Back to Top

ConPro

Gondwana Link: Ranges Link (Stirling to Porongurup) (ID: 1722)

Back to Top

Basic

Project Information

Contact Name: Keith Bradby
Project Start Date: August 15, 2007
Data Effective Date: June 30, 2012
Hectares:113,000
Sharing Status:
Ecoregion(s):

- Southwest Australia Woodlands

Operational Unit(s):

- Non-TNC

Country(ies):

- Australia

Associated Initiative(s): None

Project Description:
A Conservation Action Plan for the area between the Stirling Range and Porongurup National Parks was developed by the Ranges Link group, primarily during 2010 & 2011. The plan has assisted the group to provide more strategic direction to its work in improving conservation values through on-ground actions.
CAP history and current developments:
The original CAP was initiated at a workshop on 15 & 16 August 2007 in Albany with the following invitees and positions at the time: Margi Weir, then of Greening Australia, CAP Coaches Network; Wendy Bradshaw the of Greening Australia, author of the initial Wild Country scoping report for this area; Melinda Lyons, then of Green Skills; Therese Wade, then of Green Skills; Peter Luscombe, landholder & local ecologist; Keith Bradby, Director, Gondwana Link; Paula Deegan, then Manager of the Gondwana Link Knowledge Connection project; Simon Judd, then Wild Country Scientist, The Wilderness Society. Some further work was done by a selection of the above group at a meeting in Albany on 27 February 2008 (CAP_ Stirlingsto Porongurups_orig 080227.xls). The initial process was written up in a short report that outlined the process and listed the original targets (Wade, T. 2008. Gondwana Link. Stirlings to Forests Conservation Planning. Section One: Stirling Ranges to Porongurup Ranges. April 2008. Report prepared by Green Skills for the Gillamii Centre Cranbrook. Project funded by Lotterywest).
The current CAP was initiated at a meeting held on 4 May 2010 at the Porongurups attended by Barry Heydenrych (Greening Australia/Gondwana Link), Keith Bradby (Gondwana Link), Paula Deegan (contractor to Gondwana Link), Bella Bamford (then of Oyster Harbour Catchment Group), Judy Hunt, Lucia Quearry, Peter Luscombe & Heather Adams (Ranges Link - Oyster Harbour Catchment Group).
The CAP was progressed over the rest of 2010 and into 2011 by Barry Heydenrych (Greening Australia/Gondwana Link) with the assistance of Paula Deegan (Contractor to Gondwana Link) and meetings were attended by Judy Hunt, Lucia Quearry, Peter Luscombe & Heather Adams (Ranges Link - Oyster Harbour Catchment Group) and project officer Mark Waud (Oyster Harbour Catchment Group).
In early April 2011 the CAP was uploaded to the TNC's ConPro Website http://conpro.tnc.org/1722/ and during 2011, refinements of some of the objectives and strategies of the CAP took place, culminating in the publication of a booklet summarising key elements of the CAP [Ranges Link Group (2011). Ranges Link-Stirling to Porongurup Conservation Plan. Western Australia]. During the early part of 2012, the CAP was revisited with the group and updates and revisions were made and the CAP was reloaded to the ConPro website in July 2012.

Site/Scope Description:
What's at stake - the broader context:
Gondwana Link is one of the largest and most ambitious ecological programs in Australian history. Designed to protect and restore ecological resilience within one of the world's biodiversity hotspots, the completed Gondwana Link will stretch for 1000 kilometres across south western Australia, from the wet karri forests of the far south west to the mallee and woodland on the edge of the Nullarbor plain to the east. The area encompassing the Stirling Range and Porongurup National Parks is an important landscape in the Gondwana Link pathway. The Stirling Range was originally home to the Mineng and Goreng people whose name for it was Koi Kyeunu-ruff. The biological richness of the two national parks is well known; the Stirling Range National Park contains more than 1500 plant species, including 87 found nowhere else, and at least 138 orchid species or 38% of Western Australia's total. The nearby Porongurup National Park, although much smaller in extent is also ecologically very valuable. It is the largest inland remnant of native vegetation between the Stirling Ranges and the coast. It contains a disjunct flora association of the karri (Eucalyptus diversicolor) forest community - considered a relic of several thousand years ago when karri covered a larger area of the south west of Australia. The combination of raised hills and granite soils of the Porongurup National Park supports a range of plant communities and associated fauna, from tall open karri forest to low herblands. Over 700 native species of vascular plants have been recorded in the Porongurup National Park to date (one of the richest concentrations of plant species in Australia) and the area has been recognised as a separate vegetation system in its own right. Both the Stirling Range and Porongurup National parks provide damp refuges for Gondwanan relictual species such as certain spiders, which are more closely related to groups in mountainous areas of eastern Australia, Tasmania, New Zealand and other Gondwanan continents, than to the surrounding lowlands in the region. It is not surprising therefore that the Stirling to Porongurup area is so rich in biological diversity and endemism. The broader area for this Conservation Action Plan is approximately 113,000 hectares, incorporating most of the upper catchment area of the Kalgan River straddling the Stirling Range and Porongurup National Parks.
The Ranges Link focus area:
An area of over 40,000 hectares between the Stirling Range and Porongurup National Parks is the focus for the work of the Ranges Link group. It is situated in the Upper and Middle Catchment of the Kalgan River and is a transitional zone, characterised by extreme variation in rainfall, geology, soils and vegetation. The rainfall gradient is intense, declining by around 25 mm per kilometre in areas north of the Porongurup National Park. The soils range from young primary soils in the vicinity of the Porongurup to ancient, heavily weathered and redeposited soils to the north. The vegetation systems change from the tall karri forests on the slopes of the Porongurup Range to mallee-heath within 10 km to the north. Approximately 65% of the native vegetation of the area has been cleared for

agriculture with cropping/ grazing being the predominant land use, and some viticulture and plantation forestry in the south. A number of interesting fauna species are found within the Ranges Link area, from Gondwanan relics such as Mygalomorph spiders, land snails and giant earthworms associated with the wet-sclerophyll forests to wheatbelt-associated species such as the rare Western Whipbird and the endangered Carnaby's Black Cockatoo that nests in hollows of large trees such as Wandoo (white gum). The two well known national parks attract high numbers of tourists who enjoy sightseeing and nature-based recreation.

Project Goal Comment:
To increase the amount and quality of bushland between the Stirling Range and Porongurup National Parks to enable the area's rich biodiversity to persist across the agricultural landscape into the future.

Team Info:
The original CAP was initiated at a workshop on 15 & 16 August 2007 in Albany with the following invitees: Margi Weir, Greening Australia, CAP Coaches Network; Wendy Bradshaw, Greening Australia, author of the initial Wild Country scoping report for this area; Melinda Lyons, Greenskills; Therese Wade, Greenskills; Peter Luscombe, local ecologist; Keith Bradby, Director, Gondwana Link; Paula Deegan, Manager, Gondwana Link Knowledge Connection project; Simon Judd, Wild Country Scientist, The Wilderness Society.
Some further work was done by a selection of the above group at a meeting in Albany on 27 February 2008
(CAP_ Stirlingsto Porongurups_orig 080227.xls).
The initial process was written up in a short report that outlined the process and listed the original targets (Wade, T. 2008. Gonwana Link. Stirlings for Forests Conservation Planning. Section One: Stirling Ranges to Porongurup Ranges. April 2008. Report preprared by Green Skills for the Gillami Centre Cranbrook. Project funded by Lotterwest.
The current CAP was initiated at a meeting held on 4 May 2010 at the Porongurups attended by Barry Heydenrych, Keith Bradby, Paula Deegan (Gondwana Link), Bella Bamford (Oyster Harbour Catchment Group), Judy Hunt, Lucia Querry, Peter Luscombe & Heather Adams (Ranges Link - Oyster Harbour Catchment Group).

Full Team Compliment:
Amanda Keesing; Gondwana Link; Project Advisor, Team Member
Barry Heydenrych; Greening Australia/ Gondwana Link; Process Facilitator, Team Member
Heather Adams; Ranges Link/ Oyster Harbour Catchment Group; Leader/Manager, Team Member
Judy Hunt; Ranges Link; Team Member
Keith Bradby; Team Contact, Team Member
Lucia Quearry; Ranges Link/ Twin Creeks Reserve; Team Member
Mark Waud; Oyster Harbour Catchment Group; Team Member
Paula Deegan; Gondwana Link; Process Facilitator, Team Member
Peter Luscombe; Ranges Link; Team Member

Action Plan:

- 90% of landholders & local authority representatives and 75% of visitors to the Ranges Link (Stirling to Porongurup) area exposed to information on the value of the area's unique biodiversity and opportunities to restore ecologically stronger systems by 2015

- 95% of Kalgan River fenced from livestock by 2012 & 95% of tributaries & wetlands fenced from livestock by 2015

- 95% of Kalgan River fenced from livestock by 2012 & 95% of tributaries & wetlands fenced from livestock by 2015 : (Target = Kalgan River, tributaries and wetlands)

- Apiarists contracted to undertake feral honeybee control over 40ha of key vegetation areas by 2013'

- Baited areas mapped by 2012, regional co-ordination meeting held by 2013 and input into SCNRM regional strategy, and increase in predator control to large proportion (TBD) of Ranges Link area by 2014.

- Best practise guideline compiled by 2012.

- By 2013 a draft revegetation/restoration guideline is developed and by 2014 high quality restoration (Gondwana Link 3 star and above rating) is the norm.

- By 2013 landholders with remnants are engaged to undertake on-ground works and by 2014 key revegetation/restoration projects have been implemented.

- By 2013 landholders with Rock Sheoak remnants have been engaged undertake on-ground works.

- By 2013 planning and liason has been undertaken so that by 2014 a co-ordinated rabbit baiting program is in place in 80% of farmland in the Ranges Link area.

- By 2013 sites for potential wandoo restoration identifie and revegetation of key areas is underway.

- By 2013, best practise guidelines for hygiene and native bush are sources and compiled and by 2015 the Shire has adopted key recommendations in day to day works program.

- By 2014 90% of landholders with riparian sites have been engaged. By 2015 revegetation/restoration has been implemented at key sites.

- By 2014 bounty hunting is able to be assessed as to how effective it has been as part of strategy for fox and cat control, with possible continuation of this method if results are positive.

- By 2014 the Shire have investigated alternative sites to the current tip site and implemented key conservation measures at the site.

- By 2015 awareness about the sustainable farming strategy options is widely known about by landholders (80%) and a large proportion (TBD) are implementing these options.

- By 2015 key weed species have been reduced to the lowest cover classes (density reduced by 95%? from 2011) in key sites and infestation showing species, density and extent are captured spatially in a GIS,

- Condition and priority map for restoration of Rock Sheoak Woodlands completed by 2013

- Configuration of optimum black-gloved wallaby habitat areas for restoration designed by 2013, and key sites being started to be fenced by 2014.

- Configuration of optimum black-gloved wallaby habitat areas for restoration designed by 2013, and key sites being started to be revegetated by 2014.

- Discussion with key people and groups at an advanced stage by 2013.

- Ensure that by the 2012-2013 fire season, an adequate response (information, incentive funding) is available to reduce grazing pressures in the event of a fire at key vegetation sites.

- Ensure that by the 2012-2013 fire season, an adequate response (information, incentive funding) is available to reduce weeds in addition to grazing pressures in the event of a fire at key vegetation sites.

- Ensure that by the 2012-2013 fire season, an adequate response (information, incentive funding) is available to reduce weeds in addition to grazing pressures in the event of a fire at key vegetation sites.

- Ensure that enabling strategies (in particular for funding & capacity building) for the Ranges Link & Oyster Harbour Catchment groups are scoped and developed by 2012, to ensure the effective implementation of conservation strategies through to 2020 and beyond

- Fencing and revegetation of key Rock Sheoak sites implemented by 2014

- Identify feeding sites and nesting sites by 2013 with the view to improving the habitat and conservation status of black cockatoos in the Stirling to Porongurup Functional Landscape by 2015. : (Target = Black Cockatoos)

- If deemed appropriate, warning signs about black cockatoos on roads and roadsides in place at "cockatoo blackspots" by 2014.

- Initial baseline on black gloved wallaby distribution through community survey completed by 2012, in depth survey planned in 2013 for implementation in 2014 at which stage detailed baseline of distribution pattern has been developed.

- Investigate the need for repairs/artificial hollows in key sites informally during 2012 & 2013 and systematically from early 2014 following the results of coordinated survey.

- Key black cockatoo feed species (of a sufficient quantity and quality) included in all revegetation/restoration projects by 2013.

- Key wandoo woodland sites identified and fenced off by 2015

- Planning Department have included needs of key conservation targets and habitat linkages in planning tools and guidelines by 2015.

- Problem birds in the Ranges Link area reduced to manageable numbers by 2014.

- Ranges Link to trial filling hollows with clay against feral bees in hollows in at least 5 trees by 2012.

- To improve the condition and connectivity of Banksia attenuata shrubland vegetation communities in the Stirling to Porongurup Functional Landscape by 2015. : (Target = Banksia attenuata shrubland)

- To improve the condition and connectivity of Jarrah/marri associated vegetation communities in the Stirling to Porongurup Functional Landscape by 2015. : (Target = Jarrah & Marri Woodland)

- To improve the condition and connectivity of Mallee Heath vegetation in the Stirling to Porongurups Functional Landscape by 2015. : (Target = Mallee heath)

- To improve the condition and connectivity of Rock Sheoak vegetation in the Stirling to Porongurups Functional Landscape by 2015. : (Target = Rock Sheoak)

- To improve the condition and connectivity of Wandoo associated vegetation communities in the Stirling to Porongurup Functional Landscape by fencing all remnants and undertaking revegetation and improved management by 2015 : (Target = Wandoo Woodland Ecosystem)

Back to Top

- To improve the habitat and conservation status of black gloved wallabies (and fauna with similar habitat requirements/threats) in the Stirling to Porongurup Functional Landscape by 2015. : (Target = Black Gloved Wallaby)

- To undertake a mapping exercise to produce a new vegetation map for the Stirling to Porongurup Functional Landscape by 2012 that can be used further to refine and measure the extent of target vegetation systems.

- To undertake a mapping exercise to produce a new vegetation map for the Stirling to Porongurup Functional Landscape by 2012 that can be used further to refine and measure the extent of target vegetation systems.

- Undertake fencing of key Jarrah-Marri and Banksia attenuata sites during 2012-2014 and revegetate 50 ha of strategic proteaceous dominant vegetation by 2013

- Undertake initial survey in spring 2012, co-ordinated survey in spring 2013 with mapped nesting sites by early 2014.

