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ConPro

Gondwana Link - Augusta-Margaret River Landscape (ID: 1796)

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Basic

Project Information

Contact Name: Drew McKenzie
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Contact Organization: Cape to Cape Catchments Group
Project Start Date: August 15, 2010
Data Effective Date: January 31, 2013
Hectares:237,000
Sharing Status:

Ecoregion(s):

- Jarrah-Karri Forest And Shrublands

Operational Unit(s):

- Australia
- Non-TNC

Country(ies):

- Australia

Associated Initiative(s): None

Project Description:
Following scoping meetings in early 2010 between representatives from Gondwana Link and the Cape to Cape Catchments Group and others, three workshops in Margaret River in August 2010, October 2010 & February 2011 saw the bulk of this Conservation Action Plan developed. During the latter part of 2011, the Conservation Action Plan was develop further, and a strategic planning meeting took place in November 2011. A summary booklet was developed during 2011 and published in early 2012.
This Conservation Action Plan was developed by the Cape to Cape Catchments Group in conjunction with Gondwana Link Ltd, and was facilitated by Barry Heydenrych, who was seconded to Gondwana Link from Greening Australia for this work. It benefited significantly from the contributions of a number of people including: Don Bradshaw (University of Western Australia); Grant Wardell-Johnson (Curtin University); Cherie Kemp, Andrew Webb & Kim Williams (Department of Environment & Conservation); John McKinney, Merryn Delaney & Jared Drummond (Shire of Augusta-Margaret River), Shaun Molloy (Edith Cowan University), Margaret Moir & Drew McKenzie (Cape to Cape Catchments Group); Jen Stevens (community representative & linked to Cape to Cape Catchments Group); Keith Bradby (Gondwana Link), Paula Deegan (contractor for Gondwana Link), Yasaman Mohammadi & Peter Wren (Lower Blackwood LCDC).
The Cape to Cape Catchments Group is very grateful for funds provided for the plan development and booklet production from The Nature Conservancy, Diversicon Environmental Foundation, The Thomas Foundation and Bigididge Pty. Ltd.

Site/Scope Description:
Gondwana Link is an ambitious ecological vision that aims to link areas of bush from the wet forests of the far south west (near Margaret River) to the mallee and woodland to the east (near Kalgoorlie).
This plan focuses on the landscape that straddles the coastal vegetation of the Leeuwin-Naturaliste National Park to the forested areas of the Darling Scarp to the east and beyond (Walpole Wilderness area) representing an important part of the Gondwana Link pathway.
The Shire of Augusta-Margaret River is situated at the south-western tip of Australia. The Indian and Southern oceans bound the Shire to the west and south, and state forest occurs along the eastern perimeter. The Shire covers 237,000 ha and retains over 60% native vegetation cover including 82,246 ha of state forest and 18,815 ha in national parks. The Shire contains a significant extent of the Leeuwin-Naturaliste National Park situated along the Leeuwin-Naturaliste Ridge.
The Shire of Augusta-Margaret River contains threatened and priority ecological communities threatened vegetation types and habitat for a broad range of significant species including 69 declared rare or priority flora species and 43 threatened fauna species. A number of endangered species are endemic to the Shire, such as the Margaret River hairy marron and burrowing crayfish, white-bellied frog and Leeuwin snail. Biodiversity in this area is threatened by numerous processes, particularly clearing and fragmentation of natural vegetation and altered fire regimes. Despite significant efforts, environmental weeds impact large areas of native vegetation and threaten biodiversity values in all but the best bushland. Introduced feral animals threaten biodiversity and on-going efforts are required, particularly with respect to aquatic feral species. Significant threats are emerging in the realms of plant disease (phytophthora dieback and a range of tree declines). Climate change also presents challenges for local biodiversity with drying and warming trends, an increased fire risk and the prospect of new feral animals and weed threats. As one of the fastest growing regions in Australia, the Augusta-Margaret River Shire is under enormous pressure from population increases and associated urban expansion, tourist development, agriculture including viticulture, intensive horticulture, grazing, and plantation forestry. Proactive and comprehensive conservation activity is required to prevent the irreversible loss of biodiversity, the area's unique natural heritage, and significant degradation of environmental integrity and health — a permanent legacy for future generations.

Project Goal Comment:
"Achieve, sustain, enhance and connect a healthy, resilient and diverse landscape from forest to coast."

Team Info:
Full Team Compliment:
Jen Stevens; Cape to Cape Catchments Group; Stakeholder, Team Member

Shaun Molloy; Edith Cowan University; Project Advisor, Team Member
Paula Deegan; Gondwana Link; Project Advisor, Team Member
Keith Bradby; Gondwana Link Ltd.; Stakeholder, Project Advisor, Team Member
Amanda Keesing; Gondwana Link; Project Advisor, Team Member
Margaret Moir; Cape to Cape Catchments Group; Stakeholder, Team Member
Drew McKenzie; Cape to Cape Catchments Group; Team Contact, Leader/Manager, Team Member
Grant Wardell-Johnson; Curtin University; Project Advisor, Team Member
Don Bradshaw; University of Western Australia; Project Advisor, Team Member
Andrew Webb; Department of Environment and Conservation; Project Advisor, Team Member
Cherie Kemp; Land for Wildlife; Project Advisor, Team Member
John McKinney; Augusta-Margaret River Shire; Stakeholder, Team Member
Kim Williams; Department of Environment and Conservation; Project Advisor, Team Member
Yasaman Mohammadi; Lower Blackwood LCDC; Team Member
Peter Wren; Lower Blackwood LCDC; Team Member
Barry Heydenrych; Greening Australia/Gondwana Link; Process Facilitator, Team Member

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Action Plan:

- 1.0 SCOTT COASTAL PLAIN : 1) BROAD GOAL: TO FILL IN INFORMATION GAPS ON ECOLOGICAL PROCESSES AFFECTING BIODIVERSITY ON THE SCOTT COASTAL PLAIN BY 2012, TO DRIVE CURRENT ACTIONS AND FUTURE CONSERVATION ACTIONS BY 2015. : (Target = 1) Scott Coastal Plain)

- 1.1 Scott Coastal Plain : Undertake a literature review in early 2013, for consultation and finalisation of a short statement on the ecological implications of water abstraction on biodiversity of the Scott Coastal Plain by late 2013

- 1.2 Scott Coastal Plain : By mid 2013 initiate dialogue with appropriate stakeholders to investigate the possible incorporation of these criteria by the plantation industry for production of a feasibility statement by late 2013

- 1.3 Scott Coastal Plain : As part of the Scott River Action Plan underway in 2013 develop a Phytophthora dieback (and other pathogen) scoping document by mid-2013, establish a funding source by late 2013, commission a study in early 2014 with a report finalisation date of mid 2014.

- 1.4 Scott Coastal Plain & Black Gloved Wallaby : Undertaken consultation and literature search by mid 2013, with a statement of effectiveness of different controls and recommendations by late 2013.

- 1.5 Scott Coastal Plain : As part of future Commonwealth Government funding programs, develop an application by early 2013 for implementation of a fencing incentive project by late 2013/early 2014.

- 1.6 Scott Coastal Plain : As part of the Scott River Action Plan, identify practical methods by which planning decisions by the WA Planning Commission and Local Government can improve ecological outcomes in a succinct document by late 2013.

- 1.7 Scott Coastal Plain : Incorporate the review of the Scott River Water Quality Improvement Plan (Department of Water) and identify links to NRM groups as part of the Scott River Action Plan with key steps identified and resourced by mid 2013, and the review undertaken by late 2013.

- 1.8 Scott Coastal Plain : Develop funding application for Scott River Action Plan by early 2013, for initiation during mid 2013 and implementation by 2014 and beyond.

- 1.9 Scott Coastal Plain & Jarrah-marri Systems : Continue with ongoing weed actions in known priority areas during 2013 and beyond

- 2.0 LEEUWIN NATURALISTE RIDGE : 2) BROAD GOAL: INCREASE KNOWLEDGE OF THE KEY BIODIVERSITY DRIVERS SUCH AS WATER & FIRE (AND RELATED WEEDS) OF THE LEEUWIN NATURALIST RIDGE BY 2013 AND IMPLEMENT INTERVENTIONS FOR INCREASING THE VIABILITY OF THIS TARGET BY 2015. : (Target = 2) Leeuwin Naturaliste Ridge)

- 2.1 Leeuwin Naturaliste Ridge : Initiate discussions with Department of Water and other stakeholders on water allocation for coastal aquifers by mid 2013, aquire funding and appoint consultant by late 2013 to develop a strategy with management recommendations by late 2014.

- 2.2 Leeuwin Naturaliste Ridge : Develop a brief for this biodiversity communications strategy by mid 2013, funding by late 2013 with implementation of key aspects of the strategy underway by mid 2014.

- 2.3 Leeuwin Naturaliste Ridge : Initiate dialogue in early 2013 with a view to establishing a regular liaison opportunity (e.g. sitting on appropriate respective committees) between Cape to Cape Catchment Group and DEC to help for the purposed of improving integrate of strategies by late 2013.

- 2.4 Leeuwin Naturaliste Ridge : In consultation with appropriate stakeholders, aquire funding by late 2013, develop an initial feral control plan for the Leeuwin Naturaliste Ridge by early 2014, for implementation in late 2014 and beyond.

- 2.5 Leeuwin Naturaliste Ridge : By mid 2013, initiate a comprehensive mapping excercise for arum lily, seek and aquire funds in late 2013 for implementation of a strategic control and monitoring program by early 2014.

- 2.6 Leeuwin Naturaliste Ridge : By early 2013, identify though consultation, an outline plan targetting isolated weeds patches for implementation of actions by mid 2013 and beyond

- 2.7 Leeuwin Naturaliste Ridge : Integrate a Phytophthora dieback program for the Leeuwin Naturaliste Ridge with a Shire-wide strategy as follows: By late 2013 consult with key stakeholders involved with Phytophthora dieback to develop a funding application by early 2014, to develop a comprehensive plan for completion by mid 2014 for implementation by late 2014 and beyond.

- 3.0 WETLAND SYSTEMS : 3) BROAD GOAL: TO COLLATE INFORMATION (RESEARCH, LEGISLATION ETC.) ON WATER USE, FIRE, WEEDS ETC. FOR WETLANDS BY 2012. TO IMPLEMENT LANDSCAPE-WIDE INTERVENTIONS TO REVERSE THE TREND OF DEGRADING WETLANDS BY 2015. : (Target = 3) Wetland systems)

- 3.1 Wetland systems : As part of a bigger fire and biodiversity plan, ensure that knowledge about wetlands being protected from fire is disseminated to key stakeholders by mid 2013, to ensure no fires in wetlands in the 2013/14 fire season and beyond.

- 3.2 Wetland systems & Waterways : Appropriate person to carry out dam legislation identified by mid 2013, funding acquired by late 2013, for report to be commissioned and completed by mid 2014.

- 3.3 Wetland systems & Waterways : Ensure that options for "off-line" dams are identified during 2013 and that this aspect is included in the "dam legislation" strategy due for completion by mid 2014.

- 3.4 Wetland systems : Initiate discussions with Department of Water, DEC and other stakeholders on on ecological implication of water abstraction on wetland biodiversity by mid 2013, aquire funding and appoint consultant by late 2013 to develop a strategy with management recommendations by late 2014.

- 3.5 Wetland systems : Continue to include wetlands as part of fencing incentive projects in 2013, and by late 2013 developed a new project application for strategic fencing for acquiring of funds and implementation in 2014 and beyond.

- 3.6 Wetland systems : As part of the broader communication strategy and in established forums, ensure that messages of the importance of wetlands are communicated during 2013 and beyond.

- 3.7 Wetland systems : During 2013 and beyond, integrate projects involving grassy weeds in wetlands with DEC projects.

- 4.0 WATERWAYS : 4) BROAD GOAL: TO INCREASE THE STREAM FORESHORE CONDITION OF KEY RIVERS (>50% OF THEIR LENGTH IN A OR B GRADE) BY 2020, ENSURE NO NEW INTRODUCTIONS OF FERAL FISH OR CRUSTACEANS, AND DEVELOP STRATEGIES FOR REDUCING POINT SOURCE POLLUTANTS BY 2015. : (Target = 4) Waterways)

- 4.1 Waterways : Initiate discussions with Department of Water, DEC and other stakeholders on on ecological implication of water abstraction on waterway biodiversity by mid 2013, aquire funding and appoint consultant by late 2013 to develop a strategy with management recommendations by late 2014.

- 4.2 Waterways : By mid 2013 develop initial project brief for feral fish and crustaceans strategy for acquisition of funding by late 2013, finalisation of a report by early 2014 for implementation by mid 2014.

- 4.3 Waterways : Ensure ongoing integration of Cape to Cape's works with the work of the hairy marron recovery team in 2013 and beyond.

- 4.4 Waterways : Continue to include waterways as part of fencing incentive projects in 2013, and by late 2013 developed a new project application for strategic fencing (and provision of alternative stock watering points) for acquiring of funds and implementation in 2014 and beyond.

- 4.5 Waterways : Develop funding application for Scott River Action Plan by early 2013, for initiation during mid 2013 and implementation by 2014 and beyond.

- 4.6 Waterways : Initiate discussions with Department of Water, Local Government and Planning Commission and other stakeholders on water allocation for coastal aquifers by mid 2013, aquire funding and appoint consultant by late 2013 to develop a strategy with management recommendations by late 2014.

- 5.0 JARRAH-MARRI SYSTEMS : 5) BROAD GOAL: IDENTIFY KEY INTERVENTIONS (E.G. FIRE, WEED, FERAL ANIMAL, DISEASE & CONNECTIVITY PLANS) BY 2012 AND IMPLEMENT KEY ACTIONS TO IMPROVE THE CONSERVATION STATUS OF JARRAH-MARRI SYSTEMS BY 2015 : (Target = 5) Jarrah-marri Systems)

- 5.1 Jarrah-marri Systems : By late 2013 liaise with representatives from the Shire of Busselton and DEC with regards feral birds, scope options, acquire funding and develop and implement strategy that includes resource material by early 2014.

- 5.2 Jarrah-marri Systems : Terms of reference (& training needs) for cross-tenure terrestrial feral animal control program developed by mid 2013, designed and funding acquired by late 2013/early 2014 with implementation by mid 2014.

- 5.3 Jarrah-marri Systems : Maintain communication with WA Centre for Excellence during 2013 and beyond with correspondence, identification of applied research opportunities that meet monitoring objectives and invitations for staff to address groups on a regular basis.

- 5.4 Jarrah-marri Systems : By mid 2013 identify resources required (and consult with WA Centre of Excellence) to develop resources and methods to promote best practice hygiene protocols to reduce tree decline by early 2014 for adoption by appropriate agencies by mid 2014.

- 5.5 Jarrah-marri Systems : Continue to include jarrah-marri as part of fencing incentive projects in 2013, and by late 2013 developed a new project application for strategic fencing of key linkages and poorly represented vegetation complexes for acquiring of funds and implementation in 2014 and beyond.

- 6.0 BLACK GLOVED WALLABY : 6) BROAD GOAL: OBTAIN BASELINE INFORMATION (NUMBERS, DISTRIBUTION AS INDICATOR OF HEALTHY BUSH) ABOUT BLACK-GLOVED WALLABIES (AND FAUNA WITH SIMILAR HABITAT REQUIREMENTS/THREATS) IN THE AUGUSTA-MARGARET RIVER LANDSCAPE BY 2013, TO DRIVE KEY INTERVENTIONS FOR IMPROVING THEIR VIABILITY BY 2015 : There is an assumption that the populations are functioning well in the large forested area to the east (Target = 6) Black-gloved wallaby)

- 6.1 Black Gloved Wallaby : Design community black-gloved wallaby survey by mid 2012 for implementation during 2013 and beyond.

- 6.2 Black Gloved Wallaby : In consultation with other NRM groups and key stakeholders, in particular Dr Sandra Gillfillan and Prof. Don Bradshaw, scope a funding application by late 2013, for an application to aquire funds and initiate a regional baseline study during 2014.

- 6.3 Black Gloved Wallaby : Following the collation and investigation of preliminary survey results by mid-late 2013, develop guidelines and fauna connectivity map as a draft by early 2014, with ongoing improvements as results of further black-gloved wallaby surveys are produced in late 2014 and beyond.

- 6.4 Black Gloved Wallaby : Ensure that requirements for key fauna such as black gloved wallabies form part of the scope (2013), development (2013-2014) and implementation (2014+) of the Fire and Biodiversity Plan.

- 6.5 Black Gloved Wallaby : Ensure that information from community fauna carried done in 2013 and beyond, incorporate information on location and predation of feral animals.

- 6.6 Black Gloved Wallaby : By late 2012/early 2013 disseminated information about black gloved wallabies though community survey, website and other means and incorporate information into broader landscape-wide communications strategy.

- 7.0 AMR LANDSCAPE : 7) BROAD GOAL: DEVELOP KEY LANDSCAPE-WIDE ECOLOGICAL STRATEGIES (FOR FIRE, CONNECTIVITY, WEEDS & FERAL FAUNA) BY 2013 TO ENSURE LONG TERM IMPLEMENTATION THROUGH TO 2020 AND BEYOND.

- 7.1 AMR Landscape : A Fire and Biodiversity Plan is scoped by early 2013, funding acquired and the plan commissioned by late 2013, developed and consultation undertaken during 2014 for adoption by mid 2014 (i.e. before the 2014/15 bushfire season)

- 7.2 AMR Landscape : By late 2012 by habitat connectivity considerations are guiding on-ground actions for key conservation targets and by late 2013 SW Regional Ecological Linkages information has been incorporated formally into this process.

- 7.3 AMR Landscape : By early 2013 a review of the AMR Shire weed strategy is underway, and completed by late 2013/early 2014

- 7.4 AMR Landscape : Terms of reference for comprehensive terrestrial feral animal control program developed by mid 2013, designed and funding acquired by late 2013/early 2014 with implementation by mid 2014.

- 7.5 AMR Landscape : By late 2013 consult with key stakeholders involved with Phytophthora dieback to develop a funding application by early 2014, to develop a comprehensive plan for completion by mid 2014 for implementation by late 2014 and beyond.

- 7.6 AMR Landscape : GIS layers and gaps for AMR Shire documented by mid 2013 and new layers obtained for use in planning projects by late 2013.

- 7.7 AMR Landscape : Following acquisition of updated data layers by late 2013, develop protocols and methodology for mapping vegetation condition by early 2014.

