



RENOMINATION OF AN EXTENDED FITZGERALD RIVER NATIONAL PARK BIOSPHERE RESERVE, WESTERN AUSTRALIA



The central Barren Ranges over Doubtful Island Bay, Point Ann, Fitzgerald River National Park

February 2015



	BIOSPHERE RESERVE NOMINATION FORM [February 2004]	
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INTRODUCTION

Biosphere Reserves are areas of terrestrial and coastal/marine ecosystems, or a combination thereof, which are internationally recognized within the framework of UNESCO's Program on Man and the Biosphere (MAB). They are established to promote and demonstrate a balanced relationship between humans and the biosphere. Biosphere Reserves are designated by the International Coordinating Council of the MAB Program at the request of the State concerned. Individual Biosphere Reserves remain under the sovereign jurisdiction of the State where they are situated. Collectively, all biosphere reserves form a World Network in which participation by States is voluntary.

The World Network is governed by the Statutory Framework adopted by the UNESCO General Conference in 1995, which presents the definition, objectives, criteria and the designation procedure for biosphere reserves. The actions recommended for the development of biosphere reserves are set out in the "Seville Strategy". These documents should be used as basic references for the completion of this nomination form.

The information presented on this nomination form will be used in a number of ways by UNESCO:

- (a) for examination of the site by the Advisory Committee on Biosphere Reserves and by the Bureau of the MAB International Coordinating Council;
- (b) for use in a world-wide accessible information system, notably the UNESCO-MABnet, facilitating communications and interaction amongst persons interested in biosphere reserves throughout the world.

The nomination form consists of three parts:

Part one is a summary indicating how the nominated area responds to the functions and criteria for biosphere reserves set out in the Statutory Framework, and presents the signatures of endorsements for the nomination from the authorities concerned. Part two is more descriptive and detailed, referring to the human, physical and biological characteristics as well as to the institutional aspects. An annex to be used for updating the Directory of Biosphere Reserves on the MABnet, once the site has been approved as a biosphere reserve.

The form should be completed in English, French or Spanish. Two copies should be sent to the Secretariat, as follows:

1. The original hard copy, with the original signatures, letters of endorsement, zonation map and supporting documents. This should be sent to the Secretariat through the Official UNESCO channels, i.e. via the National Commission for UNESCO and/or the Permanent Delegation to UNESCO.
2. An electronic version (on diskette, CD etc.) of the nomination forms and if possible of maps (especially the zonation map). This can be sent directly to the MAB Secretariat:

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 Division of Ecological and Earth Sciences
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Overview of Re-nomination of Fitzgerald Biosphere

Fitzgerald River National Park Biosphere Reserve was originally listed by UNESCO in 1978 following consultation with the Australian and Western Australian Authorities (CALM 1991a; Map 1). However, it has not been formally recognised by UNESCO as a fully functional Biosphere Reserve (UNESCO 2003, Fry 2010) according to the Seville Criteria (UNESCO 1996). As a result, this re-nomination has been undertaken with the funding assistance of the Australian and Western Australian Governments through South Coast Natural Resource Management Inc, the Great Southern Development Commission and the Fitzgerald Biosphere Group. Support from the Western Australian Department of Parks and Wildlife is also gratefully acknowledged.

This document forms the re-nomination of the currently listed Fitzgerald River National Park Biosphere Reserve as an extended site - proposed as Fitzgerald Biosphere, using the Biosphere Reserve nomination form of UNESCO's MAB Program. The re-nomination has been guided by the helpful advice and stewardship of Mr Ben Phillips and Mr Doug Brown of the Protected Areas Policy and Biodiscovery Section of Parks Australia, in the Australian Government Department of Sustainability, Environment, Water, Population and Communities (now Department of Environment); and Dr Thomas Schaaf and Dr Miguel Clüsener – Godt, of the Man and Biosphere Program of UNESCO. The re-nomination and its supporting information is in line with the advice of Dr Schaaf as follows:

*As Fitzgerald River Biosphere Reserve is already listed, therefore no need to provide a very detailed new nomination dossier for the extension of the site. Use the **Nomination Form** from the UNESCO website (important for the standardization of information).*

- A. Refer in the revised nomination dossier to the modifications in terms of zonation,*
- B. Functions (related to the revised zonation/extension)*
- C. A detailed map clearly showing the zonation pattern of the biosphere reserve with the extension*
- D. The extension figures in hectares per zone*
- E. The approval of the local and national authorities (see signature block in the Nomination Form)*
- F. To what extent local people would benefit from the extended site, and*
- G. How they would be involved in decision-making processes regarding the management of the site*

In addition, the 2003 UNESCO MAB Bureau Review (UNESCO 2003), in considering that Fitzgerald River Biosphere Reserve did not function as a post Seville Biosphere Reserve, recommended that to fulfil the functions, the Australian authorities should:

- 1. Formally recognise a buffer zone and transition area in the areas where the local landcare group of farmers and landowners were currently working in cooperation with the National Park administration.*
- 2. Consider extending the marine component, so that the whole Biosphere Reserve could serve to illustrate the Ecosystem Approach (CBD 2010) for the entire Fitzgerald River catchment basin.*
- 3. Provide more information on the process of measures to rehabilitate degraded lands in the areas corresponding to the potential future transition area.*

The questions relating to these issues have been answered in the relevant sections in the nomination form following, primarily the summary section. In line with the advice, not all sections of the form have been completed. Accompanying this form are related maps, a bibliography of references and supporting documentation. A CD containing electronic copies will be sent direct.

This 2015 renomination revision includes the results of further consultation as a result of advice from the WA State Government Department of Parks and Wildlife, recommended as part of the original renomination submission process of 2012.

Nathan McQuoid

On behalf of the Biosphere Implementation Group

February 26 2015

Acknowledgements

The support and assistance of several people and organisations for the renomination project and the preparation of this document is gratefully acknowledged:

The Australian Government's Caring for Our Country Program of the Department of Sustainability, Environment, Water, Population and Communities (now Department of the Environment), through South Coast Natural Resource Management (Inc), and the Great Southern Development Commission through the Fitzgerald Biosphere Group, for the funding support for the renomination project.

The Department of Parks and Wildlife (formerly the Department of Environment and Conservation) for the production of the maps, and valuable assistance with the document drafting process. In particular Deon Utber, Regional Leader Nature Conservation; Dr John Watson, Principal Projects Officer; and Sarah Comer, Regional Ecologist.

The guidance of the Biosphere Implementation Group (BIG) and its representatives from the Department of Parks and Wildlife, Fitzgerald Biosphere Group, Ravensthorpe Agricultural Initiative Network, Friends of Fitzgerald River National Park, South West Aboriginal Land and Sea Council, the Shires of Jerramungup and Ravensthorpe, and Galaxy Lithium Australia, as the project stakeholder group.

Carl Beck, CEO; Dr Justin Bellanger, Operations Manager; Dylan Gleave, Coasts and Marine Program Leader; and Karl Hansom, Program Leader Biodiversity; South Coast Natural Resource Management (Inc), Albany WA

Brue Manning CEO, and Jessica van der Waag Project Leader, Great Southern development Commission, Albany and Katanning WA

Ross Williams, Chair, Biosphere Implementation Group, Gairdner WA

Anne Sparrow, Executive Officer, Fitzgerald Biosphere Group, Jerramungup WA

Jen Chambers, Coordinator; and Rodger Walker, former Community Landcare Officer; Ravensthorpe Agricultural Initiative Network, Ravensthorpe WA

Cr Rob Lester, Shire President; Bill Parker former CEO, and Brent Bailey, CEO; Shire of Jerramungup, Jerramungup WA

Cr Ian Goldfinch, Shire President and Pascoe Durtanovich, former CEO; Shire of Ravensthorpe, Ravensthorpe WA

Eugene Eades and Steve Woods, Noongar Representatives; and Gail Jones, Manager; South West Aboriginal Land and Sea Council, Perth WA

Steve Porritt, former Regional Director and Keith Ohlsen, Regional Manager; Department of Agriculture and Food WA, Albany and Katanning.

Dr Julia Fry, Research Scientist; University of WA Centre of Excellence in Natural Resource Management, Albany WA

Ian Briggs, General Manager Environmental Policy; Richard Borozdin, General Manager, Policy and Coordination Branch; Elliot Samson, Environmental Policy Officer. WA Department of Mines and Petroleum

Felicity Horn, Executive Officer; Guy Leyland, Principle Executive Officer; and Kerry Rowe, Director; WA Fishing Industry Council

Dr Andrew Rowland, Chief Executive Officer; Recfishwest

John Fletcher, Registered Manager; Galaxy Lithium Australia, Mt Cattlin Mine Ravensthorpe

Ben Phillips, Director Protected Area Policy; and Doug Brown, Senior Policy Officer; Parks Australia, Australian Government Department of Sustainability, Environment, Water, Population and Communities (now Department of the Environment), Canberra ACT

Dr Thomas Schaaf, Chief; Ecological Sciences and Biodiversity Section, Division of Ecological and Earth Sciences, Man and the Biosphere (MAB) Program UNESCO, Paris

Dr Miguel Clüsener – Godt, Division of Ecological and Earth Sciences, Man and the Biosphere (MAB) Program UNESCO, Paris

PART I: SUMMARY

1. PROPOSED NAME OF THE BIOSPHERE RESERVE:

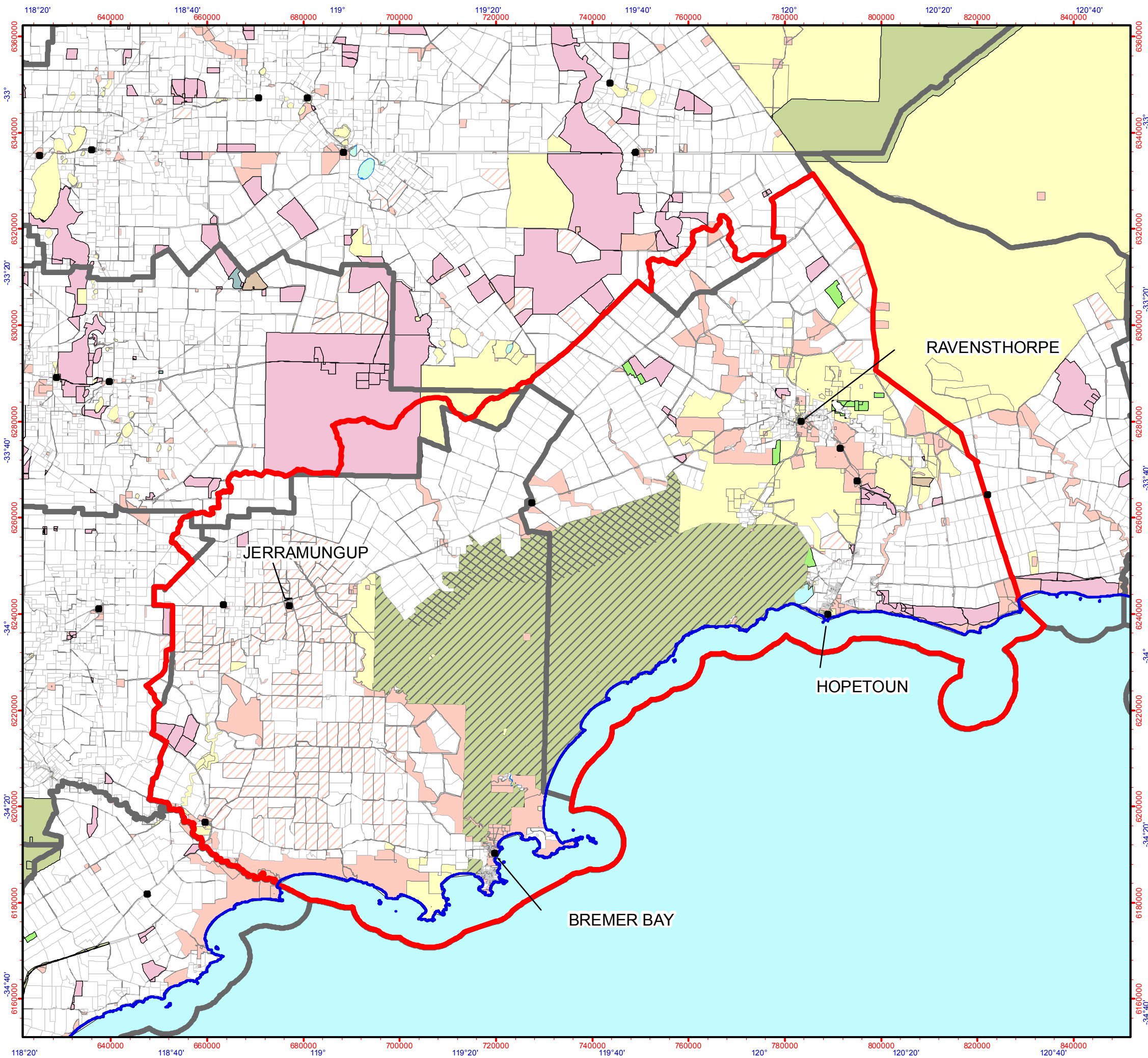
[It is advisable to use a locally accepted geographic, descriptive or symbolic name, which allows people to identify themselves with the site concerned (e.g. Río Platano Biosphere Reserve, Bookmark Biosphere Reserve). Except in unusual circumstances, Biosphere Reserves should not be named after existing national parks or similar administrative areas]

Fitzgerald Biosphere

UNESCO listed this Biosphere Reserve in 1978 as *Fitzgerald River National Park Biosphere Reserve*, following consultation with the Australian and Western Australian Authorities (CALM 1991a). It is listed as a protected area only, pre-Seville Biosphere Reserve (Map 1).

This nomination refers to a re-nomination process for an extension of the currently listed Fitzgerald River National Park Biosphere Reserve, to include a protected area Core with surrounding lands and waters as Buffer and Transition zones.

Since 1978, and primarily since 1984, Fitzgerald River National Park Biosphere Reserve has become known as *Fitzgerald Biosphere Reserve* or more often locally as *Fitzgerald Biosphere*, to avoid confusion with the Western Australian common-use protected area “Reserve” definition, which strictly only its Core and a few smaller conservation reserves in the Buffer zone are; hence the reason for the preferred proposed name. From 1984 Fitzgerald Biosphere has informally (UNESCO 2003), although widely accepted locally, operated as a post Seville Biosphere Reserve with three levels of zonation and Fitzgerald River National Park as its Core, and considerable community input (Bradby 1988, CALM 1991a, SCRIPT 1994; Watson and Sanders 1997; South Coast NRM 2011; McQuoid 2012).



Map 1 Fitzgerald Biosphere Tenure Status

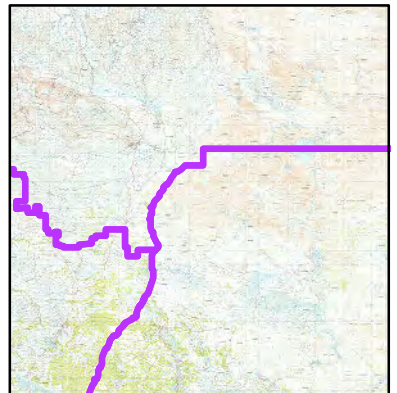
Legend

- WA Townsites
- WA Coast
- Proposed_FBR_Boundary
- Local Govt. Authorities (LGA)
- FRNP Boundary 1978
- 1994_FRNP_Update
- FBR_Core_Zone
- WA Ocean Mask
- 5(1)(h) Reserve
- Conservation Park
- Crown Freehold - Dept Interest
- Miscellaneous Reserve
- National Park
- Nature Reserve
- Crown Lease
- Crown Reserve
- Freehold
- Lease / Reserve
- Public Roads (A3)
- Unallocated Crown Land
- Water

1:800,000

0 5 10 20 30 40
Kilometres

Projection: Universal Transverse Mercator
MGA Zone 50. Datum: GDA94



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Parks and Wildlife



2. COUNTRY: Australia, State of Western Australia

3. FULFILLMENT OF THE THREE FUNCTIONS OF BIOSPHERE RESERVES

(Article 3 of the Statutory Framework presents the three functions of conservation, development and logistic support. Explain in general terms how the area fulfils these functions.)

3.1 "Conservation - contribute to the conservation of landscapes, ecosystems, species and genetic variation"

(Stress the importance of the site for conservation at the regional or global scales)

Conservation of landscape, ecosystems, species and genetic variation is attained through all three Zones with the most significant conservation of ecosystem diversity in the proposed Core Zone of Fitzgerald River National Park (Chapman and Newbey 1995; Newbey and Hickman 2008), to a very significant extent in the proposed Buffer and Transition Zones (Kern et al 2007; FBG 2008; Markey et al 2009; Gondwana Link 2012; Markey et al 2012). The Marine Component (WA State waters), included in the proposed Transition Zone for the time being (see 4.5.c), holds very significant seascapes, ecosystems, species diversity and genetic variation (DEC 1997, 1998). Fitzgerald Biosphere contains many threatened species and ecological communities, for which a recovery plan has been developed (DEC 2012b).

In world terms the natural environment of Fitzgerald Biosphere is considered to be one of the richest places on earth for botanical diversity (Myers et al 2000; Hopper and Gioia 2004). This is based on its considerable diversity of geology and landforms and relatively stable and semi-arid Mediterranean climate (McQuoid 2004a, 2004b). Upon visiting (the then) Fitzgerald River National Park Biosphere Reserve in 1989, then UNESCO Assistant Director General Dr Bernd von Droste said, *"The Fitzgerald River National Park is without doubt the most important Mediterranean ecosystem reserve in the world. It stands out for its scientific, conservation and educational values in the same way that the Galapagos Islands do."* (Fry 2010)

The proposed Core Zone as Fitzgerald River National Park (Map 2) contains three main landforms, comprising the predominantly coastal quartzite Barren Ranges complex, a broad Eocene Marine Plain and the Yilgarn Granite upland, all interspersed by rivers, creeks, wetland systems and estuaries. Upon these landforms a complex set of vegetation communities occurs, including several types of eucalypt woodlands; allocasuarina and melaleuca woodlands; many types of mallee eucalypt, banksia and melaleuca shrublands; complex adenanthos, banksia, dryandra and melaleuca kwongan heaths and thickets; and sedgeland and grasslands. Within these many communities, some 1665 species of plants occur including 62 endemics (Newbey and Hickman 2008). Many of these plants are rare, restricted and/or endangered (DEC 2012b). Fitzgerald River National Park is home to one of the most complete assemblages of vertebrate fauna of any conservation reserve in southwestern Australia, including, tammar wallaby, red-tailed wambenger, mallee fowl, western ground parrot, western bristlebird and western whipbird (CALM 1991a). The Park has been identified through south coast regional threatened species planning and spatial analysis undertaken through a Australian Government funded pilot project as one of the top three areas of importance for threatened species and communities in southern Western Australia (Gilfillan et al 2009). It has subsequently been the subject for the development a regional recovery plan under State and Federal Legislation (DEC 2012b).

The proposed Buffer Zone of natural public lands not subject to mineral exploration and mining (Map 2), comprises significant areas of conservation lands. These include nature reserves vested in

the Conservation Commission of WA and managed by the Department of Parks and Wildlife (DPaW), other Crown reserves, unallocated Crown lands, and shire reserves. These lands include the conservation significant Lake Shaster Nature Reserve, Corackerup Nature Reserve, Doubtful Islands Nature Reserve, Kundip Nature Reserve, Overshot Hill Nature Reserve, Jerdacuttup Lakes Nature Reserve, parts of Lake Magenta and Dunn Rock Nature Reserves, the Bremer Peninsulas, Jerramungup Shire coastal reserves, Ravensthorpe Shire coastal reserves, and the Pallinup and Corackerup valley. Significantly, these include several landforms not represented in the proposed Core (Fitzgerald River National Park): the deep sands and palusplains of the Esperance Sandplain, salt lakes of the Lake Shaster system, the Doubtful Islands and Bremer Peninsulas of the Albany Fraser Orogen (Myers and Hocking 1998), the limestone ridges of the Jerramungup and Ravensthorpe Shire coastal reserves, and the western wheatbelt plant community transfer of the Pallinup and Corackerup valleys (McQuoid pers. comm.). In their own rights, these landforms have very substantial conservation values, although their smaller sizes and common recreational purposes see them serve as an ideal Buffer area in cultural terms. The high values are indicated by complex vegetation communities and plant richness, in some cases matching the proposed Core Zone in diversity and endemism. The Bremer Peninsulas are wild coastal and subcoastal landforms and mostly pristine vegetation communities with outstanding botanical richness including some endemic plants (e.g. Olde and Marriott 2009; Nicolle et al 2008).

