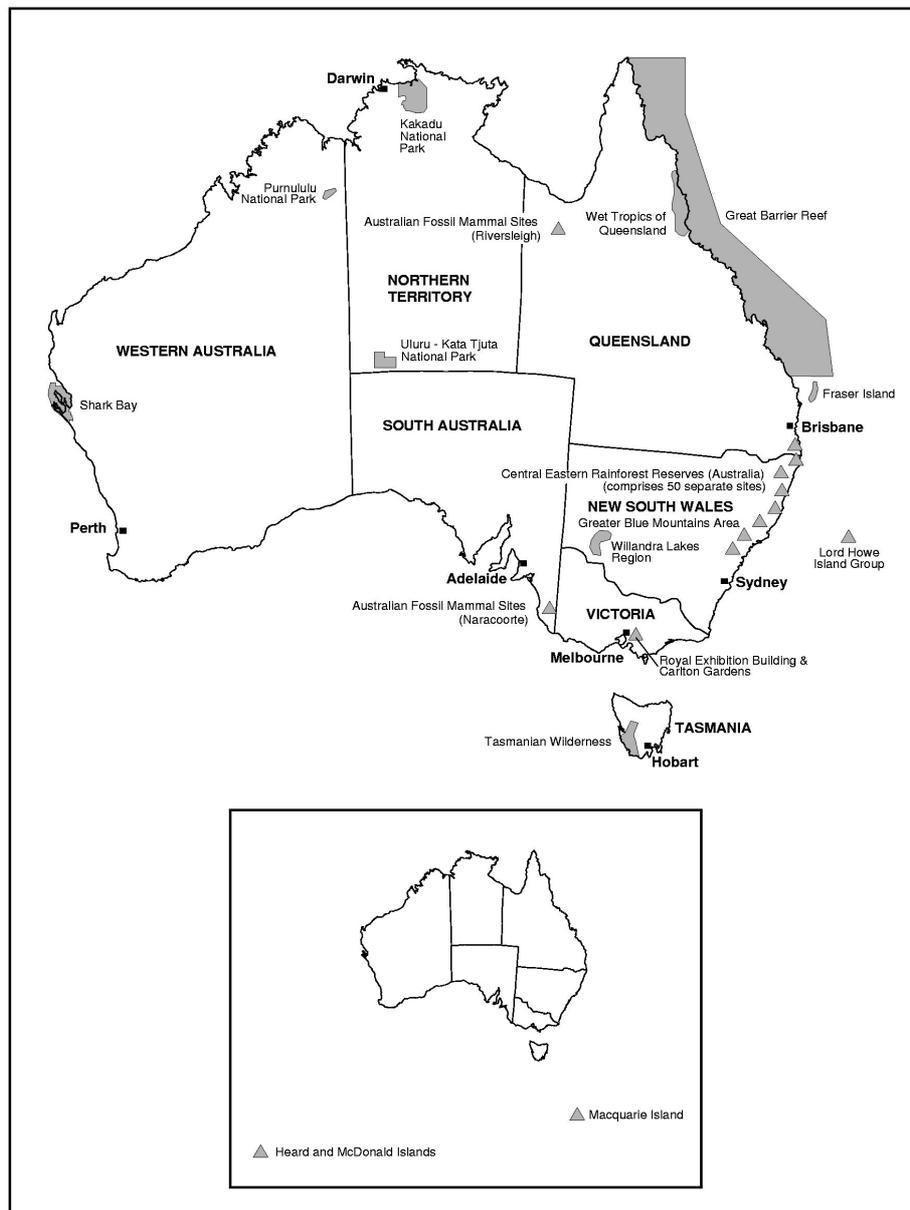


FIGURE 1. Australian World Heritage Property sites

Marine Environment

- Unique hydrological structure, banks and sills, steep salinity gradients, three biotic zones
- Faure sill
- Hypersaline environment of Hamelin Pool
- Microbial communities
- *Fragum eragatum* shell deposits
- High genetic biodiversity (e.g. snapper, venerid clams, bivalves)
- Seagrass meadows, and their role in the evolution of the marine environment
- Wooramel seagrass bank, expanse of meadows and diversity of seagrass species
- Carbonate deposits and sediments
- Northern limit of transition region between temperate and tropical marine environments, resulting in high species diversity (e.g. 323 fish species, 218 bivalve species, and 80 coral species)

Terrestrial Environment

- Botanical province transition zone, most pronounced in the southern parts of Nanga and Tamala
- Range limits (145 plant species at northern limit, 39 species at southern limit, and 28 vascular plant species endemic).
- Isolation of fauna habitats on islands and peninsulas resulting in survival of threatened species
- Range limits and fauna species richness (100 species of herpetofauna – 9 endemics, 230 species of birds representing 35% of Australia's total species)
- Species evolution illustrated in Rufous Hare Wallaby and Banded Hare Wallaby.

Criterion 3: Superlative natural phenomena, formation or features, for instance, outstanding examples of the most important ecosystems, areas of exceptional natural beauty or exceptional combinations of natural and cultural elements.

- Stromatolites
- Hypersaline environment of Hamelin Pool
- Faure sill
- Wooramel seagrass bank
- Coastal scenery – Zuytdorp cliffs, Dirk Hartog Is, Peron Peninsula, Heirisson and Bellefin Prongs
- Fragum beaches of L'haridon Bight
- Inundated birridas and lagoons such as Big Lagoon.
- Strongly contrasting colours of the dunes/cliffs, beaches and adjacent ocean of Peron Peninsula
- Abundance of marine fauna (dugongs, dolphins, sharks, rays, turtles and fish)
- Annual wildflower season display.

Criterion 4: The most important and significant natural habitats where threatened species of animals or plants of outstanding universal value still survive.

- Five out of Australia's 26 endangered mammals (Shark Bay mouse, Banded Hare-Wallaby, Rufous Hare-Wallaby, Western Barred Bandicoot, and Burrowing Bettong) survive in Shark Bay
- Bernier Island subspecies of Ash-grey mouse
- 12 threatened reptiles (e.g. Baudin Island Skink and Woma)
- Endemic Sandhill Frog
- 35 migratory bird species
- Threatened Thick Billed Grasswren
- Endemic Dirk Hartog subspecies of the southern emu-wren
- Dugong (approx. one eighth of the world's population)
- Humpback Whale
- Loggerhead and Green Turtles
- Some threatened flora species

2.2.2 Integrity

A natural heritage property inscribed on the World Heritage List must also fulfil conditions of integrity. These are described in the World Heritage Convention's Operational Guidelines (see <http://whc.unesco.org/>). In summary, the four conditions of integrity are:

World Heritage Conditions of Integrity:

1. site should contain all or most of the key interrelated and interdependent elements in their natural relationships;
2. site should have sufficient size and contain the necessary elements to demonstrate the key aspects of processes that are essential for the long-term conservation of the ecosystems and the biological diversity they contain;
3. site should be of outstanding aesthetic value and include areas that are essential for maintaining the beauty of the site; and
4. site should contain habitats for maintaining the most diverse fauna and flora characteristic of the biogeographic province and ecosystems under consideration.

In addition, the conditions of integrity require that sites should have a management plan; adequate long-term legislative, regulatory, institutional or traditional protection; site boundaries should reflect the spatial requirements of habitats, species, processes or phenomena that provide the basis for its inscription on the World Heritage List; boundaries should include sufficient areas immediately adjacent to the area of outstanding universal value in order to protect the site's heritage values from direct effects of human encroachment and impacts of resource use outside the nominated area; where existing or proposed protected areas within the site may contain several management zones, some zones may meet the actual criteria but others that do not may be essential for the management to ensure the integrity of the nominated site; and sites should be the most important for the conservation of biological diversity.

The Shark Bay World Heritage Property contains all of the inter-related and interdependent elements necessary for the maintenance of the salinity gradient, the benthic microbial communities, microbial mats and stromatolites. The whole of Hamelin Pool and L'haridon Bight and adjacent Holocene deposits are included. The World Heritage Property contains all of the elements necessary for the system to be self-perpetuating with its great size and the range of environments, including all three of the marine biotic zones. The Property contains all of the superlative natural phenomena of Shark Bay within its boundaries.

The habitats of threatened and other species of special conservation significance are of sufficient size to maintain the genetic and social health of the current populations, barring stochastic events (environmental changes including introduced predators, wildfire, etc) given the size and specific locations of current habitats. A feature of Shark Bay is the opportunity to maintain refuges on islands and some peninsulas for species that are threatened or extinct elsewhere on the mainland due to the effects of human use, such as grazing of stock, and through the introduction of predators such as the feral cat and the fox. The survival of migratory species will depend to a degree on management of some regions beyond the World Heritage Property.

The above factors, combined with adequate planning, should ensure that the ecological and evolutionary processes in the property will continue unimpeded and that the diversity and complexity of the terrestrial and marine ecosystems will be perpetuated.

A full account of the integrity of Shark Bay's World Heritage values is contained in the 1990 nomination document, prepared by the (then) Department of the Arts, Sport, the Environment, Tourism and Territories.

2.3 Shark Bay's Other Values

2.3.1 Cultural heritage

Indigenous cultural heritage

Indigenous cultural heritage includes sites such as shell middens, quarries, rock shelters, artefact shelters, burials, stone arrangements, camps and archaeological sites, as well as language.

Tindale (1974) identifies the immediate Shark Bay area as being occupied by the Malgana with the Nanda occupying the land south of Shark Bay to Kalbarri. A limited amount of information on the traditional life and customs of these people is available from records of observations of Europeans. Drawings made during the French scientific expeditions of 1801 depict semi-permanent Aboriginal camps on Peron Peninsula. Smoke was seen by navigators on Dirk Hartog Island, Edel Land and the eastern shores of Shark Bay. Since the 1850s, Aboriginal people have been closely involved in the pearling, pastoral and fishing industries and by the early 1900s had become reasonably well integrated with the Chinese, Malay and British settlers. Aboriginal people today have a strong involvement in the fishing industry.

Aboriginal sites including open shell middens, quarries, rock shelters, artefact shelters, burials and stone arrangements have been recorded for Shark Bay. Most of these sites directly overlook the shoreline or are close to it. There are over 80 known midden sites located along the coastline in the Shark Bay area.

Archaeological research has provided valuable information on occupation and use of the Shark Bay area by Aboriginal people. Archaeological research has been conducted at several sites across the Shark Bay area and collections have been made from several of them including sites at Eagle Bluff, Monkey Mia and Silver Dollar (south of Denham) (Bowdler 1990a, 1990b, 1990c, 1995, 1999) and a site at the Zuytdorp Cliffs near the shipwreck (Morse, 1988). The Silver Dollar site provides the oldest and most detailed evidence of human occupation of the region (Bowdler, 1995, 1999). It was occupied for two periods, firstly between 30 000 and 18 000 years before present, and secondly between 7000 and 6000 years before present (Bowdler 1999). The rockshelter sites at Monkey Mia are dated to within the last 1000 years and the Eagle Bluff and Zuytdorp sites at 4000 to 4600 years before present (Bowdler 1995, 1999, Morse 1988).

Historic cultural heritage

Historic cultural heritage sites include shipwreck sites and associated land camps, pearling camps, guano establishments and military camps.

Shark Bay has a long history of visits by European explorers. Dirk Hartog, aboard the Dutch trading ship *Eendracht*, is the first known European to land on the West Australian coast at Cape Inscription on Dirk Hartog Island in 1616 (Dept. of the Arts, Sports, the Environment, Tourism and Territories (DASETT), 1990, p. 3). Dutch navigator Willem de Vlamingh visited Cape Inscription in 1697 aboard the *Geelvink* and Englishman William Dampier, on the HMS *Roebuck*, subsequently explored the area in 1699, naming the area "Shark's Bay" (Suba 1995, p. 4). In 1772, Frenchman St. Alouarn landed at Cape Inscription claiming Australia for France (Suba 1995, p. 4). Baudin explored Shark Bay in 1801 and De Freycinet visited Peron Peninsula in 1818 as part of a world scientific voyage (Suba 1995, p. 4). Many of Shark Bay's islands, bays and landmarks are named after these early explorers (DASETT 1990, p. 3-4).

The commercial utilisation of Shark Bay's natural resources provides a wealth of historic sites and material, much of which is yet to be accurately located and documented. In 1949 the Commonwealth Government established a whaling station at Babbage Island, Carnarvon, and approximately 7852 humpback whales were killed before the whaling station was closed in 1963 (Stanbury 1986, DASETT 1990, p. 94). Guano was the first terrestrial industry in Shark Bay and initiated the area's colonial settlement in 1850 (Lefroy 1978, p. 9). Commercial

pearling also developed in the 1850s and numerous pearling camps were established around the coast (Lefroy 1978, p. 9). A pearling settlement, known locally as Freshwater Camp, was established at Lagoon Point in the 1870's (Lefroy 1978, p. 11). Freshwater Camp was one of the few places to provide fresh water and in 1898 was declared the townsite of Denham then officially gazetted in 1904 (Carmody 1970:50-53). The first pastoral leases were granted in the 1860s and sandalwood was first exported from the region in the 1890s (Edwards 1999, p. 291 and Suba 1995, p. 5). The fishing industry began in the early 1900s and has been the community's economic mainstay for most of this century (Lefroy 1978, p. 17).

2.3.2 Population Centres

The population of the Shire of Shark Bay is estimated to be 974 with Denham having approximately 850 and the privately operated mining town of Useless Loop having approximately 120 (Bureau of Statistics June 2005). The regional centre of Carnarvon (population approximately 6200) is immediately adjacent to the northern boundary of the Property. Tourist developments at Monkey Mia and Nanga accommodate travellers and service staff. The remainder of the World Heritage Property is sparsely inhabited by the pastoral community.

A number of State and local Government and commercial services are provided at Denham and Carnarvon, including schools (a primary school is also located at Useless Loop), electricity generation and water supplies. The surrounding marine and terrestrial environment of the World Heritage Property is an important recreational resource for residents of the area.

A sealed road connects Denham, Monkey Mia and Nanga to the Great Northern Highway and there is an unsealed road to Useless Loop. Airports exist at Denham and Carnarvon, with unsealed airstrips at Useless Loop, Nanga and some pastoral leases. Regular air services connect Carnarvon and Denham/Monkey Mia to Perth and Geraldton. Carnarvon, Denham and Monkey Mia have fishing, charter, and recreational boating jetty facilities and a ship loading facility is located at Useless Loop.

2.3.3 Economic Values

Fisheries

Commercial fishing is recognised as an important social and economic component of the Shark bay area. However, fishermen who operate in waters of Shark Bay do not necessarily reside in Denham. Commercial fishing in the Shark Bay area was worth approximately \$34.2 million in 2004/05 (Penn, Fletcher and Head 2005), making it one of the most valuable industries for the area. In addition recreational fishing makes a significant contribution to the local economy. Penn, Fletcher and Head (2005) summarise the commercial fisheries and their estimated value, where available, for 2004-05 in the Shark Bay area as including:

- ❖ Shark Bay prawn managed fishery (\$24.4M);
- ❖ Shark Bay scallop managed fishery (\$6.2M);
- ❖ Shark Bay beach seine and mesh net fishery (\$897,000);
- ❖ Shark Bay snapper managed fishery and wetline fishery (\$3.3M);
- ❖ western rock lobster and abalone fishery; and
- ❖ an aquaculture industry (including pearling).

Mineral and Petroleum Resource Development

The most significant mineral development in Shark Bay is the solar salt operation at Useless Loop. This area is excluded from the World Heritage Property. Almost all the salt is sold for export, using about 40 ship loadings per year. In 2003-04 the Useless Loop operation employed 74 people, had an output of over 1 000 000 tonnes and, at current average Australian prices, this export is valued at approximately \$A17.2 million (*WA Mineral and Petroleum Statistics Digest*, 2005). There is a proposal to expand this operation.

Gypsum has been mined in the past from evaporite pans, known as birridas, on Heirisson Prong and Useless Loop. Gypsum mining does not currently occur in the World Heritage Property. Mining leases granted in 1984 over unexploited gypsum deposits at the northern end of the Peron Peninsula recently have been relinquished. These leases became enclaves of unallocated Crown land, surrounded entirely by Francois Peron National Park when this Park was established in 1990.

Coquina shell is mined at L'haridon Bight and the material has been used around the Shark Bay area for many years for landscaping, footpaths, as aggregate in concrete, as a primary road surface, and for use as shell grit. Shell blocks from Hamelin Pool are used locally for building material, particularly in the maintenance of historic buildings.

Basic raw materials are required for road construction and maintenance including, gravel, sand, limestone and gypsum. There are numerous existing basic raw material pits generally in either shire or Main Roads Western Australia (MRWA) reserves but many also exist in UCL and pastoral leases.

One petroleum exploration tenement previously existed in the World Heritage Property but has since lapsed. It extended from Bernier and Dorre Islands to the Carnarvon Coast. A significant deposit of mineral sands has been identified on lands adjoining the World Heritage Property. The proponent is currently developing this project as a mine.

Recreation and Tourism

Tourism is the fastest growing industry in the Gascoyne region, and makes a major contribution to the local economy. Tourism Western Australia (Tourism WA) visitor statistics for the Shire of Shark Bay state that there were 127 100 overnight visitors to the area in 2004 and 2005 (domestic 80 500 and international 46 600) (TWA 2006). This figure represents about 80% of the total number of visitors. The Gascoyne region (which includes the Shires of Shark Bay, Carnarvon, Exmouth and Upper Gascoyne) has a comparatively high dependence on international visitors compared with other regions in the State. Tourism WA two year (2004 and 2005) average visitor statistics for the region states that there were 268 200 overnight visitors to the region (domestic 208 500 and international 59 700) (Tourism WA 2006). In 2004-05 tourism contributed an estimated \$154 million to the Gascoyne Region economy (Tourism WA 2006). Tourist attractions include natural and man-made features. Recreational activities are generally centred on the natural land and marine environment. Most visitor accommodation is currently located at Denham, Carnarvon, Monkey Mia and Nanga.

Pastoral Use

Pastoral leases occur in, and adjacent to, the World Heritage Property. The Shark Bay pastoral industry was based on wool production, however due to low wool prices substitution of cattle and goats for sheep has occurred. The pastoral industry in the World Heritage Property is estimated to return \$0.5 million per annum (gross) (Pastoral Lands Board).

3. Administration

3.1 Ownership and Control

The Shark Bay World Heritage Property comprises a range of tenures that are administered under State statutes. For example, freehold, pastoral lease and conservation reserves exist and a range of activities is undertaken on them. World Heritage Listing does not alter land tenure but may have some effect on land use activities. World Heritage Listing does not affect ownership rights or control and State and local laws continue to apply. Properties placed on the World Heritage List do not automatically become Commonwealth properties. However, the Commonwealth Government does have an international obligation to protect and conserve World Heritage values and this is reflected in the 1997 State-Commonwealth Agreement and legislation.

3.2 World Heritage Agreements and Legislation

The Australian Government has ultimate responsibility for implementing the World Heritage Convention in Australia and ensuring that Australia's World Heritage listed properties are properly protected and managed. This is reflected in the 1992 Intergovernmental Agreement on the Environment in which the States and Territories recognise the Commonwealth's international obligations to protect World Heritage Properties. The 1997 COAG Heads of Agreement on Commonwealth/State Roles and Responsibilities for the Environment recognises this responsibility to protect World Heritage properties, as a matter of national environmental significance, with the Commonwealth's environmental assessment and approvals processes being triggered by development proposals which are likely to have a significant impact on a matter of national environmental significance.

The Commonwealth EPBC Act implements key aspects of the 1997 COAG Heads of Agreement. The EPBC Act prohibits actions that have, will have, or are likely to have, a significant impact on the World Heritage values of a declared World Heritage property without the approval of the Commonwealth Minister for the Environment, Heritage and the Arts. Any action that is likely to have a significant impact on the World Heritage values of a World Heritage property is required to be referred to the Commonwealth Minister for the Environment, Heritage and the Arts to determine if assessment and approval is required under the EPBC Act. Assessment may be carried out by the Commonwealth or under an accredited State process. In the case of Western Australia the bilateral agreement with the Commonwealth enables Western Australia to conduct assessments using a number of accredited processes. The Commonwealth and Western Australia make their approval decisions based on the Western Australian assessment. The EPBC Act also has the capacity to accredit State/Territory management arrangements and authorisation processes under a bilateral agreement. Such accreditation in effect means that actions undertaken in accordance with an accredited management arrangement or approved under an accredited authorisation processes will not need assessment and approval by the Commonwealth Minister for the Environment, Heritage and the Arts under the EPBC Act. The EPBC Act also provides for the development of management plans for World Heritage properties with the EPBC Regulations containing a set of Australian World Heritage Management Principles.

The Western Australian and Commonwealth Governments signed an Agreement in September 1997 on administrative arrangements for the Shark Bay World Heritage Property. The 1997 State-Commonwealth Agreement provides for on-ground management, operational support and administrative structures of the Property. The Agreement details the appointment of a Shark Bay World Heritage Property Community Consultative Committee and a Shark Bay World Heritage Property Scientific Advisory Committee. It also detailed the establishment of a Shark Bay World Heritage Property Ministerial Council to coordinate policy between Western Australia and the Commonwealth on all matters concerning the Property. Existing management responsibilities of local

and State government will continue. The Ministerial Council has been replaced by the Environmental Protection Heritage Council (see section 3.3 *Shark Bay Committees*) for national, strategic or cross-cutting issues. Other site specific issues which require high level decision should be settled bilaterally by correspondence between Ministers.

The relevant State and Commonwealth Ministers will be required to approve this Strategic Plan. The Department of Environment and Conservation (DEC) (previously the Department of Conservation and Land Management), as the lead management agency for the Property, is responsible for monitoring and reporting on the implementation of the plan to relevant State and Commonwealth Ministers.

3.3 Shark Bay Committees

The organisational structure and reporting relationships of the various committees representing the world heritage properties across Australia and the relevant State and Commonwealth Ministers is undergoing a review. The structure presented here is subject to final consultation and approval by the relevant Ministers.

Environmental Protection Heritage Council

The role of the Environmental Protection Heritage Council is to deal with all national, strategic or cross-cutting issues with regard to world heritage properties. Other site specific matters will be dealt with on a bilateral basis by relevant State and Commonwealth Ministers. The responsibilities of the previous Ministerial Council, which are outlined below, will be dealt with bilaterally by correspondence between Ministers where they do not fall within the ambit of the Environment Protection Heritage Council.

Responsibilities of the previous Ministerial Council:

- ❖ coordinate policy between Western Australia and the Commonwealth on all matters concerning the Property;
- ❖ approve any management plans and any revisions of them;
- ❖ provide advice to both Governments on:
 - (i) management requirements;
 - (ii) management plans;
 - (iii) research and education;
 - (iv) presentation and promotion;
 - (v) boundary modifications;
 - (vi) community consultation and liaison; and
 - (vii) financial matters;
- ❖ refer matters to the various advisory committees for each Property consider reports from these bodies; and
- ❖ resolve any dispute that might arise between the two Governments.

Shark Bay World Heritage Property Community Consultative Committee

The role of the Community Consultative Committee (see Figure 2) is to provide advice to the EPHC or appropriate Ministers on matters relating to the protection, conservation, presentation, and management of the World Heritage Property from the viewpoint of the community. It comprises community representatives with knowledge or background in fields such as conservation, heritage, local government, fishing, tourism, Aboriginal matters, park management and/or agriculture. The Chair of the Scientific Advisory Committee (or nominated representative) is a member of the Community Consultative Committee. A majority of members must be residents of, or live in the vicinity of, the World Heritage Property.

Shark Bay World Heritage Property Scientific Advisory Committee

The role of the Scientific Advisory Committee (see Figure 2) is to provide advice to the appropriate Ministers or the EPHC on:

- ❖ scientific research priorities which will contribute to the protection and conservation of the Property and understanding of its natural history;
- ❖ new information or developments in science relevant to protection, conservation, or presentation of the Property;
- ❖ the scientific basis of management principles and practices;
- ❖ appropriateness of research funded by agencies in terms of scope, quality and relevance to management of the Property; and
- ❖ maintenance of the outstanding universal values and integrity of the Property.

The membership comprises persons who have qualifications relevant to, and/or special interest in, the protection and conservation of the Property (e.g. botany, zoology, ecology, marine science, and geomorphology). The Chair of the Community Consultative Committee (or nominated representative) is also a member of the Scientific Advisory Committee.

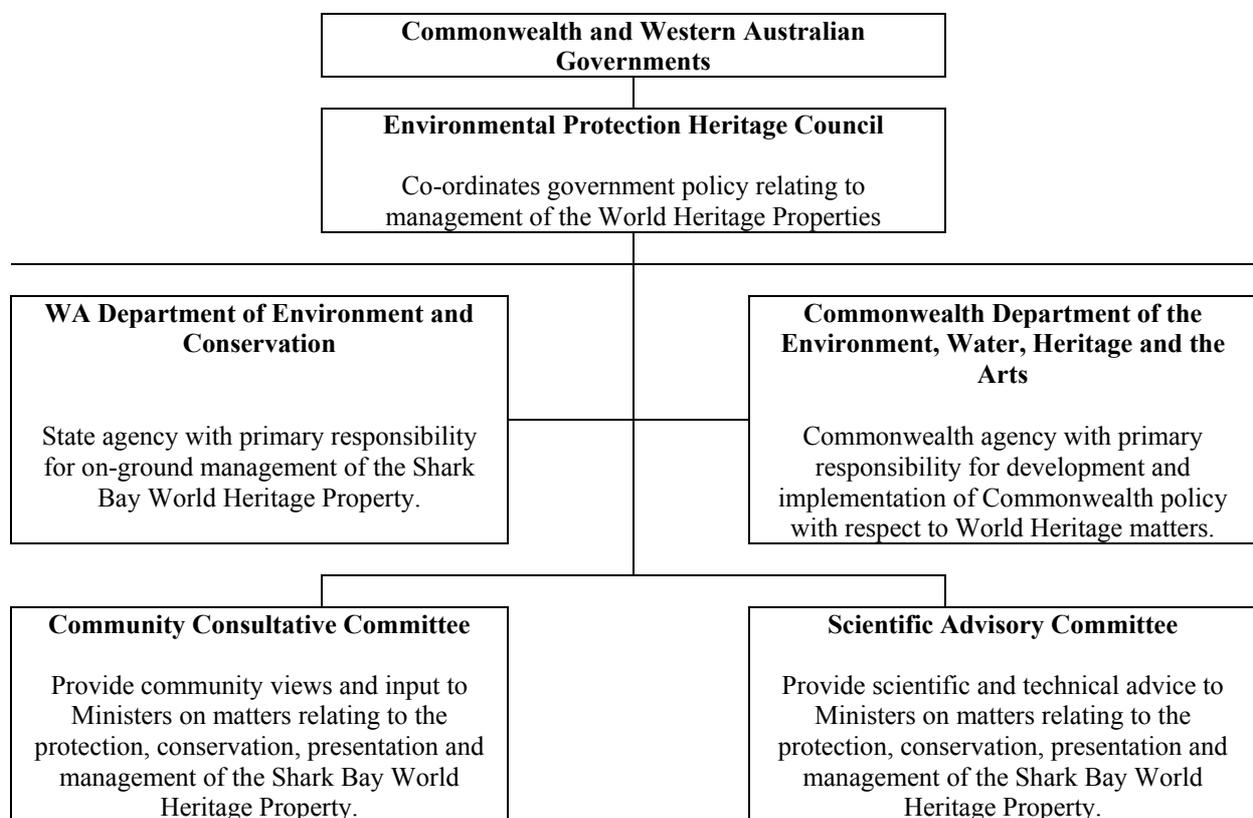


FIGURE 2. World Heritage Property Management Structure¹

3.4 Native Title

While the Shark Bay World Heritage Property was not listed for its cultural values, it is important to recognise the connection of local Aboriginal people to the land and heritage associated with the area. A number of Aboriginal cultural sites have been recorded in the Property, primarily along the coastline, but there will be many other places which have not been recorded because of lack of research or investigation or for reasons of sensitivity. Research on the human use at these sites may

¹ Structure and reporting relationship subject to further consultation and Ministerial approval.

improve our understanding of the human past in Shark Bay, including human/environment interactions.