- Wallaby gates trialled by 2013 for roll out (if successful) at 10 sites by 2014

Targets

Focal Conservation Target	Target Type	Habitat Type
Banksia attenuata shrubland Target - 1		• Shrubland :: Mediterranean-type Shrubby Vegetation
Black Cockatoos Target - 2		• Forest • Shrubland :: Mediterranean-type Shrubby Vegetation
Black Gloved Wallaby Target - 3		• Forest • Riparian Areas • Shrubland :: Mediterranean-type Shrubby Vegetation
Jarrah & Marri Woodland Target - 4		• Shrubland • Forest
Kalgan River, tributaries and wetlands Target - 5		• Wetlands • Rivers, Streams, Creeks • Riparian Areas
Mallee heath Target - 6		• Shrubland
Rock Sheoak Target - 7		• Forest
Wandoo Woodland Ecosystem Target - 8		• Forest

Notes:

Target - 1 **Description**: Banksia attenuata - dominated shrubland grows on deep white or grey sands. This biodiverse system includes species such as Melaleuca thymoides, M. striata, Calytrix flavescens, Banksia nutans v. cernuella, Jacksonia horrida, Adenanthos cuneatus, Scaevola striata, Anigozanthos rufus & Petrophile longifolia. Healthy banksia shrubland provides copious amounts of nectar and pollen, an important food source for native birds, mammals and insects throughout the year, but particularly during autumn and winter when other food sources are limited. These communities were historically small in extent and being easy to clear for agriculture in the past, are now highly fragmented and further reduced in size. In addition they are very susceptible to the plant pathogen Phytophthora cinnamomi and to other disturbances such as fire, weeds and fertiliser drift. Owing to their high value as habitat and a food-rich resource, Banksia shrublands are important for a range of species, even if they are limited in area, and should be a priority for protecting and restoring.

Target - 1 **Description Comment**: Banksia shrubland is a very important food source over autumn and winter when other food sources are limited. Therefore these areas are important refuges even if limited in area. also as habitat for smaller fauna should be a priority for linking and fencing.

Target - 2 **Description**: This target includes the three black cockatoo species, the two white-tailed black cockatoos, Carnaby's (Calyptorhynchus latirostris) & Baundin's (Calyptorhynchus baudinii) and the red-tailed black cockatoo (Calyptorhynchus magnificus). All are reliant on old trees (> 150 years) for the provision of hollows in which to nest and rear their young. All three species occur in the Ranges Link (Stirling to Porongurup) area, and owing to the steep climatic and vegetation gradients across the area, two of these species, Baundin's cockatoo and the red-tailed black cockatoo are probably close to the eastern-most extent of their range, both being more of a forest than a woodland species. The Carnaby's cockatoo, however, is more of a woodland/shrubland species, reliant on large trees, in particular Wandoo (Eucalyptus wandoo) and sometimes Karri (Eucalyptus diversicolor) for the provision of nesting hollows, that during the breeding season should ideally be located within 12 km of its favoured food source - proteaceous-rich

shrublands. Owing primarily to this species' requirement for both large old trees (which are at risk of dying or being removed on many farms) and healthy proteaceous rich shrublands (which are at risk from fragmentation, phytophthora dieback etc.) it is perhaps not surprising that Carnaby's cockatoo is listed as an endangered species.

Target - 3 **Description**: A number of the original mammal species have been lost from the Porongurup-Stirling Ranges Link area. Both fragmentation of habitats and introduced predator pressures are likely to be responsible for the decline of the black-gloved wallaby (Macropus irma). Local knowledge tells us that wallabies used to occur in large numbers in the area to the north of the Porongurup - but it is believed that hunting pressures up to a few decades ago has diminished the species in this area. In addition stories of large numbers of dingoes prior to the 1960s (where 200 dingoes were reported to be trapped per year in this period along the Gaalgegup creekline north of the Porongurup), indicate the predator pressures that this species has been under in the past. These days, threats to these wallabies include stray dogs that wander about in this area in small packs of 2-3 individuals. As a result wallabies are currently only known from the central and northern part of the Ranges Link. It has been noted that they intermingle with kangaroos and do not venture into paddocks much (will forage up to about 200m from bush) and are dependent on having a healthy understorey cover of native vegetation. This is thought to provide protection from predators. Little is known about the density of wallabies. It is known that they drink water every day and occur in small family groups of 2-4 individuals.

Target - 3 **Description Comment**: Used to occur in the Porongurup area (North of Porongurup) - 20 years ago but hunting has diminished the species in this area significantly. Threats from dogs in Porongurups - small packs of 2-3 individuals, wallabies are distributed in the central and northern part of the ranges link - Peter Luscombe noticing family groups approx. 1 km apart - could be interpreted as their range. Occur at Peter Luscombe's place and at Twin Creeks Nature Reserve, but not the Porongurups. They intermingle with roos. They do not venture into paddocks much - need cover generally - size ranges? Some areas e.g. at Drummonds block - can get close to them while grazing - wallabies will venture up to approximately 200m away from bush during foraging in paddocks. Heather Adams have noted that they will move further along wind rows of canola during harvest - the canola gives them some extra cover into paddocks - note lots of mammals are seen during harvesting - possibility of capturing this information spatially using GPS?. Lots of mammals observed following fire - the "furry road". Brush wallaby need understorey - won't see them if there is no cover - name brush wallaby - maybe the only place they can survive - (from fox predation) but .....dingoes were in large numbers in the past - Peter Luscombe heard that 200 dingoes trapped per year along the Gaalgegup creekline north of the Porongurups in the past (K.Knight reported) until the 1960s- so there was always predator pressures on them - possibly the lack of cover/habitat is more important than the presence of foxes per se? Needs brush & native grasses for good habitat - couple of hundred meters. Natural density unknown - they need to drink water every day. Peter Luscombe has 3 populations on his property, family groups of 2-4, not mobs, interaction seen between groups. Roos don't graze with sheep, follow creekline & cover and maybe wallabies do the same - at Peter Luscombe's place roos use creekline veg to move between two patches of bush. Size and density of bush is important for wallabies, threat of dog pretation - worse further south - less baiting and shooting than further north. The following reference is from http://www.dec.wa.gov.au/component/option,com_docman/task,doc_details/gid,135/Itemid,1288/ cited 5 July 2010: 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.

Target - 4 **Description**: Jarrah/Marri forest-to-low woodland is found on a range of soil types including granites, laterites and deep sands. The main understorey species are Banksia gardneri, B. grandis, Allocasuarina humilis, Bossiaea linophylla, B. ornata, Xanthorrhoea platyphylla, Hibbertia sp., Acacia leioderma, Acacia browniana v. intermedia, Agonis theiformis, Taxandria parviceps, Myoporum tetrandrum, Leucopogon revolutus, L. verticillatus and Hakea undulata. Moist pockets contain Astartea spp, Kunzea recurva, Banksia littoralis, Melaleuca preissiana, Agonis theiformis and Taxandria parviceps. This woodland is susceptible to a range of threats including dieback, rabbits and kangaroos, climate change (e.g. halfway between the Porongurup and the Stirling Ranges this vegetation type is retreating from a drying trend). Jarrah & Marri woodlands offer a diverse range of habitat and food sources for fauna (e.g. Jarrah - red-tailed black cockatoo, Marri - Carnaby's cockatoo). Black cockatoos, brush tail possum and echidna have been listed as nested species for this target.

Target - 4 **Description Comment**: This diverse vegetation type occurs on a range of soils, but is susceptible to a range of threats including dieback, rabbits and kangaroos, climate change (halfway to the Stirlings - retreating from a drying trend)

Target - 5 **Description**: The Kalgan River, its tributaries and wetlands, is a large and complex focal target representing a range of nested targets including vegetation types and species. The target is reliant on healthy, functioning aquatic ecosystems, and hydrological balances of the waterways and its associated vegetation communities. It includes the upper Kalgan River and tributaries including the Young River, Boonawarrup Creek, Gaalegup Creek and Stoney Creek and the fresh and saline wetlands of the system. It includes aquatic elements and the riparian fringe. The Kalgan River is the major river system of the Oyster Harbour catchment that terminates in a regionally significant estuary near Albany, over 100 km from its source. The Oyster Harbour and associated tidal wetlands have been recognised as nationally important by the Directory of Important Wetlands. The Kalgan River and associated tributaries and wetlands provide habitats for a large variety of plants and animals, particularly those which are restricted to moist or aquatic environments, and can also be useful as ecological corridors for movement of species between larger patches of bush. Past clearing and conversion to agriculture across the catchment have seen significant changes in the hydrology of the area's wetlands and waterways. This has resulted in a loss of fringing vegetation (& its associated biodiversity), and increases in sediment and nutrient run-off, which has caused problems for the waterways and the Oyster Harbour estuary. Fencing of streams and wetlands from livestock and revegetation of riparian areas can help to improve the condition of this target. This target includes the outliers of the Porongurup-Karri forest which system follows water courses to the north east of the Porongurup National Park. Many of the understorey components found in the Porongurup Karri System are at their inland range limits (Hibbertia serrata & Senecio ramossisimus) as are some species along the small creeks in the forest (Carex appressa, Rorripa dicyosperma and Gonocarpus diffusus). This target also includes the nested target of Flat Topped Yate (Eucalyptus occidentalis) and Yate (Eucalyptus cornuta) shrubby woodlands, which occur in small pockets on heavy loams, or granite-associated watercourses, usually on the eastern side. There are a range of fish, amphibians, reptiles such as long-necked turtles and crustaceans (e.g. gilgies) in the Kalgan system waterways and wetlands, even in saline water, and although degraded to some extent, with appropriate management the system has the capacity for improving biodiversity, water quality and hydrological flows

Target - 5 **Description Comment**: Many of the understorey components found in the Porongurups Karri System, one of the main nested targets, are at their inland range limits (HIBBERTIA SERRATA and SENECIO RAMOSSISIMUS), as are some species along the small creeks in the forest (CAREX APPRESSA, RORRIPA DICTYOSPERMA and GONOCARPUS DIFFUSUS). Several typical karri understorey species in the southern forests are absent in the Porongurup Range including LASIOPETALUM FLORIBUNDUM, karri oak (CHORILAENA QUERCIFOLIA) and karri wattle (ACACIA PENTADENIA). This target also includes the riverine communities - usually occuring on the eastern side of water ways on heavier soils - local geolology has defined this - of Eucalyptus cornuta (Yate) (different to the upland Eucalyptus cornuta communities). There are different kinds of fish in these systems and also gilgies - even in saline water - turtles in large numbers in the past - (and present) in huge numbers in farm dams (not in the creeks themselves) surviving in these dams as the creeks get saltier in summer. There are references on biodiversity values including Cook et al.(2008) and there have been studies on Lake Kaimerndyup and Tookenjup lakes.

Target - 6 **Description**: Mallee Heath occurs on a range of soil types including clay-loams and duplex soils. There are four or more eucalyptus/mallee systems, all of which are highly diverse. Overstorey species include Eucalyptus decipiens, E. phaenophilla, E. aff. angulosa, E. pleurocarpa, E. tetraptera, E. preissiana, E. pachyloma, E. falcata, E. uncinata, E. xanthonema, E. macrandra, E. talyuberlup & E. buprestium. This target also includes species-rich low heath particularly proteaceous, myrtaceous and epacridaceous genera and a range of ephemerals.

Target - 6 **Description Comment**: Examples of this heath occur on "Drummonds Block", there are patches of the Kalgan Reserve and at the edge of the National Park in really open mallee heath. This low heath is species rich, particularly proteaceous, myrtaceous and epacridaceous species and a range of ephemerals.

Target - 7 **Description**: Rock Sheoak (Allocasuarina huegeliana) occurs in small pockets on heavy loams or granite-associated ridges and creeklines (often on the eastern side of waterways) and is sometimes associated with Yate (Eucalyptus cornuta) and shrubby woodlands. These communities occur on good soils that have largely been cleared for agriculture and are susceptible to the influx of weed species. They are also threatened by climate change (can dry out easily). They contain a number of interesting ephemerals and

terrestrial orchids and they provide valuable habitat and food for a number of fauna species. Sheoak trees with their rough bark are important for housing invertebrates.

Target - 7 **Description Comment**: These communities occur on good agricultural soils that have largely been cleared for agriculture and are susceptible to influx of weed species. They are also threatened by climate change - can dry out easily and contain certain species that are under threat. They are difficult to map as they are usually associated with Granite but not always. the landscape i.e. they can occur both in creeklines (often to the eastern side of waterways - geological feature of these soils), but can also occur in uplands. They contain a number of interesting ephemerals such as the Swan River Daisy (Brachyscome iberidifolia) They are interesting in that they provide a food source, the trees could be important for nesting - hollows, and the rough bark could be important for invertebrates.

Target - 8 **Description**: Wandoo woodlands occur on duplex soils of the region and are characterised by a few tree species, most notably Wandoo (also known as white gum, Eucalyptus wandoo) with a dominant ground layer of Restionaceae (restios), Liliaceae (lilies), Orchidaceae (orchids), Poaceae (grasses), Asteraceae (daisies) and a scattered shrub understorey of hakeas, acacias & gastrolobiums (poison peas). In healthy wandoo woodlands this variety of trees and shrubs, flowering at different times of the year, provides an almost constant source of nectar for birds such as honey-eaters. Insects that feed in the canopy are eaten by insectivorous birds such as the western yellow robin, golden whistler and the rufous treecreeper. Seeds and fruit of canopy trees are another valuable food source. A number of species such as the endangered Carnaby's cockatoo rely on old trees with hollows for breeding and nesting. In addition phascogales, bats and birds utilise the upper branches and hollows of standing wandoo trees and possums often rest in tree hollows during the day and come out at night to feed on the leaves. Old Wandoo trees with their large branches also provide nesting sites for a range of birds including ducks, owls and eagles. Mistletoe (Amyema sp.) is known to be an important element of this system, with a delicately-balanced web of interactions between this parasite, its wandoo host and possums, ants, honeyeaters, mistletoe birds, the Azure butterfly/caterpillar & parasitic wasps. Wandoo woodlands occur on soils that have a high value for agriculture and as a consequence have been largely cleared. Past clearing has greatly diminished and fragmented the distribution of wandoo, leading to a loss of habitat for wildlife. In addition, selective logging of wandoo in the past, inappropriate fire regimes and agricultural practices have modified stand density and canopy cover, further damaging the associated plant and animal communities. Although clearing has largely ceased, degradation of habitat fragments continues. Many remaining trees are dying while natural regeneration and tree planting efforts are not keeping pace with this loss. Furthermore, competition for sought after hollows (that only start to form when the trees are between 150 and 200 years old) by feral bees and non-native bird species is seriously diminishing the habitat value of existing trees.

Target - 8 **Description Comment**: This ecosystem is seen as the highest priority by the Ranges Link group. Critical factors to keep wandoo in the landscape - i.e. what does a healthy patch have: Density of trees - some areas are more open though - need to have recruiting trees, Full crown, Open intact understorey, Low-deep water table - ponding and flowthrough, No stock - compaction an issue - affects porosity of soils, Wildlife activity. Hollows - habitat value for tree dwellers. There are a number of other fauna species that inhabit wandoo woodland including owls, ducks nesting in large trees. Threats to smaller woodland birds include large aggressive birds such kookaburra & currawongs, however currawongs can be useful for spreading larger fleshy fruited seed into revegetation - e.g. Exocarpus sparteus (native cherry) found coming up naturally in revegetation areas (Peter Luscombe).

