

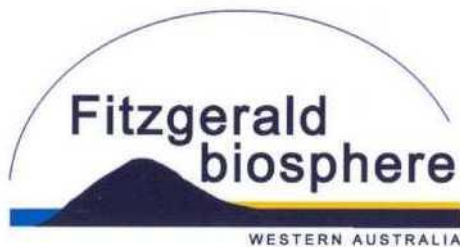
RENOMINATION OF FITZGERALD RIVER BIOSPHERE RESERVE WESTERN AUSTRALIA

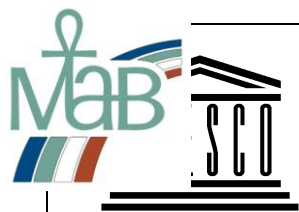


The Central Barrens over Point Ann and Doubtful Island Bay, Fitzgerald River National Park

Nathan McQuoid Landscape Ecologist
July 2012

Include DEC, JP, RA logos





BIOSPHERE RESERVE NOMINATION FORM

[February 2004]



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 Programme 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 Programme 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:

UNESCO
Division of Ecological and Earth Sciences
1, rue Miollis
F-75352 Paris Cedex 15, France
Tel: ++33 1 45 68 41 51
Fax: ++33 1 45 68 58 04
Email: mab@unesco.org

Overview of Re-nomination

Fitzgerald River Biosphere Reserve was originally listed by UNESCO in 1978 following consultation with the Australian and Western Australian Authorities (CALM 1991a). 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.

This document forms the re-nomination of the currently listed Fitzgerald River Biosphere Reserve, based on 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 Directorate of Parks Australia, in the Australian Government Department of Sustainability, Environment, Water Communities and Population; and Dr Thomas Schaaf 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 fulfill 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 nomination form following. Accompanying this completed form are relevant maps, a bibliography of references and supporting documentation.

DRAFT

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. Rio 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 Reserve

This nomination refers to a re-nomination process for the currently listed Fitzgerald River Biosphere Reserve. This Biosphere Reserve was originally listed by UNESCO in 1978 following consultation with the Australian and Western Australian Authorities (CALM 1991).

Since 1978 Fitzgerald Biosphere National Park Biosphere Reserve, has become known locally as Fitzgerald Biosphere Reserve or more often simply Fitzgerald Biosphere and has informally operated as a post Seville Biosphere Reserve with three levels of Zonation and considerable community input (SCRIPT 1994, Watson and Sanders 1997, South Coast NRM 2011).

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 fulfills 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 Core Zone of Fitzgerald River National Park (Chapman and Newbey 1995, Newbey and Hickman 2008), to a very significant extent in the Buffer or Transition Zone, and to a lesser although in some cases still very significant extent in the Zone of Cooperation. The Marine component, despite it being a Zone of Cooperation for the time being (see 4.5.c), holds very significant seascapes, ecosystems, species diversity and genetic variation (DEC 1997, 1998). Fitzgerald Biosphere Reserve contains many threatened species and ecological communities, for which a recent recovery plan has been developed (Newell et al 2010).

In world terms the natural environment of Fitzgerald River Biosphere Reserve is considered to be one of the richest places on earth for botanical diversity (Hopper and Gioia 2004, Myers et al 2000) This is based on its considerable diversity of geology and landforms and relatively stable and semi-arid Mediterranean climate (McQuoid 2004). Upon visiting Fitzgerald River 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 Core Zone of Fitzgerald River National Park contains three main landforms, comprising the predominantly coastal Barren Quartzite Range complex, a broad Eocene Marine Plain and the Yilgarn Granite upland. These are further interspersed by rivers, creeks and wetland systems. Upon

these landforms a complex set of vegetation communities occur, including several types of tree and mallee 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 sedgelands 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 (Newell et al 2010). 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 bristle bird and western whip bird. (CALM 1991).

The new Buffer or Transition Zone of natural public lands (Map 1) includes very large areas of conservation lands, including: Nature Reserves vested in the Conservation Commission of WA, other Crown reserves, unallocated Crown lands, and Shire Reserves. These lands include the conservation significant Lake Shaster Nature Reserve, Ravensthorpe Range, Cocanarup Reserve, Bremer Peninsulas, Doubtful Islands, Jerramungup Shire Coastal Reserve, and the Pallinup and Corackerup valley. These include several landforms not represented in the Core Fitzgerald River National Park, including the mineralised acid volcanic rocks of Ravensthorpe Range and Bandalup Hill (Hocking and Myers 1998), 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 gneiss (Myers and Hocking 1998), the limestone ridges of the Jerramungup Shire Coastal reserve, and the western wheatbelt plant community transfer of the Pallinup and Corackerup valleys (McQuoid pers. comm.). In their own rights, these landforms have very significant conservation values, although their smaller sizes and common recreational purposes see them as Transitional (or buffer) in cultural terms. These reserves and landforms hold significant plant diversity, in some cases matching the Core in diversity and endemism. 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), including over 50 endemics or near endemics (Hislop 2010, Harris et al 2008). The Bremer peninsulas are wild coastal and subcoastal landforms and mostly pristine vegetation communities with outstanding botanical richness including several endemics (e.g. Olde and Marriott 2009, Nicolle et al 2008).

Botanical investigation over the last decade in the proposed Transition (Buffer) Zone of Fitzgerald Biosphere continues to uncover numerous species new to science (e.g. McQuoid and Hopper 2004, Toelken and Craig 2007, Nicolle et al 2008, George 2010), Lepschi 2010, Hislop 2010). This is a measure of the intense biological diversity of this Zone

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).

Fitzgerald Biosphere Reserve has had a very significant and documented history (RAIN 2012, FBG 2011, SCNRM 2011) in fostering sustainable economic and human development. This has predominantly been since the advent of Landcare in the early 1980's (Ref) when the Jerramungup and Ravensthorpe land Conservation District Committees, precursors of the FBG and RAIN, and the strong presence of the WA department of Agriculture had a strong agenda and focus 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 Region Natural Resource Management Inc. in 2007 and the development of their Regional Natural Resource Management (NRM) strategies (SCRIPT 1994, SCNRM 2005,

2011), which included the recognition of the Fitzgerald Biosphere Subregion. The NRM strategies were designed to identify the priority sustainability issues for the themes of biodiversity, coasts and marine, Indigenous culture, land (agriculture), and water; and to design 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 the priorities across the themes (SCNRM 2011, FBG 2010).

The Gondwana Link 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 (www.gondwanalink.org.au).

The marine zone has an ecologically sustainable development function, as it is the primary drawcard for the considerable coastal recreation 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 is a major seasonal activity of the coastal towns of Bremer Bay and Hopetoun, as well as to a lesser although not insignificant extent in Fitzgerald River National Park Core Zone and recreation reserves in the Transition Zones (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 a holiday destination. The Fitzgerald Coast Tourism Association and Ravensthorpe Hopetoun Area Promotions Group provide excellent tourism guide information (Williams and Cooper eds 2011) to help cater for visitors to the area. 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 Fitzgerald Biosphere. These fisheries are in the Albany region of the South Coast Bioregion and are managed by the WA Department of Fisheries (DOF 2011). The management is sustainably managed 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 both wild catch and on-shore aquaculture, purse seine for pilchards and other small pelagic fish, gillnetting for sharks, 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 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 Reserve 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 from the 1950's at Calyerup Creek. Recently, Galaxy Resources have been mining Spodumene to derive lithium from their Mt Cattlin mine operation just to the west of Ravensthorpe (Galaxy 2011). Mining developments in Western Australia take into account ecological sustainability as it relates to the WA Environmental Protection Authority (EPA) legislation (EPA 1986). In this regard, exploration and mining is conducted in a framework of limiting environmental damage (EPA 2004a, 2004b, 2008a), and in some cases by providing environmental offsets (EPA 2008b).