- 8.0 AMR LANDSCAPE : 8) BROAD GOAL: ENSURE THAT ENABLING STRATEGIES (E.G. FUNDING, CAPACITY BUILDING, AND COMMUNICATIONS) FOR THE CAPE TO CAPE CATCHMENTS GROUP, LOWER BLACKWOOD LCDC, AND OTHER ASSOCIATED GROUPS ARE SCOPED AND DEVELOPED BY 2012, TO ENSURE THE EFFECTIVE IMPLEMENTATION OF CONSERVATION STRATEGIES FROM 2011 THROUGH TO 2020 AND BEYOND.

- 8.1 AMR Landscape : Requirements for long-term conservation funding scoped by early 2013, strategy developed by late 2013, and implemented by 2014.

- 8.2 AMR Landscape : By early 2013 incorporation of funding applications including training is in place, with funding for increased capacity for NRM groups to plan, implement, monitor and review conservation interventions by early 2014.

- 8.3 AMR Landscape : Biodiversity Communications Plan scoped by early 2013, funding acquired by late 2013, for implementation (in conjunction with existing communications projects) by early 2014.

Targets

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Focal Conservation Target	Target Type	Habitat Type
1) Scott Coastal Plain [Target - 1]	Ecological System	• Rivers, Streams, Creeks • Riparian Areas • Wetlands :: Permanent Saline, Brackish, or Alkaline Marshes/Pools • Wetlands :: Seasonal/Intermittent Freshwater Marshes/Pools • Rivers, Streams, Creeks :: Permanent • Shrubland :: Mediterranean-type Shrubby Vegetation
2) Leeuwin Naturaliste Ridge [Target - 2]	Ecological System	• Forest :: Temperate • Karst and Other Subterranean Inland Aquatic Systems • Caves and Subterranean Habitats (Non-aquatic) :: Dry Caves • Wetlands :: Bogs, Marshes, Swamps, Fens, Peatlands • Rivers, Streams, Creeks :: Seasonal/Intermittent/Irregular • Shrubland :: Mediterranean-type Shrubby Vegetation
3) Wetland systems [Target - 3]	Ecological System	• Karst and Other Subterranean Inland Aquatic Systems • Wetlands :: Permanent Saline, Brackish, or Alkaline Marshes/Pools • Wetlands :: Seasonal/Intermittent Saline, Brackish, or Alkaline Marshes/Pools • Wetlands :: Shrub Dominated • Wetlands :: Bogs, Marshes, Swamps, Fens, Peatlands
4) Waterways [Target - 4]	Ecological System	• Rivers, Streams, Creeks • Riparian Areas
5) Jarrah-marri Systems [Target - 5]	Ecological System	• Forest :: Temperate
6) Black-gloved wallaby [Target - 6]		• Forest :: Temperate • Shrubland :: Mediterranean-type Shrubby Vegetation

Notes:

[Target - 1] **Description**: Summary from booklet: 1) Scott Coastal Plain: ('nested' targets: proteaceous communities, ephemeral wetlands, ironstone communities, Quindalup dunes) The Scott River and coastal plain represent the landscape stretching eastwards from east Augusta and is made up of headlands of granite and limestone (and a rare outcrop of columnar basalt), swampy lowlands, horizontal sandplains and a range of seasonal and permanent wetlands and waterways. The area's vegetation is unique and widely recognised for its exceptional species richness, high diversity of vegetation complexes, a high concentration of rare, restricted and threatened communities,narrowly endemic plants

and wetlands of national importance containing threatened aquatic fauna. This vegetation includes proteaceous communities supporting declining mammal species such as the honey possum. The area is threatened by clearing for agriculture, Phytophthora dieback, a drying climate, water abstraction, high levels of water use by horticulture and plantation forests and altered burning regimes. Additional information: Scott River Plain (off the Blackwood plateau) (Includes ironstone communities, proteaceous communities and ephemeral wetlands) The Scott River Ironstone has been described by SAMR (2005) as follows: The Scott ironstone threatened ecological community is a winter-wet shrubland that occurs on skeletal soils over ironstone on the Scott Coastal Plain. Ironstone soils are extremely restricted in distribution and thought to have been formed by the precipitation of iron from groundwater. The community undergoes seasonal inundation with fresh water. Many taxa in the community are highly restricted in distribution, dieback susceptible and/or obligate seeders. The heath and shrublands are variously dominated by Melaleuca preissiana, Hakea tuberculata, Kunzea micrantha, or Melaleuca incana subsp. Gingilup, depending upon the degree of waterlogging. The understorey is generally dominated by Loxocarya magna. All occurrences, except the long inundated wetlands and dense thicket, have very large and diverse annual flora of Stylidium spp, Centrolepis spp, Schoenus spp and Brizula spp. This community also contains a number of restricted flora such as Darwinia ferricola, Grevillea manglesioides subsp ferricola, Lambertia orbifolia subsp Scott River Plains, and Melaleuca incana subsp. Gingilup. Further differentiation of this community is possible by consideration of factors such as soil depth and clay content, period of inundation, and time since fire. The ironstone is restricted to the western end of the Scott Coastal Plain. The original extent of the community was approximately 1780ha, but 370ha remains, representing an 82% loss of community that was originally highly restricted in distribution. Currently, approximately 126ha occurs on public land (82ha nature reserve; 2ha state forest or national park; 42ha other, mostly Shire of Augusta-Margaret River). About 200ha occurs on private land. Threats to the remaining areas include illegal clearing, fire, phytophthora dieback, stock and kangaroos, weed invasion and changes in water levels. Historically, water levels have been close to the surface, but presently groundwater is abstracted from the Yarragadee aquifer for agriculture. This threatens to reduce water levels, which may impact the community. Furthermore, the Scott River area is susceptible to acid-sulphate soils. Soil acidification also threatens the community. This is a low-lying, poorly drained, flat to undulating plain formed on Quaternary sediments. It is approximately 15km wide and extends eastward from the Blackwood River. It has a narrow strip of high dunes that run along the Southern Ocean coast (Tille and Lantzke, 1990, in SAMR,2005). Coastal plain incorporating the D'Entrecasteaux dune vegetation (and National Park), soil type is the Quindalup dunes, pressures from recreation, development, many large private landholders, many restricted vegetation types. Pen (1997 describes the vegetation of the area as follows: The vegetation of the Scott Coastal Plain is quite complex (NOTE: ONLY THE QUINDALUP SYSTEM IS INCLUDED IN THIS TARGET). The sandy coastal areas support low woodlands, scrub and scrub heaths dominated by WA peppermint and a variety of other Myrtaceae and Proteaceae species. Somewhat inland sedgelands are found in the many broad seasonally or permanently wet areas and near lakes, while low woodlands of Banksias and stunted jarrah are found on broad sandy rises. Here and there are pockets of karri tall forest and forests of marri, jarrah and coastal yate (Eucalyptus cornuta). Most of the vegetation is intact within the D'Entrecasteaux National Park, Gingilup Nature Reserve and as remnant vegetation on private land, but very large areas have been cleared for agriculture in the western portion of the plain over a distance of about 30 km. The Scott Coastal Plain is described by the Western Australian Planning Commission (2009) as one of two main areas that have: • national estate significance for high species richness; • unusually high diversity of vegetation complexes; • a concentration of rare, restricted and threatened communities; • narrowly endemic plants; • relict (primitive or Gondwanic) plants; • plants with disjunct populations; • wetlands of national importance; or • natural landscapes (national estate identification and assessment in the South-West region of Western Australia 1998, as part of the regional forest agreement process).

Target - 1 **Description Comment**: Now including the Quindalup Dunes.The main additional threat here is coastal development - on private land adjoining the Scott Coastal Plain.

Target - 2 **Description**: Summary from Booklet: 2) Leeuwin-Naturaliste Ridge: ('nested targets': caves & associated communities, tufa & rimstone pools, Austroassiminea letha (Leeuwin snail), Gondwanan relictual spp., karri communities, phascogale, coastal wetlands, granite communities, Western spinebill) The Leeuwin-Naturaliste Ridge is a granite and limestone ridge running approximately north-south through the western-most portion of the Augusta-Margaret River landscape. This includes a range of ecological communities and values including unique granite communities, coastal heathland, karri communities, coastal wetlands, tufa and rimstone pools and an extensive network of limestone cave systems including threatened aquatic root mat communities. The ecological values of the ridge are being threatened by a drying climate, increased impacts of wildfires and fire management, weeds (especially arum lily), clearing for development and recreational pressures along the coast. Additional information: The area encompasing the Leeuwin Naturaliste Ridge is defined under the Leeuwin-Naturaliste Ridge Statement of Planning Policy (LNRSPP) (Western Australian Planning Commision, 1998) as follows: The LNRSPP applies over the scenically spectacular, narrow coastal strip stretching from the nearshore waters of Cape Naturaliste to Cape Leeuwin and inland to Bussell Highway and the eastern extent of townsites along the highway. Pen (1997) describes the vegetation of the region as follows: The greater part of the Leeuwin-Naturaliste Ridge supported Jarrah-Marri forest, but most of this has now been cleared for agriculture. In a few small sandy sites Banksia low woodland was found, while pockets of the better soils supported karri tall forest which grew in large stands in the Boranup area, south of Margaret River and down to Augusta. Thickets of Acacia and other species are found along the coast, backing onto scrub and low woodland dominated by WA peppermint, mostly in teh Leeuwin-Naturaliste National Park that runs between the Capes.

Target - 2 **Description Comment**: The Statement of Planning Policy has the following "Statement of Intent" with regards Nature Conservation on the Leeuwin Naturaliste Ridge: The nature conservation values will be conserved through— • reinforcing the functions of the Leeuwin-Naturaliste National Park; • fostering strategic environmental corridors and preserving biological diversity; • protecting and maintaining remnant vegetation; • protecting water quality and quantities required to maintain ecosystem functions; • supporting the establishment of a marine reserve; and • establishing land use controls to conserve land and marine environments. (Western Australian Planning Commission (1998))

Target - 3 **Description**: Summary from booklet: 3) Wetland Systems: The wetland systems covered within this target include both the organic acid and alkaline wetlands. The organic acid wetlands include peaty swamps, 'Reedia' swamps and the Blackwood plateau wetlands. These areas include some Threatened Ecological Communities (TECs) and short range endemic fauna populations including the endangered white-bellied frog. The alkaline wetlands occur on limestone associated with the Leeuwin-Naturaliste Ridge and in some cases these areas also support TECs such as tufa communities and short range endemics such as the endangered Leeuwin freshwater snail . These areas are highly vulnerable to changes in hydrology resulting from a drying climate, water abstraction, altered fire regimes, water impoundment and increased water use demand from adjoining agricultural activities. In some instances they are also threatened by weed encroachment and grazing pressures. Additional information: Wetlands Advisory Committee (1977) cited by Pen (1997) notes that wetlands are defined as "areas of seasonally, intermittently or permanently waterlogged soils or inundated land, whether natural or otherwise, fresh or saline, e.g. waterlogged soils, ponds, billabongs, lakes, swamps, tidal flats, estuaries, rivers and their tributaries". In practise, wetland may be distinguished from upland by the occurrence of water or waterlogged soils, or vegetation typical of water conditions (e.g. paperbarks, rush beds, samphires), or hyrdic soils (i.e. formed in response to prevailing water inundation or waterlogging, and including peats, peaty sands, carbonate muds, etc). Rivers and creeks are, by definition, wetlands. However, they are often treated in isolation from the floodplains, damplands, sumplands and palusplains that surround them (Pen, 1997).

Target - 3 **Description Comment**: Critical ones are the ones supporting frog populations. Andrew says they know which ones - need to identify these and their catchments; determine how significant are dams in the catchments (and potential ones); and set priorities accordingly. Go to DoW about these ones. (Who will take on this responsibility?) High degree of endemism within wetlands; each has its distinctive species therefore every loss is significant

Target - 4 **Description**: Summary from booklet: 4) Waterways: ('nested' targets: Margaret River system, Lower Blackwood River system, short coastal streams flowing off the Leeuwin-Naturaliste Ridge, ring-tailed possum, Scott River, native fish, water rats, mussels and crayfish) Waterways within the Augusta-Margaret River landscape either flow either into the Blackwood River or westwards to the Capes coast. They represent important natural corridors for fauna movement and have a number of distinctive communities not found elsewhere. Permanent river pools provide habitat for fish, invertebrates and aquatic plants and function as important refugia during summer. The waterways support a number of iconic species that are highly threatened and/or endemic to the region including the Margaret River hairy marron, Margaret River burrowing crayfish, White-bellied frog, Orange-bellied frog and Balston's pygmy perch. The Blackwood River has experienced salinization resulting from clearing in the upper catchment and the Scott River has experienced eutrophication. Across the area the waterways are being impacted by a drying climate and increasing pressure and demand for water resources, feral aquatic fauna and adjacent agricultural activities including grazing and polluted runoff. Additional information: Includes the rivers, tributaries and riparian zones; Blackwood, Margaret, Scott, small coastal draining streams off the Leeuwin Nat Ridge. The following information was downloaded from the Ribbons of Blue website http://www.ribbonsofblue.wa.gov.au/cape-to-cape/regional-issues.html: Many of the streams in the Cape to Cape area are very degraded. Water quality is of concern as is indicated

by the excess algal growth at Quinninup Falls and algal blooms that have been observed in Ellen and Wilyabrup Brooks. In 1997 river ecologist Luke Pen assessed 166 kms of stream systems in the Cape to Cape area. Pen classified 4% as 'near pristine or relatively natural', 26% as 'sustaining sufficient habitats to maintain viable populations of plants and animals' and 70% as 'multiple use streams, highly-degraded and heavily impacted on by upstream and adjacent land use'. (Pen, 1977) The Margaret River is in reasonably good condition for much of its length. Within State Forest in the upper reaches and National Park in the middle reaches, the river is in excellent condition. A survey of the river from where it leaves State Forest to the coast was undertaken in 2002 by the Cape to Cape Catchments Group (CCCG, 2003). It was found that approximately 55% of the river is in good to excellent condition, 39% retains native vegetation with medium to high level weed infestation and 6% is degraded and erosion prone. NB Acid plume from Beenup will eventually hit the Scott River (and Blackwood later) and kill the system (Don Bradshaw). Some spots on the Scott at some times of year now reaching pH 3.5.

Target - 4 **Description Comment**: In the case of the Blackwood River main biodiversity values are in the tributaries - main river bodies in poorer condition. Perhaps consider leaving the Blackwood out of this target (Comment from 5 Oct 2010), divide this target into westward flowing and southward flowing rivers?

Target - 5 **Description**: Summary from booklet: 5) Jarrah-marri Systems: ('nested' targets: small mammals (smaller than wallabies), nectar feeding birds, black cockatoos, marri, phascogale, black-gloved wallaby, chuditch, Whicher Scarp) Jarrah-marri systems (ecosystems where jarrah (Eucalyptus marginata) and marri (Corymbia calophylla) dominate the overstorey) make up the bulk of the remnant vegetation within the Augusta-Margaret River area. Significant structural and floristic variation occurs within these systems ranging from tall forest to low woodland occurring on a range of soil types from bare rocky, granite to lateritic ironstone through to sandy soils. These systems support a wide diversity of understorey species and habitat and food sources for fauna. They support a number of iconic and threatened flora and fauna species including critical weight range mammals. These systems are susceptible to a range of threats including Phytophtora dieback, feral animals impacting on fauna and ecological processes and climate change. In recent years marri decline has had significant impact on fragmented remnants. Additional information: The southern jarrah flora is characterised by woodland and forest of jarrah or marri on lateritic soils, along with Banksia grandis (bull banksia), sheoak (Allocasuarina fraseriana), parrot bush (Dryandra sessilis) and snottygobble (Persoonia sp.). A rich understorey of shrubby species occurs, and the region has a high diversity of orchids, sundews and triggerplants. Blackbutt (E. patens), and bullich (E. megacarpa) are found in some areas of the valley floors, with Taxandria sp and a rich suite of wetland flora (AMRS, 2005).

Target - 5 **Description Comment**: incls a lot of proteaceae; very large and diverse complex

Target - 6 **Description**: Summary from bookelt: 6) Black-gloved wallaby: ('nested' targets: chuditch, jarrah marri understorey, echidnas) The black-gloved or western brush wallaby (Macropus irma) (pictured), represents the second largest mammal species in the region and relies on good habitat (in particular understorey vegetation) and connectivity. The black gloved wallaby is understood to have been very common in the early days of settlement and periodically large numbers were traded commercially for skins. Whilst the current status of the species in the area is largely unknown it is thought to have had its range seriously reduced and a significant decline in abundance within most remaining habitats. Both fragmentation of habitats and introduced predator pressures are likely to be responsible for the decline in populations. The black-gloved wallaby was chosen as a target as it is known from the area, is possibly in decline, and requires similar habitat features to a range of other critical weight range mammal species. Additional information: Black-gloved wallaby (Macropus irma) (information from DEC pamphlet) Description Pale to mid grey with distinct white facial stripe, black and white ears, black hands and feet. Long tail with crest of black hair towards extremity. Moves fast with head low and tail extended. Distribution The western brush wallaby was very common in the early days of settlement and periodically large numbers were traded commercially for skins. Their range has been seriously reduced and fragmented due to clearing for agriculture and there is a significant decline in abundance within most remaining habitat. The western brush wallaby is now distributed across the south-west of Western Australia from north of Kalbarri to Cape Arid. Habitat The western brush wallaby's optimum habitat is open forest or woodland, particularly favouring open, seasonally wet flats with low grasses and open scrubby thickets. It is also found in some areas of mallee and heathland, and is uncommon in karri forest. Behaviour The western brush wallaby is a grazer like the larger kangaroos, rather than a browser. It has not been studied in detail. Activity is greatest in the early morning and late afternoon and it rests during the hotter part of day, singly or in pairs in the shade of a bush or in small thickets. It is more diurnal in its habits than other macropods in the region. Threatening processes A dramatic increase in the number of foxes in the early 1970s in south-western Australia appears to have led to a decline in the numbers of western brush wallaby. It is thought that juveniles not long out of the pouch may fall prey to this predator. The western brush wallaby is now uncommon throughout its range but its numbers increase in response to fox baiting. It is thought that foxes may take young wallabies and there is also evidence that illegal hunting may affect their abundance in some areas. Conservation status 2000 IUCN Red List of Threatened Species Lower Risk (near threatened) Western Australian Wildlife Conservation Act Not Listed (Priority 4) Environment Protection and Biodiversity Conservation Act Not listed Habitat fragmentation and size requirement statement from Sandra Gilfillan (in litt., 2010) The decline of Black-gloved Wallabies in the wheatbelt may be attributed to fragmentation and isolation of remnants. Courtney (1994) reported that, in DECs Katanning District, only 20% of reserves less than 100ha, and only 50% less than 500 ha, which had Black-gloved Wallabies in the 1980's still had them in the1990's. She reported observations suggesting that the species can survive on reserves less than 500 ha providing there is sufficient structural diversity to provide both dense vegetation for shelter and more open areas for feeding. Short and Parsons (2004) demonstrated a significant relationship between the presence of Black-gloved Wallabies and reserve area in the wheatbelt, the species requiring approximately 83 ha of remnant to have a 10% probability of occurrence and approximately 500ha for a 40% probability. The smallest remnant that the Black-gloved Wallaby was found to occur in was 119 ha. Courtney, J. (1994). Status and Conservation of the Western Black-gloved Wallaby (Macropus irma). Conservation Statement prepared for the Conservation Council of Western Australia. Short, J. and Parsons, B. (2004). A Test of the Focal Species Approach in Western Australia. Final Report for the Land and Water Australia Project CSE9. Testing approaches to Landscape Design in Cropping Lands. CSIRO, Sustainable Ecosystems, Perth.