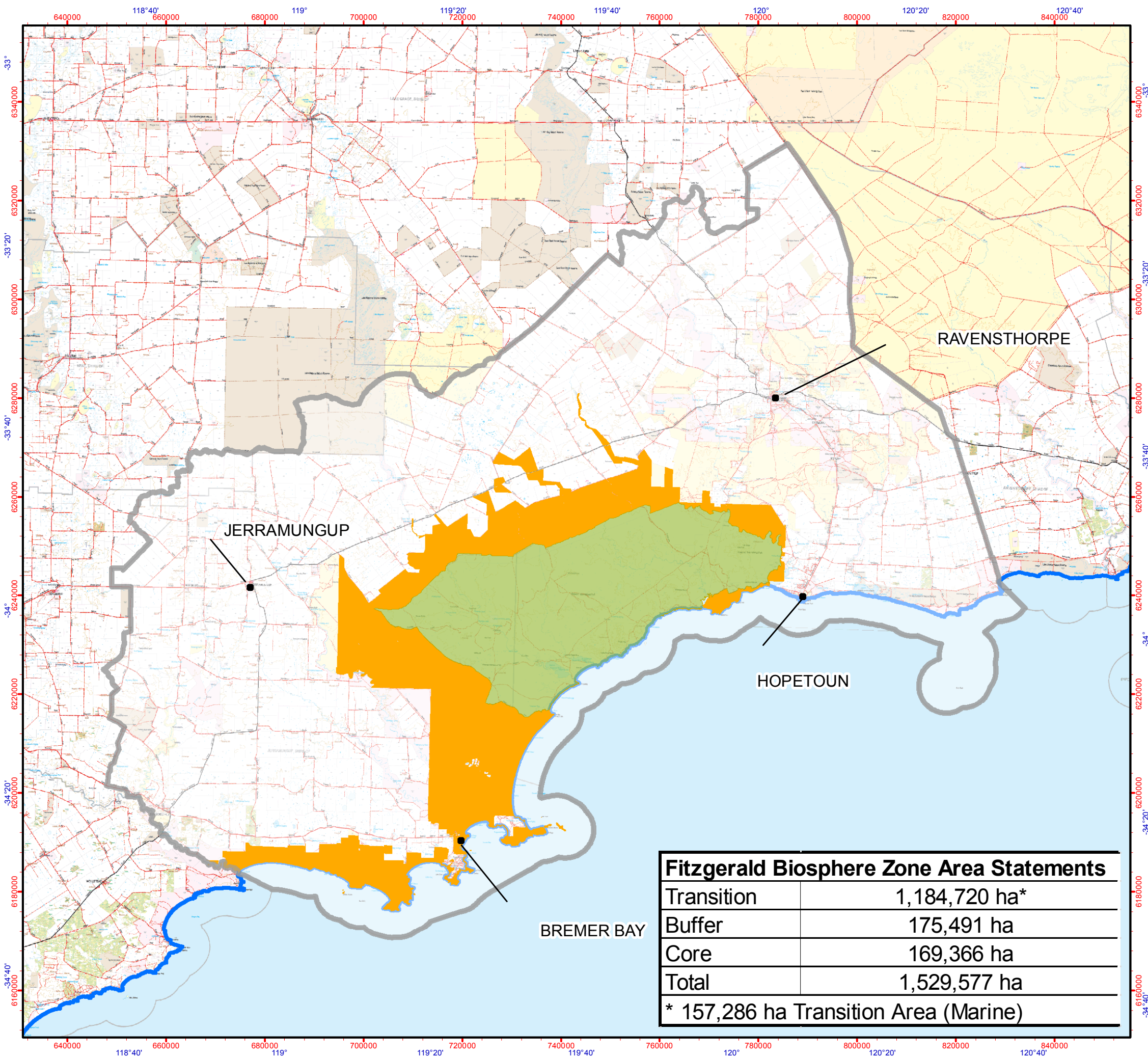
The proposed Transition Zone (Map 2) also has considerable conservation value, for both its terrestrial and marine components. The terrestrial component includes very large areas of natural lands as unallocated Crown land in the Bandalup, Cocanarup, Kundip, and Ravensthorpe Range areas. These areas are in the proposed Transition Zone because they are subject to mineral exploration and mining leases due to the predominance of mineralised acid volcanic rocks (Hocking and Myers 1998). Ravensthorpe Range is known to have exceptional botanical richness (Hopper and Gioia 2004; Chapman and Newbey 1995; Kern et al 2008; Craig et al 2008, 2009; Markey et al 2009), including over 50 endemics or near endemics (Hislop 2010; Harris et al 2008). Many often-significant areas of remnant bushland on private property are within the proposed Transition Zone, including the bushlands on private conservation properties (Greening Australia 2007; Bush Heritage Australia 2011; Gondwana Link 2011; Eades 2012). Private bushland remnants include river corridors, fragmented bushland patches ranging in size from less than one hectare to several hundred hectares in a few cases (Map 2). These remnants contain very significant conservation values (FBG 2008), including important populations of endemic threatened and plants and animals (Gondwana Link 2011; Bush Heritage Australia 2011). The proposed marine component comprises the relatively pristine State waters to the three nautical mile limit offshore. It has very significant conservation values as a range of marine ecosystems (DEC 1997, 1998; Radford et al 2008). It includes inshore calving grounds for southern right whales and migration routes for humpback whales, and feeding grounds for seals, sea lions, seabirds and the endangered great white shark (*Carcharodon carcharias*) among many other marine animals.

Botanical investigation over the last decade in the proposed Buffer and Transition Zones continues to uncover species new to science (e.g. Craven 1999; McQuoid and Hopper 2002; Toelken and Craig 2007; Nicolle et al 2008; George 2010; Lepschi 2010; Hislop 2010), providing an additional measure of the intense biological diversity of these Zones.

Map 2 Fitzgerald Biosphere Boundary and Zones

Legend

- WA Townsites
- Core Zone
- Buffer Zone
- Transition Zone



Fitzgerald Biosphere Zone Area Statements	
Transition	1,184,720 ha*
Buffer	175,491 ha
Core	169,366 ha
Total	1,529,577 ha
* 157,286 ha Transition Area (Marine)	

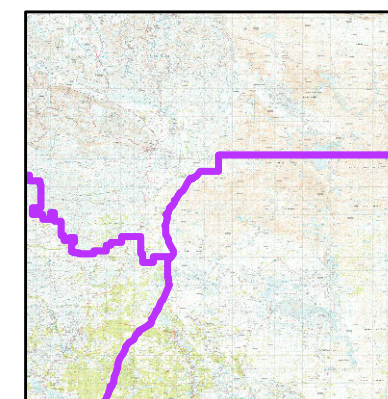


(A3)

1:779,958



Projection: Universal Transverse Mercator
MGA Zone 50. Datum: GDA94



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Parks and Wildlife



Department of
Parks and Wildlife



Graticule shown at 20 minutes intervals
Grid shown at 20000 metre intervals

Roads and tracks on land managed by DPaW may contain unmarked hazards and their surface condition is variable. Exercise caution and drive to conditions on all roads.

The Dept. of Parks and Wildlife does not guarantee that this map is without flaw of any kind and disclaims all liability for any errors, loss or other consequence which may arise from relying on any information depicted.

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3.2 "Development - foster economic and human development which is socio-culturally and ecologically sustainable".

(Indicate the potential of the proposed biosphere reserve in fulfilling this objective).

Economic and human development occurs predominantly in the proposed Transition Zone, and to a minimal extent in the Buffer and Core Zones. The proposed Transition Zone includes all private land, built upon or leased public land, Crown lands with mining developments and leases, and the marine component.

Fitzgerald Biosphere in its informal broader sense (Watson and Sanders 1997) has had a very significant and documented history (FBG 2009, 2011; South Coast NRM 2011; RAIN 2012) in fostering sustainable economic and human development. This has predominantly been since the advent of the "Landcare" movement in the early 1980's when the Jerramungup and Ravensthorpe Land Conservation District Committees, precursors of the Fitzgerald Biosphere Group* (FBG) and Ravensthorpe Agricultural Initiative Network (RAIN), and the support of the WA Department of Agriculture had a strong direction on supporting the development of more ecologically sustainable Agriculture (West 2001). This continued with the formation of the South Coast Regional Initiative Planning Team (SCRIPT) in 1994, and its later incarnation South Coast Natural Resource Management Inc. in 2007 and the development of their regional Natural Resource Management (NRM) strategies, which included the recognition of the Fitzgerald Biosphere Subregion (SCRIPT 1994; South Coast NRM 2005, 2011). The NRM strategies identify the priority sustainability issues for the themes of Biodiversity, Coast and Marine, Indigenous Culture, Land (agriculture), and Water; and to promote projects, processes and monitoring systems by which to foster their sustainable management. These initiatives were designed to foster community and economic development through the design and implementation of sustainable methods of primary production. As well significant resources have been made available to the community in the form of grants to groups and organisations to implement projects supporting the priorities across the themes (South Coast NRM 2011; FBG 2010). * = *The landcare group covering Jerramungup Shire.*

Indigenous Noongar history in the area is significant, going back the order of 45,000 years (Hassell 1975, CALM 1991a; Tindale 1994, Guilfoyle 2009; SWALSC 2012). However, the traditional owners have suffered very considerable disconnection with the land since European settlement during the 1860's. A strong Noongar community exists in parts of Fitzgerald Biosphere and in towns nearby, where great interest in redressing the disconnection is held. The Action Plan for Fitzgerald Biosphere (McQuoid 2012) provides a range of recommended actions to reconnect Noongar people and celebrate and interpret their remarkable culture. The representative advisory body – the Biosphere Implementation Group (BIG) includes Noongar membership.

The Gondwana Link landscape conservation program and its partners are building upon the strong natural matrix with an ambitious ecological restoration program to re-link remnant bushlands. This conservation-based development involves a partnership with private conservation organisations Bush Heritage Australia, Greening Australia, The Wilderness Society and the United States based Nature Conservancy. The focus is of landscape protection and restoration on private lands and has a number of employees and contractors through its partner organisations (Gondwana Link 2012).

The marine component of the Transition Zone has an ecologically sustainable development function, as it is the primary drawcard for the considerable coastal recreation and tourism industry, and the subject of a well-managed commercial fishing industry (DOF 2011). This function is divided into

two areas: flourishing land-based tourism managed and supported by local businesses and private individuals; and sea and estuary-based recreational and commercial fishing managed by the Western Australian Department of Fisheries.

Tourism and recreation are major seasonal activities of the coastal towns of Bremer Bay and Hopetoun (Map 1), as well as to a lesser although not insignificant extent in Fitzgerald River National Park proposed Core Zone and recreation reserves in the proposed Buffer Zone (CALM 1991a; Shire of Jerramungup 1994a, 1994b; Field 2001). During the Christmas and Easter and associated school holiday breaks, thousands of people largely from the hinterland Wheatbelt and Goldfields and the State capital city of Perth choose Bremer Bay and Hopetoun and the nearby coast as holiday destinations. The Fitzgerald Coast Tourism Association and Ravensthorpe Hopetoun Area Promotions Group provide outstanding tourism guide information (Williams and Cooper eds 2011) to help cater for visitors to the area. DPaW promotes and provides information on recreating in Fitzgerald River National Park through brochures and its website (www.dpaw.wa.gov.au). This includes Point Ann as a widely recognised shore-based whale watching location, and a recent improvement project is spending \$40 million on road access and recreation facilities upgrades (DEC 2012a). This lifestyle-based industry is probably sustainable in its current form due to the relatively low impact, predominantly town-based accommodation, the existence of several businesses supporting tourists and the relative remoteness and inaccessibility of large areas (CALM 1991a, 1991b).

Commercial and recreational fishing are major activities of the marine and estuarine waters of the proposed Transition Zone marine component. These fisheries are managed as part of the South Coast Bioregion and are managed by the WA Department of Fisheries (DOF 2011). They have a sustainable management regime applied, based on an ecosystem based fisheries management (EBFM) framework (Fletcher et al 2010). The fisheries of The Fitzgerald Biosphere are an important economic driver across recreational and commercial basis and include abalone wild catch and on-shore aquaculture, purse seine for pilchards and other small pelagic fish, gillnetting for sharks, estuarine fishing, beach based seine for Australian salmon and herring, trap-based for rock lobster and deep water crabs, and a small scale scallop operation (DOF 2011). The recreational fishery is concentrated around the towns of Bremer Bay and Hopetoun and adjacent more accessible coastal and estuarine areas. It includes shore and boat-based ocean fishing, and dinghy and shore-based fishing in estuaries and rivers (DOF 2011).

Mining has occurred in Fitzgerald Biosphere since gold was first discovered in 1898 (Ravensthorpe Shire 2010a), predominantly for metals in the Ravensthorpe area associated with the mineralisation in the Ravensthorpe Range (Witt 1997). In the Jerramungup area gold has been mined at a small scale a few times from the 1950's at Calyerup Creek. Galaxy Resources have been mining Spodumene to derive lithium from their Mt Cattlin mine operation just to the west of Ravensthorpe (Galaxy 2011). First Quantum Minerals (FQM) mine nickel and other associated metals at their Bandalup Hill site in the eastern part of the proposed extended Biosphere Reserve. These mining interests are within the proposed Transition Zone, no mining occurs in the proposed Buffer or Core Zones, although prior to National Park gazettal, early tenements and small scale mining operations did exist in what is now Fitzgerald River National Park.

Mining developments in Western Australia take into account ecological sustainability as it relates to the WA Environmental Protection legislation (EP Act 1986). In this regard, exploration and mining is conducted in a framework of limiting and managing environmental damage (EPA 2004a, 2004b, 2008a), and in some cases by providing environmental offsets (EPA 2008b). Mining companies

predominantly operate in the Ravensthorpe area of eastern Fitzgerald Biosphere where the mining operations comprise and provide very significant economic benefits to the Ravensthorpe community. The coastal town of Hopetoun has grown extensively since the large Ravensthorpe Nickel Operations (RNO) mine at Bandalup Hill east of Ravensthorpe was commenced in the early 2000's, due to investment in housing developments for mine staff and contractors and the flow-on commercial opportunities of mine development and management. The economic and social support benefits of mining are fully recognised by the community, as is the balance between environmental protection and economic development in such a naturally diverse and often sensitive landscape (Brereton et al 2007). Mining companies explore, develop and operate within strict Australian and WA State Government legislation, which ensures that operations are as environmentally sound as possible, including for flora fauna and habitat consideration and protection, hazardous emissions management, water management, and mine site rehabilitation. With the adherence and application of environmental protection and management legislation, a great deal of information about the areas natural environment has been discovered, including many new plant species (Markey et al 2009, Markey et al 2012) as a result of extensive investigation and inventory work.

Land development as subdivisions in Bremer Bay, Jerramungup, Hopetoun and Ravensthorpe, with a few smaller developments to split farms into smaller original locations, has seen a steady rise in the numbers of people coming to the area over the last few decades. These developments have been driven by coastal living opportunities for recreation and employment at mines in the case of Hopetoun. Mining development has seen Ravensthorpe grow appreciably, mainly with new houses on town blocks. The land developments of the wild landscape of the Point Henry Peninsula at Bremer Bay have been conducted according to strict landscape protection guidelines (Shire of Jerramungup 2007), in line with ecologically sustainable development.

3.3 "Logistic support - support for demonstration projects, environmental education and training, research and monitoring related to local, regional, national and global issues of conservation and sustainable development".

(Indicate current or planned facilities).

Considerable logistic support for environmental and sustainable development exists in Fitzgerald Biosphere across its three proposed Zones. It can be divided into Commonwealth legislation and policy resourcing (marine reserves planning and threatened species and communities management), State agencies, natural resource management group support (funded by State and Commonwealth), local government authorities, community groups, universities and research institutions, international groups, private organisations and individuals. These logistic initiatives include management planning, education, interpretation, monitoring, and research of landscapes, visitors, local communities, threatened species and communities, vegetation communities, flora taxonomy, plant dieback disease, fisheries, archaeology, and human communities. A very strong and sophisticated community exists (resident in the proposed Transition Zone) in the broader Fitzgerald Biosphere, a community that often collaborates on initiatives of research (Chapman and Newbey 1995a, 1995b; Watson et al 1996; Craig et al 2008; DEC 2012b), development (Shire of Jerramungup in prep), and logistical support (Barrett et al 2009; CALM 1991a; DOE 2004; DOW 2008) through the Biosphere Implementation Group (McQuoid 2012).

Since 1976 there has been a National Park Ranger presence in the proposed Core Zone (CALM 1991a). The Department of Parks and Wildlife (DPaW) (formerly the Department of Environment and Conservation (DEC) and the Department of Conservation and Land Management (CALM)), has statutory management responsibility for Fitzgerald River National Park under the CALM Act 1984.

The Fitzgerald River National Park Advisory Committee (FRNPAC) was established during the management planning process that produced the 1991 Fitzgerald River National Park Management Plan (CALM 1991a). The advisory committee includes representation from community individuals and groups, and local authorities, and continues its activities today. DPaW also has had an increasing presence and support available to the management and research of the proposed Core Zone and aspects of the proposed Buffer Zone and to some extent in the proposed Transition Zone since 1985 (e.g. CALM 1991b; Sanders 1996; 1996; Sanders and Watson 1997; Kern et al 2008; Hislop 2010; DEC 2012a). This includes the operations base in Ravensthorpe, which supports the management of Fitzgerald River National Park and activities in the Buffer and Transition Zones. Often these initiatives are in partnership with other organisations (Watson et al 1996), including South Coast NRM (Wilkins et al 2006; Craig et al 2007, 2008; Barrett et al 2009), the Australian Government Department of Environment (and its various previous entities) (Leighton and Watson 1992; Sanders 1996, 1997; Robinson and Coates 1995; Robinson 1997; Gilfillan et al 2008; DEC 2012b), and the Friends of Fitzgerald River National Park (previously Fitzgerald River National Park Association) (Chapman and Newbey 1987). Also by community groups in collaboration with the Water and Rivers Commission (WRC)/Department of Environment/Department of Water (DOW/DOE) (WRC 2001; DOE 2004; DOW 2006, 2008); and community/agency collaborations (Coffey 2009; South Coast NRM 2011). Local government authorities have undertaken management planning for their reserve systems (Field 2001; Shire of Jerramungup 1994a, 1994b), and includes their relationship and role with Man and Biosphere (MAB) Objectives in their strategic plans (Shire of Ravensthorpe 2010; Shire of Jerramungup 2012b). By private organisations, including Gondwana Link and its partners including Bush Heritage Australia and Greening Australia (Sanders 2008). University supported research has included biological (e.g. Harris et al 2008) and social (e.g. Switzer 1988; Buckley 2007) investigations. The WA Museum has conducted endemic invertebrate research (Framenau et al 2008). As well, many individuals involved in an extensive range of activities, principally research (eg. George 2010, McQuoid and Hopper 2009; Hassell and Dodson 2002; Deegan 2005, 2006).

Mining and mineral exploration interests in the Ravensthorpe area of the proposed Buffer and Transition Zones have seen a substantial biological survey effort in line with Western Australian Environmental protection legislation and guidelines that biological surveys be conducted to research and manage potential impacts (EPA 1986, 2004a, 2004b, 2008a). The survey work has provided very significant information regarding fauna, flora and vegetation, which *inter alia* has enabled the discovery of many new plant species (e.g. Wege and Thiele 2009; Lepschi 2010; Hislop 2010).

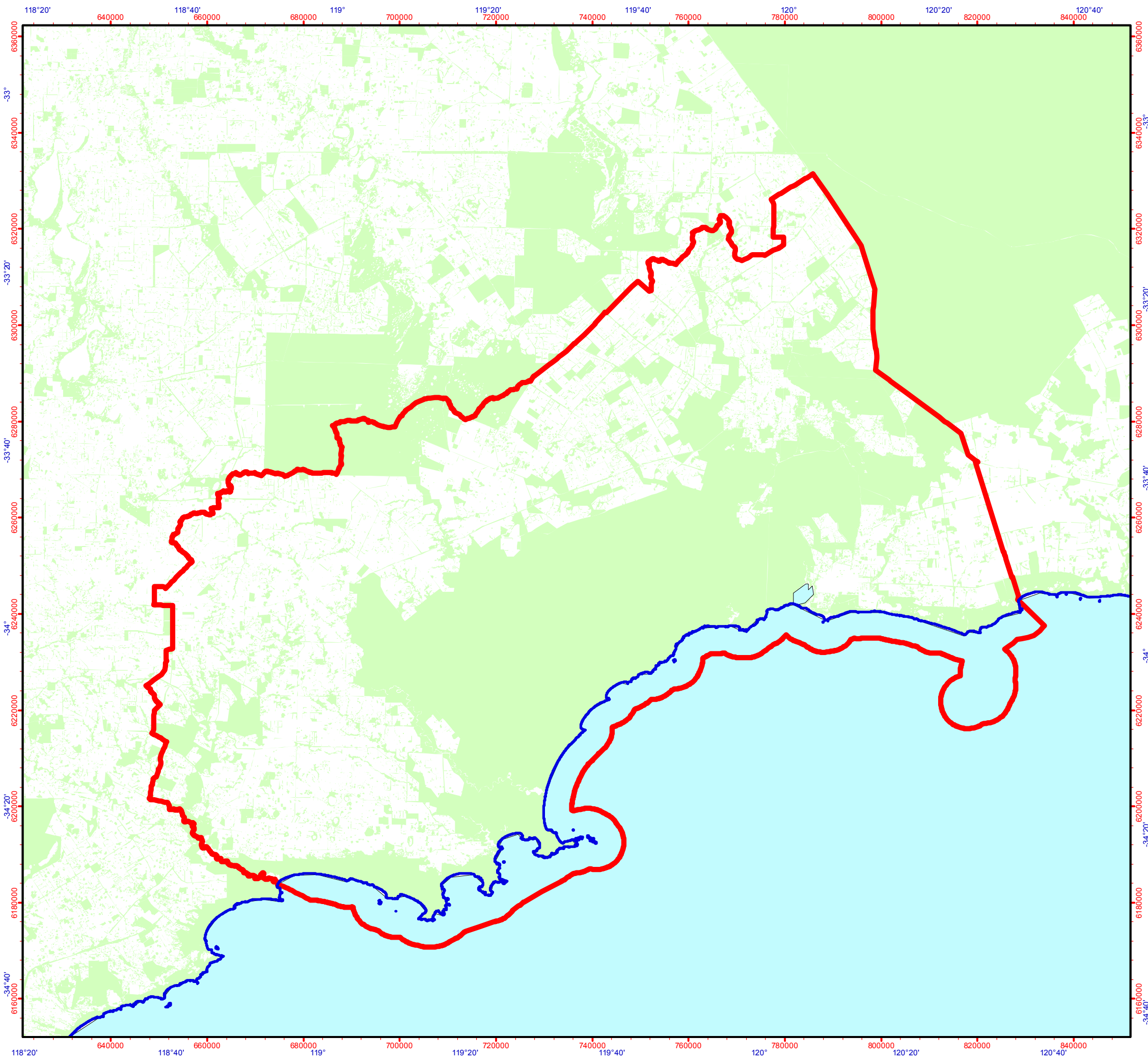
In the Transition Zone logistic support has been considerable with a focus on improving the sustainability of agriculture (West 2001), soil conservation, resource condition appraisals (Dept. of Agriculture and Food 2002, 2004, 2006a, 2006b) and the quality of water (WRC 2001; DOE 2004; DOW 2006, 2008), and biodiversity in catchments, watercourses and remnant vegetation (FBG 2008). These themes have been brought together in under the umbrella of natural resource management through the excellent initiatives of South Coast NRM and its former SCRIPT (SCRIPT 1996, 2000, 2004, 2005; South Coast NRM 2011). An excellent example of addressing agricultural sustainability was the Fitzgerald River Catchment Demonstration Initiative (CDI) project (FBG 2009). The project was conducted during 2004 to 2009 to undertake salinity management demonstration activities on the Jerramungup plain upstream of Fitzgerald River National Park. These activities implemented catchment plans that had been the result of a planning focus over the previous decade, and involved salinity containment practices, including establishing perennial pastures, riparian and remnant vegetation protection and surface water control in the Fitzgerald River Catchment. The Australian and Western Australian Governments supplied \$1.2 million, and

the local Fitzgerald River Catchment Group supplied matching funds to undertake the project. Multiple partners were involved including Fitzgerald Biosphere Group, Department of Agriculture and Food, Department of Environment and Conservation (now the Department of Parks and Wildlife), Department of Water, South Coast NRM, Commonwealth Scientific and Industrial Research Organisation (CSIRO), Shire of Jerramungup, University of Western Australia's (UWA) Centre for Excellence in Natural Resource Management (CENRM) and catchment landholders.