Threats

Threat (*Common Taxonomy*) *	Targets Threatened
Climate change (Climate Change & Severe Weather :: Habitat Shifting & Alteration)	• Wandoo Woodland Ecosystem • Kalgan River, tributaries and wetlands • Rock Sheoak • Banksia attenuata shrubland • Mallee heath • Jarrah & Marri Woodland • Black Cockatoos
Weeds (Invasive & Other Problematic Species & Genes :: Invasive Non-Native/Alien Species)	• Wandoo Woodland Ecosystem • Kalgan River, tributaries and wetlands • Rock Sheoak • Banksia attenuata shrubland • Mallee heath • Jarrah & Marri Woodland • Black Cockatoos
Fragmentation due to historical clearing (Natural System Modifications :: Other Ecosystem Modifications)	• Wandoo Woodland Ecosystem • Rock Sheoak • Banksia attenuata shrubland • Mallee heath • Jarrah & Marri Woodland • Black Cockatoos • Black Gloved Wallaby
Wildfire (Natural System Modifications :: Fire & Fire Suppression)	• Banksia attenuata shrubland • Black Cockatoos • Black Gloved Wallaby • Jarrah & Marri Woodland • Kalgan River, tributaries and wetlands • Mallee heath • Rock Sheoak • Wandoo Woodland Ecosystem

Back to Top

Threat (*Common Taxonomy*) *	Targets Threatened
Phytophthora dieback (Invasive & Other Problematic Species & Genes :: Invasive Non-Native/Alien Species)	• Banksia attenuata shrubland • Mallee heath • Jarrah & Marri Woodland • Black Cockatoos
Historical clearing causing hydrological change (Natural System Modifications :: Other Ecosystem Modifications)	• Wandoo Woodland Ecosystem • Kalgan River, tributaries and wetlands • Banksia attenuata shrubland • Jarrah & Marri Woodland
Current Clearing (development, infrastructure, farming) (Human Intrusions & Disturbance :: Work & Other Activities)	• Wandoo Woodland Ecosystem • Kalgan River, tributaries and wetlands • Banksia attenuata shrubland • Jarrah & Marri Woodland • Black Gloved Wallaby
Grazing (rabbits, roos, livestock & feral pigs) (Natural System Modifications :: Other Ecosystem Modifications)	• Wandoo Woodland Ecosystem • Kalgan River, tributaries and wetlands • Rock Sheoak • Banksia attenuata shrubland • Mallee heath • Jarrah & Marri Woodland
Carnivores (foxes, dogs, cats, pigs, kookaburras) (Invasive & Other Problematic Species & Genes :: Invasive Non-Native/Alien Species)	• Wandoo Woodland Ecosystem • Black Cockatoos • Black Gloved Wallaby
Loss of food sources within foraging distance of nesting sites (Natural System Modifications :: Other Ecosystem Modifications)	• Black Cockatoos
Deaths by vehicles (Transportation & Service Corridors :: Roads & Railroads)	• Black Cockatoos • Black Gloved Wallaby
Competition for hollows (Invasive & Other Problematic Species & Genes :: Invasive Non-Native/Alien Species)	• Black Cockatoos
Barriers (fences and roads) (Natural System Modifications :: Other Ecosystem Modifications)	• Kalgan River, tributaries and wetlands • Black Gloved Wallaby
Prescribed burning (current practices) (Natural System Modifications :: Fire & Fire Suppression)	• Wandoo Woodland Ecosystem • Banksia attenuata shrubland • Mallee heath • Jarrah & Marri Woodland
Marri canker (Invasive & Other Problematic Species & Genes :: Invasive Non-Native/Alien Species)	• Jarrah & Marri Woodland
Current Removal of Paddock Trees (Biological Resource Use :: Logging & Wood Harvesting)	• Wandoo Woodland Ecosystem • Black Cockatoos
Accumulation of nutrients (Agriculture & Aquaculture :: Livestock Farming & Ranching)	• Jarrah & Marri Woodland
Loss of mycovores (fungi eaters such as woylies & quenda) (Natural System Modifications :: Other Ecosystem Modifications)	• Wandoo Woodland Ecosystem
Illegal culling (Biological Resource Use :: Hunting & Collecting Terrestrial Animals)	• Black Cockatoos
Agricultural impact (Agriculture & Aquaculture :: Livestock Farming & Ranching)	• Kalgan River, tributaries and wetlands

Strategies

Strategy (*Common Taxonomy*)	Threats Addressed
Buffer creeks with natural vegetation *Land/Water Management :: Habitat & Natural Process Restoration*	-

Back to Top

Strategy (*Common Taxonomy*)	Threats Addressed
Communications Strategy *Education & Awareness :: Awareness & Communications*	-
Consider installing artificial nesting hollows; repair potential hollows : (Artificial nesting hollows have not proven to be effective unless they are placed in areas in which (recent) historical breeding has occured and repairing hollows needs to be preceded by location of suitable hollows, and protection and repairing hollows is possibly more activities to undertake first. A low priority strategy for now but may become more important in the future.) *Species Management :: Species Recovery*	-
Continuation of revegetation strategy : (There is a revegetation strategy that is already underway that includes the re-establishment of Mallee Heath communities that needs to be continued) *Land/Water Management :: Habitat & Natural Process Restoration*	-
Continue fencing wandoo woodland : (NB Have fenced most of the larger blocks. Areas to be fenced getting smaller. Potential fencing sources include SCNRM, state government, Mt. Barker Chickens) *Land/Water Management :: Site/Area Management*	-
Continue with mapping exercise to determine key sheoak areas and opportunities for fencing & revegetation *Land/Water Management :: Site/Area Management*	-
Continue with sustainable farming strategy implementation (Oyster Harbour Catchment Group) : (No till, improved fertilizer practices, cover on paddocks etc.) *Land/Water Management :: Site/Area Management*	-
Continue/expand the wandoo woodland mapping by Ranges Link group : (Most planted areas have been captured digitally. Needs assessment and completion.) *Land/Water Management :: Habitat & Natural Process Restoration*	-
Develop a larger scale approach to make fox control do-able over regional scales (through NRM groups; Dept. Ag etc.) : (South Coast NRM can assist in this regard. There are some accreditation requirements which can now be done on-line. Should be an OHCG-driven activity. Likely to be more need to do it & more incentive in areas in which sheep are the main stock animals. There is an organised fox shoot in April of each year.) *Land/Water Management :: Invasive/Problematic Species Control*	-
Develop best practise manual for wandoo revegetation, recruitment, weed control : (It is suggested that UWA Restoration Ecology students could be involved (ask Peter Speldewinde the course co-ordinator). Check what resources the WWF Woodland Watch project has developed so far as well as the Wandoo Recovery Group.) *Education & Awareness :: Awareness & Communications*	-
Develop sponsorship for a bounty on shooting foxes & cats : (This should be done as part of an integrated strategy. It will be offered to the two licensed roo shooters that operate in the area and also get them to assist with mapping occurrence of wallabies and of ferals that they control. (Q: Is DNA testing of foxes still part of some research project - need to follow up) *Land/Water Management :: Invasive/Problematic Species Control*	-
Drive slower, education (signage) especially in Stirling Range National Park : There have and are ongoing deaths of black cockatoos feeding or drinking on or adjacent to road sides. There is debate as to how bad this threat is, how effective signage will be - and how difficult it will be to implement, and these are some of the reasons why this strategy is currently ranked low. However, this may change in the future as more information comes to light. *Education & Awareness :: Awareness & Communications*	-

Back to Top

Strategy (*Common Taxonomy*)	Threats Addressed
Engage with Department of Planning and Infrastructure to ensure that the regional planning strategy recognises the need for habitat linkages and that this is taken into account with new subdivisions/ other changes affecting native vegetation : (This should be part of a Gondwana Link Ltd. strategy as it cuts across a number of planning areas) *Law & Policy :: Policies & Regulations*	-
Ensure that revegetation efforts include wandoo plantings : (Hindrance is acquiring the land to do it. Tends to be good farm soil (unless it has become saline in which case you need to use saline spp).) *Land/Water Management :: Habitat & Natural Process Restoration*	-
Ensure that there is post-fire control of grazers : (In particular rabbits & roos are a problem in the early stages following fire. Objective should be that control of grazers is an accepted post-fire action. In addition the rabbit baiting stations need to be set up as fast as possible post fire - and the grazing and rabbit control strategies need to be linked. The most effective method of achieving this is through face to face contact with landholders where fires have taken place and to ensure that they take action quickly) *Land/Water Management :: Invasive/Problematic Species Control* • **Comment:** This strategy was previously called (April 2011) "Keep kangaroo & rabbit numbers down, especially following wildfires", but was replaced with this (a very similar strategy) that had been developed for other vegetation targets	-
Fence & control weeds post fire; keep grazers numbers down : (The issue of grazers is the same as for the Jarrah/Marri, Banksia attenuata shrubland, & Rock sheoak targets . Kangaroos & rabbits need to be controlled - has also been addressed by including two new strategies (grazing & rabbit baiting) to this target) *Land/Water Management :: Invasive/Problematic Species Control*	-
Fence off rivers & creeks (and wetlands) : (The Kalgan River is mostly fenced from stock (estimated 90%), but there are some tributaries still to go (need to define this - analysis through GIS); wetlands also being fenced; some seasonal wetlands being fenced too - will allow regeneration when they next flood. Lake Kiamerndyip. Important to maintain the fences) *Land/Water Management :: Site/Area Management*	-
Fence rock sheoak remnants *Land/Water Management :: Site/Area Management*	-
Fencing (primarily) and revegetation of Jarrah-Marri & Banksia attenuata vegetation communities : (There are a number of opportunities to fence off bush from stock closer to Porongurup. There is a need for the mapping to be completed to identify opportunities across Ranges Link area. There is more fencing than revegetation taking place) *Land/Water Management :: Site/Area Management*	-
Funding & capacity building strategy *External Capacity Building :: Conservation Finance*	-
Identify further sites for possible revegetation *Land/Water Management :: Habitat & Natural Process Restoration*	-
Identify key nesting sites (trees with hollows within critical distance of key feeding sites) *Species Management :: Species Recovery*	-
Implement bee poison control *Land/Water Management :: Invasive/Problematic Species Control*	-
Implement coordinated rabbit baiting program : (Need a network of rabbit baiting stations that get baited regularly. Need to identify the sites where they are needed first. Get more baiting stations (like those designed by Jack Mercer). Need to work out roles & responsibilities (Ranges Group, OHCG, landowners). Possibly approach Albany Tip Shop re supply of suitable containers) *Land/Water Management :: Invasive/Problematic Species Control*	-

Back to Top

Strategy (*Common Taxonomy*)	Threats Addressed
Implement good revegetation practices : (This involves a ranges of factors including machinery hygiene; when removing weeds from bush, mulch away from bush to reduce re-infestation, full mix of spp (don't leave out susceptible spp - maybe use heavier load of some of them); use diversity of seed sources (ie not all the jarrah/marri seed from one tree); do the reveg really well & do lots of it (note that with regards phytophthora resistant jarrah - local provenance is more important than resistance and having the wrong provenance) *Land/Water Management :: Habitat & Natural Process Restoration*	-
Implement training & information sessions with Shire to improve hygiene with day to day activities : (This strategy also applies to other vegetation types, not just Mallee Heath) *Education & Awareness :: Awareness & Communications*	-
Implement weed control strategy following wildfires : (Bridal creeper & capeweed are particularly bad. Similar strategy to current Porongurup project. First 1-2 years are most important) *Land/Water Management :: Invasive/Problematic Species Control*	-
Investigate the feasibility of contacting wildlife carers re taking wallabies to release into secure habitats (add to gene pool) *Species Management :: Species Re-Introduction*	-
Lobby the shire to reconsider the position of the tip and the importance of native vegetation *Law & Policy :: Policies & Regulations*	-
Maintain weed projects that are currently underway : (There are teams organised by Green Skills to reduce the spread of key weeds and, and in addition Lisa & Klaus Braun have a project extending into areas adjacent to Porongurup National Park. Important to ensure ongoing funds for weed projects.) *Land/Water Management :: Invasive/Problematic Species Control*	-
Mapping Strategy *Land/Water Protection :: Site/Area Protection*	-
Plant food sources in all revegetation *Land/Water Management :: Habitat & Natural Process Restoration*	-
Plug bee-used hollows with clay : (This is an idea that needs to be tested, a low priority for now but may prove to be important in the future) *Land/Water Management :: Invasive/Problematic Species Control*	-
Reduce competition for nesting hollows by culling galahs & other predators *Land/Water Management :: Invasive/Problematic Species Control*	-
Restoration of key areas of habitat with high linkage value on previously cleared land using high quality revegetation/ restoration practices : (Black gloved wallabies seem to have shifted away from Porongurups in last 50 or so years. Need to be able to answer the questions: Where are they now? Can we maintain them there?) *Land/Water Management :: Habitat & Natural Process Restoration*	-
Undertake community survey of black gloved wallaby and other fauna species (in particular quendas [bandicoots]) : (It is important to establish a baseline for the species. The community survey should included records from sightings by roo shooters and other community input. Use cameras at fences to try to determine how they do get through (under/over/through). Following this survey a more in-depth targeted survey should be undertaken.) *Species Management :: Species Management*	-
Undertake habitat protection (fencing) of good quality bush that has the potential to support black gloved wallabies and create important habitat linkages *Land/Water Management :: Site/Area Management*	-

Back to Top

Strategy (*Common Taxonomy*)	Threats Addressed
Undertake research on "wallaby friendly" fences/gates; install at appropriate locations : (Peter Luscombe described a hinged gate arrangement that can be trialled, possibly as his property) *Species Management :: Species Management*	-
Undefined :: Undefined	-

Back to Top

Viability Summary

Conservation Targets		Landscape Context		Condition		Size		Viability Rank
		Grade	Weight	Grade	Weight	Grade	Weight	
1	Banksia attenuata shrubland	Fair	1.0	Fair	1.0	-	1.0	Fair
2	Black Cockatoos	Fair	1.0	Fair	1.0	Poor	1.0	Fair
3	Black Gloved Wallaby	Poor	1.0	-	1.0	Fair	1.0	Fair
4	Jarrah & Marri Woodland	Fair	1.0	Fair	1.0	Fair	1.0	Fair
5	Kalgan River, tributaries and wetlands	Fair	1.0	Poor	1.0	-	1.0	Fair
6	Mallee heath	-	1.0	Fair	1.0	Fair	1.0	Fair
7	Rock Sheoak	-	1.0	Fair	1.0	Fair	1.0	Fair
8	Wandoo Woodland Ecosystem	Fair	1.0	Fair	1.0	Poor	1.0	Fair
Project Biodiversity Health Rank								Fair