Target - 6 **Description Comment**: Being excluded by fencing Known to occur - Tanamara road (last couple of years), Willyabrup Ridge (last couple of years), Warner Glen (2010), Mowen Road (5 years ago) other sitings from a few years ago.

Threats

Threat (*Common Taxonomy*) *	Targets Threatened
Drying climate (Climate Change & Severe Weather :: Habitat Shifting & Alteration)	• 1) Scott Coastal Plain • 2) Leeuwin Naturaliste Ridge • 3) Wetland systems • 4) Waterways • 5) Jarrah-marri Systems
Water impoundment (Natural System Modifications :: Dams & Water Management/Use)	• 2) Leeuwin Naturaliste Ridge • 3) Wetland systems • 4) Waterways
Water abstraction (Natural System Modifications :: Dams & Water Management/Use)	• 1) Scott Coastal Plain • 2) Leeuwin Naturaliste Ridge • 3) Wetland systems • 4) Waterways

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Threat (*Common Taxonomy*) *	Targets Threatened
Dry season wildfires (Natural System Modifications :: Fire & Fire Suppression)	• 1) Scott Coastal Plain • 2) Leeuwin Naturaliste Ridge • 3) Wetland systems • 4) Waterways • 5) Jarrah-marri Systems
High water use by horticulture, viticulture, plantation forests (Natural System Modifications :: Dams & Water Management/Use)	• 1) Scott Coastal Plain • 3) Wetland systems • 4) Waterways
Phytophthora cinnamomi (Invasive & Other Problematic Species & Genes :: Invasive Non-Native/Alien Species)	• 1) Scott Coastal Plain • 2) Leeuwin Naturaliste Ridge • 5) Jarrah-marri Systems
Weeds (Invasive & Other Problematic Species & Genes :: Invasive Non-Native/Alien Species)	• 1) Scott Coastal Plain • 2) Leeuwin Naturaliste Ridge • 3) Wetland systems • 4) Waterways • 5) Jarrah-marri Systems
Clearing - development (Residential & Commercial Development :: Housing & Urban Areas)	• 1) Scott Coastal Plain • 2) Leeuwin Naturaliste Ridge • 4) Waterways • 5) Jarrah-marri Systems
Introduced animals (ferals) (Invasive & Other Problematic Species & Genes :: Invasive Non-Native/Alien Species)	• 2) Leeuwin Naturaliste Ridge • 6) Black-gloved wallaby • 5) Jarrah-marri Systems
Marri decline (Natural System Modifications :: Other Ecosystem Modifications)	• 5) Jarrah-marri Systems
Grazing (Agriculture & Aquaculture :: Livestock Farming & Ranching)	• 1) Scott Coastal Plain • 3) Wetland systems • 4) Waterways • 6) Black-gloved wallaby • 5) Jarrah-marri Systems
Agriculture - nutrients (Pollution :: Agricultural & Forestry Effluents)	• 1) Scott Coastal Plain
Clearing - agriculture (Natural System Modifications :: Other Ecosystem Modifications)	• 1) Scott Coastal Plain • 3) Wetland systems
Recreational pressure (Residential & Commercial Development :: Tourism & Recreation Areas)	• 1) Scott Coastal Plain • 2) Leeuwin Naturaliste Ridge • 3) Wetland systems • 4) Waterways
Vehicle deaths (Transportation & Service Corridors :: Roads & Railroads)	• 6) Black-gloved wallaby
Acid sulphate soils (Natural System Modifications :: Other Ecosystem Modifications)	• 1) Scott Coastal Plain • 3) Wetland systems
Urbanisation - pollution (Pollution :: Household Sewage & Urban Waste Water)	• 4) Waterways
Agricultural pollutants (Pollution :: Agricultural & Forestry Effluents)	• 4) Waterways
Aquatic feral fauna (Invasive & Other Problematic Species & Genes :: Invasive Non-Native/Alien Species)	• 4) Waterways
Logging (Biological Resource Use :: Logging & Wood Harvesting)	• 5) Jarrah-marri Systems
Acid plume from Beenup (Pollution :: Industrial & Military Effluents)	• 4) Waterways
Barriers to movement (Natural System Modifications :: Other Ecosystem Modifications)	• 6) Black-gloved wallaby
Habitat loss & degradation (Natural System Modifications :: Other Ecosystem Modifications)	• 6) Black-gloved wallaby

Strategies

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Strategy (*Common Taxonomy*)	Threats Addressed
1.1 Scott Coastal Plain : Identify the ecological implications of water abstraction on the biodiversity of the Scott Coastal Plain. : Get a better handle on ecological implications and priority *Land/Water Management :: Site/Area Management*	-
1.2 Scott Coastal Plain : Develop Forest Stewardship Council "type" criteria for water drawdown & nutrient management in relation to plantation plantings *Law & Policy :: Private Sector Standards & Codes*	-
1.3 Scott Coastal Plain : Develop Phytophthora dieback (& other pathogen) study with recommendations for the Scott Coastal Plain : Need to interpret Scott River Plain communities for Pc occurence and risk & protectable areas (especially focussing on "uninterpretable areas) *Land/Water Management :: Invasive/Problematic Species Control*	-
1.4 Scott Coastal Plain & Black Gloved Wallaby : Quantify kangaroo grazing impacts, effectiveness of control methodologies and recommendations *Land/Water Management :: Invasive/Problematic Species Control*	-
1.5 Scott Coastal Plain : Develop and implement fencing incentive project for the Scott Coastal Plain that incorporates South West Regional Linkages information into fencing priorities *Land/Water Management :: Site/Area Management*	-
1.6 Scott Coastal Plain : Identify key step(s) in the planning process with potential for improving ecological outcomes : ID where in the planning process there is most potential for improving ecological outcomes and how to do it *Law & Policy :: Policies & Regulations*	-
1.7 Scott Coastal Plain : Review the Scott River Water Quality Improvement Plan (Department of Water) and identify links to the work of the Cape to Cape Catchments Group and the Blackwood Basin Group via the Lower Blackwood Land Conservation District Committee. *Land/Water Management :: Site/Area Management*	-
1.8 Scott Coastal Plain : Develop and implement a Scott River Action Plan to link a number of actions and strategies for this area including best practice fertiliser management and farm scale nutrient hotspots. *Land/Water Management :: Site/Area Management*	-
1.9 Scott Coastal Plain & Jarrah-marri Systems : Implement strategic weed actions while Augusta-Margaret River weed strategy is being reviewed & updated. : While one of the overarching strategies relates to a shire-wide weed strategy and action plan, ongoing weed actions still need to be carried out in a strategic co-ordinated way. *Land/Water Management :: Invasive/Problematic Species Control*	-
2.1 Leeuwin Naturaliste Ridge : Develop a water allocation and management strategy for the coastal aquifers. *Law & Policy :: Policies & Regulations*	-
2.2 Leeuwin Naturaliste Ridge : Design and implement communications strategy on the importance of biodiversity (e.g. Tufa) on the Leeuwin Naturaliste Ridge *Education & Awareness :: Awareness & Communications*	-
2.3 Leeuwin Naturaliste Ridge : Integrate strategies for the Leeuwin Naturaliste Ridge with the Department of Environment and Conservation's Parks and Reserves Management Plan for the area : Need to rethink the reason for this strategy and how it will work in a practical sense - outcomes etc. *Land/Water Management :: Site/Area Management*	-
2.4 Leeuwin Naturaliste Ridge : Design and implement a targeted cross-tenure feral control plan for the Leeeuwin Naturaliste Ridge. *Land/Water Management :: Invasive/Problematic Species Control*	-

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Strategy (*Common Taxonomy*)	Threats Addressed
2.5 Leeuwin Naturaliste Ridge : Develop and implement a strategic environmental weed control program targeting arum lily across the landscape. : Large areas of Arum - need new solutions Comment on ranking - not feasible to access some areas of Leeuwin Naturaliste National Park *Land/Water Management :: Invasive/Problematic Species Control*	-
2.6 Leeuwin Naturaliste Ridge : Develop and implement a strategic environmental weed control program targeting isolated, small weed patches to prevent further spread. : e.g. Dolicos pea, vinca, Geralton carnation weed, Sydney golden wattle (Acacia longifolia), Broombush *Land/Water Management :: Invasive/Problematic Species Control*	-
2.7 Leeuwin Naturaliste Ridge : Develop and implement a Phytophthora dieback management & prevention program for the Leeuwin Naturaliste Ridge. : Note - the area includes the non limestone areas on the eastern side of the ridge in which there is dieback *Land/Water Management :: Invasive/Problematic Species Control*	-
3.1 Wetland systems : Ensure that future fire strategies take into account fire ecology in wetlands and address the issue of optimum burning regime. *Land/Water Protection :: Resource & Habitat Protection*	-
3.2 Wetland systems & Waterways : Critically evaluate existing dam legislation with regards factors including: downstream vegetation effects (not only dam footprint), by-passes to address altered hydrology, re-evaluation of aesthetics" as a reason for dam construction. : Implied is that it will be implemented as well, and amended Who should be following up? *Law & Policy :: Legislation*	-
3.3 Wetland systems & Waterways : Continue to explore options for "off-line" dams in different catchments *Law & Policy :: Policies & Regulations*	-
3.4 Wetland systems : Identify the ecological implications of water abstraction on the biodiversity of wetlands : Implies that this information feeds into an implementation strategy, then these rankings are relevant *Education & Awareness :: Awareness & Communications*	-
3.5 Wetland systems : Continue to implement and expand fencing incentive projects for wetlands. *Land/Water Protection :: Site/Area Protection*	-
3.6 Wetland systems : Communicate key messages about the importance of wetlands to decision and policy makers to ensure that they are recognised as more than "golf course soils". *Education & Awareness :: Awareness & Communications*	-
3.7 Wetland systems : Support DEC control of grassy weeds in key wetlands : Currently underway - needs to continue, mainly couch and kikuyu *Land/Water Management :: Invasive/Problematic Species Control*	-
4.1 Waterways : Identify the ecological implications of water abstraction on the biodiversity of waterways *Education & Awareness :: Awareness & Communications*	-
4.2 Waterways : Implement strategy for prevention and management of feral fish & crustaceans *Land/Water Management :: Invasive/Problematic Species Control*	-
4.3 Waterways : Continue involvement in the implementation of hairy marron recovery actions as developed by the recovery team. *Species Management :: Species Recovery*	-
4.4 Waterways : Continue with fencing (and alternative watering point) incentive programs along key waterways, associated tributaries and creeks : This strategy previously said Margaret River but was broadened Included the provision of alternative watering points into this strategy *Land/Water Management :: Site/Area Management*	-

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Strategy (*Common Taxonomy*)	Threats Addressed
4.5 Waterways : Undertake a River Action Plan for the Scott River. : Use the Margaret River and more recent versions as a template. This is planned for the near future and is more than a plan - will require lots of community engagement, but still needs on ground action. Can Margaret River successes be used to influence uptake in Scott River? For example demonstrate what river used to be and could be again? *Land/Water Management :: Site/Area Management*	-
4.6 Waterways : Develop a strategy for enforcing setbacks along rivers. *Law & Policy :: Policies & Regulations*	-
5.1 Jarrah-marri Systems : Develop and implement a control program for containment of feral bird species (e.g. corellas, sulphur-crested cockatoos) : Find out about legislation for shooting feral birds Apparently there is shooting of feral birds in Busselton shire reserves, as well as netting *Land/Water Management :: Invasive/Problematic Species Control*	-
5.2 Jarrah-marri Systems : Design and implement a targeted cross-tenure feral control plan for Jarrah-Marri systems (in particular training & communication) : Wording from previous "strategies" that gives detail Promote opportunities for landholders to be trained and accredited in fox baiting. • Investigate whether cat trapping with landowners in association with fox baiting is necessary, and if so implement integrated program • Initiate small scale communications project about feral cats and wildlife and what people can do (e.g. reducing rubbish bin access by cats) *Undefined :: Undefined*	-
5.3 Jarrah-marri Systems : Maintain strong involvement with the five year project investigating marri and jarrah health being managed by the Western Australian Centre of Excellence for Climate Change, Woodland and Forest Health (ensure that management needs are being addressed by the research). : Need to keep under review - determine at some stage whether it is yielding answers that help with management. *Education & Awareness :: Awareness & Communications*	-
5.4 Jarrah-marri Systems : Investigate and promote best practice/ hygiene protocols for native tree maintenance to reduce the impact of tree decline. : This strategy was originally focussed on Marri tree health and reducing spread of disease, but it would be good to broaden it a bit more. Could get some people together to develop these resources relatively easily *Land/Water Management :: Invasive/Problematic Species Control*	-
5.5 Jarrah-marri Systems : Develop and implement a strategic fencing incentive project for jarrah-marri linkages and poorly represented/ reserved vegetation complexes. : Some of this is already occuring under the Cape to Cape Catchment's incentive projects, some of the largest blocks or remnant vegetation in the Shire are large Jarrah-Marri blocks Need to develop a spatial process to develop priorities for implementing on ground work for this system Incorporate SWREL project data into this spatial process of prioritisation *Land/Water Management :: Habitat & Natural Process Restoration*	-
6.1 Black Gloved Wallaby : Design and implement a targeted community survey for black-gloved wallabies that could include collection of data from kills/other opportunistic sightings and collects basic habitat data of sighting locations to allow predictive modelling. : Design and implement a targeted community survey for black-gloved wallabies including spotlighting, remote cameras, targeting specific areas such as reserves (co-ordinated survey) *Education & Awareness :: Awareness & Communications*	-

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Strategy (*Common Taxonomy*)	Threats Addressed
6.2 Black Gloved Wallaby : Develop a funding application for a regional black-gloved wallaby baseline study that could include universities undertaking the following activities (amongst others) with post-graduate students: numbers & distribution, habitat needs & thresholds, feeding patterns from gut contents studies. : The issue of working out habitat needs & thresholds for black-gloved wallabies in the Augusta-Margaret River Landscape is an important component of this. (There is limited info on threshhold areas from wheatbelt). *External Capacity Building :: Conservation Finance*	-
6.3 Black Gloved Wallaby : Develop an integrated strategy and action plan for improving habitat size, quality and connectivity for black gloved wallabies and fauna with similar habitat requirements. *Land/Water Management :: Habitat & Natural Process Restoration*	-
6.4 Black Gloved Wallaby : Work out optimum fire regime for Black Gloved Wallabies as part of development of "Fire and Biodiversity Plan" : Need to update threat table to include that fire is actually very important for black-gloved wallabies. *Land/Water Management :: Site/Area Management*	-
6.5 Black Gloved Wallaby : Further investigate predation sources and optimum strategies for specific interventions with black gloved wallabies in mind (e.g. fox baiting) *Land/Water Management :: Invasive/Problematic Species Control*	-
6.6 Black Gloved Wallaby : Raise community awareness about Black Gloved Wallabies *Education & Awareness :: Awareness & Communications*	-
7.1 AMR Landscape : Incorporate the following into a "Fire and Biodiversity Plan" - investigate value of Wildfire Threat Assessment approach, need more debate about value/impacts of prescribed burning, need to examine opportunity for other responses to fire risk: town planning, design : Scope the requirements and develop a brief for a "Fire and Biodiversity" Plan for the Augusta Margaret River Landscape including elements that will assist with biodiversity management such as a Wildfire Threat Analysis and overlap with Shire requirements for protecting human life and property *Land/Water Management :: Habitat & Natural Process Restoration*	-
7.2 AMR Landscape : Develop a strategy for optimising habitat connectivity that links conservation targets, and takes the South West Regional Ecological Linkages work into account. *Land/Water Management :: Habitat & Natural Process Restoration*	-
7.3 AMR Landscape : Review & update the Augusta-Margaret River Shire weed strategy. : Need for a strategic approach to ID which weeds to target, where and how. Coordinate action through Shire *Land/Water Management :: Invasive/Problematic Species Control*	-
7.4 AMR Landscape : Develop and implement a comprehensive terrestrial feral animal control program for the August-Margaret River landscape. *Land/Water Management :: Invasive/Problematic Species Control*	-
7.5 AMR Landscape : Develop and implement a Phytophthora dieback management & prevention program for the Augusta-Margaret River landscape. : Busselton have done a firebreak assesment of soils for dieback - something similar could be a starting point for the Augusta-Margaret River Shire Need to examine status quo especially with regards DEC managed land *Land/Water Management :: Invasive/Problematic Species Control*	-
7.6 AMR Landscape : Develop GIS data layers for vegetation type, condition and extent for the Augusta-Margaret River landscape. *Land/Water Management :: Site/Area Management*	-
7.7 AMR Landscape : Investigate and source best layers and tools for mapping vegetation condition across the landscape. *Land/Water Management :: Site/Area Management*	-

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Strategy (*Common Taxonomy*)	Threats Addressed
8.1 AMR Landscape : Develop and implement a long-term funding strategy for conservation interventions in the Augusta-Margaret River landscape. *External Capacity Building :: Conservation Finance*	-
8.2 AMR Landscape : Increase the capacity of local natural resource management groups to plan, implement, monitor and review conservation interventions in the Augusta-Margaret River landscape. *External Capacity Building :: Alliance & Partnership Development*	-
8.3 AMR Landscape : Develop and implement a biodiversity communications plan for the Augusta-Margaret River landscape. *Education & Awareness :: Awareness & Communications*	-