Fitzgerald Biosphere has also had some focus on social research (Buckley 2008) and been the subject of a comprehensive research bibliography (Deegan 2005, 2006). The two local NRM groups, Fitzgerald Biosphere Group* (FBG) in the west and Ravensthorpe Agricultural Initiative Network (RAIN) in the east, are energetic and focussed community-based groups with a strong resource sustainability agenda (FBG 2011; RAIN 2012). Both groups had their genesis in the old Landcare District Committee (LCDC) apparatus of the early 1980's, and act as umbrella groups to several catchment, grower and other community groups. Both also operate 'shop fronts' their respective towns of Jerramungup and Ravensthorpe, and are the key partner groups performing roles between State agencies, South Coast NRM, local authorities and other resourcing partners. They are core members of the Biosphere Implementation Group (BIG) and together continue to provide extensive and fundamental logistical support. The Malleefowl Preservation Group (MPG) is a particularly active and award winning community group with a focus on the proposed Transition Zone and more broadly outside Fitzgerald Biosphere Reserve through the activities of many supportive landowners (Rijavec and Dennings 2009). Its significant activity focuses on logistic support for habitat protection and enhancement through its membership and in partnerships with other groups including Gondwana Link. * *The Fitzgerald Biosphere group is the NRM group covering lands of the Shire of Jerramungup, rather than the entire proposed Biosphere Reserve.*

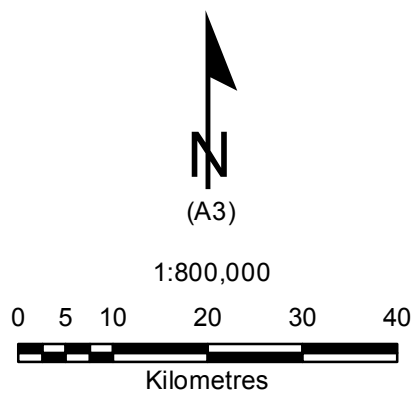
The Gondwana Link Project based its initial focus area in the Western Fitzgerald Biosphere due to its significant biological diversity (Hopper and Gioia 2004), and relatively intact natural lands (Gondwana Link 2012). The focus area comprises a matrix of proposed Buffer and Transition Zones with relatively large public conservation reserves, a significant matrix of privately owned reserves (Sanders 2008; Bush Heritage Australia 2011), and private farmlands. The Gondwana Link initiative and its partners are building upon the strong natural matrix with an ambitious ecological restoration program to re-link remnant bushlands. Map 3 shows the native vegetation extent across the proposed Transition Zone and its linkage with the proposed Core and Buffer Zones.

Over the last nine or so years, several NRM projects have included Noongar cultural investigation and conservation as key aspects of their design and delivery. Principal among these is the natural and cultural restoration program at the Nowanup property in the southwest corner of Fitzgerald Biosphere (Eades 2012). This remarkable program supports Noongar people through cultural celebration, youth development, ecological restoration, nature interpretation and cross-cultural activities. It is centred on the Noongar meeting place, a semi traditional stone amphitheatre developed as part of the NGO Greening Australia and Shell Development Australia Reconnections Project from 2004 to 2008 (Greening Australia 2007). The project also focused on revegetation of the Nowanup property, a key part of the broader Gondwana Link program. The program included Shell employees committing them and their family's time to undertake revegetation and engage in cross-cultural activities with local Noongar people. The restoration work included 300 ha of native vegetation established on cleared farmland of Nowanup. Other examples include the Culham Inlet Management Plan (DOW 2008) that has included the investigation of Noongar cultural history and the Fitzgerald River National Park improvement project (DEC 2012) that has seen archaeological surveys undertaken as part of the road upgrade program (Guilfoyle 2009).

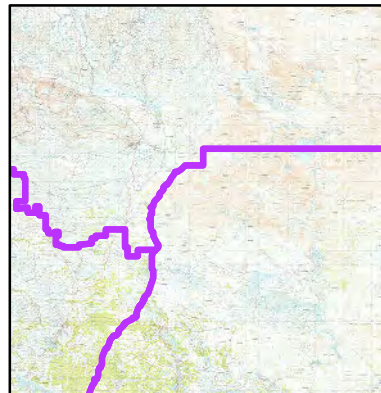


Map 3 Fitzgerald Biosphere Native Vegetation

- Legend
- WA Coast
 - Proposed_FBR_Boundary
 - WA Ocean Mask
 - Native Vegetation



Projection: Universal Transverse Mercator
MGA Zone 50. Datum: GDA94



Produced by the
Department of
Parks and Wildlife



Graticule shown at 20 minutes intervals
Grid shown at 20000 metre intervals

Roads and tracks on land managed by DPaW may contain unmarked hazards and their surface condition is variable. Exercise caution and drive to conditions on all roads.

The Dept. of Parks and Wildlife does not guarantee that this map is without flaw of any kind and disclaims all liability for any errors, loss or other consequence which may arise from relying on any information depicted.

Produced at 2:54pm, on Jan 28, 2015

The proposed marine component of Fitzgerald Biosphere comprises Western Australian State waters (Map 2). It is proposed as part of the Transition Zone, as it supports many commercial and recreation activities. The activities are focussed on fishing, which is sustainably managed by the logistical support of the Western Australian Department of Fisheries (DOF 2005, 2011). The marine component of the proposed Transition Zone is included in the draft South Coast Regional Marine Strategic Plan and the reference report to government: *Oceans of Opportunity: A Proposed Strategic Framework for Marine Waters off Western Australia's South Coast* (DEC 2010). State Government agencies and universities have undertaken marine research, including the 2006-2008 Marine Futures Project by University of Western Australia (Radford et al 2008) that is supporting the management of marine waters within the proposed Transition Zone.

The two principal local authorities of Fitzgerald Biosphere, the Shires of Jerramungup and Ravensthorpe provide a range of logistic support including reserve planning (Field 2001; Jerramungup Shire 1994a, 1994b; Shire of Ravensthorpe 2014c), ranger services, tourism planning, information support, and development/building planning and management services, (Shire of Jerramungup 2007, 2009, 2012, 2013; Ravensthorpe Shire 2010a, 2010b, 2012, 2013). The local authority Community Strategic Planning (CSP) process has delivered different responses to the MAB Objective and Fitzgerald Biosphere. The Shire of Jerramungup CSP (Jerramungup Shire 2012b) has as its first (of four) vision: *In 2025, the Shire of Jerramungup will be recognised internationally as an active world biosphere reserve. A carbon neutral, well designed, Green Star Community where conservation and the sustainable use of natural resources is monitored, researched and continually refined. The first of four aspiration pillars states: Pillar 1: Environmental Aspirations. The key aspirations within this area reflect the Shire's location and proximity to the Fitzgerald River National Park. The Shire's location is recognised internationally for its biodiversity, pristine coastal environment and human interaction with the landscape. Land use planning, land capability and natural resource management are addressed in this area.* The Shire of Ravensthorpe Community Strategic Plan (Shire of Ravensthorpe 2014a) does not mention Fitzgerald Biosphere, although its theme 2: *A thriving business and industry including tourism: A strong, diversified economic tourist and industrial base that provides varied employment opportunities for all ages;* and theme 3: *Adequate services and infrastructure to cater for the community: Sustainable infrastructure that allows for effective travel, and services within the local government and to other rural and metropolitan areas,* provide justification for the use of the Biosphere Objective as support to deliver quality outcomes for the community. In addition the two other themes of a *Vibrant, supportive and socially connected community,* and *Civic Leadership* will find support in the Biosphere Objective. The Shire Strategic Community Plans have associated Corporate Business Plans (Jerramungup Shire 2012c, Ravensthorpe Shire 2014b) to support the delivery of visions, pillars and themes through Shire governance and management processes and structures.

While marine reserves are not a current feature of Fitzgerald Biosphere as proposed, logistic support in the form of marine reserves planning in the area has been extensive for both Commonwealth and State waters. Commonwealth efforts include a comprehensive marine reserve system for southwest Commonwealth marine waters (Kalbarri WA, to Kangaroo Island SA). Up to 2013, the then Australian Government Department of Sustainability, Environment, Water, Population and Communities (SEWPC) (now Department of Environment) completed designation of the South-West Region Commonwealth Marine Reserve network, which includes waters offshore from Fitzgerald Biosphere as part of the 'Bremer' Commonwealth Marine Reserve proposal (Commonwealth of Australia 2012). In 2013, a review was put in place for the management of the marine reserve network that may affect the allowable activities inside the reserves (Australian

Government n.d). The Western Australian government has a draft marine reserves strategic framework (DEC 2010, CALM 1994) that includes recommendations for consideration of marine reserves in the State waters of an extended (as proposed) Fitzgerald Biosphere.

The Biosphere Implementation Group (BIG) brings together the focus of logistic support through its membership and partner organisations for the future of a broader Fitzgerald Biosphere. Through the Action Plan for Fitzgerald Biosphere (McQuoid 2012), it will develop further logistical support of the MAB Objectives in implementing the Plan. The focus will be on strengthening existing partnerships, bringing new partners and new resources to grow the opportunities.

Logistic support has been and is extensive in the proposed Core, Buffer and Transition Zones. Looking ahead, a review of logistic support would be useful to take account of the changes in society, the re-invigoration of the extended Fitzgerald Biosphere concept, and to refocus and more effectively consider the issues facing the future of the resource. This is being planned in part through the current Action Plan for Fitzgerald Biosphere for predominantly the proposed Buffer and Transition Zones (McQuoid 2012), with the proposed Core Zone covered by the management of DPaW through statutory management planning. The Action Plan recommends priority management and research activities in response to MAB objectives, and implementation through partnerships and other forms of collaboration, and by attracting a broader range of external resources.

4. CRITERIA FOR DESIGNATION AS A BIOSPHERE RESERVE

[Article 4 of the Statutory Framework presents 7 general criteria for an area to be qualified for designation as a biosphere reserve which are given in order below.]

4.1. "Encompass a mosaic of ecological systems representative of major biogeographic regions, including a gradation of human intervention"

(The term "mosaic" refers to a diversity of natural habitats and land cover types derived from human uses such as fields, managed forests, etc. The term "major biogeographic region" is not strictly defined but it would be useful to refer to the map of the "World Network of Biosphere Reserves" which presents 12 major ecosystem types at a global scale).

An extended Fitzgerald Biosphere would encompass a range of ecological systems and a gradation of human intervention over an area of around 1.53 million hectares (Map 2; Watson and Sanders 1997). In terms of the major ecosystem categories currently recognised by the MAB Program, the proposed extended Fitzgerald Biosphere includes, in broad system terms: woodlands or scrub; river catchments, small mountain ranges, wetlands, estuaries, and inshore marine ecosystems. It has a Mediterranean climate with cool wet winters and warm to hot dry summers. Annual rainfall varies from around 360 mm in the north, to over 600 mm in the south (DEC 2012b).

Fitzgerald Biosphere sits within the Interim Biogeographic Regionalisation of Australia (IBRA) Fitzgerald Region (Thackway and Cresswell 1995) of Esp 1, Esp 2, and Mal 2 IBRA sub-regions. It lies within the South West Floristic Region of Australia, standing out for its high levels of botanical diversity and endemism (Hopper and Gioia 2004). It comprises a number of geological systems including the Yilgarn Craton, Ravensthorpe Range Greenstone Belt, Eocene Marine Plain, Barrens Quartzite Ranges and Schist formations, Albany Fraser Orogen, and Quaternary limestone of the coast (Witt 1997; Myers and Hocking 1998). Overlying and associated with this complex geology is an array of landforms, drainages, wetlands and soil systems as weathered products (McQuoid 2004b), which gives rise to a remarkable diversity of vegetation and flora (McQuoid 2004a; Craig et al 2008; DEC 2012b). This floristic diversity was the basis for Fitzgerald River National Park's listing as a Biosphere reserve in 1978 (CALM 1991a).

The proposed marine component comprising Western Australian State waters sits in the southwest Bioregion (Map 2; DOF 2011a), and within that the mesoscale ecosystem of WA South Coast based on Integrated Marine and Coastal Regionalisation of Australia (IMCRA) 4 Boundaries (Commonwealth of Australia 2006). Further offshore the part complete Bremer Commonwealth Marine Reserve is part of the South West Region Commonwealth marine reserves network (Commonwealth of Australia 2012) and these ecosystems will be the subject of potential inclusion in a further expanded Fitzgerald Biosphere once the Australian Government marine reserves process are finally in place.

Several estuaries and short streams contact the coast and marine ecosystems, comprising important natural habitats (Chuwen et al 2009). These systems have a very significant interaction between ocean and river catchment, as well as between people and nature through recreation and commercial fisheries (DOF 2005) and other water-based activities.

It includes areas with varying degrees of human intervention across a spectrum. Ranging from little to almost none in large parts of the proposed Core Zone and parts of the proposed Buffer and Transition Zones and in some parts of the marine component of the proposed Transition Zone, to full intervention on modified lands (cleared and built on) in the private land aspects of the proposed Transition Zone (Map 2).

4.2 "Be of significance for biological diversity conservation"

(This should refer not only to the numbers of endemic species, or rare and endangered species at the local, regional or global levels, but also to species of globally economic importance, rare habitat types or unique land use practices (for example traditional grazing or artisanal fishing) favouring the conservation of biological diversity. Give only a general indication here.)

The expanded as proposed Fitzgerald Biosphere is one of the World's most important areas for biodiversity conservation (von Drost pers. comm. 1989 in Fry 2010; Hopper and Gioia 2004; Myers et al 2001; May and McKenzie 2003). It contains a large number of plant species including many endemic taxa (Chapman and Newbey 1995, 1995; Barrett 1996; McQuoid 2004a; Gilfillan 2000; Gilfillan et al 2009; DEC 2012b). At its Core Fitzgerald River National Park has one of the most intact vertebrate fauna assemblages of any conservation reserve in Southern Australia (CALM 1991a) including a number of threatened species (DEC 2012b). It protects an endemic skink (*Lerista viduata*) (Chapman and Newbey 1995b), and a number of short-range endemic invertebrates (Barrett 1996; Framenau et al 2008).

The proposed marine component (WA State waters) is critical for the conservation of biological diversity as it contains a number of high value marine ecosystems and habitats (DEC 1997, 1998; Radford et al 2008). This includes calving grounds for southern right whales and migration routes for humpback whales. The proposed marine component, including the Doubtful Islands, is also an important breeding area for New Zealand Fur Seals and Australia Sea Lions. The 2006-2008 University of Western Australia Marine Futures Project (Radford et al 2008) found that out of 156 marine sponge specimens collected across all project areas including project locations in the marine component of the Fitzgerald Biosphere, 50% or 78 species were considered to be new species.

The expanded Fitzgerald Biosphere is of such significance due to its complexity of landforms overlying a range of geological systems as outlined in 4.1. This gives rise to a very complex mosaic of vegetation systems (Craig et al 2008), and within that an exceptional floristic diversity (CALM 1991a; Chapman and Newbey 1995a; Hopper and Gioia 2004; McQuoid 2004a; Newbey and Hickman 2008). A very significant matrix of native vegetation cover exists across the three proposed Zones; Map 3 shows its extent and patterning.

An excellent outline of the biological diversity of (the expanded as proposed) Fitzgerald Biosphere is provided by DEC 2012b, *section 2.3 Biodiversity of the Fitzgerald Biosphere*, which states:

The Fitzgerald Biosphere is internationally and nationally recognised for its high biodiversity richness, species endemism and high level of threats, as it is part of the international Southwest Biodiversity Hotspot (Myers et al. 2000) and includes the National Biodiversity Hotspot 'Fitzgerald River Ravensthorpe'.

The Fitzgerald Biosphere includes a great complexity of geology and associated soils and vegetation communities. It has a Mediterranean climate with cool wet winters and hot dry summers. The average annual rainfall varies from 360 mm in the north to over 600 mm in the south west coast. The landscape units of the biosphere are explained below in Section 2.

The Biosphere is particularly significant for its plant diversity with over 2500 described vascular flora species, over 100 of which are endemic to the Biosphere. The FRNP and Ravensthorpe Range are floristic hotspots within this area.

As with most Mediterranean areas, the diversity of vertebrate taxa in the Fitzgerald Biosphere is not as rich as its flora diversity, with 29 mammal, 51 reptiles, 14 frogs and 209 bird species (DEC 2009). However, FRNP supports more vertebrate species than any other conservation reserve in south-western Australia. The FRNP is at a faunal crossroads in a north-south and east-west

direction and includes both arid and mesic adapted species (Chapman et al. 1995). Only one vertebrate species, the skink (Lerista viduata), is endemic to the Biosphere.

Little is known about other components of the Fitzgerald Biosphere biodiversity, such as invertebrates and fungi. As part of a south coast inventory survey for fungi and short-range endemic invertebrates in 2006/07, 181 species of fungi (Syme 2008) and over 70 species of terrestrial invertebrates (Framenau et al. 2008; Harvey & Leng 2008) were recorded in the Biosphere. However, these surveys were not extensive and there remains much to be learnt about the biodiversity of the Biosphere.

The Fitzgerald Biosphere retains just over half (51%) of its native (or remnant) vegetation. The most regionally significant areas are:

- *Fitzgerald River National Park,*
- *Ravensthorpe Range and its link between FRNP and Southern Goldfields,*
- *Coastal reserve system between FRNP and Pallinup River (which continues further west towards Albany),*
- *Lake Magenta Nature Reserve and the Fitzgerald River corridor link to FRNP,*
- *Corackerup/Peniup area and its links to Pallinup River,*
- *Jerdacuttup Lakes Nature Reserve.*

(RAP 1997; Watson & Wilkins 1999)

4.3 "Provide an opportunity to explore and demonstrate approaches to sustainable development on a regional scale"

(Describe in general terms the potential of the area to serve as a pilot site for promoting the sustainable development of its region (or "eco-region"))

The size and diversity of natural landforms, seascapes and agricultural lands, together with a strong community and excellent logistical support, has seen the informally broader (expanded as proposed) Fitzgerald Biosphere as an incubator of approaches to sustainable development over the last three decades (FBG 2012; RAIN 2012; South Coast NRM 2011; Shire of Jerramungup 2013). Demonstration of this is found throughout this renomination form by the extensive references cited. A vital feature of many of the references and the work they comprise is that they describe a very strong sense of collaboration, which has seen the local community heavily involved or instrumental in the formulation of many scientific studies (Chapman and Newbey 1995a, 1995b; Watson et al 1996; Hassell and Dodson 2002; McQuoid and Hopper 2002, 2004; Wilkins et al 2006; Craig et al 2008; Kern et al 2008; Nicolle et al 2008; Harvey and Leng 2008; Syme 2008; Hopper and McQuoid 2009), management and development plans (CALM 1991a; DOE 2004; DOW 2006, 2008; Barrett et al 2009; DEC 2012b; SCRIPT 2005; Project Dieback 2008; South Coast NRM 2011), reports (Bradby 1988; Guilfoyle 2009), interpretation material (McQuoid 2004a; MPG; Hillyer 2006), and books (Hassell 1975; Copp 2001; Rijavec and Dennings 2009; Craig 2011; Miller-Hornsey 2011).

The demonstration of different approaches to sustainable development has occurred across the three proposed Zones. This has principally been driven by the regional natural resource management strategy process (SCRIPT 2000, 2004, 2005; South Coast NRM 2011), through the community and in partnership with WA and Australian Governments, which develops priorities for sustainable management of the regions' biological and physical values. Alongside this, strong support for sustainable development occurs in the marine component for fisheries management (Fletcher et al 2002, 2010; DOF 2005, 2011a, 2011b). The Department of Parks and Wildlife is investigating new ways to manage the region's many threatened species and ecological communities in collaboration

with the Australian Government and community through an innovative landscape approach (Gilfillan et al 2009; DEC 2012b).

Several community groups occupy key places in promoting sustainable development and management of the regions natural resources; including the two local Fitzgerald Biosphere based natural resource management (NRM) groups Fitzgerald Biosphere Group (FBG) and Ravensthorpe Agricultural Initiative Network (RAIN). These groups have a long history of the support of sustainable development (FBG 2011, 2012; RAIN 2012; DOE 2004; DOW 2006, 2008) and are well placed to continue and expand their supportive roles. Specifically, they form part of the core of the BIG, and via the Action Plan for Fitzgerald Biosphere (McQuoid 2012) in collaboration with other members and through broadened new partnerships, will look to increase the promotion of sustainable development. The community has been the subject of studies regarding community sustainability (Williams et al 2008), demonstrating a proactive approach to addressing sustainability.

Agriculture in Fitzgerald Biosphere, through the FBG, RAIN, South Coast NRM and the Department of Agriculture and Food (DAFWA) continues to explore and promote sustainable agricultural production (FBG, 2011, 2012; RAIN 2012; South Coast NRM 2011). These initiatives often link agricultural production and the conservation of nature through their design, implementation and monitoring processes. Examples include catchment management planning (DOW 2006, 2008), remnant vegetation protection and revegetation, saltland pasture development, perennial pasture development, agroforestry, grains industry research projects, soil management, precision farming, extension works and agricultural exchange programs (FBG 2009; RAIN 2012).

The Gondwana Link project, active in western and northeastern Fitzgerald Biosphere, and its partners Bush Heritage Australia and Greening Australia have undertaken very significant landscape scale conservation planning (Sanders 2008), and ecological restoration activities (Jonson 2010). These works have occurred as property purchase, planning and restoration in western Fitzgerald Biosphere, and planning in the Ravensthorpe Link in eastern Fitzgerald Biosphere.

As a broader aspect of the Noongar cultural reconnection underway, the South Coast NRM Restoring Connections project involved Noongar communities across the South Coast region in identifying, protecting and restoring culturally significant places at risk of degradation (South Coast NRM 2012). The work has included on-ground restoration and preservation works at site of cultural and natural significance. The project has engaged and supported the involvement of the Noongar people of the South Coast region in natural resource management and heritage projects, and provided technical expertise as required. It has also helped community groups to identify and access additional funds to scope and develop enterprises.

The remarkable landscape and seascape of the extended Fitzgerald Biosphere is locally revered. The diversity, desire and drive of local groups and agencies, with their collaborations and partners, combine to make Fitzgerald Biosphere particularly well placed to promote the Man and Biosphere (MAB) Objectives. This alignment of place, commitment and opportunity will continue to promote sustainable development of its natural resources, and the new opportunities on the horizon include energy production, tourism development, urban development, architecture, and marine protected area management and research (bremercanyon.com 2014) This renomination process, and the support of recent plans and studies on the future of Fitzgerald Biosphere (UNESCO 2003; Fry 2010; McQuoid 2012) has also sparked a wider renewal of interest to realise community development opportunities via the MAB agenda.

Mining activities in the Transition Zone, principally in the Ravensthorpe area where increased mineralisation is reflected in complex geology, are conducted according to strict environmental protection legislation (WA Govt. 1986, EPA 2003). The WA Department of Mines and Petroleum (DMP) is responsible for ensuring that mine sites are closed, decommissioned and rehabilitated in an environmentally sustainable manner under the Mining Act 1978 (WA Govt. 1978). Environmental sustainability is a foundation of mining operations of which site rehabilitation is a key part (Govt. of WA 2011). As an indication of this policy intent, the Mine Closure Planning Guidelines (Govt. of WA 2011) Foreword states, inter alia: *"The aim of the guidelines is to ensure that, for every mine in Western Australia, a planning process is in place so the mine can be closed, decommissioned and rehabilitated in an ecologically sustainable manner, consistent with agreed postmining outcomes and land uses, and without unacceptable liability to the State. Mine closure planning should be an integral part of mine development and operations planning and as such the level of information required will correspond to the life span of the mine and reflect the various stages of the life cycle of the project."* Some examples of mining and mineral exploration in Fitzgerald Biosphere, under the environmental regulations for exploration activities, and mine development, management and closure, could be considered for use as a model or pilot.

4.4 "Have an appropriate size to serve the three functions of biosphere reserves"

(This refers more particularly to (a) the surface area required to meet the long term conservation objectives of the core are(s) and the buffer zone(s) and (b) the availability of areas suitable for working with local communities in testing out and demonstrating sustainable uses of natural resources.)