Back to Top

Threat Summary

Project-specific Threats (Common Taxonomy *)	Banksia attenuata shrubland	Black Cockatoos	Black Gloved Wallaby	Jarrah & Marri Woodland	Kalgan River, tributaries and wetlands	Mallee heath	Rock Sheoak	Wandoo Woodland Ecosystem	Overall Threat Rank
Climate change (*Habitat Shifting & Alteration*)	**High**	**Very High**	-	**High**	**High**	**Low**	**Medium**	**High**	**Very High**
Weeds (*Invasive Non-Native/Alien Species*)	**High**	**Low**	-	**Medium**	**High**	**Low**	**High**	**Medium**	**High**
Fragmentation due to historical clearing (*Other Ecosystem Modifications*)	**High**	**Very High**	**High**	**Medium**	-	**Medium**	**Low**	**Medium**	**High**
Wildfire (*Fire & Fire Suppression*)	**Medium**	**Medium**	**Medium**	**Medium**	**Medium**	**Medium**	**Low**	**High**	**High**
Phytophthora dieback (*Invasive Non-Native/Alien Species*)	**High**	**Medium**	-	**High**	-	**Medium**	-	-	**High**
Historical clearing causing hydrological change (*Other Ecosystem Modifications*)	**Medium**	-	-	**Low**	**High**	-	-	**Medium**	**Medium**
Current Clearing (development, infrastructure, farming) (*Work & Other Activities*)	**Medium**	-	**High**	**Medium**	**Medium**	-	-	**Medium**	**Medium**
Grazing (rabbits, roos, livestock & feral pigs) (*Other Ecosystem Modifications*)	**High**	-	-	**Medium**	**Medium**	**Low**	**Medium**	**Medium**	**Medium**
Carnivores (foxes, dogs, cats, pigs, kookaburras) (*Invasive Non-Native/Alien Species*)	-	**Medium**	**Medium**	-	-	-	-	**Low**	**Medium**

Back to Top

Project-specific Threats (Common Taxonomy *)	Banksia attenuata shrubland	Black Cockatoos	Black Gloved Wallaby	Jarrah & Marri Woodland	Kalgan River, tributaries and wetlands	Mallee heath	Rock Sheoak	Wandoo Woodland Ecosystem	Overall Threat Rank
Loss of food sources within foraging distance of nesting sites (*Other Ecosystem Modifications*)	-	**High**	-	-	-	-	-	-	**Medium**
Deaths by vehicles (*Roads & Railroads*)	-	**Medium**	**Medium**	-	-	-	-	-	**Medium**
Competition for hollows (*Invasive Non-Native/Alien Species*)	-	**High**	-	-	-	-	-	-	**Medium**
Barriers (fences and roads) (*Other Ecosystem Modifications*)	-	-	**Medium**	-	**Medium**	-	-	-	**Medium**
Prescribed burning (current practices) (*Fire & Fire Suppression*)	**High**	-	-	**Medium**	-	**Low**	-	**Low**	**Medium**
Marri canker (*Invasive Non-Native/Alien Species*)	-	-	-	**High**	-	-	-	-	**Medium**
Current Removal of Paddock Trees (*Logging & Wood Harvesting*)	-	**Medium**	-	-	-	-	-	**Medium**	**Medium**
Accumulation of nutrients (*Livestock Farming & Ranching*)	-	-	-	**Medium**	-	-	-	-	**Low**
Loss of mycovores (fungi eaters such as woylies & quenda) (*Other Ecosystem Modifications*)	-	-	-	-	-	-	-	**Medium**	**Low**

Back to Top

Project-specific Threats (Common Taxonomy *)	Banksia attenuata shrubland	Black Cockatoos	Black Gloved Wallaby	Jarrah & Marri Woodland	Kalgan River, tributaries and wetlands	Mallee heath	Rock Sheoak	Wandoo Woodland Ecosystem	Overall Threat Rank
Illegal culling (*Hunting & Collecting Terrestrial Animals*)	-	**Medium**	-	-	-	-	-	-	**Low**
Agricultural impact (*Livestock Farming & Ranching*)	-	-	-	-	**Medium**	-	-	-	**Low**
Threat Status for Targets and Project	**Very High**	**Very High**	**High**	**High**	**High**	**Medium**	**Medium**	**High**	**Very High**

Back to Top

Action Plan

Objective: 90% of landholders & local authority representatives and 75% of visitors to the Ranges Link (Stirling to Porongurup) area exposed to information on the value of the area's unique biodiversity and opportunities to restore ecologically stronger systems by 2015

Strategic Action: Communications Strategy

Progress	Updated	Comments
On Track	Mar 1, 2012	• 2.1.4[WCa] farmers and fishers improving their knowledge and skills in natural resource management by June 2013. Improving management practices • Booklet, signage and property visits

- **Action Step:** Develop and implement strategy for communicating the value of the biodiversity of the Ranges Link to landholders, local authorities and visitors.

Objective: 95% of Kalgan River fenced from livestock by 2012 & 95% of tributaries & wetlands fenced from livestock by 2015

Strategic Action: Fence off rivers & creeks (and wetlands): (The Kalgan River is mostly fenced from stock (estimated 90%), but there are some tributaries still to go (need to define this - analysis through GIS); wetlands also being fenced; some seasonal wetlands being fenced too - will allow regeneration when they next flood. Lake Kiamerndyip. Important to maintain the fences)

Progress	Updated	Comments
On Track	Mar 1, 2012	• 2.1.4[WCa] 77.6 fencing @ $3,600 fencing materials & contractor (Protect high biodiversity value remnant bushland, waterways and revegetation.) Protecting 465.6 ha of native vegetation

- **Action Step:** Approach landholders who have priority sites and discuss funding options for revegetation and fencing
- **Action Step:** Continue with fencing incentive projects

Objective: 95% of Kalgan River fenced from livestock by 2012 & 95% of tributaries & wetlands fenced from livestock by 2015 : (Target = Kalgan River, tributaries and wetlands)

Strategic Action: Buffer creeks with natural vegetation

Progress	Updated	Comments
On Track	Mar 1, 2012	Ongoing fencing programs, revegetation automatic in flood zone, planned for some areas e.g. wetland, e.g. Brachysema seedlings in floodzone - late in season - very successful

- **Action Step:** Approach landholders who have priority sites and discuss funding options for revegetation and fencing
- **Action Step:** Ranges Link members to communicate regularly with seed suppliers, weed contractors, revegetation contractors before during and after works to ensure constantly improving revegetation practises
- **Action Step:** Undertake high-quality revegetation project

Back to Top

Strategic Action: Fence off rivers & creeks (and wetlands): (The Kalgan River is mostly fenced from stock (estimated 90%), but there are some tributaries still to go (need to define this - analysis through GIS); wetlands also being fenced; some seasonal wetlands being fenced too - will allow regeneration when they next flood. Lake Kiamerndyip. Important to maintain the fences)

Progress	Updated	Comments
On Track	Mar 1, 2012	• 2.1.4[WCa] 77.6 fencing @ $3,600 fencing materials & contractor (Protect high biodiversity value remnant bushland, waterways and revegetation.) Protecting 465.6 ha of native vegetation

- **Action Step:** Approach landholders who have priority sites and discuss funding options for revegetation and fencing
- **Action Step:** Continue with fencing incentive projects

Objective: Apiarists contracted to undertake feral honeybee control over 40ha of key vegetation areas by 2013'

Strategic Action: Implement bee poison control

Progress	Updated	Comments
On Track	Mar 1, 2012	• 2.5.10[WCa] Reduce the impact of invasive bee species over 40 ha using a qualified apiarist.

- **Action Step:** Contract apiarists to remove problem bee swarms

Objective: Baited areas mapped by 2012, regional co-ordination meeting held by 2013 and input into SCNRM regional strategy, and increase in predator control to large proportion (TBD) of Ranges Link area by 2014.

Strategic Action: Develop a larger scale approach to make fox control do-able over regional scales (through NRM groups; Dept. Ag etc.): (South Coast NRM can assist in this regard. There are some accreditation requirements which can now be done on-line. Should be an OHCG-driven activity. Likely to be more need to do it & more incentive in areas in which sheep are the main stock animals. There is an organised fox shoot in April of each year.)

Progress	Updated	Comments
Planned	Mar 1, 2012	-

- **Action Step:** Organise South Coast regional wide get together with groups to work out common issues, approaches & funding opportunity for fox and other fauna control including getting input from SCNRM/Bush Heritage Australia Pilot project in the FitzStirling
- **Action Step:** Create map of which areas are regularly baited and where the gaps are
- **Action Step:** Continue & with on-ground baiting projects

Objective: Best practise guideline compiled by 2012.

Strategic Action: Develop best practise manual for wandoo revegetation, recruitment, weed control: (It is suggested that UWA Restoration Ecology students could be involved (ask Peter Speldewinde the course co-ordinator). Check what resources the WWF Woodland Watch project has developed so far as well as the Wandoo Recovery Group.)

Progress	Updated	Comments
Planned	Mar 1, 2012	There is a lot of information available that needs to be compiled into a simple format

- **Action Step:** Compile folder of available wandoo management information
- **Action Step:** Write grant proposal for wandoo woodland booklet
- **Action Step:** Contract someone to develop short booklet on best practices for wandoo woodland management

Objective: By 2013 a draft revegetation/restoration guideline is developed and by 2014 high quality restoration (Gondwana Link 3 star and above rating) is the norm.

Strategic Action: Implement good revegetation practices: (This involves a ranges of factors including machinery hygiene; when removing weeds from bush, mulch away from bush to reduce re-infestation, full mix of spp (don't leave out susceptible spp - maybe use heavier load of some of them); use diversity of seed sources (ie not all the jarrah/marri seed from one tree); do the reveg really well & do lots of it (note that with regards phytophthora resistant jarrah - local provenance is more important than resistance and having the wrong provenance)

Progress	Updated	Comments
On Track	Mar 1, 2012	-

- **Action Step:** Develop/ adapt best practise operating guidelines with regards weed & dieback spread and general hygiene practices, species selections & other guidelines for revegetation
- **Action Step:** Ranges Link members to communicate regularly with seed suppliers, weed contractors, revegetation contractors before during and after works to ensure constantly improving revegetation practises
- **Action Step:** Undertake monitoring of revegetation projects as standard practise

Objective: By 2013 landholders with remnants are engaged to undertake on-ground works and by 2014 key revegetation/restoration projects have been implemented.

Strategic Action: Continuation of revegetation strategy: (There is a revegetation strategy that is already underway that includes the re-establishment of Mallee Heath communities that needs to be continued)

Progress	Updated	Comments
On Track	Mar 1, 2012	There is funding from SCNRM for 20 hectares of revegetation

- **Action Step:** Approach landholders who have priority sites and discuss funding options for revegetation and fencing
- **Action Step:** Ranges Link members to communicate regularly with seed suppliers, weed contractors, revegetation contractors before during and after works to ensure constantly improving revegetation practises
- **Action Step:** Undertake high-quality revegetation project

Objective: By 2013 landholders with Rock Sheoak remnants have been engaged undertake on-ground works.

Strategic Action: Identify further sites for possible revegetation

Progress	Updated	Comments
On Track	Mar 1, 2012	-

- **Action Step:** Compile prioritised list of possible sites for revegetation following mapping of areas
- **Action Step:** Approach landholders who have priority sites and discuss funding options for revegetation and fencing

Strategic Action: Continue with mapping exercise to determine key sheoak areas and opportunities for fencing & revegetation

Progress	Updated	Comments
On Track	Mar 1, 2012	• 2.1.4[WCa] Mapping of representative vegetation types (Wandoo Woodland Ecosystem, Rock Sheoak, Banksia attenuata Shrubland, Mallee Heath, Jarrah & Marri Woodland)

- **Action Step:** Map areas of different vegetation types from existing aerial photos, vegetation and geological maps and by undertaking field visits to ground truth areas

Objective: By 2013 planning and liason has been undertaken so that by 2014 a co-ordinated rabbit baiting program is in place in 80% of farmland in the Ranges Link area.

Strategic Action: Implement coordinated rabbit baiting program: (Need a network of rabbit baiting stations that get baited regularly. Need to identify the sites where they are needed first. Get more baiting stations (like those designed by Jack Mercer). Need to work out roles & responsibilities (Ranges Group, OHCG, landowners). Possibly approach Albany Tip Shop re supply of suitable containers)

Progress	Updated	Comments
On Track	Mar 1, 2012	• 2.5.10[WCa] Reduce the impact of vertebrate pest animals through the control of foxes, feral cats, and rabbits over 5,000 ha. (800 foxes and 50 cats)

- **Action Step:** Work out roles and responsibilities between Ranges Link, Oyster Harbour Catchment Groups & Landholders
- **Action Step:** Identify key sites where rabbit baiting stations will be most effective
- **Action Step:** Aquire materials for baits
- **Action Step:** Work with landholders to install bait stations at appropriate sites
- **Action Step:** Ensure that bait stations are regularly baited, and any results from monitoring communicated back

Objective: By 2013 sites for potential wandoo restoration identifie and revegetation of key areas is underway.

Strategic Action: Ensure that revegetation efforts include wandoo plantings: (Hindrance is acquiring the land to do it. Tends to be good farm soil (unless it has become saline in which case you need to use saline spp).)

Progress	Updated	Comments
On Track	Mar 1, 2012	-

- **Action Step:** Approach landholders who have priority sites and discuss funding options for revegetation and fencing
- **Action Step:** Ranges Link members to communicate regularly with seed suppliers, weed contractors, revegetation contractors before during and after works to ensure constantly improving revegetation practises

- **Action Step:** Undertake high-quality revegetation project
- **Action Step:** Undertake monitoring of revegetation projects as standard practise

Objective: By 2013, best practise guidelines for hygiene and native bush are sources and compiled and by 2015 the Shire has adopted key recommendations in day to day works program.

Strategic Action: Implement training & information sessions with Shire to improve hygiene with day to day activities: (This strategy also applies to other vegetation types, not just Mallee Heath)

Progress	Updated	Comments
Planned	Mar 1, 2012	-

- **Action Step:** Develop/ adapt best practise operating guidelines with regards weed & dieback spread and general hygiene practices, species selections & other guidelines for revegetation
- **Action Step:** Develop and implement strategy for communicating the value of the biodiversity of the Ranges Link to landholders, local authorities and visitors.

Objective: By 2014 90% of landholders with riparian sites have been engaged. By 2015 revegetation/restoration has been implemented at key sites.

Strategic Action: Buffer creeks with natural vegetation

Progress	Updated	Comments
On Track	Mar 1, 2012	Ongoing fencing programs, revegetation automatic in flood zone, planned for some areas e.g. wetland, e.g. Brachysema seedlings in floodzone - late in season - very successful

- **Action Step:** Approach landholders who have priority sites and discuss funding options for revegetation and fencing
- **Action Step:** Ranges Link members to communicate regularly with seed suppliers, weed contractors, revegetation contractors before during and after works to ensure constantly improving revegetation practises
- **Action Step:** Undertake high-quality revegetation project

Objective: By 2014 bounty hunting is able to be assessed as to how effective it has been as part of strategy for fox and cat control, with possible continuation of this method if results are positive.

Strategic Action: Develop sponsorship for a bounty on shooting foxes & cats: (This should be done as part of an integrated strategy. It will be offered to the two licensed roo shooters that operate in the area and also get them to assist with mapping occurrence of wallabies and of ferals that they control. (Q: Is DNA testing of foxes still part of some research project - need to follow up)

Progress	Updated	Comments
On Track	Mar 1, 2012	• 2.5.10[WCa] Reduce the impact of vertebrate pest animals through the control of foxes, feral cats, and rabbits over 5,000 ha. (800 foxes and 50 cats)

- **Action Step:** Implement targeted fox & cat bounty project for professional kangaroo shooters

- **Action Step:** Ensure that kangaroo shooters are recording key pest and native fauna species with a GPS & feeding information back to Ranges Link
- **Action Step:** Integrate bounty project with other predator control methods
- **Action Step:** Tie the bounty project with outcomes based monitoring of native fauna
- **Action Step:** Encourage university students to undertake studies that assist with learnings from strategies like this

Objective: By 2014 the Shire have investigated alternative sites to the current tip site and implemented key conservation measures at the site.