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Viability Summary

Conservation Targets		Landscape Context		Condition		Size		Viability Rank
		Grade	Weight	Grade	Weight	Grade	Weight	
1	1) Scott Coastal Plain	Good	1.0	Good	1.0	Good	1.0	Good
2	2) Leeuwin Naturaliste Ridge	Fair	1.0	Good	1.0	Good	1.0	Good
3	3) Wetland systems	Fair	1.0	-	1.0	Fair	1.0	Fair
4	4) Waterways	Fair	1.0	Fair	1.0	-	1.0	Fair
5	5) Jarrah-marri Systems	Good	1.0	Fair	1.0	Good	1.0	Good
6	6) Black-gloved wallaby	Fair	1.0	-	1.0	Fair	1.0	Fair
Project Biodiversity Health Rank								Good

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Threat Summary

Project-specific Threats (Common Taxonomy *)	1) Scott Coastal Plain	2) Leeuwin Naturaliste Ridge	3) Wetland systems	4) Waterways	5) Jarrah-marri Systems	6) Black-gloved wallaby	Overall Threat Rank
Drying climate (*Habitat Shifting & Alteration*)	High	High	Very High	High	High	-	Very High
Water impoundment (*Dams & Water Management/Use*)	-	Low	High	High	-	-	High
Water abstraction (*Dams & Water Management/Use*)	High	Low	Very High	High	-	-	High
Dry season wildfires (*Fire & Fire Suppression*)	Medium	High	High	Low	Medium	-	High
High water use by horticulture, viticulture, plantation forests (*Dams & Water Management/Use*)	Medium	-	High	Low	-	-	Medium
Phytophthora cinnamomi (*Invasive Non-Native/Alien Species*)	Medium	Low	-	-	High	-	Medium
Weeds (*Invasive Non-Native/Alien Species*)	Low	Medium	Low	Low	Medium	-	Medium
Clearing - development (*Housing & Urban Areas*)	Low	Medium	-	Low	Medium	-	Medium
Introduced animals (ferals) (*Invasive Non-Native/Alien Species*)	-	Low	-	-	High	Medium	Medium
Marri decline (*Other Ecosystem Modifications*)	-	-	-	-	High	-	Medium
Grazing (*Livestock Farming & Ranching*)	Low	-	Low	Medium	Low	Low	Low
Agriculture - nutrients (*Agricultural & Forestry Effluents*)	Low	-	-	-	-	-	Low

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Project-specific Threats (Common Taxonomy *)	1) Scott Coastal Plain	2) Leeuwin Naturaliste Ridge	3) Wetland systems	4) Waterways	5) Jarrah-marri Systems	6) Black-gloved wallaby	Overall Threat Rank
Clearing - agriculture (*Other Ecosystem Modifications*)	**Medium**	-	**Low**	-	-	-	**Low**
Recreational pressure (*Tourism & Recreation Areas*)	**Low**	**Medium**	**Low**	**Low**	-	-	**Low**
Vehicle deaths (*Roads & Railroads*)	-	-	-	-	-	**Medium**	**Low**
Acid sulphate soils (*Other Ecosystem Modifications*)	**Low**	-	**Low**	-	-	-	**Low**
Urbanisation - pollution (*Household Sewage & Urban Waste Water*)	-	-	-	**Low**	-	-	**Low**
Agricultural pollutants (*Agricultural & Forestry Effluents*)	-	-	-	**Medium**	-	-	**Low**
Aquatic feral fauna (*Invasive Non-Native/Alien Species*)	-	-	-	**Medium**	-	-	**Low**
Logging (*Logging & Wood Harvesting*)	-	-	-	-	**Low**	-	**Low**
Acid plume from Beenup (*Industrial & Military Effluents*)	-	-	-	**Medium**	-	-	**Low**
Barriers to movement (*Other Ecosystem Modifications*)	-	-	-	-	-	**Medium**	**Low**
Habitat loss & degradation (*Other Ecosystem Modifications*)	-	-	-	-	-	**Medium**	**Low**
Threat Status for Targets and Project	**High**	**High**	**Very High**	**High**	**High**	**Medium**	**Very High**

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Action Plan

Objective: 1.0 SCOTT COASTAL PLAIN : 1) BROAD GOAL: TO FILL IN INFORMATION GAPS ON ECOLOGICAL PROCESSES AFFECTING BIODIVERSITY ON THE SCOTT COASTAL PLAIN BY 2012, TO DRIVE CURRENT ACTIONS AND FUTURE CONSERVATION ACTIONS BY 2015. : (Target = 1) Scott Coastal Plain)

Objective: 1.1 Scott Coastal Plain : Undertake a literature review in early 2013, for consultation and finalisation of a short statement on the ecological implications of water abstraction on biodiversity of the Scott Coastal Plain by late 2013

- **Strategic Action:** 1.1 Scott Coastal Plain: Identify the ecological implications of water abstraction on the biodiversity of the Scott Coastal Plain.: Get a better handle on ecological implications and priority

Objective: 1.2 Scott Coastal Plain : By mid 2013 initiate dialogue with appropriate stakeholders to investigate the possible incorporation of these criteria by the plantation industry for production of a feasibility statement by late 2013

- **Strategic Action:** 1.2 Scott Coastal Plain: Develop Forest Stewardship Council "type" criteria for water drawdown & nutrient management in relation to plantation plantings

Objective: 1.3 Scott Coastal Plain : As part of the Scott River Action Plan underway in 2013 develop a Phytophthora dieback (and other pathogen) scoping document by mid-2013, establish a funding source by late 2013, commission a study in early 2014 with a report finalisation date of mid 2014.

- **Strategic Action:** 1.3 Scott Coastal Plain: Develop Phytophthora dieback (& other pathogen) study with recommendations for the Scott Coastal Plain : Need to interpret Scott River Plain communities for Pc occurence and risk & protectable areas (especially focussing on "uninterpretable areas)

Objective: 1.4 Scott Coastal Plain & Black Gloved Wallaby : Undertaken consultation and literature search by mid 2013, with a statement of effectiveness of different controls and recommendations by late 2013.

- **Strategic Action:** 1.4 Scott Coastal Plain & Black Gloved Wallaby: Quantify kangaroo grazing impacts, effectiveness of control methodologies and recommendations

Objective: 1.5 Scott Coastal Plain : As part of future Commonwealth Government funding programs, develop an application by early 2013 for implementation of a fencing incentive project by late 2013/early 2014.

- **Strategic Action:** 1.5 Scott Coastal Plain: Develop and implement fencing incentive project for the Scott Coastal Plain that incorporates South West Regional Linkages information into fencing priorities

Objective: 1.6 Scott Coastal Plain : As part of the Scott River Action Plan, identify practical methods by which planning decisions by the WA Planning Commission and Local Government can improve ecological outcomes in a succinct document by late 2013.

- **Strategic Action:** 1.6 Scott Coastal Plain: Identify key step(s) in the planning process with potential for improving ecological outcomes: ID where in the planning process there is most potential for improving ecological outcomes and how to do it

Objective: 1.7 Scott Coastal Plain : Incorporate the review of the Scott River Water Quality Improvement Plan (Department of Water) and identify links to NRM groups as part of the Scott River Action Plan with key steps identified and resourced by mid 2013, and the review undertaken by late 2013.

- **Strategic Action:** 1.7 Scott Coastal Plain: Review the Scott River Water Quality Improvement Plan (Department of Water) and identify links to the work of the Cape to Cape Catchments Group and the Blackwood Basin Group via the Lower Blackwood Land Conservation District Committee.

Objective: 1.8 Scott Coastal Plain : Develop funding application for Scott River Action Plan by early 2013, for initiation during mid 2013 and implementation by 2014 and beyond.

- **Strategic Action:** 1.8 Scott Coastal Plain: Develop and implement a Scott River Action Plan to link a number of actions and strategies for this area including best practice fertiliser management and farm scale nutrient hotspots.

Objective: 1.9 Scott Coastal Plain & Jarrah-marri Systems : Continue with ongoing weed actions in known priority areas during 2013 and beyond

- **Strategic Action:** 1.9 Scott Coastal Plain & Jarrah-marri Systems: Implement strategic weed actions while Augusta-Margaret River weed strategy is being reviewed & updated.: While one of the overarching strategies relates to a shire-wide weed strategy and action plan, ongoing weed actions still need to be carried out in a strategic co-ordinated way.

Objective: 2.0 LEEUWIN NATURALISTE RIDGE : 2) BROAD GOAL: INCREASE KNOWLEDGE OF THE KEY BIODIVERSITY DRIVERS SUCH AS WATER & FIRE (AND RELATED WEEDS) OF THE LEEUWIN NATURALIST RIDGE BY 2013 AND IMPLEMENT INTERVENTIONS FOR INCREASING THE VIABILITY OF THIS TARGET BY 2015. : (Target = 2) Leeuwin Naturaliste Ridge)

Objective: 2.1 Leeuwin Naturaliste Ridge : Initiate discussions with Department of Water and other stakeholders on water allocation for coastal aquifers by mid 2013, aquire funding and appoint consultant by late 2013 to develop a strategy with management recommendations by late 2014.

- **Strategic Action:** 2.1 Leeuwin Naturaliste Ridge: Develop a water allocation and management strategy for the coastal aquifers.

Objective: 2.2 Leeuwin Naturaliste Ridge : Develop a brief for this biodiversity communications strategy by mid 2013, funding by late 2013 with implementation of key aspects of the strategy underway by mid 2014.

- **Strategic Action:** 2.2 Leeuwin Naturaliste Ridge: Design and implement communications strategy on the importance of biodiversity (e.g. Tufa) on the Leeuwin Naturaliste Ridge

Objective: 2.3 Leeuwin Naturaliste Ridge : Initiate dialogue in early 2013 with a view to establishing a regular liaison opportunity (e.g. sitting on appropriate respective committees) between Cape to Cape Catchment Group and DEC to help for the purposed of improving integrate of strategies by late 2013.

- **Strategic Action:** 2.3 Leeuwin Naturaliste Ridge: Integrate strategies for the Leeuwin Naturaliste Ridge with the Department of Environment and Conservation's Parks and Reserves Management Plan for the area: Need to rethink the reason for this strategy and how it will work in a practical sense - outcomes etc.

Objective: 2.4 Leeuwin Naturaliste Ridge : In consultation with appropriate stakeholders, aquire funding by late 2013, develop an initial feral control plan for the Leeuwin Naturaliste Ridge by early 2014, for implementation in late 2014 and beyond.

- **Strategic Action:** 2.4 Leeuwin Naturaliste Ridge: Design and implement a targeted cross-tenure feral control plan for the Leeeuwin Naturaliste Ridge.

Objective: 2.5 Leeuwin Naturaliste Ridge : By mid 2013, initiate a comprehensive mapping excercise for arum lily, seek and aquire funds in late 2013 for implementation of a strategic control and monitoring program by early 2014.

- **Strategic Action:** 2.5 Leeuwin Naturaliste Ridge: Develop and implement a strategic environmental weed control program targeting arum lily across the landscape.: Large areas of Arum - need new solutions Comment on ranking - not feasible to access some areas of Leeuwin Naturaliste National Park

Objective: 2.6 Leeuwin Naturaliste Ridge : By early 2013, identify though consultation, an outline plan targetting isolated weeds patches for implementation of actions by mid 2013 and beyond

- **Strategic Action:** 2.6 Leeuwin Naturaliste Ridge: Develop and implement a strategic environmental weed control program targeting isolated, small weed patches to prevent further spread.: e.g. Dolicos pea, vinca, Geralton carnation weed, Sydney golden wattle (Acacia longifolia), Broombush

Objective: 2.7 Leeuwin Naturaliste Ridge : Integrate a Phytophthora dieback program for the Leeuwin Naturaliste Ridge with a Shire-wide strategy as follows: By late 2013 consult with key stakeholders involved with Phytophthora dieback to develop a funding application by early 2014, to develop a comprehensive plan for completion by mid 2014 for implementation by late 2014 and beyond.

- **Strategic Action:** 2.7 Leeuwin Naturaliste Ridge: Develop and implement a Phytophthora dieback management & prevention program for the Leeuwin Naturaliste Ridge.: Note - the area includes the non limestone areas on the eastern side of the ridge in which there is dieback

Objective: 3.0 WETLAND SYSTEMS : 3) BROAD GOAL: TO COLLATE INFORMATION (RESEARCH, LEGISLATION ETC.) ON WATER USE, FIRE, WEEDS ETC. FOR WETLANDS BY 2012. TO IMPLEMENT LANDSCAPE-WIDE INTERVENTIONS TO REVERSE THE TREND OF DEGRADING WETLANDS BY 2015. : (Target = 3) Wetland systems)

Objective: 3.1 Wetland systems : As part of a bigger fire and biodiversity plan, ensure that knowledge about wetlands being protected from fire is disseminated to key stakeholders by mid 2013, to ensure no fires in wetlands in the 2013/14 fire season and beyond.

- **Strategic Action:** 3.1 Wetland systems: Ensure that future fire strategies take into account fire ecology in wetlands and address the issue of optimum burning regime.

Objective: 3.2 Wetland systems & Waterways : Appropriate person to carry out dam legislation identified by mid 2013, funding acquired by late 2013, for report to be commissioned and completed by mid 2014.

- **Strategic Action:** 3.2 Wetland systems & Waterways: Critically evaluate existing dam legislation with regards factors including: downstream vegetation effects (not only dam footprint), by-passes to address altered hydrology, re-evaluation of aesthetics" as a reason for dam construction.: Implied is that it will be implemented as well, and amended Who should be following up?

Objective: 3.3 Wetland systems & Waterways : Ensure that options for "off-line" dams are identified during 2013 and that this aspect is included in the "dam legislation" strategy due for completion by mid 2014.

- **Strategic Action:** 3.3 Wetland systems & Waterways: Continue to explore options for "off-line" dams in different catchments

Objective: 3.4 Wetland systems : Initiate discussions with Department of Water, DEC and other stakeholders on on ecological implication of water abstraction on wetland biodiversity by mid 2013, aquire funding and appoint consultant by late 2013 to develop a strategy with management recommendations by late 2014.

- **Strategic Action:** 3.4 Wetland systems: Identify the ecological implications of water abstraction on the biodiversity of wetlands: Implies that this information feeds into an implementation strategy, then these rankings are relevant

Objective: 3.5 Wetland systems : Continue to include wetlands as part of fencing incentive projects in 2013, and by late 2013 developed a new project application for strategic fencing for acquiring of funds and implementation in 2014 and beyond.

- **Strategic Action:** 3.5 Wetland systems: Continue to implement and expand fencing incentive projects for wetlands.

Objective: 3.6 Wetland systems : As part of the broader communication strategy and in established forums, ensure that messages of the importance of wetlands are communicated during 2013 and beyond.

- **Strategic Action:** 3.6 Wetland systems: Communicate key messages about the importance of wetlands to decision and policy makers to ensure that they are recognised as more than "golf course soils".

Objective: 3.7 Wetland systems : During 2013 and beyond, integrate projects involving grassy weeds in wetlands with DEC projects.

- **Strategic Action:** 3.7 Wetland systems: Support DEC control of grassy weeds in key wetlands: Currently underway - needs to continue, mainly couch and kikuyu

Objective: 4.0 WATERWAYS : 4) BROAD GOAL: TO INCREASE THE STREAM FORESHORE CONDITION OF KEY RIVERS (>50% OF THEIR LENGTH IN A OR B GRADE) BY 2020, ENSURE NO NEW INTRODUCTIONS OF FERAL FISH OR CRUSTACEANS, AND DEVELOP STRATEGIES FOR REDUCING POINT SOURCE POLLUTANTS BY 2015. : (Target = 4) Waterways)

Objective: 4.1 Waterways : Initiate discussions with Department of Water, DEC and other stakeholders on on ecological implication of water abstraction on waterway biodiversity by mid 2013, aquire funding and appoint consultant by late 2013 to develop a strategy with management recommendations by late 2014.

- **Strategic Action:** 4.1 Waterways: Identify the ecological implications of water abstraction on the biodiversity of waterways

Objective: 4.2 Waterways : By mid 2013 develop initial project brief for feral fish and crustaceans strategy for acquisition of funding by late 2013, finalisation of a report by early 2014 for implementation by mid 2014.

- **Strategic Action:** 4.2 Waterways: Implement strategy for prevention and management of feral fish & crustaceans

Objective: 4.3 Waterways : Ensure ongoing integration of Cape to Cape's works with the work of the hairy marron recovery team in 2013 and beyond.

- **Strategic Action:** 4.3 Waterways: Continue involvement in the implementation of hairy marron recovery actions as developed by the recovery team.

Objective: 4.4 Waterways : Continue to include waterways as part of fencing incentive projects in 2013, and by late 2013 developed a new project application for strategic fencing (and provision of alternative stock watering points) for acquiring of funds and implementation in 2014 and beyond.

- **Strategic Action:** 4.4 Waterways: Continue with fencing (and alternative watering point) incentive programs along key waterways, associated tributaries and creeks: This strategy previously said Margaret River but was broadened Included the provision of alternative watering points into this strategy

Objective: 4.5 Waterways : Develop funding application for Scott River Action Plan by early 2013, for initiation during mid 2013 and implementation by 2014 and beyond.

- **Strategic Action:** 4.5 Waterways: Undertake a River Action Plan for the Scott River.: Use the Margaret River and more recent versions as a template. This is planned for the near future and is more than a plan - will require lots of community engagement, but still needs on ground action. Can Margaret River successes be used to influence uptake in Scott River? For example demonstrate what river used to be and could be again?

Objective: 4.6 Waterways : Initiate discussions with Department of Water, Local Government and Planning Commission and other stakeholders on water allocation for coastal aquifers by mid 2013, aquire funding and appoint consultant by late 2013 to develop a strategy with management recommendations by late 2014.

- **Strategic Action:** 4.6 Waterways: Develop a strategy for enforcing setbacks along rivers.

Objective: 5.0 JARRAH-MARRI SYSTEMS : 5) BROAD GOAL: IDENTIFY KEY INTERVENTIONS (E.G. FIRE, WEED, FERAL ANIMAL, DISEASE & CONNECTIVITY PLANS) BY 2012 AND IMPLEMENT KEY ACTIONS TO IMPROVE THE CONSERVATION STATUS OF JARRAH-MARRI SYSTEMS BY 2015 : (Target = 5) Jarrah-marri Systems)

Objective: 5.1 Jarrah-marri Systems : By late 2013 liaise with representatives from the Shire of Busselton and DEC with regards feral birds, scope options, acquire funding and develop and implement strategy that includes resource material by early 2014.