The expanded as proposed Fitzgerald Biosphere comprises 1.529 million hectares of terrestrial lands and State waters across a range of wild and altered landscapes and seascapes. With its proposed expansion, Fitzgerald Biosphere is of substantial size, serving with excellence the three functions of Biosphere Reserves. It features three substantial proposed Zones of Core, Buffer and Transition, including a marine component, which together with its biodiversity significance constitutes a remarkable opportunity for conservation, development and logistic support to richly occur.

The proposed Core Zone of Fitzgerald River National Park comprises 296,390 ha; the proposed Buffer Zone comprises 140,797 ha of natural bushlands (Map 2, Map 3) the terrestrial lands of its proposed Transition Zone – 1,092,208 ha, and the marine component (WA State waters) of the proposed Transition Zone is 157,286 ha (Map 2), (DEC 2012b).

The substantial size of the proposed Core Zone is generally sufficient to meet long-term conservation objectives, and its relationship and layout with the adjoining proposed Buffer Zone assists to a significant degree (Map 2) (Watson and Sanders 1997; Wilkins et al 2006). However, threatening processes do exist that require extensive consideration and careful management, these include Phytophthora (*Phytophthora spp.*) dieback, vertebrate predators, frequent unseasonal and landscape scale fire, weed ingress, inappropriate recreational use, and a lack of ecological knowledge in some instances (DEC 2012b). As well, despite their size, the natural lands of the proposed Core, Buffer and Transition Zones are subject to the inflow of drainage catchments from cleared lands of the proposed Transition Zone. This can be a cause for concern from issues such as nutrient increase and flow, weed invasion, and a harbour for feral animals.

The size and arrangement of the proposed Core, Buffer and Transition Zones provides substantial opportunities for local communities to design and implement conservation and development activities in line with the sustainable use of natural resources, with many examples undertaken over

many years (SCRIPT 1996, 2000, 2005; DOE 2004; DOW 2006, 2008; South Coast NRM 2011; FBG 2011, RAIN 2012).

The three Zones, with the new inclusion of a marine component, provide a very significant opportunity to continue to design, test and demonstrate sustainable uses of natural resources into the future. This opportunity is being supported through the Action Plan for Fitzgerald Biosphere and the implementation of its priorities (McQuoid 2012).

Additional reservations and/or environmental protection measures are not sought by this renomination, or the Fitzgerald Biosphere community. Very strong State and Commonwealth regulatory frameworks and measures for environmental protection are in place for mining and exploration activities. Land and sea use in the Buffer and Transition Zones is not regulated or restricted in any way by having Biosphere Reserve status. UNESCO has no authority or regulatory powers within a Biosphere (Reserve), nor can it; authority and regulatory power is in place through the WA and Australian Governments. It may be possible that the approach to mineral exploration and mining in Fitzgerald Biosphere and its environmental protection measures as response to government regulations, could be a useful example for other Biosphere Reserves in balancing and managing the potential conflict between resource extraction and conservation.

4.5 Through appropriate zonation:

"(a) a legally constituted core area or areas devoted to long term protection, according to the conservation objectives of the biosphere reserve, and of sufficient size to meet these objectives"?"

(Describe the core area(s) briefly, indicating their legal status, their size, the main conservation objectives)

The 2012 Fitzgerald River National Park (FRNP) is the proposed Core Zone. It is vested in the Conservation Commission of Western Australia and is managed by the Western Australian Department of Parks and Wildlife (DPaW) under the CALM Act 1984. The original Fitzgerald River National Park Biosphere Reserve listing was for the 1978 242,739 ha National Park. In 1992 the size of the National Park was increased to 329,039 ha following the inclusion of 86,300 ha of land across the northern flank of the Park (CALM 1991a), as was the listing expanded (UNESCO 2004; DEC 2012b). In recent years a spatial discrepancy was discovered and other lands were added, taking the current size of FRNP to 297,244 ha (Map 1, L. Coney, DPaW Pers. Comm.).

This Zoning follows the prescriptions in Section 4.0 of the FRNP Management Plan (CALM 1991a), which formally recognises FRNP as the core of Fitzgerald Biosphere. This section of the FRNP Plan also includes prescriptions for the recognition of Fitzgerald Biosphere, including the support of the community and the role of the managing agency. The primary purpose of the proposed Core Zone of FRNP is of National Park for the conservation of flora and fauna, habitats and landforms, and for public recreation (CALM 1991a). FRNP is further zoned (CALM 1991a) into wilderness, conservation and recreation zones. The CALM 1991 FRNP Management Plan (CALM 1991a) details how FRNP will be managed for the primary objective of conservation by the Department of Parks and Wildlife.

The proposed national park Core Zone contains a number of small reserves that are not currently included in the national park (Map 1, Map 2). The Fitzgerald River National Park Management Plan (CALM 1991a) prescribes that these reserves are deleted and included in the national park. As they currently stand, they have been included as part of the proposed Buffer Zone.

"(b) a buffer zone or zones clearly identified and surrounding or contiguous to the core area or areas, where only activities compatible with the conservation objectives can take place..."

(Describe briefly the buffer zones(s), their legal status, their size, and the activities, which are ongoing and planned there).

The proposed Buffer Zone (Map 2) comprises the public conservation lands between the proposed Core and the outer Boundary, which are free of formal mining or mineral exploration interests. These collectively cover a large area of around 140,797 ha and are in places linked to the proposed Core Zone (Map 2). The notion of *Buffer* is designed to relate to a continuation of the core-type conservation of FRNP as a cooperative surrounding matrix, and to increased human interaction with nature in the Transition Zone. The proposed Buffer Zone comprises State conservation reserves, other State Crown reserves, some unallocated Crown lands, and local government reserves, and includes some islands. (Map 2). The Zone is a diverse mixture of large intact and fragmented natural areas, where multiple purposes, tenures, coastal and inland situations, accessibility and remoteness see a mixture of both increased recreational and untouched nature conservation uses, compared to the proposed Core Zone. Notwithstanding, it is primarily managed as a collection of conservation and recreation reserves by agencies represented on the Biosphere Implementation Group.

"(c) an outer transition area where sustainable resource management practices are promoted and developed"

(The Seville Strategy gave increased emphasis to the transition area since this is the area where the key issues on environment and development of a given region are to be addressed. The transition area is by definition not delimited in space, but rather is changing in size according to the problems that arise over time. Describe briefly the transition area as envisaged at the time of nomination, the types of questions to be addressed there in the near and the longer terms. The size should be given only as an indication).

The proposed Transition Zone is the remainder of lands, as the private, and cleared and built-on public lands, unallocated Crown lands, and other natural lands in the public land system, and the State waters of the adjoining ocean and estuaries (Map 2). The terrestrial lands comprise 1,092,208 ha, and the waters 157,286 ha. The proposed Transition Zone relates to the activities and enterprises of the human community being in cooperation with the proposed Buffer and Core Zones in line with MAB program objectives (UNESCO 1996, 2008). The terrestrial component of the proposed Transition Zone contains a comprehensive matrix of natural vegetation remnants with very significant conservation value, including very large areas of unallocated Crown lands (Map 2, Map 3).

The proposed Transition Zone contains several exploration and mining leases and tenements, and a few active mine sites, predominantly on unallocated Crown lands (UCL), other reserves and some private ex-farmlands. Minerals sought and mined by these activities are mostly nickel, gold, spodumene (lithium), and silver. The exploration for and mining of these commodities is significant economic driver and societal contributor for the Biosphere, and is seen as a very necessary and important activity in the Ravensthorpe area in eastern Fitzgerald Biosphere (Shire of Ravensthorpe 2014a). The mining and exploration activities are guided and managed by comprehensive and strict environmental protection legislation (EPA 1986, 2004a, 2004b, 2008, Australian Govt. 1999), which includes the investigation and management of flora, fauna, threatened species and communities, dieback disease, groundwater, water, pollution and rehabilitation. As well, Indigenous cultural sites are investigated, managed and protected, and the Indigenous community involved in consultation and protection measures (WA Govt. 1972).

The natural public lands of the Transition Zone, where the mining economic activity takes place, are in-effect nature conservation estate because: mining footprints are relatively small, site rehabilitation is a significant feature of post mining operations, the mining and exploration leases are predominantly on intact public land, exploration is often a low impact activity, and many exploration leases do not eventuate as mines. The Transition Zone natural public lands are often biologically rich and landform diverse, and ecologically consistent and contiguous with the often-adjointing Buffer Zone natural areas.

The proposed Transition Zone includes the entire marine component of Fitzgerald Biosphere, comprising Western Australian State waters to three nautical miles offshore (Map 2). Potential changes to include other Zoning in the marine component will be addressed after Australian and State Government reservation processes currently underway (Commonwealth of Australia 2012; CALM 1998; DEC 2012) are complete. The application of Transition Zone for the marine component is designed to cater for the areas strong commercial and recreational use, and with the finalisation of government planning processes incomplete, is the best current zoning option. The Australian Government marine planning process identifies the Bremer Commonwealth Marine Reserve in Commonwealth waters offshore from Fitzgerald Biosphere (Commonwealth of Australia 2012). Further to the Commonwealth marine reserves being finalised and management plans approved (Australian Government n.d.) and with possible further progress on marine reserve planning and implementation for Western Australian State waters, the Biosphere Implementation Group will consider revised application of Core, Buffer and Transition Zoning as part of its review processes.

4.6 "Organizational arrangements should be provided for the involvement and participation of a suitable range of *inter alia* public authorities, local communities and private interests in the design and the carrying out of the functions of a biosphere reserve."

(Are such arrangements in place or foreseen)

The advisory group for the broader Fitzgerald Biosphere is the Biosphere Implementation Group (BIG). This group comprises the State and local public authorities, community groups, and Indigenous (Noongar) representatives. Whilst acknowledging the statutory role of DPaW regarding management responsibility for the Core and most of the Buffer Zone as well as its state-wide responsibilities for the protection of flora and fauna under the Wildlife Conservation Act, 1950 (hence including the Transition Zone), the BIG provides representation, Action Plan governance, administrative support and guidance for the extended Fitzgerald Biosphere. Its membership is variously responsible for aspects of Fitzgerald Biosphere, including DPaW as managers of the proposed Core Zone and parts of the proposed Buffer Zone, The Shires of Jerramungup and Ravensthorpe as managers of some parts of the proposed Buffer Zone and as Local Government governance for the proposed Transition Zone. The community groups Fitzgerald Biosphere Group, Ravensthorpe Agricultural Initiative Network, and the Friends of Fitzgerald River National Park, address conservation and agricultural sustainability as their core business. Indigenous representation by the Noongar people is through the South West Aboriginal Land and Sea Council (SWALSC) Wagył Kaip Land Claim (SWALSC 2010).

Fitzgerald Biosphere has a long and strong history of community initiative and involvement, including collaboration with agencies and other groups (see also section 3.3). The BIG continues this tradition providing a broad community base that includes the agencies, groups and individuals to be involved in a collaborative and consultative manner regarding the decision making processes for the management of the site.

4.7 Mechanisms for implementation

Does the proposed biosphere reserve have:

"(a) mechanisms to manage human use and activities in the Buffer zone or zones"?

(Briefly describe)

Several mechanisms currently exist to manage human use and activities relating to the three principle Biosphere Reserve functions of Conservation, Development and Logistic Support in the proposed Buffer Zone (and for the substantial natural areas of the Transition Zone). These include Acts of Parliament: Environmental Protection and Biodiversity Conservation Act 1999, Conservation and Land Management Act 1984 as amended, Wildlife Conservation Act 1950, Environmental Protection Act 1986, Fish Resource Management Act 1994, Heritage Act of Western Australia 1990. Plans: The FRNP Management Plan 1991 – 2001 (CALM 1991a) as a Core Zone plan that relates to the proposed Buffer Zone, the DEC South Coast Region Plan, (CALM 1991b), South Coast NRM Southern Prospects 2011 - 2016, the collaborative Project Dieback Phytophthora management plan and stakeholder engagement model (Project Dieback 2008); the two Jerramungup Shire Council Coastal Reserve Management Plans (1994a, 1994b), the Shire of Jerramungup Community Strategic Plan 2012 - 2025 (Shire of Jerramungup 2102), The Shire of Ravensthorpe Coastal Management Plan (Field 2001), the Shire of Ravensthorpe Community Strategic Plan 2014 – 2024 (Shire of Ravensthorpe 2014a) the Shire of Ravensthorpe Corporate Business Plan (Shire of Ravensthorpe 2014b), the Hamersley Inlet Reserve Management Plan (Shire of Ravensthorpe 2014c), the Macro-Corridors Report (Wilkins et al 2006), Wellstead Estuary Management Plan (DOW 2006) Culham Inlet Management Plan (DOW 2008), Southern Shores 2009 – 2030 (Coffey et al 2009; and fisheries management (DOF 2005; 2011).

Natural resource management agencies and organisations have infrastructure and staff including:

- DPaW. Three ranger stations, one local office, seven staff of National Park Rangers, Operations Officers and Conservation Staff. Supported by Regional and District office and staff in Albany 200 km west.
- Fisheries Department. Staff presence from District Office in Albany 200 km west and Esperance 200 km east
- FBG. Headquarters in Jerramungup. Two full time staff and project contractors
- RAIN. Headquarters in Ravensthorpe, Two full time staff, one part time, project contractors
- South Coast NRM. Headquarters in Albany 200 km west, and Esperance 200 km east. Support staff of five.
- Shire of Jerramungup. Headquarters in Jerramungup, Depot in Bremer Bay. On – ground Ranger staff of two. Total staff of 30, full and part time.
- Shire of Ravensthorpe. Headquarters in Ravensthorpe, Depot in Hopetoun. On – ground Ranger staff of one. Total staff of 25.
- Community Telecentres. Bremer Bay. Jerramungup, Hopetoun and Ravensthorpe. Resourced by the WA Department of Lands and Regional Development, with a staff of two at each centre. Provides a range of community services including visitor information (DRDL 2011) for people accessing the proposed Buffer and Core Zones.

In addition, the Action Plan for Fitzgerald Biosphere (McQuoid 2012) is designed to support the indirect management of activities in the proposed Buffer and Transition Zones. This is principally aimed at the community development wishes of the community in response to the criteria of MAB

Seville Strategy (UNESCO 1996) and Madrid Action Plan (UNESCO 2008). Some of the recommendations relate to education, interpretation and relationships to other plans including the Fitzgerald River National Park Management Plan (CALM 1991a) (see next section b).

"(b) a management plan or policy for the area as a biosphere reserve"?

(Briefly describe)

The proposed Core Zone, Fitzgerald River National Park, has an active Management Plan (CALM 1991a) implemented and reviewed by the Department of Parks and Wildlife. It includes prescriptions relating to MAB objectives in its sections 4.0 and 20.0, which include recognising Fitzgerald River National Park as the Core Zone, community involvement and the role of the DPaW.

The Action Plan for Fitzgerald Biosphere (McQuoid 2012) has been developed by the Fitzgerald Biosphere Group (FBG), with the funding assistance of the Australian National Commission for UNESCO. Centred on the UNESCO MAB Seville Criteria, and Madrid Action Plan (UNESCO 1996, 2003, 2008), the plan is also reflective of the UNESCO MAB 2003 Bureau Review (UNESCO 2003), and the local initiatives - the Fitzgerald River National Park Management Plan (CALM 1991a) and the 2010 University of Western Australia (UWA) Centre for Excellence in Natural Resource Management (CENRM) 'Assessment of the Current Situation Report' (Fry 2010). Taking into account the many actions, prescriptions, recommendations and targets of these plans and reports, the Action Plan for Fitzgerald Biosphere provides responses arrived at by consultation through the Biosphere Implementation Group (BIG) and the broader community. It forms the overarching instrument by which to guide the progress of the extended Fitzgerald Biosphere and its community. The Action Plan is to be implemented and reviewed through the BIG, with a review process occurring every three years, with the next review due in 2015.

The then Department of Environment and Conservation (now Department of Parks and Wildlife), with the assistance of the Commonwealth Department of Sustainability, Environment, Water, Population and Communities (SEWPC) (now Department of the Environment), have completed the *Fitzgerald Biosphere Recovery Plan: A landscape approach to threatened species and ecological communities for recovery and conservation* (DEC 2012b). This groundbreaking plan addresses all three proposed Zones. *Inter alia*, the Plan's Foreword states:

This Fitzgerald Biosphere Recovery Plan constitutes the formal national regional recovery plan for 11 flora species and provides recovery guidance for the remaining species and ecological communities largely endemic to the Fitzgerald Biosphere on the south coast of Western Australia that are listed under the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act).

For the purpose of this plan, the term 'Fitzgerald Biosphere' or 'Biosphere' refers to the combination of the core Biosphere area as recognised by MAB and the buffer and transition zones as defined by catchment boundaries as shown in figure 1. Accordingly, this Recovery Plan applies to the threatened species and ecological communities occurring within the core area and the buffer and transition zones. However, the plan does not constitute an EPBC Act management plan for the MAB Biosphere.

The Biosphere includes 41 threatened species/communities listed by the State of WA, 33 of which are also listed by the Commonwealth.

This recovery plan had its genesis in the broader Threatened Species and Ecological Communities Regional Strategic Management Plan South Coast Region, Western Australia (Gilfillan et al 2009)

The South Coast NRM Southern Prospects (South Coast NRM 2011), details NRM priorities and targets for actions and activities to mitigate threats that include initiatives for Fitzgerald Biosphere (Reserve) as one of its subregions. The excellent collaborative Project Dieback Phytophthora management plan and stakeholder engagement model (Project Dieback 2008) provides a sophisticated approach to conservation management. It embraces the community and stakeholders in a partnership to improve the understanding and management, and limit the impacts and spread of this devastating terrestrial ecosystem disease

"(c) a designated authority or mechanism to implement this policy or plan"?

(Briefly describe)

The Department of Parks and Wildlife are responsible for implementing and reviewing the Fitzgerald River National Park Management Plan (CALM 1991a; DEC 2012a) and the Fitzgerald Biosphere Recovery Plan (DEC 2012b). The BIG is responsible for guiding the implementation and reviewing the Action Plan for Fitzgerald Biosphere. In addition the supporting plans are the responsibility of supporting agencies including Jerramungup and Ravensthorpe Shire Councils and South Coast NRM.



Yes



No



Planned

(d) programs for research, monitoring, education and training"?

(Describe briefly research/activities monitoring (ongoing or planned) as well education and training activities)

Fitzgerald Biosphere has a strong history of natural resource research and monitoring, and to a lesser extent education and training. A range of plans and programs featuring research, monitoring and education are in varying degrees of implementation, and training initiatives are a priority. The design and development of these programs and projects is seen as significant community development opportunities.

A broad range of skilled and widely known researchers have been involved in research activities for many years, in many cases in collaboration with researchers from the local community. This has been dominated by a research agenda for biological inventory, ecology and natural resource management (eg, Brooker and Hopper 1991; Chapman and Newbey 1987, 1995a, 1995b; DEC 1997, 1998; Craig et al 2008; Hopper and McQuoid 2009; Chuwen et al 2009; Nicolle et al 2008; Sanders 2008; Olde and Marriott 2009; Craven et al 2010; Fletcher et al 2010; Jonson 2010). A research bibliography project instigated by the Fitzgerald Biosphere Group catalogued the very large range of research across many themes undertaken (to then) (Deegan 2005, 2006). Research, monitoring, education and training are included in several planning documents and reports (eg CALM 1991a; DAFWA 2002, 2004, 2006a, 2006b; DOE 2004, DOW 2008, 2010; Fry 2010; DEC 2012b; South Coast NRM 2011).

A focus on research, monitoring, education, and in particular for training is a high priority of the Action Plan for Fitzgerald Biosphere (McQuoid 2012). The Plan provides actions for specific activities designed to invoke a richness of knowledge development to better understand, manage and benefit the nature, culture and community of Fitzgerald Biosphere. The intention is to develop a

strong research, monitoring, education and training culture and reputation for Fitzgerald Biosphere, and the MAB objectives provide a pathway for this.

Ongoing Research and Monitoring:

Biodiversity conservation management for principally the proposed Core and Buffer Zone, and natural areas in the Transition Zone (Chapman and Newbey 1995a; CALM 1991a), includes threatened species and communities (DEC 2012b). Includes monitoring of sites, ecosystems and species for recovery.

Monitoring sites were set up by Chapman and Newbey (Chapman and Newbey 1987, 1995a, 1995b), which have been incorporated into research (Hassell and Dodson 2002) and monitoring initiatives, and remain in place for future use.

The Gondwana Link initiative and its partners have developed restoration research (Sanders 2008; Jonson 2010) for the Transition Zone, and restoration ecology and works will continue to be researched and monitored.

Fisheries Management is currently strongly ecosystem and sustainable catch-based (Fletcher et al 2002; Fletcher et al 2010; DOF 2011a, 2011b) as a Western Australia-wide approach. Some work has been conducted in Fitzgerald Biosphere proposed marine and estuarine waters (DEC 1997, 1998; DOF 2005; Chuwen et al 2009), and research and monitoring work continues in aspects of these systems.

Sustainable agriculture has had a rich history of research and monitoring, particularly in the fields of soil conservation and catchment management (e.g. DAFWA 2002, 2004, 2006a, 2006b). Considerable research has been undertaken across a range of themes to assist the productivity and sustainability of agriculture, including assessing and addressing climate change, as outlined in the RAIN Ravensthorpe Profile (Chambers 2009) and in the FBG 30 years of Landcare (FBG 2012). Some efforts were undertaken to develop some Fitzgerald Biosphere brand products (Business Today 2004), although this was discontinued.

Planned Research and Monitoring

The Action Plan for Fitzgerald Biosphere (McQuoid 2012) includes actions to design and deliver research on the priority themes of architecture, landscape architecture, anthropology, archaeology sustainable agriculture, climate change, landscape ecology, disturbance ecology, restoration ecology, estuarine and marine ecosystems, fisheries, and ecotourism. The need for monitoring systems and programs to develop knowledge and improve the management of natural resources and cultural history is a priority. Programs and systems will be designed and implemented in partnership and collaboration with research organisations. This focus will support the development of a strong research and logistic support reputation for Fitzgerald Biosphere.

Ongoing Education and Training

A co-ordinated awareness raising and school education programme was undertaken within the buffer and transition zones around 1995-1997 by the then Department of Conservation and Land Management (CALM), which involved all schools located within the proposed Fitzgerald Biosphere. This involved basic flora and fauna survey and monitoring work undertaken by school students, teaching staff and many parents (Sanders 1996). Subsequent education programs have included landcare – based activities of FBG, RAIN and South Coast NRM for schoolchildren and to some degree adults, which is ongoing as resources permit. FBG through the Bremer Bay Trails

Committee have developed a drive trail network that includes natural and cultural history (McMahon 2011). The Shires of Jerramungup and Ravensthorpe have recent trail planning initiatives that have developed plans for terrestrial and water based nature and access trails, these are designed for tourist use and to improve access ease and experiences of natural areas (Shire of Jerramungup 2013, Fitzgerald Coast Tourism Association 2013, Shire of Ravensthorpe 2013). The Ravensthorpe Hopetoun Promotions group has a long history of trails and interpretation (Williams and Cooper 2011). DPaW have an ongoing interpretation program for National Park visitors, which has had a recent injection of significant resources (CALM 1991a; DEC 2012a).