Land development as subdivisions in Bremer Bay, Hopetoun and Ravensthorpe, with a few smaller developments to split farms into 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 Reserve across its three Zones. It can be divided into State Agencies, Commonwealth legislation resourcing, The 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 in Fitzgerald Biosphere, a community that often collaborates on initiatives of research (Chapman and Newbey 1995a, 1995b, Watson et al 1996, Craig et al 2008, Newell et al 2010), development (Shire of Jerramungup in prep), and logistical support (Barrett et al 2009, CALM 1991, DOE 2004, DOW 2008) through the Biosphere Implementation Group (McQuoid in 2012).

Since 1976 there has been a National Park Ranger presence in the Core Zone (CALM 1991a). The Department of CALM, and now the DEC have had an increasing presence and support available to the management and research of the Core Zone and aspects of the Transition Zone and to some extent in the Zone of Cooperation since 1985 (CALM 1991b, Kern et al 2008, Hislop 2010, DEC 2012). 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 Sustainability, Environment, Water, Population and Communities (DSEWPC) and its various previous entities (Leighton and Watson 1992, Sanders 1996, 1997; Robinson and Coates 1995; Robinson 1997; Gilfillan et al 2008, Newell et al 2010), and the Friends of Fitzgerald River National Park (previously Fitzgerald River National Park

Association) (Chapman and Newbey 1995). 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/SCMG 2009, South Coast NRM 2011). Local Government Authorities have undertaken management planning for their reserve systems (Field 2001, Shire of Jerramungup 1994a, 1994b), and include their relationship and role with Biosphere in their strategic plans (Shire of Ravensthorpe 2010, Shire of Jerramungup 2012 in prep). 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). The WA Museum has conducted endemic invertebrate research (Framenau et al 2008). As well, many individuals involved in an extensive range of principally research activities (eg. George 2010, McQuoid and Hopper 2004, Hassell and Dodson 2002, Deegan 2005, 2006).

Mining and mineral exploration interests in the Ravensthorpe area of the Transition Zone have seen a very significant 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 Zone of Cooperation logistic support has been considerable with a focus on improving the sustainability of Agriculture (West 2001), soil conservation, resource condition appraisals (Dept 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. These themes have been brought together in the Guise of Natural Resource Management (NRM) through the excellent initiatives of South Coast NRM and its former SCRIPT (SCRIPT 1996, 2000, 2004, 2005; South Coast NRM 2011). It has also had some focus on social research (Buckley 2008) and been the subject of a comprehensive research bibliography (Deegan 2006). The two local Natural Resource Management 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, 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 Zone of Cooperation 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 Gondwana Link Project based its initial focus area in the Western Fitzgerald Biosphere Reserve due to its significant biological diversity (Hopper and Gioia 2004), and relatively intact natural lands (www.gondwanalink.org.au). The focus area comprises a matrix of Transition and Cooperation Zones with relatively large public conservation reserves, a significant matrix of privately owned reserves Bush Heritage Australia (Sanders 2008, www.bushheritage.org.au/gondwana_link).

(www.greeningaustralia.org.au/visionary-projects/gondwana-link), 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.

The marine seascape of Fitzgerald Biosphere Reserve at the time of this renomination comprises Western Australian State Waters. It is part of the Zone of Cooperation as it is a newly added component with many commercial and recreation activities undertaken. 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 two principal Local Authorities of Fitzgerald Biosphere, the Shire of Jerramungup and Ravensthorpe provide a range of logistic support from planning (Field 2001, Jerramungup Shire 1994a, 1994b, 2006, ranger services, tourism planning (Ravensthorpe Shire 2010b) and information support, and vital urban and building planning and management services.

Logistic support in the form of marine reserves planning has been extensive, and is moving towards finalising as an implemented reserves system in the next few years. The Australian Government DSEWPC are in the final stages of the designation of a marine reserve system for Commonwealth waters, which includes waters offshore from Fitzgerald Biosphere (DSEWPC 2012). In addition, The Western Australian government has a draft marine reserves strategic framework (DEC 2010, Wilson 1994) that includes recommendations for marine reserves off the Fitzgerald Biosphere coast.

The new Biosphere Implementation Group has been formed to bring together the focus of logistic support through its membership and partner organisations for the future of Fitzgerald Biosphere. Through the Fitzgerald Biosphere Action Plan, it will further develop logistical support to cover all areas of the MAB objective in implementing the plan. The focus will be on strengthening existing partnerships, bringing new partners and new resources to grow the opportunities. A key area of new focus will be the marine component in line with Australian and State Government marine reservation agendas.

Logistic support has been and is extensive in the Core, Transition and Cooperation Zones. Looking ahead, a review of logistic support would be useful to take account of the changes in society, reinvigoration of Fitzgerald Biosphere Reserve, and to refocus and more effectively consider the issues facing the future of the resource. This is being planned in part through the current Fitzgerald Biosphere Action Plan for predominantly the Transition Zone, and Zone of Cooperation (McQuoid 2012), with the Core Zone covered by its current management by DEC. 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 (McQuoid 2012).

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 Reserve would encompass a range of ecological systems and a gradation of human intervention over an area of around 1.3 million hectares (Watson and Sanders 1997). In terms of the major ecosystem categories currently recognised by the MAB Program, the proposed extended Fitzgerald Biosphere Reserve includes, in broad system terms: woodlands or scrub; river catchments, wetlands, estuaries, and 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 (Newell et al 2010).

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 regions. (Map 2).

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 vegetation and flora (McQuoid 2004a, Craig et al 2008, Newell et al 2010). This floristic diversity was the basis for Fitzgerald River National Park's listing as a Biosphere reserve in 1978 (CALM 1991).

The Marine component comprising Western Australian State waters sits in south west Bioregion (DOF 2011a), and within that the mesoscale ecosystem of WA South Coast based on IMCRA 4 Boundaries (Commonwealth of Australia 2006). Further offshore the South West Marine Region of the Commonwealth Waters lie (DEWSPC 2012), these ecosystems will be the subject of potential inclusion once the Australian Government Marine Reserves process is complete. 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).

It includes areas with varying degrees human intervention across a spectrum, from little to almost none in large parts of the Core and small parts of the Transition Zones and in some parts of the Marine Zone of Cooperation, to full intervention on modified lands (cleared and built on) in the private land aspects of the Zone of Cooperation (Map 1).

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.)

Fitzgerald Biosphere Reserve 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 (2002). It contains a large number of plant species including many endemic taxa (Chapman and Newbey 1995, 1995), Barrett 1996, McQuoid 2004, Gilfillan 2000. Gilfillan et al 2009, Newell et al 2010). Fitzgerald River National Park a its Core has one of the most intact vertebrate fauna assemblages of any conservation reserve in Southern Australia (CALM 1991) including a number of threatened species (Newell et al 2010). It protects an endemic skink (Chapman and Newbey 1995b), and a number of short-range endemic invertebrates (Barrett 1996, Framenau et al 2008).

The marine component (WA State waters) is critical for the conservation of biological diversity as it has a number of ecosystems and habitats (DEC 1997, 1998; Radford et al 2008). This includes calving grounds for southern right whales and migration routes for humpback whales.