- **Strategic Action:** 5.1 Jarrah-marri Systems: Develop and implement a control program for containment of feral bird species (e.g. corellas, sulphur-crested cockatoos): Find out about legislation for shooting feral birds Apparently there is shooting of feral birds in Busselton shire reserves, as well as netting

Objective: 5.2 Jarrah-marri Systems : Terms of reference (& training needs) for cross-tenure terrestrial feral animal control program developed by mid 2013, designed and funding acquired by late 2013/early 2014 with implementation by mid 2014.

- **Strategic Action:** 5.2 Jarrah-marri Systems: Design and implement a targeted cross-tenure feral control plan for Jarrah-Marri systems (in particular training & communication) : Wording from previous "strategies" that gives detail Promote opportunities for landholders to be trained and accredited in fox baiting. • Investigate whether cat trapping with landowners in association with fox baiting is necessary, and if so implement integrated program • Initiate small scale communications project about feral cats and wildlife and what people can do (e.g. reducing rubbish bin access by cats)

Objective: 5.3 Jarrah-marri Systems : Maintain communication with WA Centre for Excellence during 2013 and beyond with correspondence, identification of applied research opportunities that meet monitoring objectives and invitations for staff to address groups on a regular basis.

- **Strategic Action:** 5.3 Jarrah-marri Systems: Maintain strong involvement with the five year project investigating marri and jarrah health being managed by the Western Australian Centre of Excellence for Climate Change, Woodland and Forest Health (ensure that management needs are being addressed by the research).: Need to keep under review - determine at some stage whether it is yielding answers that help with management.

Objective: 5.4 Jarrah-marri Systems : By mid 2013 identify resources required (and consult with WA Centre of Excellence) to develop resources and methods to promote best practice hygiene protocols to reduce tree decline by early 2014 for adoption by appropriate agencies by mid 2014.

- **Strategic Action:** 5.4 Jarrah-marri Systems: Investigate and promote best practice/ hygiene protocols for native tree maintenance to reduce the impact of tree decline.: This strategy was originally focussed on Marri tree health and reducing spread of disease, but it would be good to broaden it a bit more. Could get some people together to develop these resources relatively easily

Objective: 5.5 Jarrah-marri Systems : Continue to include jarrah-marri as part of fencing incentive projects in 2013, and by late 2013 developed a new project application for strategic fencing of key linkages and poorly represented vegetation complexes for acquiring of funds and implementation in 2014 and beyond.

- **Strategic Action:** 5.5 Jarrah-marri Systems: Develop and implement a strategic fencing incentive project for jarrah-marri linkages and poorly represented/ reserved vegetation complexes.: Some of this is already occuring under the Cape to Cape Catchment's incentive projects, some of the largest blocks or remnant vegetation in the Shire are large Jarrah-Marri blocks Need to develop a spatial process to develop priorities for implementing on ground work for this

system Incorporate SWREL project data into this spatial process of prioritisation

Objective: 6.0 BLACK GLOVED WALLABY : 6) BROAD GOAL: OBTAIN BASELINE INFORMATION (NUMBERS, DISTRIBUTION AS INDICATOR OF HEALTHY BUSH) ABOUT BLACK-GLOVED WALLABIES (AND FAUNA WITH SIMILAR HABITAT REQUIREMENTS/THREATS) IN THE AUGUSTA-MARGARET RIVER LANDSCAPE BY 2013, TO DRIVE KEY INTERVENTIONS FOR IMPROVING THEIR VIABILITY BY 2015 : There is an assumption that the populations are functioning well in the large forested area to the east (Target = 6) Black-gloved wallaby)

Objective: 6.1 Black Gloved Wallaby : Design community black-gloved wallaby survey by mid 2012 for implementation during 2013 and beyond.

- **Strategic Action:** 6.1 Black Gloved Wallaby: Design and implement a targeted community survey for black-gloved wallabies that could include collection of data from kills/other opportunistic sightings and collects basic habitat data of sighting locations to allow predictive modelling.: Design and implement a targeted community survey for black-gloved wallabies including spotlighting, remote cameras, targeting specific areas such as reserves (co-ordinated survey)

Objective: 6.2 Black Gloved Wallaby : In consultation with other NRM groups and key stakeholders, in particular Dr Sandra Gillfillan and Prof. Don Bradshaw, scope a funding application by late 2013, for an application to aquire funds and initiate a regional baseline study during 2014.

- **Strategic Action:** 6.2 Black Gloved Wallaby: Develop a funding application for a regional black-gloved wallaby baseline study that could include universities undertaking the following activities (amongst others) with post-graduate students: numbers & distribution, habitat needs & thresholds, feeding patterns from gut contents studies.: The issue of working out habitat needs & thresholds for black-gloved wallabies in the Augusta-Margaret River Landscape is an important component of this. (There is limited info on threshhold areas from wheatbelt).

Objective: 6.3 Black Gloved Wallaby : Following the collation and investigation of preliminary survey results by mid-late 2013, develop guidelines and fauna connectivity map as a draft by early 2014, with ongoing improvements as results of further black-gloved wallaby surveys are produced in late 2014 and beyond.

- **Strategic Action:** 6.3 Black Gloved Wallaby: Develop an integrated strategy and action plan for improving habitat size, quality and connectivity for black gloved wallabies and fauna with similar habitat requirements.

Objective: 6.4 Black Gloved Wallaby : Ensure that requirements for key fauna such as black gloved wallabies form part of the scope (2013), development (2013-2014) and implementation (2014+) of the Fire and Biodiversity Plan.

- **Strategic Action:** 6.4 Black Gloved Wallaby: Work out optimum fire regime for Black Gloved Wallabies as part of development of "Fire and Biodiversity Plan": Need to update threat table to include that fire is actually very important for black-gloved wallabies.

Objective: 6.5 Black Gloved Wallaby : Ensure that information from community fauna carried done in 2013 and beyond, incorporate information on location and predation of feral animals.

- **Strategic Action:** 6.5 Black Gloved Wallaby: Further investigate predation sources and optimum strategies for specific interventions with black gloved wallabies in mind (e.g. fox baiting)

Objective: 6.6 Black Gloved Wallaby : By late 2012/early 2013 disseminated information about black gloved wallabies though community survey, website and other means and incorporate information into broader landscape-wide communications strategy.

- **Strategic Action:** 6.6 Black Gloved Wallaby: Raise community awareness about Black Gloved Wallabies

Objective: 7.0 AMR LANDSCAPE : 7) BROAD GOAL: DEVELOP KEY LANDSCAPE-WIDE ECOLOGICAL STRATEGIES (FOR FIRE, CONNECTIVITY, WEEDS & FERAL FAUNA) BY 2013 TO ENSURE LONG TERM IMPLEMENTATION THROUGH TO 2020 AND BEYOND.

Objective: 7.1 AMR Landscape : A Fire and Biodiversity Plan is scoped by early 2013, funding acquired and the plan commissioned by late 2013, developed and consultation undertaken during 2014 for adoption by mid 2014 (i.e. before the 2014/15 bushfire season)

- **Strategic Action:** 7.1 AMR Landscape: Incorporate the following into a "Fire and Biodiversity Plan" - investigate value of Wildfire Threat Assessment approach, need more debate about value/impacts of prescribed burning, need to examine opportunity for other responses to fire risk: town planning, design: Scope the requirements and develop a brief for a "Fire and Biodiversity" Plan for the Augusta Margaret River Landscape including elements that will assist with biodiversity management such as a Wildfire Threat Analysis and overlap with Shire requirements for protecting human life and property

Objective: 7.2 AMR Landscape : By late 2012 by habitat connectivity considerations are guiding on-ground actions for key conservation targets and by late 2013 SW Regional Ecological Linkages information has been incorporated formally into this process.

- **Strategic Action:** 7.2 AMR Landscape: Develop a strategy for optimising habitat connectivity that links conservation targets, and takes the South West Regional Ecological Linkages work into account.

Objective: 7.3 AMR Landscape : By early 2013 a review of the AMR Shire weed strategy is underway, and completed by late 2013/early 2014

- **Strategic Action:** 7.3 AMR Landscape: Review & update the Augusta-Margaret River Shire weed strategy.: Need for a strategic approach to ID which weeds to target, where and how. Coordinate action through Shire

Objective: 7.4 AMR Landscape : Terms of reference for comprehensive terrestrial feral animal control program developed by mid 2013, designed and funding acquired by late 2013/early 2014 with implementation by mid 2014.

- **Strategic Action:** 7.4 AMR Landscape: Develop and implement a comprehensive terrestrial feral animal control program for the August-Margaret River landscape.

Objective: 7.5 AMR Landscape : By late 2013 consult with key stakeholders involved with Phytophthora dieback to develop a funding application by early 2014, to develop a comprehensive plan for completion by mid 2014 for implementation by late 2014 and beyond.

- **Strategic Action:** 7.5 AMR Landscape: Develop and implement a Phytophthora dieback management & prevention program for the Augusta-Margaret River landscape.: Busselton have done a firebreak assesment of soils for dieback - something similar could be a starting point for the Augusta-Margaret River Shire Need to examine status quo especially with regards DEC managed land

Objective: 7.6 AMR Landscape : GIS layers and gaps for AMR Shire documented by mid 2013 and new layers obtained for use in planning projects by late 2013.

- **Strategic Action:** 7.6 AMR Landscape: Develop GIS data layers for vegetation type, condition and extent for the Augusta-Margaret River landscape.

Objective: 7.7 AMR Landscape : Following acquisition of updated data layers by late 2013, develop protocols and methodology for mapping vegetation condition by early 2014.

- **Strategic Action:** 7.7 AMR Landscape: Investigate and source best layers and tools for mapping vegetation condition across the landscape.

Objective: 8.0 AMR LANDSCAPE : 8) BROAD GOAL: ENSURE THAT ENABLING STRATEGIES (E.G. FUNDING, CAPACITY BUILDING, AND COMMUNICATIONS) FOR THE CAPE TO CAPE CATCHMENTS GROUP, LOWER BLACKWOOD LCDC, AND OTHER ASSOCIATED GROUPS ARE SCOPED AND DEVELOPED BY 2012, TO ENSURE THE EFFECTIVE IMPLEMENTATION OF CONSERVATION STRATEGIES FROM 2011 THROUGH TO 2020 AND BEYOND.

Objective: 8.1 AMR Landscape : Requirements for long-term conservation funding scoped by early 2013, strategy developed by late 2013, and implemented by 2014.

- **Strategic Action:** 8.1 AMR Landscape: Develop and implement a long-term funding strategy for conservation interventions in the Augusta-Margaret River landscape.

Objective: 8.2 AMR Landscape : By early 2013 incorporation of funding applications including training is in place, with funding for increased capacity for NRM groups to plan, implement, monitor and review conservation interventions by early 2014.

- **Strategic Action:** 8.2 AMR Landscape: Increase the capacity of local natural resource management groups to plan, implement, monitor and review conservation interventions in the Augusta-Margaret River landscape.

Objective: 8.3 AMR Landscape : Biodiversity Communications Plan scoped by early 2013, funding acquired by late 2013, for implementation (in conjunction with existing communications projects) by early 2014.

- **Strategic Action:** 8.3 AMR Landscape: Develop and implement a biodiversity communications plan for the Augusta-Margaret River landscape.

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All Monitoring Indicators

Methods	Objectives	Key Indicator References by Target (w/Current Indicator Measurement)	Threat References by Target (w/Current Indicator Measurement)
Indicator: **Based on % of original remaining, rating required for each specific communities within the broad target (Mattiske mapping)**			
-	• 1.0 SCOTT COASTAL PLAIN : 1) BROAD GOAL: TO FILL IN INFORMATION GAPS ON ECOLOGICAL PROCESSES AFFECTING BIODIVERSITY ON THE SCOTT COASTAL PLAIN BY 2012, TO DRIVE CURRENT ACTIONS AND FUTURE CONSERVATION ACTIONS BY 2015. : (Target = 1) Scott Coastal Plain) • 2.0 LEEUWIN NATURALISTE RIDGE : 2) BROAD GOAL: INCREASE KNOWLEDGE OF THE KEY BIODIVERSITY DRIVERS SUCH AS WATER & FIRE (AND RELATED WEEDS) OF THE LEEUWIN NATURALIST RIDGE BY 2013 AND IMPLEMENT INTERVENTIONS FOR INCREASING THE VIABILITY OF THIS TARGET BY 2015. : (Target = 2) Leeuwin Naturaliste Ridge)	**1) Scott Coastal Plain** • Size: Size / extent of characteristic communities / ecosystems **2) Leeuwin Naturaliste Ridge** • Size: Size / extent of characteristic communities / ecosystems	
Indicator: **Canopy condition**			
-	• 5.0 JARRAH-MARRI SYSTEMS : 5) BROAD GOAL: IDENTIFY KEY INTERVENTIONS (E.G. FIRE, WEED, FERAL ANIMAL, DISEASE & CONNECTIVITY PLANS) BY 2012 AND IMPLEMENT KEY ACTIONS TO IMPROVE THE CONSERVATION STATUS OF JARRAH-MARRI SYSTEMS BY 2015 : (Target = 5) Jarrah-marri Systems)	**5) Jarrah-marri Systems** • Condition: Tree health	
Indicator: **Changes in hydrological regime**			
-	• 1.0 SCOTT COASTAL PLAIN : 1) BROAD GOAL: TO FILL IN INFORMATION GAPS ON ECOLOGICAL PROCESSES AFFECTING BIODIVERSITY ON THE SCOTT COASTAL PLAIN BY 2012, TO DRIVE CURRENT ACTIONS AND FUTURE CONSERVATION ACTIONS BY 2015. : (Target = 1) Scott Coastal Plain) • 2.0 LEEUWIN NATURALISTE RIDGE : 2) BROAD GOAL: INCREASE KNOWLEDGE OF THE KEY BIODIVERSITY DRIVERS SUCH AS WATER & FIRE (AND RELATED WEEDS) OF THE LEEUWIN NATURALIST RIDGE BY 2013 AND IMPLEMENT INTERVENTIONS FOR INCREASING THE VIABILITY OF THIS TARGET BY 2015. : (Target = 2) Leeuwin Naturaliste Ridge) • 3.0 WETLAND SYSTEMS : 3) BROAD GOAL: TO COLLATE INFORMATION (RESEARCH, LEGISLATION ETC.) ON WATER USE, FIRE, WEEDS ETC. FOR WETLANDS BY 2012. TO IMPLEMENT LANDSCAPE-WIDE INTERVENTIONS TO REVERSE THE TREND OF DEGRADING WETLANDS BY 2015. : (Target = 3) Wetland systems)	**1) Scott Coastal Plain** • Landscape Context: Hydrologic regime - (timing, duration, frequency, extent) **2) Leeuwin Naturaliste Ridge** • Landscape Context: Hydrologic regime - (timing, duration, frequency, extent) **3) Wetland systems** • Landscape Context: Hydrologic regime - (timing, duration, frequency, extent)	
Indicator: **Characteristic assemblages**			

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Methods	Objectives	Key Indicator References by Target (w/Current Indicator Measurement)	Threat References by Target (w/Current Indicator Measurement)
-	• 3.0 WETLAND SYSTEMS : 3) BROAD GOAL: TO COLLATE INFORMATION (RESEARCH, LEGISLATION ETC.) ON WATER USE, FIRE, WEEDS ETC. FOR WETLANDS BY 2012. TO IMPLEMENT LANDSCAPE-WIDE INTERVENTIONS TO REVERSE THE TREND OF DEGRADING WETLANDS BY 2015. : (Target = 3) Wetland systems)	**3) Wetland systems** • Size: Size / extent of characteristic communities / ecosystems	
Indicator: **Community and species diversity**			
-	• 1.0 SCOTT COASTAL PLAIN : 1) BROAD GOAL: TO FILL IN INFORMATION GAPS ON ECOLOGICAL PROCESSES AFFECTING BIODIVERSITY ON THE SCOTT COASTAL PLAIN BY 2012, TO DRIVE CURRENT ACTIONS AND FUTURE CONSERVATION ACTIONS BY 2015. : (Target = 1) Scott Coastal Plain) • 2.0 LEEUWIN NATURALISTE RIDGE : 2) BROAD GOAL: INCREASE KNOWLEDGE OF THE KEY BIODIVERSITY DRIVERS SUCH AS WATER & FIRE (AND RELATED WEEDS) OF THE LEEUWIN NATURALIST RIDGE BY 2013 AND IMPLEMENT INTERVENTIONS FOR INCREASING THE VIABILITY OF THIS TARGET BY 2015. : (Target = 2) Leeuwin Naturaliste Ridge)	**1) Scott Coastal Plain** • Condition: Species composition / dominance **2) Leeuwin Naturaliste Ridge** • Condition: Species composition / dominance	
Indicator: **Ecological linkages/proximity analysis**			
-	• 1.0 SCOTT COASTAL PLAIN : 1) BROAD GOAL: TO FILL IN INFORMATION GAPS ON ECOLOGICAL PROCESSES AFFECTING BIODIVERSITY ON THE SCOTT COASTAL PLAIN BY 2012, TO DRIVE CURRENT ACTIONS AND FUTURE CONSERVATION ACTIONS BY 2015. : (Target = 1) Scott Coastal Plain) • 2.0 LEEUWIN NATURALISTE RIDGE : 2) BROAD GOAL: INCREASE KNOWLEDGE OF THE KEY BIODIVERSITY DRIVERS SUCH AS WATER & FIRE (AND RELATED WEEDS) OF THE LEEUWIN NATURALIST RIDGE BY 2013 AND IMPLEMENT INTERVENTIONS FOR INCREASING THE VIABILITY OF THIS TARGET BY 2015. : (Target = 2) Leeuwin Naturaliste Ridge) • 6.0 BLACK GLOVED WALLABY : 6) BROAD GOAL: OBTAIN BASELINE INFORMATION (NUMBERS, DISTRIBUTION AS INDICATOR OF HEALTHY BUSH) ABOUT BLACK-GLOVED WALLABIES (AND FAUNA WITH SIMILAR HABITAT REQUIREMENTS/THREATS) IN THE AUGUSTA-MARGARET RIVER LANDSCAPE BY 2013, TO DRIVE KEY INTERVENTIONS FOR IMPROVING THEIR VIABILITY BY 2015 : There is an assumption that the populations are functioning well in the large forested area to the east (Target = 6) Black-gloved wallaby)	**1) Scott Coastal Plain** • Landscape Context: Connectivity among communities & ecosystems **2) Leeuwin Naturaliste Ridge** • Landscape Context: Landscape pattern (mosaic) & structure **6) Black-gloved wallaby** • Landscape Context: Landscape pattern (mosaic) & structure	
Indicator: **Environmental flow**			