Planned Education and Training

Greatly increased education and training for the Fitzgerald Biosphere community and visitors is a priority for the Action Plan for Fitzgerald Biosphere. The Plan includes actions to design, resource and collaborate to deliver education programs for children and adults on a range of key themes, inter alia including the MAB Biosphere Program in Fitzgerald Biosphere, terrestrial and marine nature, landform and seaform history, Noongar culture and history, sustainable agriculture, and sustainable architecture. Delivery models are planned to include trails hubs and networks, interpretation materials such as books, brochures, electronic media, guides, smartphone apps, maps, guest talks etc. Training is planned to be focussed on practical hands-on knowledge and skill development for local community and businesses to help foster better understanding of the cultural and natural history of Fitzgerald Biosphere. It will be undertaken in collaboration with partners and will be designed to help enrich the lives and enterprises of the community.

5. ENDORSEMENTS

- 5.1 Signed by the authority/authorities in charge of the management of the core area(s), as outlined in 17.5.1:

Agency: The Western Australian Department of Parks and Wildlife

Full name: _____

Title: _____

Date: _____

Signature: _____

- 5.2 Signed by the authority/authorities in charge of the management of the buffer zone(s) units. The management jurisdiction of the Department of Parks and Wildlife shown on Map 1, including unallocated Crown lands according to the Memorandum of Understanding (MOU) with the Department of Regional Development and Lands supported by an order under section 33(2) of the CALM Act. As outlined in 17.5.2 of this document:

Agency: The Western Australian Department of Parks and Wildlife

Full name: _____

Title: _____

Date: _____

Signature: _____


- 5.3 Signed by the authority/authorities in charge of the management of the buffer zone(s) units, as the lands vested in local government authorities.

Agency: Shire of Jerramungup

Full name: Robert Hester

Title: Shire President

Date: 10/3/2015

Signature: 

Agency: Shire of Ravensthorpe

Full name: Ian M Goldfinch

Title: Shire President

Date: 3/2/15

Signature: 

- 5.4 Signed by the authority/authorities, elected local government recognized authority or spokesperson representative of the communities located in the transition area.

Agency: Shire of Jerramungup

Full name: Brent Bailey

Title: Chief Executive Officer

Date: 10/3/2015

Signature: 

Agency: Shire of Ravensthorpe

Full name: ASW → Ann M. Cochrane

Title: President

Date: 3/03/2015

Signature: 

- 5.5 Signed on behalf of the MAB National Committee or focal point:

Agency: Director of National Parks, Parks Australia. Department of Sustainability, Environment, Water, Population and Communities

Full name: _____

Title: _____

Date: _____

Signature: _____

PART II: DESCRIPTION

6. LOCATION (LATITUDE AND LONGITUDE):

[Indicate in degrees - minutes, seconds the coordinates of the central point AND the external limits of the proposed biosphere reserve to be used for a Geographic Information System (GIS)]

Proposed Core Fitzgerald River National Park is: 33 deg 43' to 34 deg 24' S. 119 deg 05' to 120 deg 05' E.

Proposed outer terrestrial Boundary is 33 deg 55' to 34 deg 21' S. 118 deg 37' to 120 deg 05' E.

Proposed outer marine component Boundary is 34 deg 33' S to 33 deg 58' S. 118 deg 56' to 120 deg 35' E

7. AREA (see Map 1 and Map 2): Provide:

Total: 1,529, 577(ha)

- 7.1 Size of terrestrial Core Area(s): 296, 390 ha;
If appropriate, size of marine Core Area(s): _____ ha.
- 7.2 Size of terrestrial Buffer Zone(s): 140, 979 ha;
If appropriate, size of marine Buffer Zone(s): _____ ha.
- 7.3 Approx. size of terrestrial Transition Area(s) (if applicable): 934, 922 ha;
If appropriate, approx. size of marine Transition Area(s): 157, 286 ha.
- 7.4 Brief rationale of this zonation (in terms of the various roles of biosphere reserves) as it appears on the zonation map. In the cases where a different type of zonation is also in force at the national level, please indicate how it can coexists with the requirements of the biosphere reserve zonation system:

Outer Boundary Definition

- A. Fits the UNESCO MAB Seville Article 4 of the Statutory Framework for Biosphere Reserves. General Criteria for an area to be qualified for designation as a Biosphere Reserve:
 1. It should encompass a mosaic of ecological systems representative of major biogeographic regions, including a gradation of human interventions
 2. It should be of significance for biological diversity conservation
 3. It should provide an opportunity to explore and demonstrate approaches to sustainable development on a regional scale
 4. It should have an appropriate size to serve the three functions of Biosphere Reserves, as set out in article 3
 5. It should include these functions, through appropriate zonation, recognising:
 - (a) a legally constituted core area or areas devoted to long-term protection, according to the conservation objectives of the Biosphere reserve, and of sufficient size to meet these objectives;

- (b) a buffer zone or zones clearly identified and surrounding or contiguous to the core area or areas, where only activities compatible with the conservation objectives can take place;
 - (c) an outer transition area where sustainable resource management practices are promoted and developed
- 6. Organisational arrangements should be provided for the involvement and participation of a suitable range of inter alia public authorities, local communities and private interests in the design and carrying out of the functions of a Biosphere Reserve
- 7. In addition, provisions should be made for:
 - (a) mechanisms to manage human use and activities for the area as a biosphere reserve;
 - (b) a management policy or plan for the area as a biosphere reserve;
 - (c) a designated authority or mechanism to implement this policy or plan;
 - (d) programs for research, monitoring, education and training.
- B. Is based on the criteria of UNESCO Madrid Action Plan (MAP): *Action 2.2.4. Clearly define the outer boundary of the BR in determining the transition area through stakeholder consultation. (Each BR should consider natural, e.g. watershed, ecosystem, etc., as well as political and administrative boundaries in defining its delimitation, and clearly explain the rationale behind that determination in the nomination/ periodic review forms.*
- C. Is catchment based, in line with the South Coast Natural Resource Management Fitzgerald Biosphere sub region (South Coast NRM 2012), with some exceptions as small adjustments to follow The South West Aboriginal Land and Sea Council (SWALSC) Wagyl Kaip land claim (SWALSC 2010) eastern boundary, and the Shires of Jerramungup and Ravensthorpe local government boundaries (Map 2).
- D. Includes all of the Shire of Jerramungup, this takes in small areas in the south west of the Biosphere outside the sub region/catchment boundary, except the Pallinup Catchment as follows in E.
- E. Does not include the majority of the extensive Pallinup River catchment as it extends largely outside the accepted community locale and the Jerramungup local government boundary, the edge of which is marked by the centre of the lower river section. It does include all of the catchment of its tributary, Corackerup Creek. The lower Pallinup catchment affects the extreme southwest corner of Fitzgerald Biosphere, and a natural delineation clearly identifiable as the edge of the Biosphere Reserve. It is a very different ecosystem - not closely related to any other in Fitzgerald Biosphere or the broader south coast, identified by its very different dominant vegetation types, with this eccentric characteristic making it worthy of a degree of inclusion in Fitzgerald Biosphere.
- F. Includes the western section of the Shire of Ravensthorpe, west of Fence Rd and the 'vermin fence' north of South Coast Highway.
- G. Includes the south flowing catchments of the Gairdner, Fitzgerald, West and Phillips Rivers. The upper parts of these catchment boundaries extend short distances to the north and northwest into the Shires of Gnowangerup, Kent and Lake Grace, outside the Shires of Jerramungup and Ravensthorpe. This whole-catchment integrity is in line with the natural landscape units (catchments) being the first order of inclusion, and significance as they relate

to the core of the Biosphere Reserve. There are no implications or responsibilities for the Shires of Gnowangerup, Kent and Lake Grace.

- H. The eastern boundary is the vermin fence north of South Coast Highway and Fence Road south to Starvation Bay south of the highway. This line, while not quite inclusive of all of the Jerdacuttup River catchment (it does include most of it), follows the eastern boundary of the South West Aboriginal Land and Sea Council (SWALSC) Wagyl Kaip claim boundary (SWALSC 2010). Following this recognises the importance of Noongar culture and their claim processes, and is in line with the MAB criteria of political and administrative boundaries. In addition, one of the four earlier iterations of the Fitzgerald Biosphere Boundary and where the Fitzgerald Biosphere road sign on the highway stands had Fence Road as the eastern boundary. And when travelling west from Esperance towards Ravensthorpe, the high point reached where Fence Rd crosses South Coast Highway is the first place the eastern Barrens and Ravensthorpe Range can be seen from, serving a usefully visible natural divide.
- I. Includes the marine component of the State waters (Map 1, Map 2), which is out to 3 nautical miles from land including islands and exposed reefs.

Zonation

- A. The 2015 Fitzgerald River National Park (FRNP) proposed as the **Core Zone**. The original listing was for the 1978 242,739 ha (Watson and Sanders 1997) National Park. In 1990 the size of the National Park was increased to 329, 039 ha following the inclusion of 86,300 ha of land across the northern flank of the Park (CALM 1991a) (Map 1), and this was included in an updated (core only) Fitzgerald River National Park Biosphere Reserve. However, in the subsequent years to 2010 the size has altered due to the discovery of a spatial discrepancy and other lands being added, taking the size of FRNP at August 2012 to 299,390 ha. This Zoning of the Core follows the prescriptions in the FRNP Management Plan (CALM 1991a).
- B. A **Buffer Zone** comprising all the public nature conservation lands between the proposed Core and the Boundary. This Zone is a diverse combination of small to large intact and fragmented natural areas, where mostly nature conservation and recreation purpose tenures in coastal and inland situations. Varied accessibility and remoteness provide a mixture of largely untouched nature conservation uses and some recreational use.
- C. A **Transition Zone** of cooperation, including privately owned lands, areas of natural public lands subject to mineral exploration and mining, and cleared and built-on public lands remaining; as well as the marine component comprising the State of Western Australia waters to 3 nautical miles off shore. This Zone relates to the activities and enterprises of the human community being in cooperation with the proposed **Buffer** and **Core Zones**.
- D. The Marine component to comprise the adjacent Western Australian State waters; these are the waters of the Southern Ocean for three nautical miles offshore from land, islands and exposed reefs. The whole of this marine component is part of the proposed **Transition Zone** for the time being, and will be reconsidered by the Biosphere Implementation Group (BIG) once the Australian Government has finalised its South West Marine Reservation processes, including the Bremer Commonwealth Marine Reserve (Commonwealth of Australia 2012). In the future, the proposed marine component it will likely be altered to include **Core** and **Buffer Zones** in line with WA Government Marine Reservation processes, which in current draft include some of the State waters off the Fitzgerald Biosphere coast as candidate areas for further consideration for marine reserves. Their inclusion in Fitzgerald Biosphere will be

further considered along with the Commonwealth marine reserves as part of the three-year review process of the BIG, with the results conveyed to UNESCO.

8. BIOGEOGRAPHICAL REGION:

[Indicate the generally accepted name of the biogeographical region in which the proposed Biosphere Reserve is located. You may wish to refer to the map of the World Network of Biosphere Reserves presenting 12 major ecosystem types.]

Fitzgerald Biosphere sits within the Southeast Coastal Province of the Southwest Australian Floristic Region (Hopper and Gioia 2004), the Esperance Sandplain and Mallee IBRA regions (Thackway and Cresswell 1995), and the marine component in the southwest Bioregion (DOF 2011a) and the mesoscale ecosystem of IMCRA 4 Boundaries (Commonwealth of Australia 2006).

9. LAND USE HISTORY:

[If known, give a brief summary of past/historical land use(s) of the main parts of the proposed biosphere reserve]

10. HUMAN POPULATION OF PROPOSED BIOSPHERE RESERVE:

[Approximate number of people living within the proposed biosphere reserve]

Estimate

permanently / seasonally

10.1 Core Area(s): _____ / _____

10.2 Buffer Zone(s): _____ / _____

10.3 Transition Area(s): _____ / _____

10.4 Brief description of local communities living within or near the proposed Biosphere Reserve:

[Indicate ethnic origin and composition, minorities etc., their main economic activities (e.g. pastoralism) and the location of their main areas of concentration, with reference to a map if necessary]

10.5 Name(s) of nearest major town(s):

The proposed Buffer and Transition Zones of Fitzgerald Biosphere contain the towns of Bremer Bay, Hopetoun, Jerramungup and Ravensthorpe (Map 1), the hamlets of Boxwood Hill, Gairdner, Needilup, Fitzgerald, Kundip, Desmond and Jerdacuttup, and the localities of Jacup, West River and Dunn Rock. The next nearest large towns are Albany some 120 km to the west of the western proposed boundary, and Esperance some 130 km to the east of the eastern proposed boundary.

10.6. Cultural significance:

[Briefly describe the proposed Biosphere Reserve's importance in terms of cultural values (religious, historical, political, social, ethnological)]

11. PHYSICAL CHARACTERISTICS

11.1. General description of site characteristics and topography of area:

[Briefly describe the major topographic features (wetlands, marshes, mountain ranges, dunes etc.) which most typically characterize the landscape of the area.]

An extended Fitzgerald Biosphere has an array of natural diversity. It is ancient, eroded and subdued yet complex. With fossil valleys, broad sandplains, granite rises, greenstone ranges, ancient sea floors turned into mountains, Eocene landforms of breakaways ridges plains and valleys; rivers creeks and estuaries, coastal cliffs and dunes; offshore islands, and wild southern ocean seascapes.

Fitzgerald Biosphere comprises eight major terrestrial landforms: The coastal quartzite Barren Range, the Bremer Peninsulas of the Albany Fraser Orogen gneiss, an extensive Eocene marine plain with spongolite cliffs and gorges, the Corackerup Creek and lower Pallinup valleys in the southwestern corner, coastal limestone ridges and dunes, the granite upland of the southern edge of the Yilgarn Block craton, the greenstone and associated metamorphosed volcanic rocks of the Ravensthorpe Range, and the broad Esperance sandplain with its deep sands and shallow swamps. These all provide the enormous mosaic diversity of soils, vegetation and habitat systems including wetlands, rivers, creeks, sandplains, granite meadows, woodlands, shrublands, kwongan heathlands, thickets and sedgeland.

11.2.1 Highest elevation above sea level: 502 metres

11.2.2 Lowest elevation above sea level: 0 metres

11.2.3 For coastal/marine areas, maximum depth below mean sea level: 80 metres

11.3. Climate:

[Briefly describe the climate of the area using one of the common climate classifications]

11.3.1. Average temperature of the warmest month: _____ °C

11.3.2 Average temperature of the coldest month: _____ °C

11.3.3. Mean annual precipitation: _____ mm, recorded at an elevation of _____ metres

11.3.4. If a meteorological station is in or near the proposed Biosphere Reserve, indicate the year since when climatic data have been recorded:

a) manually: _____

b) automatically: _____

c) Name and location of station: _____

11.4. Geology, geomorphology, soils:

[Briefly describe important formations and conditions, including bedrock geology, sediment deposits, and important soil types]

12. BIOLOGICAL CHARACTERISTICS

[List main **habitat types** (e.g. tropical evergreen forest, savannah woodland, alpine tundra, coral reef, kelp beds) and **land cover** types (e.g. residential areas, agricultural land, pastoral land). For each type circle REGIONAL if the habitat or land cover type is widely distributed within the biogeographical region within which the proposed Biosphere Reserve is located to assess the habitats or land cover type's representativeness. Circle LOCAL if the habitat is of limited distribution within the proposed Biosphere Reserve to assess the habitats or land cover type's uniqueness. For each habitat or land cover type, list characteristic species and describe important **natural processes** (e.g. tides, sedimentation, glacial retreat, natural fire) or **human impacts** (e.g. grazing, selective cutting, agricultural practices) affecting the system. As appropriate, refer to the vegetation or land cover map provided as supporting documentation.]

12.1. First type of habitat/land cover: _____ DISTRIBUTION
Regional/Local

12.1.1. Characteristic species:

12.1.2. Important natural processes:

12.1.3. Main human impacts:

12.1.4. Relevant management practices:

12.2. Second type of habitat/land cover: _____ DISTRIBUTION
Regional/Local

12.2.1. Characteristic species:

12.2.2. Important natural processes:

12.2.3. Main human impacts:

12.2.4. Relevant management practices:

12.3. Third type of habitat/land cover: _____ DISTRIBUTION
Regional/Local

12.3.1. Characteristic species:

12.3.2. Important natural processes:

12.3.3. Main human impacts:

12.3.4. Relevant management practices:

12.4. Fourth type of habitat/land cover: _____ DISTRIBUTION
Regional/Local

12.4.1. Characteristic species:

12.4.2. Important natural processes:

12.4.3. Main human impacts:

12.4.4. Relevant management practices:

13. CONSERVATION FUNCTION

13.1. Contribution to the conservation of landscape and ecosystem biodiversity

[Describe and give location of landscapes, ecosystems, habitats and/or land cover types of particular significance for the conservation of biological diversity.]

13.2 Conservation of species biodiversity

[Identify main species (with scientific names) or groups of species of particular interest for the conservation of biological diversity, in particular if they are rare or threatened with extinction; use additional sheets if need be.]

13.3. Conservation of genetic biodiversity:

[Indicate species or varieties of traditional or economic importance and their uses, e.g. for medicine, food production, etc.]

14. DEVELOPMENT FUNCTION

14.1. Potential for fostering economic and human development, which is socio-culturally and ecologically sustainable:

[Describe how the area has potential to serve as a pilot site for promoting the sustainable development of its region or "eco-region". Describe how the area has potential to serve as a pilot site for promoting the sustainable development of its region or "eco-region"]

14.2. If tourism is a major activity:

- how many visitors come to the proposed Biosphere Reserve each year?
- is there a trend towards increasing numbers of visitors? (Give some figures if possible)

14.2.1. Type(s) of tourism

[Study of flora and fauna, recreation, camping, hiking, sailing, horse riding, fishing, hunting, skiing, etc.]

14.2.2. Tourist facilities and description of where these are located and in which zone of the proposed biosphere reserve:

14.2.3. Indicate positive and/or negative impacts of tourism at present or foreseen:

14.3. Benefits of economic activities to local people:

[Indicate for the activities described above whether the local communities derive any income or benefits directly or indirectly from the site proposed as a Biosphere Reserve and through what mechanism]

15. LOGISTIC SUPPORT FUNCTION

15.1. Research and monitoring

15.1.1. To what extent has the past and planned research and monitoring program been designed to address specific management questions in the potential biosphere reserve? (For example, to identify areas needing strict protection as core areas, or to determine causes of and means to halt soil erosion, etc.).

15.1.2. Brief description of past research and/or monitoring activities

[Indicate the dates of these activities and extent to which the research and monitoring programs are of local/national importance and/or of international importance.]

- Abiotic research and monitoring [climatology, hydrology, geomorphology, etc.]

- Biotic research and monitoring [flora, fauna]:

- Socio-economic research [demography, economics, traditional knowledge, etc.]:

15.1.3. Brief description of on-going research and/or monitoring activities:

- Abiotic research and monitoring [climatology, hydrology, geomorphology, etc.]:

- Biotic research and monitoring [flora, fauna]

- Socio-economic research [demography, economics, traditional knowledge, etc.]:

15.1.4. Brief description of planned research and/or monitoring activities:

- Abiotic research and monitoring [climatology, hydrology, geomorphology, etc.]:

- Biotic research and monitoring [flora, fauna]:

- Socio-economic research [demography, economics and traditional knowledge]:

15.1.5. Estimated number of national scientists participating in research within the proposed biosphere reserve on:

- a permanent basis: _____
- an occasional basis: _____

15.1.6. Estimated number of foreign scientists participating in research within the proposed Biosphere Reserve on:

- a permanent basis: _____
- an occasional basis: _____

15.1.7. Estimated number of masters and/or doctoral theses carried out on the proposed biosphere reserve each year:

15.1.8. Research station(s) within the proposed Biosphere Reserve:

[...] = permanent

[...] = temporary

15.1.9. Permanent research station(s) outside the proposed Biosphere Reserve:

[If no permanent research station exists within the proposed Biosphere Reserve, indicate the location, distance to the core area, name and address of the most relevant research station]

15.1.10 . Permanent monitoring plots

[Indicate the year established, the objective of monitoring, the type and frequency of observations and measurements, and whether an internationally recognized protocol is being used, for example the Smithsonian-MAB MAPMON protocol for monitoring forest biodiversity]:

15.1.11. Research facilities of research station(s)

[meteorological and/or hydrological station, experimental plots, laboratory, computerised databases, Geographical Information System, library, vehicles, etc.]:

15.1.12. Other facilities

[e.g. facilities for lodging or for overnight accommodation for scientists etc.]:

15.1.13. Does the proposed biosphere reserve have an Internet connection?

15.2. Environmental education and public awareness

[Environmental education -- sometimes now referred to as education for sustainable development -- can be aimed at schoolchildren, the adult population of the local communities, and visitors from home and abroad].

15.2.1 Describe environmental education and public awareness activities, indicating the target group(s):

15.2.2. Indicate facilities for environmental education and public awareness activities [visitors' centre; interpretative programs for visitors and tourists; nature trails; ecomuseum demonstration projects on sustainable use of natural resources]:

15.3 Specialist training

[Acquisition of professional skills by managers, university students, decision-makers etc.]

[Describe specialist training activities: for example research projects for students; professional training and workshops for scientists; professional training and workshops for resource managers and planners; extension services to local people; training for staff in protected area management]

15.4 Potential to contribute to the World Network of Biosphere Reserves

[Collaboration among biosphere reserves at a national, regional and global level in terms of exchange of scientific information, experience in conservation and sustainable use, study tours of personnel, joint seminars and workshops, Internet connections and discussion groups, etc.]

15.4.1. Collaboration with existing biosphere reserves at the national level (indicate on-going or planned activities):

The Fitzgerald River National Park Biosphere Reserve was a contributing member of the Australian Biosphere Reserve Working Group through the early 1980's and the 1990's including chairing the group from the mid 1990's until 2001. A meeting of the working group was held in Albany Western Australia in 1997 in conjunction with the IUCN World Commission on Protected Areas international mid term congress. This included a full day field visit to the Fitzgerald River National Park for delegates and biosphere working group members.

The network gathering of Biosphere Reserve managers was held in Noosa Queensland Australia in November 2014. This included representatives of UNESCO based in Paris and Samoa, and Biosphere Reserves from South Korea, Portugal, New Zealand and Australia. Useful contacts were made and lessons learnt from the experiences of other members of the Biosphere reserve network. This included opportunities for further collaboration and advocating for the broader use of the opportunities for sustainability from the Man and Biosphere Program.