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, McQuoid 2004, Hopper and Gioia 2004, Newbey and Hickman 2008).

An excellent outline of the biological diversity of Fitzgerald Biosphere reserve is provided by Newell et al 2010 in its section 2.3 **Biodiversity of the Fitzgerald Biosphere** 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)

Indigenous Noongar history in the area is significant (Hassell 1975, CALM 1991a, Tindale 1994, Guilfoyle 2009). However, these 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 Reserve and in towns nearby, where great interest in redressing the disconnection is held. The Fitzgerald Biosphere Reserve Action Plan (McQuoid 2012), through the BIG, which includes Noongar representation, provides a range of recommended actions to reconnect Noongar people and celebrate and interpret their remarkable culture.

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 Fitzgerald Biosphere Reserve as an incubator of approaches to sustainable development over the last three decades (FBG 2012, RAIN 2012, SCNRM 2011, Shire of Jerramungup in prep). 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, French and McQuoid 2008; Hopper and McQuoid 2009), management and development plans (CALM 1991a; DOE 2004; DOW 2006, 2008; Barrett et al 2009; Newell et al 2010; SCRIPT 2005; SCNRM 2011), reports (Bradby 1988, Guilfoyle 2009), interpretation material (McQuoid 2004a, MPG, Hillyer 2006), and books (Hassell 1975, Rijavec and Dennings 2009, Craig 2011, Miller-Hornsey 2011).

The demonstration of different approaches to sustainable development has occurred across the three Zones. This has principally been driven by the regional Natural resource management Strategy process (SCRIPT 2000, 2004, 2005; SCNRM 2011), through the community and in partnership with WA and Australian Governments, it 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 Environment and Conservation 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, Newell et al 2010).

Several community groups occupy key places in promoting sustainable development and management of the regions natural resources, These include the two local Fitzgerald Biosphere Reserve based natural resource management groups FBG and 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 to continue and expand their supportive roles. Specifically, they form the core of the BIG and in collaboration with other members through the Fitzgerald Biosphere Reserve Action Plan and through broader new partnerships will look to increase the promotion of sustainable development.

Agriculture in Fitzgerald Biosphere, through the FBG, RAIN, South Coast NRM and the Department of Agriculture and Food continues to explore and promote sustainable agricultural production (FBG, 2011, 2012, RAIN 2012, SCNRM 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 (RAIN 2012).

The Gondwana Link project active in western and northeastern Fitzgerald Biosphere Reserve, 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).

The remarkable landscape and seascape of 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 Reserve particularly well placed to promote the Man and Biosphere Objectives. This lining up 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. This renomination process, and the support of recent studies on the future of Fitzgerald Biosphere Reserve (Fry 2010, UNESCO 2003, McQuoid 2012) has also sparked a wider renewal of interest to realise community development opportunities via the MAB agenda.

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.)

Fitzgerald Biosphere reserve comprises 1.3 million hectares of terrestrial lands across a range of wild and altered landscapes, and State waters as its marine component. Fitzgerald Biosphere Reserve with its proposed extensions is of substantial size, serving with excellence the three functions of Biosphere Reserves. It features three very large zones of Core, Transition and Cooperation, which together with its biodiversity significance, constitutes a remarkable opportunity for conservation, development and research to richly occur.

The Core Zone of Fitzgerald River National Park is 330,000 ha (CALM 1991a); the Transition Zone comprises around 130,000 ha of natural bushlands (Newell et al 2010; terrestrial lands of its Zone of

Cooperation around 840 000 ha, and the marine component of the Zone of Cooperation **XX Ha (map 1)**.

The substantial size of the Core Zone is generally sufficient to meet long-term conservation objectives, and its relationship and layout with the adjoining Transition Zone assists to a significant degree (Watson and Sanders 1997, Wilkins et al 2006). However, threatening processes do exist that require deep consideration and careful management these include *Phytophthora* dieback, vertebrate predators, frequent fire, weed ingress, inappropriate recreational use, and a lack of ecological knowledge in some instances (Newell et al 2010). As well, despite their size, the natural lands of the Core and Transition Zones are subject to the inflow of drainage catchments from cleared lands of the Zone of Cooperation. 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 Core, Transition, and Cooperation 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 Fitzgerald Biosphere Action Plan and the implementation of its priorities (McQuoid 2012).

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**. The original 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 1991). Other lands were added in the subsequent years to 2010, taking the size of FRNP to 333,000 ha (Map 1). This Zoning of the Core follows the prescriptions in Section 4.0 of the FRNP Management Plan (CALM 1991), which formally recognises FRNP as the core of Fitzgerald Biosphere Reserve. This section of the FRNP Plan also includes prescriptions for the implementation of Fitzgerald Biosphere Reserve, including the support of the community and the role of the managing agency, then CALM, and now the Department of Environment and Conservation. The primary purpose of the Core Zone of FRNP is of National Park for the Conservation of Flora and Fauna, habitats and landforms, and for Public Recreation (CALM 1991). FRNP is further zoned (CALM 1991) into wilderness, conservation and recreation zones. The CALM 1991 Management plan details how FRNP will be managed with the primary objective of conservation by the Department of Conservation and Land Management (now Department of Environment and Conservation).

"(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 **Transition Zone** (The MAB's "Buffer") (Map 1) comprises all the public natural lands between the Core and the Boundary These are collectively a very large area covering around 1.3 million ha (Watson and Sanders 1997) and mostly linked to the Core Zone (Wilkins et al 2006). The notion of *Transition* is designed to relate to a transition of core conservation in FRNP radiating to increased human interaction with nature. The **Transition Zone** is a mixture of State conservation reserves, other State Crown reserves, unallocated Crown lands, and Local Government reserves, and includes some islands. (Map 1). The term *Transition* is preferred to **Buffer**, as it is believed it better describes this as a diverse mixture of large intact and fragmented natural areas **Zone**, where its 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 Core Zone. Notwithstanding, it is primarily managed as a collection of conservation areas by several Authorities.

"(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 **Zone of Cooperation** (MAB's Transition) is the remainder of lands, as the private, and cleared and built-on public lands outside the reserve and other natural public land system, and the State waters of the adjoining ocean and estuaries (Map 1). The terrestrial lands comprise **XX ha**, and the waters **XX ha**. The term *Zone of Cooperation* (or *Cooperation Zone*) is preferred for use in Fitzgerald Biosphere Reserve. This preference relates to the activities and enterprises of the human community being in **cooperation** with the *Transition* and *Core Zones* in line with MAB program objectives (UNESCO 1996, 2008).

The proposed **Zone of Cooperation** includes the entire marine component of Fitzgerald Biosphere Reserve, comprising Western Australian State Waters to three nautical miles offshore (Map 1). 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) are complete. The designation of **Cooperation 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 recommends a Bremer Marine Reserve (Commonwealth of Australia 2012) in Commonwealth waters offshore from Fitzgerald Biosphere Reserve. When finalised in 2013, the Biosphere Implementation Group, as part of its review process, will consider this new reserve for **Core or Transition Zoning**.

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 administrative group for Fitzgerald Biosphere Reserve is the Biosphere Implementation Group (BIG). This group comprises the State and Local public authorities, community groups, and Indigenous (Noongar) representatives involved in Fitzgerald Biosphere. It provides overarching representation, governance, administrative support and direction for Fitzgerald Biosphere reserve. Its membership is variously responsible for aspects of Fitzgerald Biosphere, including DEC as managers of the Core Zone and parts of the Transition Zone, The Shires of Jerramungup and Ravensthorpe as managers of much of the lands of the Transition Zone and as Local Government for the Cooperation Zone. The 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. Indigenous representation is by the Noongar people through the South West Aboriginal Land and Sea Council (SWALSC) WagyL Kaip Land Claim (SWALSC 2010).