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Methods	Objectives	Key Indicator References by Target (w/Current Indicator Measurement)	Threat References by Target (w/Current Indicator Measurement)
-	• 4.0 WATERWAYS : 4) BROAD GOAL: TO INCREASE THE STREAM FORESHORE CONDITION OF KEY RIVERS (>50% OF THEIR LENGTH IN A OR B GRADE) BY 2020, ENSURE NO NEW INTRODUCTIONS OF FERAL FISH OR CRUSTACEANS, AND DEVELOP STRATEGIES FOR REDUCING POINT SOURCE POLLUTANTS BY 2015. : (Target = 4) Waterways)	**4) Waterways** • Landscape Context: Hydrologic regime - (timing, duration, frequency, extent)	
Indicator: **Fauna assemblages**			
-	• 4.0 WATERWAYS : 4) BROAD GOAL: TO INCREASE THE STREAM FORESHORE CONDITION OF KEY RIVERS (>50% OF THEIR LENGTH IN A OR B GRADE) BY 2020, ENSURE NO NEW INTRODUCTIONS OF FERAL FISH OR CRUSTACEANS, AND DEVELOP STRATEGIES FOR REDUCING POINT SOURCE POLLUTANTS BY 2015. : (Target = 4) Waterways)	**4) Waterways** • Condition: Species composition / dominance	
Indicator: **Geocrinia alba, G. vitellina, Engaewa (species sensitive to disturbance, trampling etc)**			
-	• 3.0 WETLAND SYSTEMS : 3) BROAD GOAL: TO COLLATE INFORMATION (RESEARCH, LEGISLATION ETC.) ON WATER USE, FIRE, WEEDS ETC. FOR WETLANDS BY 2012. TO IMPLEMENT LANDSCAPE-WIDE INTERVENTIONS TO REVERSE THE TREND OF DEGRADING WETLANDS BY 2015. : (Target = 3) Wetland systems)	**3) Wetland systems** • Landscape Context: Organic structure & stability	
Indicator: **Guild of pollinators**			
-	• 5.0 JARRAH-MARRI SYSTEMS : 5) BROAD GOAL: IDENTIFY KEY INTERVENTIONS (E.G. FIRE, WEED, FERAL ANIMAL, DISEASE & CONNECTIVITY PLANS) BY 2012 AND IMPLEMENT KEY ACTIONS TO IMPROVE THE CONSERVATION STATUS OF JARRAH-MARRI SYSTEMS BY 2015 : (Target = 5) Jarrah-marri Systems)	**5) Jarrah-marri Systems** • Condition: Pollination, dispersal	
Indicator: **Honey possums**			
-	• 1.0 SCOTT COASTAL PLAIN : 1) BROAD GOAL: TO FILL IN INFORMATION GAPS ON ECOLOGICAL PROCESSES AFFECTING BIODIVERSITY ON THE SCOTT COASTAL PLAIN BY 2012, TO DRIVE CURRENT ACTIONS AND FUTURE CONSERVATION ACTIONS BY 2015. : (Target = 1) Scott Coastal Plain)	**1) Scott Coastal Plain** • Size: Distribution and abundance	
Indicator: **Plant species composition**			
-	• 5.0 JARRAH-MARRI SYSTEMS : 5) BROAD GOAL: IDENTIFY KEY INTERVENTIONS (E.G. FIRE, WEED, FERAL ANIMAL, DISEASE & CONNECTIVITY PLANS) BY 2012 AND IMPLEMENT KEY ACTIONS TO IMPROVE THE CONSERVATION STATUS OF JARRAH-MARRI SYSTEMS BY 2015 : (Target = 5) Jarrah-marri Systems)	**5) Jarrah-marri Systems** • Landscape Context: Landscape pattern (mosaic) & structure	
Indicator: **Presence of chuditch**			

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Methods	Objectives	Key Indicator References by Target (w/Current Indicator Measurement)	Threat References by Target (w/Current Indicator Measurement)
-	• 5.0 JARRAH-MARRI SYSTEMS : 5) BROAD GOAL: IDENTIFY KEY INTERVENTIONS (E.G. FIRE, WEED, FERAL ANIMAL, DISEASE & CONNECTIVITY PLANS) BY 2012 AND IMPLEMENT KEY ACTIONS TO IMPROVE THE CONSERVATION STATUS OF JARRAH-MARRI SYSTEMS BY 2015 : (Target = 5) Jarrah-marri Systems)	**5) Jarrah-marri Systems** • Condition: Trophic structure	
Indicator: **Standard physical and chemical parameters**			
-	• 4.0 WATERWAYS : 4) BROAD GOAL: TO INCREASE THE STREAM FORESHORE CONDITION OF KEY RIVERS (>50% OF THEIR LENGTH IN A OR B GRADE) BY 2020, ENSURE NO NEW INTRODUCTIONS OF FERAL FISH OR CRUSTACEANS, AND DEVELOP STRATEGIES FOR REDUCING POINT SOURCE POLLUTANTS BY 2015. : (Target = 4) Waterways)	**4) Waterways** • Condition: Water quality	
Indicator: **Structure (age class distribution)**			
-	• 5.0 JARRAH-MARRI SYSTEMS : 5) BROAD GOAL: IDENTIFY KEY INTERVENTIONS (E.G. FIRE, WEED, FERAL ANIMAL, DISEASE & CONNECTIVITY PLANS) BY 2012 AND IMPLEMENT KEY ACTIONS TO IMPROVE THE CONSERVATION STATUS OF JARRAH-MARRI SYSTEMS BY 2015 : (Target = 5) Jarrah-marri Systems)	**5) Jarrah-marri Systems** • Landscape Context: Landscape pattern (mosaic) & structure	
Indicator: **TBD**			
-	• 6.0 BLACK GLOVED WALLABY : 6) BROAD GOAL: OBTAIN BASELINE INFORMATION (NUMBERS, DISTRIBUTION AS INDICATOR OF HEALTHY BUSH) ABOUT BLACK-GLOVED WALLABIES (AND FAUNA WITH SIMILAR HABITAT REQUIREMENTS/THREATS) IN THE AUGUSTA-MARGARET RIVER LANDSCAPE BY 2013, TO DRIVE KEY INTERVENTIONS FOR IMPROVING THEIR VIABILITY BY 2015 : There is an assumption that the populations are functioning well in the large forested area to the east (Target = 6) Black-gloved wallaby)	**6) Black-gloved wallaby** • Landscape Context: Movement across the landscape • Size: Distribution and abundance	
Indicator: **Timing of fires**			
-	• 3.0 WETLAND SYSTEMS : 3) BROAD GOAL: TO COLLATE INFORMATION (RESEARCH, LEGISLATION ETC.) ON WATER USE, FIRE, WEEDS ETC. FOR WETLANDS BY 2012. TO IMPLEMENT LANDSCAPE-WIDE INTERVENTIONS TO REVERSE THE TREND OF DEGRADING WETLANDS BY 2015. : (Target = 3) Wetland systems)	**3) Wetland systems** • Landscape Context: Fire regime - (timing, frequency, intensity, extent)	
Indicator: **Total extent (as a % of original)**			
-	• 5.0 JARRAH-MARRI SYSTEMS : 5) BROAD GOAL: IDENTIFY KEY INTERVENTIONS (E.G. FIRE, WEED, FERAL ANIMAL, DISEASE & CONNECTIVITY PLANS) BY 2012 AND IMPLEMENT KEY ACTIONS TO IMPROVE THE CONSERVATION STATUS OF JARRAH-MARRI SYSTEMS BY 2015 : (Target = 5) Jarrah-marri Systems)	**5) Jarrah-marri Systems** • Size: Size / extent of characteristic communities / ecosystems	
Indicator: **Vegetation condition**			

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Methods	Objectives	Key Indicator References by Target (w/Current Indicator Measurement)	Threat References by Target (w/Current Indicator Measurement)
-	• 5.0 JARRAH-MARRI SYSTEMS : 5) BROAD GOAL: IDENTIFY KEY INTERVENTIONS (E.G. FIRE, WEED, FERAL ANIMAL, DISEASE & CONNECTIVITY PLANS) BY 2012 AND IMPLEMENT KEY ACTIONS TO IMPROVE THE CONSERVATION STATUS OF JARRAH-MARRI SYSTEMS BY 2015 : (Target = 5) Jarrah-marri Systems)	**5) Jarrah-marri Systems** • Condition: Vertical structure	
Indicator: **Vegetation condition class**			
-	• 4.0 WATERWAYS : 4) BROAD GOAL: TO INCREASE THE STREAM FORESHORE CONDITION OF KEY RIVERS (>50% OF THEIR LENGTH IN A OR B GRADE) BY 2020, ENSURE NO NEW INTRODUCTIONS OF FERAL FISH OR CRUSTACEANS, AND DEVELOP STRATEGIES FOR REDUCING POINT SOURCE POLLUTANTS BY 2015. : (Target = 4) Waterways)	**4) Waterways** • Condition: Stream foreshore condition	

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Assessment of Target Viability

Conservation Target	Key Attribute (Category)	Indicator	Current Indicator Measurement	Rating Comments: (Poor, Fair Good Very Good)	Current Rating and Date	Desired Rating and Date
1) Scott Coastal Plain	Species composition / dominance [1] (Condition)	Community and species diversity	-	**Poor:** TBD **Fair:** - **Good:** - **Very Good:** TBD	Good [2] *Aug 15, 2010*	Good
1) Scott Coastal Plain	Connectivity among communities & ecosystems [3] (Landscape Context)	Ecological linkages/proximity analysis [4]	-	**Poor:** Proximity Analysis Level 3 and other native vegetation\ **Fair:** Proximity Analysis Level 2 **Good:** Proximity Analysis Level 1b & 1c **Very Good:** Proximity Analysis Level 1a	Good [5] *Aug 15, 2010*	Very Good [6]
1) Scott Coastal Plain	Hydrologic regime - (timing, duration, frequency, extent) [7] (Landscape Context)	Changes in hydrological regime	-	**Poor:** TBD **Fair:** - **Good:** - **Very Good:** TBD	Good [8] *Aug 15, 2010*	Good
1) Scott Coastal Plain	Distribution and abundance [9] (Size)	Honey possums [10]	-	**Poor:** - **Fair:** - **Good:** - **Very Good:** -	Good [11] *Aug 15, 2010*	Good
1) Scott Coastal Plain	Size / extent of characteristic communities / ecosystems [12] (Size)	Based on % of original remaining, rating required for each specific communities within the broad target (Mattiske mapping) [13]	-	**Poor:** <360 ha **Fair:** 360 ha **Good:** 1070 ha **Very Good:** 1780 ha	Good [14] *Aug 15, 2010*	Good
2) Leeuwin Naturaliste Ridge	Species composition / dominance (Condition)	Community and species diversity [15]	Good	**Poor:** TBD **Fair:** - **Good:** - **Very Good:** TBD	Good *Aug 15, 2010*	Good
2) Leeuwin Naturaliste Ridge	Hydrologic regime - (timing, duration, frequency, extent) [16] (Landscape Context)	Changes in hydrological regime [17]	-	**Poor:** Water stops running over to feed the Tufa **Fair:** Water sometimes runs over and feeds the Tufa **Good:** Water often runs over and feeds the Tufa **Very Good:** Water constantly runs over and feeds the Tufa	Fair *Oct 15, 2010*	Good
2) Leeuwin Naturaliste Ridge	Landscape pattern (mosaic) & structure [18] (Landscape Context)	Ecological linkages/proximity analysis [19]	Good	**Poor:** Proximity Analysis Level 3 and other native vegetation\ **Fair:** Proximity Analysis Level 2 **Good:** Proximity Analysis Level 1b & 1c **Very Good:** Proximity Analysis Level 1a	Very Good [20] *Aug 15, 2010*	Very Good
2) Leeuwin Naturaliste Ridge	Size / extent of characteristic communities / ecosystems (Size)	Based on % of original remaining, rating required for each specific communities within the broad target (Mattiske mapping) [21]	Good	**Poor:** TBD **Fair:** - **Good:** - **Very Good:** TBD	Good *Aug 15, 2010*	Good
3) Wetland systems	Fire regime - (timing, frequency, intensity, extent) [22] (Landscape Context)	Timing of fires	Good?	**Poor:** TBD **Fair:** - **Good:** - **Very Good:** TBD	Good [23] *Aug 15, 2010*	Good [24]
3) Wetland systems	Hydrologic regime - (timing, duration, frequency, extent) [25] (Landscape Context)	Changes in hydrological regime	-	**Poor:** TBD **Fair:** - **Good:** - **Very Good:** TBD	Fair [26] *Aug 15, 2010*	Good

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Conservation Target	Key Attribute (Category)	Indicator	Current Indicator Measurement	Rating Comments: (Poor, Fair Good Very Good)	Current Rating and Date	Desired Rating and Date
3) Wetland systems	Organic structure & stability [27] (Landscape Context)	Geocrinia alba, G. vitellina, Engaewa (species sensitive to disturbance, trampling etc) [28]	-	**Poor:** - **Fair:** not many **Good:** quite a lot **Very Good:** lots	Good [29] *Aug 15, 2010*	Good
3) Wetland systems	Size / extent of characteristic communities / ecosystems [30] (Size)	Characteristic assemblages	-	**Poor:** - **Fair:** - **Good:** - **Very Good:** -	Fair [31] *Aug 15, 2010*	Good
4) Waterways	Species composition / dominance [32] (Condition)	Fauna assemblages	-	**Poor:** No mussels **Fair:** - **Good:** - **Very Good:** presence of mussels	Fair [33] *Oct 15, 2010*	-
4) Waterways	Stream foreshore condition (Condition)	Vegetation condition class [34]	based on % of stream foreshore in A or B grade	**Poor:** 0 - 25 % in A or B grade **Fair:** 25 - 50 % in A or B grade **Good:** 50 - 75 % in A or B grade **Very Good:** 75 - 100 % A or B grade	Fair *Oct 15, 2010*	Very Good
4) Waterways	Water quality [35] (Condition)	Standard physical and chemical parameters	-	**Poor:** - **Fair:** - **Good:** - **Very Good:** -	Good *Oct 15, 2010*	- [36]
4) Waterways	Hydrologic regime - (timing, duration, frequency, extent) (Landscape Context)	Environmental flow [37]	-	**Poor:** TBD **Fair:** TBD **Good:** TBD **Very Good:** TBD	Fair *Oct 15, 2010*	Good [38]
5) Jarrah-marri Systems	Pollination, dispersal [39] (Condition)	Guild of pollinators [40]	-	**Poor:** Red tail bee absent + a poor complement of birds **Fair:** Red tail bee + a partial complement of birds (including the many insectivorous species - Golden whistler, wrens, scrubwrens **Good:** Red tail bee + a good complement of birds (including the many insectivorous species - Golden whistler, wrens, scrubwrens **Very Good:** Red tail bee + a full complement of birds (including the many insectivorous species - Golden whistler, wrens, scrubwrens	Fair [41] *Aug 15, 2010*	Good
5) Jarrah-marri Systems	Tree health [42] (Condition)	Canopy condition	-	**Poor:** TBD **Fair:** TBD **Good:** TBD **Very Good:** TBD	Fair *Aug 15, 2010*	Good
5) Jarrah-marri Systems	Trophic structure [43] (Condition)	Presence of chuditch [44]	-	**Poor:** TBD **Fair:** TBD **Good:** TBD **Very Good:** TBD	Fair *Aug 15, 2010*	Good
5) Jarrah-marri Systems	Vertical structure [45] (Condition)	Vegetation condition [46]	-	**Poor:** TBD **Fair:** TBD **Good:** TBD **Very Good:** TBD	Fair [47] *Aug 15, 2010*	Good
5) Jarrah-marri Systems	Landscape pattern (mosaic) & structure (Landscape Context)	Structure (age class distribution) [48]	-	**Poor:** TBD **Fair:** TBD **Good:** TBD **Very Good:** TBD	Fair [49] *Aug 15, 2010*	Good

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Conservation Target	Key Attribute (Category)	Indicator	Current Indicator Measurement	Rating Comments: (Poor, Fair Good Very Good)	Current Rating and Date	Desired Rating and Date
5) Jarrah-marri Systems	Landscape pattern (mosaic) & structure [50] (Landscape Context)	Plant species composition	-	**Poor:** Red tail bee absent **Fair:** TBD **Good:** TBD **Very Good:** TBD	Good [51] *Aug 15, 2010*	Very Good
5) Jarrah-marri Systems	Size / extent of characteristic communities / ecosystems [52] (Size)	Total extent (as a % of original) [53]	-	**Poor:** TBD **Fair:** TBD **Good:** TBD **Very Good:** TBD	Good *Aug 15, 2010*	Good
6) Black-gloved wallaby	Landscape pattern (mosaic) & structure [54] (Landscape Context)	Ecological linkages/proximity analysis [55]	-	**Poor:** Proximity Analysis Level 3 and other native vegetation\ **Fair:** Proximity Analysis Level 2 **Good:** Proximity Analysis Level 1b & 1c **Very Good:** Proximity Analysis Level 1a	Fair *Oct 15, 2010*	-
6) Black-gloved wallaby	Movement across the landscape [56] (Landscape Context)	TBD	-	**Poor:** lots of fences/ roads affecting movement **Fair:** some fences/roads affecting movement **Good:** few fences/roads affecting movement **Very Good:** No fences/roads affecting movement	Fair	-
6) Black-gloved wallaby	Distribution and abundance (Size)	TBD	-	**Poor:** Nil (Alternative - 0-25% sites occupied) **Fair:** Breeding groups present (Alternative 25-50% of sites occupied) **Good:** breeding groups genetically interacting (Alternative 50-75% of sites occupied) **Very Good:** breeding groups thriving (Alternative 75-100% of sites occupied)	Fair	-

COMMENTS:

1. There is old information - recovery plans that have been done before Greg Keighery paper off the web - diversity of Scott River National Park and the Camping Reserve (small reserve area with a whole section of flora that do not occur anywhere else) Most TEC are in road reserves and private lands - e.g. Governer Broom Road Difficult to classify - Webb says it is good - based on exisitng - Drew says much is gone - Margaret much not sustainable - big dairys, phytoph, decline water table and weeds (pasture weeds), stock

2. Currently good, but with some potential to improve through additional purchase/reservation (DB)

3. Linkages through SWE - keep all linkages in 1A category (Kim Williams, DEC 20August2010 - this constitutes very good in terms of connectivity The South West Regional Ecological Linkages Project has categorised a range of linkage values based on proximity and regional significance. Molloy, S., Wood, J., Hall, S., Waldrodt, S. and Whisson, G. (2009) South West Regional Ecological Linkages Technical Report. Western Australian Local Government Association and Department of Environment and Conservation, Perth.