On 3 June 1992, the High Court of Australia rejected the doctrine that Australia was terra nullius (land belonging to no-one) at the time of British settlement. The common law of Australia recognises a form of native title that reflects the entitlement of the indigenous inhabitants of Australia, in accordance with their laws and customs, to their traditional lands. The rights of native title claimants or holders will depend on traditional laws, customs and cultural connections but may be affected by past dealings in land as well as existing tenures and uses, such as national park and marine park, private land and pastoral use.

The Commonwealth *Native Title Act 1993* (Native Title Act) gives recognition and protection to native title rights, and defines a process that enables the determination of whether or not native title exists in any particular case, and what rights and interests native title claimants have. Actions within the World Heritage Property and which affect native title must comply with the Native Title Act to be valid.

The Yamatji Marlpa Barna Baba Maaja Aboriginal Corporation is the representative Aboriginal body appointed under the Commonwealth's Native Title Act for the planning area. The role of native title representative Aboriginal bodies is to assist Aboriginal groups or individuals to make applications for native title, help resolve disagreements between groups making applications, and assist groups and individuals by representing them in native title negotiations and proceedings.

Three native title claims have been lodged over the lands of and adjacent to the Shark Bay World Heritage Property: the Malgana Shark Bay People's Application (WC98/17), the Nanda People (WG6136/98) and the Gnulli (WC97/28). The Malgana claim area covers the lands and waters in the immediate vicinity of Shark Bay whilst the Nanda claim area extends from Kalbarri northwards to the shores of Henri Freycinet Bay while the Gnulli claim covers the coastal area between Hamelin and Carnarvon. Native Title Working Groups have been established to deal with claims in the area but no native title determination has been made. For the applications to be registered the claimants must demonstrate that they have had an ongoing traditional connection with the land.

Existing reserves have been created within the Shark Bay area under the *Land Act 1933*, *Land Administration Act 1997* (Land Administration Act) or the CALM Act. Reserves vested prior to 23 December 1996 have had native title rights extinguished by the vesting process (Ward High Court decision August 2002). Reservation of Crown land that has not been subject to prior extinguishment (such as freehold land) will need to comply with the 'future acts' provisions of the Native Title Act. This will include pastoral leases and surrendered pastoral lease areas and reservation will not extinguish native title. Native title rights and interests may be found to exist on reserves and proposed reserves, except where they have been legally extinguished under Australian law.

Management of reserves within the Property can be carried out by the relevant agency within the limits of the reserve's purpose (e.g. DEC can manage its reserves and parks according to their purpose). The existence of a native title claim does not prevent such operations but claimants are to be notified of proposed public works and management plans in accordance with the Native Title Act.

There is a strong interest by Aboriginal people in being involved in the management of conservation estate and to strengthen cultural ties to the land. Working together with Aboriginal people to care for the land will be beneficial to the preservation of natural and cultural heritage, as well as enriching cross-cultural awareness. Currently there is no formal arrangement with the Yamatji Corporation and the Shark Bay World Heritage Property committees but this may be considered in the future. The Department of Environment and Conservation and Conservation Commission WA acknowledge the aspirations of Aboriginal people to obtain native title over their traditional lands and waters under the provisions of the Native Title Act.

In implementing this Strategic Plan, the rights, interests and activities of native title holders will be treated according to Commonwealth and State laws and will be dealt with in a fair and racially non-discriminatory manner. During the implementation or subsequent review of this Strategic Plan, particular attention will be given to compliance of appropriate Government legislation and policies.

In some circumstances, the exercising of a native title right may be inconsistent with Australia's obligations under the World Heritage Convention to protect World Heritage values. In these instances native title claimants or holders will be encouraged to protect World Heritage values, and it may be appropriate to negotiate a cooperative management agreement between the native title claimants or holders and the relevant management agency, in which native title claimants or holders agree not to assert certain native title rights. Any such cooperative management agreements must also be consistent with the goals of this Plan and Australia's obligations under the World Heritage Convention.

3.5 Planning Framework

The Shark Bay World Heritage Property includes a range of tenures managed for a variety of purposes. A number of State Government agencies and the local government authorities also have statutory responsibilities that apply over the area (see Figure 3).

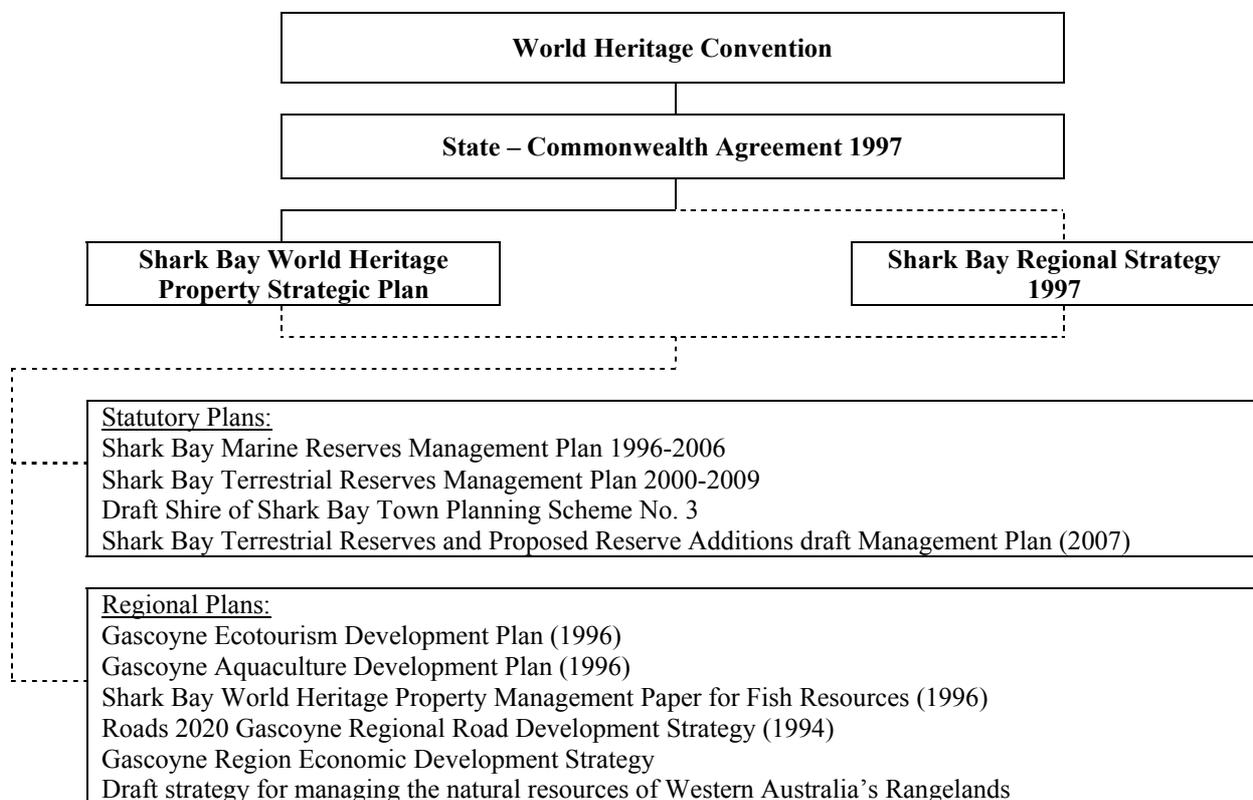


FIGURE 3. World Heritage Property Planning Framework

Planning should be an integral and ongoing part of management for the protection of World Heritage values, and plans may be produced by government or private interests. These may include site development plans, statutory plans such as Shire Town Planning Schemes, regional plans, reserve management plans and plans to address specific issues such as fisheries management, natural resource management, extraction of basic raw materials, tourism and roading.

A comprehensive planning program is required, with priorities identified according to the potential impacts on World Heritage values and management needs. Several resource planning documents have been prepared, or are in preparation, which impact on the protection and management of World Heritage values. Examples include:

- ❖ Basic Raw Materials of the Shark Bay World Heritage Area (1996)
- ❖ Tamala-Carrarang Recreation and Tourism Plan (1998)
- ❖ Heirisson Prong Community Biosphere Reserve Management Plan 1999-2004 (1999)
- ❖ Fisheries Environmental Management Review – Gascoyne (2000)
- ❖ Hamelin Pool Common Management Plan (2001)
- ❖ South Peron Peninsula Recreation Assessment Study (2001)
- ❖ Shark Bay World Heritage Property Landscape Study, Summary & Resource Documents (2001)
- ❖ Periodic Report 2002 – Section II Shark Bay World Heritage Property (2002)
- ❖ Fisheries Environmental Management Plan for the Gascoyne Region draft (2002)
- ❖ Shark Bay World Heritage Area Communications Strategy 2003-2006 (2002)
- ❖ Shark Bay World Heritage Area Interpretation Action Plan 2003-2006 (2003)
- ❖ Denham Town Planning Scheme No 3 Draft (2004)
- ❖ Shark Bay World Heritage Property Recreation and Tourism Plan Draft (2005)
- ❖ Aquaculture Plan for Shark Bay draft (2004)

It is important that World Heritage values are taken into consideration in the preparation of plans, and that plans are consistent with this Strategic Plan in relation to the protection of the values. Given the broad community interest in Shark Bay and the potential impacts on local residents, community involvement in planning is essential. Furthermore, there is a need to consult with the Commonwealth Government during the preparation of plans where the outcomes of the plan may affect World Heritage values, or the integrity of the World Heritage Property.

4. Management Goal, Objectives, Strategies and Actions

The Strategic Plan establishes a primary goal that is derived from the World Heritage Convention and is consistent with the management principles listed in the Regulations of the Commonwealth's EPBC Act. The document then determines key goals for each of the main requirements – identify, protect, conserve, present, rehabilitate and transmit. The Plan then lists several objectives for the key goals. Strategies and actions are then provided to meet these objectives. The organisation having primary responsibility is listed as is the priority of each action. Finally the expected outcomes are stated.

Primary Goal

In accordance with Australia's obligations under the World Heritage Convention, to identify, protect, conserve, present and transmit to future generations Shark Bay's World Heritage values and, if appropriate, rehabilitate areas.

Key Goals

Identification

Key Goal: Within the Shark Bay World Heritage Property, identify areas of outstanding universal value and ensure the most appropriate tenures and legislation for their protection are in place.

Identification refers to Australia's obligation to identify areas of outstanding universal value that are considered worthy of protection under World Heritage Convention, and to comprehensively document these values.

Protection

Key Goal: Protect Shark Bay's World Heritage values through effective legislation and management.

Protection refers to Australia's obligation to ensure appropriate legislation, and regulatory and institutional arrangements are in place to protect and manage the Property and obtain widespread community support.

Arrangements for protection and management are detailed in the 1997 State-Commonwealth Agreement. The Agreement provides for protection and management primarily through State legislation by the relevant State government agencies and local government, provided that such management is consistent with the EPBC Act and discharges Australia's obligations under the World Heritage Convention.

Conservation

Key Goal: Conserve Shark Bay's World Heritage values by actively working towards eliminating threatening processes that affect the long-term integrity of the area and its capacity for ongoing natural evolution.

Conservation refers to the management of threatening processes that will impact on the integrity of the Property and its capacity to maintain ecological viability in the long term.

The degree of threat will determine the level of management required. Management, research and monitoring programs will be undertaken to assist in the understanding, control and, where possible, eventual elimination of threatening processes, thereby maximising the extent of self-sustaining natural areas. Obtaining levels of sufficient ecological resources to maintain viable populations, especially of threatened species, are a key to achieving self-sustaining natural areas. Threatening processes include fire, cyclones, introduced plants and animals, problem native species, plant and animal diseases, pollution, impacts from human activities, and competing land uses.

Presentation

Key Goal: Present Shark Bay's World Heritage values to local, national and international communities.

Presentation refers to the obligation to provide information, education, interpretation and promotion to local residents and national and international visitors and communities to create greater awareness and understanding of its universal values while engendering support and respect for the Property.

The Shark Bay World Heritage Property will be presented and interpreted in ways which create a greater appreciation of, and support for, its outstanding universal values. This will be done using a variety of media within and external to the Property as well as developing facilities and activities that promote the universal values of the Property. Through the development of communication and interpretation plans and application of appropriate media techniques, visitors and local residents will be able to obtain a greater understanding of the values of the Shark Bay area.

Rehabilitation

Key Goal: Identify and rehabilitate degraded areas of the Shark Bay World Heritage Property.

Rehabilitation refers to the obligation to restore and manage degraded areas that are the result of unmanaged threatening processes.

Changes to natural functioning ecosystems can result in degraded areas. The introduction of weeds and feral animals, plant and animal diseases, fire, pollution, human activities and competing land uses can all result in areas of the Property becoming degraded. These require some form of rehabilitation to ensure the values of the Property are maintained.

Transmission

Key Goal: Transmit to future generations the outstanding universal values of the Shark Bay World Heritage Property.

Transmission refers to the obligation to conserve the universal values of the Property by managing the lands and waters entrusted to the community for the appreciation and benefit of present and future generations. Transmission will only be achieved if the protection, conservation, presentation and rehabilitation goals are achieved.

Actions

This section of the Strategic Plan details the specific objectives, strategies and actions that address the protection, conservation and presentation requirements of the Shark Bay World Heritage Property. The

agencies with the primary responsibilities for implementing actions have been nominated in the plan, and a priority (high, medium, low or ongoing) assigned to each action. The priority designated for each action has been established in consultation with the agency with the primary responsibility for that action.

High Priority

- ❖ actions that are necessary in response to significant present or imminent threats to World Heritage values; or
- ❖ actions that are highly important for the rehabilitation or presentation of World Heritage values; or
- ❖ actions for which completion is critical to commencing other actions or strategies.

Implementation of high priority actions is anticipated to commence within one to two years of the release of this Plan.

Medium Priority

- ❖ actions which are required in response to identified potential or future threats to World Heritage values; or
- ❖ actions which improve the presentation of World Heritage values that are currently not threatened or experiencing degradation; or
- ❖ actions which can not be commenced or completed until other actions have been completed.

Implementation of medium priority actions is anticipated to commence within six years of the release of this Plan.

Low Priority

- ❖ actions, which would be desirable, however, are not currently critical for the protection, conservation, or presentation of World Heritage values.

Implementation of low priority actions is anticipated to commence within the life of this Plan.

Ongoing Priority

- ❖ actions which will occur as part of agencies' normal responsibilities; or
- ❖ actions which are required to maintain the outcomes of high, medium or low priority actions.

It is anticipated that actions which require ongoing review, monitoring or evaluation will occur on a one (annual), two (regular), or six (periodic) year basis depending on what is determined as appropriate by the agency responsible for that action.

The agencies nominated as having primary responsibility (highlighted in bold) have the lead in the implementing, monitoring, evaluating and reporting of all activities associated with the action. It is important that the primary agency consults with all other agencies and stakeholders that are identified as having a secondary responsibility for the implementation of the action. Primary agencies will also be responsible for consulting with, and providing reports to, DEC (as the lead management agency for the World Heritage Property) on the implementation of actions.

4.1 Goal, Objectives, Strategies and Actions for Identification

Goal: Within the Shark Bay World Heritage Property, identify areas of outstanding universal value and ensure the most appropriate tenures and legislation for their protection are in place.

The Shark Bay World Heritage Property incorporates several different tenure types including private, leasehold, town, national and marine parks, other reserves and unallocated Crown land. The extent of the area may not change during the life of this Plan but changes in tenure have been proposed in other reports (see section 3.5 *Planning Framework*).

The World Heritage values have been summarised previously. While the nomination document adequately identified and described the values of the Property, through on-going research and surveys other values may be identified, the extent of biodiversity assets clarified or ecological requirements of individual species determined.

Objective

- ❖ Identify areas of outstanding value and ensure their appropriate protection.

Strategies

- ❖ Conduct biological research and surveys of terrestrial and marine environments.
- ❖ Review tenure and land use requirements.

| Actions | Primary Responsibility | Priority |
|--|-------------------------------|-----------------|
| 1. Support the conduct of and undertake biological research and surveys. | DEC, DoF, DOIR | Ongoing |
| 2. Implement natural resource monitoring programs to record the status and value of biological and other natural resources. | DEC, DoF, DOIR | Ongoing |
| 3. Identify areas of outstanding value. | DEC, DoF | Ongoing |
| 4. Identify areas where World Heritage values would be better protected and managed by a change in tenure in liaison with the community, including leaseholders where appropriate. | DEC, LGAs, DoF, DPI | Ongoing |

Expected Outcomes

- ❖ Improved knowledge of biological and other natural resources and the threats to these resources.
- ❖ Appropriate allocation of lands and tenures across the Property.

4.2 Goal Objectives, Strategies and Actions for Protection

| |
|---|
| <p>Goal: Protect Shark Bay's World Heritage values through effective legislation and management.</p> |
|---|

4.2.1 Management Arrangements

The 1997 State-Commonwealth Agreement establishes the administrative arrangements for protection and management of the World Heritage Property (Figure 2). It is essential that the activities of agencies, authorities and stakeholders are consistent with the details of the Agreement.

DEC is the lead management agency for the Shark Bay World Heritage Property. In this respect, DEC is responsible in the World Heritage Property for:

- ❖ overseeing development of management plans (terrestrial and marine);
- ❖ liaising with agencies and other parties to ensure that development and management activities do not threaten the Property's outstanding universal values;
- ❖ conducting or encouraging relevant research;
- ❖ compiling and maintaining a comprehensive database for management purposes;
- ❖ managing terrestrial and marine estate it has legislative responsibility for; and
- ❖ distributing information and implementing promotional activities.

In addition, DEC will report to the Commonwealth Government on dates and in a manner to be determined by the General Conference of UNESCO on the protection, conservation, presentation, rehabilitation and transmission to future generations of the Property, as per the requirements of Article 29 of the World Heritage Convention.

In fulfilling its World Heritage responsibilities, DEC will liaise closely with other agencies and stakeholders in respect to the establishment of priorities for the management of the Property, and coordinate requests for funding. This process will occur in close liaison with the Community Consultative Committee and Scientific Advisory Committee.

A number of agencies and authorities have key statutory responsibilities in the management of the World Heritage Property. For example, the Conservation Commission of Western Australia and the Marine Parks and Reserves Authority are the vesting authorities for terrestrial and marine conservation reserves respectively within the Property. In addition, there are private owners and occupiers who have management responsibilities in the World Heritage Property.

For the Property to be effectively managed it is essential that all agencies and individuals with responsibilities are aware of the implications of World Heritage Listing, their responsibilities in regard to protection of World Heritage values, and have put in place the procedures and processes to handle World Heritage matters. In this respect, it is important that DEC, as the lead management agency, ensures that other agencies are made aware of the management structures and of these requirements for the Property. Regular effective communication between agencies and relevant authorities will ensure that they actively consider World Heritage values in their activities and actions.

Administrative procedures may be required to enable coordination and management of the Property with respect to the protection and conservation of World Heritage values. This may include the development of memoranda of understanding and agreements between government departments, local authorities and other agencies to detail operating procedures in the Property.

This Strategic Plan outlines specific actions and responsibilities for a variety of government agencies, local authorities and other groups. Sufficient resources need to be allocated by management agencies and the Commonwealth for the implementation of the strategies of the Plan. Management priorities

need to be defined to ensure resources are used most effectively. Establishment of priorities and deployment of resources should be based on significance of, and threats to, World Heritage values and management goals.

Land owners, holders and occupiers are to be encouraged to manage their lands/leases, and to adopt appropriate practices, in a manner that provides for the protection of World Heritage values. The objectives and concerns of individual landowners, occupiers and managers need to be recognised and satisfactorily addressed.

The 1997 State-Commonwealth Agreement recognises that there may be instances where actions undertaken for the management of the World Heritage Property may have a detrimental social and economic impact on a stakeholder. The Agreement notes that such instances will be considered by the Commonwealth and State Governments and where appropriate the Commonwealth and State will consider the taking of measures by both parties (including in special circumstances the making of act of grace payments) to address the detrimental effect of any such impact.

Objective

- ❖ Australia's international duty to identify, protect, conserve, present and transmit to future generations and, if appropriate, rehabilitate the World Heritage values of Shark Bay is achieved through effective integrated management.

Strategy

- ❖ Develop and implement effective legislative and administrative arrangements in order to maintain the integrity of World Heritage values, and the overall integrity of the World Heritage Property.

| Actions | Primary Responsibility | Priority |
|--|--|-----------------|
| 1. Manage the World Heritage Property in accordance with the Agreement between the State of Western Australia and the Commonwealth of Australia on Administrative Arrangements for the Property. | DEC, other relevant authorities and agencies | Ongoing |
| 2. Provide relevant information to all authorities and agencies with management responsibilities within the Property in respect of World Heritage listing, the values and their management obligations. | DEC | High |
| 3. Where appropriate, develop memoranda of understanding and agreement between government departments, local authorities and other agencies or groups to detail operating procedures in the World Heritage Property. | DEC, other relevant authorities and agencies | Ongoing |
| 4. Through community and interagency consultation, identify and regularly review priorities for the protection of World Heritage values. | DEC, other relevant authorities and agencies | Ongoing |
| 5. Consult with resource managers, land owners and occupiers if, and where, they are likely to be affected by requirements for management and protection of the World Heritage Property. | DEC, other relevant authorities and agencies | Ongoing |
| 6. Where reserves are established, prepare statutory management plans and ensure such plans address and meet World Heritage objectives and management principles. | DEC, other relevant authorities and agencies | High |
| 7. Provide information to the community that identifies management responsibilities for the Property. | DEC | Ongoing |

Expected Outcomes

- ❖ World Heritage values are protected through appropriate Government administrative arrangements and procedures.
- ❖ Management of the World Heritage Property occurs in accordance with Government legislation, policy and agreements.
- ❖ All government authorities and agencies are aware of, and implementing, their management obligations for the World Heritage Property.
- ❖ Priorities for the protection of World Heritage values are identified and regularly reviewed.
- ❖ Resource managers, landowners, community groups and occupiers are being consulted, and issues of concern addressed, on matters of relevance in the management of the World Heritage Property.

4.2.2 Tenure

Tenure provides the basis for management of lands and waters. Shark Bay's World Heritage values occur across several tenures but World Heritage listing does not alter tenure or take away ownership rights or control. The World Heritage Property excludes the town of Denham (with the exception of Reserve No. 30899 'Little Lagoon'), the Shark Bay Salt Joint Venture at Useless Loop (including the area proposed for expansion and the port loading facility) and former gypsum mining leases near Useless Loop.

Over much of Shark Bay, the World Heritage values can be effectively protected and managed with existing tenure and land use activities. However, changes in tenure may facilitate improved protection and management of World Heritage values in some areas. Economic and social values also need to be taken into account when tenure changes are considered. The type and area of existing tenures in the Shark Bay World Heritage Property are shown in Table 1 and Map 2.

TABLE 1. Summary of Tenure – Shark Bay World Heritage Property

| Area | Area of WHP (Ha) | Area of WHP (%) |
|---|------------------|-----------------|
| Marine | | |
| Marine reserves | 882 000 | 40.2 |
| Other State waters | 687 750 | 31.4 |
| Land | | |
| Pastoral leases - not to be surrendered | 131 732 | 6.0 |
| Ex Pastoral lease - purchased & surrendered | 251 522 | 11.4 |
| Pastoral lease - proposed surrender | 61 247 | 2.8 |
| National parks, nature reserves, conservation parks | 121 825 | 5.6 |
| Other land (UCL, UMR, Shire reserves) | 56 607 | 2.6 |
| Freehold | 842 | 0.04 |
| | | |
| TOTAL | 2 193 521 | 100 |

The marine conservation estate includes Hamelin Pool Marine Nature Reserve (132 000 ha), Shark Bay Marine Park (748 725 ha) and Reserve 30885, a class A reserve for 'Preservation of Sedimentary Deposits'. The majority of the seabed within the Shark Bay World Heritage Property is jointly vested with the Minister for Transport as a body corporate under the *Marine and Harbours Act 1981* with the area also being within the proclaimed Port of Carnarvon under the *Shipping and Pilotage Act 1967*.

The terrestrial conservation estate includes Francois Peron National Park (52 528.6 ha), Shell Beach Conservation Park (517.8 ha), Zuytdorp Nature Reserves (58 850.0 ha), Bernier and Dorre Islands Nature Reserve (9719.8 Ha) and the many other island nature reserves scattered throughout the World Heritage Property (209.0 ha). The setting aside of various terrestrial parts of the Property for conservation purposes has been identified in various documents and processes including:

- ❖ the *Conservation Reserves for Western Australia Systems 9* report (EPA 1975);
- ❖ subsequent planning documents (e.g. *Shark Bay Region Plan* (State Planning Commission 1988), *Shark Bay Regional Strategy* (WA Planning Commission 1997), *Shark Bay Marine Reserves Management Plan 1996-2006* (CALM 1996), *Shark Bay World Heritage Property Management Paper for Fish Resources No. 91* (DoF 1996), *Shark Bay Terrestrial Reserves Management Plan 2000-2009* (CALM 2000); and
- ❖ the 2015 pastoral lease exclusion for public purpose process (during this process, DEC has identified pastoral lands that would contribute towards a comprehensive, adequate and representative (CAR) reserve system² and provide for future sustainable tourism and recreation use, both terrestrial and marine.)

Nanga pastoral lease (175 000 ha) was purchased in 2000 for conservation purposes and set aside as unallocated Crown land (UCL). The southern part of Tamala pastoral lease (about 56 343 ha) was surrendered and purchased in 2006. Part of Carrarang pastoral lease (18 772 ha) including the northern part of Heirisson prong was surrendered in January 2008. Agreement has been reached to purchase most of Dirk Hartog Island pastoral lease (61 674 ha). The portion of South Peron UCL (part of 53 000 ha) to be set aside for conservation purpose is yet to be determined. Areas adjoining the World Heritage Property that have been purchased for conservation purposes include part of Yaringa (30 464 ha) and part Murchison House (37 580 ha) pastoral leases. Negotiations are continuing to purchase the western part of Nerren Nerren pastoral lease. The current and proposed tenure changes are illustrated in Maps 2 and 3.

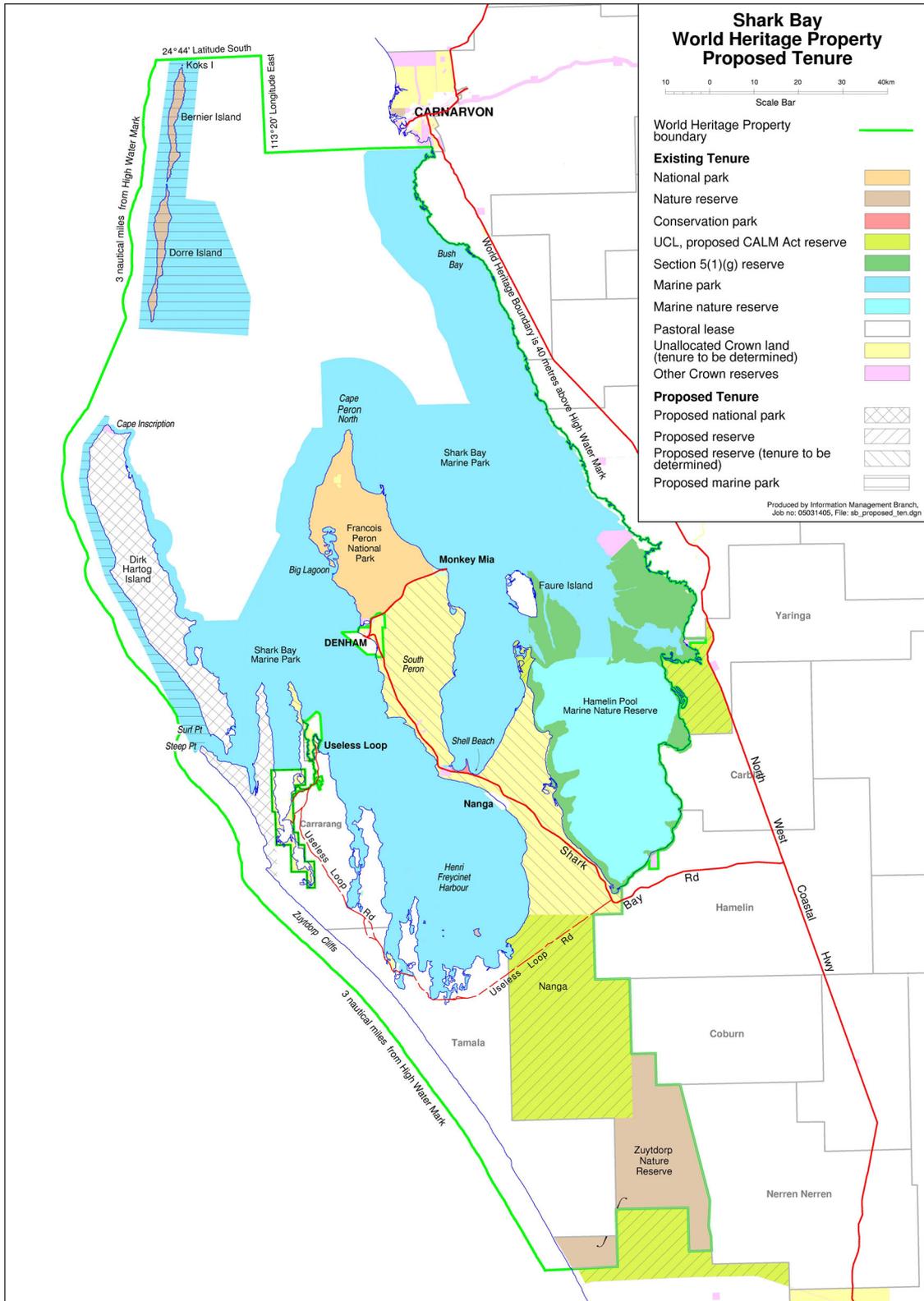
Implementation of the recommended tenure changes will facilitate improved protection and management of the World Heritage values. Significant tenure changes recommended in the *Shark Bay Regional Strategy* (WA Planning Commission 1997) include:

- ❖ establishment of national parks at Dirk Hartog Island and Edel Land (part of Carrarang Station);
- ❖ establishment of a multiple use conservation reserve over South Peron;
- ❖ inclusion of parts of Tamala and Nanga Stations into the Zuytdorp Nature Reserve;
- ❖ establishment of a nature reserve over Petit Point (part of Nanga Station);
- ❖ extension of the Shark Bay Marine Park to include the waters adjacent to Bernier and Dorre Islands and the waters west of Dirk Hartog Island and Edel Land;
- ❖ establishment of a Fish Habitat Protection Area over the waters of the World Heritage Property not included in marine reserves; and
- ❖ consideration of the establishment of a Marine Management Area.