15.4.2. Collaboration with existing biosphere reserves at the regional or subregional levels, including promoting transfrontier sites and twinning arrangements (indicate on-going or planned activities)

[Here, 'regional' refers to the regions as Africa, Arab region, Asia and Pacific Latin America and the Caribbean, Europe. Transfrontier biosphere reserves can be created by two or more contiguous countries to promote cooperation to conserve and sustainably use ecosystems, which straddle the international boundaries. Twinning arrangements usually consist of agreements between sites located at some distance in different countries to promote activities such as cooperative research projects, cultural exchanges for schoolchildren and adults, etc.]

15.4.3 Collaboration with existing biosphere reserves in thematic networks at the regional or international levels (indicate ongoing and planned activities) [Networks of sites which have a common geographic theme such as islands and archipelagos, mountains, or grassland systems, or a common topic of interest such as ecotourism, ethnobiology etc.]

The Biosphere Responsible Tourism program (www.biospheretourism.com) was outlined at the 2014 Noosa network gathering. This program and its opportunities will be brought to the attention of the members of the Biosphere Implementation group, with a view to considering supporting the involvement of Fitzgerald Biosphere and its tourism businesses in the program.

15.4.4 Collaboration with existing biosphere reserves at the international level (indicate ongoing and planned activities: [Notably through Internet connections, twinning arrangements, bilateral collaborative research activities, etc.]

Due to climatic and geographic similarities an informal twinning arrangement was established with the Kogelberg Biosphere Reserve, South Africa around 1999-2001. This involved liaison and some cross visitation. Unfortunately the arrangements lapsed due to core priorities, funding issues and changes in personnel. A rekindling of this relationship will be investigated by the Biosphere Implementation Group (BIG).

16. USES AND ACTIVITIES

16.1 Core Area(s):

Fitzgerald River National Park

16.1.1 Describe the uses and activities occurring within the core area(s):

[While the core area is intended to be strictly protected, certain activities and uses may be occurring or allowed, consistent with the conservation objectives of the core area]

Class “A” reserve with the Purpose of National Park. For the Conservation of Nature and Recreation. It is managed by the Department of Parks and Wildlife under the CALM Act 1984 and via the Fitzgerald River National Park Management Plan (CALM 1991a), which outlines a comprehensive regime of protection and acceptable use. This statutory plan remains in force until it is formally modified or replaced.

16.1.2. Possible adverse effects on the core area(s) of uses or activities occurring within or outside the core area(s):

(Indicate trends and give statistics if available)

Introduction of Phytophthora dieback disease from outside the reserve is a potentially severe threat. The disease is a soil-borne pathogen that severely affects native plants, often leading to catastrophic decline, and is spread by the movement of infected soil. Some small infestations occur, and Biosphere Reserve-wide management systems and community involvement will greatly assist maintaining the proposed Core (and Buffer) Zones largely dieback free.

The Fitzgerald River National Park Management Plan (CALM 1991a) provides dieback disease management guidelines for the proposed Core Zone. The Recovery Plan for Fitzgerald Biosphere Threatened Species and Ecological Communities (DEC 2012b) and the WA Regional NRM Group Collaboration Project Dieback (Project Dieback 2008) provides management guidelines to assist the management of dieback disease for the proposed Core, Buffer and the terrestrial Transition Zone.

The Department of Parks and Wildlife (DPaW) is currently progressing the development of a management plan specifically for the management of Phytophthora Dieback within Fitzgerald River National Park.

DPaW has been undertaking a baiting program since 1996 to mitigate the impact of the introduced European fox. There is substantial evidence that the reduction of fox number within the park have

lead to a meso-predator release of feral cats, in that they have likely replaced to fox as a top-level predator on a largely predator naive native fauna. DPaW has recently obtained approval for operational use of a new bait (Eradicat®) designed specifically to manage feral cat predators in conservation reserves (WA Minister for the Environment 2015).

Frequent and landscape scale fire is a threat to conservation values of the proposed Core Zone and this is managed by DPaW under the FRNP Management Plan (CALM 1991a). Other agencies and the community are involved through the role of the DPaW fire control working group (CALM 1991a), and operational assistance with fire prevention and suppression.

16.2. Buffer zone(s)

16.2.1 Describe the main land uses and economic activities in the buffer zone(s):

[Buffer zones may support a variety of uses which promote the multiple functions of a Biosphere Reserve while helping to ensure the protection and natural evolution of the core area(s).]

The proposed Buffer Zone comprises Crown land tenures of natural lands, as protected areas predominantly for nature conservation and recreation purposes vested in state government and local authority entities. It is a matrix that surrounds the proposed Core Zone and extends across broad areas to intersperse the proposed terrestrial Transition Zone.

Economic activity of the proposed Buffer Zone is limited, it relates indirectly to the economies of local towns are influenced by the use of the Buffer Zone for recreation activities including camping, fishing, four wheel driving, nature appreciation and surfing, particularly in coastal areas (Williams and Cooper 2011).

16.2.2 . Possible adverse effects on the buffer zone(s) of uses or activities occurring within or outside the buffer zone(s)in the near and longer terms:

Introduction of Phytophthora dieback disease from outside the reserve is a potentially severe threat. The disease is a soil-borne pathogen that severely affects native plants, often leading to catastrophic decline, and is spread by the movement of infected soil. Some small infestations occur, and Biosphere Reserve-wide management systems and community involvement will greatly assist maintaining the proposed Buffer (and Core) Zones largely dieback free. The WA Regional NRM Group collaboration Project Dieback (Project Dieback 2008) provides management guidelines to assist the management of dieback disease for the proposed Core, Buffer and terrestrial Transition Zones.

Frequent and landscape scale fire is a potential threat to conservation values of the proposed Buffer and Transition Zones. Local government undertakes bushfire management (Shire of Jerramungup 2012, Shire of Ravensthorpe 2012), having the responsibility for fire suppression on lands in their jurisdiction and unallocated Crown Lands (UCL) and unmanaged reserves (UMR), with the assistance of the Department of Fire and Emergency Services (DFES). DPaW manage fire on lands under their jurisdiction (CALM 1991a), and as part of their responsibility on UCL and UMR under the Memorandum of Understanding between DPaW and the Department of Regional Development and lands, as supported by an order under section 33(2) of the CALM Act 1984 (DRDL 2010). DPaW also provide support to bushfire suppression on UCL and UMR lands when a multi-agency

response is required, and operational partnerships for fire management between these agencies and the local community is commonplace and effective.

16.3. Transition area

[The Seville Strategy gave increased emphasis to the transition area since this is the area where the key issues on environment and development of a given region are to be addressed. The transition area is by definition not delimited in space, but rather is changing in size according to the problems that arise over time. Describe briefly the transition area as envisaged as the time of nomination, the types of questions to be addressed there in the near and the longer terms. The size should be given only as an indication]

16.3.1. Describe the main land uses and major economic activities in the transition area(s):

The proposed Transition Zone comprises terrestrial privately owned, built-on and leased lands, and natural Crown lands subject to mineral exploration and mining leases and tenements; and, a marine component comprising State waters out to the three nautical mile limit from shore, islands and reef breaks.

The proposed Transition Zone is where the human community conducts the majority of its enterprises. In the privately owned terrestrial area it is for broad acre agriculture consisting of cereal and oilseed cropping, sheep for wool and meat, and cattle for beef production (South Coast NRM 2011). In natural Crown lands of the Transition Zone, mineral exploration and mining is a very significant economic activity, of great interest to the local community (Shire of Ravensthorpe 2010a) and the State of WA. Its economic value provides opportunities for degrees and examples of environmental protection, and landscape rehabilitation in line with its adherence to legislation and company policy, and indeed 'social licence'.

In the relatively natural marine component commercial fishing for finfish, sharks, rock lobsters, crabs and scallops predominates (DOF 2005). The marine and estuarine areas are also significant attractants for recreational users who undertake fishing and water sports including diving and boating. Whale watching is also a growing recreational pursuit in winter and spring. The dominant enterprise of the coastal towns of Bremer Bay and Hopetoun is the support of recreational visitors or tourism; this includes hospitality as caravan parks, motels, hotels and small-scale retail outlets.

Indirect economic activities of the natural lands of the Transition Zone include support for recreation such as camping, fishing and four wheel driving. As well, some small scale honey production and licensed wildflower picking occurs.

16.3.2. Possible adverse effects of uses or activities on the transition area(s):

The most significant adverse effects and activities in proposed terrestrial transition area are from the landscape scale impacts of relatively recently cleared agricultural land (private lands), and more localised impacts from mining developments in natural Crown lands.

The widespread clearing of the large areas of agricultural land mostly occurred from the 1950's to the 1980's. This has brought apparently unforeseen effects of ecosystem fragmentation, secondary salinity and soil loss, which are the subject of much effort and resources to address through the design of more sustainable agricultural systems. Notwithstanding, among the agricultural lands, significant privately owned remnant bushland areas do exist that hold considerable biodiversity and

landscape scale conservation values (Map 3). Some adverse effects from pest plant and animals occur, sometimes including grazing effects of native animals on crops in paddocks adjoining proposed Buffer and Core bushland areas. Arrangements are in place for the mitigation of some of these effects, although an increased understanding of the factors involved and diversity of approaches are needed, and these will be the subjects of research activities.

Mining, and to a much lesser extent exploration activities on the natural lands of the Transition Zone, principally in the Ravensthorpe area where increased mineralisation is reflected in complex geology, can and do have adverse affects on nature conservation values. However, exploration and mining is conducted according to strict environmental protection legislation (WA Govt. 1986, EPA 2003), including comprehensive rehabilitation requirements (see 3.2 and 4.3). Notwithstanding, mining and mineral exploration can have adverse impacts, and it is accepted that their existence can also have some nature and culture conservation benefits, including an increased knowledge base from environmental and heritage studies and protection measures undertaken, and from the rehabilitation of damaged and mined sites.

Frequent and landscape scale fire is a potential threat to conservation values of the proposed Transition Zone, as the effects of unplanned fire on conservation values and agricultural enterprises can be significant. Local government undertakes fire prevention and management in conjunction with landholders (Shire of Jerramungup 2012, Shire of Ravensthorpe 2012). This includes a fire control officer structure, firebreaks, restricted burning times and at times joint operations with other agencies including the Fire and Emergency Services Authority and DPaW. In the case of natural lands of the proposed Transition Zone, the same possible adverse effects and activities apply as in the proposed Buffer Zone (see 16.2.2 above).

The marine component of the proposed transition zone is subject to relatively conservative and rigorous fisheries management for both the commercial and recreational fisheries. The marine ecosystems are highly prized for economic, intrinsic and lifestyle appeal, as such they are the subject of a mixture of protective scrutiny and occasional exploitative behaviour. Some very vulnerable fish species are easily impacted and will be aided by continued research and it's informing of management regimes. The marine ecosystems and the fisheries they support are a priority for research activities in the Action Plan for Fitzgerald Biosphere (McQuoid 2012).

The careful management and enduring sustainability of the terrestrial and marine components of the proposed Transition Zone is a strong local desire, well supported by the existence of the Biosphere Reserve and its conservation, development and logistic support functions.

17. INSTITUTIONAL ASPECTS

17.1. STATE, PROVINCE, REGION OR OTHER ADMINISTRATIVE UNITS:

[List in hierarchical order administrative division(s) in which the proposed Biosphere Reserve is located (e.g. state(s), counties, districts)]

State of Western Australia.

Local government areas of the whole of the Shire of Jerramungup, and the western section of the Shire of Ravensthorpe. Very small areas of the neighbouring shires of Gnowangerup, Kent and Lake Grace to the west and north where the south-flowing catchments rise are included; this is for catchment management boundary integrity rather than a local government jurisdictional function as in the case of the Shires of Jerramungup and Ravensthorpe (Map 1). The Shires of Gnowangerup, Kent and Lake Grace have been contacted regarding this.

Department of Parks and Wildlife (DPaW) Albany District within its South Coast Region. DPaW has statutory management responsibility for protected areas in Western Australia under the CALM Act 1984 as well as the protection of native flora and fauna state wide through the Wildlife Conservation Act 1950.

The eastern section of the Wagyl Kaip land Claim of the indigenous Noongar people. This land claim for traditional owners informs the eastern Boundary of the proposed extension of Fitzgerald Biosphere, following the vermin fence and Fence Road.

The South Coast Natural Resource Management Region 'Fitzgerald Biosphere Subregion', except the sections east of the vermin fence and Fence Road and some other minor differences in catchment extent detail.

17.2. UNITS OF THE PROPOSED BIOSPHERE RESERVE:

[Indicate the name of the different land management units (as appropriate, e.g. protected area, territories of municipalities, private lands) making up the core area(s), the buffer zone(s) and the transition area).

The proposed Core Zone is a protected area – Fitzgerald River National Park. The Buffer Zone comprises some classes and jurisdictions of protected areas, mainly conservation and recreation estate. The Transition Zone terrestrial component is privately owned land and alienated public lands (built on or cleared), and unallocated Crown lands subject to mineral exploration and mining; and the proposed marine component is the Western Australian State waters.

Map 1 shows the original and 1994 updated Fitzgerald River National Park Biosphere Reserve; and land tenures, purposes, and local authority boundaries.

Map 2 shows proposed Zoning as Core, Buffer and Transition.

Map 3 shows native vegetation extent.

17.2.1. Are these units contiguous or are they separate?

[A biosphere reserve made up of several geographically separate units is called a "cluster biosphere reserve". Please state if this is the case of the proposal.]

As proposed, Fitzgerald Biosphere is close to the MAB model (UNESCO 1996; Watson and Sanders 1997). It has a central protected area Core Zone (Fitzgerald River National Park), surrounded by a semi-contiguous Buffer Zone, and a Transition Zone commonly beyond the Core and Buffer that includes a terrestrial and marine component. The Buffer Zone sections are in some cases connected to each other and the Core Zone. In many cases, substantial natural bushland areas in the terrestrial Transition Zone complement and join parts of the Buffer and Core Zones, in particular the unallocated Crown lands and private conservation properties provide this feature. Map 2 shows the radiating, matrix and corridor pattern of the Zoning, and Map 3 shows the patterning of remnant vegetation.

17.3. Protection Regime of the core area(s) and, if appropriate of the buffer zone(s)

17.3.1. Core area(s):

[Indicate the type (e.g. under national legislation) and date since when the legal protection came into being and provide justifying documents (with English or French summary of the main features)]

The proposed Core Zone is a protected area, Fitzgerald River National Park, first proclaimed in 1973 (CALM 1991a).

Map 1 shows the original Fitzgerald River National Park Biosphere reserve, and Map 2 shows the dimensions and extent of the proposed Core Zone and its relationship with the proposed Buffer and Transition Zones.

17.3.2 Buffer zone(s):

[Indicate the type (e.g. under national legislation) and date since when the legal protection came into being and provide justifying documents (with English or French summary of the main features. If the buffer zone does not have legal protection, indicate the regulations that apply for its management.)]

Several public land tenures and purposes primarily for conservation and recreation comprise the proposed Buffer Zone. Map 2 shows this pattern. The Department of Parks and Wildlife, and the Shires of Jerramungup and Ravensthorpe manage the majority of lands comprising the buffer zone. The Biosphere Implementation Group (BIG) membership is comprised of the majority of the agencies with statutory responsibilities for the management of the majority of lands of the proposed Buffer Zone, and a representative of the mining industry with leases and tenements in the proposed Transition Zone. Associated support is provided to the BIG by the remaining agencies. The role of the BIG is to represent stakeholders.

Since July 2003, responsibility for the pre-suppression management of fire, and declared plants and animals on unallocated Crown land (UCL) and unmanaged reserves (UMR) outside the metropolitan area, regional centres and townsites was transferred to the Department of Parks and Wildlife (DPaW). A Memorandum of Understanding (MOU) has been executed by DPaW and the Department of Regional Development and lands (DRDL), detailing the roles and functions of each agency and opening the way for DPaW to take a broader management role in the future. The MOU is supported by an order under section 33(2) of the CALM Act 1984 (DRDL 2010). The management responsibility of bushfire suppression on UCL and UMR rests with local government authorities with support from the Department of Fire and Emergency Services (DFES). DPaW may provide support to bushfire suppression on these lands when a multi-agency response is required.

The majority of Crown lands comprising the proposed Buffer Zone are managed by the DPaW and the Shires of Jerramungup and Ravensthorpe, and this authority is reflected in the signature blocks in sections 5.2 and 5.3.

17.4. Land use regulations or agreements applicable to the transition area (if appropriate)

The terrestrial private lands of the proposed Transition Zone are under the direct control of private citizens, subject to the Acts, Laws and Regulations of the national, state and local government authorities. The unallocated Crown lands and other reserves are under the jurisdiction of the Government of Western Australia, and the management direction of the mining companies who hold the leases and tenements according to Acts, Laws and Regulations of the national, state and local government authorities.

As is the case for the proposed Buffer Zone above (17.3.2), responsibility for the pre-suppression management of fire, and declared plants and animals on unallocated Crown land (UCL) and unmanaged reserves (UMR) outside the metropolitan area, regional centres and townsites was transferred to the Department of Parks and Wildlife (DPaW). A Memorandum of Understanding (MOU) has been executed by DPaW and the Department of Regional Development and Lands (DRDL) (now the Department of Lands), detailing the roles and functions of each agency and opening the way for DPaW to take a broader management role in the future. The MOU is supported by an order under section 33(2) of the CALM Act 1984 (DRDL 2010). The management responsibility of bushfire suppression on UCL and UMR rests with local government authorities with support from the Department of Fire and Emergency Services (DFES). DPaW may provide support to bushfire suppression on these lands when a multi-agency response is required.

The marine component of the proposed transition zone is under the jurisdiction of the Government of Western Australia as “State Waters” to the 3 nautical mile limit, whereupon Commonwealth of Australia Waters begin, marking the southern edge of an extended Fitzgerald Biosphere as proposed.

17.5. Land tenure of each zone:

[Describe and give the relative percentage of ownership in terms of national, state/provincial, local government, private ownership, etc. for each zone.]

17.5.1. Core area(s):

A Class Reserve for the Purpose of National Park, vested in the Conservation Commission of Western Australia, and managed on their behalf by the Department of Parks and Wildlife. Listed by UNESCO as Fitzgerald River National Park Biosphere Reserve (CALM 1991a, UNESCO 2004).

Percentage the Core comprises of the whole Fitzgerald Biosphere as proposed is 19.377%

17.5.2. Buffer zone (s):

Public lands of the tenures of nature reserve, other vested Crown land (Aboriginal Land Trust reserve, shire reserve, water reserve), Crown freehold land, CALM Act 5g reserve, and some areas of unallocated Crown land. Land uses include the conservation of nature, protection of water supplies, recreation and camping, stock uses, and for the use of Aboriginal people. Map 1 shows the land tenure types that comprise the proposed Buffer Zone.

Local Government vested reserves comprise significant parts of the proposed Buffer Zone, particularly close to the coast near the towns of Bremer Bay and Hopetoun, and to a lesser extent surrounding and near the inland towns of Jerramungup and Ravensthorpe.

A small section of the neighbouring Shire of Kent contains Buffer Zone reserves in the central northern section of Fitzgerald Biosphere, as the southern section of Lake Magenta Nature Reserve and unallocated Crown land to its east in the upper Fitzgerald River catchment (Map 1).

The Biosphere Implementation Group (BIG) membership is comprised of the majority of the agencies with statutory responsibilities for the management of the lands of the proposed Buffer Zone. Associated support is provided to the BIG by the remaining agencies. The role of the BIG is to represent stakeholders in advancing Man and Biosphere Objectives.

Percentage the Buffer comprises of the whole Fitzgerald Biosphere as proposed is 9.217%

17.5.3. Transition area(s):

Private freehold and leasehold land, predominantly for agriculture, industry or housing. Some small parcels of public land built on as shire facilities or cleared and leased for agriculture.

Public lands as significant areas of unallocated Crown land, some areas of other vested Crown land (shire reserve, water reserve), Crown freehold land, and CALM Act 5g reserve. Land uses include mining and exploration leases and tenements, recreation, stock uses. Map 1 shows the land tenure types that comprise the proposed Transition Zone

State Waters, under the jurisdiction of the Government of Western Australia, to the three nautical mile limit (Map 2).

Some small sections of the neighbouring Shires of Gnowangerup, Kent and Lake Grace are included in the Transition Zone, to include the upper parts of Corackerup Creek and Gairdner, Fitzgerald and Phillips River catchments (Map 1).

Percentage the Transition area comprises of the whole Fitzgerald Biosphere as proposed is 71.406% (61.123% Terrestrial, 10.283% Marine).

17.5.4. Foreseen changes in land tenure:

[Is there a land acquisition program, e.g. to purchase private lands, or plans for privatization of state-owned lands?]

The Australian (Commonwealth) Government Commonwealth Marine Reserves network in the southwest marine region (Commonwealth of Australia 2012) is likely to include the Bremer Commonwealth Marine Reserve in Commonwealth Waters offshore from and adjoining the WA State Waters that comprise the proposed marine component of the Transition Zone. When this reservation process is complete, the boundary and zoning of Fitzgerald Biosphere will be reviewed to assess the implementation of marine core and buffer zones accordingly.

Accordingly, any reservation results of the Western Australian State Government's marine reserve planning process (DEC 2010) will also be considered for rezoning if and when they may occur in the future.

17.6. Management plan or policy and mechanisms for implementation

[The Seville Strategy recommends promoting the management of each biosphere reserves essentially as a "pact" between the local community and society as a whole. Management should be open, evolving and adaptive. While the aim is to establish a process leading to elaborating a comprehensive management plan for the whole site reflecting these ideas and involving all stakeholders, this may not yet exist at the time of nomination. In this case however, it is necessary to indicate the main features of the management policy, which is being applied to guide land use at present for the area as a whole, and the 'vision' for the future.]

The proposed Core Zone, Fitzgerald River National Park, has an active Management Plan (CALM 1991a) implemented and reviewed by the Department of Parks and Wildlife. It includes prescriptions relating to MAB objectives in its sections 4.0 and 20.0, which include recognising Fitzgerald River National Park as the Core Zone, community involvement and the role of the DPaW.

The Action Plan for Fitzgerald Biosphere (McQuoid 2012) is the inclusive management plan for the broader Fitzgerald Biosphere, administered and reviewed by the representative Biosphere Implementation Group (BIG). The Action Plan is centred on the UNESCO MAB Seville Criteria, and Madrid Action Plan (UNESCO 1996, 2003, 2008), the plan is also reflective of the UNESCO MAB 2003 Bureau Review (UNESCO 2003) and the local planning initiatives: the statutory Fitzgerald River National Park Management Plan (CALM 1991a) and the 2010 University of Western Australia (UWA) Centre of Excellence in Natural Resource Management (CENRM) Assessment of the Current Situation Report (Fry 2010). The Action Plan takes into account the many actions, prescriptions, recommendations and targets of these plans and reports. Its Actions have been arrived at by consultation through the BIG and the broader community, and forms the broad instrument by which to guide the progress of Fitzgerald Biosphere and its community. The Action Plan is to be implemented and reviewed through the BIG, with a review process occurring every three years. The next review due in November 2015. See also 4.6 and 4.7.