4. The rationale for deciding how the individual ratings are determined was estimated (Barry Heydenrych 31August2010) using the categories from Molloy et. al. 2009, and applying them to the categories as follows: Very Good: Proximity Analysis Level 1a (ref: Kim Williams, DEC) Good: Proximity Analysis Level 1b & 1c (identified in the workshop as the most appropriate current category - maps in Molloy et. al. 2009 confirm this. Fair: Proximity Analysis Level 2a, 2b & 2c Poor: Proximity Analusis Level 3a, 3b & 3c and other less connected native vegetation Where: Proximity analysis Level 1 The whole of all patches with a proximity to a Regional Ecological Linkage of the following scales: a) With an edge touching or <100m from a Regional Ecological Linkage; b) All other patches with an edge touching or <100m from a patch selected in a): and, c) All other patches with an edge touching or <100m from a patch selected in b) Proximity analysis Level 2 The whole of all patches and Regionally Significant Assets with a proximity to a Regional Ecological Linkage of the following scales: a) With an edge touching or <500m from a Regional Ecological Linkage; b) All other patches with an edge touching or <500m from a patch selected in a): and, c) All other patches with an edge touching or <500m from a patch selected in b) Proximity analysis Level 3 The whole of all patches and Regionally Significant Assets with a proximity to a Regional Ecological Linkage of the following scales: a) With an edge touching or <1000m from a Regional Ecological Linkage; b) All other patches with an edge touching or <1000m from a patch selected in a): and, c) All other patches with an edge touching or <1000m from a patch selected in b) Ref: Molloy et. al. 2009

5. Currently good, but with some potential to improve through additional purchase/reservation (DB)

6. Want it to require little human intervention to maintain for future

7. Aquifer changes (some dependent on Yaragadee; others on other aquifers). Changes in water levels in wetlands can lead to acidification (exposure of acid sulphate soils)

8. Currently good, but with some potential to improve through additional purchase/reservation (DB)

9. Honey possums are dependent on sequence of flowering of suite of proteaceous, myrtaceae & Ericaceae spp, which are a signicant component of Scott River Plain vegetation. Food sources - and therefore Honey possums - are vulnerable to Phytophthora and too frequent fires. Also highly vulnerable to predation because of daytime resting on ground (often not with much cover). Honey possum distribution and abundance will therefore closely reflect extent, diversity and condition of proteaceous communities.

10. The rationale for deciding how the individual ratings are determined was estimated (Barry Heydenrych 31August2010) using the categories from Molloy et. al. 2009, and applying them to the categories as follows: Very Good: Proximity Analysis Level 1a (ref: Kim Williams, DEC) Good: Proximity Analysis Level 1b & 1c (identified in the workshop as the most appropriate current category - maps in Molloy et. al. 2009 confirm this. Fair: Proximity Analysis Level 2a, 2b & 2c Poor: Proximity Analusis Level 3a, 3b & 3c and other less connected native vegetation Where: Proximity analysis Level 1 The whole of all patches with a proximity to a Regional Ecological Linkage of the following scales: a) With an edge touching or <100m from a Regional Ecological Linkage; b) All other patches with an edge touching or <100m from a patch selected in a): and, c) All other patches with an edge touching or <100m from a patch selected in b) Proximity analysis Level 2 The whole of all patches and Regionally Significant Assets with a proximity to a Regional Ecological Linkage of the following scales:

11. Currently good, but with some potential to improve through additional purchase/reservation (DB)

12. Size attribute needs to be applied at community level, not for all of the Scott River Plain Based on Mattiske mapping - back of biodiversity discussion paper Overall ha added from literature - Feb 2011 - Gibson, N, Keighery, G & Keighery, B 2000. Threatened plan communities of Western Australi.1 The ironstone communities of the Swan and Scott Coastal Plains. Journal of the Royal Society of Western Australia, 83:1-11

13. Added in from literature Gibson, Keighery & Keighery, 2000, based on original extent, current extent and an average of these two as an estimate of what would comrpise a move from fair to good. Does not take into account community level differences within this target

14. Currently good, but with some potential to improve through additional purchase/reservation (DB)

15. Based on current veg mapping

16. Many species and systems are dependent on having a balance hyrdology, 'Caves and Tufa - very obvious when changes occur Is quality a function of quantity? (salinity, pH - check on work on Yaragadee - seems need a similar survey for this area)

17. Different catchments have different regimes, but some where extraction for example is large (Leeuwin Swamp) (Augusta drinking water) - it is affecting the Leeuwin snail -

18. connectivity, diversity and pattern

19. Based on current veg mapping

20. SWREL Report shows that all links on the ridge are within native vegetation

21. Based on current veg mapping

22. Fire timing important in relation to whether peat burns. Aim is to keep fire out of the wetlands in dry conditions. GWJ to fill in indicator ratings for this. Brumation - torpor for amphibians and reptiles can do this in dry conditions (hibernation like activity) Frequency is important - how long between fires, even if at the right season - intensity issue (Busselton - fire burnt out a wetland in summer - not showing signs of recovery)

23. Based on GWJ's assessment

24. Expect it's good at the moment; climate and water extraction changes indicate a decreasing trend, probably strong. May be fire management methods to protect from dry season burning by preventiitive methods in winter.

25. Peat oxidises or burns if hydrology changes (loss of water level) GWJ to provide information on indicators Some areas in Yaragadee report will cover some of this - Yaragadee - Spearwood Brook, Rosa Brook

26. Likely to be variable across the project area?? But declining across the area due to general drying (climate change) and in some cases due to water diversions. Stuffed in cleared areas.

27. GWJ

28. Monitoring available for Geocrinia - DEC (Kim Williams)

29. Trend may vary in particular wetlands

30. Each wetland likely to have a characteristic assemblage, not all likely to be known and will require research

31. Have lost a lot up to 1990s. G alba lost about 70% of habitat up to 1980s. Some improvement since then due to fencing of wetlands, but condition still decreasing (due mostly to hydrology). Source: GWJ

32. Need to list actual aquatic fauna Pierre Horwitz to be approched for help with indicators in the following reference: Migration patterns of fishes of the Blackwood, River and relationships to groundwater intrusion. Report to the Department of Water, Government of Western Australia by Stephen J. Beatty, Fiona McAleer and David L. Morgan November 2009 Centre for Fish and Fisheries Research, Murdoch University, it has been noted that that groundwater plays "an important role in maintaining relictual fish fauna in a major river system of this region. This study identifies two species that are appropriate as indicators of river connectivity and in the setting and monitoring of Ecological Water Requirements (EWRs) for this river in light of groundwater extraction, increasing salinisation and reduced rainfall (and thus surface water run■off and groundwater recharge) as a consequence of climate change. In the main channel of the Blackwood River, the study found a strong relationship between the upstream movement of Freshwater Cobbler Tandanus bostocki through riffle zones and discharge during the baseflow period, i.e. March in 2006, 2007, 2008 and 2009. The species was found to undergo large localised movements in the main channel of the Blackwood River that were variable both spatially and temporally. Movements during low flow periods (i.e. highest proportional contribution by groundwater to total flow) were best explained and highly correlated with amount of discharge. It is proposed these movements are probably related to feeding rather than spawning activity as large numbers of small, immature individuals (the study found the females of the species matured at ~172 mm Total Length (TL)) were recorded moving through the riffle zones. Furthermore, by examining the reproductive biology of the species, peak spawning was shown to occur from October to

December (i.e. outside the baseflow period). Subsequent modelling of upstream movements of Freshwater Cobbler over two riffle zones during the driest month (i.e. March) determined that the level of discharge and subsequent riffle depths that would preclude upstream passage by the species were 381.5 l/sec (0.18 m depth) and 101.9 l/sec (0.05 m depth), for the riffles downstream and upstream of the major groundwater discharge zone, respectively. The significance of riffle access to sustaining the population requires further research, however, it is the largest bodied fish of the river and obviously utilises these riffle habitats in large numbers during baseflow. Therefore, if baseflow discharge maintains adequate depth on these riffle zones such that this species is able to access them, then it could be assumed smaller bodied fishes could also access or negotiate them. It 3 is therefore proposed (along with ensuring the sustainability of the Balston's Pygmy Perch in Milyeannup Brook) that this species should become an indicator of ecological river connectivity during baseflow and be incorporated in monitoring the adequacy of determined EWRs of the river. Furthermore, in terms of an ecological trigger, the rate of future groundwater extraction from the Leederville and Yarragadee Aquifers should not exceed that which will continue to enable this species to access these riffle zones during the baseflow period or lead to a reduction in the baseflow stream length in Milyeannup Brook. These data represent a comprehensive baseline of fish communities in arguably one of the region's most important river systems, and highlight the value in long term monitoring of a diverse range of aspects relating to the ecology of these fishes. These findings have considerable implication for setting and monitoring Ecological Water Requirements of this and other rivers in this region; particularly in light of regional groundwater extraction pressures and reduced rainfall due to predicted climate change.

33. need measurement on fauna e.g. fish presence etc.

34. Based on foreshore condition work - see State of Environment Strategy 2009, Stream condition in the Cape Cape subregion 2002,

35. Macro invertebrates not that useful in some systems, do not find that much for example in the Margaret River

36. Water Corp reports, stream condition reports Cape to Cape, Blackwood is not in good condition but the others are not good - check with reports, and possibly leave Blackwood out if management not possible to influence

37. The environmental flow is what is left over if allocation and abstraction occurs - but is arbitrary

38. Need to get info on environmental flows, % values Different rivers different quality There was some discussion about the overall condition of the rivers in the Margaret River Shire, the overall condition of rivers in the Cape to Cape Subregion is good (Cape to Cape, 2002, Stream condition in the Cape to Cape subregion, southwest Western Australia 2002), but the quality of the Blackwood and Scott is not as good, meaning that the overall health of rivers in the Shire of Augusta Margaret River may be less than good.

39. Need to consider birds, mammals, invertebrates. Bird assemblage fairly complete, mammals not, invertebrates dunno. Red tailed bee - Trichocolletes erythrurus is a good indicator of fair to good understorey - feeds on all peas (Fabaceae), e.g. hardenbergia, bossea etc., and pea mimics (Bee orchid, morning irisis), but not known from areas with poor understorey and revegetation and limited by distance - need to know critical movement thresholds - drop out of the system where poor connectivity (e.g. in Kings Park but not in nearby pea filled (e.g. hardenbergia thriving but red tail bee not seen) suburban gardens (Margaret Moir). only live for a short period & feed in spring- nest in sand in ground close to food source - male dies first, then female lays eggs and dies, overwinter as larvae. specialist long tounge - niche feeder where honeybees cant get to Buzz pollination Fill in with more information from Don Bradshaw, GWJ and DEC

40. Will (maybe) be different ratings for each polloinator group

41. Bird asemblages likely to be good; mammals poor-fair; invertebrates don't know.

42. Marri decline (cankers, defoliators, other pathogens); seems to be increasingly affecting overstorey species. Phytophthora as well Some marri work Spectera - aerial images - how active the canopy is (can use vineyards), talking about using that for dieback decline - Paul, Barbara & Giles Hardy - Murdoch Veg machine - use to look at

43. Loss of native predators and introduction of ferals a major cause of loss of small mammals, birds, other critters. Focus on chuditch (rather than suite of native predators) to more accurately reflect relatrionship with populations of native prey species Need to look at trapping success and history elsewhere - follow up with DEC (Kim Williams)

44. Likely to be different ratings for different native predators: eagles & other raptors (probably OK), chuditch (probably poor-fair, greatly reduced from original), goannas, carpet pythons (probably only fair at best). Total loss of dingoes, thylacine. Kim Williamns: chuditch actually in better condition than this and likely to be reduced in priority rating.

45. This implies that there are a number of layers of vegetation from ground covers through to old hollow bearing trees range of indicator species such as hollow depent fauna Can use existing vegetation condition criteria to examine

46. Has changed dramatically

47. Reduced logging has contributed to a mild increase in trend overall but Phytophthora contributing to decrease, as will climate change. Will be poorer condition in some specific areas.

48. Has changed dramatically

49. Reduced logging has contributed to a mild increase in trend overall but Phytophthora contributing to decrease, as will climate change. Will be poorer condition in some specific areas.

50. Influenced by Phytophthora, grazing, other disturbances, but also a reflection of soil types, etc. Good representation of suites of species, but need more survey work - assumption based on existing rem veg

51. GWJ thinks it is currently good; MM not so convinced. Need to look at the data available and determine our reference condition and areas.

52. Already lost all we're prepared to.

53. Not bad cf to other SW Aust areas, but overall loss in total area is high.

54. We need more information to make informed decisions - need to know where they are at the moment

55. see proximity analysis info Molloy et al

56. Roads and fences are impeding movement Difficulty in moving across the landscape - e.g. Bramley may not be viable on its own, how to they move to other areas, dogs nearby, fences etc.(need to look at if they are in Bramley) Roo shooters - and farmers for information Follow up with DEC, survey with community

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Strategy Effectiveness

Objective: 1.0 SCOTT COASTAL PLAIN : 1) BROAD GOAL: TO FILL IN INFORMATION GAPS ON ECOLOGICAL PROCESSES AFFECTING BIODIVERSITY ON THE SCOTT COASTAL PLAIN BY 2012, TO DRIVE CURRENT ACTIONS AND FUTURE CONSERVATION ACTIONS BY 2015. : (Target = 1) Scott Coastal Plain)

Percent Complete: 0%

Indicator: Based on % of original remaining, rating required for each specific communities within the broad target (Mattiske mapping)

Measurement Report:

Measure	Date	Source	Trend	Comments
	Aug 15, 2010	Rough Guess	Mild Decrease	Will be different for each community. Ironstone communities likely to be lowest rating
	Aug 15, 2010	Rapid Assessment	Mild Decrease	Currently good, but with some potential to improve through additional purchase/reservation (DB)

Indicator: Changes in hydrological regime

Measurement Report:

Measure	Date	Source	Trend	Comments
	Aug 15, 2010	Rough Guess	Mild Decrease	
	Aug 15, 2010	Rapid Assessment	Mild Decrease	Currently good, but with some potential to improve through additional purchase/reservation (DB)

Indicator: Community and species diversity

Measurement Report:

Measure	Date	Source	Trend	Comments
	Aug 15, 2010	Rough Guess	Mild Decrease	In places, very good now. Will need definition by community.
	Aug 15, 2010	Rapid Assessment	Mild Decrease	Currently good, but with some potential to improve through additional purchase/reservation (DB)

Indicator: Ecological linkages/proximity analysis

Measurement Report:

Measure	Date	Source	Trend	Comments
	Aug 15, 2010	Rapid Assessment	Mild Decrease	Currently good, but with some potential to improve through additional purchase/reservation (DB)

Indicator: Honey possums

Measurement Report:

Measure	Date	Source	Trend	Comments
Population of Honey possums	Aug 15, 2010	Expert Knowledge	Mild Decrease	In areas unburnt for 25 years, condition is good, but in burnt areas Honey possums population is down by at least 50%. Might need indicator ratings separately for burnt & unburnt areas (most of the area < 25 years unburnt currently??)
	Aug 15, 2010	Rapid Assessment	Mild Decrease	Currently good, but with some potential to improve through additional purchase/reservation (DB)

Objective: 1.1 Scott Coastal Plain : Undertake a literature review in early 2013, for consultation and finalisation of a short statement on the ecological implications of water abstraction on biodiversity of the Scott Coastal Plain by late 2013

Percent Complete: 0%

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Objective: 1.2 Scott Coastal Plain : By mid 2013 initiate dialogue with appropriate stakeholders to investigate the possible incorporation of these criteria by the plantation industry for production of a feasibility statement by late 2013

Percent Complete: 0%

Objective: 1.3 Scott Coastal Plain : As part of the Scott River Action Plan underway in 2013 develop a Phytophthora dieback (and other pathogen) scoping document by mid-2013, establish a funding source by late 2013, commission a study in early 2014 with a report finalisation date of mid 2014.

Percent Complete: 0%

Objective: 1.4 Scott Coastal Plain & Black Gloved Wallaby : Undertaken consultation and literature search by mid 2013, with a statement of effectiveness of different controls and recommendations by late 2013.

Percent Complete: 0%

Objective: 1.5 Scott Coastal Plain : As part of future Commonwealth Government funding programs, develop an application by early 2013 for implementation of a fencing incentive project by late 2013/early 2014.

Percent Complete: 0%

Objective: 1.6 Scott Coastal Plain : As part of the Scott River Action Plan, identify practical methods by which planning decisions by the WA Planning Commission and Local Government can improve ecological outcomes in a succinct document by late 2013.

Percent Complete: 0%

Objective: 1.7 Scott Coastal Plain : Incorporate the review of the Scott River Water Quality Improvement Plan (Department of Water) and identify links to NRM groups as part of the Scott River Action Plan with key steps identified and resourced by mid 2013, and the review undertaken by late 2013.

Percent Complete: 0%

Objective: 1.8 Scott Coastal Plain : Develop funding application for Scott River Action Plan by early 2013, for initiation during mid 2013 and implementation by 2014 and beyond.

Percent Complete: 0%

Objective: 1.9 Scott Coastal Plain & Jarrah-marri Systems : Continue with ongoing weed actions in known priority areas during 2013 and beyond

Percent Complete: 0%

Objective: 2.0 LEEUWIN NATURALISTE RIDGE : 2) BROAD GOAL: INCREASE KNOWLEDGE OF THE KEY BIODIVERSITY DRIVERS SUCH AS WATER & FIRE (AND RELATED WEEDS) OF THE LEEUWIN NATURALIST RIDGE BY 2013 AND IMPLEMENT INTERVENTIONS FOR INCREASING THE VIABILITY OF THIS TARGET BY 2015. : (Target = 2) Leeuwin Naturaliste Ridge)

Percent Complete: 20%

% Met	Date Updated	Comments
20	Jan 31, 2013	-

Indicator: Based on % of original remaining, rating required for each specific communities within the broad target (Mattiske mapping)

Measurement Report:

Measure	Date	Source	Trend	Comments
Good	Aug 15, 2010	Expert Knowledge	Flat	

Indicator: Changes in hydrological regime

Measurement Report:

Measure	Date	Source	Trend	Comments
	Oct 15, 2010	Not Specified	Not Specified	

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Indicator: Community and species diversity

Measurement Report:

Measure	Date	Source	Trend	Comments
Good	Aug 15, 2010	Expert Knowledge	Flat	

Indicator: Ecological linkages/proximity analysis

Measurement Report:

Measure	Date	Source	Trend	Comments
Good	Aug 15, 2010	Expert Knowledge	Flat	SWREL Report shows that all links on the ridge are within native vegetation

Objective: 2.1 Leeuwin Naturaliste Ridge : Initiate discussions with Department of Water and other stakeholders on water allocation for coastal aquifers by mid 2013, aquire funding and appoint consultant by late 2013 to develop a strategy with management recommendations by late 2014.