A Memorandum of Understanding between the Department for Planning and Infrastructure (DPI) and CALM (now DEC) was agreed to in 2004 for the administration and management of fire, weeds and vermin on unallocated Crown land and unmanaged reserves in Western Australia (outside metropolitan and townsites areas). A separate MOU was agreed to between DPI and DEC in 2005 for the acquisition and management of pastoral leases or parts of leases for conservation purposes as part of the 2015 pastoral lease renewal negotiations. This MOU recognises the State's commitment to establish a comprehensive, adequate and representative conservation reserve system. A further MOU between DEC and the Department of Fisheries (DoF) was agreed to in 2005. This MOU establishes principles of cooperation and integration between the two departments for marine protected areas that include marine conservation reserves under the CALM Act and fish habitat protection areas and other protected areas under the Fish Resources Management Act.

² (see Establishment of a Comprehensive, Adequate and Representative Terrestrial Conservation Reserve System in Western Australia on NatureBase at http://www.naturebase.net/national_parks/management/index.html).

MAP 3. Shark Bay World Heritage Property Proposed Tenure Changes



Objective

- ❖ Ensure tenure is appropriate to maintain World Heritage values, the overall integrity of the World Heritage Property and that ecological processes are continuing unimpeded.

Strategy

- ❖ Seek, through effective consultation, administration and legislation, appropriate amendments in tenure in the World Heritage Property.

| Actions | Primary Responsibility | Priority |
|--|--------------------------|----------|
| 1. Implement the tenure recommendations identified in the Shark Bay Regional Strategy (1997) and other approved terrestrial and marine management plans. | DPI, DEC, DoF, LGAs | High |
| 2. As part of the community monitoring program, assess the impacts of tenure changes on economic, social and environmental values. | DPI, DEC, DoF, LGAs, GDC | High |

Expected Outcomes

- ❖ World Heritage values are protected through appropriate tenure and use.
- ❖ Tenure changes proposed in Map 3 are progressed.
- ❖ New tenure change proposals have community support.
- ❖ Economic and social values are properly considered in proposals for tenure change.

4.2.3 Impact Assessment

It is necessary to ensure that proposed activities or developments within or outside the World Heritage Property do not have an unacceptable impact on World Heritage values. The Commonwealth's EPBC Act provides the framework under Commonwealth legislation for the environmental impact assessment of relevant activities affecting the World Heritage Property. Under this Act actions which are likely to have a significant impact on:

- ❖ the World Heritage values of the Shark Bay World Heritage Property;
 - ❖ any nationally threatened species or endangered ecological community in the Shark Bay World Heritage Property; or
 - ❖ internationally protected migratory species in the Shark Bay World Heritage Property,
- must be subject to a rigorous environmental impact assessment process. This process may be a Commonwealth process or a State process that has been accredited by the Commonwealth as meeting appropriate criteria.

The Environmental Protection Authority (EPA) has State responsibility for environmental impact assessment under the *Environmental Protection Act 1986* (Environment Protection Act). Any activity likely to have a significant effect on the environment can be referred to the Authority. The Authority must then recommend that the proposal be considered either informally or publicly. The Environment Protection Act provides a framework for environmental assessment within the World Heritage Property by the State Government. The EPA *Guidance Statement for Assessment of Development Proposals in the Shark Bay World Heritage Property No. 49* (November 2000) deals with the environmental impact assessment of development proposals within and adjacent to the Property and assists proponents, consultants and the general public with aspects of the process. A section 16(e) report produced in 2003 provides advice on the environmental impacts of petroleum exploration and development and whether they are compatible with the protection, conservation and presentation of

the Shark Bay World Heritage Property and, if so, what framework for the administration and regulation of these activities is required.

The State Government's planning policies, *State Coastal Planning Policy* (SPP2.6) which delineates criteria for the assessment of coastal development and *Country Coastal Planning Policy* (DC6.1) which outlines various development controls, are relevant to the World Heritage Property. SPP2.6 provides guidelines for siting developments to ensure they are protected from coastal processes; establishing coastal foreshore reserves for conservation, management, public access and recreation reasons; protecting public interest; engaging the community; complying with foreshore plans or other statutory management plans; protecting the coastal environment; and justifying any development proposal. DC6.1 provides guidelines for minimising impacts on coastal ecology such as drainage patterns, sediment and water quality; protecting or enhancing coastal visual amenity; protection soils from degradation; and catering for pedestrian access.

Together, the Commonwealth and State legislation will operate to ensure an effective and efficient process that minimises duplication. The intention is to ensure that on-ground management of a single, rigorous and transparent environmental assessment process, reflecting world's best practice, will be delivered by the Western Australian Government. The 1997 State-Commonwealth Agreement outlines in more detail the application of the Western Australian EPA process to actions in the Shark Bay World Heritage Property.

Objective

- ❖ Ensure that the environmental assessment process is applied to relevant proposals and is effective in the protection of World Heritage values, and the overall integrity of the World Heritage Property.

Strategy

- ❖ Seek, through effective consultation, the appropriate assessment of the impact of the activities or developments proposed to occur within or adjacent to World Heritage Property.

| Actions | Primary Responsibility | Priority |
|---|------------------------------------|-----------------|
| 1. Refer all proposals with potential to impact on World Heritage values through the environmental assessment process in accordance with State and Commonwealth legislation and the State-Commonwealth Agreement. | Proponent , EPA, DEC, DEWHA | Ongoing |
| 2. Liaise with the Commonwealth regarding the environmental evaluation and decision making process where a proposal has potential to affect World Heritage values. | EPA , DEC, DEWHA | Ongoing |
| 3. Consider the cumulative impact of activities and developments in the environmental assessment for the World Heritage Property. | EPA , DEC, DEWHA, DoIR | Ongoing |

Expected Outcomes

- ❖ World Heritage values are not degraded by activities or developments within or adjacent to the World Heritage Property.
- ❖ Activity or development proposals that may have a significant impact on World Heritage values are assessed.

- ❖ There is efficient and effective co-operation between the State of Western Australia and Commonwealth of Australia on environmental assessments that relate to the protection of World Heritage values.

4.3 Objectives, Strategies and Actions for Conservation

Goal: Conserve Shark Bay's World Heritage values by actively working towards eliminating threatening processes that affect the long-term integrity of the area and its capacity for ongoing natural evolution.

4.3.1 Integrity of World Heritage Values

There is an obligation on Australia to maintain the integrity of the World Heritage values of Shark Bay. Integrity may be affected by changes to natural processes and by human-induced disturbance. Information on how the integrity of World Heritage values may be affected needs to be improved. The conditions of integrity that need to be met with respect to the Shark Bay Property are described in section 2.2 *Shark Bay's World Heritage Values and Integrity*. All protection, conservation and rehabilitation issues relate in some way to maintenance, restoration or enhancement of the integrity of World Heritage values. To conserve the values of the Property, management aims to maintain species richness and genetic diversity, to ensure populations of threatened species remain viable, to control threatening processes, and to maintain opportunities for continued natural evolution in the area. With several different tenures within the World Heritage Property, coordination and collaboration is required for effective management of threatening processes.

Active and ongoing monitoring of World Heritage values is crucial to maintaining the Property's integrity. The World Heritage Convention's Operational Guidelines state that on-site monitoring should be put in place as an integral component of day-to-day conservation and management of the Property and the lead management agency should record every year the condition of the site. Australia is required to report to the World Heritage Committee every 6 years on the state of conservation of Properties, which necessitates that ongoing monitoring is undertaken. The last report was submitted in 2002.

Objective

- ❖ Maintain, and where possible enhance, the World Heritage values and overall integrity of the World Heritage Property.

Strategies

- ❖ Through effective management avoid, or minimise, threats to the integrity of the World Heritage values and the Property.
- ❖ Rehabilitate areas of the World Heritage Property where the integrity of World Heritage values is under threat.

| Actions | Primary Responsibility | Priority |
|--|---|-----------------|
| 1. Investigate and document baseline information on the condition and extent of World Heritage values, and potential threats to the integrity of World Heritage values. | DEC, DoF | High |
| 2. Through collaboration, ensure human-induced disturbances to the integrity of World Heritage values are minimised. | ALL relevant landholders and management agencies | Ongoing |
| 3. Through collaboration, identify and restore areas of the Property where appropriate to enhance the integrity of World Heritage values or the overall integrity of the Property. | DEC, relevant landholders and management agencies | Ongoing |

| | | |
|---|----------|---------|
| 4. Regularly monitor the condition of World Heritage values, and the overall integrity of the World Heritage Property. | DEC, DoF | Ongoing |
| 5. Record the condition of the Property annually and produce reports every 6 years on the state of the conservation of the World Heritage Property. | DEC | Ongoing |

Expected Outcomes

- ❖ Baseline information on the condition and extent of World Heritage values and environmental, economic and social assets is collated, and potential risks to these values are identified.
- ❖ Threats to the integrity of the World Heritage values are identified and understood, with appropriate management actions being implemented.
- ❖ The integrity of the World Heritage values and overall integrity of the World Heritage Property is maintained, or enhanced through rehabilitation.
- ❖ There is an ongoing awareness and understanding of the condition of the World Heritage values.
- ❖ Regular reports keep governments and the community informed of the condition of World Heritage values and overall integrity of the Property.

4.3.2 Research and Monitoring

Knowledge is essential for effective planning and management of the World Heritage Property. Whilst monitoring might be defined as an examination of performance, research is the acquisition of new knowledge. Research can be an inventory (what is there and where it is), baseline (how do the value characteristics vary naturally), process oriented (define the ecology of the value and factors that influence its health) or predictive (models that allow forecasting of what may occur). The acquisition of knowledge needs to be multidisciplinary and integrated and the community needs to be involved in the process of obtaining knowledge.

A considerable amount of scientific knowledge about Shark Bay's natural environment and visitor use already exists (see *Bibliography*). However there are gaps and the level of understanding is often inadequate for management purposes or determining the consequences of decisions on economic, social and environmental aspects. Further management-oriented research into environmental, economic and social issues is required, particularly on the impact of human activities and threatening processes. Therefore a long-term, prioritised research program and monitoring program needs to be developed.

The impacts of threatening processes and management actions need to be regularly monitored and evaluated so that adjustments and refinements might be made. A systematic monitoring and evaluation program to measure the impacts of human activities and each of the threatening processes is required and should be annually documented. The program should include, where possible, consideration of cumulative impacts. The evaluation process should relate to:

- ❖ the effectiveness of management practices; and
- ❖ the social, economic and environmental effects of management practices.

The marine and terrestrial management plans detail some of the research and monitoring requirements for parts of the Property.

Objective

- ❖ Make available information from relevant research and monitoring programs to natural resource managers and other relevant stakeholders to ensure that management in the World Heritage Property is based on the best available scientific knowledge.

Strategies

- ❖ Obtain the knowledge required to effectively protect and manage the World Heritage values.
- ❖ Monitor impacts of human activities and threatening processes on World Heritage values.
- ❖ Collate information from research and monitoring programs necessary for input into periodic reports required for the property.

| Actions | Primary Responsibility | Priority |
|---|--|-----------------|
| 1. Through broad consultation, develop a research and monitoring program that identifies and prioritises needs and knowledge gaps throughout the World Heritage Property. | DEC , DoIR, DoA, DoF, WAM, GDC, DPI, tertiary and other research institutions | High |
| 2. Through collaboration, identify research and monitoring opportunities then facilitate and support priorities. | DEC , DoIR, DoA, DoF, WAM, GDC | Ongoing |
| 3. Through collaboration, investigate opportunities and seek to establish facilities to assist research within the World Heritage Property. | Tertiary and research institutions DEC, DoF, WAM, DoA | Medium |
| 4. Use CALM Act management plans to identify and detail research and monitoring requirements for biodiversity conservation and nature-based recreation and tourism. | DEC | Medium |
| 5. Develop and maintain a database record of research in Shark Bay. | DEC | Medium |
| 6. Incorporate findings from research and monitoring programs into periodic reports prepared for the World Heritage Property. | DEC | High |

Expected Outcomes

- ❖ Research and monitoring priorities are identified and supported.
- ❖ Research and monitoring programs are developed and implemented which provide the knowledge required for effective management of the World Heritage Property.
- ❖ Facilities and administrative support are available to assist research.
- ❖ A research database for the World Heritage Property is developed and the information made available as appropriate, to assist in effective management of the World Heritage Property.
- ❖ Management decisions are founded on solid scientific and technical information.

4.3.3 Conservation of Native Flora and Fauna

In both the terrestrial and marine environments of the World Heritage Property there exist transitional communities between temperate and tropical environments, and this contributes to the species richness of the area. The diversity of flora and fauna and the presence of threatened species are significant values of the Property and all four criteria on which Shark Bay was nominated rely totally, or in part, on the presence of these values.

All flora and fauna are protected under the *Wildlife Conservation Act 1950* (Wildlife Conservation Act) and cannot be taken without lawful authority. The Commonwealth EPBC Act also contains provisions dealing with nationally threatened species. There are a number of declared (under the Wildlife Conservation Act) threatened flora and fauna within the World Heritage Property. Some of these are also listed under the Commonwealth EPBC Act as nationally threatened species. Many of these species are protected through the management of conservation reserves in which they occur. Some species of fauna are classified under the Wildlife Conservation Act as “in need of special

protection”, and some fauna and flora species have been identified by DEC as “priority species” because they are restricted to a small number of populations that may be under threat. It is important that these species of conservation interest also receive protection.

The conservation of threatened species is also facilitated by the preparation of species recovery plans or interim recovery plans under Commonwealth and State legislation. These plans address issues such as species distribution, number and size of populations, biology, potential threats and measures to achieve recovery. The management of human use (e.g. fishing, camping, driving, boating) and threatening processes (e.g. feral animals, weeds, inappropriate fire regimes) is essential to the maintenance of these important populations. Recovery plans for the purpose of State and Commonwealth legislation have been prepared for the Shark Bay mouse, woylie, rufous hare-wallaby (mala), greater bilby, chuditch and malleefowl. A draft recovery plan for the mala has been prepared as well as a combined draft recovery plan for the Western barred bandicoot, banded hare-wallaby and burrowing bettong. An interim recovery plan for the thick-billed grasswren has been produced. A recovery plan for the greater stick-nest rat is a high priority. A recovery plan has been prepared for marine turtles that include green, loggerhead, hawksbill and leatherback turtles. Recovery plans are in preparation for the humpback whale and southern right whale.

An important fauna management strategy is to re-establish populations of threatened species in areas where they formerly occurred. Peron Peninsula has significant potential for the establishment of a large area free of feral animals for fauna translocations. An electrified barrier fence erected across the peninsula’s narrow neck at Taillefer Isthmus is a major barrier to incursion by feral animals. *Project Eden* was commenced in 1994 by DEC to control feral animals on the Peron Peninsula (see section 4.3.10 *Introduced Animals*) and to enable the re-introduction of threatened and other fauna. Captive breeding populations for the bilby, banded hare-wallaby and rufous hare-wallaby (mala) at the Peron Captive Breeding Centre continue to supply animals for releases within the World Heritage Property. Other species to be targeted for re-introduction as part of *Project Eden* include southern brown bandicoot (quenda), red-tailed phascogale and chuditch. A similar project, the *Dirk Hartog Island Ecological Restoration*, is proposed for the island. Introduced animals, primarily goats and cats, are to be removed then native fauna reintroductions undertaken. The restoration project will also include vegetation restoration, weed control, rubbish removal, soil rehabilitation and surveying of flora and fauna.

Other areas within the World Heritage Property have also had threatened native fauna reintroduced. This has been undertaken on Heirisson Prong (for the boodie, Western barred bandicoot and greater stick-nest rat) as part of the Useless Loop Community Biosphere Project Group (ULCBPG) and Peron Peninsula (for the malleefowl, woylie and bilby) as part of Project Eden. On Salutation Island the greater stick-nest rat has been successfully established to protect the species, although they did not previously occur there. More recently Shark Bay mice, boodies, banded hare-wallabies, Western barred bandicoots and greater stick-nest rats have been reintroduced to Faure Island. These reintroductions were undertaken by the not-for-profit organisation Australian Wildlife Conservancy in cooperation with the Perth Zoo, CSIRO, ULCBPG and DEC’s *Project Eden*.

The World Heritage Property is located at the transition zone of two botanical provinces – South West and Eremaean. As such many flora species are located at the northern and southern limit of their geographical range. As listed under the Regulations of the Wildlife Conservation Act, the Property contains two rare species of flora (i.e. taxa that have been adequately searched for and are deemed to be in the wild either rare, in danger of extinction, or otherwise in need of special protection) and sixty-one Priority listed species (i.e. taxa that are poorly known) (source: WA Herbarium). The rare species are *Caladenia barbarella* and *Eucalyptus beardiana* with *E. beardiana* currently not occurring within a conservation reserve. Under the EPBC Act *E. beardiana* is listed as endangered and *Triodia bromoides* and *Caladenia barbarella* are listed as vulnerable. There are ten Priority 1, twenty-one Priority 2, twenty-six Priority 3 and six Priority 4 species with forty-three species of flora are endemic to the Shark Bay area (WA Herbarium 18 April 2005). Many flora species are at the northern limit and several at the southern limit of their range in the Shark Bay area.

Knowledge is required on the distribution, biology, threatening processes and management requirements of threatened species and other species of special conservation interest within the World Heritage Property. Furthermore, priorities for conservation of species within the World Heritage Property need to be established.

The unique hydrologic structure of Shark Bay gives rise to a number of significant marine biological features such as the stromatolitic microbiolites and certain bivalves, marine organisms that are tolerant of hypersaline environments. These varied marine environments have given rise to a diverse fish fauna and genetic variations of snapper and clams. Shark Bay contains the largest seagrass meadows as well as some of the most species-rich seagrass assemblages in the world. Shark Bay is located near the northern limit of a transition zone between temperate and tropical marine fauna. The threatened green and loggerhead turtles inhabit the region and nesting sites occur on the sandy beaches of Dirk Hartog Island, Shelter Bay and Cape Peron. The extensive areas of seagrass meadows are home to the specially protected dugong with an estimated population of 10 000, with densities at the highest levels recorded in Australia (Marsh et al 1994). Hawksbill and leatherback turtles are known to visit the Shark Bay area as are southern right and humpback whales. Bottlenose dolphins are common.

An increasingly popular tourist activity in the World Heritage Property is wildlife interaction. Wildlife interaction is any activity where people seek to interact with wildlife in some way that does not include the physical taking of species. Wildlife interactions are a key component of many nature-based tourism operations, providing opportunities to educate visitors and to foster support for conserving flora and fauna and their habitats. It is important to ensure that species targeted for interaction are not adversely impacted and are provided with the appropriate legislative protection and management. Therefore appropriate monitoring of the health and condition of these animals is essential and tourist operations modified as required.

Objective

- ❖ Maintain, and where possible enhance, the number and diversity of native flora and fauna assets in the World Heritage Property.

Strategies

- ❖ For improved management and through biological research, survey and monitoring, continue to increase the knowledge of native terrestrial and marine flora and fauna assets and their condition.
- ❖ Identify potential threats to native flora and fauna assets.
- ❖ Improve the conservation status of threatened species in the World Heritage Property through developing and implementing a Strategic Plan for *Project Eden* and *Dirk Hartog Island Ecological Restoration* projects, and facilitating other reintroduction projects.
- ❖ Through effective management avoid, or minimise, threats to the maintenance of the diversity of native terrestrial and marine flora and fauna assets in the World Heritage Property.
- ❖ Encourage wildlife interactions that maximise educational opportunities and foster support for wildlife conservation, and which do not adversely impact on fauna populations.

| Actions | Primary Responsibility | Priority |
|---|------------------------|----------|
| 1. Manage and regularly monitor human activities and threatening processes that have potential to adversely impact native flora and fauna, especially threatened flora and fauna and species of conservation interest, in a manner consistent with State and Commonwealth legislation and policies. | DEC, DoF, DEWHA | Ongoing |
| 2. Manage native flora and fauna within conservation reserves in accordance with statutory plans such as the Shark Bay Marine Reserves and Terrestrial | DEC, DoF | Ongoing |

| | | |
|--|---|---------|
| Reserves Management Plans and appropriate fisheries management plans. | | |
| 3. Identify research and monitoring priorities then promote, encourage and facilitate research and monitoring which will assist management of native flora and fauna and especially threatened flora and fauna and species of conservation significance. | DEC, DoF | Ongoing |
| 4. Support the preparation and implementation of recovery plans for all threatened flora and fauna in the World Heritage Property. | DEC, DEWHA | High |
| 5. Develop and implement through inter-agency collaboration policies that conserve the diversity of marine and terrestrial flora and fauna in the World Heritage Property. | DEC, DoF, DEWHA, other relevant agencies | Ongoing |
| 6. Apply the environmental impact assessment process to activities that may have a significant impact on threatened species. | Proponent, EPA, DEC, DoF, DEWHA | Ongoing |
| 7. Manage wildlife interactions in accordance with controls and regulations provided under the Wildlife Conservation Act and CALM Act. | DEC, Tourism WA, other relevant agencies | Ongoing |

Expected Outcomes

- ❖ The native flora and fauna values of the World Heritage Property are maintained and enhanced.
- ❖ The threatened native flora and fauna of the World Heritage Property are identified and documented.
- ❖ The threatened native flora and fauna are conserved through the implementation of the *Shark Bay Marine Reserves Management Plan* (CALM 1996), the *Shark Bay Terrestrial Reserves Management Plan* (CALM 2000), *Shark Bay Regional Strategy* (WA Planning Commission 1997) and recovery plans for threatened native flora and fauna.
- ❖ Legislation and Policies are prepared that conserve the diversity of flora and fauna values in the World Heritage Property.
- ❖ Recovery plans are prepared for all threatened flora and fauna in the World Heritage Property.
- ❖ Research and monitoring priorities are identified.
- ❖ Research and monitoring is management-oriented and undertaken according to priorities.
- ❖ Human activities and threatening processes that are assessed as having the potential to impact adversely on flora and fauna values are controlled.
- ❖ Wildlife interactions are controlled and managed in a sustainable manner and achieve improved community support for conservation programs.

4.3.4 Conservation of Ecological Communities

An 'ecological community' is a naturally occurring biological assemblage that occurs in a particular type of habitat. In the Shark Bay area, examples of ecological communities include the coastal birridas, scrub-heaths, Acacia shrublands, woodlands associated with eucalypts in the southern parts of the area, and hummock grasslands of spinifex. All ecological communities serve an important ecological function and so are intrinsically significant. However, ecological communities that are particularly vulnerable include those with the following characteristics:

- ❖ a community that is restricted in its extent;
- ❖ particular habitats or ecosystems that contain sensitive species;
- ❖ communities that are threatened (e.g. Threatened Ecological Communities); and
- ❖ communities that are species-rich or contain aggregations of endemic, disjunct or relictual flora species.

Shark Bay is transitional between tropical and temperate environments. The Shark Bay area contains a range of terrestrial and marine ecological communities that support a diverse native fauna and flora. Knowledge of some communities is limited although many appear fragile and sensitive to disturbance. There is one threatened ecological community and several other ecological communities at risk in the Shark Bay area (May and McKenzie 2003):

Table 5: Threatened Ecological Communities and Other Ecosystems at Risk in the Shark Bay Area

| Community | Status ³ | Threatening Processes |
|--|---------------------|---|
| Threatened Ecological Community | | |
| Hypersaline microbial community (Hamelin stromatolite) ⁴ | V, P4 | Recreation, climate change leading to changed sea levels, nutrient enrichment |
| Other ecosystems at risk | | |
| Reptile assemblages of islands, gulfs and peninsulas | V | Feral animals (cats, foxes, goats), grazing, changed fire regimes |
| Coastal heath communities at Steep Point | V | Grazing, feral animals (goats), clearances for proposed developments |
| Eucalyptus mallee sp. and Acacia scrub with scattered <i>E. loxophleba</i> | V | Increasing fragmentation, loss of habitat and lack of recruitment, grazing; feral animals (rabbits); changed fire regimes |
| <i>Acacia rostellifera</i> low forest | V | Increasing fragmentation, loss of habitat and lack of recruitment, grazing; feral animals (rabbits); changed fire regimes |

The conservation of these ecological communities is essential in maintaining biological diversity and Shark Bay's World Heritage values. Knowledge of some communities is limited, particularly in the marine environment, which makes it difficult to determine management requirements. The *Shark Bay Marine Reserves Management Plan* (CALM 1996) and the *Shark Bay Terrestrial Reserves Management Plan* (CALM 2000) detail measures to protect and conserve communities within conservation reserves. The *Shark Bay Regional Strategy* (WA Planning Commission 1997) recommends additional areas for inclusion in conservation reserves to protect some of these marine and terrestrial communities.

Some of the significant ecological communities are not represented within the existing conservation reserve system although the newly acquired areas or areas proposed for acquisition will ensure these communities are protected within a conservation reserve system. Various managers control other areas, but remain subject to the Wildlife Conservation Act in respect to the protection of flora and fauna, and the *Fish Resource Management Act 1994* (Fish Resource Management Act) in relation to the protection of fish. It is essential that activities in the World Heritage Property do not adversely impact on ecological communities.

The Commonwealth EPBC Act contains provisions for dealing with nationally threatened ecological communities.

Objective

- ❖ Maintain, and where possible enhance, the integrity of ecological communities in the World Heritage Property.

³ TECs are listed by WATSCU and approved by the WA Minister for the Environment whilst ecosystems at risk are not formally approved.

⁴ Although within the marine environment, terrestrial activities can have an impact on this community.