Fitzgerald Biosphere Reserve has a long and strong history of community initiative and involvement, including collaboration with agencies and other groups (see also section 3.3) And 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 (Transition) 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 Research in the Fitzgerald Transition (UNESCO Buffer) Zone. These include plans: The FRNP Management Plan 1991 – 2001 (CALM 1991) as a Core Zone plan that relates to the Transition Zone, the DEC South Coast Region Plan (CALM 1991b), South Coast NRM Southern Prospects 2011 - 2016, the two Jerramungup Shire Council Coastal Reserve Management Plans (1994a, 1994b), the Shire of Jerramungup Community Strategic Plan 2012 - 2017 (Shire of Jerramungup in prep), The Shire of Ravensthorpe Coastal Management Plan (Field 2001) 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:

- DEC. 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 Dept. Staff presence from district office in Albany 200 km west
- 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. Support staff of 10.
- Shire of Ravensthorpe. Headquarters in Ravensthorpe, Depot in Hopetoun. On – ground Ranger staff of one.
- Community Tele-Centres. 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 Transition and Core Zones.

In addition, the Fitzgerald Biosphere Action Plan (McQuoid 2012) is designed to support the indirect management of activities in the Transition Zone. 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 CALM 1991 (see next section b).

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

The Fitzgerald Biosphere Action Plan (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 planning initiatives: the Fitzgerald River National Park Management Plan (CALM 1991a) and the 2010 UWA 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 Fitzgerald Biosphere Action Plan 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 Fitzgerald Biosphere Reserve. The Action Plan is to be implemented and reviewed through the BIG; the review process occurring every three years, with the next review due in November 2013, marking three years since the inaugural meeting of the BIG.

The South Coast NRM Southern Prospects (SCNRM 2011), details NRM priorities and targets for actions and activities to mitigate threats that include initiatives for Fitzgerald Biosphere as one of its subregions.

The Department of Environment and Conservation have completed the Fitzgerald Biosphere Recovery Plan: A landscape approach to threatened species and ecological communities for recovery and conservation (Newell et al 2012). This groundbreaking plan addresses all three 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)

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

The Department of Environment and Conservation are responsible for implementing and reviewing the Fitzgerald River National Park Management Plan (CALM 1991a) and the Fitzgerald Biosphere Recovery Plan (DEC 2012); the BIG is responsible for implementing and reviewing the Fitzgerald Biosphere Action Plan. 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) programmes for research, monitoring, education and training"?
(Describe briefly research/activities monitoring (ongoing or planned) as well education and training activities)

Fitzgerald Biosphere Reserve 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 for development.

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 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; Newell et al 2010; SCNRM 2011).

A focus on research, monitoring, education, and in particular for training is a high priority of the Fitzgerald Biosphere Action Plan (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 and culture of Fitzgerald Biosphere Reserve. The intention is to develop a strong research, monitoring, education and training culture and reputation for Fitzgerald Biosphere Reserve, and the MAB objectives provide a pathway for this.

Ongoing Research and Monitoring:

Biodiversity conservation for Core and Transition Zone Management (Chapman and Newbey 1995a, CALM 1991a), including threatened species and communities (Newell et al 2010). Includes monitoring of sites, ecosystems and species for recovery.

Monitoring sites were set up by Chapman and Newbey (Chapman and Newbey 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 Zone of Cooperation, and restorations 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 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 Chambers Ed. 2009. Some efforts were undertaken to develop some Fitzgerald Biosphere Brand products (Business Today 2004), although this was discontinued.

Planned Research and Monitoring

The Fitzgerald Biosphere Action Plan 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 a strong research reputation for Fitzgerald Biosphere Reserve.

Ongoing Education and Training

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 Ravensthorpe Hopetoun Promotions group has a long history of trails and interpretation (Williams and Copper 2011). DEC have an interpretation program for National Park visitors (CALM 1991a, DEC 2012) that is ongoing.

Planned Education and Training

Greatly increased education and training for the Fitzgerald Biosphere Reserve community and visitors is a priority for the Fitzgerald Biosphere Action Plan. 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 Reserve, 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 as books, brochures, electronic media, guides, smartphone apps, maps, guest talks etc. Training will 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 Reserve. 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):

Full name : _____

Title : _____

Date: _____

Full name : _____

Title : _____

Date: _____

5.2 Signed by the authority/authorities in charge of the management of the buffer zone(s):

Full name : _____

Title : _____

Date: _____

Full name : _____

Title : _____

Date: _____

5.3 Signed as appropriate by the National (or State or Provincial) administration responsible for the management of the core area(s) and the buffer zone:

Full name : _____

Title : _____

Date: _____

Full name : _____

Title : _____

Date: _____

Full name : _____

Title : _____

Date: _____

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

Full name : _____

Title : _____

Date: _____

Full name : _____

Title : _____

Date: _____

Full name : _____

Title : _____

Date: _____

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

Full name : _____

Title : _____

Date: _____

DRAFT

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)]

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.

Include Marine area of Western Australian State Waters

7. AREA (see Map 1): Provide:

Total: (ha)

- 7.1 Size of terrestrial Core Area(s): _____ ha;
If appropriate, size of marine Core Area(s); _____ ha.
- 7.2 Size of terrestrial Buffer Zone(s): _____ ha;
If appropriate, size of marine Buffer Zone(s); _____ ha.
- 7.3 Approx. size of terrestrial Transition Area(s) (if applicable): _____ ha;
If appropriate, approx. size of marine Transition Area(s); _____ 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 coexist 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 Western Australian South Coast Natural Resource Management Fitzgerald Biosphere sub region (SCNRM 2012), with some exceptions as small adjustments to follow The South West Aboriginal Land and Sea Council (SWALSC) Wajyl Kaip land claim (SWALSC 2010) eastern boundary, and the two central Local Government boundaries.
- 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. The lower Pallinup catchment affects the extreme southwest corner of the Biosphere Reserve, and a natural delineation clearly identifiable as the edge of Fitzgerald Biosphere Reserve. It is a very different ecosystem - not closely related to any other in Fitzgerald Biosphere Reserve and 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 Reserve.
- 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 catchment boundaries of the Gairdner, Fitzgerald, West and Phillips Rivers that extend short distances to the north outside the Shires of Jerramungup and

Ravensthorpe. This is in line with the catchments being the first order of inclusion and the significance of these catchments relating to the centre of the Biosphere Reserve.

- H. The eastern boundary is the vermin fence north of South Coast Highway and Fence Road south to Starvation Bay south of the Hwy. This line, while not quite inclusive of all of the Jerdacuttup River catchment (gets almost all of it), follows the eastern boundary of the South West Aboriginal Land and Sea Council (SWALSC) Wagyl Kaip claim boundary. Following this recognises the importance of Noongar culture and their claim processes, follows the MAB political and administrative boundaries, and if we were to go east of here it would trigger a whole new need for consultation with the Goldfields Land and Sea Council Aboriginal Claim processes, which is a bridge too far for such a small area. In addition, one of the four earlier iterations of the Biosphere Boundary and where the sign on the Highway stands had Fence Rd as the eastern boundary, and when travelling west from Esperance towards Ravensthorpe, the high point reached where Fence Rd crosses the Hwy is the first place the Barrens and Ravensthorpe Range can be seen from – a usefully visible natural divide.
- I. Includes the marine component of the State Waters (Map 1), which is out to 3 nautical miles from land including islands.