Strategic Action: Lobby the shire to reconsider the position of the tip and the importance of native vegetation

Progress	Updated	Comments
Planned	Mar 1, 2012	-

- **Action Step:** Write letter/ talk to shire councillors re possible moving of the tip
- **Action Step:** Develop and implement strategy for communicating the value of the biodiversity of the Ranges Link to landholders, local authorities and visitors.

Objective: By 2015 awareness about the sustainable farming strategy options is widely known about by landholders (80%) and a large proportion (TBD) are implementing these options.

Strategic Action: Continue with sustainable farming strategy implementation (Oyster Harbour Catchment Group): (No till, improved fertilizer practices, cover on paddocks etc.)

Progress	Updated	Comments
On Track	Mar 1, 2012	-

Action Step: Continue with implementation of sustainable farming projects (no till, reduction in fertilizer run-off, cover on paddocks etc.). 80% of farmers regularly soil testing and maximising stubble retention.

Comment: Data not readily available. May require honours student to conduct survey working with fertiliser companies.

Objective: By 2015 key weed species have been reduced to the lowest cover classes (density reduced by 95%? from 2011) in key sites and infestation showing species, density and extent are captured spatially in a GIS,

Strategic Action: Maintain weed projects that are currently underway: (There are teams organised by Green Skills to reduce the spread of key weeds and, and in addition Lisa & Klaus Braun have a project extending into areas adjacent to Porongurup National Park. Important to ensure ongoing funds for weed projects.)

Progress	Updated	Comments
On Track	Sep 20, 2012	• 2.5.12[WCa] Reduce the impact of Weeds of National Significance with 150 ha of WoNS treated, including Bridal Creeper and Blackberry

- **Action Step:** Ensure that weeds are adequately mapped and a GIS layer is produced & maintained
- **Action Step:** Undertake strategic weed control project

Back to Top

Objective: Condition and priority map for restoration of Rock Sheoak Woodlands completed by 2013

Strategic Action: Continue with mapping exercise to determine key sheoak areas and opportunities for fencing & revegetation

Progress	Updated	Comments
On Track	Mar 1, 2012	• 2.1.4[WCa] Mapping of representative vegetation types (Wandoo Woodland Ecosystem, Rock Sheoak, Banksia attenuata Shrubland, Mallee Heath, Jarrah & Marri Woodland)

- **Action Step:** Map areas of different vegetation types from existing aerial photos, vegetation and geological maps and by undertaking field visits to ground truth areas

Objective: Configuration of optimum black-gloved wallaby habitat areas for restoration designed by 2013, and key sites being started to be fenced by 2014.

Strategic Action: Undertake habitat protection (fencing) of good quality bush that has the potential to support black gloved wallabies and create important habitat linkages

Progress	Updated	Comments
On Track	Jun 1, 2012	• 2.1.4[WCa] 77.6 fencing @ $3,600 fencing materials & contractor (Protect high biodiversity valueremnant bushland, waterways and revegetation.) Protecting 465.6 ha of native vegetation.

- **Action Step:** Map areas of different vegetation types from existing aerial photos, vegetation and geological maps and by undertaking field visits to ground truth areas
- **Action Step:** Compile GIS layer of black-gloved wallabies following surveys
- **Action Step:** Design configuration of optimum black-gloved wallaby habitat areas for restoration
- **Action Step:** Approach landholders who have priority sites and discuss funding options for revegetation and fencing
- **Action Step:** Fence remnants

Objective: Configuration of optimum black-gloved wallaby habitat areas for restoration designed by 2013, and key sites being started to be revegetated by 2014.

Strategic Action: Restoration of key areas of habitat with high linkage value on previously cleared land using high quality revegetation/ restoration practices: (Black gloved wallabies seem to have shifted away from Porongurups in last 50 or so years. Need to be able to answer the questions: Where are they now? Can we maintain them there?)

Progress	Updated	Comments
Planned	Mar 1, 2012	Need baseline information from surveys first

- **Action Step:** Map areas of different vegetation types from existing aerial photos, vegetation and geological maps and by undertaking field visits to ground truth areas
- **Action Step:** Compile GIS layer of black-gloved wallabies following surveys
- **Action Step:** Design configuration of optimum black-gloved wallaby habitat areas for restoration

- **Action Step:** Compile prioritised list of possible sites for revegetation following mapping of areas
- **Action Step:** Approach landholders who have priority sites and discuss funding options for revegetation and fencing
- **Action Step:** Ranges Link members to communicate regularly with seed suppliers, weed contractors, revegetation contractors before during and after works to ensure constantly improving revegetation practises
- **Action Step:** Undertake high-quality revegetation project
- **Action Step:** Undertake monitoring of revegetation projects as standard practise

Objective: Discussion with key people and groups at an advanced stage by 2013.

Strategic Action: Investigate the feasibility of contacting wildlife carers re taking wallabies to release into secure habitats (add to gene pool)

Progress	Updated	Comments
Planned	Mar 1, 2012	Not a priority at this stage, but maybe something to look into in the future

- **Action Step:** Talk to DEC & fauna consultants with regards rules of translocating black-gloved wallabies
- **Action Step:** Encourage university students to undertake studies that assist with learnings from strategies like this

Objective: Ensure that by the 2012-2013 fire season, an adequate response (information, incentive funding) is available to reduce grazing pressures in the event of a fire at key vegetation sites.

Strategic Action: Implement coordinated rabbit baiting program: (Need a network of rabbit baiting stations that get baited regularly. Need to identify the sites where they are needed first. Get more baiting stations (like those designed by Jack Mercer). Need to work out roles & responsibilities (Ranges Group, OHCG, landowners). Possibly approach Albany Tip Shop re supply of suitable containers)

Progress	Updated	Comments
On Track	Mar 1, 2012	• 2.5.10[WCa] Reduce the impact of vertebrate pest animals through the control of foxes, feral cats, and rabbits over 5,000 ha. (800 foxes and 50 cats)

- **Action Step:** Work out roles and responsibilities between Ranges Link, Oyster Harbour Catchment Groups & Landholders
- **Action Step:** Identify key sites where rabbit baiting stations will be most effective
- **Action Step:** Aquire materials for baits
- **Action Step:** Work with landholders to install bait stations at appropriate sites
- **Action Step:** Ensure that bait stations are regularly baited, and any results from monitoring communicated back

Strategic Action: Ensure that there is post-fire control of grazers: (In particular rabbits & roos are a problem in the early stages following fire. Objective should be that control of grazers is an accepted post-fire action. In addition the rabbit baiting stations need to be set up as fast as possible post fire - and the grazing and rabbit control strategies need to be linked. The most effective method of achieving this is through face to face contact with landholders where fires have taken place and to ensure that they take action quickly)

Back to Top

Progress	Updated	Comments
Planned	Mar 1, 2012	-

- **Action Step:** Draw up a 1 page checklist (e.g. contact kangaroo shooter, timing & methods of rabbit control) as easily accessible reminder for use by Ranges Link members when talking to landholders who have had fires.

Objective: Ensure that by the 2012-2013 fire season, an adequate response (information, incentive funding) is available to reduce weeds in addition to grazing pressures in the event of a fire at key vegetation sites.

Strategic Action: Fence & control weeds post fire; keep grazers numbers down: (The issue of grazers is the same as for the Jarrah/Marri, Banksia attenuata shrubland, & Rock sheoak targets . Kangaroos & rabbits need to be controlled - has also been addressed by including two new strategies (grazing & rabbit baiting) to this target)

Progress	Updated	Comments
On Track	Mar 1, 2012	Fencing component on track, other activities planned for future implementation. Fencing reference: • 2.1.4[WCa] 77.6 fencing @ $3,600 fencing materials & contractor (Protect high biodiversity value remnant bushland, waterways and revegetation.) Protecting 465.6 ha of native vegetation

- **Action Step:** Undertake strategic weed control project
- **Action Step:** Fence remnants

Objective: Ensure that by the 2012-2013 fire season, an adequate response (information, incentive funding) is available to reduce weeds in addition to grazing pressures in the event of a fire at key vegetation sites.

Strategic Action: Develop best practise manual for wandoo revegetation, recruitment, weed control: (It is suggested that UWA Restoration Ecology students could be involved (ask Peter Speldewinde the course co-ordinator). Check what resources the WWF Woodland Watch project has developed so far as well as the Wandoo Recovery Group.)

Progress	Updated	Comments
Planned	Mar 1, 2012	There is a lot of information available that needs to be compiled into a simple format

- **Action Step:** Compile folder of available wandoo management information
- **Action Step:** Write grant proposal for wandoo woodland booklet
- **Action Step:** Contract someone to develop short booklet on best practices for wandoo woodland management

Strategic Action: Implement weed control strategy following wildfires : (Bridal creeper & capeweed are particularly bad. Similar strategy to current Porongurup project. First 1-2 years are most important)

Progress	Updated	Comments
Planned	Mar 1, 2012	There is an element of opportunism involved here but the planned resource booklets will assist greatly in this regard.

- **Action Step:** Undertake strategic weed control project

Objective: Ensure that enabling strategies (in particular for funding & capacity building) for the Ranges Link & Oyster Harbour Catchment groups are scoped and developed by 2012, to ensure the effective implementation of conservation strategies through to 2020 and beyond

Strategic Action: Funding & capacity building strategy

Progress	Updated	Comments
On Track	Jun 30, 2012	Funding Biodiversity Fund application successful, Mt Barker Chickens have committed ongoing funds, Community Action Grants successful, funding currently available for a range of activities & more options being investigated. Capacity building Session on Miradi & Conpro with regards the Ranges Link CAP undertaken with Mark Waud in June 2012, but more training required.

- **Action Step:** Develop and implement a long-term funding strategy for conservation interventions in the Ranges Link — Stirling to Porongurup area.

- **Action Step:** Increase the capacity of the Ranges Link & Oyster Harbour Catchment Group to plan, implement, monitor and review conservation interventions in the Stirling to Porongurup area.

Objective: Fencing and revegetation of key Rock Sheoak sites implemented by 2014

Strategic Action: Continue with mapping exercise to determine key sheoak areas and opportunities for fencing & revegetation

Progress	Updated	Comments
On Track	Mar 1, 2012	• 2.1.4[WCa] Mapping of representative vegetation types (Wandoo Woodland Ecosystem, Rock Sheoak, Banksia attenuata Shrubland, Mallee Heath, Jarrah & Marri Woodland)

- **Action Step:** Map areas of different vegetation types from existing aerial photos, vegetation and geological maps and by undertaking field visits to ground truth areas

Strategic Action: Fence rock sheoak remnants

Progress	Updated	Comments
On Track	Mar 1, 2012	• 2.1.4[WCa] 77.6 fencing @ $3,600 fencing materials & contractor (Protect high biodiversity value remnant bushland, waterways and revegetation.) Protecting 465.6 ha of native vegetation

- **Action Step:** Approach landholders who have priority sites and discuss funding options for revegetation and fencing

- **Action Step:** Fence remnants

Back to Top

Objective: Identify feeding sites and nesting sites by 2013 with the view to improving the habitat and conservation status of black cockatoos in the Stirling to Porongurup Functional Landscape by 2015. : (Target = Black Cockatoos)

Objective: If deemed appropriate, warning signs about black cockatoos on roads and roadsides in place at "cockatoo blackspots" by 2014.

Strategic Action: Drive slower, education (signage) especially in Stirling Range National Park: There have and are ongoing deaths of black cockatoos feeding or drinking on or adjacent to road sides. There is debate as to how bad this threat is, how effective signage will be - and how difficult it will be to implement, and these are some of the reasons why this strategy is currently ranked low. However, this may change in the future as more information comes to light.

Progress	Updated	Comments
Planned	Mar 1, 2012	-

- **Action Step:** Talk to DEC, Birds Australia to find out about the signage and other awareness raising activities

Objective: Initial baseline on black gloved wallaby distribution through community survey completed by 2012, in depth survey planned in 2013 for implementation in 2014 at which stage detailed baseline of distribution pattern has been developed.

Strategic Action: Undertake community survey of black gloved wallaby and other fauna species (in particular quendas [bandicoots]): (It is important to establish a baseline for the species. The community survey should included records from sightings by roo shooters and other community input. Use cameras at fences to try to determine how they do get through (under/over/through). Following this survey a more in-depth targeted survey should be undertaken.)

Progress	Updated	Comments
On Track	Mar 1, 2012	• Mailout out survey forms to Landholders • GPS referenced observations by roo shooters underway • 2.1.4[WCa] Infrared Camera Monitoring to determine areas and numbers, impact of fences effectiveness of gates

- **Action Step:** Undertake community based survey to develop initial baseline of wallaby distribution
- **Action Step:** Develop community survey further with the help of fauna consultants to identify suitable habitat areas
- **Action Step:** Undertake second survey to identify baseline of suitable habitat occupation by black-gloved wallabies
- **Action Step:** Encourage university students to undertake studies that assist with learnings from strategies like this

Objective: Investigate the need for repairs/artificial hollows in key sites informally during 2012 & 2013 and systematically from early 2014 following the results of coordinated survey.

Strategic Action: Consider installing artificial nesting hollows; repair potential hollows: (Artificial nesting hollows have not proven to be effective unless they are placed in areas in which (recent) historical breeding has occured and repairing hollows needs to be preceded by location of suitable hollows, and protection and repairing hollows is possibly more activities to undertake first. A low priority strategy for now but may become more important in the future.)

Progress	Updated	Comments
Minor Issues	Mar 1, 2012	This aspect is dependent on survey work that needs to be done first

- **Action Step:** Repair hollows where necessary, following identification of key breeding sites, and if necessary install artificial hollows
- **Action Step:** Encourage university students to undertake studies that assist with learnings from strategies like this

Back to Top

Objective: Key black cockatoo feed species (of a sufficient quantity and quality) included in all revegetation/restoration projects by 2013.

Strategic Action: Plant food sources in all revegetation

Progress	Updated	Comments
On Track	Mar 1, 2012	-

- **Action Step:** Map areas of different vegetation types from existing aerial photos, vegetation and geological maps and by undertaking field visits to ground truth areas
- **Action Step:** Compile prioritised list of possible sites for revegetation following mapping of areas
- **Action Step:** Approach landholders who have priority sites and discuss funding options for revegetation and fencing
- **Action Step:** Develop Ranges-Link cockatoo plant species list
- **Action Step:** Ranges Link members to communicate regularly with seed suppliers, weed contractors, revegetation contractors before during and after works to ensure constantly improving revegetation practises
- **Action Step:** Undertake high-quality revegetation project
- **Action Step:** Undertake monitoring of revegetation projects as standard practise
- **Action Step:** Encourage university students to undertake studies that assist with learnings from strategies like this

Objective: Key wandoo woodland sites identified and fenced off by 2015

Strategic Action: Continue/expand the wandoo woodland mapping by Ranges Link group: (Most planted areas have been captured digitally. Needs assessment and completion.)