Strategies

- ❖ Improve knowledge of ecological communities and their condition, and identify potential threats.
- ❖ Improve the conservation status of ecological communities in the World Heritage Property.
- ❖ Through effective management avoid, or minimise, threats to the maintenance of the diversity of ecological communities in the World Heritage Property.

| Actions | Primary Responsibility | Priority |
|---|---|-----------------|
| 1. Identify and document the ecological communities of the World Heritage Property. | DEC, DEWHA, DoF | High |
| 2. Manage and regularly monitor human activities and threatening processes that have the potential to adversely impact on the integrity of ecological communities, in a manner consistent with State and Commonwealth legislation and policies. | DEC, DEWHA, all relevant management agencies | Ongoing |
| 3. Manage ecological communities within conservation reserves in accordance with the Shark Bay Marine Reserves and Terrestrial Reserves management plans. | DEC | Ongoing |
| 4. Through interagency collaboration, implement the Shark Bay Regional Strategy recommendations to include additional areas into the conservation reserve system. | DPI, DEC, all relevant management agencies | High |
| 5. Through consultation, identify research and monitoring priorities for ecological communities in the World Heritage Property then promote, encourage and facilitate research and monitoring in accordance with management priorities. | DEC, LGA, all relevant management agencies | Ongoing |
| 6. Through consultation, support the preparation and implementation of recovery plans for threatened ecological communities. | DEC, DEWHA, all relevant management agencies | High |
| 7. Apply the environmental impact assessment process to activities that may have a significant impact on ecological communities. | Proponent, EPA, DEC, DoF, DEWHA | Ongoing |

Expected Outcomes

- ❖ The ecological communities of the World Heritage Property are identified and documented.
- ❖ The values of ecological communities of the World Heritage Property are maintained and enhanced.
- ❖ Ecological communities are conserved through the implementation of the *Shark Bay Marine Reserves Management Plan* (CALM 1996), the *Shark Bay Terrestrial Reserves Management Plan* (CALM 2000), *Shark Bay Regional Strategy* (WA Planning Commission 1997) and recovery plans for threatened ecological communities.
- ❖ Policies are prepared that conserve the diversity of ecological communities in the World Heritage Property.
- ❖ Research and monitoring priorities are identified.
- ❖ Research and monitoring is management-oriented and undertaken according to priorities.
- ❖ Human activities and threatening processes that are assessed as having the potential to adversely impact on ecological communities are controlled.

4.3.5 Conservation of Marine Formations and Terrestrial Landforms

A number of the unique marine formations and landforms of Shark Bay are significant World Heritage values.

Marine formations of significance include the stromatolites, Faure Sill and the Wooramel Seagrass Bank. Activities that may adversely impact on these formations require careful management. These activities are generally addressed in the *Shark Bay Marine Reserves Management Plan* (CALM 1996); however there may be activities external to the marine reserves that could affect these areas. For example, any activity that degrades water quality or affects surface water runoff in the Wooramel catchment may alter sedimentation patterns that may affect the Faure Sill and seagrass in this area.

Significant landforms include the Zuytdorp Cliffs and dune formation of Dirk Hartog Island, the extensive shell deposits of L'haridon Bight and Hamelin Pool, Heirisson and Bellefin Prongs and the birridas, lagoons and coastal features of Peron Peninsula. These landforms must be managed to ensure that human activities and threatening processes do not have a negative impact on the integrity and scenic values of the Property. The new *Shark Bay Terrestrial Reserves and Proposed Reserve Additions Management Plan* (draft in preparation) will cover many of the landforms.

Objective

- ❖ Maintain, and where possible enhance, the integrity of marine formations and landforms in the World Heritage Property.

Strategies

- ❖ Improve knowledge of marine formations and landforms and their condition, and identify potential threats.
- ❖ Through effective management avoid, or minimise, threats to the integrity of marine formations and landforms in the World Heritage Property.

| Actions | Primary Responsibility | Priority |
|--|---|-----------------|
| 1. Manage marine formations and terrestrial landforms within conservation reserves in accordance with the Shark Bay Marine Reserves Management Plan and Shark Bay Terrestrial Reserves Management Plan. | DEC | Ongoing |
| 2. Through consultation, identify research and monitoring priorities for marine formations and landforms in the World Heritage Property. | DEC, LGAs, other relevant agencies | High |
| 3. Promote, encourage and facilitate research and monitoring in accordance with management priorities. | DEC, LGAs, other relevant agencies | High |
| 4. Through collaboration, regularly monitor and manage activities that have the potential to adversely impact the integrity of marine formations and landforms of World Heritage value, including visual impact. | DEC, LGAs, MRWA, DoIR, EPA, Western Power, | Ongoing |
| 5. Apply the environmental impact assessment process to proposals that may adversely impact on the integrity of marine formations and landforms. | Proponent, EPA, DEC, DoF, DEWHA | Ongoing |
| 6. Develop and implement appropriate land use controls where necessary. | LGAs | Ongoing |

Expected Outcomes

- ❖ The integrity of marine formations and landforms is maintained.
- ❖ Marine formations and landforms are conserved through the implementation of the *Shark Bay Marine Reserves Management Plan 1996-2006* (CALM 1996) and the *Shark Bay Terrestrial Reserves Management Plan* (CALM 2000).
- ❖ Research and monitoring priorities are identified.
- ❖ Research and monitoring is management-oriented and undertaken according to priorities.
- ❖ Marine formation and landform values are protected from potentially degrading activities.
- ❖ Activities and proposals that are assessed as having the potential to adversely impact on formations and landforms are controlled.

4.3.6 Conservation of Landscapes and Seascapes

The seascapes and landscapes of Shark Bay are a significant visual resource value of the World Heritage Property.

Features of significance include:

- ❖ exceptional coastal scenery with sea cliffs such as the Zuytdorp cliffs, wide sweeping beaches of sand and shells interspersed by rocky platforms, headlands, peninsulas and islands;
- ❖ low rolling hills interspersed with low, flat claypans or birridas; and
- ❖ shallow bays, lagoons, channels, extensive seagrass meadows, coral, sand flats, mangroves and limestone reef.

The broadscale landscape character of the World Heritage Property and preliminary assessment of landform, vegetation, waterform and land use for each landscape character type have been considered as part of a broad, state-wide study in 1994. A more detailed Landscape Study for the Property to document the exceptional natural beauty and aesthetic qualities of the Property was completed in 2001 (CALM 2001a, CALM 2001b). This study identified the aesthetic values of the Property and established objectives and guidelines for the management of these values.

Human activities in some areas may have already modified visual aspects of the landscape or seascape. In some instances the visual resource may be able to be restored through rehabilitation and appropriate management actions.

Human-imposed changes to the seascape and landscape should not detract from the natural visual character of the Property. Some development proposals may adversely impact on landscape and seascape values. Developments and activities that may adversely impact on the aesthetic qualities of the natural landscape and seascape may be unacceptable and require appropriate planning, assessment and management. Visual seascape and landscape management ranges from broad scale to site specific analysis, and includes sensitive planning, design and construction.

Objective

- ❖ Maintain, and where appropriate, restore and enhance the integrity of visual seascape and landscape values of the World Heritage Property.

Strategies

- ❖ Improve knowledge of landscape and seascape and their condition, and identify potential threats.
- ❖ Through effective management avoid, or minimise, threats to the integrity of landscapes and seascapes in the World Heritage Property.
- ❖ Rehabilitate and restore areas of the World Heritage Property where the visual seascape and landscape values are degraded.

| Actions | Primary Responsibility | Priority |
|--|--------------------------------------|-----------------|
| 1. Apply the objectives and guidelines for the management of the landscapes and seascapes as identified in the Landscape Study. | DEC , All management agencies | High |
| 2. Manage and regularly monitor activities that have the potential to adversely impact on the integrity of landscapes and seascapes of World Heritage value. | DEC , EPA, DPI, LGAs, DoIR | Ongoing |
| 3. Through consultation, identify degraded visual landscapes and seascapes and rehabilitate, in accordance with priorities developed from the scenic management area classification. | DEC , LGAs, MRWA | Medium |
| 4. Through consultation, evaluate the visual impact of proposed developments and activities in areas within or adjoining the World Heritage Property as part of the planning and assessment process of relevant legislation. | All management agencies | Ongoing |

Expected Outcomes

- ❖ The important landscape and seascape values of the World Heritage Property are identified and documented.
- ❖ The integrity of landscape and seascape values of the World Heritage Property is maintained.
- ❖ Landscape and seascape values are protected from potentially degrading activities.
- ❖ Priority management actions are identified and implemented for degraded landscape and seascape values.
- ❖ Impacts on the landscape and seascape values are considered in the environmental assessment process for proposed developments and activities in, and adjacent to, the World Heritage Property.

4.3.7 Conservation of Cultural Heritage

Although the World Heritage Property has been primarily established because of the international significance of its natural values, Shark Bay has cultural values of national and international significance. Shark Bay has historical significance because it is the location of the earliest recorded site of European landfall on the West Australian coast; the place where many studies and collections were made by explorers and therefore the place where some of the earliest records of Australia's native flora and fauna are represented; contains several historic shipwreck sites; and has non-indigenous cultural heritage associated with the pearling, fishing, pastoral and mining (guano) industry. The Shark Bay area has six historic listed sites on the Australian Heritage database with five sites on the Register of the National Estate and one site on the National Heritage List.

The Shark Bay area is mainly associated with the Malgana and Nanda people. Tindale (1974) identifies the immediate Shark Bay area as being occupied by the Malgana people with the Nanda people occupying the land south of Shark Bay to Kalbarri.

In Western Australia, the Department of Indigenous Affairs (DIA) is responsible for the administration of the *Aboriginal Heritage Act 1972* (Aboriginal Heritage Act). The Act provides for the protection of sites and objects used by, or traditional to, the original inhabitants of Australia and the management of Aboriginal sites in consultation with the Aboriginal community. All Aboriginal sites and objects are protected, including those sites not yet registered with the DIA. Under the Act, it is an offence for anyone to alter in any way an Aboriginal site or object without the relevant Minister's permission. Prior to any development or activity that involves disturbing the land, DIA recommends that suitably qualified consultants be engaged to conduct ethnographic and archaeological surveys of the area to

ensure that no site is damaged or altered that would result in a breach of section 17 of the Act. In order to avoid a possible breach of the Act, a Notice under section 18 of the Act should be submitted to the Aboriginal Cultural Material Committee seeking the Minister for Indigenous Affairs prior written consent to use the land.

Extensive surveys for Aboriginal occupation and use across the WHP have been conducted. These sites are recorded on the DIA database and protected under the Aboriginal Heritage Act and some are listed on the Register of the National Estate.

There are over 80 known midden sites located along the coastline in the Shark Bay area. Archaeological research has been conducted at several sites across the Shark Bay area and collections have been made from several of them including sites at Eagle Bluff, Monkey Mia and Silver Dollar (south of Denham) (Bowdler 1990a, 1990b, 1990c, 1995) and a site at the cliffs near the *Zuytdorp* shipwreck (Morse, 1988). The Silver Dollar site provides the oldest and most detailed evidence of human occupation of the region (Bowdler 1999). It was occupied for two periods, firstly between 30 000 and 18 000 years before present, and secondly between 7000 and 6000 years before present (Bowdler 1999). The rockshelter sites at Monkey Mia are dated to within the last 1000 years and the Eagle Bluff and Zuytdorp sites at 4000 to 4600 years before present (Bowdler 1999, Morse 1988). The management of these sites may require development of a cultural heritage plan in consultation with the relevant Native Title Working Party groups for the Property.

Bowdler (1990b, 1995, 1999) suggests that the hiatus in occupation in both the Pleistocene and Holocene periods is possibly a result of lower sea levels during drier periods, a subsequent lack of fresh water, sea water rises inundating sites, and possible declines in mangrove populations on which Aboriginal people were dependent and change in the food consumed. Occupation of the area may have been continuous and as further research is undertaken, other reasons may be suggested for the hiatus in occupation.

A limited amount of information on the traditional life and customs of these people is available from records of observations of Europeans. Drawings made during the French scientific expeditions of 1801 depict semi-permanent Aboriginal camps on Peron Peninsula. Smoke was seen by navigators on Dirk Hartog Island, Edel Land and the eastern shores of Shark Bay. Since the 1850s, Aboriginal people have been closely involved in the pearling, pastoral and fishing industries and by the early 1900s had become reasonably well integrated with the Chinese, Malay and British settlers. Aboriginal people today have a strong involvement in the fishing industry.

A significant episode in Shark Bay's history is the decade of the Lock Hospitals on Bernier and Dorre Islands between 1908 and 1918. These were hospitals specifically established for Indigenous patients suffering from venereal disease with female patients residing on Bernier Island and male patients on Dorre Island. Remnants of the hospital buildings and artefacts from this era still remain on the islands. Many Indigenous people were buried on the islands. The Lock Hospitals are listed on the Register of the National Estate.

Under the provisions of the State *Maritime Archaeology Act 1973* (Maritime Archaeology Act) and the Commonwealth *Historic Shipwrecks Act 1976* (Historic Shipwrecks Act), vessels wrecked in Western Australian or Commonwealth waters may be protected as historic shipwrecks. The delineation of State and Commonwealth waters for the purposes of historic shipwrecks is complex. The Maritime Archaeology Act has jurisdiction over waters of the world heritage area within the limits of the state, while the Historic Shipwrecks Act has jurisdiction over all other waters in the area. There is currently no legal determination on exactly where the limits of the State may be within the area of Shark Bay.

The Maritime Archaeology Act protects any ship that was lost, wrecked or abandoned, or was stranded, on or off the coast of Western Australia in State waters before the year 1900. The Historic Shipwrecks Act protects historic shipwrecks and associated relics found in Australian waters from the

low water mark to the edge of the continental shelf which are over 75 years old regardless of whether their actual locations are known. The Commonwealth Minister for the Environment, Heritage and the Arts can also make a declaration to protect any historically significant shipwrecks or relics that are less than 75 years old.

In addition to the protection of shipwreck sites, any historic shipwreck relic on land associated with a Commonwealth historic shipwreck is covered under the Historic Shipwrecks Act whilst any object or site on land associated with a shipwreck in State waters is covered by the Maritime Archaeology Act (WAMM 2005). Provisions of the Maritime Archaeology Act allow for the protection of maritime archaeological sites that lie underwater or on land and include relics, structures, fortifications, camps sites or other locations of historic interest associated with a historic ship. The *Heritage of Western Australia Act 1990* (Heritage of WA Act) applies to the protection of historical places in the terrestrial estate. Additional Commonwealth protection under the EPBC Act is provided when places are listed on the Commonwealth Heritage List and/or National Heritage List.

Shark Bay has a long history of visits by early European explorers. Dirk Hartog, aboard the Dutch trading ship the *Eendracht*, is the first known European to land on the West Australian coast and landed at Cape Inscription in 1616 (Dept. of the Arts, Sports, the Environment, Tourism and Territories (DASETT), 1990, p. 3). He left a pewter plate inscribed with a record of his visit and nailed to a post left standing upright on top of a cliff in a rock cleft. This plate is the oldest extant record of Europeans landing in Australia. In 1697, Dutch navigator Willem de Vlamingh in the *Geelvink* visited Cape Inscription. Men from the ship climbed the cliff, finding an oak post with a pewter plate lying beside it. Vlamingh replaced Hartog's plate with one of his own, inscribing the original message and adding a record of his own visit before nailing it to a new post.

The original Hartog plate is located in the Rijksmuseum in Amsterdam, and in 1947 the Vlamingh plate was returned to Australia and is now on display at the WA Maritime Museum in Fremantle. The original posts were removed in 1908 and now held at the WA Maritime Museum. Representations of these original posts were installed at this time. The Commonwealth placed a memorial plate at Cape Inscription in 1938. The 'Dirk Hartog Landing Site 1616 – Cape Inscription Area' was entered in the National Heritage List on 6 April 2006; there is therefore an expectation that the place will be managed in accordance with the EPBC Act.

Englishman William Dampier, on the HMS *Roebuck*, subsequently explored the area in 1699, landed at nearby Dampier's Landing and named the area "Shark's Bay" (Suba, 1995, p4). In 1772, Frenchman St. Alouarn landed at Cape Inscription at Turtle Bay, claiming Australia for France. Frenchmen Nicolas Baudin explored Shark Bay in 1801 and 1803. De Freycinet established a camp on Peron Peninsula at Cape Lesueur in 1818 as part of a world scientific voyage (Suba, 1995, p4). British navigators King visited the area in 1822 and Grey in 1839. Denham made a comprehensive survey of the area in 1858. Many of Shark Bay's islands, bays and landmarks are named after these early explorers (DASETT, 1990, pp3-4).

The Cape Inscription lighthouse was constructed in 1910 and operated by the State until the Commonwealth took over in 1915 (Department of the Environment and Heritage, 2004). Initially the site consisted of the lighthouse tower, an oil store, tank and quarters but since the conversion from kerosene to automatic acetylene operation, only the lighthouse has been maintained due to the station being unmanned in 1917. The lighthouse keeper's quarters were re-roofed in 2006. The tower is 16.3m high and constructed of cast concrete. The associated maritime infrastructure and archaeological remains of the timber jetty, horse-drawn cable tramway and light railway at Turtle Bay are significant features of the Cape Inscription lightstation complex. The small area around the lighthouse is a historical reserve and is on the Register of the National Estate. About 243 hectares of UCL in the northern part of Dirk Hartog Island that surrounds the Cape Inscription lightstation is to be vested with the Shire of Shark Bay as a historical reserve.

There are a number of known and unidentified historic shipwrecks that are of historic significance in

the Shark Bay area. The '*Zuytdorp*' is a significant seventeenth century Dutch East Indiaman shipwrecked in 1712 and is located at the base of cliffs on the Edel Land Peninsula. Captained by Norwegian T Griff, the *Gudrun*, carrying a cargo of timber, ran aground on the 23 October 1901 on the southern side of the fourth sandbank and the French whaler *Perseverant* lost off the north end of Dirk Hartog Island in 1841 (Western Australian Maritime Museum, 2004).

The commercial utilisation Shark Bay's natural resources provides a wealth of historic sites and material, much of which are yet to be accurately located and documented. As early as 1792, two American whalers visited Shark Bay (Stanbury 1986). In 1949 the Commonwealth Government established a whaling station at Babbage Island, Carnarvon, and approximately 7852 humpback whales killed before the whaling station was closed in 1963 (Stanbury 1986, DASETT 1990, p. 94). Guano was the first terrestrial industry in Shark Bay and initiated the area's colonial settlement in 1850 (Lefroy 1978, p. 9). Commercial pearling also developed in the 1850s and numerous pearling camps were established around the coast (Lefroy 1978, p. 9). A pearling settlement, known locally as Freshwater Camp, was established at Lagoon Point in the 1870s (Lefroy 1978, p. 11). Freshwater Camp was one of the few places to provide fresh water and in 1898 was declared the townsite of Denham then officially gazetted in 1904 (Carmody 1970:50-53). The first pastoral leases were granted in the 1860s and sandalwood was first exported from the region in the 1890s (Edwards 1999, p. 291 and Suba 1995, p. 5). The fishing industry began in the early 1900s and has been the community's economic mainstay for most of this century (Lefroy 1978, p. 17).

One of the lifeboats from the German raider, *Kormoran*, that sank the HMAS Sydney with the loss of all 645 crew in 1941, was purchased by the owners of Carrarang Station who used it to transport wool. Its remains can be still seen at Carrarang Landing.

The historic Peron Station Homestead is located in the Francois Peron National Park. Built in the 1950s the homestead site is representative of early pastoral operations. The remaining structures include the homestead, windmills, an overseer's quarters, a shearer's quarters, a cook house, shearing shed and yards, a killing shed, machinery shed, tack room and horse yards. A heritage assessment completed by Suba (1995) states that individually the buildings have little heritage significance but collectively provide an authentic representation of pastoral life. The homestead was refurbished in 1998 and other improvements have been made since then. The site is now used to interpret the pastoral history and Project Eden.

Other historic sites within the Shark Bay World Heritage Property listed on the Register of the National Estate include Wolgedda Pioneer Cottage at Nanga Station. The Shire of Shark Bay maintains the Municipal Inventory that provides statutory protection to historic places under the Town Planning Scheme. The Inventory includes places listed on the Register of the National Estate and other places of local or regional significance.

Objective

- ❖ Maintain, and where possible enhance, the integrity of cultural heritage in the World Heritage Property.

Strategies

- ❖ Improve knowledge and understanding of cultural heritage sites, artefacts, places and their condition and people through research.
- ❖ Identify potential threats to cultural heritage.
- ❖ Through effective management, avoid or minimise, threats to sites, artefacts and places of cultural significance.
- ❖ Promote greater understanding, appreciation and awareness of cultural heritage.

| Actions | Primary Responsibility | Priority |
|---|--|-----------------|
| 1. Identify and document sites of cultural significance. | LGAs, WAM & DIA, DEC | High |
| 2. In consultation with relevant Native Title representative organisations, establish an Indigenous cultural heritage working group and develop a cultural heritage plan for the Property. | DIA, Yamatji Corporation, DEC, other land holders | Medium |
| 3. Manage and regularly monitor human activities and threatening processes that have the potential to adversely impact on the integrity of cultural heritage, in a manner consistent with Local, State and Commonwealth Government legislation and policies. | LGAs, WAM & DIA, DEC | Ongoing |
| 4. Consult with relevant heritage organisations such as National Trust and Heritage Council, in undertaking management of cultural heritage places. | LGAs & WAM, DEC | Medium |
| 5. In consultation with relevant management agencies, identify research and monitoring priorities for cultural heritage in the World Heritage Property then promote, encourage and facilitate research and monitoring in accordance with management priorities. | LGAs, WAM & DIA, DEC | Medium |
| 6. Facilitate the implementation of information, education and interpretation programs and activities to present cultural heritage to visitors and develop greater awareness. | All management agencies | Medium |

Expected Outcomes

- ❖ Cultural heritage sites, artefacts and places are identified and documented.
- ❖ Values of cultural heritage within the World Heritage Property are maintained, protected and presented to the public.
- ❖ Research and monitoring priorities are identified and undertaken according to priorities.
- ❖ Human activities and threatening processes that are assessed as having the potential to adversely impact on cultural heritage are controlled.
- ❖ There is an increase in community and visitor awareness, appreciation and understanding of cultural heritage of the World Heritage Property and support for the protection of cultural heritage values.
- ❖ Education materials and interpretive materials produced contain accurate information about protecting cultural heritage.

4.3.8 Pollution and Waste

Shark Bay is a semi-enclosed embayment, with a low flushing rate. Pollutants are likely to be slow to disperse which may increase the impacts on the marine environment. There are no known point sources of pollution within the World Heritage Property. However, a range of potential pollution sources exist that could impact on World Heritage values, particularly in the marine environment. Potential sources of pollution include:

- ❖ atmospheric pollution, for example, industrial and vehicle emissions, carbon dioxide levels (see section 4.3.15 *Climate Change*) or bushfires;
- ❖ marine pollution, for example, fuel and oil spills, littering (especially plastics and fishing line), bilge and ballast discharge from ships, sewage, dredging, discharge of bitterns;

- ❖ chemical, nutrient, or exotic biota pollution from existing industries, such as salt mining and aquaculture, and associated shipping activities;
- ❖ land pollution, for example, littering and urban, industrial and agricultural pollution;
- ❖ groundwater pollution, for example, seepage from septic, and nutrients and chemicals from agricultural activities;
- ❖ dust associated with mining and agricultural practices; and
- ❖ noise pollution.

The Gascoyne and Wooramel rivers drain into Shark Bay, but their flow is intermittent and runoff small. It is possible that large-scale activities in the Gascoyne and Wooramel River catchments could result in pollutants entering the World Heritage Property through the flowing of the watercourse. There is little surface runoff in Shark Bay because of low rainfall, high evaporation and permeable soils, however there is active regional groundwater flow.

The DEC is responsible for pollution control and abatement. The DoW is responsible for managing water resources and generally the Water Corporation (WC) and/or the local authority is responsible for the disposal of sewage. Management of marine pollution is the responsibility of the DPI and DoF, depending upon the activity.

DPI is responsible for shipping activities in State waters including managing oil spills. Discussion of ballast water management from commercial ships is provided in section 4.3.10 *Introduced Animals*. At a State level, an Oil Spill Contingency Plan (OSCP) exists detailing how an incident would be handled to minimise the impacts of such an event on the marine environment. In addition the port area at Useless Loop has an OSCP and as a condition of their licence, any petroleum operators are required to submit an OSCP. A specific plan for the Shark Bay World Heritage Property may not be warranted but a Shark Bay sub-plan could be developed within the State plan. The impact of foreign ballast discharge on the marine environment is of great concern.

The waste treatment works at Monkey Mia require monitoring to ensure they continue to operate efficiently as do the pit toilets at various camping and day use sites. The management and, where required, rehabilitation of the rubbish tips requires addressing. There are old fencelines, poly pipe used to distribute water, and other rubbish associated with pastoral activities scattered across the planning area including Peron Peninsula, Nanga, Edel Land and Dirk Hartog Island. The management of rubbish from Dirk Hartog Island will be included as part of the ecological restoration project for the island (see section 4.3.3 *Conservation of Native Flora and Fauna*).

Objective

- ❖ Minimise the impact of pollution and waste on World Heritage values and the overall integrity of the World Heritage Property.

Strategy

- ❖ Develop and implement effective management arrangements and monitoring systems in order to address pollution and waste issues in the World Heritage Property.

| Actions | Primary Responsibility | Priority |
|---|-------------------------------|-----------------|
| 1. Through inter-agency collaboration, facilitate and undertake research and monitoring to assist in the identification of occurrences of pollution and to improve understanding of the impact of pollution on World Heritage values. | DEC, DPI, DoF | Medium |
| 2. Refer any developments or activities that may be significant sources of pollution to the World Heritage | Proponent, EPA, DEC, DoF | Ongoing |

| | | |
|---|--|---------|
| Property through the environmental assessment process. | | |
| 3. Through inter-agency collaboration, collate existing environmental datasets into the DPI Oil Sill Response Atlas and prepare a sub-plan to the existing DPI OSCP that details possible scenarios and response strategies for the Property. | DPI , DOIR (as required), EPA, DEC, DoF | High |
| 4. Through inter-agency collaboration, prepare guidelines for controlling the introduction of non-indigenous species by managing shipping movements and ballast discharge. | DPI , EPA, DEC, DoF, LGAs | High |
| 5. Evaluate, monitor, and control through appropriate regulations and management, point sources of nutrient inputs and other pollutants into the marine and groundwater environments of the World Heritage Property. | DEC , EPA, LGAs, DoF | Ongoing |
| 6. Review sullage disposal practices and impacts in the Property, and where appropriate facilitate the removal and treatment of sullage from vessels at major ports and anchorages. | LGAs , DPI, WC | Medium |
| 7. Review, and upgrade where appropriate, existing sewage treatment and assess proposals for new developments to ensure that World Heritage values will not be adversely impacted by disposal of effluent. | WC , LGAs, EPA, DEC | Medium |
| 8. Evaluate, monitor and control emission sources that contribute to air pollution in the World Heritage Property. | DoE , EPA | Ongoing |

Expected Outcomes

- ❖ There is improved knowledge of the impacts of pollution on World Heritage values.
- ❖ There are improved monitoring and management practices to manage and control existing and potential non-indigenous marine species.
- ❖ The integrity of the World Heritage Property is protected from the impacts of pollution from developments or other activities.
- ❖ Strategies and actions have been developed and implemented to prevent such impacts occurring.
- ❖ An emergency pollution and oil spill contingency plan for the World Heritage Property is developed.
- ❖ The integrity of the World Heritage values is not being impacted by sullage.
- ❖ Sewerage and effluent treatment and disposal do not impact on World Heritage values.

4.3.9 Introduced Plants

Weed species have the potential to impact upon World Heritage values through displacement of native species and destruction of habitat. The *State Weed Plan* (SWP) (DoA 2001) has been developed to help achieve coordinated and effective weed management throughout Western Australia. The Western Australian Weeds Committee (WAWC) was formed in 2004 as a key recommendation of the SWP and was established as a sub committee of the Natural Resource Management Council (NRMC). The *Environmental Weed Strategy for Western Australia* (EWS) (CALM 1999) is consistent with the *State Weed Plan* and rates environmental weeds as high, moderate, mild or low based on their potential invasiveness, distribution and environmental impacts. This rating provides the basis for identifying control priorities, with the highest rated species and species that pose a specific threat to conservation values within the World Heritage Property being a focus for weed management. Weeds may also

impact on pastoral production values and degrade the aesthetic and recreational values of the Property. Weed invasions are generally related to disturbances, caused by:

- ❖ removal of existing vegetation cover and soil exposure;
- ❖ introduction of seeds and plant material, including species introduced for agricultural purposes;
- ❖ construction, maintenance and use of roads, powerlines and waterlines;
- ❖ fire, cyclones and clearing which remove the vegetation cover;
- ❖ grazing and livestock movements; and
- ❖ movement of people.