Zonation

- A. The 2012 Fitzgerald River National Park (FRNP) 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 1991). Other lands were added in the subsequent years to 2010, taking the size of FRNP to XXXXXX ha. This Zoning of the Core follows the prescriptions in the FRNP Management Plan (CALM 1991).
- B. A Transition Zone (The MAB's "Buffer") comprising all the public natural lands between the Core and the Boundary (Watson and Sanders 1997). The term *Transition* is preferred by the BIG as it is believed it better describes this as a diverse mixture of large intact and fragmented natural areas Zone, where its multiple purposes, tenures, coastal and inland situations, accessibility and remoteness see a mixture of increased recreational use and untouched nature conservation uses. This notion of *transition* relating to a transition of human interaction with nature.
- C. A Zone of Cooperation (MAB's Transition) as all the private, and cleared and built-on public lands remaining. As similar to the use of Transition Zone, the term *Cooperation Zone* (or *Zone of Cooperation*) is preferred for use in Fitzgerald Biosphere. This preference relates to the activities and enterprises of the human community being in cooperation with the *Transition* and *Core Zones*.
- D. The Marine component comprises Western Australian State waters; these are the waters of the Southern Ocean for three nautical miles offshore from land and exposed reefs. The whole of this marine component is a **Zone of Cooperation** for the time being, and will be

reconsidered by the Biosphere Implementation Group (BIG) once the Australian Government has finalised its Marine Reservation processes (Commonwealth of Australia 2012). It may also be altered to include Core and Transition Zones in the future in line with WA Government Marine Reservation processes, which in current draft include some of the State Waters off the Fitzgerald Biosphere Coast. These will be further considered as part of the recommended three-year review process of Fitzgerald Biosphere, and the results of this review process 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.]

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 Transition and Cooperation Zones of Fitzgerald Biosphere Reserve contain the towns of Bremer Bay, Hopetoun, Jerramungup and Ravensthorpe, 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)]

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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.]

11.2.1 Highest elevation above sea level:

11.2.2 Lowest elevation above sea level: _____ metres

11.2.3 For coastal/marine areas, maximum depth below mean sea level:
 ___N/A___ 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]

Outline only, use Narpalungup Nature data

12. BIOLOGICAL CHARACTERISTICS

[List main **habitat types** (e.g. tropical evergreen forest, savanna 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 habitat's or land cover type's representativeness. Circle LOCAL if the habitat is of limited

distribution within the proposed Biosphere Reserve to assess the habitat's 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 programme 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.).

Brief outline, and ref AP

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 programmes 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, computerized 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 programmes 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):

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 archipelagoes, mountains, or grassland systems, or a common topic of interest such as ecotourism, ethnobiology etc.]

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.]

16. USES AND ACTIVITIES

16.1 Core Area(s):

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]

Brief outline and refs, refer to AP

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)

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).]

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:

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):

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

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)]

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).

Map 1 shows land tenures, purposes, Local Authority boundaries
Brief outline, indicate more or less the typical model, mention marine situation

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.]

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)

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.)

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

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 No's for the purpose of National Park. Vested in the Conservation Commission of Western Australia.

17.5.2. Buffer Zone(s):

17.5.3. Transition area(s):

17.5.4. Foreseen changes in land tenure:

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

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.]

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]

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)

17.6.3 The designated authority or coordination mechanisms to implement this plan or policy (Name, structure and composition, its functioning to date)

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.)

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

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]

17.8. Authority(ies) in charge

17.8.1. The proposed biosphere reserve as a whole:

Name:

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): _____

Legal powers:

17.8.3. The buffer zone(s)

Name: _____

Legal powers (if appropriate):

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)

Fitzgerald Biosphere Action Plan, FRNP Management Plan, Southern Prospects 2011 - 2016,
Wilkins et al,

[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]

() **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 2 Fitzgerald Biosphere Location and Features

() **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 1 Fitzgerald Biosphere Reserve Boundary and Zones

() **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].

() **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].

() **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]

() **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.]

() **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].

- List of References page

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: Fitzgerald Biosphere Group _____

City with postal code: Jerramungup WA 6337 _____

Country: Australia _____

Telephone: 08 98 351 127 _____

Telefax (or telex): 08 98 351 329 _____

E-mail: anne@fbg.org.au _____

Web site: www.fbg.org.au

20.2. Administering entity of the core area:

Name: Department of Conservation and Environment, South Coast Region

Street or P.O. Box: 120 Albany Highway

City with postal code: Albany 6330

Country: Western Australia

Telephone: 619 08 9842 4500

Telefax (or telex): 619 08 9841 7105

E-mail: _____

Web site www.dec.wa.gov.au

20.3. Administering entity of the Transition (buffer) zone

Name: Shire of Jerramungup _____

Street or P.O. Box: Vasey Street _____

City with postal code: Jerramungup WA 6337 _____

Country: Australia _____

Telephone: 08 98 351 022 _____

Telefax (or telex): 08 98 351 161 _____

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

Web site:

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

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Annex to Biosphere Reserve Nomination Form, February 2004

MABnet Directory of Biosphere Reserves

Biosphere Reserve Description¹

Administrative details

Country:

Name of BR:

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

Administrative authorities: (17.8)

Name Contact: (20.1)

Contact address: (20.1)

Related links *(web sites):*

Description

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

Approximately 25 lines

Major ecosystem type: (13.1)

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

Location (latitude & longitude): (6)

Area (ha): (7)

Total: (7)

Core area(s): (7)

Buffer zone(s): (7)

Transition area(s) *(when given):* (7)

Different existing zonation: (7.4)

Altitudinal range (metres above sea level): (11.2)

Research and monitoring

Brief description: 15.1.3)

Approximately 5 lines

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

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 | | Modeling | ✓ |
| 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 | ✓ |
| Modeling | ✓ | | |
| 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 | ✓ | | |

References

- Barrett S, Comer S, McQuoid N, Porter M, Tiller C and Utber D. 2009. *Identification and conservation of fire sensitive ecosystems and species of the south coast natural resource management region*. Department of Environment and Conservation, Albany.
- Barrett, S. 1996. *A Biological Survey of Mountains in South Western Australia*. Department of Conservation and Land Management. Perth, WA
- Bradby K 1989. *A Park in Perspective: a report on the past, present and future of the Fitzgerald River National Park*. Fitzgerald River Park Association.
- Brooker, M.I.H. and Hopper, S.D. 1991. *A taxonomic revision of Eucalyptus wandoo, E. redunca, and allied species (Eucalyptus series Levispermae Maiden–Myrtaceae) in Western Australia*. Nuytsia 8: 1–189.
- Buckley A. 2007. *Beyond conceptual elegance: Local participation and the 'model' Fitzgerald Biosphere Reserve*. Curtin University, ALCOA Foundation Conservation and Sustainability Fellowship Program, Sustaining Gondwana. Working Paper Series ISSN: 1834-6278 Issue 4.
- Bush Heritage Australia. Undated. www.bushheritage.org.au/gondwana_link. Bush Heritage Australia, Melbourne Vic
- Business Today. 2004. *Lamb and Yabby Feasibility Study and Market Assessment Trial*. Fitzgerald Biosphere Marketing Association.
- CALM 1991a. *Fitzgerald River National Park Management Plan 1991-2001*. Management Plan No 15. Department of Conservation and Land Management. Perth WA
- CALM 1991b. *South Coast Region Plan*. Department of Conservation and Land Management. Perth
- Chambers J. Ed. 2009. *Ravensthorpe Profile*. Ravensthorpe Agricultural Initiative Network. Ravensthorpe WA
- Chapman A and KR Newbey (eds) 1987. *A biological survey of the Fitzgerald area, Western Australia. Final Report (June 1987) Part 2. Site description and rainfall data*. Fitzgerald River National Park Association Inc.
- Chapman A., and Newbey K.R. 1995a. *A biological survey of the Fitzgerald area, Western Australia*. CALMScience [Supplement 3]. Department of Conservation and Land Management, Perth.
- Chapman, A. & Newbey, K.R. 1995b. *A vertebrate fauna survey and some notes on the vegetation of the Ravensthorpe Range, Western Australia*. CALMScience 1: 465–508.
- Chuwen, B.M., Hoeksma, S.D., and Potter, I.C. 2009. *The Divergent Environmental Characteristics of Permanently Open, Seasonally Open and Normally Closed Estuaries of South – Western Australia*. Estuarine, Coastal and Shelf Science. Volume 85, Issue 1: 12-21