Progress	Updated	Comments
On Track	Jun 1, 2012	• 2.1.4[WCa] Mapping of representative vegetation types (Wandoo Woodland Ecosystem, Rock Sheoak, Banksia attenuata Shrubland, Mallee Heath, Jarrah & Marri Woodland)

- **Action Step:** Map areas of different vegetation types from existing aerial photos, vegetation and geological maps and by undertaking field visits to ground truth areas

Strategic Action: Ensure that revegetation efforts include wandoo plantings: (Hindrance is acquiring the land to do it. Tends to be good farm soil (unless it has become saline in which case you need to use saline spp).)

Progress	Updated	Comments
On Track	Mar 1, 2012	-

- **Action Step:** Approach landholders who have priority sites and discuss funding options for revegetation and fencing
- **Action Step:** Ranges Link members to communicate regularly with seed suppliers, weed contractors, revegetation contractors before during and after works to ensure constantly improving revegetation practises
- **Action Step:** Undertake high-quality revegetation project

Back to Top

- **Action Step:** Undertake monitoring of revegetation projects as standard practise

Strategic Action: Continue fencing wandoo woodland: (NB Have fenced most of the larger blocks. Areas to be fenced getting smaller. Potential fencing sources include SCNRM, state government, Mt. Barker Chickens)

Progress	Updated	Comments
On Track	Mar 1, 2012	• 2.1.4[WCa] 77.6 fencing @ $3,600 fencing materials & contractor (Protect high biodiversity value remnant bushland, waterways and revegetation.) Protecting 465.6 ha of native vegetation.

- **Action Step:** Approach landholders who have priority sites and discuss funding options for revegetation and fencing
- **Action Step:** Fence remnants

Objective: Planning Department have included needs of key conservation targets and habitat linkages in planning tools and guidelines by 2015.

Strategic Action: Engage with Department of Planning and Infrastructure to ensure that the regional planning strategy recognises the need for habitat linkages and that this is taken into account with new subdivisions/ other changes affecting native vegetation: (This should be part of a Gondwana Link Ltd. strategy as it cuts across a number of planning areas)

Progress	Updated	Comments
On Track	Mar 1, 2012	Gondwana Link is engaging with the Department of Planning and Infrastructure on this matter.

- **Action Step:** Gondwana Link to continue dialogue with Department of Planning with regards habitat linkages and regional planning issues
- **Action Step:** Feed ecological outcomes monitoring results into tools that can be used for planning decisions

Objective: Problem birds in the Ranges Link area reduced to manageable numbers by 2014.

Strategic Action: Reduce competition for nesting hollows by culling galahs & other predators

Progress	Updated	Comments
Minor Issues	Mar 1, 2012	Need to get clarity on legislation, also community perceptions may be a problems, especially in areas in which tourism is important

- **Action Step:** Contact DEC to get clarity on legislation about culling feral birds
- **Action Step:** Shoot feral birds in key locations

Objective: Ranges Link to trial filling hollows with clay against feral bees in hollows in at least 5 trees by 2012.

Strategic Action: Plug bee-used hollows with clay: (This is an idea that needs to be tested, a low priority for now but may prove to be important in the future)

Progress	Updated	Comments
Planned	Mar 1, 2012	-

- **Action Step:** Peter Luscombe to trial the installation of clay plugs to remove feral bees from tree hollows

Objective: To improve the condition and connectivity of Banksia attenuata shrubland vegetation communities in the Stirling to Porongurup Functional Landscape by 2015. : (Target = Banksia attenuata shrubland)

Objective: To improve the condition and connectivity of Jarrah/marri associated vegetation communities in the Stirling to Porongurup Functional Landscape by 2015. : (Target = Jarrah & Marri Woodland)

Objective: To improve the condition and connectivity of Mallee Heath vegetation in the Stirling to Porongurups Functional Landscape by 2015. : (Target = Mallee heath)

Objective: To improve the condition and connectivity of Rock Sheoak vegetation in the Stirling to Porongurups Functional Landscape by 2015. : (Target = Rock Sheoak)

Objective: To improve the condition and connectivity of Wandoo associated vegetation communities in the Stirling to Porongurup Functional Landscape by fencing all remnants and undertaking revegetation and improved management by 2015 : (Target = Wandoo Woodland Ecosystem)

Objective: To improve the habitat and conservation status of black gloved wallabies (and fauna with similar habitat requirements/threats) in the Stirling to Porongurup Functional Landscape by 2015. : (Target = Black Gloved Wallaby)

Objective: To undertake a mapping exercise to produce a new vegetation map for the Stirling to Porongurup Functional Landscape by 2012 that can be used further to refine and measure the extent of target vegetation systems.

Strategic Action: Mapping Strategy

Progress	Updated	Comments
On Track	Jun 1, 2012	• 2.1.4[WCa] Mapping of representative vegetation types (Wandoo Woodland Ecosystem, Rock Sheoak, Banksia attenuata Shrubland, Mallee Heath, Jarrah & Marri Woodland)

- **Action Step:** Map areas of different vegetation types from existing aerial photos, vegetation and geological maps and by undertaking field visits to ground truth areas

- **Action Step:** Develop short description of vegetation types of mapped areas and get the areas digitised and onto a GIS system.

Objective: To undertake a mapping exercise to produce a new vegetation map for the Stirling to Porongurup Functional Landscape by 2012 that can be used further to refine and measure the extent of target vegetation systems.

Strategic Action: Continue/expand the wandoo woodland mapping by Ranges Link group: (Most planted areas have been captured digitally. Needs assessment and completion.)

Progress	Updated	Comments
On Track	Jun 1, 2012	• 2.1.4[WCa] Mapping of representative vegetation types (Wandoo Woodland Ecosystem, Rock Sheoak, Banksia attenuata Shrubland, Mallee Heath, Jarrah & Marri Woodland)

- **Action Step:** Map areas of different vegetation types from existing aerial photos, vegetation and geological maps and by undertaking field visits to ground truth areas

Back to Top

Objective: Undertake fencing of key Jarrah-Marri and Banksia attenuata sites during 2012-2014 and revegetate 50 ha of strategic proteaceous dominant vegetation by 2013

Strategic Action: Fencing (primarily) and revegetation of Jarrah-Marri & Banksia attenuata vegetation communities: (There are a number of opportunities to fence off bush from stock closer to Porongurup. There is a need for the mapping to be completed to identify opportunities across Ranges Link area. There is more fencing than revegetation taking place)

Progress	Updated	Comments
On Track	Mar 1, 2012	2.1.4[WCa] 77.6 fencing @ $3,600 fencing materials & contractor (Protect high biodiversity valueremnant bushland, waterways and revegetation.) Protecting 465.6 ha of native vegetation.

- **Action Step:** Continue with fencing incentive projects
- **Action Step:** Where appropriate (and necessary for fauna habitat outcomes) undertake strategic, high quality restoration of Jarrah-Marri and Banksia attenuata systems.

Objective: Undertake initial survey in spring 2012, co-ordinated survey in spring 2013 with mapped nesting sites by early 2014.

Strategic Action: Identify key nesting sites (trees with hollows within critical distance of key feeding sites)

Progress	Updated	Comments
Minor Issues	Mar 1, 2012	-

- **Action Step:** Identify trees with hollows (or potential) and protect them (within 2 years)
- **Action Step:** Produce GIS map of key nesting sites
- **Action Step:** Map areas of different vegetation types from existing aerial photos, vegetation and geological maps and by undertaking field visits to ground truth areas
- **Action Step:** Encourage university students to undertake studies that assist with learnings from strategies like this
- **Action Step:** Feed ecological outcomes monitoring results into tools that can be used for planning decisions

Objective: Wallaby gates trialled by 2013 for roll out (if successful) at 10 sites by 2014

Strategic Action: Undertake research on "wallaby friendly" fences/gates; install at appropriate locations: (Peter Luscombe described a hinged gate arrangement that can be trialled, possibly as his property)

Progress	Updated	Comments
On Track	Mar 1, 2012	• 2.1.4[WCa] Erect 10 Wallaby Gates (Gates required to allow wallabies to move freely to and from fenced areas, and into Stirling Range National Park)

- **Action Step:** Build prototype wallaby gates
- **Action Step:** Install gate at test site where wallabies can be observed
- **Action Step:** Undertake monitoring, including photo-monitoring of gates to establish how useful they are

- **Action Step:** If proven that wallaby gates work, construct appropriate number and install at key locations guided by surveys and observations

Back to Top

All Monitoring Indicators

Methods	Objectives	Key Indicator References by Target (w/Current Indicator Measurement)	Threat References by Target (w/Current Indicator Measurement)
Indicator: **Availability of hollows for breeding and nearby food sources**			
• Carry out survey in spring to identify areas in which breeding is taking place following the methodology of Birdlife Australia. (Birds Australia. Undated. Volunteer Nesting Survey Guide. Unpublished 13 page booklet, Carnaby's Black-Cockatoo Recovery Project. Floreat, Western Australia.)	• Identify feeding sites and nesting sites by 2013 with the view to improving the habitat and conservation status of black cockatoos in the Stirling to Porongurup Functional Landscape by 2015. : (Target = Black Cockatoos)	**Black Cockatoos** • Size: Population recruitment	
Indicator: **Crown condition**			
-	• To improve the condition and connectivity of Jarrah/marri associated vegetation communities in the Stirling to Porongurup Functional Landscape by 2015. : (Target = Jarrah & Marri Woodland)	**Jarrah & Marri Woodland** • Condition: Tree health	
Indicator: **Discrete populations within critical range**			
-	• Identify feeding sites and nesting sites by 2013 with the view to improving the habitat and conservation status of black cockatoos in the Stirling to Porongurup Functional Landscape by 2015. : (Target = Black Cockatoos)	**Black Cockatoos** • Landscape Context: Genetic flows between populations	
Indicator: **Fire age mosaic**			
• Develop GIS fire data layer (DEC & Gondwana Link have some of this information). Fire mapping may be a surrogate for condition from DEC data layer as per DEC fire sensitive ecosystems report (Barret et al., 2009)	• To improve the condition and connectivity of Banksia attenuata shrubland vegetation communities in the Stirling to Porongurup Functional Landscape by 2015. : (Target = Banksia attenuata shrubland)	**Banksia attenuata shrubland** • Landscape Context: Fire regime - area burnt (proportion of target)	
Indicator: **Foreshore assessment**			
• Stream foreshore assesment (Pen-Scott method)	• 95% of Kalgan River fenced from livestock by 2012 & 95% of tributaries & wetlands fenced from livestock by 2015 : (Target = Kalgan River, tributaries and wetlands)	**Kalgan River, tributaries and wetlands** • Condition: Stream condition	
Indicator: **Healthy understorey (Proteaceae in mix)**			
-	• To improve the condition and connectivity of Jarrah/marri associated vegetation communities in the Stirling to Porongurup Functional Landscape by 2015. : (Target = Jarrah & Marri Woodland)	**Jarrah & Marri Woodland** • Condition: Species Composition	
Indicator: **Map of proteaceous-dominant vegetation**			
-	• Identify feeding sites and nesting sites by 2013 with the view to improving the habitat and conservation status of black cockatoos in the Stirling to Porongurup Functional Landscape by 2015. : (Target = Black Cockatoos)	**Black Cockatoos** • Condition: Abundance of food resources	
Indicator: **Measuring the affect of fences to restricting movement**			

Back to Top

Methods	Objectives	Key Indicator References by Target (w/Current Indicator Measurement)	Threat References by Target (w/Current Indicator Measurement)
-	• To improve the habitat and conservation status of black gloved wallabies (and fauna with similar habitat requirements/threats) in the Stirling to Porongurup Functional Landscape by 2015. : (Target = Black Gloved Wallaby)	**Black Gloved Wallaby** • Landscape Context: Movement across the landscape	
Indicator: **Number/ percentage of potential suitable habitat occupied**			
• % of suitable habitat occupied as per the methodology developed by Gilfillan (2010) in the FitzStirling	• To improve the habitat and conservation status of black gloved wallabies (and fauna with similar habitat requirements/threats) in the Stirling to Porongurup Functional Landscape by 2015. : (Target = Black Gloved Wallaby)	**Black Gloved Wallaby** • Size: Distribution and abundance	
Indicator: **Percentage of catchment with perennial vegetation cover**			
• GIS analysis of vegetation, possibly incorporating Vegmachine (CSIRO) data on condition	• 95% of Kalgan River fenced from livestock by 2012 & 95% of tributaries & wetlands fenced from livestock by 2015 : (Target = Kalgan River, tributaries and wetlands)	**Kalgan River, tributaries and wetlands** • Landscape Context: Catchment hydrology	
Indicator: **Physical, chemical and biological Ausrivas indices**			
• Ausrivas biological indices as per the ecological values report on South Coast Waterways by Cook et al. (2008)	• 95% of Kalgan River fenced from livestock by 2012 & 95% of tributaries & wetlands fenced from livestock by 2015 : (Target = Kalgan River, tributaries and wetlands)	**Kalgan River, tributaries and wetlands** • Condition: Water quality	
Indicator: **Pools affected by sedimentation**			
-	• 95% of Kalgan River fenced from livestock by 2012 & 95% of tributaries & wetlands fenced from livestock by 2015 : (Target = Kalgan River, tributaries and wetlands)	**Kalgan River, tributaries and wetlands** • Condition: Permanent pools	
Indicator: **Presence of fertile trees and recruitment**			
-	• To improve the condition and connectivity of Rock Sheoak vegetation in the Stirling to Porongurups Functional Landscape by 2015. : (Target = Rock Sheoak)	**Rock Sheoak** • Condition: Population structure & recruitment	
Indicator: **Presence of proteaceous obligate seeders**			
-	• To improve the condition and connectivity of Mallee Heath vegetation in the Stirling to Porongurups Functional Landscape by 2015. : (Target = Mallee heath)	**Mallee heath** • Condition: Species Composition	
Indicator: **Range of ant activity**			
-	• To improve the condition and connectivity of Wandoo associated vegetation communities in the Stirling to Porongurup Functional Landscape by fencing all remnants and undertaking revegetation and improved management by 2015 : (Target = Wandoo Woodland Ecosystem)	**Wandoo Woodland Ecosystem** • Condition: Active soil fauna	
Indicator: **Range of tree ages**			
-	• To improve the condition and connectivity of Jarrah/marri associated vegetation communities in the Stirling to Porongurup Functional Landscape by 2015. : (Target = Jarrah & Marri Woodland)	**Jarrah & Marri Woodland** • Landscape Context: Population structure & recruitment	
Indicator: **Seed set**			