TABLE 2. Environmental Weeds rated as ‘High’ and Declared Weed Species recorded in WHP

| Common Name | Taxa |
|---|-------------------------|
| <i>Acetosa vesicaria</i> | ruby dock |
| <i>Aerva javanica</i> | kapok bush |
| <i>Argemone ochroleuca</i> * | Mexican poppy |
| <i>Brassica tournefortii</i> | Mediterranean turnip |
| <i>Bromus diandrus</i> | great brome |
| <i>Carthamus lanatus</i> * | saffron thistle |
| <i>Cenchrus ciliaris</i> | buffel grass |
| <i>Cenchrus setigerus</i> | birdwood grass |
| <i>Echium plantagineum</i> * | Patersons curse |
| <i>Emex australis</i> * | doublegee |
| <i>Lupinus cosentinii</i> | sandplain lupin |
| <i>Lycium ferocissimum</i> | African box-thorn |
| <i>Passiflora foetida</i> | stinking passion flower |
| <i>Passiflora foetida</i> var. <i>hispida</i> | |
| <i>Tamarix aphylla</i> * | athel pine |

* Declared species under the *Agriculture and Related Resources Protection Act 1976* (as of June 2006).

With funding support from the Commonwealth, a collaborative project between the Shire of Shark Bay, Main Roads WA and DEC has produced a weed register for the Property. In their study of the southern Carnarvon Basin, Keighery *et al.* (2000) found eighty-eight taxa of terrestrial weeds or introduced plants. A report provided by the WA Herbarium (18 April 2005) lists 83 taxa as weeds. Of these, ten are rated as ‘High’ according to the EWS and five are declared weeds under the *Agricultural and Related Resources Protection Act 1976* (ARRP Act). They vary in distribution and degree of threat to World Heritage values and have the potential to impact significantly on natural vegetation and fauna habitats within the World Heritage Property.

The extent to which introduced plants may threaten the World Heritage values has not been evaluated. There is currently no co-ordinated weed control program in the World Heritage Property. Landowners, managers and occupiers are responsible for controlling and eradicating weeds declared under the ARRP Act. Currently, there is no legislative requirement for landowners, managers or occupiers to control weeds in the World Heritage Property other than those threatening agriculture and declared under the Act. Administration of the Act is the responsibility of the Department of Agriculture and Food (DoAF).

Potential weeds in the World Heritage Property also include exotic marine plants and micro-organisms. Introduction of these species is usually associated with bilge and ballast discharge from ships, hull fouling, natural dispersal, aquaculture and bait use, deliberate introductions, and dredging activities through disturbance. Introduction of exotic marine flora is discussed in detail under section 4.3.10 *Introduced Animals* since there are more introduced animals than plants in the Shark Bay area. In the World Heritage Property the major shipping activities that occur are involved with servicing the Useless Loop Salt operation. Each year around 40 ships visited the port. Ships are also known to enter

the protected waters of Shark Bay en-route along the Western Australian coastline and discharge ballast water.

Research into the contents of ballast water unloaded at Shark Bay is required to ascertain if plant organisms are being released, and if so, the risk they present to the marine environment. Wyatt (2002) listed one exotic marine plant species (and 9 animal species) from his study of ports in the Shark Bay area (see section 4.3.10 *Introduced Animals* for more details).

Objective

- ❖ Minimise the impact of introduced plants on World Heritage values and the overall integrity of the World Heritage Property.

Strategies

- ❖ Develop and implement a weed management strategy to manage the introduction and spread of introduced terrestrial and marine plants.
- ❖ Implement control strategies for introduced plants that provide the greatest strategic benefit to the protection of World Heritage values and overall integrity of the Property.
- ❖ Monitor the effectiveness of introduced plant control strategies.

| Actions | Primary Responsibility | Priority |
|--|--|-----------------|
| 1. Investigate and report on the status and distribution of introduced plants in the World Heritage Property, and their potential impacts on World Heritage values. | DEC, DoAF, DoF, All land & water managers | High |
| 2. Through consultation, identify and document priorities for control of introduced plants in the World Heritage Property. | All landholders and management agencies | High |
| 3. Facilitate and ensure co-ordinated control programs of introduced plants are undertaken according to identified priorities. | DoAF/DoF, DEC, All landholders and management agencies | High |
| 4. Work with land managers and assist to develop action plans to prevent the introduction of additional weed species infestations and eradication of any declared new weed populations that occur. | DoAF/DoF, DoF, DEC, All landholders and management agencies | High |
| 5. Through consultation, develop procedures and a monitoring program that aims to prevent the introduction and establishment of exotic marine plants in the World Heritage Property. | DoF, DEC, AQIS, DPI | High |
| 6. Through promotional and educational activities, encourage and facilitate community involvement in introduced plant control programs. | DoAF, DEC, DoF | Low |
| 7. Conduct further research on the environmental impacts of introduced land and marine plant species. | DEC, DoF | High |
| 8. Work with land and water managers to regularly monitor the status and distribution of priority introduced plants and the success of control programs. | DoAF/DoF, DEC | High |

Expected Outcomes

- ❖ The presence of introduced plant species, their distribution and potential impacts on World Heritage values are identified.
- ❖ Priorities, by species and location, for weed control are identified by species and locations.
- ❖ Introduced plant control programs are co-ordinated and implemented according to priorities.
- ❖ New introduced plant infestations are minimised and eradicated.
- ❖ The community is actively involved in the implementation of introduced plant control programs.
- ❖ Up to date information is available on the status and distribution of introduced plants and the efficiency of control programs.
- ❖ Introduced plants are not degrading World Heritage values.

4.3.10 Introduced Animals

Feral or introduced animals pose a threat to the integrity of World Heritage values. The most significant threats are from cats, foxes, rabbits and goats. These species prey on native fauna, compete for food and shelter, and damage native plants, habitats and landforms.

An integrated control, and where practicable, eradication program is needed for introduced animals that are threatening World Heritage values. In some instances, further knowledge is required to determine effective control techniques.

At present there are no introduced animals on Bernier and Dorre Islands Nature Reserve. Feral goats were eradicated from Bernier and Dorre Islands in the 1980's. Given the conservation significance of Bernier and Dorre Islands for five threatened mammal species, the potential for the introduction of feral animals (particularly predators) is a threat. The eradication of any introduced animals on the islands is a management priority. This issue is addressed in more detail in the *Shark Bay Terrestrial Reserves Management Plan* (CALM 2000).

Landowners, managers and occupiers are responsible for controlling and eradicating feral animals declared under the ARR Act. Foxes, rabbits and goats are declared under the Act, however feral cats are not. There is, therefore, no legislative requirement for landowners, managers or occupiers to control feral animals in the World Heritage Property other than those threatening agriculture and declared under the Act. Administration of this Act is the responsibility of the Department of Agriculture and Food.

Significant control programs for foxes, cats, goats and rabbits are being implemented on the Peron Peninsula by DEC as part of Project Eden (see section 4.3.3 *Conservation of Native Flora and Fauna*). Feral goat control was commenced in 1990 and has resulted in the removal of over 12 000 goats and a reduction to very low numbers of this species on the Peninsula. Of the initial estimated 2500 foxes on the Peninsula, 95% were eradicated as a result of aerial baiting in 1995. Since then almost total eradication has been achieved and on-going aerial baiting ensures fox numbers are kept at very low levels. Aerial baiting and ground control activities since 1995 have significantly reduced the cat population on Peron Peninsula. The rabbit population, which shows seasonal fluctuations, is being maintained at a reasonable level through myxomatosis (released in 1994), a poisoning program. The release of rabbit calicivirus disease in 1996 and again in 1998 has had limited effect.

A similar program to control foxes, cats and rabbits is being implemented on Heirisson Prong by the Useless Loop Community Biosphere Project Group and CSIRO. On Faure Island, the Australian Wildlife Conservancy has eradicated feral cats and feral goats. Introduced house mice are still present and a small fenced area contains a small number of sheep and a horse. Integrated feral goat control occurs on Zuytdorp Nature Reserve and some pastoral leases in and adjacent to the World Heritage Property. Most pastoral leases within the Property currently raise and sell goats. However if not properly managed goats can result in considerable environmental damage, not only to their own properties but because of ineffective boundary fencing, to neighbouring conservation estate.

There is a relatively small number of known introduced animal species in Australian waters. This suggests that successful invasions are generally rare. Factors such as the physical environment in the recipient region, species specific requirements including minimum size of breeding populations, availability of suitable habitats and biotic resistance of local communities to invasion by non-indigenous species (NIS), likely related to the ‘health’ of the native system, are all likely to influence successful establishment of NIS in a region.

The introduction of marine pest species can have significant economic and ecological consequences by disrupting fisheries, causing extinctions of native species, changing community compositions and altering physical environments. If exotic animal species are able to survive they can have catastrophic consequences on the marine environment such as the prawn and scallop fisheries in Shark Bay. Ultimately no area subject to human utilisation can remain free of exotic marine species and preservation of a unique marine area such as Shark Bay requires management action to limit the introduction, spread and ultimately impacts of NIS (Wyatt *et al.* 2005). The overlap of biotic provinces and mixture of temperate and tropical species suggests that there is potential for a broad suite of NIS to establish (Wyatt *et al.* 2005). Conversely, the high species diversity, high salinity levels and low nutrient concentrations may resist potential invaders (Wyatt *et al.* 2005).

The study by Wyatt *et al.* (2005) focused on sites primarily associated with commercial and recreational vessels, Useless Loop, Carnarvon, Denham and Monkey, and used fouling plates to encrusting species. The study revealed the presence of ten introduced species (1 plant, 9 animals) in Shark Bay (Wyatt *et al.* 2005). In summary Wyatt *et al.* (2005) concluded:

- ❖ the most likely vector for introductions was hull fouling from shipping traffic (domestic/recreational);
- ❖ the extent to which ballast water creates a significant threat the Shark Bay remains to be determined through further assessments, research and monitoring;
- ❖ due to the higher number of species from temperate waters, temperate invaders from southern ports have tentatively been implicated as a greater risk to the Shark Bay area;
- ❖ the capacity for NIS to establish within natural habitats of Shark Bay where impacts on native biota and World Heritage values may be significant, remains unknown and a comprehensive baseline survey of the whole Shark Bay marine area is required; and
- ❖ the potential exists for high impact pest species to pose a significant threat to Shark Bay

Although these non-indigenous species do not include species on the Commonwealth’s ‘target’ list of marine pests, the presence of these species is still considered to be a threat to World Heritage values.

There is potential for the introduction of marine NIS in ballast discharge from ships. Management of ballast discharge in Commonwealth waters is the responsibility of the Australian Quarantine and Inspection Service (AQIS) whilst in State waters it is managed by the DoF. Considerable national effort has been and is continuing to be focussed on developing arrangements to protect Australia from the introduction and translocation of marine pests through ballast water and hull fouling (and other vectors). In 2001 the Commonwealth Government introduced mandatory ballast water management arrangements for all commercial ships carrying international ballast water in an effort to eliminate or minimise Australia’s exposure to exotic marine fauna and flora. AQIS administers these arrangements. In 2005 Australia signed, subject to ratification, the ‘International Convention for the Control and Management of Ship’s Ballast Water and Sediment’ (the Convention). The Convention is yet to be enacted nationally or internationally. In addition the Commonwealth, Northern Territory and States (except NSW) have signed an Intergovernmental Agreement on a ‘National System for the Prevention and Management of Marine Pest Incursion’ (the National System), which generally implements the Convention with the objectives of:

- ❖ preventing the introduction of exotic marine species to Australia;
- ❖ preventing the translocation within Australia of exotic marine species;

- ❖ providing emergency preparedness and response capacity to respond to and, where feasible, eradicate outbreaks of exotic marine species in Australia; and
- ❖ managing and control exotic marine species in Australia

Various elements of the National System have been approved whilst other elements are being developed. Western Australia is actively involved in management efforts through the DoF, who were instructed by Cabinet to take the lead role for the State in developing the national arrangements for the prevention and management of marine pest incursions. The National Introduced Marine Pest Coordination Group has been established to coordinate efforts and provide advice on exotic marine species.

Objective

- ❖ Minimise the impacts of introduced animals on World Heritage values and on the integrity of the World Heritage Property.

Strategies

- ❖ Develop and implement introduced animal management strategy to control the introduction and movement of introduced animals.
- ❖ Implement control strategies for introduced animals that provide the greatest strategic benefit to the protection of World Heritage values.
- ❖ Monitor the effectiveness of exotic terrestrial and marine animals control strategies.

| Actions | Primary Responsibility | Priority |
|--|--|-----------------|
| 1. Investigate and report on the status and distribution of introduced animals in the World Heritage Property, and their potential impacts on World Heritage values. | DEC, DoAF, DoF, All land & water managers | High |
| 2. Through consultation, identify and document priorities for introduced animal control in the World Heritage Property. | DEC, DoAF, DoF | High |
| 3. Facilitate and undertake co-ordinated introduced animal control programs according to identified priorities. | DEC, All land & water managers | High |
| 4. Work with land and water managers and assist to develop action plans to prevent the introduction of additional introduced animal species and eradication of any new populations that occur. | DoAF/DoF, DEC, All land & water managers | High |
| 5. Through consultation, develop procedures and a monitoring program that aims to prevent the introduction and establishment of exotic marine animals in the World Heritage Property. | DoF, DEC, AQIS, DPI | High |
| 6. Through promotional and educational activities, encourage and facilitate community involvement in introduced animal control programs. | DoAF/DoF, DEC, LGAs | High |
| 7. Conduct further research on the environmental impacts of introduced and land marine animal species. | DEC, DoF | High |
| 8. Work with land and water managers and regularly monitor the status, distribution and impact of priority introduced animals and the success of control programs. | DoAF/DoF, DEC | High |

Expected Outcomes

- ❖ The presence of introduced animal species, their distribution and potential impacts on World Heritage values are identified.
- ❖ Priorities for introduced animal control are identified by species and locations.
- ❖ Introduced animal control programs are co-ordinated and implemented according to priorities.
- ❖ New introduced animal infestations are minimised and rapidly eradicated.
- ❖ Feral animals do not become established on Bernier and Dorre Islands Nature Reserve, and other smaller island reserves.
- ❖ Exotic marine animals do not become established within the World Heritage Property.
- ❖ The community is actively involved in the implementation of introduced animal control programs.
- ❖ Up to date information is available on the status and distribution of introduced fauna and the efficiency of control programs.
- ❖ Introduced animals are not degrading World Heritage values.

4.3.11 Fire

Fire is a natural process that occurs in the semi-arid environment and has an important role in determining vegetation structure and composition. Little is known about the effect of fire on vegetation communities in the World Heritage Property. Vegetation structure has been modified through grazing on pastoral leases and this has probably altered natural fire regimes in parts of the World Heritage Property. Further knowledge on fire ecology (the study of the interaction of fire, the biota [plant and animals species, vegetation communities], and habitats in which they live), and the requirements of species and communities is required to protect biodiversity.

There is minimal documentation of fire history in the World Heritage Property. Aerial photography and satellite images provide evidence of numerous small fires in the last 50 years. In recent years many of the fires have resulted from human activities. Appropriate management of fire is essential, since some fire regimes could degrade World Heritage values. In situations where the information on the impact of fire is limited, fire will be used conservatively as a management tool.

The *Shark Bay Terrestrial Reserves Management Plan* (CALM 2000) addresses fire management on existing conservation reserves in the World Heritage Property, including Bernier and Dorre Islands Nature Reserve, Francois Peron National Park and Zuytdorp Nature Reserve.

The Department's State-wide role in fire protection is defined within the *Bush Fires Act 1954* (Bush Fires Act) and its subsequent amendments. Part IV of the Act specifies that the responsibility for controlling and extinguishing bush fires lies with local government authorities and bush fire control officers appointed by them. Fire can threaten human lives and resources valued by the community and there is a responsibility under the Bush Fires Act to protect community values from wildfire. The protection of World Heritage values should be considered in wildfire suppression activities conducted for the protection of life and community assets.

Objective

- ❖ Provide for appropriate fire management in the World Heritage Property in a manner that is consistent with the protection of World Heritage values and the overall integrity of the World Heritage Property.

Strategy

- ❖ Through effective consultation, seek to have the protection of World Heritage values considered as a priority in the planning and response to fire management within the World Heritage Property.

| Actions | Primary Responsibility | Priority |
|---|---|-----------------|
| 1. Contain wildfires through inter-agency support such that World Heritage values are protected to the greatest degree practicable by the most appropriate means available taking into consideration the values of the Property and new knowledge. | BFS, LGAs, DEC, landholders and managers | Ongoing |
| 2. Where appropriate for vegetation management, develop and implement programs to utilise fire to protect and enhance biodiversity and particularly habitat for threatened species and World Heritage values. | DEC, landholders and managers | Medium |
| 3. Facilitate liaison between landholders, managers, local authorities and Indigenous people to ensure that there are consistent policies for fire management. | BFS, DEC, LGAs, Yamatji Corporation | Medium |
| 4. Develop and implement an inter-agency education program to increase community awareness, including visitors and recreational users of the World Heritage Property, in relation to the prevention of fire and the role and use of fire in ecosystem management. | BFS, DEC, LGAs | Low |
| 5. Facilitate and incorporate the results of research into fire prevention, fire control, fire ecology and fire behaviour in the World Heritage Property into fire management and suppression programs in consultation with relevant landholders. | DEC, tertiary institutions | Low |
| 6. Undertake a basic Wildfire Threat Analysis of the Property to determine key assets for protection. | DEC, BFS, FESA, LGAs | Medium |

Expected Outcomes

- ❖ Life and community assets are protected from fire.
- ❖ World Heritage values are protected and enhanced, through appropriate fire management and educational activities.
- ❖ Biodiversity assets are maintained and conserved.
- ❖ There is a consistent approach to fire management and wildfire suppression in the World Heritage Property.
- ❖ The community is aware and supportive of fire prevention measures and of the role and use of fire in ecosystem management.
- ❖ There is increased knowledge of fire ecology and behaviour in the Shark Bay environment.

4.3.12 Recreation

A wide range of activities occurs on the lands and waters of the World Heritage Property. A comprehensive baseline user survey for the World Heritage Property was organised by CALM between June and November 1993. The survey provided baseline data on visitors and visitor use of the World Heritage Property. Site specific visitor surveys have been conducted at Monkey Mia in 2002, 2003 and 2004 and Bernier and Dorre islands in 1994. More detailed surveys have been conducted into the visitor-dolphin interaction (Morsbach 2001) and the how visitors use the visitor centre (Ugarte 2002). The results of these surveys have enabled sound decisions about what recreation activities and facilities to provide throughout the Property.

The baseline 1993 user survey indicated the most popular recreation sites within the World Heritage Property were Monkey Mia, Francois Peron National Park, Shell Beach Conservation Park, Hamelin Pool and Steep Point. The most popular land-based activities included viewing the Monkey Mia dolphins (73.9%), sightseeing (62.25%), photography (57.8%), and picnicking or barbecuing (49.6%).

The most popular water-based activities undertaken in the World Heritage Property were linefishing (45.5%), swimming (37.9%) and power boating (28%). From visitor surveys conducted at Monkey Mia in 2002 and 2003, the dolphin interaction still rates as the most popular activity.

The 1993 user survey indicated that linefishing is the most popular marine-based activity. As such it can have a significant impact on the environment of Shark Bay. The Recreational Fisheries Program of DoF has a strategic plan to conduct creel surveys of recreational fishing in each of the State's bioregions on a rotating bioregion-by-bioregion basis (Sumner *et al.* 2002a). Information on the recreational catch and fishing effort for each bioregion of Western Australia is required to develop management strategies to ensure the sustainability of fishing activities and for the conservation of fish stocks and fish habitat. The data collected will be used to assess the status of stocks for prime recreational species and provide fishing quality indicators such as catch rates, size composition, and variety of species caught. The Gascoyne Coast area was last surveyed in 1998-99.

Sumner *et al.* (2002a) found that the total annual recreational fishing effort for Shark Bay was 89 065 fisher days, comprising 49 321 fisher days by boats launched from public ramps at Nanga, Denham and Monkey Mia, 17 448 fisher days by boats launched from beaches within the marine park and 22 296 days by shore-based fishers. The most common species kept by all recreational fishers in Shark Bay were (in order of weight kept) pink snapper (58 tonnes), blue-lined emperor (22 tonnes), narrow-barred Spanish mackerel (15 tonnes), spangled emperor (7 tonnes), tailor (4 tonnes), whiting species (3 tonnes), western butterfish (2 tonnes) and mullet species (2 tonnes) (Sumner *et al.* 2002a). The catch of pink snapper includes the inner gulf stock (41 tonnes) and oceanic stock (17 tonnes) landed in Shark Bay (Sumner *et al.* 2002a).

Recreational planning has provided the framework and basis for improved visitor management across the Property. The *Tamala-Carrarang Recreation and Tourism Plan* (Safstrom 1998), *Recreation Assessment Study of South Peron* (CALM 2001) and the draft *Shark Bay World Heritage Property Recreation and Tourism Plan* (Regeneration Technology) have all provided valuable information and direction for catering for a range of recreation opportunities in appropriate settings.

Many of the passive recreational activities such as birdwatching, sight seeing and walking have minimal impact on environmental values if sites are developed and managed appropriately. Some of the more active existing recreational use is adversely impacting on World Heritage values. For example, use of the coast for remote four-wheel-driving, camping and fishing is degrading coastal landforms on some areas. It is essential recreation sites and activities are designed and managed to prevent degradation of coastal features and other values of the Property. Wildlife interaction if not managed appropriately and based on the results of sound research, can have a negative impact on the health and breeding of species.

A number of key recreational sites have been developed within the World Heritage Property. Monkey Mia is an intensive use area catering to large numbers. Remote camping is provided for at Francois Peron National Park, South Peron, Gladstone, Bush Bay and at Carrarang and Tamala Stations. Day use facilities are provided at Shell Beach Conservation Park, Hamelin Pool Marine Nature Reserve, Francois Peron National Park and Shire managed sites at Bush Bay, New Beach, Little Lagoon and Eagle Bluff. These and other visitor sites yet to be developed require sustainable management to ensure they do not become degraded or the visitor experience and enjoyment is not compromised. The intent is not so much to restrict numbers but to ensure the activities undertaken are sustainable. This is especially important at intensive use sites such as Monkey Mia where hundreds of people are concentrated within a small area to participate in dolphin viewing. On-going monitoring of the visitor sites and experience is required to measure changes over time.

There are a number of recreation opportunities that could be provided with minimal impact to World Heritage values. These would provide visitors with opportunities to view and enjoy the values of the World Heritage Property. Furthermore, well-managed recreation has the potential to generate greater support for the conservation of Shark Bay's World Heritage values. Recreation developments may

require consultation with Indigenous people, local residents, and possibly the wider community. Recreation site development plans have been completed for Eagle Bluff and the Cape Peron area that provide opportunities for visitors to view wildlife and coastal scenery. The Cape Peron plans provide appropriate mechanisms to control vehicle and pedestrian access at recreation sites around Cape Peron and Skip Jack Point day use areas. Walk trails and lookout facilities will also be developed at strategic sites within the area.

Management plans for the marine and terrestrial conservation reserves and recreation site development plans contain detailed strategies for the management and provision of recreation facilities and activities. A number of recreation areas outside of conservation reserves are being managed by local government authorities and land managers, generally in accordance with site development plans.

Objective

- ❖ Encourage residents and visitors to enjoy and appreciate the values of Shark Bay by providing for diverse and sustainable recreational activities that do not adversely impact on the World Heritage values or overall integrity of the Property.

Strategies

- ❖ Develop recreation opportunities and visitor experiences that enhance presentation of World Heritage values.
- ❖ Promote recreation activities and developments that are consistent with the maintenance and presentation of World Heritage values.
- ❖ Through effective management avoid, or minimise, the adverse impact of the recreation activities on the integrity of World Heritage values or the overall integrity of the Property.
- ❖ Provide information that improves awareness of appropriate recreation that has minimal impact on World Heritage values.

| Actions | Primary Responsibility | Priority |
|---|---|-----------------|
| 1. In consultation with the community and key organisations including Indigenous organisations, implement the Recreation and Tourism Plan for the World Heritage Property. | DEC, Tourism WA, GDC, DoF, LGA, Yamatji Corporation | High |
| 2. Facilitate and provide a range of appropriate planned recreation opportunities in the World Heritage Property through consultation with relevant stakeholders. | DEC, LGAs, Tourism WA, other relevant land & water managers | High |
| 3. Research, evaluate and regularly monitor the impact on World Heritage values of recreation development and activities and sustainable visitor use. | DEC, DoF, LGAs, Tourism WA, other relevant land & water managers | Ongoing |
| 4. Degraded recreation sites to be identified and prioritised for rehabilitation requirements, and where appropriate facilities upgraded in accordance with site development plans. | DEC, LGAs, Tourism WA, other land managers | High |
| 5. Incorporate, where possible, the interpretation of World Heritage values in the provision and management of recreation sites, facilities, services and activities. | DEC, DoF, LGAs, Tourism WA | High |

Expected Outcomes

- ❖ A range of recreation opportunities (from remote through to developed) are developed that increases community understanding and support for the World Heritage Property.
- ❖ Recreation opportunities are used as a means for promoting and advertising the value of World Heritage.
- ❖ Recreation is not adversely impacting on the integrity of World Heritage values.
- ❖ Recreation sites are well managed, with minimal degradation to the landform and other environmental features.
- ❖ Visitor satisfaction levels with recreation sites and facilities within the World Heritage Property continue to be rated highly.

4.3.13 Nature-based Tourism

The significant and diverse range of natural values and features represents a major resource for expansion of nature-based tourism in Shark Bay. In a number of cases existing opportunities to view and experience the World Heritage Property are limited. Nature-based tourism represents an opportunity to increase community knowledge, understanding and enjoyment of the Shark Bay environment with minimal impact on the integrity of World Heritage values. Furthermore, well-managed tourism has the potential to increase community support, and generate essential funds, for the conservation of Shark Bay's World Heritage values.

Tourism WA's *Pathways Forward: Strategic Plan 2003-2008* (2003) identified the need to develop and promote tourism around key iconic experiences in order to provide a platform for a competitive and sustainable tourism industry within limited available resources. The Tourism WA's Destination Development Strategies have been produced to focus regional development resources on enhancing tourism product in iconic experience areas. The *Australia's Coral Coast Destination Development Strategy: An action approach* (Tourism WA 2004) recognises that the World Heritage Property being marketed nationally and internationally as a premium tourism destination.

An increasingly popular tourist activity in the World Heritage Property is wildlife interaction and a wide array of terrestrial and marine wildlife may be of interest to the public for observing. Wildlife interaction is any activity where people seek to interact with wildlife in some way that does not include the physical taking of species. Wildlife interactions are a key component of many nature-based tourism operations, providing opportunities to educate visitors and to foster support for conserving flora and fauna and their habitats. This may include watching marine mammals such as dolphins, whales and dugongs, fish feeding and viewing wildlife events such as turtle nesting, watching terrestrial animals such as those that are a part of Project Eden (see section 4.3.3 *Conservation of Native Flora and Fauna*). It is important to ensure that species targeted for interaction are not adversely impacted and are provided with the appropriate legislative protection and management. Therefore appropriate monitoring of the health and condition of these animals is required and tourist operations modified accordingly to minimise the risk of adverse impacts.

Private tourism developments exist and others are likely to be proposed for the World Heritage Property. It is important that, monitored through the approvals process, they do not adversely impact on World Heritage values. Existing tourism facilities in Shark Bay range from hotel and caravan park accommodation with associated facilities and services at Denham, Monkey Mia and Nanga. A small caravan park is located at the Hamelin Pool Telegraph Station. Dirk Hartog Island also provides tourist accommodation and services. Tourism developments may require consultation with Indigenous people, local residents, and possibly the wider community.

Management plans for the marine and terrestrial conservation reserves contain detailed strategies for management and facilitation of nature-based tourism opportunities. These plans will be compatible with the development of tourism in the region as outlined in the *Shark Bay Regional Strategy* (WA Planning Commission 1997) and consistent with State tourism strategies. Management should provide

equity between users (for example, consider visitors, boat users, tour operators) and provide for a broad spectrum of activities.