Coffey Environments & SCMG, 2009. *Southern Shores 2009-2030: a strategy to guide coastal zone planning and management in the South Coast Region of Western Australia*. Prepared by Coffey Environments, Albany, Western Australia.

Coleman, G., J. 1998. *South Coast Terrestrial and Marine Reserve Integration Study*. Department of Conservation and Land Management Marine Conservation Branch, Fremantle WA

Commonwealth of Australia. 2006. *A Guide to the Integrated Marine and Coastal Regionalisation of Australia Version 4.0*. Department of the Environment and Heritage, Canberra, Australia.

Commonwealth of Australia 2012. *Final Commonwealth Marine Reserves Proposal*. Director of national Parks, Department of Sustainability, Environment, Water, Population and Communities. Canberra

Copp I. 2001. *Geology and Landforms of the South West*. Department of Conservation and Land Management, Perth WA

Craig, G.F. Hickman, E.J. McQuoid N.K. Newell J., Rick A. and Sandiford E.M. 2008. *Vegetation of Ravensthorpe Range, Mt Short to Kundip*. Department of Environment and Conservation, South Coast Natural Resource Management, Albany

Craig, G.F., assisted by Bennett M., Chambers, W., Penglase. E.M., Taylor H., and Tink. E. 2011. *Native Plants of the Ravensthorpe Region. Second Edition*. Ravensthorpe Wildflower Show Inc. Ravensthorpe WA.

Craven L. 1999. *Melaleuca stramentosa* Austral.Syst.Bot. 12:906. CSIRO Canberra

Craven, L.A., Lepschi B.J., and Cowley K.J. 2010. *Melaleuca (Myrtaceae) of Western Australia: five new species, three new combinations, one new name and a new state record*. Nuytsia 20: 27-36. Department of Environment and Conservation, Perth

Deegan P. 2005. *Fitzgerald Biosphere Bibliography*. Fitzgerald Biosphere Group, Jerramungup.

Deegan P. 2006. *Fitzgerald Biosphere review: the state of knowledge of the Fitzgerald Biosphere*. Fitzgerald Biosphere Group, Jerramungup.

Department of Agriculture and Food WA (DAFWA), 2002. *Rapid Catchment Appraisal 234, North Jerramungup*. Department of Agriculture and Food Western Australia.

Department of Agriculture and Food WA (DAFWA), 2004. *Rapid Catchment Appraisal 273, Bremer - Gairdner* Department of Agriculture and Food Western Australia.

Department of Agriculture and Food WA (DAFWA), 2006a. *Rapid Catchment Appraisal, Ravensthorpe* Department of Agriculture and Food Western Australia.

Department of Agriculture and Food WA (DAFWA), 2006b. *Ravensthorpe Area Catchment Appraisal*. Resource Management Technical Report, Department of Agriculture and Food Western Australia. (Contributors include Angela Massenbauer, John Simons, Brendan Nicholas, Harvey Jones, Julianne Hill, Tilo Massenbauer).

Department of Environment (DOE) 2004. *Jerdacuttup River Action Plan*. Department of Environment, Water Resource Management Series, No WRM 43

Department of Environment and Conservation (DEC) 1997. *Biological Survey of the Major Benthic Habitats of the South Coast (Starvation Boat Harbour – Groper Bluff): 7-21 March 1997*. Department of Conservation and Land Management Marine Conservation Branch, Fremantle WA

Department of Environment and Conservation (DEC) 1998. *Biological Survey of the Major Benthic Habitats of the South Coast (Starvation Boat Harbour – Red Island): 7-21 March 1997*. Department of Conservation and Land Management Marine Conservation Branch, Fremantle WA

Department of Environment and Conservation (DEC) 2010. *Oceans of Opportunity: A Proposed Strategic Framework for the Marine Waters of Western Australia's South Coast*. Report to the WA Minister for the Environment. Department of Environment and Conservation Fremantle WA

Department of Environment and Conservation, (DEC) 2012. *Fitzgerald River National Park Improvement Project Update May 2012*. Western Australian Department of Environment and Conservation, Albany.

Department of Fisheries (DOF). 2005. *South Coast Estuarine Fishery Management Plan 2005*. Fish Resources Management Act 1994. Doc. No. 22-01.

Department of Fisheries, (DOF) 2011a. *State of the Fisheries and Aquatic Resources Report 2010/11*. Fletcher, W.J. and Santoro, K. (eds). Department of Fisheries, Western Australia

Department of Fisheries (DOF) 2011b. *Resource Assessment Framework for Finfish Resources in Western Australia*. Fisheries Occasional Publication. No. 85.

Department of Regional Development and Lands (DRDL) 2011. *Connecting to our Growing Community Brochure*. Community Resource Network. Department of Regional Development and Lands, Perth WA

Department of Water (DOW) 2006 *Wellstead Estuary Management Plan*. Fitzgerald Biosphere Group, Department of Water, Albany

Department of Water (DOW) 2008 *Culham Inlet Management Plan*. Ravensthorpe Agricultural Initiative Network (RAIN), Department of Water, Albany

Environmental Protection Act 1986. Government of Western Australia

Environmental Protection Authority 2008a. *Environmental Offsets – Biodiversity. Guidance Statement No. 9*, EPA. Perth WA

(EPA) Environmental Protection Authority, 2008b. *Environmental Guidance for Planning and Development. Guidance Statement No. 33*. Perth, Western Australia.

(EPA) Environmental Protection Authority, 2004a. *Terrestrial Flora and Vegetation Surveys For Environmental Impact assessment in Western Australia. Guidance Statement No. 51*. Perth, Western Australia.

(EPA) Environmental Protection Authority, 2004b. *Environmental Guidance for Terrestrial fauna Survey in Western Australia. Guidance Statement No 56* Perth, Western Australia.

Field, C. (2001) *Ravensthorpe District Coastal Management Plan*. A plan to guide the coastal and marine management within the Ravensthorpe region

Fitzgerald Biosphere Group (FBG) 2011. *2011 Annual Report*. Fitzgerald Biosphere Group Jerramungup WA

Fitzgerald Biosphere Group (FBG) 2012. *30 Years of Landcare*. Fitzgerald Biosphere Group Jerramungup WA

Fletcher, W.J., Chesson, J., Fisher, M., Sainsbury, K.J., Hundloe, T., Smith, A.D.M. and Whitworth, B. 2002. *National ESD reporting framework for Australian fisheries: The "how to" guide for wild capture fisheries*. Fisheries Research and Development Corporation (FRDC) project 2000/145, ESD Reporting and Assessment Subprogram, Fisheries Research and Development Corporation, Canberra.