17.6.1. Indicate how and to what extent the local communities living within and next to the proposed biosphere reserve have been associated with the nomination process

[This can range from being an entirely locally driven initiative, to a more 'top down' approach led by government authorities or scientific institutions. Describe the steps taken and the stakeholders involved]

The renomination process has been a collaborative effort, prompted by concerns in the community that Fitzgerald Biosphere was not recognised by UNESCO as a fully functional post-Seville Biosphere Reserve (UNESCO 2003; Fry 2010). While "Fitzgerald Biosphere" is well accepted by the local and regional community (SCRIPT 1996, 2000, 2004; South Coast NRM 2011), it was apparent that formalisation of the broader Fitzgerald Biosphere should be pursued (Fry 2010). South Coast NRM secured resources to support the development of a Renomination of an expanded site to UNESCO as a project. The project adopted the BIG as the stakeholder group, and to consult with the community and broader stakeholders to gauge interest and address the issues of Boundaries and Zones, and consider a marine component. Significant interest and support for the continued listing of an expanded Fitzgerald Biosphere with a marine component is manifest in the convening, representativeness, efforts and desires of the BIG, the Action Plan for Fitzgerald Biosphere (McQuoid 2012), and this renomination process.

During 2013, the Department of Parks and Wildlife undertook further consultation with WA State Government agencies relating to this renomination of an expanded Fitzgerald Biosphere. That process resulted in a request for further consultation at with commercial and recreational fishing and mining interests. This consultation was undertaken during 2014 and has resulted in measures to

include ongoing liaison and inclusion of fishing and mining interests in Fitzgerald Biosphere, review of the design of the proposed Buffer and Transition Zones, and adding mining interests to the membership of the BIG.

17.6.2. Main features of management plan or land use policy

(Describe the ‘vision’ of what the proposed biosphere reserve is expected to achieve in the short and longer term, and the benefits foreseen for the local communities and other stakeholders)

The principle features of the Action Plan for Fitzgerald Biosphere are:

- It is based on the MAB Seville Criteria and Madrid Action Plan;
- Takes into account and complements other plans and reports including the statutory Fitzgerald River National Park Management Plan (CALM 1991a);
- Has a strong and committed broadly representative stakeholder group;
- Supports the strategic planning desires of the Shires of Jerramungup and Ravensthorpe;
- Contains the wishes of the community, and
- Is a foundation for community development based on ecological sustainability and conservation, of culture and nature.

The Action Plan Summary states:

The remarkable nature and vibrant communities of Fitzgerald Biosphere, together with the objectives of the Man and Biosphere Program, present a unique opportunity for preservation, prosperity and posterity.

The UNESCO MAB Program objective is to address a sustainable balance between the goals of conserving biological diversity, promoting economic development and maintaining cultural values. Biosphere reserves are sites where this objective is discussed, designed, resourced, tested, demonstrated and refined. Accordingly, this Action Plan outlines the background to this charter and describes detailed Actions by which to fulfil its worth in Fitzgerald Biosphere, and in doing so advance communities and enterprises.

The Fitzgerald Biosphere community is committed to addressing the MAB objectives to achieve conservation and development from the three functions of Biosphere Reserves. To this end, the formation of the Biosphere Implementation Group (BIG) is a recent collaborative initiative to bring the key community and stakeholder groups and agencies together to guide the progress of Fitzgerald Biosphere, and to implement and review this Action Plan. The title Fitzgerald Biosphere is preferred to Fitzgerald Biosphere Reserve to avoid confusion with the notion of conservation reserve commonly used for protected areas.

This Action Plan for Fitzgerald Biosphere provides a response framework for the broader Fitzgerald Biosphere, based principally on the criteria of the UNESCO MAB Program Seville Strategy (UNESCO 1996). As well, it responds to the UNESCO Madrid Action Plan (UNESCO 2008), takes into account State agency and regional planning initiatives, and includes the wishes of the community. The Plan relates primarily to activities in the Buffer and Transition and Zones, while recognising the Core Zone of Fitzgerald River National Park and its existing Management Plan (CALM 1991; Map 1), and its management by the Department of Environment and Conservation (now Parks and Wildlife).

The Action Plan is a strategic approach to achieving improved conservation, development and support. Its priorities are research, monitoring, education, and training, supported by communication and coordination. It provides opportunities for involvement and collaboration for like-minded groups, individuals and organisations. Resourcing will be sought from a range of sources and contributors, including grants, partners, collaborators, sponsors and the contributions of volunteers. Progress will be assessed every three years by the BIG, and adjustments to priorities made.

The Plan has two parts. Part One a background outlining its basis and supporting information, and Part Two tables Actions of processes, programs, and projects designed to make Fitzgerald Biosphere a fully functional and exemplar Biosphere Reserve.

This Plan has been developed with the valuable assistance of the Australian Government Department of Foreign Affairs and Trade's United Nations Education, Scientific and Cultural Organisation (UNESCO) Commission.

The Action Plan is seen as a pathway to address the sustainable development of the community and landscape; a platform from which to develop the area's reputation for the conservation of nature and culture, and for sustainable enterprises; and as an attractant to contribution, partnerships and resources. The plan is provided as an attached document to this Renomination Form (Appendix 2).

17.6.3. The designated authority or coordination mechanisms to implement this plan or policy

(Name, structure and composition, its functioning to date)

The Action Plan will be administered by the Biosphere Implementation Group (BIG), a representative body with its membership is variously responsible for aspects of the Fitzgerald Biosphere, including:

- Department of Parks and Wildlife as statutory managers of the proposed Core Zone and parts of the proposed Buffer Zone, and aspects of the proposed Transition Zone;
- Shires of Jerramungup and Ravensthorpe as managers of much of the lands of the proposed Buffer Zone and as Local Government governance for the Transition Zone;
- Community groups Fitzgerald Biosphere Group (FBG) Ravensthorpe Agricultural Initiative Network (RAIN) and the Friends of Fitzgerald River National Park (FoFRNP) that address conservation and agricultural sustainability as their core business;
- A representative of the mining and mineral exploration interests in the Buffer and Transition Zones,
- Indigenous representation is by the Noongar people through the South West Aboriginal Land and Sea Council (SWALSC) Wagyl Kaip Land Claim (SWALSC 2010).

The BIG was convened in November 2010 (McQuoid 2012) and currently meets twice yearly. Its current focus has been as stakeholder group for this Renomination Project and its processes, and for the development of the Action Plan for Fitzgerald Biosphere.

17.6.4. The means of application of the management plan or policy (For example through contractual agreements with landowners or resources users, traditional users' rights, financial incentives, etc.)

17.6.5. Indicate how and to what extent the local communities participate in the formulation and the implementation of the management plan or policy (informed/consulted: decision making role etc.)

The community of Fitzgerald Biosphere, through the Biosphere Implementation Group (BIG) and via consultation, were involved in the development of the Actions of the Action Plan for Fitzgerald Biosphere. It should be noted that government agency stakeholders are considered part of this community and were also involved in developing the Plan's Actions. The Actions of the Plan were arrived at through consultation including workshops, broader discussions with the community, and the circulation of Plan drafts for comment. Community priorities and desires were canvassed and included, in line with the Seville Criteria and the recommendations of Madrid and other relevant plans upon which the Action Plan is based.

The application of the Action Plan, as implementation and review, is formalised via the BIG, which has broad community representation. In addition, the community has the opportunity to be involved in implementation through the plan's philosophy of collaboration and contribution for implementation. Resourcing the implementation is a challenge, as no formal budgets exist for what is essentially a voluntary process. However, the Action Plan is designed to provide a platform to attract contribution to its implementation, building on the profile and popularity of the area and its nature.

Developing and implementing the Action Plan follows Fitzgerald Biosphere's strong history of community involvement, including collaboration with agencies and other groups (see also section 4.6 and 3.3). The BIG and the Action Plan development and implementation process continues this, by providing a broad community base (that includes the agencies, groups and individuals) to be involved in a collaborative and consultative manner regarding the decision making processes for the management of the site.

The local authority (Shires of Jerramungup and Ravensthorpe) Community Strategic Planning (CSP) processes are community inclusive processes that have differing responses to the MAB Objective and Fitzgerald Biosphere (see 3.3). The Shire of Jerramungup CSP (Jerramungup Shire 2012b) has direct Biosphere Program related initiatives in its plan. While the Shire of Ravensthorpe Community Strategic Plan (Shire of Ravensthorpe 2014a) has indirect responses, principally relating to community, infrastructure and tourism, which can be fulfilled in line with the Biosphere Objective.

17.6.6. The year of start of implementation of the management plan or policy

The Action Plan for Fitzgerald Biosphere was completed in 2013. Although the Fitzgerald River National Park Management Plan (CALM 1991a) has been in operation by CALM/DEC/DPaW since 1991, and it contains initiatives enacting some MAB objectives.

17.7. Financial source(s) and yearly budget:

[Biosphere reserves require technical and financial support for their management and for addressing interrelated environmental, land use, and socio-economic development problems. Indicate the source and the relative percentage of the funding (e.g. from national, regional, local administrations, private funding, international sources etc.) and the estimated yearly budget in the national currency]

As mentioned in the Action Plan Summary excerpt in 17.6.2, The Plan has been developed with the valuable assistance of the Australian Government Department of Foreign Affairs and Trade's United Nations Education, Scientific and Cultural Organisation (UNESCO) Commission.

No dedicated revenue stream exists to implement the Action Plan, and obtaining resources to implement the Actions is the next step for the BIG and the broader Fitzgerald Biosphere community. Several opportunities for resourcing exist across the government, non-government, corporate, and private assistance spectrum, and these will be canvassed for support.

Indirect revenues exist for the implementation of allied projects for natural resource management initiatives, principally through the community groups South Coast Natural Resource Management Inc, the Fitzgerald Biosphere Group (FBG) and the Ravensthorpe Agricultural Initiative Network (RAIN), and associated community groups.

The Action Plan has been developed as a catalyst and foundation by which to seek and attract resources through a range of collaborations, grants, partnerships and contributions from individuals and groups. Implementation will depend upon what resources can be obtained for which Actions, with the review process designed to assess progress and adjust priorities. It is believed that with the Action Plan and its direction in place, funds and other types of contributions such as in kind support will be obtained.

17.8. Authority(ies) in charge

The Biosphere Implementation Group (BIG) as the representative body. With the Department of Parks and Wildlife (DPaW) responsible under the CALM Act for the management of the proposed Core Zone, and the implementation of the Fitzgerald Biosphere Recovery Plan: A Landscape Approach to Threatened Species and Ecological Communities Recovery and Biodiversity Conservation (DEC 2012b). It is also responsible for significant parts of the proposed Buffer and Transition Zones including nature reserves, CALM Act reserves, vested Crown lands, and other land categories, and with the unallocated Crown land sections under a memorandum of understanding (MOU) with the Department of Regional Development and Lands (DRDL) for the management of fire, and declared plants and animals (DRDL 2012).

17.8.1. The proposed biosphere reserve as a whole:

Name: Fitzgerald Biosphere

If appropriate, name the National (or State or Provincial) administration to which this authority reports:

17.8.2. The core area(s):

[Indicate the name of the authority or authorities in charge of administering its legal powers (in original language with English or French translation)]

Name(s): Conservation Commission of Western Australia, through the Department of Parks and Wildlife

Legal powers: Western Australian Conservation and Land Management (CALM) Act as amended. Fitzgerald River National Park Management Plan 1991 – 2001 (CALM 1991) as amended.

17.8.3. The buffer zone(s)

Name: Department of Parks and Wildlife for lands administered under the CALM Act and management functions for unallocated Crown lands under a memorandum of understanding (MOU) with the Department of Regional Development and Lands (DRDL) for the management of fire, and declared plants and animals (DRDL 2012). Shire of Jerramungup, Shire of Ravensthorpe.

Legal powers (if appropriate):

CALM Act 1984 as amended. Wildlife Conservation Act 1950. Western Australian Local Government Act 1995. Local Government By-Laws and Planning Schemes.

18. SPECIAL DESIGNATIONS:

[Special designations recognize the importance of particular sites in carrying out the functions important in a biosphere reserve, such as conservation, monitoring, experimental research, and environmental education. These designations can help strengthen these functions where they exist or provide opportunities for developing them. Special designations may apply to an entire proposed biosphere reserve or to a site included within. They are therefore complementary and reinforcing of the designation as a biosphere reserve. They are therefore complementary and reinforcing to designation as a biosphere reserve. Check each designation that applies to the proposed biosphere reserve and indicate its name]

Name:

- ☐ UNESCO World Heritage Site
- ☐ RAMSAR Wetland Convention Site
- ☐ Other international/regional I conservation conventions/directives [Please specify]
- ☐ Long term monitoring site [Please specify]
- ☐ Other [Please specify]

19. SUPPORTING DOCUMENTS (to be submitted with nomination form)

[Clear, well-labelled maps are indispensable for evaluating Biosphere Reserve proposals. The maps to be provided should be referenced to standard coordinates wherever possible. Electronic versions are encouraged]

(1) General location map

A GENERAL LOCATION MAP of small or medium scale must be provided showing the location of the proposed Biosphere Reserve, and all included administrative areas, within the country, and its position with respect to major rivers, mountain ranges, principal towns, etc.

Map 1. Fitzgerald Biosphere pre Seville Core; Tenure and Town Locations

(2) Biosphere Reserve zonation map [large scale, preferably in black & white for photocopy reproduction]

[A BIOSPHERE RESERVE ZONATION MAP of a larger scale showing the delimitations of all core area(s) and buffer zone(s) must be provided. The approximate extent of the transition area(s) should be shown, if possible. While large scale and large format maps in colour are advisable for reference purposes, it is recommended to also enclose a Biosphere Reserve zonation map in a A-4 writing paper format in black & white for easy photocopy reproduction. It is recommended that an electronic version of the zonation map be provided]

Map 2. Fitzgerald Biosphere Boundary and Zones

(3) Vegetation map or land cover map

[A VEGETATION MAP or LAND COVER MAP showing the principal habitats and land cover types of the proposed Biosphere Reserve should be provided, if available].

Map 3. Fitzgerald Biosphere Remnant Vegetation

() List of legal documents (if possible with English or French translation)

[List the principal LEGAL DOCUMENTS authorizing the establishment and governing use and management of the proposed Biosphere Reserve and any administrative area(s) they contain. Please provide a copy of these documents, if possible with English or French translation].

(4) List of land use and management plans

[List existing LAND USE and MANAGEMENT PLANS (with dates and reference numbers) for the administrative area(s) included within the proposed Biosphere Reserve. Provide a copy of these documents]

Appendix 2. Attached documents

- Action Plan for Fitzgerald Biosphere 2012
- Fitzgerald River National Park Management Plan 1991 - 2001
- Fitzgerald Biosphere Recovery Plan: A Landscape Approach to Threatened Species and Ecological Communities Recovery and Biodiversity Conservation. DEC 2012

() Species list (to be annexed)

[Provide a LIST OF IMPORTANT SPECIES (threatened species as well as economically important species) occurring within the proposed Biosphere Reserve, including common names, wherever possible.]

(5) List of main bibliographic references (to be annexed)

[Provide a list of the main publications and articles of relevance to the proposed biosphere reserve over the past 5-10 years].

Appendix 1. References

Appendix 2. Accompanying documents

20. ADDRESSES

20.1 Contact address of the proposed biosphere reserve:

[Government agency, organization, or other entity (entities) to serve as the main contact on the MABnet to whom all correspondence within the World Network of Biosphere Reserves should be addressed.]

Name: Chairman, Biosphere Implementation Group

Street or P.O. Box: C/- Fitzgerald Biosphere Group, Tobruk Rd _____

City with postal code: Jerramungup, Western Australia 6337 _____

Country: Australia _____

Telephone: 08 98 351 127 _____

Telefax (or telex): 08 98 351 329 _____

E-mail: ardwilliams@harboursat.com.au or anne@fbg.org.au _____

Web site: www.fbg.org.au

20.2. Administering entity of the Core and Buffer area:

Name: Regional Manager, Department of Parks and Wildlife, South Coast Region

Street or P.O. Box: 120 Albany Highway

City with postal code: Albany, Western Australia, 6330

Country: Australia

Telephone: 619 08 9842 4500

Telefax (or telex): 619 08 9841 7105

E-mail: deon.utber@dpaw.wa.gov.au _____

Web site www.dpaw.wa.gov.a

20.3. Administering entity of the Buffer and Transition Zones

Name: CEO, Shire of Jerramungup _____

Street or P.O. Box: Vasey Street _____

City with postal code: Jerramungup, Western Australia, 6337 _____

Country: Australia _____

Telephone: 08 98 351 022 _____

Telefax (or telex): 08 98 351 161 _____

E-mail: ceo@jerramungup.wa.gov.au _____

Web site: www.jerramungup.wa.gov.au

Name: CEO, Shire of Ravensthorpe _____
Street or P.O. Box: Morgans St _____
City with postal code: Ravensthorpe, Western Australia, 6346 _____
Country: Western Australia _____
Telephone: 08 98 390 000 _____
Telefax (or telex): _____
E-mail: ceo@ravensthorpe.wa.gov.au _____
Web site: www.ravensthorpe.wa.gov.

Annex to Biosphere Reserve Nomination Form, February 2004

MABnet Directory of Biosphere Reserves

Biosphere Reserve Description¹

Article I. Administrative details

Country: Australia,

State: Western Australia

Name of BR: Fitzgerald Biosphere

Year designated: *(to be completed by MAB Secretariat)* 1978

Administrative authorities: (17.8) Biosphere Implementation Group

Name Contact: (20.1) Chairman, Biosphere Implementation Group

Contact address: (20.1) C/- Fitzgerald Biosphere Group, Tobruk Rd Jerramungup WA 6337

Article II. Related links (web sites): www.dpaw.wa.gov.au : www.fbg.org.au : www.fitzgeraldfriends.org.au : www.southcoastnrm.com.au

Article III. Description

General description: *(Site characteristics in 11.1; human population in 10; land management units in 17.2)*

Approximately 25 lines

Fitzgerald Biosphere has a rich array of natural diversity. It is ancient, eroded and subdued yet complex. With fossil valleys, broad sandplains, granite rises, greenstone ranges, ancient sea floors turned into mountains, Eocene landforms of breakaways ridges plains and valleys, rivers creeks and estuaries, coastal cliffs and dunes, and wild southern ocean seascapes.

Its variety of terrestrial landforms provides the enormous diversity of soils, vegetation and habitat systems. They are covered with vegetation communities of sedgeland, kwongan, thickets, banksia and mallee shrublands, and woodlands of mallet, moort, sheoak, wonil and yate. The estuaries have dense surrounding woodlands of swamp yate and paperbark, with dense understoreys of sedges and rushes, and swan grass meadows grow in shallow waters. The seascape includes islands, inshore and offshore reefs, sea cliffs, seagrass beds and sandy seafloors, supporting a rich variety of marine ecosystems including whale calving grounds and migration routes, and seabird nesting sites.

The terrestrial flora comprises around 2500 species and subspecies, many restricted and uncommon, with over 100 endemic. At the core of Fitzgerald Biosphere, Fitzgerald River National Park has around 1700, including 65 endemic. Endemic plants are predominant on the peculiar substrates of the Barren Ranges, Ravensthorpe Range, and the Eocene spongolite breakaways.

Fitzgerald River National Park is home to the most intact vertebrate fauna assemblage of any conservation reserve in southwestern Australia. It still contains tammar, red-tailed wambenger, dibbler, ground parrot, western bristlebird, western whipbird, and mallee fowl.

The human communities consist of a range of enterprise and lifestyle bases, the predominant land use of the transition zone is broad-acre agriculture, mining activity in the Ravensthorpe area, and in the marine

¹ To be posted on the MABnet once the nomination has been approved. The numbers refer to the relevant sections of the nomination form.

component commercial fishing and recreation. The buffer zone has recreational and nature conservation in the majority of its lands. It contains the towns of Bremer Bay, Hopetoun, Jerramungup and Ravensthorpe. Its coastal towns attract support for agriculture, mining, NRM and tourism industries, as well as lifestyle and recreation industry residents and seasonal holidaymakers attracted to the remote and relatively pristine nature and the relaxed atmosphere.

Fitzgerald Biosphere contains the whole of the shire of Jerramungup, the western section of the Shire of Ravensthorpe, and the upper catchments of the southwards flowing rivers where they occur short distances beyond to the north into adjoining Shires. The Core Zone is the whole of Fitzgerald River National Park. The Buffer Zone surrounding natural public lands including nature and recreation reserves. The Transition Zone is the privately owned land, unallocated Crown land and other reserves with mineral exploration and mining leases (and conservation values), built on and cleared public land, and a marine component comprising Western Australian State waters to 3 nautical miles off shore, islands and breaking reefs.

Major ecosystem type: (13.1)

Fitzgerald Biosphere sits within the Southeast Coastal Province of the Southwest Australian Floristic Region (Hopper and Gioia 2004), the Esperance Sandplain and Mallee IBRA regions (Thackway and Cresswell 1995), and the marine component in the southwest Bioregion (DOF 2011a) and the mesoscale ecosystem of IMCRA 4 Boundaries (Commonwealth of Australia 2006).

Major habitats & land cover types: (Titles of 12.1, 12.2, 12.3)

The complex geology including quartzite ranges, granite uplands, gneiss peninsulas, spongolite marine plain, sandplain and coastal limestone, which underlie an array of landforms, drainages, wetlands and soil systems (McQuoid 2004b). These in turn support a considerable diversity of vegetation and flora (McQuoid 2004a; Craig et al 2008; DEC 2012b). Vegetation communities include an immense range of woodlands, shrublands, thickets, kwongan, sedgeland, aquatic meadows and moss and lichen swards.

Location (latitude & longitude): (6)

Core Fitzgerald River National Park is: 33 deg 43' to 34 deg 24' S. 119 deg 05' to 120 deg 05' E.

Outer terrestrial Boundary is 33 deg 54' to 34 deg 21' S. 118 deg 37' to 120 deg 33' E.

Outer marine component boundary is 34 deg 33' S to 33 deg 58' S. 118 deg 56' to 120 deg 35' E

Area (ha): (7)

Total: (7) 1,529,577 ha

Core area(s): (7) 297,244 ha

Buffer zone(s): (7) 140,979 ha

Transition area(s) (when given): (7) 1,092,208 ha: 934,922 ha terrestrial and 157,286 ha marine component.

Different existing zonation: (7.4)

Altitudinal range (metres above sea level): (11.2) 80 metres below sea level in the marine component, to 502 metres above sea level in the terrestrial component (Quartzite Range at Thumb Peak, or Quyne-dilunup)

Research and monitoring

Brief description: 15.1.3)

Approximately 5 lines

Core and Buffer Zone research and monitoring predominantly is for biodiversity conservation management (Chapman and Newbey 1995a; CALM 1991a), including threatened species and communities (DEC 2012b). Includes monitoring of sites, ecosystems and species for recovery.

Transition Zone research and monitoring includes restoration ecology research (Sanders 2008; Jonson 2010). Sustainable Agriculture for soil conservation and catchment management (e.g. DAFWA 2002, 2004, 2006a, 2006b), productivity and sustainability, including assessing and addressing climate change. Post

mining rehabilitation on affected lands (EPA 2003; DMP 2011). Fisheries Management is ecosystem and sustainable catch-based (Fletcher et al 2002; Fletcher et al 2010; DOF 2011a, 2011b). Ecosystem inventory research has been a focus in marine and estuarine waters (DEC 1997, 1998; DOF 2005; Chuwen et al 2009).