In some instances, the provision of facilities and presentation of the World Heritage Property is not well integrated with different destinations displaying different styles and structures of facilities and inconsistent format of information. To minimise their ‘footprint’ on the environment, tourism activities in the World Heritage Property should be coordinated and only those recreational and commercial tourism developments compatible with the management of the World Heritage Property promoted. Liaison and consultation with the tourism industry is crucial in planning and developing tourism within the World Heritage Property. The draft *Shark Bay World Heritage Property Recreation and Tourism Plan* (Regeneration Technology) and *Communication Strategy* (Chapman 2002) address many of these issues.

Promotion of the World Heritage Property by all members of the tourism industry should be accurate and consistent and where possible reflect the objectives relating to the conservation and protection of the World Heritage values. It should provide a clear, consistent and accurate message to visitors as to what World Heritage means and what the values of Shark Bay are. Development of a WHP marketing and promotional package for the Property that all businesses might access and utilise would provide this consistency. The introduction of a recognition or accreditation program for tour operators and guides would be beneficial in achieving this outcome for the World Heritage Property.

Objective

- ❖ Facilitate quality tourism services for visitors that complement the presentation of the World Heritage Property and do not compromise the integrity of World Heritage values or the overall integrity of the Property.

Strategies

- ❖ Develop nature-based tourism opportunities and visitor experiences that enhance presentation of World Heritage values.
- ❖ Promote nature-based tourism activities and developments that are consistent with the maintenance and presentation of World Heritage values.
- ❖ Through effective management avoid, or minimise, the adverse impact of nature-based tourism on the integrity of World Heritage values or the overall integrity of the Property.
- ❖ Seek, through effective consultation, the appropriate marketing and interpretation of the World Heritage Property.

| Actions | Primary Responsibility | Priority |
|---|---|-----------------|
| 1. In consultation with the community and key organisations, implement the Recreation and Tourism Plan for the World Heritage Property. | DEC , Tourism WA, GDC, LGAs, ACC | High |
| 2. Through collaboration between the tourism industry and relevant agencies encourage the development of a range of tourism opportunities and experiences that support the presentation and protection of World Heritage values. | LGA's , DEC, Tourism WA, DPI | Ongoing |
| 3. Evaluate tourism development proposals, including infrastructure associated with the developments, by referral through the environmental assessment process and apply, where appropriate, the annual monitoring of environmental impacts as a condition of approval. | DoE , LGAs, EPA, DEC, Tourism WA | Ongoing |

| | | |
|--|--|---------|
| 4. Research, regularly monitor and evaluate the impact on World Heritage values of nature-based tourism developments and activities and sustainable visitor use. | DEC, DoF, LGAs, Tourism WA, other relevant land & water managers | Ongoing |
| 5. Through regular liaison with tourism industry representatives foster clear, consistent and accurate promotion and a coordinated approach to the provision of information, services and facilities in the World Heritage Property. | Tourism WA, ACC, DEC, LGAs | Ongoing |
| 6. Develop and implement programs for tour operators and guides to be kept well informed. | Tourism WA, ACC, DEC | High |
| 7. Annually monitor tourism promotion to ensure it is accurate, integrated and promotes appropriate use of the World Heritage Property. | Tourism WA, ACC, DEC | Ongoing |

Expected Outcomes

- ❖ A range of nature-based tourism opportunities is developed that increases community awareness, understanding and support for the World Heritage Property.
- ❖ Tourism developments and activities do not adversely impact on the integrity of World Heritage values.
- ❖ The provision of tourist information, services and facilities is integrated, coordinated and presented in a consistent manner as a result of liaison between the tourism industry and agencies.
- ❖ Tourism operators and guides are trained and are providing accurate, consistent and quality information about the World Heritage Property.
- ❖ Marketing and promotion of the World Heritage Property is accurate and consistent with the protection of World Heritage values.

4.3.14 Access

Access is the prime factor that affects use of the World Heritage Property. Access to the World Heritage Property is possible by road, air and water. Currently the main access is by road via North West Coastal Highway from north and south, and then from the Overlander Roadhouse to Denham. With the exception of roads to Denham, Monkey Mia and Shell Beach, access within the World Heritage Property comprises mainly unformed and unsealed roads and tracks. Pastoral station roads and tracks are also used.

Air access is via airstrips at Denham, Carnarvon, Useless Loop and Nanga. Denham and Carnarvon have sealed airstrips with regular airline services. Services are also provided by commercial airlines from Perth, Geraldton and Carnarvon. Most pastoral stations have private airstrips. Powerboats and kayaks/canoes provide access to marine waters and remote coastal areas inaccessible by road. Access by large ships is available at Useless Loop and jetties are located at Denham and Monkey Mia. A number of short walks are provided at several visitor sites across the Property.

In a number of instances, access to the coastline in the World Heritage Property is poorly managed. The open and fragile shrubland vegetation communities of the coast are prone to ad hoc establishment of numerous trails and campsites, with subsequent degradation (clearing, erosion and weed infestation) to the coastal dunes and beaches. In some coastal locations access by a relatively small number of people has caused significant damage. Uncontrolled access to the coast is a threat to the World Heritage values of the Property.

The demand for access within the World Heritage Property is likely to increase. The *ROADS 2020 Regional Road Development Strategy* (MRWA 1997) detailed proposals and priorities to upgrade road access within the region. This includes the following road developments in the World Heritage

Property: upgraded access to Hamelin Pool; upgraded access to Useless Loop and Steep Point; upgraded road access in the Francois Peron National Park; and a review of road access requirements along the Zuytdorp Cliffs at the southern end of the World Heritage Property. Many of these projects will be ongoing.

Improved access throughout the World Heritage Property needs to be balanced with an assessment of the human activity carrying capacity, and the ability to provide adequate management resources for the particular area. This is important so as not to adversely impact on the World Heritage values, yet allow for access and appreciation of the World Heritage Property. Existing inappropriate access should be closed and action taken to prevent establishment of new, uncontrolled access. A range of access to cater for remote through to developed opportunities needs to be considered. The *Tamala-Carrarang Recreation and Tourism Plan* (Safstrom 1998), *South Peron Recreation Assessment Study* (CALM 2002), draft *World Heritage Property Recreation and Tourism Plan* (Regeneration Technology), *Shark Bay Marine Reserves Management Plan 1996-2006* (CALM 1996) and *Shark Bay Terrestrial Reserves Management Plan* (CALM 2000) have identified access management issues and requirements for various sections of the coastline and Property.

Objective

- ❖ Provide for an appropriate level of access in the World Heritage Property that addresses the needs of all stakeholders and which does not compromise the integrity of World Heritage values.

Strategies

- ❖ Improve land and marine access in a manner that provides opportunities for the community to experience and appreciate World Heritage values while minimising adverse impacts on the World Heritage Property.
- ❖ Seek, through effective consultation, access routes that are consistent with the protection of World Heritage values, and maintain the overall integrity of the World Heritage Property.

| Actions | Primary Responsibility | Priority |
|--|-----------------------------------|-----------------|
| 1. Through consultation with relevant agencies, plan, develop and implement a program to upgrade the land and marine access network in the World Heritage Property and minimise impacts on environmentally sensitive lands and waters. | LGAs/MRWA, DEC, DPI | Ongoing |
| 2. Refer new access proposals through the environmental assessment process, and include consideration of the impacts on World Heritage values. | MRWA, LGAs, DEC, EPA, DPI | Ongoing |
| 3. Restrict access and close tracks where they are adversely impacting on World Heritage values. | DEC, LGAs, MRWA | High |
| 4. Through collaboration, identify and implement priorities for the management and restoration of degraded coastal sites in the World Heritage Property. | DEC, LGAs, pastoral lease holders | High |

Expected Outcomes

- ❖ Land and marine access in the World Heritage Property is improved to complement presentation of World Heritage values.
- ❖ Environmental assessment of access proposals considers the impacts on World Heritage values.
- ❖ Roads and access routes are not degrading the integrity of World Heritage values.
- ❖ Degraded access tracks and roads are closed and rehabilitated.

- ❖ Coastal access sites are well managed, with minimal degradation to the landform and other environmental features.

4.3.15 Climate Change

There is now broad scientific agreement that global climate change due to human induced increases in the concentrations of greenhouse gases is already apparent. At a national level Australia's continental average temperature has risen by about 0.7° C from 1910-1999, with most of this increase occurring after 1950 (CSIRO 2001a). Global sea levels are projected to rise by 9cm to 88 cm by 2070 (*Climate Change 2001: The scientific basis*, 2001). The Intergovernmental Panel on Climate Change (IPCC) report *Climate Change 2001: The scientific basis* (2001) provides a more detailed and comprehensive consideration of the potential impacts of climate change.

The Western Australian Greenhouse Taskforce (2004) listed the following changes evident in the Western Australian climate during the last 90 years: rising daily average temperatures; and consistent regional trends in rainfall changes – with the trend in the northern regions being to wetter conditions. It is difficult to translate global predictions to regional climate. Given the climatic characteristics of the World Heritage Property in which the probability of occurrence of precipitation events is so important, magnitude/frequency considerations become especially significant. Climate modelling and analysis by CSIRO (2001b) suggests continued warming and changes in rainfall patterns in Australia including:

- ❖ an increase in the average annual temperature of 0.4 - 2° C over most of Australia by 2030 (relative to 1990), with slightly more warming in north-western Australia;
- ❖ an increase in the average annual temperature of between 1.0 – 6.0 ° C over most of Australia by 2070, with spatial variations similar to those for 2030, and the highest potential increases projected for the northwest of Western Australia; and
- ❖ a likely decrease in rainfall in the south-west – with rainfall projections for other parts of Western Australia less certain.

There are also indications that weather events may generally be more extreme, with increases in floods, droughts and lightning, and that tropical cyclones may have greater peak wind intensity and more intense rainfall (Western Australian Greenhouse Taskforce 2004).

Climate change continues to be the subject of intense international and national focus. Responses to climate change involve a number of global, national, State and local level initiatives including for example, the United Nations Framework Convention on Climate Change, the Kyoto Protocol, and the National Greenhouse Strategy. At a national level climate change resulting from emissions of greenhouse gases has been identified as a key threatening process under the EPBC Act. At State level, the *Western Australian Greenhouse Strategy* (WA Greenhouse Taskforce 2004) facilitates fulfilment of the State's responsibilities regarding national and international agreements regarding climate change.

Climate change presents an additional pressure for native species and ecosystems as well as exacerbating existing pressures such as habitat fragmentation/modification, competition by introduced species and altered fire regimes. The IPCC consider natural systems especially vulnerable to climate change because of limited adaptive capacity, and suggest that whilst some species may increase in abundance or range, climate change will increase existing risks of extinction of some more vulnerable species and increase loss of biodiversity (IPCC 2001, cited in Western Australian Greenhouse Taskforce 2004).

The Department of the Environment and Heritage's (DEH) *National Biodiversity and Climate Change Action Plan 2004-2007* (2004) identifies potential impacts of climate change on Australian species and ecosystems as including:

- ❖ reductions in the geographic range of species;
- ❖ changes to the timing of species' lifecycles;
- ❖ changes in population dynamics and survival;
- ❖ changes in location of species' habitats;
- ❖ increases in the risk of extinction for species that are already vulnerable;
- ❖ increased opportunity for range expansion of invasive species;
- ❖ changes in the structure and composition of ecosystems and communities;
- ❖ changes in coastal and estuarine habitat due to rising sea levels; and
- ❖ changes in plant growth and ecosystem function arising from increased carbon dioxide concentration in the atmosphere.

Climate change also is likely to bring increases in acidity of oceans leading to bleaching events, increases in storm surges and consequent damage to infrastructure.

Species and communities that are already located at the limit of their climatic ranges are likely to be more vulnerable than those located well within their climatic range. The *National Biodiversity and Climate Change Action Plan 2004-2007* (DEH 2004) details other species and communities that may be more vulnerable to climate change including those with:

- ❖ very limited or restricted climatic ranges;
- ❖ limited dispersal ability;
- ❖ very specialised habitat requirements; and
- ❖ small populations and/or low genetic diversity

Within the Shark Bay World Heritage Property there are a number of species and communities that are endemic or at or near the limits of their range (see sections 4.3.3 *Conservation of Native Flora and Fauna* and 4.3.4 *Conservation of Ecological Communities*) and which are likely to be particularly vulnerable to climate change.

The issue of projecting and responding to climate change is complicated by significant knowledge deficits and uncertainty including regarding the interplay of natural climate variability (including phenomena such as the El Niño Southern Oscillation and related weather systems), human induced climate change, regarding future levels of global greenhouse emissions, the capacity of oceans and biological systems to absorb carbon dioxide or other greenhouse gasses, and the global and regional atmospheric and ocean system responses to these chemical changes. Still less certain are region-specific impacts of projected changes to particular climate factors and natural environments. Although some modelling and predictions have been undertaken for the south-west ecosystems, none has been undertaken for northern areas of the State. In view of these uncertainties, climate change management strategies need to:

- ❖ use adaptive management principles that generate better understanding of the interaction between taxa and community resilience and climate factors;
- ❖ be flexible to allow use of better knowledge as it is generated;
- ❖ promote the resilience of taxa and communities to climate change by limiting or reducing those pressures over which we have some management control;
- ❖ manage for uncertainty (e.g. by extending the conservation reserve system as appropriate and providing buffers, corridors and climate refugia);
- ❖ monitor changes to taxa and community structure and representation over time; and
- ❖ reducing knowledge deficits about climate variability and change.

In recognition of the need to better understand climate variability and change on biodiversity the *Western Australian Greenhouse Strategy* (WA Greenhouse Taskforce 2004) includes specific provision for investigation into the biodiversity impacts due to future climate change. At the individual reserve level, implementing strategies that create reserves, control pest animals and weeds, manage fire, and re-introduce threatened native plants and animals, will help improve the resilience of species

and ecosystems and hence decrease their vulnerability to climate change. In addition, strategies that aim to rehabilitate vegetation and reduce overgrazing by introduced and native herbivores will assist in increasing the amount of carbon that is sequestered in the land and therefore contribute towards managing climate change.

Objective

- ❖ Minimise the impacts of climate change on World Heritage values and on the integrity of the World Heritage Property.

Strategies

- ❖ Understand the effects of climate change on the Shark Bay World Heritage Property.
- ❖ Developing adaptive management practices as new knowledge is acquired.

| Actions | Primary Responsibility | Priority |
|--|-------------------------------------|-----------------|
| 1. Investigate the potential vulnerability of WHP species and communities to climate change (in particular species and communities of special conservation significance or likely to be highly vulnerable to climate change) and facilitate and complement delivery of broader climate-biodiversity research priorities. | DEC, DoF, State Sustainability Unit | Ongoing |
| 2. Implement climate change adaptive management practices as necessary in response to new knowledge, changes in State-wide climate-biodiversity strategies or improved understanding of biological systems. | DEC, DoF, DPI | Ongoing |
| 3. Incorporate the potential for climate change impacts into recovery plans for threatened species and communities. | DEC, DEWHA | Medium |
| 4. Ensure the reserve system is comprehensive, representative and adequate to provide climate refugia and protect biological entities and systems. | DEC, DoF, DEWHA | High |
| 5. Implement strategies within this plan aimed at rehabilitation of vegetation and reducing overgrazing by native and introduced herbivores. | DEC, DoA, | Ongoing |

Expected Outcomes

- ❖ Improve knowledge and understanding of climate change, its processes and impacts.
- ❖ Management practices acknowledge potential impacts of climate change and strategies in place to manage change.
- ❖ Adequate areas set aside for conservation protection and act as climate refugia.
- ❖ Introduced plants and animals controlled and opportunities for vegetation recovery and growth maximised.

4.3.16 Mineral Resource Development

World Heritage listing does not prevent development but developments are carefully evaluated under the *Environmental Protection Act 1986* (Environment Protection Act) and only allowed to proceed if they can be implemented in a way that does not compromise the values for which the area was listed. The Environmental Protection Authority (EPA) has developed *Guidance Statement for Assessment of Development Proposals in Shark Bay World Heritage Property No. 49* (2000) for assessing environmental factors of developments.

In addition to the EPA needing to assess development proposals for the Shark Bay area, the Shark Bay World Heritage Property is a matter of National Environmental Significance under the Commonwealth EPBC Act. Accordingly, proponents are responsible for referring a proposal that has, will have or is likely to have a significant impact on World Heritage values of a declared World Heritage Property to the Commonwealth Minister for the Environment, Heritage and the Arts for approval.

An activity can be permitted in the World Heritage Property if it will be carried out in a manner that is consistent with the protection of World Heritage values. This test will need to be applied to any proposal for mineral resource exploration and development in Shark Bay. In applying this test, it is clear that mineral resource exploration and development in some parts of the World Heritage Property will not be compatible with the protection of World Heritage values. In these parts of the World Heritage Property, mineral resource exploration and development will not be permitted.

A high priority is to identify both terrestrial and marine areas that should be placed in a category where mineral resource exploration and development will not be permitted. These areas should then be clearly indicated in all management plans affecting the Property. Proposals for mineral exploration and development in these areas will not be considered, and so no environmental impact assessment will be initiated. Mining in terrestrial reserves is based on section 24 of the *Mining Act 1978* (Mining Act). The Department of Industry and Resources (DoIR) has provided direction about dealing with such areas in its Information Series No. 11 *Guidelines for Mineral Exploration and Mining Access within Conservation Reserves and other Environmentally Sensitive Lands in Western Australia* (1998).

In relation to those areas in which exploration and development are not prohibited, all applications will be subject to the environmental assessment process identified in section 4.2.3 *Impact Assessment* of this Plan. Applications will be approved only if the assessment process clearly demonstrates that the relevant activities will not have an adverse impact on World Heritage values or the overall integrity of the World Heritage Property.

The 1997 State-Commonwealth Agreement provided for the continuation of existing commercial activities as long as they complied with existing controls and was not a threat to the World Heritage values of the Property. On this basis, these existing activities have been allowed to continue, subject to compliance with relevant conditions and ongoing monitoring.

A number of mining activities were occurring or were proposed within or adjacent to Shark Bay prior to World Heritage listing. These included shell extraction and solar salt production. Shark Bay was accepted for inscription on the World Heritage List on this basis, indicating that the World Heritage Committee was satisfied that, with appropriate management, these existing activities would not threaten the values or the integrity of the Shark Bay World Heritage Property. The solar salt production lease and previously worked gypsum leases were excluded from the Property, as they were highly modified areas that would not meet the World Heritage criteria or conditions of integrity.

Mineral tenements (and applications for mining leases and exploration licenses) present within or adjacent to the World Heritage Property include those for gypsum, mineral sands, shell coquina (see section 4.3.19 *Basic Raw Material Use*) and salt (see section 4.3.18 *Salt Production*).

The cancelled gypsum mining leases at Brown Inlet are excluded from the World Heritage Property. The unexploited gypsum mining tenements located on northern part of Peron Peninsula have recently been relinquished and these areas should be included in the François Peron National Park.

Current exploration activity to assess resources of heavy mineral sands is taking place on exploration licences to the south and east of the southern terrestrial portion of the World Heritage Property. There are also several granted mining leases in this area that cover the recently discovered Amy Zone of heavy mineral sand deposits. Any future proposal to conduct exploration activities within the Property will be viewed in accordance with the assessment process set out in the 1997 Inter-governmental Agreement and relevant State and Commonwealth legislation, and will be subject to assessment that it

may be undertaken in a manner that is consistent with the protection of the World Heritage values. Those areas where an exploration licence extends into the Property are currently the subject of a 'no mining' condition.

Shell deposits (*Fragum erugatum*) are extracted from a mining lease and a quarry on Reserve 41076 adjacent to L'haridon Bight. The shell deposits are used primarily for the production of high quality extender and filler material. The mine provides granulated shell for the poultry industry, which aids in egg production and hardening of shells. It is also used as a basic raw material for road construction within the Shark Bay area (see section 4.3 19 *Basic Raw Material Use*). Environmental conditions imposed by the Environmental Protection Authority provide guidelines to ensure that shell extraction is sustainable in the long term and any new proposals would require environmental assessment in accordance with State and Commonwealth legislation. The *Fragum* deposits of L'haridon Bight are one of the identified World Heritage values of Shark Bay and contribute to the integrity of the World Heritage Property. Some research on the biology of this species has been undertaken to determine the potential shell accretion rates for L'haridon Bight. Shell extraction and processing infrastructure are visible from the popular Shell Beach visitor site. Extraction and product processing has the potential to adversely impact the aesthetic value of the area and these impacts may need to be managed.

Coquinite (consolidated *Fragum* shell) is extracted from a quarry reserve near the Hamelin Pool Telegraph Station. This resource is limited, and as such, must be carefully managed. The Shire of Shark Bay manages this area in accordance with the *Hamelin Pool Common Management Plan* (2001). Coquinite has been traditionally used in the construction of buildings, many of which have heritage value. Continued strictly regulated use of the deposits is necessary for the maintenance of these heritage buildings.

Disturbance of the seabed may impact on geomorphological and biological processes and, therefore, may impact on World Heritage values. Exploration and development proposals for the marine environment will also require environmental assessment, in accordance with the 1997 State-Commonwealth Agreement.

Evaporitic rocks within the Silurian sequence (e.g. sandstone, siltstone and limestone) may contain more valuable components, such as sylvite (KCl). No occurrences are known in the Shark Bay region, but if indications of its presence were to be found there could be demand to explore for it. No other minerals are considered to be prospective in the prevailing economic and strategic climate. Any new proposals will be subject to the regulatory framework set out in this Section.

Objective

- ❖ Ensure that mineral resource exploration and development does not impact on World Heritage values and the overall integrity of the World Heritage Property.

Strategies

- ❖ Identify areas in which mineral resource development will not be permitted.
- ❖ In relation to other areas, seek, through consultation, the appropriate assessment of mineral resource development proposals in the World Heritage Property.

| Actions | Primary Responsibility | Priority |
|--|--|----------|
| 1. Manage mineral resource exploration and development in accordance with relevant State legislation such as the Mining Act and the Environmental Protection Act, and relevant Commonwealth legislation. | DoIR, EPA, DEC, DEWHA, other relevant agencies | Ongoing |

| | | |
|---|---|---------|
| 2. Identify in management plans the parts of the Shark Bay World Heritage Property in which mineral resource development will not be permitted. | DEC , LGAs, DoF | Ongoing |
| 3. Refer relevant mineral resource exploration and development proposals through the environmental assessment process, and include consideration of the impacts on World Heritage values and on the overall integrity of the World Heritage Property. | Proponent , DoIR, EPA, DEC, DEWHA, other relevant agencies | Ongoing |
| 4. Apply, where appropriate, the annual monitoring of environmental impacts as a condition of approval for exploration and mining activities in the World Heritage Property. | DoIR , EPA, DEC | Ongoing |

Expected Outcomes

- ❖ Mineral resource exploration and development is not degrading World Heritage values and the overall integrity of the World Heritage Property.
- ❖ The environmental impacts of exploration and mining are being regularly monitored and reported on.

4.3.17 Petroleum Resource Development

Petroleum resource development, both exploration and extraction, and associated infrastructure may have the potential to impact on World Heritage values. The disturbance of the seabed may impact on geomorphological and biological processes and, thus, exploration proposals require environmental assessment.

In 1994 the State Government announced its general policy on petroleum exploration and extraction in marine conservation reserves, *New Horizons*. No drilling or production will be allowed in marine nature reserves (e.g. Hamelin Pool) or in Sanctuary or Recreation Zones in marine parks. Drilling and production will be possible in those portions of General Use Zones where it has been established that such activities will not impact on sensitive marine habitats. Drilling and production will not be permitted in Special Purpose Zones where such activities are incompatible with the purpose of the zone. Seismic surveys may be permitted into areas that are not available for drilling. Any proposals for exploration and production are referable under the Environment Protection Act process. This policy framework has been given statutory standing through the *Acts Amendment (Marine Reserves) Act 1997*. Any petroleum activity within the Property will also need to be referred to the Department of the Environment, Water, Heritage and the Arts for assessment under the EPBC Act.

Currently, those parts of the World Heritage Property where drilling and production are not allowed are the Hamelin Pool Marine Nature Reserve, eight Sanctuary zones and three Recreation zones (around 7.5% of the total area of the Property). There are also six Special Purpose zones (around 8% of the total area of the Property) within the Shark Bay Marine Park, where such activities may not be allowed if they are assessed as incompatible with the conservation purpose of the zone. The location and extent of these zones can be found in the *Shark Bay Marine Reserves Management Plan* (CALM 1995). This marine plan is to be reviewed in the near future.

The Shark Bay region has not seen active petroleum tenements for over 25 years. However, the status of the one petroleum exploration tenement currently in the World Heritage Property, Euro Pacific Energy Pty Ltd Exploration Permit EP 406, is ‘pending renewal’ and extends from Bernier and Dorre Islands to the Carnarvon Coast. No field exploration activity has occurred within this tenement. The DoIR, as the decision-making authority as defined in Section 38 of the Environment Protection Act, will refer petroleum proposals in accordance with Section 38(1) of the Act, and refer to the EPA a proposal that appears likely, if implemented, to have a significant effect on the environment.

The policy to be applied in relation to petroleum resource development in the World Heritage Property has been reviewed. In order to progress this review, the 1997 State-Commonwealth Agreement sets out a process for addressing the issue of whether petroleum exploration and extraction is compatible with the protection of World Heritage values in Shark Bay. The WA Minister for the Environment sought advice from the Environmental Protection Authority under S.16 (e) of the Environment Protection Act regarding environmental aspects of petroleum exploration and extraction activities within the Property. The section 16(e) report was completed in October 2003. In summary the report states that petroleum exploration and extraction in the Shark Bay World Heritage Property is incompatible with the maintenance of natural and cultural heritage values. However the report notes three scenarios where some development might be considered.

Having received advice from the EPA, the WA Minister for the Environment will refer this advice to the Commonwealth Minister for the Environment, Heritage and the Arts. Relevant State and Commonwealth Ministers will then decide whether petroleum exploration and extraction activities are compatible with the protection, conservation and presentation of the Property and, if so, will agree on a framework for the administration and regulation of these activities. If the Ministers decide that exploration and development activities are not compatible with the protection, conservation and presentation of the Property, then no exploration or development activities will be permitted in the Property. If the Ministers decide that such activities are compatible, then a framework for the regulation of these activities will be agreed. This framework would, *inter alia*, set out environmental assessment and approval processes and would identify areas in respect of which applications would be considered. Relevant State and Commonwealth legislation will apply.

Objective

- ❖ Ensure that petroleum resource development does not adversely impact on World Heritage values and on the overall integrity of the World Heritage Property.

Strategy

- ❖ Evaluate the compatibility of petroleum development and establish State Government policy on the basis of this evaluation.

| Actions | Primary Responsibility | Priority |
|---|------------------------|----------|
| 1. Manage petroleum resource exploration and development in accordance with relevant State legislation such as the Petroleum Act and the Environmental Protection Act, and relevant Commonwealth legislation. | DoIR, EPA, DEC, DEWHA | High |
| 2. Relevant agencies to ensure that advice provided to Ministers (or the EPHC) relating to petroleum resource development within the Property is consistent with State Government policy and administrative procedures. | DoIR, EPA, DEC, DEWHA | High |

Expected Outcomes

- ❖ Petroleum resource exploration and extraction are not degrading the integrity of World Heritage values.
- ❖ As required, the environmental impacts of exploration and mining are being regularly monitored and reported on.

4.3.18 Salt Production

The Shark Bay Salt operation at Useless Loop and Useless Inlet was established in 1965, prior to World Heritage Listing of Shark Bay. It was excluded from the World Heritage Property because the area had been highly modified and would not meet the World Heritage natural criteria and integrity requirements. The Property was inscribed on the World Heritage List as it was accepted that this activity could be managed to avoid being a threat to the World Heritage values or integrity of the Property. Some activities of the operation, such as dredging of the Denham channel and disposal of dredge spoils, occurs within the World Heritage Property. It is important to ensure that rigorous controls and monitoring are applied to any of the operation's activities that may impact on the World Heritage Property, so that such impacts can be avoided or minimised.

The salt operation is managed in accordance with the *Shark Bay Solar Salt Industry Agreement Act 1983* (State Agreement Act), an agreement between the State and the Shark Bay Salt Joint Venture (SBSJV). This State Agreement Act provides SBSJV with the right (and also the obligation) to carry out solar salt production on the project site and the maintenance of all necessary infrastructure to support that operation. This includes any expansion at Useless Loop or Useless Inlet, expansion of wharf facilities and expansion of the Denham channel by dredging. The DOIR administers the State Agreement Act.