Percent Complete: 0%

Objective: 2.2 Leeuwin Naturaliste Ridge : Develop a brief for this biodiversity communications strategy by mid 2013, funding by late 2013 with implementation of key aspects of the strategy underway by mid 2014.

Percent Complete: 0%

Objective: 2.3 Leeuwin Naturaliste Ridge : Initiate dialogue in early 2013 with a view to establishing a regular liaison opportunity (e.g. sitting on appropriate respective committees) between Cape to Cape Catchment Group and DEC to help for the purposed of improving integrate of strategies by late 2013.

Percent Complete: 0%

Objective: 2.4 Leeuwin Naturaliste Ridge : In consultation with appropriate stakeholders, aquire funding by late 2013, develop an initial feral control plan for the Leeuwin Naturaliste Ridge by early 2014, for implementation in late 2014 and beyond.

Percent Complete: 5%

% Met	Date Updated	Comments
5	Feb 6, 2013	-

Objective: 2.5 Leeuwin Naturaliste Ridge : By mid 2013, initiate a comprehensive mapping excercise for arum lily, seek and aquire funds in late 2013 for implementation of a strategic control and monitoring program by early 2014.

Percent Complete: 15%

% Met	Date Updated	Comments
15	Feb 6, 2013	-

Objective: 2.6 Leeuwin Naturaliste Ridge : By early 2013, identify though consultation, an outline plan targetting isolated weeds patches for implementation of actions by mid 2013 and beyond

Percent Complete: 10%

% Met	Date Updated	Comments
10	Feb 6, 2013	-

Objective: 2.7 Leeuwin Naturaliste Ridge : Integrate a Phytophthora dieback program for the Leeuwin Naturaliste Ridge with a Shire-wide strategy as follows: By late 2013 consult with key stakeholders involved with Phytophthora dieback to develop a funding application by early 2014, to develop a comprehensive plan for completion by mid 2014 for implementation by late 2014 and beyond.

Percent Complete: 0%

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Objective: 3.0 WETLAND SYSTEMS : 3) BROAD GOAL: TO COLLATE INFORMATION (RESEARCH, LEGISLATION ETC.) ON WATER USE, FIRE, WEEDS ETC. FOR WETLANDS BY 2012. TO IMPLEMENT LANDSCAPE-WIDE INTERVENTIONS TO REVERSE THE TREND OF DEGRADING WETLANDS BY 2015. : (Target = 3) Wetland systems)

Percent Complete: 5%

% Met	Date Updated	Comments
5	Jan 31, 2013	-

Indicator: Changes in hydrological regime

Measurement Report:

Measure	Date	Source	Trend	Comments
	Aug 15, 2010	Rapid Assessment	Not Specified	Likely to be variable across the project area?? But declining across the area due to general drying (climate change) and in some cases due to water diversions. Stuffed in cleared areas.

Indicator: Characteristic assemblages

Measurement Report:

Measure	Date	Source	Trend	Comments
	Aug 15, 2010	Not Specified	Mild Increase	Have lost a lot up to 1990s. G alba lost about 70% of habitat up to 1980s. Some improvement since then due to fencing of wetlands, but condition still decreasing (due mostly to hydrology). Source: GWJ

Indicator: Geocrinia alba, G. vitellina, Engaewa (species sensitive to disturbance, trampling etc)

Measurement Report:

Measure	Date	Source	Trend	Comments
	Aug 15, 2010	Not Specified	Flat	Trend may vary in particular wetlands

Indicator: Timing of fires

Measurement Report:

Measure	Date	Source	Trend	Comments
Good?	Aug 15, 2010	Expert Knowledge	Not Specified	Based on GWJ's assessment

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Objective: 3.1 Wetland systems : As part of a bigger fire and biodiversity plan, ensure that knowledge about wetlands being protected from fire is disseminated to key stakeholders by mid 2013, to ensure no fires in wetlands in the 2013/14 fire season and beyond.

Percent Complete: 5%

% Met	Date Updated	Comments
5	Feb 6, 2013	-

Objective: 3.2 Wetland systems & Waterways : Appropriate person to carry out dam legislation identified by mid 2013, funding acquired by late 2013, for report to be commissioned and completed by mid 2014.

Percent Complete: 0%

Objective: 3.3 Wetland systems & Waterways : Ensure that options for "off-line" dams are identified during 2013 and that this aspect is included in the "dam legislation" strategy due for completion by mid 2014.

Percent Complete: 0%

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Objective: 3.4 Wetland systems : Initiate discussions with Department of Water, DEC and other stakeholders on on ecological implication of water abstraction on wetland biodiversity by mid 2013, aquire funding and appoint consultant by late 2013 to develop a strategy with management recommendations by late 2014.

Percent Complete: 0%

Objective: 3.5 Wetland systems : Continue to include wetlands as part of fencing incentive projects in 2013, and by late 2013 developed a new project application for strategic fencing for acquiring of funds and implementation in 2014 and beyond.

Percent Complete: 25%

% Met	Date Updated	Comments
25	Feb 6, 2013	-

Objective: 3.6 Wetland systems : As part of the broader communication strategy and in established forums, ensure that messages of the importance of wetlands are communicated during 2013 and beyond.

Percent Complete: 0%

Objective: 3.7 Wetland systems : During 2013 and beyond, integrate projects involving grassy weeds in wetlands with DEC projects.

Percent Complete: 10%

% Met	Date Updated	Comments
10	Feb 6, 2013	-

Objective: 4.0 WATERWAYS : 4) BROAD GOAL: TO INCREASE THE STREAM FORESHORE CONDITION OF KEY RIVERS (>50% OF THEIR LENGTH IN A OR B GRADE) BY 2020, ENSURE NO NEW INTRODUCTIONS OF FERAL FISH OR CRUSTACEANS, AND DEVELOP STRATEGIES FOR REDUCING POINT SOURCE POLLUTANTS BY 2015. : (Target = 4) Waterways)

Percent Complete: 15%

% Met	Date Updated	Comments
15	Jan 31, 2013	-

Indicator: Environmental flow

Measurement Report:

Measure	Date	Source	Trend	Comments
	Oct 15, 2010	Not Specified	Not Specified	

Indicator: Fauna assemblages

Measurement Report:

Measure	Date	Source	Trend	Comments
	Oct 15, 2010	Not Specified	Not Specified	need measurement on fauna e.g. fish presence etc.

Indicator: Standard physical and chemical parameters

Measurement Report:

Measure	Date	Source	Trend	Comments
	Oct 15, 2010	Not Specified	Not Specified	

Indicator: Vegetation condition class

Measurement Report:

Measure	Date	Source	Trend	Comments

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based on % of stream foreshore in A or B grade	Oct 15, 2010	Not Specified	Flat	

Objective: 4.1 Waterways : Initiate discussions with Department of Water, DEC and other stakeholders on on ecological implication of water abstraction on waterway biodiversity by mid 2013, aquire funding and appoint consultant by late 2013 to develop a strategy with management recommendations by late 2014.

Percent Complete: 0%

Objective: 4.2 Waterways : By mid 2013 develop initial project brief for feral fish and crustaceans strategy for acquisition of funding by late 2013, finalisation of a report by early 2014 for implementation by mid 2014.

Percent Complete: 50%

% Met	Date Updated	Comments
50	Feb 6, 2013	-

Objective: 4.3 Waterways : Ensure ongoing integration of Cape to Cape's works with the work of the hairy marron recovery team in 2013 and beyond.

Percent Complete: 25%

% Met	Date Updated	Comments
25	Feb 6, 2013	-

Objective: 4.4 Waterways : Continue to include waterways as part of fencing incentive projects in 2013, and by late 2013 developed a new project application for strategic fencing (and provision of alternative stock watering points) for acquiring of funds and implementation in 2014 and beyond.

Percent Complete: 25%

% Met	Date Updated	Comments
25	Feb 6, 2013	-

Objective: 4.5 Waterways : Develop funding application for Scott River Action Plan by early 2013, for initiation during mid 2013 and implementation by 2014 and beyond.

Percent Complete: 0%

Objective: 4.6 Waterways : Initiate discussions with Department of Water, Local Government and Planning Commission and other stakeholders on water allocation for coastal aquifers by mid 2013, aquire funding and appoint consultant by late 2013 to develop a strategy with management recommendations by late 2014.

Percent Complete: 0%

Objective: 5.0 JARRAH-MARRI SYSTEMS : 5) BROAD GOAL: IDENTIFY KEY INTERVENTIONS (E.G. FIRE, WEED, FERAL ANIMAL, DISEASE & CONNECTIVITY PLANS) BY 2012 AND IMPLEMENT KEY ACTIONS TO IMPROVE THE CONSERVATION STATUS OF JARRAH-MARRI SYSTEMS BY 2015 : (Target = 5) Jarrah-marri Systems)

Percent Complete: 10%

% Met	Date Updated	Comments
10	Jan 31, 2013	-

Indicator: Canopy condition

Measurement Report:

Measure	Date	Source	Trend	Comments
	Aug 15, 2010	Rough Guess	Mild Decrease	

Indicator: Guild of pollinators

Measurement Report:

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Measure	Date	Source	Trend	Comments
	Aug 15, 2010	Rough Guess	Mild Decrease	Bird asemblages likely to be good; mammals poor-fair; invertebrates don't know.

Indicator: Plant species composition

Measurement Report:

Measure	Date	Source	Trend	Comments
	Aug 15, 2010	Not Specified	Flat	GWJ thinks it is currently good; MM not so convinced. Need to look at the data available and determine our reference condition and areas.

Indicator: Presence of chuditch

Measurement Report:

Measure	Date	Source	Trend	Comments
	Aug 15, 2010	Not Specified	Unknown	

Indicator: Structure (age class distribution)

Measurement Report:

Measure	Date	Source	Trend	Comments
	Aug 15, 2010	Not Specified	Flat	Reduced logging has contributed to a mild increase in trend overall but Phytophthora contributing to decrease, as will climate change. Will be poorer condition in some specific areas.

Indicator: Total extent (as a % of original)

Measurement Report:

Measure	Date	Source	Trend	Comments
	Aug 15, 2010	Not Specified	Flat	

Indicator: Vegetation condition

Measurement Report:

Measure	Date	Source	Trend	Comments
	Aug 15, 2010	Not Specified	Flat	Reduced logging has contributed to a mild increase in trend overall but Phytophthora contributing to decrease, as will climate change. Will be poorer condition in some specific areas.

Objective: 5.1 Jarrah-marri Systems : By late 2013 liaise with representatives from the Shire of Busselton and DEC with regards feral birds, scope options, acquire funding and develop and implement strategy that includes resource material by early 2014.

Percent Complete: 0%

Objective: 5.2 Jarrah-marri Systems : Terms of reference (& training needs) for cross-tenure terrestrial feral animal control program developed by mid 2013, designed and funding acquired by late 2013/early 2014 with implementation by mid 2014.

Percent Complete: 0%

Objective: 5.3 Jarrah-marri Systems : Maintain communication with WA Centre for Excellence during 2013 and beyond with correspondence, identification of applied research opportunities that meet monitoring objectives and invitations for staff to address groups on a regular basis.

Percent Complete: 0%

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Objective: 5.4 Jarrah-marri Systems : By mid 2013 identify resources required (and consult with WA Centre of Excellence) to develop resources and methods to promote best practice hygiene protocols to reduce tree decline by early 2014 for adoption by appropriate agencies by mid 2014.

Percent Complete: 15%

% Met	Date Updated	Comments
15	Feb 6, 2013	-

Objective: 5.5 Jarrah-marri Systems : Continue to include jarrah-marri as part of fencing incentive projects in 2013, and by late 2013 developed a new project application for strategic fencing of key linkages and poorly represented vegetation complexes for acquiring of funds and implementation in 2014 and beyond.

Percent Complete: 15%

% Met	Date Updated	Comments
15	Feb 6, 2013	-

Objective: 6.0 BLACK GLOVED WALLABY : 6) BROAD GOAL: OBTAIN BASELINE INFORMATION (NUMBERS, DISTRIBUTION AS INDICATOR OF HEALTHY BUSH) ABOUT BLACK-GLOVED WALLABIES (AND FAUNA WITH SIMILAR HABITAT REQUIREMENTS/THREATS) IN THE AUGUSTA-MARGARET RIVER LANDSCAPE BY 2013, TO DRIVE KEY INTERVENTIONS FOR IMPROVING THEIR VIABILITY BY 2015 : There is an assumption that the populations are functioning well in the large forested area to the east (Target = 6) Black-gloved wallaby)

Percent Complete: 10%

% Met	Date Updated	Comments
10	Jan 31, 2013	-

Indicator: Ecological linkages/proximity analysis

Measurement Report:

Measure	Date	Source	Trend	Comments
	Oct 15, 2010	Not Specified	Not Specified	

Indicator: TBD

Measurement Report:

Measure	Date	Source	Trend	Comments
Target: 6) Black-gloved wallaby, Category: Size, KEA: Distribution and abundance				
	-	Not Specified	Not Specified	
Target: 6) Black-gloved wallaby, Category: Landscape Context, KEA: Movement across the landscape				
	-	Not Specified	Not Specified	

Objective: 6.1 Black Gloved Wallaby : Design community black-gloved wallaby survey by mid 2012 for implementation during 2013 and beyond.

Percent Complete: 20%

% Met	Date Updated	Comments
20	Jan 31, 2013	-

Objective: 6.2 Black Gloved Wallaby : In consultation with other NRM groups and key stakeholders, in particular Dr Sandra Gillfillan and Prof. Don Bradshaw, scope a funding application by late 2013, for an application to aquire funds and initiate a regional baseline study during 2014.

Percent Complete: 0%

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Objective: 6.3 Black Gloved Wallaby : Following the collation and investigation of preliminary survey results by mid-late 2013, develop guidelines and fauna connectivity map as a draft by early 2014, with ongoing improvements as results of further black-gloved wallaby surveys are produced in late 2014 and beyond.

Percent Complete: 0%

Objective: 6.4 Black Gloved Wallaby : Ensure that requirements for key fauna such as black gloved wallabies form part of the scope (2013), development (2013-2014) and implementation (2014+) of the Fire and Biodiversity Plan.

Percent Complete: 0%

Objective: 6.5 Black Gloved Wallaby : Ensure that information from community fauna carried done in 2013 and beyond, incorporate information on location and predation of feral animals.

Percent Complete: 0%

Objective: 6.6 Black Gloved Wallaby : By late 2012/early 2013 disseminated information about black gloved wallabies though community survey, website and other means and incorporate information into broader landscape-wide communications strategy.

Percent Complete: 0%

Objective: 7.0 AMR LANDSCAPE : 7) BROAD GOAL: DEVELOP KEY LANDSCAPE-WIDE ECOLOGICAL STRATEGIES (FOR FIRE, CONNECTIVITY, WEEDS & FERAL FAUNA) BY 2013 TO ENSURE LONG TERM IMPLEMENTATION THROUGH TO 2020 AND BEYOND.

Percent Complete: 0%

Objective: 7.1 AMR Landscape : A Fire and Biodiversity Plan is scoped by early 2013, funding acquired and the plan commissioned by late 2013, developed and consultation undertaken during 2014 for adoption by mid 2014 (i.e. before the 2014/15 bushfire season)

Percent Complete: 10%

% Met	Date Updated	Comments
10	Feb 6, 2013	-

Objective: 7.2 AMR Landscape : By late 2012 by habitat connectivity considerations are guiding on-ground actions for key conservation targets and by late 2013 SW Regional Ecological Linkages information has been incorporated formally into this process.

Percent Complete: 0%

Objective: 7.3 AMR Landscape : By early 2013 a review of the AMR Shire weed strategy is underway, and completed by late 2013/early 2014

Percent Complete: 35%

% Met	Date Updated	Comments
35	Feb 6, 2013	-

Objective: 7.4 AMR Landscape : Terms of reference for comprehensive terrestrial feral animal control program developed by mid 2013, designed and funding acquired by late 2013/early 2014 with implementation by mid 2014.

Percent Complete: 0%

Objective: 7.5 AMR Landscape : By late 2013 consult with key stakeholders involved with Phytophthora dieback to develop a funding application by early 2014, to develop a comprehensive plan for completion by mid 2014 for implementation by late 2014 and beyond.

Percent Complete: 0%

Objective: 7.6 AMR Landscape : GIS layers and gaps for AMR Shire documented by mid 2013 and new layers obtained for use in planning projects by late 2013.

Percent Complete: 0%

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Objective: 7.7 AMR Landscape : Following acquisition of updated data layers by late 2013, develop protocols and methodology for mapping vegetation condition by early 2014.

Percent Complete: 0%

Objective: 8.0 AMR LANDSCAPE : 8) BROAD GOAL: ENSURE THAT ENABLING STRATEGIES (E.G. FUNDING, CAPACITY BUILDING, AND COMMUNICATIONS) FOR THE CAPE TO CAPE CATCHMENTS GROUP, LOWER BLACKWOOD LCDC, AND OTHER ASSOCIATED GROUPS ARE SCOPED AND DEVELOPED BY 2012, TO ENSURE THE EFFECTIVE IMPLEMENTATION OF CONSERVATION STRATEGIES FROM 2011 THROUGH TO 2020 AND BEYOND.

Percent Complete: 0%

Objective: 8.1 AMR Landscape : Requirements for long-term conservation funding scoped by early 2013, strategy developed by late 2013, and implemented by 2014.

Percent Complete: 10%

% Met	Date Updated	Comments
10	Feb 6, 2013	-

Objective: 8.2 AMR Landscape : By early 2013 incorporation of funding applications including training is in place, with funding for increased capacity for NRM groups to plan, implement, monitor and review conservation interventions by early 2014.

Percent Complete: 25%

% Met	Date Updated	Comments
25	Feb 6, 2013	-

Objective: 8.3 AMR Landscape : Biodiversity Communications Plan scoped by early 2013, funding acquired by late 2013, for implementation (in conjunction with existing communications projects) by early 2014.

Percent Complete: 0%