Back to Top

Methods	Objectives	Key Indicator References by Target (w/Current Indicator Measurement)	Threat References by Target (w/Current Indicator Measurement)
-	• To improve the condition and connectivity of Banksia attenuata shrubland vegetation communities in the Stirling to Porongurup Functional Landscape by 2015. : (Target = Banksia attenuata shrubland)	**Banksia attenuata shrubland** • Condition: Pollination	
Indicator: **Size and extent of the vegetation system**			
• GIS analysis of vegetation, possibly incorporating Vegmachine (CSIRO) data on condition	• To improve the condition and connectivity of Wandoo associated vegetation communities in the Stirling to Porongurup Functional Landscape by fencing all remnants and undertaking revegetation and improved management by 2015 : (Target = Wandoo Woodland Ecosystem) • To improve the condition and connectivity of Jarrah/marri associated vegetation communities in the Stirling to Porongurup Functional Landscape by 2015. : (Target = Jarrah & Marri Woodland)	**Jarrah & Marri Woodland** • Size: Patch size & shape **Wandoo Woodland Ecosystem** • Size: Patch size & shape	
Indicator: **Species richness and composition**			
-	• To improve the condition and connectivity of Rock Sheoak vegetation in the Stirling to Porongurups Functional Landscape by 2015. : (Target = Rock Sheoak)	**Rock Sheoak** • Condition: Community condition	
Indicator: **Suite of fauna**			
-	• To improve the condition and connectivity of Wandoo associated vegetation communities in the Stirling to Porongurup Functional Landscape by fencing all remnants and undertaking revegetation and improved management by 2015 : (Target = Wandoo Woodland Ecosystem)	**Wandoo Woodland Ecosystem** • Condition: Active habitat for tree dwellers	
Indicator: **TBD**			
-	• To improve the condition and connectivity of Wandoo associated vegetation communities in the Stirling to Porongurup Functional Landscape by fencing all remnants and undertaking revegetation and improved management by 2015 : (Target = Wandoo Woodland Ecosystem)	**Wandoo Woodland Ecosystem** • Landscape Context: Landscape pattern (mosaic) & structure	
Indicator: **Total area of (healthy) target vegetation**			
• GIS analysis of vegetation, possibly incorporating Vegmachine (CSIRO) data on condition	• To improve the condition and connectivity of Mallee Heath vegetation in the Stirling to Porongurups Functional Landscape by 2015. : (Target = Mallee heath) • To improve the condition and connectivity of Rock Sheoak vegetation in the Stirling to Porongurups Functional Landscape by 2015. : (Target = Rock Sheoak)	**Mallee heath** • Size: Patch size & shape **Rock Sheoak** • Size: Patch size & shape	
Indicator: **Tree crown cover**			
• Crown cover ratings. Based on existing work on Wandoo trees, using photographs of tree crowns in different categories as a quick reference. Also look at methods developed by Angela Sanders (2012) for Yate monitoring in the FitzStirling area.	• To improve the condition and connectivity of Wandoo associated vegetation communities in the Stirling to Porongurup Functional Landscape by fencing all remnants and undertaking revegetation and improved management by 2015 : (Target = Wandoo Woodland Ecosystem)	**Wandoo Woodland Ecosystem** • Condition: Tree health	
Indicator: **Understorey & recruitment**			

Back to Top

Methods	Objectives	Key Indicator References by Target (w/Current Indicator Measurement)	Threat References by Target (w/Current Indicator Measurement)
-	• To improve the condition and connectivity of Wandoo associated vegetation communities in the Stirling to Porongurup Functional Landscape by fencing all remnants and undertaking revegetation and improved management by 2015 : (Target = Wandoo Woodland Ecosystem)	**Wandoo Woodland Ecosystem** • Condition: Species composition / dominance	
Indicator: **Vegetation condition**			
-	• To improve the condition and connectivity of Banksia attenuata shrubland vegetation communities in the Stirling to Porongurup Functional Landscape by 2015. : (Target = Banksia attenuata shrubland)	**Banksia attenuata shrubland** • Condition: Species composition / dominance	

Back to Top

Project Resources

There is not enough information to produce this report.

Back to Top

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
Banksia attenuata shrubland	Pollination [1] (Condition)	Seed set [2]	TBD	**Poor:** 0-30% **Fair:** 30-60% **Good:** 60-80% **Very Good:** 80-100%	Fair	Good
Banksia attenuata shrubland	Species composition / dominance [3] (Condition)	Vegetation condition [4]	Condition score/rating	**Poor:** poor score **Fair:** fair score **Good:** good score **Very Good:** very good score	Fair	Good
Banksia attenuata shrubland	Fire regime - area burnt (proportion of target) [5] (Landscape Context)	Fire age mosaic [6]	Banksia nutans (abundance?)	**Poor:** fire interval of < 5 years or > 50 years **Fair:** fire intervals >5years but <10 years or >40years but <50years **Good:** fire intervals >10years but <20 years or >30years but <40 years **Very Good:** 20 - 30 year interval between fires	Fair	Good
Black Cockatoos	Abundance of food resources [7] (Condition)	Map of proteaceous-dominant vegetation	Hectares of proteaceous-dominant vegetation	**Poor:** TBD **Fair:** TBD **Good:** TBD **Very Good:** TBD	Fair *Jul 15, 2010*	Good
Black Cockatoos	Genetic flows between populations [8] (Landscape Context)	Discrete populations within critical range [9]	TBD	**Poor:** TBD **Fair:** TBD **Good:** TBD **Very Good:** TBD	Fair *Jul 15, 2010*	Good
Black Cockatoos	Population recruitment [10] (Size)	Availability of hollows for breeding and nearby food sources	Number of hollows utilised for nesting	**Poor:** few hollows **Fair:** some hollows **Good:** many hollows **Very Good:** lots of hollows within critical distance of food resources	Poor [11] *Jul 15, 2010*	Fair
Black Gloved Wallaby	Movement across the landscape [12] (Landscape Context)	Measuring the affect of fences to restricting movement	Ability of wallabies to get through standard ringlock fences	**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	Poor [13]	Good
Black Gloved Wallaby	Distribution and abundance [14] (Size)	Number/ percentage of potential suitable habitat occupied	Number of potential sites occupied	**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 [15]	Good
Jarrah & Marri Woodland	Species Composition [16] (Condition)	Healthy understorey (Proteaceae in mix)	Condition rating/ flora survey values	**Poor:** unhealthy/dead proteaceous heath **Fair:** Proteaceous heath present **Good:** Proteaceous heath heathly **Very Good:** Proteaceouts heath in excellent condition with recruitment	Fair	Good

Back to Top

Conservation Target	Key Attribute (Category)	Indicator	Current Indicator Measurement	Rating Comments: (Poor, Fair Good Very Good)	Current Rating and Date	Desired Rating and Date
Jarrah & Marri Woodland	Tree health [17] (Condition)	Crown condition	Modify from Wandoo crown condition as follows:C1, (75-100% crown cover), C2 (45 - 65% crown cover), C3 (20-30%), C4 (10% crown cover)	**Poor:** C4 (10% crown cover) **Fair:** C3 (20-30%) **Good:** C2 (45 - 65% crown cover) **Very Good:** C1, (75-100% crown cover)	Fair	Good
Jarrah & Marri Woodland	Population structure & recruitment [18] (Landscape Context)	Range of tree ages	Number of individuals per size/age class	**Poor:** only old trees **Fair:** mostly old trees, some younger ones **Good:** mix of age classes **Very Good:** full mix of age classes	Fair	Good
Jarrah & Marri Woodland	Patch size & shape [19] (Size)	Size and extent of the vegetation system	Hectares of this vegetation type	**Poor:** TBD **Fair:** TBD **Good:** TBD **Very Good:** TBD	Fair	Good
Kalgan River, tributaries and wetlands	Permanent pools [20] (Condition)	Pools affected by sedimentation	TBD - likely to vary from poor to good within micro catchments. Status will need to be established by subcatchment.	**Poor:** Pools lost through sedimentation; others being affected **Fair:** All or most pools affected by sedimentation **Good:** Some pools affected by sedimentation **Very Good:** No "unnatural" sedimentation of pools	Fair *Jul 7, 2010*	Good
Kalgan River, tributaries and wetlands	Stream condition [21] (Condition)	Foreshore assessment [22]	TBD once new baseline assessments are completed - 1997 report is 19% A grade	**Poor:** <20% A grade **Fair:** 20%-50% A grade **Good:** 51%-80% A grade **Very Good:** >80% A grade	Poor *Jan 1, 1997*	Good
Kalgan River, tributaries and wetlands	Water quality [23] (Condition)	Physical, chemical and biological Ausrivas indices	TBD: Ratings to be determined with CENRM and Department of Water to ensure consistency with wider south coast databases	**Poor:** tbd **Fair:** tbd **Good:** tbd **Very Good:** tbd	Fair *Jul 1, 2007*	Good
Kalgan River, tributaries and wetlands	Catchment hydrology [24] (Landscape Context)	Percentage of catchment with perennial vegetation cover	% of remnant vegetation in subcatchments - current estimate 34%	**Poor:** <20% **Fair:** 20%-50% **Good:** 51%-80% **Very Good:** >80%	Fair *Jul 7, 2010*	Good
Mallee heath	Species Composition [25] (Condition)	Presence of proteaceous obligate seeders [26]	TBD	**Poor:** few obligate seeding banksias and dryandra's present **Fair:** some obligate seeding banksias and dryandra's present **Good:** many obligate seeding banksias and dryandra's present **Very Good:** most obligate seeding banksias and dryandra's present	Fair [27] *Jul 7, 2010*	Good
Mallee heath	Patch size & shape [28] (Size)	Total area of (healthy) target vegetation [29]	Hectares & fragmentation index	**Poor:** Extensive fragmentation, very small percentage of pre-European vegetation **Fair:** Much fragmentation small percentage of pre-European vegetation **Good:** Some fragmentation large percentage of pre-European vegetation **Very Good:** Little fragmentation very large percentage of pre-European vegetation	Fair [30]	Good

Back to Top

Conservation Target	Key Attribute (Category)	Indicator	Current Indicator Measurement	Rating Comments: (Poor, Fair Good Very Good)	Current Rating and Date	Desired Rating and Date
Rock Sheoak	Community condition [31] (Condition)	Species richness and composition [32]	-	**Poor:** High proportion of weeds, bare, no recruitment **Fair:** due to weeds - fair = less weeds **Good:** low weed burden, good recruitment **Very Good:** no weeds - compelte understorey	Fair	Good
Rock Sheoak	Population structure & recruitment [33] (Condition)	Presence of fertile trees and recruitment	Number of trees per age class	**Poor:** only old trees **Fair:** mostly old trees, some younger ones **Good:** mix of age classes **Very Good:** full mix of age classes	Fair	Good
Rock Sheoak	Patch size & shape [34] (Size)	Total area of (healthy) target vegetation [35]	Hectares & fragmentation index	**Poor:** Extensive fragmentation, very small percentage of pre-European vegetation **Fair:** Much fragmentation small percentage of pre-European vegetation **Good:** Some fragmentation large percentage of pre-European vegetation **Very Good:** Little fragmentation very large percentage of pre-European vegetation	Fair	Good
Wandoo Woodland Ecosystem	Active habitat for tree dwellers [36] (Condition)	Suite of fauna [37]	Presence of key indicator species - (e.g. rufus tree creeper)	**Poor:** few tree dwelling species present **Fair:** some tree dwelling species present **Good:** many tree dwelling species present **Very Good:** all tree dwelling species present	Good *Jul 7, 2010*	Good
Wandoo Woodland Ecosystem	Active soil fauna [38] (Condition)	Range of ant activity [39]	TBD	**Poor:** Poor diversity - a few species dominate **Fair:** Fair diversity of soil fauna **Good:** Good diversity of soil fauna **Very Good:** Very good diversity of soil fauna	Fair *Jul 7, 2010*	Good
Wandoo Woodland Ecosystem	Species composition / dominance [40] (Condition)	Understorey & recruitment [41]	Flora survey condition ranking (e.g. Kaesehagen scale)	**Poor:** Poor understorey, old trees only **Fair:** Some understorey, mainly old trees, some young ones **Good:** Good understorey, mix of age classes **Very Good:** Excellent understorey, full compliment of age classes	Fair	Good
Wandoo Woodland Ecosystem	Tree health [42] (Condition)	Tree crown cover [43]	% crown cover	**Poor:** C4 (10% crown cover) **Fair:** C3 (20-30% crown cover) **Good:** C2 (45 - 65% crown cover) **Very Good:** C1, (75-100% crown cover),	Fair	Good
Wandoo Woodland Ecosystem	Landscape pattern (mosaic) & structure [44] (Landscape Context)	TBD	TBD	**Poor:** TBD **Fair:** TBD **Good:** TBD **Very Good:** TBD	Fair *Jul 7, 2010*	Good

Back to Top

Conservation Target	Key Attribute (Category)	Indicator	Current Indicator Measurement	Rating Comments: (Poor, Fair Good Very Good)	Current Rating and Date	Desired Rating and Date
Wandoo Woodland Ecosystem	Patch size & shape [45] (Size)	Size and extent of the vegetation system [46]	Connectivity index and area (hectares)	**Poor:** Few large patches over 20 ha, many skinny roadside patches **Fair:** Some patches over 20ha - squarish solid blocks **Good:** Many patches over 20 ha, some patches over 100 ha **Very Good:** Pre European sizes (100s of hectares)	Poor	Good

COMMENTS:

1. Obvious measure of pollination. may be difficult to measure and will vary naturally from year to year. ask Peter Luscombe Work has shown that pollination and seed set is better in good quality bush - see paper by David Paton - University of Adelaide - research by Prof. Don Bradshaw - honey possums - need 25 years for honey possums to come back. If only burn small areas - honey possums may return with flowering. NB - one study has said that the optimum fire interval should be 3times the period for the longest obligate reseeding plant species. Seed set varies but can be broken down into 3 main families - legumes, Proteaceae & Myrtaceae. Legumes have good seed set - 2-3 years after fire, Mytaceae & proteaceae build up of seed set over next 10 years and after 25 years tend to be on the decline (Proteaceae & Myrtaceae). E.g. from Peter Luscombe - Southern Boundary of Stirlings - Banksia attenuata (small tree) -good seed set (80% of plants of right age have seed set) & adjacent Banksia gardneri (ground cover) less than 5% - appears that pollinators for tree ok but for ground cover - not present/eaten by foxes? - possums?

2. Peter Luscombe to provide indicator rating detail

3. Use David Kashagen (1994) scale or similar Old comment: Have range of conditions - some excellent others poor - a number of sizeable patches - better in size and shape than wandoo according to Ranges Link mapping to date (7 June 2010)

4. % of B. attenuata cover; presence of weeds; could be used

5. Tricky question - linked to wildfires. Some area have been burnt twice in five years - (hot fires) i.e. have been hammered by wildfires - other areas not burnt in 50 years. There are areas that "need" to be burnt but with caution because kangaroo, rabbit and weed control need to be undertaken for the first 2 years after the fire - DEC not doing on some areas and the biodiversity is taking a big dive - Peter Luscombe has personal experience of this - very important to do the follow up - most destructive are the rabbits. Optimum - OK is one hot fire in 25 years, at summer/autumn - patch burning - smaller areas - not whole sections as this may negatively affect fauna - e..g honey possums. Comment from 16 June 2010 - need to actually map which areas are at what age and which areas should ideally not be burnt for x many years. Good quality bush - fire intensity doesn't effect bush - they sprout back - but if bad quality bush - doesn't come back so well. Peter Luscombe's place - good quality bush - can burn after 6 years and all species will come back - included are indicators for fire frequency such as Banksia nutans - obbligate reseeder - possibly make this indicator species

6. These suggested fire intervals are put up for review and should not be viewed as absolute values as other factors including intensity, scale and past fire history etc. need to be taken into account. Also - need to be calibrated for this vegetation type - as values were extrapolated from research from the Gnangara area (Wilson et al., 2010)

7. These key ecological attributes and indicators were developed for Carnaby's Cockatoo for the Forest to Stirlings CAP with Raana Scott of Birds Australia. The assumptions for Carnaby's will need to be tested for the other two cockatoo species.