The State Agreement Act requires SBSJV to operate in accordance with State environment legislation and also contains provisions requiring on-going environmental investigation, monitoring and reporting for the duration of the project. Environmental reporting is on a three-year cycle of two annual interim reports and a detailed triennial report, in which past performance is evaluated and plans for the next three-year period are put forward. DoIR and other relevant agencies review the reports.

The triennial reporting procedures allow the State or the developer to seek amendments to existing environmental programs. This normally results from a review of past results, experience and changes in technology or project structure. If the State is not satisfied with changes proposed by the developer, the responsible Minister can then require amendments to the program.

With about 40 ship loadings per year at Useless Loop, the most significant potential impacts on the World Heritage Property from salt mining include the risk of oil spillage from a shipwreck and the possibility of introducing foreign biota via hull fouling and ballast waters. These issues are addressed in sections 4.3.8 *Pollution*, 4.3.9 *Introduced Plants* and 4.3.10 *Introduced Animals*.

Bitterns and other discharges from the salt operation and other operations such as dredging must be managed in such a way that there is no impact on World Heritage values. There is a program in place to monitor whether dredging has an impact on salinity levels in Freycinet Estuary. There is a proposal to use larger ships to enable larger loads to be carried. This will require deeper dredging of the access channel. Issues of concern are the impact on water quality, coastal planning implications, where the spoil material will be dumped, the timing of the works (e.g. avoid important dugongs and prawn seasons) and what on-going monitoring will be put in place. All proposals for expansion must be subject to the environmental impact assessment process set out in section 4.2.3 *Impact Assessment*.

The SBSJV has applied for Special Act Mining Leases 276A and 280A to expand the existing salt field. These applications have been made pursuant to Clause 5A of the State Agreement Act which specifically provides for SBSJV to apply for further mining leases. The additional lease applications are within the World Heritage Property and Clause 5A(2) of the State Agreement Act provides that the State will deal with the applications in accordance with the Mining Act and other applicable legislation and 1997 State-Commonwealth Agreement.

Objective

- ❖ Ensure that operations of Shark Bay Salt Joint Venture do not adversely impact on World Heritage values and the overall integrity of the World Heritage Property.

Strategy

- ❖ Through effective consultation, seek to have the protection of World Heritage values considered in the management and control of Shark Bay Salt Joint Venture operations.

| Actions | Primary Responsibility | Priority |
|---|----------------------------|----------|
| 1. Regularly monitor, and report on, environmental management of the operations of SBSJV in accordance with the Agreement Act. | DoIR, SBSJV, EPA, DEC, DoF | Ongoing |
| 2. Refer new operational proposals by SBSJV through the environmental assessment process, and include consideration of the impacts on adjacent World Heritage values. | DoIR, EPA | Ongoing |

Expected Outcomes

- ❖ The continuation of salt production in Shark Bay.
- ❖ The operations of SBSJV are not degrading the integrity of adjacent World Heritage values.
- ❖ The environmental impacts of the operations of SBSJV are being monitored and reported.

4.3.19 Basic Raw Material Use

Basic raw materials (BRM) within the World Heritage Property that are currently utilised include gravel, sand, limestone, gypsum and shell grit/coquina. These are used for construction and maintenance purposes and approval for extraction is effected through various mechanisms depending on which organisation has legislative responsibility for the land or resource.

Extraction of basic raw materials on Crown lands may occur under a mining lease granted under the Mining Act with approval of the vested authority. Local Authorities generally extract basic raw materials for their own use through the creation of quarry reserves on Crown land under the Land Administration Act or under the powers of the *Local Government Act 1995* (Local Government Act) on other land tenures. DEC may utilise BRM on lands it manages without licence or allow access by Local and State Government through various methods depending on the tenure of the land. Limited access for other Government authorities to conservation reserves may be allowed in accordance with DEC and Conservation Commission of Western Australia policy. BRM extraction operations are regulated and managed by DoIR in consultation with DEC with respect to environmental issues.

BRM on private land are not defined as minerals under the Mining Act. Consequently BRM are extracted through extractive industry licences issued under the Local Government Act. Private landowners and pastoral lessees may utilise BRM on properties they own or lease for their own purposes without licence. Main Roads Western Australia may access BRM from private land under the powers of the *Public Works Act 1902*, and as outlined above for Crown land.

Unless properly managed, BRM extraction and associated infrastructure have the potential to impact on World Heritage values, particularly the visual landscape. Currently, where BRM extraction is likely to have a significant impact on the environment it is subject to assessment under the Environmental Protection Act. Otherwise monitoring and rehabilitation may be the responsibility of Local Government, DoIR, DEC, a pastoral lessee or a private operator, depending on the mechanism of extraction. Standards of management of BRM extraction and rehabilitation vary depending on the

operator and the controlling authority. As several agencies are involved, coordination of BRM extraction is required.

The planning and coordination of BRM extraction is proposed to be addressed in a plan to be prepared by the organisations responsible for the resource and the land upon which the resource occurs. The BRM plan will address resource availability, demands and a process to ensure World Heritage values are not adversely impacted by these activities. Particular attention will be given to ensuring there is appropriate access for BRM extraction on South Peron. As a first phase in this process, DOIR prepared a report in 1996 documenting an inventory of the available BRM within the World Heritage Property was produced. Although there is no shortage of road materials, transportation distances will increase the cost of using the materials.

Shell deposits (*Fragum erugatum*) are extracted from a mining lease and a quarry on Reserve 41076 adjacent to L'haridon Bight (see section 4.3.16 *Mineral Resource Development*). The shell deposits are used as a basic raw material within the Shark Bay area. Environmental conditions established by the Environmental Protection Authority provide guidelines to ensure that shell extraction is sustainable in the long term. The extraction of coquinite (consolidated shell deposits) also requires careful management (see section 4.3.16 *Mineral Resource Development*)

Objective

- ❖ Ensure that basic raw material extraction does not adversely impact on World Heritage values and the overall integrity of the World Heritage Property.

Strategy

- ❖ Through consultation, identify sources of basic raw materials and seek to establish appropriate management and controls for basic raw material extraction in the World Heritage Property.

| Actions | Primary Responsibility | Priority |
|---|---|-----------------|
| 1. Manage basic raw material extraction in accordance with the Mining Act, Environmental Protection Act, Local Government Act, and other relevant State and Commonwealth legislation and policies. | DoIR/LGAs/DEC , EPA, other relevant agencies | Ongoing |
| 2. Ensure that the environmental assessment process applies to environmentally significant proposals for basic raw material use. | Proponent , EPA, LGAs, DPI, DoIR, DEC | Ongoing |
| 3. Through inter-agency consultation prepare a basic raw material plan for the World Heritage Property, and manage extraction in accordance with this plan. | DOIR/LGAs/MRWA , DEC | High |
| 4. Through liaison with relevant agencies identify and rehabilitate existing and disused basic raw material sites. | DoIR/LGAs/DEC , MRWA, DPI, EPA | Low |
| 5. Identify opportunities and facilitate research into the natural processes that influence the shell deposits at L'haridon Bight. | DEC , DoIR | High |
| 6. Manage sustainable extraction of <i>Fragum erugatum</i> shell deposits on the eastern shore of L'haridon Bight in accordance with environmental conditions established under relevant legislation such as the Environmental Protection Act and Mining Act. | EPA , DoIR, LGAs, DEC | Ongoing |
| 7. Manage extraction of coquinite in accordance with the Hamelin Pool Common Management Plan. | LGA , DoIR | Ongoing |

Expected Outcomes

- ❖ Basic raw material extraction is not degrading the integrity of World Heritage values.
- ❖ Basic raw material extraction is occurring in accordance with a basic raw material plan that addresses progressive rehabilitation of sites.
- ❖ All basic raw material sites are rehabilitated.
- ❖ Research has produced an improved understanding of the ecological processes of shell deposition in L'haridon Bight.
- ❖ Shell extraction in L'haridon Bight is occurring on a sustainable basis.
- ❖ The coquinite resource is managed with limited extraction.

4.3.20 Fisheries

Commercial fisheries in the Shark Bay area operate in both State and Commonwealth waters. As such they are subject to both State and Commonwealth legislation and policies as well as international agreements. In State controlled waters (up to 3 nm), the DoF has statutory responsibility for the management and regulation of recreational and commercial fishing, aquaculture and pearling in accordance with the Fish Resources Management Act and Pearling Act. These fisheries may have a direct (e.g. through access) or indirect impact on terrestrial reserves and proposed reserve additions. The DoF has prepared several fisheries management papers for the Shark Bay area to guide fisheries management.

A Memorandum of Understanding (MOU) has been developed between the Minister for the Environment and the Minister for Fisheries to establish principles of cooperation and integration between the DEC and the DoF in the management of the State's marine protected areas. Collaborative operational plans will be developed between DEC and DoF to ensure efficient and effective delivery of a range of programs where there is overlapping or shared agency responsibility or mutual interest, including patrol and enforcement. Specific actions include joint patrols, cross-authorisation of agency staff, improved liaison and reporting arrangements.

Some fisheries activities may have the potential to degrade World Heritage values if not managed appropriately. It is therefore necessary to ensure that management arrangements are in place and implemented in a timely way, to ensure that fisheries that occur within the World Heritage Property do not degrade World Heritage values. Various fish management papers for the area have been prepared to assist in managing fish resources.

The DoF is committed to the implementation of Ecologically Sustainable Development (ESD) for the management of the State's fish resources. The Fish Resources Management Act allowed the DoF to take a more pro-active role in the sustainable management of marine, estuarine and riverine ecosystems and establish a Fish and Fish Habitat Protection Program. In accordance with the national strategy, ESD considers environmental, social and economic well-being issues associated with the activity being examined. A national ESD framework for fisheries has been created. Each fishery can be assessed, taking into account issues such as technological changes, natural cycles of fish species, market supply and demand, and job creation in new fisheries. From 2003, only fisheries that harvest in an ecologically sustainable manner, i.e. can demonstrate that their fishing operations and methods are not endangering any species or ecosystem, will be allowed to continue operation and be granted export approval. The Commonwealth DEWHA is the body responsible for assessing whether a fishery shows it is harvesting in an environmentally sustainable manner and providing certification so the product can be exported. Commercial fisheries that export, operate in Commonwealth waters or World Heritage areas, are independently assessed against ESD guidelines under the EPBC Act by the Commonwealth Minister for the Environment, Heritage and the Arts. All the Shark Bay managed fisheries (apart from the Beach seine and wetline fishery) have undergone this assessment process and passed.

At a State Level, the Government released *New Horizons – The Way Ahead in Marine Conservation*

and Management (1998) which provides guidance on the establishment and management of marine conservation reserves. At a national level, the conservation of marine biodiversity, maintenance of ecosystem integrity and the sustainable use of marine resources are addressed by the Inter-governmental Agreement on the Environment. This is implemented through actions developed under national strategies such as the *National Strategy for Ecologically Sustainable Development* (1992), the *National Strategy for the Conservation of Australia's Biological Diversity* (1992), *Australia's Oceans Policy* (1998), and the *Strategic Plan of Action for the National Representative System of Marine Protected Areas: A Guide for Action by Australian Governments* (1999).

Commercial fisheries are an important economic and social component of Shark Bay worth approximately \$34.2 million for the year 2004-05 (Penn, Fletcher and Head 2005). Some aquaculture (including pearling) occurs in Shark Bay. Recreational fishing is a major activity of visitors and locals and also a tourist attraction. Line fishing has been a highly popular activity and is conducted from boats, beaches and cliffs. Commercial and recreational fishing occurred prior to World Heritage Listing.

Commercial and recreational fishing, and aquaculture operations, are controlled and regulated under the Fish Resources Management Act and managed by the DoF on the basis of ecological and fish stock sustainability. The DoF prepared the *Shark Bay World Heritage Property: Management Paper for Fish Resources No. 91* in 1996. This paper addresses potential impacts on World Heritage values by fisheries activities and recommends appropriate management strategies to ensure the maintenance of these values. This has been prepared in conjunction with, and complements, the *Shark Bay Marine Reserves Management Plan 1996-2006* (CALM 1996). The Management Paper provides a detailed basis for management of Shark Bay's fish resources.

In 1996 the DoF prepared an *Aquaculture Development Plan for the Gascoyne* (1996), which includes the Shark Bay area. This plan identifies areas potentially suitable for future aquaculture activities taking account of the environmental conditions and the needs of other user groups. The plan also identifies possible environmental impacts that might result from aquaculture activities and management requirements that may mitigate these impacts. More recently a draft *Aquaculture Plan for Shark Bay* (DoF 2004) has been released. This draft Plan builds upon the *Aquaculture Development Plan for the Gascoyne* (DoF 1996) and aims to provide guidance to aquaculture proponents, the community and government agencies on the future development of aquaculture activities in the Shark Bay area, while conserving World Heritage values. This Plan identifies constraints to aquaculture development, areas where aquaculture may occur, and appropriate species that may be used.

There is increasing interest in the establishment of land bases for aquaculture, and for the use of artesian water for aquaculture pursuits in Shark Bay. The demand for sites for aquaculture (including pearling for non-maxima species) is also increasing within the waters of Shark Bay. Pearl oyster culture is a newly developed industry that has already attracted considerable investment. Careful planning for the future development of this industry is required so as to not adversely impact on the marine environment and visual seascape values of the World Heritage Property. Proposals will be assessed using Ministerial Policy Guideline No. 8 (DoF) that outlines referral bodies and environmental impact assessment requirements.

Within the World Heritage Property and as at April 2004, there are six non-maxima pearl oysters, one land-based finfish hatchery trialling the production of pink snapper, and two licences for sea-cage aquaculture of finfish (draft *Aquaculture Plan for Shark Bay*, 2004). These are all licensed under the Fish Resources Management Act.

The Shark Bay Prawn managed fishery is a significant industry in the Shark Bay area with commercial production of 1,748 tonnes (mostly king prawns) and an estimated annual value of \$24.4M in the year 2004-05 (Penn, Fletcher and Head 2005). Management of the fishery is based on limited entry, crew limitations, gear controls, season and area openings and closures, moon phase closures and daily fishing time controls. Management of bycatch is important for the ecological sustainability of the

fishery and the DoF released a draft *Bycatch Action Plan for the Shark Bay Prawn Managed Fishery* in 2002. Bycatch reduction devices have been fitted to trawl fisheries (Bunting 2002) and secondary bycatch devices to reduce the incidence of turtle captures will be compulsory on all nets from 2005 (Penn, Fletcher and Head 2005). The industry is managed under the *Shark Bay Prawn Management Plan* (DoF 1993).

The Shark Bay Scallop managed fishery is a smaller but still significant industry in the Shark Bay area with commercial production of 1,665 tonnes and an estimated annual value of \$6.2M in the year 2004-05 (Penn, Fletcher and Head 2005). The industry is managed under the *Shark Bay Scallop Management Plan* (DoF 1994).

The Shark Bay Beach seine and mesh net managed fishery is sustainably managed by applying a limited number of licences and by the type and amount of gear that can be used. The fishery includes the taking of whiting, sea mullet, tailor and yellowfin. It had an estimated annual value of about \$887,000 in 2004/05 (Penn, Fletcher and Head 2005). The industry is managed under the *Shark Bay Beach Seine and Mesh Net Management Plan* (DoF 1994).

The Shark Bay snapper managed fishery has been in operation since the late 1980s. Since 2001 sustainable management of pink snapper has been subject to a quota system. A total allowable catch is set which involves setting explicit target biomass ceiling levels by areas and sector. In 2004-05 the quota was reduced from previous years and the prawn and scallop managed fisheries elected not to take their snapper quota. The estimated value of the industry was \$3.3M in 2004/05 that included \$1.68M of other finfish (Penn, Fletcher and Head 2005). During the same period, the recreational fishing component was estimated as contributing about 7.5% of the commercial fishing production (Penn, Fletcher and Head 2005). The industry is managed under the *Shark Bay Snapper Management Plan* (DoF 1994) and Amendment (2000).

Objective

- ❖ Ensure that commercial and recreational fisheries do not adversely impact on World Heritage values and the overall integrity of the World Heritage Property.

Strategy

- ❖ Through effective management, consider the protection of World Heritage values in the management and control of commercial and recreational fisheries.

| Actions | Primary Responsibility | Priority |
|---|-------------------------------|-----------------|
| 1. Manage fisheries, in accordance with the Shark Bay Marine Reserves Management Plan, Shark Bay World Heritage Property Management Paper for Fish Resources, controls and regulations provided under the Fish Resources Management Act, and relevant State and Commonwealth legislation. | DoF, DEC, DEWHA | Ongoing |
| 2. Regularly monitor, and report on, the states of targeted fish species in Shark Bay. | DoF | Ongoing |
| 3. Assess aquaculture proposals in accordance with the environmental impact assessment process set out in section 4.2.3 and procedures established under the Fish Resources Management Act, and include consideration of the impacts on World Heritage values. | DoF, EPA, DEWHA, DEC | Ongoing |

Expected Outcomes

- ❖ Commercial and recreational fishing activities are not degrading World Heritage values.
- ❖ Commercial and recreational fisheries are continuing without any significant decrease in the population size of target species.
- ❖ The potential impacts on World Heritage values are being considered in the assessment and management of aquaculture operations.
- ❖ Reports and Management Paper reviews prepared by DoF demonstrate that the strategies of the *Shark Bay World Heritage Property Management Paper for Fish Resources* (DoF 1996) are being implemented.

4.3.21 Pastoral use

In recent years a number of pastoral stations or parts of stations have been set aside or identified as potential areas for conservation reserves. Nanga station and part of Yaringa station have been set aside for conservation. The 2015 pastoral lease exclusion process for 'public purpose' has led to an agreement between Government and pastoral lease holders for areas of land to be excluded from a number of properties within and adjacent to the World Heritage Property for the purpose of conservation. Further negotiations are continuing concerning the timing of such exclusions. Within or adjacent to the boundaries of the World Heritage Property, Nanga and Dirk Hartog stations, and parts of Yaringa, Murchison House, Carrarang, Tamala and Nerren Nerren stations have been identified as areas to be surrendered for conservation with many of these leases already purchased. Faure Island has been purchased by the Australian Wildlife Conservancy and is being managed as a wildlife sanctuary. A further nine pastoral leases are adjacent to the boundary of the World Heritage Property.

If all these changes are included, approximately 21% of the land area of the World Heritage Property is Crown land leased for pastoral purposes, totalling about 132 000 ha. Based on average sheep numbers carried on these properties, pastoralism in the area would be expected to return approximately \$0.5M per annum, based on \$16.3 gross return/head of sheep (Pastoral Lands Board). However, due to the low price of wool, sheep have been substituted with cattle and goats in the past several years.

Given the large area of land in Shark Bay located within pastoral leases, pastoralists are important resource managers in the World Heritage Property. Pastoralists should be consulted where the management of the World Heritage Property impacts on pastoral leases. Similarly, pastoralists should be addressed when pastoral activities impact on World Heritage values.

Pastoral leases are managed in accordance with the Land Administration Act and administered by the Pastoral Lands Board. The lessee is subject to many requirements including those relating to rent, improvements to the property, stocking levels, land deterioration, cultivation of non-indigenous species and clearing vegetation. The Land Administration Act also provides for permits to be issued for limited purposes other than pastoral activities. A permit may potentially be issued for clearing land, growing and selling of non-indigenous pasture, agriculture or horticulture production and sale, pastoral based tourist activities and non-pastoral purposes in enclosed or improved areas.

Regulation and control of declared weeds and feral animals on pastoral leases is the responsibility of Department of Agriculture and Food (see sections 4.3.9 *Introduced Plants* and 4.3.10 *Introduced Animals*). The *Soil and Land Conservation Act 1945* (administered by the Department of Agriculture and Food) also applies to pastoral leases.

Seaward boundaries of pastoral leases adjacent to the World Heritage Property are generally not fenced and in some cases stock occasionally graze the coastal fringe, and infrastructure such as pipelines occurs outside the leases. Fencing will generally not be required and grazing that occurs outside the lease will be permitted provided that World Heritage values are not impaired. Any fencing

that may be required will be done in liaison with the relevant pastoralist and costs negotiated with the State Government.

Activities on pastoral leases that have potential to impact on World Heritage values include overstocking, clearing of native vegetation, the introduction or enhancement of non-indigenous plants for pasture improvement and increased use of feral animals as commercial stock. These issues need to be considered in the management and administration of pastoral activities. Permits should not be granted for activities which would adversely affect World Heritage values.

Environmentally significant activities will be subject to the environmental impact assessment process under State and Commonwealth legislation.

Objective

- ❖ Ensure that commercial activities on pastoral leases do not adversely impact on World Heritage values and the overall integrity of the World Heritage Property.

Strategy

- ❖ Through effective consultation, seek to have the protection of World Heritage values considered in the management and control of commercial activities on pastoral leases.

| Actions | Primary Responsibility | Priority |
|---|---|-----------------|
| 1. Manage pastoral activities in accordance with the Land Administration Act, the Soil and Land Conservation Act and other relevant State and Commonwealth Acts. | PLB , DPI, DoAF, other relevant agencies | Ongoing |
| 2. Evaluate and apply, where appropriate, pastoral lease conditions that provide for the protection and conservation of World Heritage values. | PLB , DPI, DoAF | High |
| 3. Liaise regularly with Shark Bay pastoralists on matters of common interest with the management of the World Heritage Property and of pastoral leases. | DoAF , DEC, DoA, other relevant agencies | Ongoing |
| 4. Establish monitoring sites, and periodically monitor and report on the environmental response of the pastoral leases to grazing and identify any activities which may impact on World Heritage values. | DoAF , PLB, Lease holders, DEC | Low |

Expected Outcomes

- ❖ Pastoral operations are not degrading the integrity of World Heritage values.
- ❖ The protection of World Heritage values is being considered in the management of pastoral leases.
- ❖ The Shark Bay pastoral community is regularly consulted, and issues of concern to pastoralists and to the management of the World Heritage Property are satisfactorily resolved.
- ❖ Monitoring sites on pastoral leases demonstrate that pastoral activities are not impacting on World Heritage values.

4.3.22 Horticultural use

Previously there was one licenced sandalwood operator in the Shark Bay area and sandalwood occurs on many of the pastoral leases and UCL in the area but not in large quantities. Sandalwood collection has now ceased. Adjacent to the World Heritage Property in Carnarvon there is intensive and

extensive horticultural operations whilst on the Wooramel River there is a small operation. Horticultural activities that have the potential to impact on World Heritage values will be subject to environmental impact assessment process under State and Commonwealth legislation.

Limiting factors that will influence the effect of horticulture in the Shark Bay area include climate, water and soils. The salt-laden air that flows across the peninsulas and the lower temperatures at Shark Bay, and therefore less ability to generate sufficient 'heat units' for growing crops, can be difficult factors to manage. The water quality from the Birdrong Aquifer is saline and therefore the crops selected not only need to tolerate the high levels of saline water but also produce good quality product over time. The risk of salt accumulating in the soil or rising saline water tables also need to be considered in assessing proposals.

The growing of horticultural crops can also lead to changes in certain native and pest animal species such as parrots and rabbits. Regulation and control of native plants and animals is the responsibility of the DEC (see sections 4.3.3 *Conservation of Native Flora and Fauna*). Ensuring the root stock or seed used for growing a horticultural crop is free of disease and other exotic plants are necessary not only for the viability of the product but also protection of biodiversity. Regulation and control of declared weeds is the responsibility of DoAF (see sections 4.3.9 *Introduced Plants*).

A proposal for a date farm has been assessed and the above environmental factors as well as economic and social criteria were considered in assessing the proposal. Commercial date production is highly labour intensive (fruit thinning, tying bunches to leaves, fitting covers to bunches for protection from birds, hand pollination), and represents a significant proportion of total fixed costs (DoA Internal report, 2004). The introduction of such horticultural activities will have some social impact on the local towns and services provided by them. The economic impacts of proposed horticultural activities need to be well researched using comparable, successful projects as a basis for measuring the economic impact and returns from the proposal. Establishment of such enterprises requires substantial capital investment, particularly in processing where fumigation against insects, cleaning, grading, packing and storing produce is required. Establishing trial areas might be an effective means of measuring the economic impacts of a full-scale project.

Objective

- ❖ Ensure that horticultural use does not adversely impact on World Heritage values and the overall integrity of the World Heritage Property.

Strategy

- ❖ Through effective consultation, seek to have the protection of World Heritage values considered in assessing and undertaking horticultural use on appropriate lands within the World Heritage Property.

| Actions | Primary Responsibility | Priority |
|---|--|-----------------|
| 1. Manage horticultural activities in accordance with the Land Administration Act and other relevant State and Commonwealth Acts. | DPI, DoAF, LGA, other relevant agencies | Ongoing |
| 2. Assess horticultural proposals in accordance with legislative requirements, relevant policies and any inter-Governmental agreements. | EPA, DoAF, DEWHA, DEC, DEWHA | |
| 3. Liaise regularly with persons undertaking horticultural activities on matters of common interest with the management of the World Heritage Property. | DPI, DoAF, DEC, other relevant agencies | Ongoing |

| | | |
|--|----------------------------------|-----|
| 4. Establish monitoring sites or systems, and periodically monitor and report on the environmental response of the horticultural activities and identify any operations which may impact on World Heritage values. | DoAF , Lease holders, DEC | Low |
|--|----------------------------------|-----|

Expected Outcomes

- ❖ Horticultural activities are not degrading the integrity of World Heritage values.
- ❖ The protection of World Heritage values is being considered in the assessment of proposals and undertaking horticultural activities.
- ❖ Monitoring horticultural use demonstrates that activities are not impacting on World Heritage values.

4.3.23 Other Resource Use

A number of smaller commercial industries utilise natural resources within the World Heritage Property including sandalwood harvesting, craftwood production, wildflower picking, seed collecting and apiculture. There is potential for other natural resource use industries to develop in the World Heritage Property. The most compatible new resource industries will be those that provide for the retention of World Heritage values. To ensure that World Heritage values are adequately protected, any new resource development should be appropriately assessed before commencing.

Local flora is utilised to a minor extent for commercial wildflower picking, seed collecting, craftwood and for firewood. This use is controlled by DEC under the CALM Act and the Wildlife Conservation Act. No taking of flora for commercial purposes is permitted on conservation reserves and as such these activities would be limited to pastoral leases and to reserves that permitted such use, e.g. timber reserves. Conditions are imposed on these activities. Threatened flora is protected from being harvested.

Objective

- ❖ Ensure that natural resource use does not adversely impact on World Heritage values and the overall integrity of the World Heritage Property.

Strategy

- ❖ Through effective consultation, seek to have the protection of World Heritage values considered in the management and control of natural resource use.

| Actions | Primary Responsibility | Priority |
|---|---|----------|
| 1. Manage, and monitor, other resource use in accordance with relevant State and Commonwealth legislation. | All relevant management agencies | Ongoing |
| 2. Evaluate new natural resource development proposals, including an assessment on the impact on World Heritage values. | All relevant management agencies | Ongoing |

Expected Outcomes

- ❖ Natural resource use and development is not degrading the integrity of World Heritage values.

4.3.24 Resource Use by Aboriginal People

Archaeological research indicates that Aboriginal use of natural resources at Shark Bay dates from about 30 000 years ago (see section 2.3.1 *Cultural Heritage* and section 4.3.7 *Conservation of Cultural Heritage*).

Use of flora and fauna by Aboriginal people is provided for under the Wildlife Conservation Act. Flora and fauna can be taken by Aboriginal people for food for consumption (not sale) except for species declared as threatened or specially protected under the Wildlife Conservation Act. The only exception to this is the dugong. Dugong may be taken (the definition of ‘take’ includes to kill or capture, disturb or molest) under certain circumstances and for certain purposes in Western Australia. A “person of Aboriginal descent” (as defined in Section 4 of the *Aboriginal Affairs Planning Authority Act 1972*) may take dugong sufficient only for food for himself and his family. Dugong may not be sold, given to persons outside the hunter’s family, or taken from a Marine Park, Marine Nature Reserve or Marine Protected Area without a licence issued under the Wildlife Conservation Act.

The fauna species targeted and the numbers of animals taken by Aboriginal people in Shark Bay are difficult to determine. Small numbers of dugongs, green turtles, kangaroos and other fauna (lizards, goannas) is known to be taken in the World Heritage Property.