Fletcher, W.J., Shaw, J., Metcalf, S.J., & Gaughan, D.J. 2010. *An Ecosystem Based Fisheries Management framework: the efficient, regional-level planning tool for management agencies*. Marine Policy 34 (2010) 1226–1238

Framenau, V.M., Moir, M.L., and Harvey, M.S.. 2008. *Terrestrial Invertebrates of the South Coast NRM Region of Western Australia: Short-range Endemics in Gondwanan Relictual Habitats*. Western Australian Museum, Perth, WA

Fry J. (2010) *Assessment of the Current Situation Report, CENRM Report No 115*. University of Western Australia Centre of Excellence in Natural Resource Management, Albany WA

Galaxy Resources 2011. *Annual Report 2011*. Galaxy Resources, West Perth, WA

George, A.S. 2010. *Calothamnus roseus (Myrtaceae): precursor paper to Flora of Australia*. Nuytsia 20: 183– 200

Gilfillan, S. 2000. *Terrestrial Fauna of the South Coast – A Review*. South Coast management Group, Albany

Gilfillan, S., Mitchell, P., Newell J., Danks A., and Comer S. 2009. *South Coast Threatened Species and Ecological Communities Strategic Management Plan*. Department of Environment and Conservation, Albany

Gondwana Link. Undated. www.gondwanalink.org.au. Gondwana Link, Albany, WA

Greening Australia. Undated. www.greeningaustralia.org.au/visionary-projects/gondwana-link. Greening Australia, Perth WA

Guilfloye D. 2009. *Report of an Archaeological Heritage Assessment along Hamersley Road, Fitzgerald River National Park, Western Australia*. Report to Brad Goode and Associates and Main Roads Western Australia. Applied Archaeology Australia

Harris, R. J., Majer, J.D., Williams, C., Buckley A. & Stehlik D. 2008. *Ravensthorpe Range and Overshot Hill – an overview of biodiversity values, threats and conservation*. Sustaining Gondwana Working Paper Series, issue 12.

Hassell, E.1975. *My Dusky Friends: Aboriginal life customs and legends, and glimpses of station life at Jarramungup in the 1880's*. Hassell C.W. Ed. CW Hassell, Perth

- Hassell C.W., and Dodson J.R. 2002. *The Fire History of South west Australia Prior to European Settlement in 1826 – 1829*. In I. Abbott and N. Burrows (Eds). *Fire in ecosystems of south west Australia : impacts and management*. Department of Conservation and Land Management. Leiden: Blackhys Publishing pp. 71 - 85, The Netherlands
- Hillyer V. 2006. *Map of Fitzgerald Biosphere Region Including the Fitzgerald River National Park*. Friends of Fitzgerald River National Park, Ravensthorpe WA
- Hislop, M. 2010. *A new locally endemic species of Acrotriche (Ericaceae: Styphelioideae: Styphelieae) from the Ravensthorpe area*. Nuytsia 20: 19-25. Department of Environment and Conservation, Perth WA
- Hodgkin, E.P. and Clark, R. (1990). *Estuaries of the Shire of Ravensthorpe and the Fitzgerald River National Park. Estuarine Studies Series No. 7*. Environmental Protection Authority, WA.
- Hopper, S.D. & Gioia, P. 2004. *The southwest Australian floristic region: evolution and conservation of a global hot spot of biodiversity*. Annual Review of Ecology, Evolution and Systematics 35: 623–650.
- Hopper, S.D. & McQuoid, N.K. (2009). *Two new rare species and a new hybrid in Eucalyptus series Tetrapterae (Myrtaceae) from southern coastal Western Australia*. Australian Systematic Botany 22: 180-192.
- Jerramungup Shire Coastal Reserves Committee (JSCRC). 1994. *Doubtful Islands Area Coastal Plan. Stage 1, Management of the Coastal Zone – Jerramungup Shire*. Department of Planning and Urban Development Perth, and Shire of Jerramungup, Jerramungup WA
- Jerramungup Shire Coastal Reserves Committee (JSCRC). 1994. *Beaufort Inlet to Wellstead Estuary Coastal Plan. Stage 2, Management of the Coastal Zone – Jerramungup Shire*. Department of Planning and Urban Development Perth, and Shire of Jerramungup, Jerramungup WA
- Jerramungup Shire. 2007. *Town Planning Scheme No 2*. Shire of Jerramungup WA
- Jerramungup Shire. 2009. *Shire of Jerramungup Strategic Plan*. Shire of Jerramungup, Jerramungup WA
- Jerramungup Shire. (in prep). *Shire of Jerramungup Community Strategic Plan 2012 -*. Shire of Jerramungup, Jerramungup WA
- Jonson, J. 2010. *Ecological Restoration of Cleared Agricultural Land in Gondwana Link: Lifting the Bar at Peniup*. Ecological Management and Restoration. Volume 11, Issue 1, pp 16-26.
- Kern, S., Jasper, R. and True D. 2008. *Floristic survey of the Ravensthorpe Range 2007*. Unpublished report for Department of Environment and Conservation, Western Botanical: Bassendean WA.
- Leighton, S., and Watson, J. 1992. *A Preliminary Biological Survey of Four River Foreshore Reserves along the South Coast of Western Australia. 'Save the Bush' South Coast River Corridor Project*. Department of Conservation and Land Management South Coast region, Albany WA
- Lepschi B. 2010. *Melaleuca sophisma*. Nuytsia 20:32-33 (2010)
- Malleefowl Preservation Group (MPG). Undated. Group Profile. Malleefowl Preservation Group Inc. Ongerup WA

- McMahon 2011. *Bremer Bay and Point Henry Drive Trail (Banjelungup Drive Trail)*. Bremer Bay Trails Committee.
- McQuoid, N. K. and Hopper S.D. 2002. *Eucalyptus calyerup (Myrtaceae), a new species of possible hybrid origin from the south –western Australia*. Nuytsia 15 (1) : 63-68. Department of Conservation and Land Management. Perth WA
- McQuoid N.K. 2004a. *Reasons for Richness, the Nature of the Flora of Fitzgerald Biosphere*. SCRIPT Albany, Natural Heritage Trust, Canberra.
- McQuoid N.K. 2004b. *The Natural Patterns and Ecozones of the WA South Coast natural Resource Management Region*. Southern Prospects 2004 – 2009. Background Paper 9. South Coast regional Initiative Planning Team, Albany
- McQuoid N. 2012. *Action Plan for Fitzgerald Biosphere Reserve*. Australian National Commission for UNESCO, Fitzgerald Biosphere Group, Jerramungup WA
- Miller-Hornsey B. 2011. *A Bremer Bay Ramble, Wildflowers of Bremer Bay*. Fitzgerald Biosphere Group, Jerramungup.
- Myers, JS & Hocking, R. 1998. *Geological map of Western Australia 1:250 000, 13th edition*, Geological Survey of Western Australia, Perth.
- Myers, N., Mittermieir, R.A., Mittermieir, C.G. da Fonesca G.A.B., and Kent J. 2000. *Biodiversity Hotspots for Conservation Priorities*. Nature 404: 803 – 808
- Newell J, Comer S, and Utber D. 2010. *Fitzgerald Biosphere Recovery Plan: A Landscape Approach to Threatened Species and Ecological Communities Recovery and Biodiversity Conservation*. Department of Environment and Conservation, Albany.
- Nicolle, D., French, M.E., and McQuoid N. 2008. *A revision of Eucalyptus ser. Cornutae subser. Conjunctae (Myrtaceae) from the south coast of Western Australia, including the description of four new taxa and comments on the hybrid origin of E. bennettiae*. Nuytsia 18: 197-222.
- Olde, P.M., and Marriott, N.R., 2009. *Grevillea tetragonoloba (Proteaceae: Grevilleoideae) recircumscribed, with notes on its typification and a new segregate species, Grevillea nivea, described*. Nuytsia 19: (2): 229–243
- Radford, B., van Neil, K., and Holmes K. 2008. *WA Marine Futures: Benthic Modelling and Mapping Final Report*. University of Western Australia, Perth WA
- Ravensthorpe Agricultural Initiative Network (RAIN) 2012. *Projects History Document*. RAIN Ravensthorpe
- Ravensthorpe Shire 2010a. *2010- 2025 Strategic Plan*. Shire of Ravensthorpe. Ravensthorpe WA
- Ravensthorpe Shire 2010b. *Shire of Ravensthorpe Tourism Strategy*. Evolve Solutions. Shire of Ravensthorpe
- Rijavec F., and Dennings S. 2009. *Malleefowl Believers: Stories of the Malleefowl and its Champions*. Malleefowl Preservation Group, Ongerup WA