The Action Plan for Fitzgerald Biosphere (McQuoid 2012) identifies research and monitoring, as well as education and training as priorities. Research and monitoring priorities include: sustainable agriculture, archaeology, architecture, landscape architecture, disturbance and restoration ecology, society and culture, and tourism.

Specific variables (please fill in the table below and tick the relevant parameters)

Abiotic		Biodiversity	
Abiotic factors	✓	Afforestation/Reforestation	✓
Acidic deposition/Atmospheric factors		Algae	✓
Air quality		Alien and/or invasive species	✓
Air temperature		Amphibians	✓
Climate, climatology	✓	Arid and semi-arid systems	✓
Contaminants		Autoecology	✓
Drought	✓	Beach/soft bottom systems	✓
Erosion	✓	Benthos	✓
Geology	✓	Biodiversity aspects	✓
Geomorphology	✓	Biogeography	✓
Geophysics	✓	Biology	✓
Glaciology		Biotechnology	
Global change		Birds	✓
Groundwater	✓	Boreal forest systems	
Habitat issues	✓	Breeding	✓
Heavy metals		Coastal/marine systems	✓
Hydrology	✓	Community studies	✓
Indicators	✓	Conservation	✓
Meteorology	✓	Coral reefs	✓
Modelling		Degraded areas	✓
Monitoring/methodologies	✓	Desertification	
Nutrients	✓	Dune systems	✓
Physical oceanography	✓	Ecology	✓
Pollution, pollutants	✓	Ecosystem assessment	✓
Siltation/sedimentation	✓	Ecosystem functioning/structure	✓
Soil	✓	Ecotones	✓
Speleology		Endemic species	✓
Topography	✓	Ethology	✓
Toxicology		Evapotranspiration	✓
UV radiation		Evolutionary studies/Palaeoecology	✓
		Fauna	✓
		Fires/fire ecology	✓
		Fishes	✓
		Flora	✓
		Forest systems	
		Freshwater systems	✓
		Fungi	✓
		Genetic resources	✓

	Genetically modified organisms	
	Home gardens	✓
	Indicators	✓
	Invertebrates	✓
	Island systems/studies	✓
	Lagoon systems	✓
	Lichens	✓
	Mammals	✓
	Mangrove systems	
	Mediterranean type systems	✓
	Microorganisms	✓
	Migrating populations	✓
	Modelling	✓
	Monitoring/methodologies	✓
	Mountain and highland systems	✓
	Natural and other resources	✓
	Natural medicinal products	✓
	Perturbations and resilience	✓
	Pests/Diseases	✓
	Phenology	✓
	Phytosociology/Succession	✓
	Plankton	✓
	Plants	✓
	Polar systems	
	Pollination	✓
	Population genetics/dynamics	✓
	Productivity	✓
	Rare/Endangered species	✓
	Reptiles	✓
	Restoration/Rehabilitation	✓
	Species (re) introduction	✓
	Species inventorying	✓
	Sub-tropical and temperate rainforest	
	Taxonomy	✓
	Temperate forest systems	✓
	Temperate grassland systems	
	Tropical dry forest systems	
	Tropical grassland and savannah systems	
	Tropical humid forest systems	
	Tundra systems	
	Vegetation studies	✓
	Volcanic/Geothermal systems	
	Wetland systems	✓
	Wildlife	✓

Socio-economic		Integrated monitoring	
Agriculture/Other production systems	✓	Biogeochemical studies	✓
Agroforestry	✓	Carrying capacity	✓
Anthropological studies	✓	Conflict analysis/resolution	
Aquaculture	✓	Ecosystem approach	✓
Archaeology	✓	Education and public awareness	✓
Bioprospecting	✓	Environmental changes	✓
Capacity building	✓	Geographic Information System (GIS)	✓
Cottage (home-based) industry	✓	Impact and risk studies	✓
Cultural aspects	✓	Indicators	✓
Demography		Indicators of environmental quality	✓
Economic studies	✓	Infrastructure development	✓
Economically important species	✓	Institutional and legal aspects	
Energy production systems	✓	Integrated studies	✓
Ethnology/traditional practices/knowledge	✓	Interdisciplinary studies	✓
Firewood cutting		Land tenure	✓
Fishery	✓	Land use/Land cover	✓
Forestry	✓	Landscape inventorying/monitoring	✓
Human health	✓	Management issues	✓
Human migration		Mapping	✓
Hunting		Modelling	✓
Indicators	✓	Monitoring/methodologies	✓
Indicators of sustainability	✓	Planning and zoning measures	✓
Indigenous people's issues	✓	Policy issues	✓
Industry	✓	Remote sensing	✓
Livelihood measures		Rural systems	✓
Livestock and related impacts	✓	Sustainable development/use	✓
Local participation	✓	Transboundary issues/measures	
Micro-credits		Urban systems	✓
Mining	✓	Watershed studies/monitoring	✓
Modelling	✓		
Monitoring/methodologies	✓		
Natural hazards	✓		
Non-timber forest products			
Pastoralism			
People-Nature relations	✓		
Poverty			
Quality economies/marketing	✓		
Recreation	✓		
Resource use	✓		
Role of women	✓		
Sacred sites	✓		
Small business initiatives	✓		
Social/Socio-economic aspects	✓		
Stakeholders' interests	✓		
Tourism	✓		
Transports	✓		

Appendix 1. References

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Appendix 2. Accompanying documents

Map 1. Proposed Fitzgerald Biosphere Estate

Map 2. Proposed Fitzgerald Biosphere Boundary and Zones

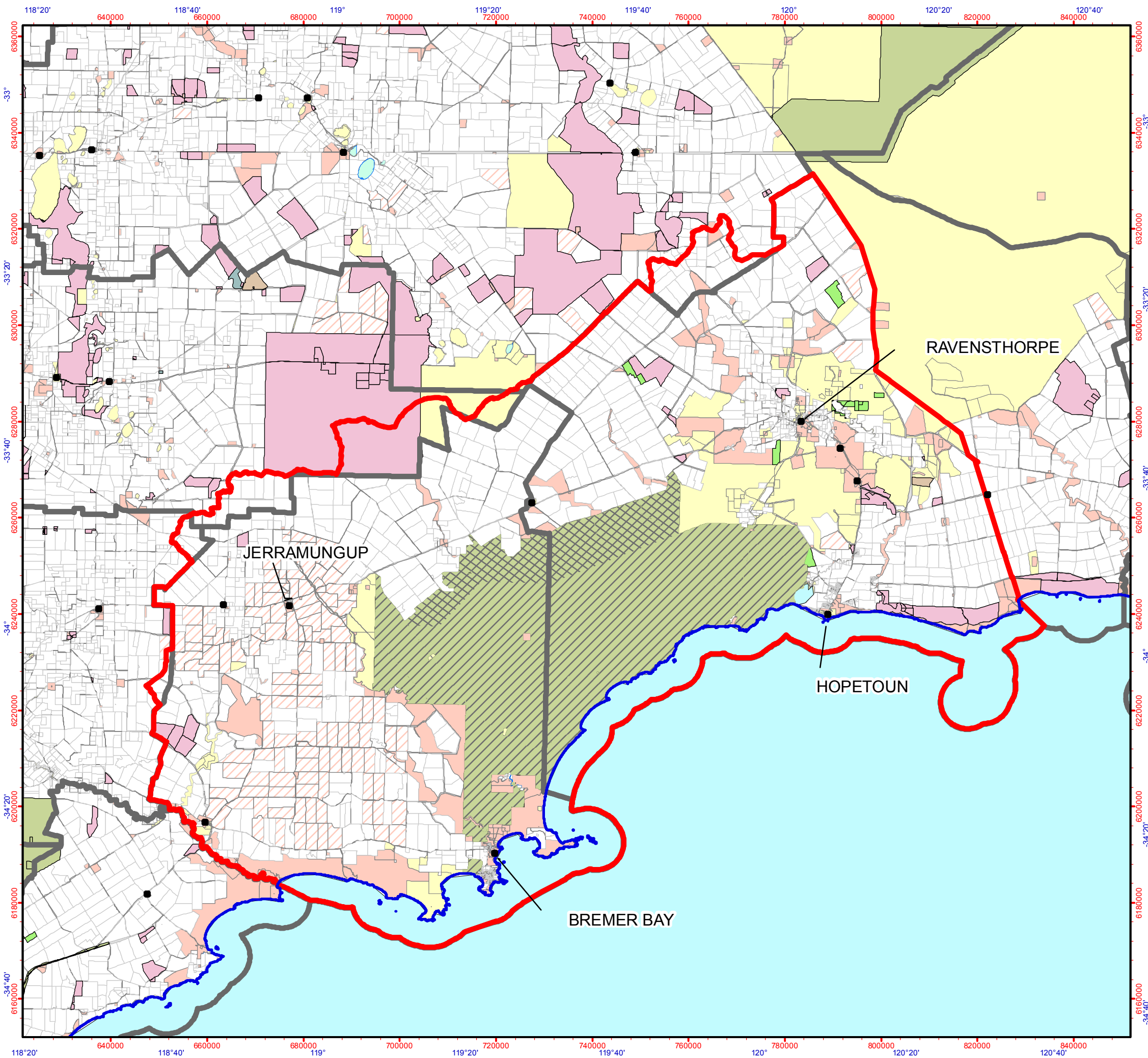
Map 3. Fitzgerald Biosphere Remnant vegetation

Action Plan for Fitzgerald Biosphere 2012. McQuoid 2012

Fitzgerald River National Park Management Plan 1991 – 2001. CALM 1991

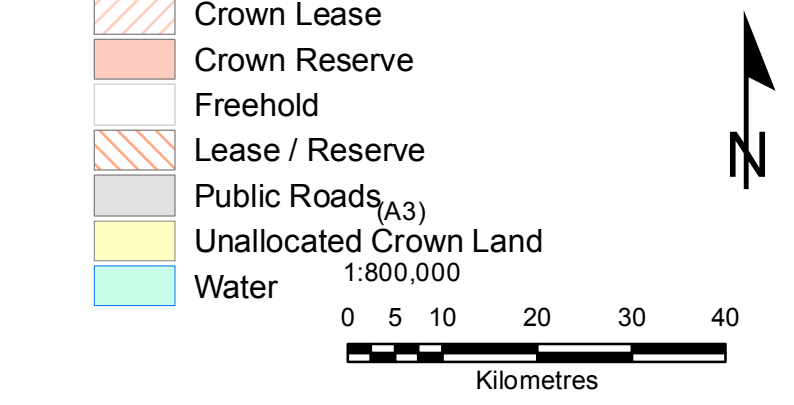
Fitzgerald Biosphere Recovery Plan: A Landscape Approach to Threatened Species and Ecological Communities Recovery and Biodiversity Conservation. DEC 2102

CD containing copies of this form and the attached documents

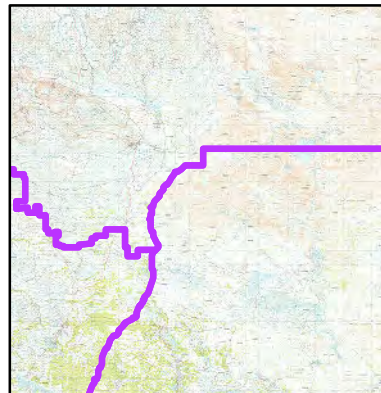


Map 1 Fitzgerald Biosphere Tenure Status

- Legend
- WA Townsites
 - WA Coast
 - Proposed_FBR_Boundary
 - Local Govt. Authorities (LGA)
 - FRNP Boundary 1978
 - 1994_FRNP_Update
 - FBR_Core_Zone
 - WA Ocean Mask
 - 5(1)(h) Reserve
 - Conservation Park
 - Crown Freehold - Dept Interest
 - Miscellaneous Reserve
 - National Park
 - Nature Reserve
 - Crown Lease
 - Crown Reserve
 - Freehold
 - Lease / Reserve
 - Public Roads (A3)
 - Unallocated Crown Land
 - Water



Projection: Universal Transverse Mercator
MGA Zone 50. Datum: GDA94



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Parks and Wildlife

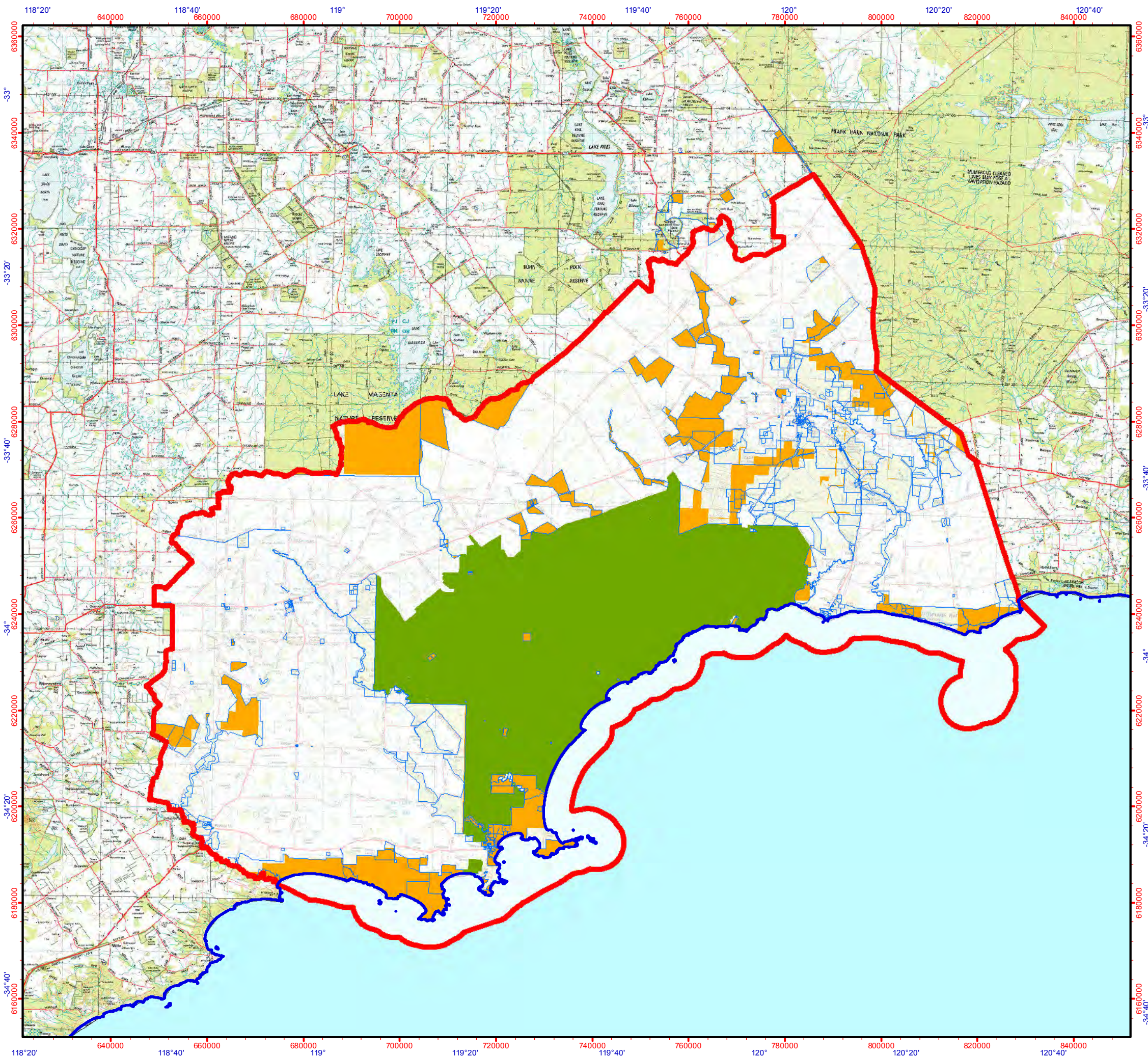


Graticule shown at 20 minutes intervals
Grid shown at 20000 metre intervals

Roads and tracks on land managed by DPaW may contain unmarked hazards and their surface condition is variable. Exercise caution and drive to conditions on all roads.

The Dept. of Parks and Wildlife does not guarantee that this map is without flaw of any kind and disclaims all liability for any errors, loss or other consequence which may arise from relying on any information depicted.

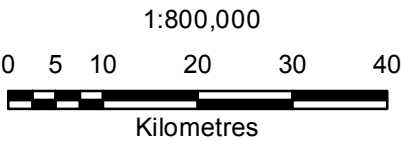
Produced at 2:54pm, on Jan 28, 2015



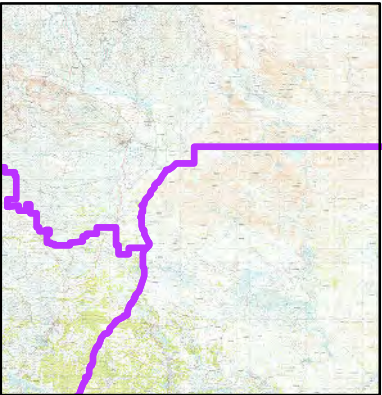
Map 2 Fitzgerald Biosphere Boundary and Zones

- Legend
- WA Coast
 - Proposed_FBR_Boundary
 - FBR_Crown_Lands
 - FBR_Buffer_Zone
 - FBR_Core_Zone
 - FBR_Transition_Zone
 - WA Ocean Mask

- AUSLIG 250k Imagery - GDA Lat/Long
RGB
- Red: Band_1
 - Green: Band_2
 - Blue: Band_3

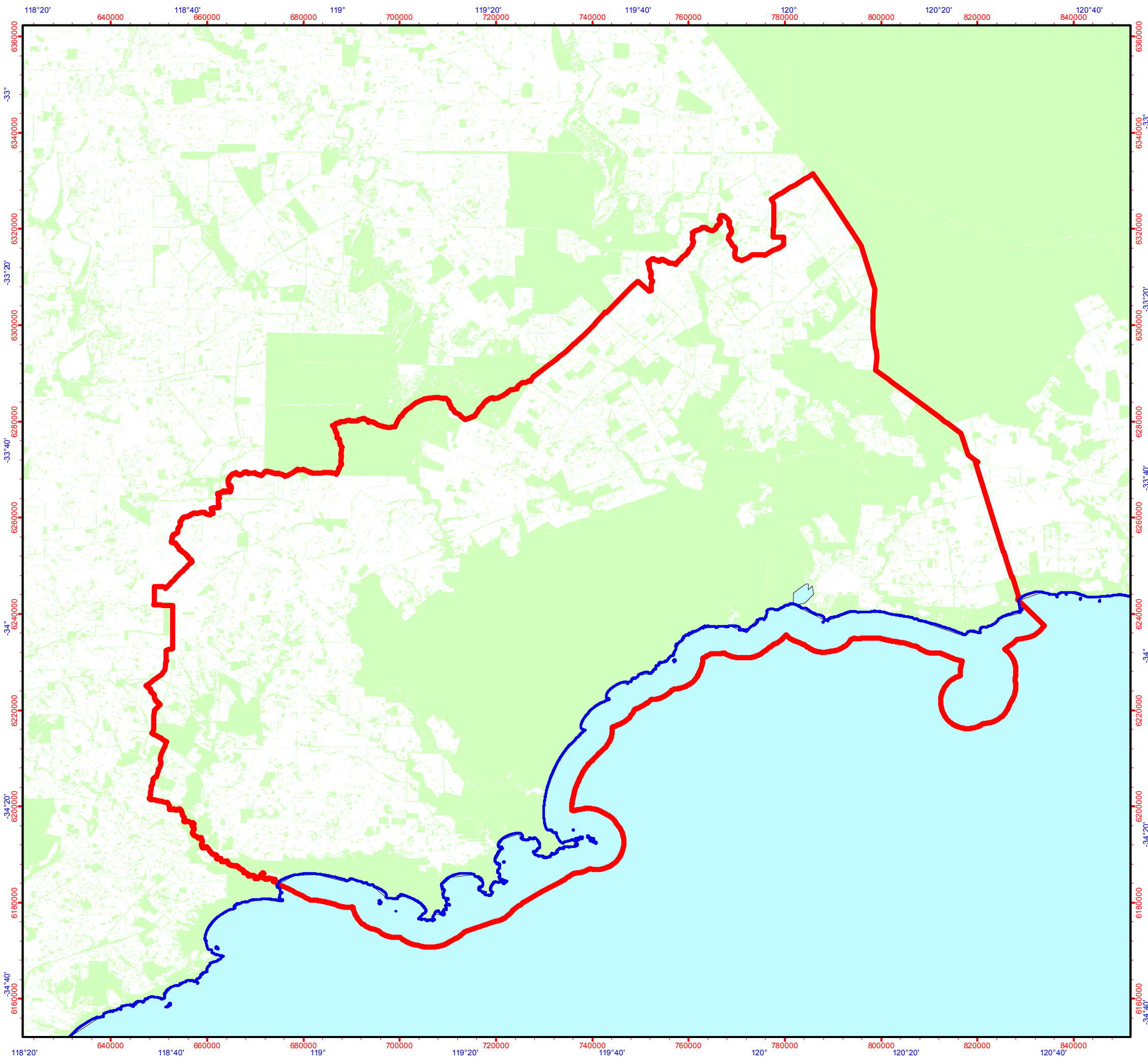


Projection: Universal Transverse Mercator
MGA Zone 50. Datum: GDA94



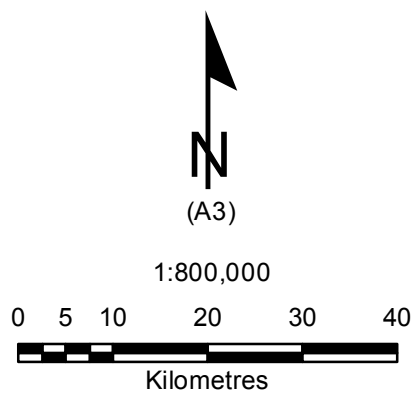
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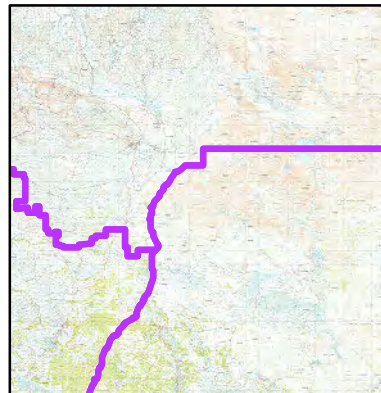


Map 3
Fitzgerald Biosphere
Native Vegetation

- Legend
- WA Coast
 - Proposed_FBR_Boundary
 - WA Ocean Mask
 - Native Vegetation



Projection: Universal Transverse Mercator
MGA Zone 50. Datum: GDA94



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Graticule shown at 20 minutes intervals
Grid shown at 20000 metre intervals

Roads and tracks on land managed by DPaW may contain unmarked hazards and their surface condition is variable. Exercise caution and drive to conditions on all roads.

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