The management of hunting of flora and fauna in marine and terrestrial conservation reserves has been considered in the *Shark Bay Marine Reserves Management Plan* (CALM 1996) and the *Shark Bay Terrestrial Reserves Management Plan* (CALM 2000). The taking of flora and fauna outside these reserves will be managed in accordance with relevant legislation and policy.

The use of fish resources by Aboriginal people is managed through the Wildlife Conservation Act and the Fish Resources Management Act. This use is presented in the *Shark Bay World Heritage Property Management Paper for Fish Resources* (DoF 1996).

Aboriginal resource use must be managed sustainably to ensure there are no adverse impacts on World Heritage values. It is important that these activities are monitored to ensure that the World Heritage values are not degraded. If certain activities have potential to impact on these values then, in liaison with local Aboriginal communities, the issue should be reviewed and appropriate steps taken to protect these values.

Objective

- ❖ Ensure that Aboriginal use of resources do not adversely impact on World Heritage values and the overall integrity of the World Heritage Property.

Strategy

- ❖ Through liaison with Aboriginal communities, seek to establish cooperative approaches to traditional resource use and the protection of World Heritage values.

| Actions | Primary Responsibility | Priority |
|--|------------------------|----------|
| 1. Provide for Aboriginal use of resources, in accordance with relevant legislation such as the Wildlife Conservation Act and the Fish Resources Management Act. | DEC, DoF, YLSC | Ongoing |
| 2. In consultation with local Indigenous people and native title representative bodies, develop protocols for use of resources. | DEC, DoF, YLSC | Medium |

| | | |
|--|----------|---------|
| 3. Manage Aboriginal resource use in conservation reserves in accordance with the terrestrial reserves and marine reserves management plans. | DEC, DoF | Ongoing |
| 4. Regularly monitor use of traditional resources in partnership with local Aboriginal communities and native title representative bodies. | DEC, DoF | Medium |

Expected Outcomes

- ❖ Aboriginal resource use is recognised and accommodated for in the World Heritage Property.
- ❖ Aboriginal resource use is not degrading the integrity of World Heritage values.
- ❖ Liaison occurs with Aboriginal communities in regards to the management of Aboriginal resource use.

4.3.25 Services and Infrastructure

Services and infrastructure, such as roads, accommodation/housing, electricity, water, waste disposal, tourism developments and communications are necessary to service the towns, pastoral stations and industries within and adjacent to the World Heritage Property.

The provision of new services and infrastructure has the potential to impact on World Heritage values, depending on location and type. Such impacts may include the clearing of vegetation, introduction of weeds, visual impacts and the destruction of important habitats. To ensure that infrastructure does not cause these impacts it is important that there is a process of environmental assessment (see section 4.2.3 *Impact Assessment*). Proposed infrastructure development sited near coastal areas needs to be assessed against a range of environmental, social and economic criteria and referred to the Coastal Planning and Development Group within the DPI. In assessing such proposals the public interest is to be considered and whether the establishment of coastal foreshore reserves is required. The study of the landscape completed in 2001 provides a valuable aid to determining the impact of such services and infrastructure on the visual amenity of the Shark Bay area including wind turbines used for generating power and the location of infrastructure close to shorelines.

Groundwater from the Carnarvon Artesian Basin aquifer provides an important water resource for the settlements of Denham, Useless Loop, Monkey Mia and Nanga and the pastoral leases within the World Heritage Property. It is unlikely that current levels of extraction or usage of this groundwater would impact on World Heritage values. However any significant increase in extraction is likely to have an impact on World Heritage values.

Objective

- ❖ Ensure that the provision of services and infrastructure do not adversely impact on World Heritage values and the overall integrity of the World Heritage Property.

Strategy

- ❖ Through effective consultation, seek to have the protection of World Heritage values considered in the provision and control of services and infrastructure.

| Actions | Primary Responsibility | Priority |
|---|--|----------|
| 1. As necessary, refer service and infrastructure proposals through the environmental assessment process, and include consideration of the impact on World Heritage values. | EPA, DPI, LGAs, DEC, other relevant agencies | Ongoing |

| | | |
|--|---|---------|
| 2. Through consultation in the planning process, consider the impact on visual resource values of the World Heritage Property in the siting and design of services and infrastructure. | LGAs , DPI, DEC, DoIR, other relevant agencies | Ongoing |
|--|---|---------|

Expected Outcomes

- ❖ Services and infrastructure provided do not degrade World Heritage values.

4.4 Goal, Objectives, Strategies and Actions for Presentation

Goal: Present Shark Bay's World Heritage values to local, national and international communities.

4.4.1 Information, Interpretation and Education

The many organisations, visitor sites and businesses in Shark Bay provide an opportunity to inform the public of the universal natural values of the World Heritage Property. Appreciation of these values will encourage visitors in general to take a responsible approach to use of the area as well as improve the quality of their experience. Community education and participation in management will be an important means of generating community understanding and support for the Property. Education and participation in management is not limited to the local community but also includes the national and international community. The Shark Bay terrestrial and marine management plans outline various communication and interpretation actions for presenting World Heritage values to the public.

The existing programs and activities consist of:

- ❖ Information – providing basic data about the reserves, e.g. access, facilities, attractions, activities, regulations, code of care and cost;
- ❖ Interpretation – explaining and enhancing appreciation of the natural and cultural features; and
- ❖ Education – providing resource materials, presentations, organised field activities and other programs designed to facilitate learning (particularly school groups and visitors with special interests).

Information, interpretation and education enable visitors to: plan their visit to the parks and reserves; find their way to specific features and attractions; understand the type of behaviour and actions that are appropriate in the Shark Bay area; and learn about, appreciate and value the natural environment they are experiencing.

Nature-based tourism provides an exciting opportunity to interpret the natural features to visitors. Effective provision of information through signs, interpretive facilities, written publications, tourist facilities, tour operators and through personal interaction with agency officers is crucial to interpreting the natural features. Provision of recreation opportunities such as camping and picnicking and tourism opportunities such as boat tours and wildlife interactions, provides avenues for distributing information and knowledge about the values of the Shark Bay World Heritage Property.

Information about Shark Bay is provided through a variety of people and organisations, in a range of locations and using varied techniques and media. This creates a situation whereby a high percentage of both visitors and residents have a limited understanding of the importance of World Heritage listing and what features of natural significance are found in the Property, resulting in inconsistent messages being presented throughout the Property. Coordination of these programs and consistency of the information provided is important to ensure accurate information is disseminated, and to maximise the opportunities that exist in Shark Bay for interpretation of World Heritage values.

In August 2001, a Denham-based community education coordinator was appointed to develop a comprehensive and integrated communication and interpretive plans for the Property, in consultation with the local community and key stakeholders. The result was the two reports: *Shark Bay World Heritage Area Communication Strategy* (Chapman 2002a) and *Shark Bay World Heritage Area Interpretation Action Plan* (Chapman 2003). These documents provide comprehensive and detailed information on presenting information to the community and visitors.

The *Communications Strategy* aims to develop communications for the Shark Bay World Heritage Property which meet conservation and environmental objectives, as well as community aspirations (social and economic) for the area, and which enhance visitor experience and satisfaction. A number of primary communication knowledge/appreciation and behavioural objectives were developed in consultation with stakeholders:

- ❖ Knowledge/Appreciation Objectives
 1. Increased awareness and appreciation for World Heritage Values;
 2. Increased understanding of what World Heritage listing means;
 3. Increased awareness and understanding of Shark Bay's natural environment and how it works;
 4. Increased awareness of what to expect from a visit to Shark Bay;
 5. Increased awareness of and appreciation for Shark Bay's cultural history;
 6. Increased understanding of fish ecology and awareness of fishing impacts.
- ❖ Behavioural Objectives
 1. Improved responsibility on land;
 2. Improved responsibility among fishers;
 3. General improvement in responsibility;
 4. Improved responsibility among boaters;
 5. Improved responsibility among divers and beachcombers;
 6. Increased community involvement and ownership;
 7. Increased visitor numbers in off-peak times and extending visitor stays;
 8. Reduced tourism impacts on the local community.

The *Communications Strategy* adopts the 'Best Practice Model' developed by the ANZECC Working Party and applies the model through several implementation strategies built around identifying the key audience groups and the primary communication objectives listed above. The key audience groups are general visitors, local residents, Perth residents, agency staff and tour operators and their staff. As a key component of the *Communication Strategy*, a Style Guide and Logo for the World Heritage Property has been developed. This product is available free-of-charge and presents guidelines and information, such as text, graphics and photos, in a consistent format that all individuals, groups and organisations can use to promote their operations and the Property.

The *Interpretation Action Plan* aims to guide development of interpretation products across the Shark Bay World Heritage Property and coordinate the efforts of the various agencies and bodies who are undertaking interpretive activities in the area. The 'story' to be told across the Property involves presenting information on four groups of people: the indigenous people, the maritime explorers, the settlers, and the global community. The Interpretation Action Plan develops a number of themes and story elements for each of these four 'stories'.

The construction of the Shark Bay Interpretive Centre in Denham was one of the key recommendations of the *Shark Bay Regional Strategy* (WA Planning Commission 1997). The centre opened in 2006 and provides information, interpretation and education for local people and visitors to understand the natural, cultural and World Heritage values of Shark Bay as well as activities and services available across the Property.

Objective

- ❖ Encourage awareness, understanding, appreciation and support of World Heritage values through effective use of information, interpretation and education.

Strategies

- ❖ Provide information that increases community knowledge and understanding about the World Heritage Property and encourages support for the protection of World Heritage values.

- ❖ Develop, and promote the provision of, accurate and consistent information about the World Heritage Property to visitors across all tenures.

| Actions | Primary Responsibility | Priority |
|--|---|-----------------|
| 1. Through collaboration with relevant agencies, monitor the implementation of the Communication Strategy and Interpretation Action Plan that details education and information actions for the World Heritage Property. | DEC , DoF, Tourism WA, LGAs, WAM | High |
| 2. Facilitate the implementation of information and education programs according to identified priorities. | DEC , DoF, LGAs, Tourism WA | High |
| 3. Operate the visitor centre and provide interpretive displays and materials that present the World Heritage values of the Property. | LGAs , DEC, DoF, WAM, Tourism WA, GDC | High |
| 4. Annually review and update as required interpretive materials and signs to ensure that they contain information that is accurate and consistent. | DEC , LGAs, DoF, Tourism WA, WAM, DoIR | Ongoing |

Expected Outcomes

- ❖ Continued implementation of the World Heritage Property communication and interpretation plans.
- ❖ Information and education programs are coordinated and implemented according to priorities.
- ❖ There is an increase in community awareness, appreciation and understanding of the World Heritage Property and support for the protection of World Heritage values.
- ❖ A successfully operated World Heritage Visitor Centre.
- ❖ Education materials and information signs are produced that contain accurate information about protecting World Heritage values and are of a consistent standard and style.

4.4.2 Social Research

Knowledge of the perceptions, attitudes and values of local community members and use, patterns, needs and expectations of visitors are important components of improved and effective management. Such knowledge gathered through social research and monitoring, provide a basis for improving management practices and to be able to predict, and respond to changes in community needs and visitor use patterns and demands. Knowledge of the perceptions, attitudes and values of local community members towards the World Heritage Property is critical to determining the level of support for the Property and changes over time. Such social research would investigate the impacts of the World Heritage Property on local communities and people, particularly economic, social and environmental impacts. To date, although a considerable number of visitor surveys have been undertaken, there is little definitive data on the attitudes of the members of the local community.

Some data on visitor numbers and visitor use within the World Heritage Property has been documented. A visitor user survey for the World Heritage Property was conducted by CALM between June and November 1993, and provided baseline data, especially on the attitudes and levels of satisfaction of residents of Denham. This 1993 survey indicated that visitors surveyed originated from the Perth metropolitan area (29.9%), country WA (28.4%), interstate (17.1%) and overseas (5.2%) with the rest local residents. The University of Notre Dame conducted a limited visitor satisfaction survey in the Shark Bay area in December 1995. More recently, CALM has conducted visitor surveys at Monkey Mia in 2002 and 2003, and in 2004 an honours student from Murdoch University conducted a visitor survey at Monkey Mia. No further surveys of Denham residents have been conducted. Since 1993 the percentage of international and interstate visitors has increased substantially. Although subject to strong seasonal variations, recent surveys at Monkey Mia show that at least 30% of visitors are from overseas and 25% from interstate. The profile of the age group has

also changed with an increasing number of people from the 15-24 year age group, most likely backpackers.

Visitor records have been kept at Monkey Mia since 1986, and this data provides an indication of visitation patterns and demographics of visitors. Further, road counters have been in place at key visitor sites in Francois Peron National Park, Shell Beach Conservation Park and the Hamelin Pool Marine Nature Reserve since 1997. Currently, there are no pedestrian counters installed within the World Heritage Property.

A visitor survey (landscape assessment) was undertaken as part of the *Landscape Study* (CALM 2001), to investigate community perceptions of Shark Bay landscapes. This survey found that the most beautiful places were natural with no human modifications and that water and coast are relatively consistent attributes of beautiful places. This correlates with the 1993 visitor survey, where the most common comment for future management was 'leave it as it is' and people expressed a desire for a low level of development in the area. Visitor surveys have been conducted at Monkey Mia on a more regular basis than other places in the Property.

Surveys of the community were undertaken as part of producing a *Communication Strategy* (Chapman 2002a) and *Interpretation Action Plan* (Chapman 2003). As part of this project key stakeholder groups were identified and opinions and issues developed and presented in a *Stakeholder Discussion Document* (Chapman 2002b). The *Communication Strategy* presents implementation strategies, performance indicators and evaluation methods for measuring the success of implementation.

Research should be conducted to ascertain the quantitative and qualitative aspects of visitor use (types and patterns of use and visitor expectations and perceptions). This can then provide the basis of improving opportunities for presenting the World Heritage Values. In 2002 CALM and now DEC commenced conducting visitor surveys at Monkey Mia, Peron Homestead, Cape Peron, Hamelin Pool and Shell Beach. The data collected from surveys will continue to identify visitor numbers, their point of origin, what activities they undertake, length of stay and their level of satisfaction. Data collected will be entered onto the VISTAT database (DEC's visitor information and statistics collection system).

The most popular water-based activity for visitors to Shark Bay is line fishing. The Recreational Fisheries Program of the DoF has a strategic plan to conduct creel surveys of recreational fishing in each of the states bioregions on a rotating bioregion-by-bioregion basis. The Gascoyne Coast area was surveyed in 1998-99 with data collected on the status of stocks of prime recreational species and fishing quality indicators such as catch rates, size composition, and variety of species caught.

A standard community and visitor survey design that can be repeated in future years would be beneficial in providing consistent long-term data. The survey design would preferably be comprehensive and integrated between agencies. The research should provide data on the numbers, characteristics, attitudes, preferences, activities and seasonal patterns of visitors within the World Heritage Property. Ideally it would be beneficial if visitor and community research in Shark Bay was consistent with research undertaken in other Australian World Heritage Properties.

Objective

- ❖ Maintain an understanding of people's activities and expectations through regular surveying to enable improved management and presentation of the World Heritage Property and address concerns and current trends.

Strategy

- ❖ Through surveys, obtain knowledge of visitor use, needs and expectations and utilise this information to effectively plan for and manage recreation and tourism.

- ❖ Through surveys, obtain knowledge of community perceptions, attitudes and values to effectively plan and manage community involvement.

| Actions | Primary Responsibility | Priority |
|--|---|-----------------|
| 1. Through consultation with relevant management agencies identify and determine priorities for visitor research and monitoring. | DEC , Tourism WA, DoF, LGAs, GDC | High |
| 2. Develop and implement a collaborative standard visitor monitoring program and provide regular reports on the outcomes of the program. | DEC , Tourism WA, DoF, LGAs | High |
| 3. Through liaison with relevant agencies, facilitate the use of visitor research outcomes in the planning, assessment and development of recreation, tourism, access and education proposals for the World Heritage Property. | DEC , Tourism WA, DoF, LGAs, other relevant agencies | Ongoing |
| 4. Through consultation with relevant agencies and groups, regularly conduct community surveys to better understand and address concerns. | GDC , LGAs, DEC, DoF | Ongoing |

Expected Outcomes

- ❖ Priorities for social research of visitors and community members are identified and implemented.
- ❖ There is an improved understanding of visitor use, patterns, needs and expectations in the World Heritage Property.
- ❖ Management of recreation and tourism operations and activities considers the behaviour, and requirements, of visitors.
- ❖ There is an improved understanding of community perceptions, attitudes and values towards World Heritage values and an increased appreciation of the benefits derived from the Property.

4.5 Goal, Objectives, Strategies and Actions for Rehabilitation

Goal: Identify and rehabilitate degraded areas of the Shark Bay World Heritage Property.

4.5 1 Rehabilitation

A proportion of the Shark Bay World Heritage Property has been modified by past and present activities. Some disturbance had already occurred in the area at the time it was listed as a World Heritage Property. It has been caused by activities such as mining and quarrying, clearing of vegetation for agriculture, pastoral grazing, physical damage by vehicles, machinery and people, the introduction of feral animals and environmental weeds, and trawling and mooring activities.

Disturbance by events such as cyclones and fire can have significant environmental impacts. Disturbance is expressed in various ways, including changes to natural assemblages of plants and animals (both terrestrial and marine), changes in ecological processes, soil compaction and/or erosion, salinisation and reduction in water quality. Introduction of weeds and feral animals can change the natural assemblages, whereas the loss of native fauna can impact on ecological processes.

Human-based activities can lead to accelerated rates of erosion and disturb the delicate balance of species that give the landscape and seascape its unique character. Rehabilitation requirements will vary according to the type and extent of disturbance to World Heritage values. Priorities will be based on the level of impact or threat to the values. Appropriate techniques will need to be determined.

A number of State Government agencies and the local government authorities have statutory responsibilities regarding the management and rehabilitation of activities that may disturb the natural environment. These include DoAF, DoIR, DPI, DEC and the Shires of Carnarvon and Shark Bay. It is important that in rehabilitating degraded areas that native endemic species are used and that the introduction of plant diseases and introduced plants is prevented.

Objective

- ❖ Maintain or enhance the integrity of the World Heritage values through the rehabilitation of disturbed areas.

Strategy

- ❖ Rehabilitate disturbed areas with priority given to activities providing the greatest benefit to the protection and enhancement of World Heritage values.

| Actions | Primary Responsibility | Priority |
|--|-----------------------------------|-----------------|
| 1. Develop and maintain an inventory of degraded sites. | DEC, DoAF, DoIR, LGAs, DPI | High |
| 2. Through inter-agency consultation, identify and document rehabilitation requirements and priorities. | DEC, DoIR, LGAs, DoAF, DPI | High |
| 3. Through inter-agency consultation, establish appropriate standards and techniques for rehabilitation. | DoIR/LGAs/DEC, DoAF, DPI | High |
| 4. Facilitate and undertake the rehabilitation of disturbed areas according to identified priorities on lands according to legislative responsibilities. | DoIR/LGAs/DEC, DoAF, DPI | Medium |

| | | |
|---|--------------------------------------|---------|
| 5. Through educational activities, encourage community understanding of disturbances in the Property and facilitate community involvement in rehabilitation projects. | DoIR/LGAs/DEC, DoAF | Ongoing |
|---|--------------------------------------|---------|

Expected Outcomes

- ❖ Rehabilitation requirements are identified and prioritised, and impacts minimised.
- ❖ Standards and rehabilitation techniques appropriate for the World Heritage Property are developed.
- ❖ Degraded World Heritage values are rehabilitated and support functioning ecosystems.
- ❖ The Shark Bay community is actively involved in rehabilitation projects and have an increased awareness of causes of degradation in the World Heritage Property.

5. Implementation and Review

5.1 Implementation

Implementing the Shark Bay World Heritage Property Strategic Plan will be seen as a demonstration that Australia is fulfilling its international obligation under the World Heritage Convention.

There are many agencies with responsibility for implementing this Plan. In each section, this plan identifies the agency with the primary responsibility for implementation of each action, and indicates other supporting agencies. DEC, as the lead management agency, will liaise with other agencies in regards to an implementation program. In many instances, agencies or authorities implement actions in this Plan under existing programs.

It is unlikely that resources will be available to achieve all actions immediately and many actions are of an on-going nature. As a result, it is expected that agencies will initially commit available resources to actions that have been identified as having high priority, or are of necessity an ongoing priority. The priorities presented in the Strategic Plan may be varied as new knowledge becomes available, or new developments or issues arise. Where necessary, relevant Ministers will provide direction in identifying priority actions for implementation, with advice from the Community Consultative Committee and Scientific Advisory Committee.

5.2 Review & Reporting

The Western Australian Government has primary responsibility for reporting on the status of the World Heritage Property, and coordinating implementation of the goals, objectives, strategies and actions outlined within the plan.

The Australian World Heritage Management Principles require a review of the Strategic Plan at intervals “not more than 7 years”. Periodic Reports are required by the IUCN every six years and a reporting format has been adopted for all World Heritage Properties across Australia. A Periodic Report was submitted in 2002 and these reports may be viewed at <http://whc.unesco.org/en/287#9>. A review of the Strategic Plan will also occur at six year intervals and coincide with the production of the Periodic Report required by the IUCN. The term of the Strategic Plan is twelve years with a review at 6 years. However to coincide with the next IUCN reporting timeline, the term of this first Strategic Plan will be fourteen years from the date of approval by relevant State and Commonwealth Ministers.

The review will be submitted to relevant State and Commonwealth Ministers and detail the achievement of outcomes and progress towards the goals and objectives of this plan. Both the Periodic Report and the review will be prepared by DEC with input from other management agencies and authorities. The review of the Strategic Plan should identify the extent to which the goals and objectives have been achieved and strategies and actions implemented, the reasons for lack of achievement or implementation, assess new information which may affect management, and propose changes and new goals, objectives, strategies and actions where appropriate. The review will be made available to the public and viewed at www.sharkbay.org.

Expected outcomes have been outlined for each objective in this Plan. These provide a performance measure of whether the actions that are identified have been completed, and whether the objectives, strategies and actions for each issue have been successfully addressed. Relevant State and Commonwealth Ministers will be responsible for monitoring the implementation of this plan. The Ministers will receive advice from the Community Consultative Committee and Scientific Advisory Committee on the outcomes of actions, and whether the priority of certain actions requires amendment as a result of new developments or issues in the World Heritage Property. Measures of the effectiveness of this Strategic Plan will include:

- ❖ success in maintaining the integrity of the World Heritage Property;
- ❖ improvement in the protection, conservation, rehabilitation and presentation of the World Heritage values;
- ❖ leadership by agencies responsible for implementation of strategies identified in the Plan;
- ❖ ownership of the Strategic Plan by the Shark Bay community;
- ❖ commitment to consultation and participation;
- ❖ adequate resourcing;
- ❖ perceived usefulness of the Strategic Plan;
- ❖ quality results from the implementation of the strategies.

At the end of the term of this Plan, a new plan shall be produced using the same level of consultation and submitted for approval by relevant State and Commonwealth Ministers. Amendments to the plan can occur within the life of the Strategic Plan, however, these changes will only be made after going through a public consultation process and are approved by the relevant State and Commonwealth Ministers.

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7. Appendices

Appendix 1: Abbreviations

| | |
|-------------------|--|
| ACC | Australia's Coral Coast Tourist Association |
| AQIS | Australian Quarantine and Inspection Service |
| BFS | Bush Fires Service |
| CALM | Department of Conservation and Land Management |
| CCC | Shark Bay World Heritage Property Community Consultative Committee |
| CCWA | Conservation Commission of Western Australia |
| DoAF | Department of Agriculture & Food (State) |
| DEWHA | Department of the Environment, Water, Heritage and the Arts (Commonwealth) |
| DOIR | Department of Industry and Resources (State) |
| DoE | Department of Environment (State) |
| DoF | Department of Fisheries (State) |
| DoT | Department of Transport |
| DOLA | Department of Land Administration |
| DPI | Department for Planning and Infrastructure (State) |
| EPA | Environmental Protection Authority (State) |
| GDC | Gascoyne Development Commission |
| GTA | Gascoyne Tourism Association |
| LGAs | Local Government Authorities |
| MC | Shark Bay World Heritage Property Ministerial Council |
| MPRA | Marine Parks and Reserves Authority |
| MRWA | Main Roads Western Australia |
| PLB | Pastoral Lands Board |
| SAC | Shark Bay World Heritage Property Scientific Advisory Committee |
| SBLCD | Shark Bay Land Conservation District |
| Tourism WA | Tourism Western Australia |
| WAM | Western Australian Museum |
| WAMM | Western Australian Maritime Museum |
| WC | Water Corporation |

Appendix 2: Key Legislation

Commonwealth

Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth) – provides for the protection and conservation of world heritage properties and the application of an environmental impact assessment and approval process to activities that may have a significant impact on matters of national environmental significance. These include world heritage properties, national heritage places, nationally threatened animal and plant species and ecological communities, and internationally protected migratory species.

Historic Shipwrecks Act 1976 – provides for the protection of historic shipwrecks in Australian waters and relics associated with the shipwrecks which are in or have been removed from those waters.

Native Title Act 1993 – provides for the recognition of native title rights and sets down some basic principles in relation to native title in Australia

Petroleum (Submerged Land) Act 1967 – provides for shared control between the Commonwealth and State for exploiting offshore petroleum resources.

World Heritage Properties Conservation Act 1983 – repealed - provides for the protection and conservation of World Heritage Properties in Australia

State

Aboriginal Heritage Act 1972 – provides for the protection of all Aboriginal sites and Aboriginal cultural objects in Western Australia.

Agriculture and Related Resources Protection Act 1976 – deals with the management and control of certain declared plants and animals, the preservation or control of the introduction and spread of exotic plants and animals, and other related purposes.

Bush Fires Act 1954 – provides for the administration, management and control of bushfires in areas outside the metropolitan area.

Conservation and Land Management Act 1984 – provides for CALM to be responsible for the conservation of flora and fauna and for management of certain lands and waters including national parks, conservation parks, nature reserves, marine parks and marine nature reserves throughout the State.

Environmental Protection Act 1986 – provides for the prevention, control and abatement of environmental pollution, and for the conservation, preservation, protection, enhancement and management of the environment, and related purposes.

Fish Resources Management Act 1994 – provides for the management of fish resources, and related purposes.

Fishing and Related Industries Compensation (Marine Reserves) Act 1997 – provides for the payment of compensation to holders of Fisheries leases, licences and permits on account of the effect of gazettal of marine nature reserves and marine parks constituted under the CALM Act 1984.

Heritage of Western Australia 1990 – provides for the protection of heritage places on State land

Land Administration Act 1997 – deals with the allocation, tenure and lease of Crown land.

Local Government Act 1995 – the Shires of Shark Bay and Carnarvon have By-Laws which prohibit or restrict certain activities in the Shires.

Marine and Harbours Act 1981 – provides for the control of navigation and shipping activities in all State waters.

Maritime Archaeology Act 1973 – provides for the protection of wrecks and relics lost in State water before 1900.

Mining Act 1978 – provides for exploration and mining to proceed in appropriate locations.

Public Works Act 1902 – provides for the construction of public works,

Shark Bay Solar Salt Industry Agreement Act 1983 – sets out the agreement between the State and industry with respect to the establishment and carrying on of a solar salt industry and other allied mining and ancillary industries.

Soil and Land Conservation Act 1945 – deals with the conservation of soil and land resources, and to the mitigation of the effects of erosion, salinity and flooding.

State Petroleum Act 1967 – provides for the granting of petroleum permits on land and internal waters.

State Petroleum (Submerged Lands) Act 1982 – allows petroleum permits to be granted in the State Territorial sea.

Titles Validation Act 1995 – provides for validation, under section 19 of the Native Titles Act 1993 of the Commonwealth, past acts attributable to the State, to provide for the effects of the validation, and to confirm certain rights.

Town Planning and Development Act 1928 – provides for the planning and development of land for urban and rural purposes.

Western Australian Marine Act 1982 – provides for the regulation of navigation and shipping by the Department of Transport.

Western Australian Planning Commission Act 1985 – deals with the establishment of a body with responsibility for urban, rural and regional land use planning and land development, and related matters.

Wildlife Conservation Act 1950 – provides for protection of native flora and fauna on all land and in all waters within State boundaries. CALM is responsible for the administration of this Act.