- Robinson, C. J., and Coates, D. J. 1995. *Declared Rare and Poorly Known Flora in the Albany District, Western Australian Wildlife Management Program No. 20*. Department of Conservation and Land management, Perth, WA
- Robinson C.J. 1997. *Integrated Vegetation Management Plan for the Fitzgerald Biosphere Reserve Zone of Cooperation*. Department of Conservation and Land Management, Albany. Environment Australia, Canberra
- Sanders A. 1996. *Conservation value of Fitzgerald Biosphere Reserve buffer/transition zone, phases I-IV*. Unpublished report to Environment Australia, Canberra.
- Sanders, A. 1997. *Monitoring in the Fitzgerald Biosphere Reserve*. Department of Conservation and Land Management, Albany in conjunction with Environment Australia, Canberra, ACT.
- Sanders, A. 2008. *Living with the Land: Guidelines for the Fitz-Stirling*. Compiled by A. Sanders for Greening Australia and Bush Heritage Australia
- SCRIPT. 1996. *Draft South Coast Regional Land and Water Care Strategy. The Fitzgerald Biosphere*. Regional Assessment Panel, South Coast Regional Initiative Planning Team, Albany WA
- SCRIPT. 2000. *DRAFT Southern Prospects Regional Strategy – A Regional Strategy To Guide Sustainable Use of Natural Resources, Protect Conservation Values, and Develop Vibrant Rural Communities on the South Coast of Western Australia 200-2005*. South Coast Regional Initiative Planning Team, Albany, WA
- SCRIPT 2004. *Southern Prospects 2004 – 2009*. Draft for Public Comment, South Coast regional Initiative Planning Team, Albany, WA
- SCRIPT 2005. *The First NRM Investment Plan for the South Coast region of WA for the period 2005/06 to 2007/08*. South Coast regional Initiative Planning Team, Albany, WA
- South Coast NRM. 2011. *Southern Prospects 2011 – 2016. The South Coast Regional Strategy for Natural Resource Management*. South Coast NRM, Albany
- South Coast NRM 2011b. *Media Release: Securing the Iconic Fitz*. South Coast NRM Albany, WA
- South West Aboriginal Land and Sea Council (SWALSC) 2010. *South West Aboriginal Land and Sea Council Annual Report*. South West Aboriginal Land and Sea Council, Cannington, WA.
- Switzer C. 1988. *The Fitzgerald River National Park International Biosphere Reserve Project: Case study of a locally based policymaking initiative in environmental management*. Honours Thesis, School of Environmental and Life Sciences, Murdoch University, WA
- Thackway, R and Cresswell, I. 1995. *An Interim Biogeographic Regionalisation for Australia: a framework for setting priorities in the National Reserves System*. Cooperative Program Version 4, Australian Nature Conservation Agency, Canberra
- Thomas, A 1989. *Trembling horizon: the story of an important place-the Fitzgerald Biosphere Project area*. The Fitzgerald Biosphere Project, Jerramungup W.A
- Tindale, N.B. 1994. *Aboriginal tribes of Australia, their terrain, environmental controls, distribution, limits, and proper names*. With four sheet map. Berkely and Canberra; University of California Press

Toelken, H.R. & Craig, G.F. 2007. *Kunzea acicularis*, *K. strigosa* and *K. similis* subsp. *mediterranea* (Myrtaceae) – new taxa from near Ravensthorpe, Western Australia. *Nuytsia* 17: 385–396

UNESCO 1996. *Biosphere reserves: The Seville Strategy and Statutory Framework of the World Network*. UNESCO Man and Biosphere Program, Paris France

UNESCO 2001. *Seville + 5, International meeting of Experts Proceedings*. Pamplona Spain, October 2000. MAB Report series No. 69. UNESCO Paris

UNESCO 2003. *Man and the Biosphere (MAB) Programme Meeting of the Bureau of the International Coordinating Council* UNESCO Headquarters, Paris, Room XVI (Bonvin Building) 8-11 July 2003 Final Report

UNESCO 2004. MAB Biosphere Directory. www.unesco.org/mabdb/br/brdir/directory/biores.asp

UNESCO 2008. *Madrid Action Plan 2008*. UNESCO Man and Biosphere Program, Paris France

Water and Rivers Commission 2001, *Bremer River Foreshore Condition*, Water and Rivers Commission, Water Resource Management Series, No WRM 25

Watson, J. & Sanders, A. (1997). *Fitzgerald River National Park Biosphere Reserve 1978–1997: the evolution of integrated protected area management*. *Parks* 7(1): 9–19

Watson, J, Lullfitz, W, Sanders, A & McQuoid, N 1996. *Networks and the Fitzgerald River National Park Biosphere Reserve, Western Australia*, in D Saunders, J Craig & E Mattiske (eds), *The Role of Networks*, Surrey Beatty and Sons, NSW

Wege, J.A. and Thiele, K.R. 2009. *Two new species of Hibbertia (Dilleniaceae) from near Ravensthorpe in Western Australia*. *Nuytsia* 19(2): 303-310. WA Herbarium, Department of Conservation and Environment, Perth WA

West, G. 2001. *'Biosphere Reserves for developing quality economies: the Fitzgerald River Biosphere Reserve, Australia'*. Seville + 5, Report Series No. 69. UNESCO Paris

Wilkins, P., Gilfillan, S., Watson, J., and Sanders, A. (ed). 2006. *The Western Australian South Coast Macro Corridor Network – a bioregional strategy for nature conservation*. Department of Conservation and Land Management (CALM) and South Coast regional Initiative Planning Team (SCRIPT), Albany, Western Australia.

Williams A., and Cooper R. Eds (2011) *Wilderness Within Reach, Ravensthorpe and Hopetoun visitor map and information guide*. Fitzgerald Coast Tourism Association Ravensthorpe WA.

Wilson B. 1994. *A Representative Marine Reserves System for Western Australia*. Report of Marine Parks and Reserves Selection Working Group. Department of Conservation and Land Management. Perth WA

Witt W.K. 1997. *Geology of the Ravensthorpe and Cocanarup 1: 100 000 sheets*. Geological survey of WA, Dept Minerals and Energy.