8. These key ecological attributes and indicators were developed for Carnaby's Cockatoo for the Forest to Stirlings CAP with Raana Scott of Birds Australia. The assumptions for Carnaby's will need to be tested for the other two cockatoo species. Peter Luscombe - who lives 12 km North of the Porongurups notices white tailed black cockatoos flying North in the morning and South in the evening - he says there are not many Wandoo trees south of his property and was wondering if they are nesting in hollows in Karri trees in the Porongurups - will need to check if this is the case. Heather Adams - who lives just south of the Stirling Ranges - noticed that the white tailed black cockatoos fly south in the morning and north at night - the assumption is that these ones are nesting in the Stirling Ranges and coming to her place to feed. Investigate what radio tracking work done on them about movements etc. There were also some observations about feeding habits - Peter Luscombe noticed how they are currently eating the seed of the Erodium (Geranium family), and how they trash the Banksia baxteri. Heather Adams noted that in the 25 years that she had been in the area flock sizes of (presumably) Carnaby's had gone down from 200 to about 70 and that there are still people who shoot them. Peter Luscombe noted that Tim Saggers - near the SW end of the Stirlings had reported birds nesting in his wandoo trees.

9. Without a large research project such as a PHD - this aspect will be impossible to determine values for

10. These key ecological attributes and indicators were developed for Carnaby's Cockatoo for the Forest to Stirlings CAP with Raana Scott of Birds Australia. The assumptions for Carnaby's cockatoo will need to be tested for the other two cockatoo species.

11. Difficult to generalise across species - was rated poor for Carnaby's cockatoos - does this hold for the other two species as well? There were comments at a meeting of 1 Nov 2010 with the Ranges Link group that Red Tailed black numbers were actually increasing at one property For the moment - leave the rating as per the Carnaby's assessment, assuming that the lack of hollows goes for all three species

12. DNA important but out of scope for group unless PHD student comes along It is thought that movement of wallaby populations across the landscape is important for gene flow and rigor within the species. It is assumed that fences such as the one along the southern border of the Stirling Range National Park, as well as some roads have a negative impact on this movement accross the landscape. The extent to which this is occuring needs to be investigated further with surveys, cameras. There are no (Nature Map website, June 2010) official records for Porongurups or the broader Ranges Link area! This shows inadequate mapping that needs to be addressed.

13. Need to check how fences affect movements - cant get through ring lock - but can get through plain wire but so can sheep - suggestion to investigate further with remote cameras. Heather' Adams has a patch of bush 50 ha & Kamballup reserve (with wallabies) - same sort of size - but Judy Hunt's bush - no wallabies. Do a map of current distribution - where they currently are - may indicate that they are in the larger patches only - compare with wheatbelt research - 100ha cut off.

14. This refers to sufficient numbers of wallabies for successful breeding Sandra Gillfillans's work on this species and Tammar wallabies for the Fitzstirling area have give some baseline information as to the percentage of occupied sites in the area, the fair rating of 36% of sites occupied was to be increased to 50% of sites occupied to achieve a "good" rating. However, further work is required to determine if occupied sites means that successful breeding is taking place. Remote camera work may be able to assist in this regard.

15. Biggest threat to the south of the Ranges Area packs of dogs just North of the Porongurups, but no so at the northern end just south of the Stirling Ranges. Northern part of the range is less likely to have feral dogs - also more shooting north, less baiting to the south. Note if there is a strategy to increase fox baiting the dogs will be taken as well.

16. Healthy understorey needs to have proteaceae in the mix. Add the presence of proteaceous heath to the Jarrah Marri target as the indicator. Needs appropriate fire regime and feral control esp. rabbits , foxes etc.

17. Similar to Wandoo Tree Decline - indicator ratings to be determined

18. Complex systems across varying soils from sand to laterite. Phytopthora an issue

19. This is the most prevalent vegetation in this system - in the southern half of the area at least. i.e. remnants are the most prevalant - but may not have been the most prevalant vegetation in pre-European times (check with Beard mapping), predominate vegetation would have been Wandoo and Mallee on siltones (clayloam) - the reason for most rem veg in Jarrah Marri today is less nutrients & poorer soils for agricultural and only started with clearing once the trace elements were introduced - 1960s- 1980s

20. This indicator and this comment taken from Fitzstirling CAP, need to modify data for Kalgan system Monitor by looking at quality of pools during stream foreshore condition - can not do a lot about - there has always been sediment (Fitz - comparision between Peniup and pools and Farringtons - whole creek bed is a sand bed) Peter Luscombe has noticed long pools that have formed where they weren't before - from more extreme rainfall. Can only do something where there is clear evidence of a gully leading into a pool. The strategy for the catchment cover and stream condition (i.e. more riparian revegetation) will improved the quality of the pools Permanent pools provide habitat for fish, invertebrates and aquatic and terrestrial plants in the creeks and function as refugia for many species during summer and dry seasons, although the extent of their ecological functions and values is not fully understood. These permanent pools are vulnerable to both sedimentation and physico-chemical changes in water quality, and in very degraded sections some pools have disappeared entirely after filling with sand. It appears that much of the sandy sediment may have entered the creek systems during major rainfall events in the past (eg in the 1950s and 1980s). These "sand slugs" are now relatively stable as they have been colonised by shrubs (mainly Acacia saligna), grasses and chenopods. These slugs may not move any further downstream unless there is further disturbance or major flooding before they are fully stabilised. There is also evidence of more recent and continuing movement of sediments into creeklines at sites where a combination of overstocking and cropping practices which deplete soil cover and reduced extent of riparian vegetation occurs. Identifying the sources of the sediments and its movement will assist in the management of the creeks by pinpointing priority areas for restoration works. (Prosser & Karsssies 2001) (Wilkinson et al 2004)

21. Some work had been done on the Kalgan previously (APACE Green Skills & Pen 1997, Survey of River Foreshores in the Oyster Harbour Catchment 1997. Water Resource Technical Series. Water and Rivers Commission Report WRT 17. 1997 Water and Rivers Commission, East Perth) and the findings were that at that stage, 55% of the rivers and streams had been fenced, and with regards condition of the surveyed river 19% of the riparian zone was A grade, 34 % B grade, 30% C grade and 17% D grade. (Pen-Scott method of assessing riparian vegetation and stream condition has been used successfully on many south coast rivers. (Jansen et al 2003) (Price & Lovett (1999)) (Lovett & Price (1999)) (W & R Comm (1999)) (W & R Comm 2000) (W & R Comm 2002) (W & R Comm 2002)

22. Compare these categories with recent work by Angela Sanders (2012) in the FitzStirling area

23. Indicators such as the invertebrate species suggested by Cook et. al. (2008). There are 11 existing sites on the Kalgan River (Cook et. al. 2008) measured in Jan 2006; Dec 2007 which can be used as baselines and measured at regular intervals (e.g, 5 years) (see Angela Sanders 2012 report - need 10 years to properly establish indicators!) The AusRivAS program undertook nation-wide sampling and developed a model to predict macroinvertebrate communities that should occur in the absence of impacts (and therefore also developed an indicator of river health based on observed vs expected communities present). In 2006, the Department of Water commenced a project with CENRM to apply the same methodology across 29 river systems on the south coast to develop a more specific set of reference points for this region the results of which have been published (Cook et al., 2008).

24. Need to do the GIS analysis for Ranges Link area, but the area for the analysis needs to be reviewed - i.e. how much of the Upper Catchment should be included as current area does not included the whole of the upper catchment. Apace Green Skills & Pen (1997) noted that the remnant vegetation for the Upper Kalgan was 34% (66 % cleared by 1991). The following is a comment from Fitzstirling CAP for this attribute: There are extensive references correlating hydrological function and catchment "health" to the area of the catchment covered by native perennial vegetation. There is however very little data to demonstrate the quantitate relationship between catchment clearing and hydrological function, and even less data to show relationships between hydrological functions (eg streamflow, runoff) with channel morphology or ecological functions for any of the waterways in the south coast catchments east of Albany. In the absence of any reliable quantitative data on which to base threshold indicator levels, we have set the lower and upper thresholds at 20% and 80% of catchment clearing. These coincide with the levels used in the Water Resources Background Paper to the South Coast Regional Strategy for NRM (2004) to identify rivers at high risk of salinisation and nutrient pollution, and "near pristine" rivers respectively. The intermediate threshold of 50% vegetation cover is merely a midpoint and should be used cautiously. While the % of catchment vegetated will be used as an indicator, we will also need to do some calibration of catchment cover vs groundwater hydrology so that we are able to verify our assumptions. Direct groundwater level monitoring will be required. (Lillicrap 2004) (Rutherford et al 2000) (Water & Rivers Commission 2002) (NLWRA 2002) (SCRIPT 2004)

25. Obligate seeders are the most sensitive spp in the system and managing for these spp will look after most of the other spp obligate seeders banksia & dryandras - DEC - have been die offs in the last 10 years through erratic climatic events i.e. floods & drought different number of species, no deaths from natural attrition could lose all obligate seeders in one event - if not burnt within a few months could be lost forever - for each month that there is no fire - chances of regeneration plumit accordingly - fungus, insect etc. or else fire will incinerated. The group is in a good position to restore this vegetation type because of local expertise and proven techniques. Seed needs to be collected now particularly from senescing obligate seeders.

26. Many areas have lost species through poor fire regime, nutrient pollution from surrounding areas and weed invasion and lack of recruitment partly due to fire regime and isolation. Major changes to the management required to prevent further losses.

27. P.Luscombe W. Bradshaw, D. Redreau expert advice local knowledge

28. Need to restore mallee vegetation through protection buffering and revegetation if we are to retain the remaining biodiversity of this ecological community. current population/ area is too small, requires collection of local seed and large scale revegetation. Immediate threat. This community is reported to be on the brink of complete destruction - surviving areas being too small and often still degrading due to the range of stresses. Collection of seed and regenerationusing the local genetic material is essential for long term survival of this community.

29. Need to get values from GIS analysis

30. P Luscombe (pers. com.)

31. The health of the understorey of this community that occurs on heavier soils is threatened by a range of weeds, and other factors. A healthy Rock Sheoak community will in part be reflected by a healthy suite of understorey species. Bridal creeper and annual daisies are a problem due to rich soil NB for strategies: Given the space - i.e. no grazing or cropping - this veg can establish itself naturally from adjoing patches of bush - .e.g wind blown seed - sheoak, followed up bird dispersed species - Excocarpus .Rock Sheoak (Allocasuarina huegeliana is fast growing and nitrogen fixing) Lot of the natural understorey are ephemerals - so current may have low species numbers in understorey but if a fire went though would increase natural species richness

32. Use Kasehagen (1994) vegetation condition scale or similar - possibly Vegmachine

33. The health of the understorey of this community that occurs on heavier soils is threatened by a range of weeds, and other factors. A healthy Rock Sheoak community will in part be reflected by a healthy suite of understorey species. Bridal creeper and annual daisies are a problem due to rich soil NB for strategies: Given the space - i.e. no grazing or cropping - this veg can establish itself naturally from adjoing patches of bush - .e.g wind blown seed - sheoak, followed up bird dispersed species - Excocarpus .Rock Sheoak (Allocasuarina huegeliana is fast growing and nitrogen fixing) Lot of the natural understorey are ephemerals - so current may have low species numbers in understorey but if a fire went though would increase natural species richness

34. The area of individual patches, as well as the shape is important to their functioning and may have important consequences for future revegetation work in restoring these systems. Follows geological formations of granite in the drier zone i.e. not present in the Porongurup granites. Ranges link currently doing reveg of this rock sheoak system - reconnecting patches.

35. Need to get values from GIS analysis

36. Antichinus will forage 500 m from a patch of bush (Peter Luscombe) - occur at Peter's place, pygmy possums occur at Heather Adams and Judy Hunt's place. Bees commandeering hollows are a problem - need to be addressed. Rufus tree creepers are still active in the Ranges link & the group notes that honey possums are still seen from time to time Vegetation of the area has not been mapped or assessed in any detail, however local expert knowledge is extremely thorough and reliable. Basil (Sep 2010), Availability of hollows, indicator would be the number of hollows, could be linked to a feral bee control - link to nesting boxes - Raana Scotts work on assesing hollows

37. Need to compile the fauna list of representative tree dwellers in Wandoo Woodlands

38. For areas that are fenced the fauna would be good but poor if it is not fenced This includes a range of fauna species including insects, other invertebrates, fungi eaters e.g. bandicoots - group notes that bandicoots are still seen around Could be baselined by having students doing pitfall traps in Wandoo Woodland - Jonathan Majoer (as per Fitzstirling studies) Would be good to know what the suites of species are to watch out for - simple indicators - e.g. ongoing student groups from CENRM Vegetation of the area has not been mapped or assessed in any detail, however local expert knowledge is extremely thorough and reliable. Water table for the wandoo trees tbd Ponding verses flooding - need to look at which factors are critial to wandoo health

39. Need to establish baselines. Expensive and needs expert assistance.

40. Wandoo is known to be at severe risk from Wandoo crown decline, etc etc. How to measure - density? may be open naturally - should density of wandoo trees be a measure. Look at existing reports - link wandoo recruits and understorey - look at existing work to get an indicator. Wandoo is susceptible to Bridal Creeper - rating would include weeds etc. Estimate condition for existing reports. Peter Luscombe is able to monitor the reveg,. patch that he has done - the old trees had a lot of deaths etc. to see how it improves in time - both understorey, old trees and recruitment

41. Need healthy understorey and a range of age classes of wandoo

42. Wandoo is known to be at severe risk from Wandoo crown decline, a condition caused by a combination of factors, climate, tree physiology, pests and diseases, possibly all exacerbated by stresses caused by grazing, nutrients, chemicals and extended dry periods The Ranges Link group noted that they estimated that a rating of 60% of trees having a full crown correlated with the fair rating for this target & other values were estimated The Wandoo Recovery Group have a number of monitoring standards for determining crown decline as follows: C1, (75-100% crown cover), C2 (45 - 65% crown cover), C3 (20-30%), C4 (10% crown cover) - need to confirm ranges and do some field measurements

43. Best estimate based on observation by current team present. Need to research Wandoo Recovery Group information & calibrate after a few field measurements.

44. Rufus tree creepers are an indicator of connectivity as they need to breed with other populations for viability - disappeared from a patch near Wendy Bradshaw's house- assume that they moved off for breeding purposes. Compare to pre-European extent, western end of the Stirlings as an indicator. GIS analysis.

45. Wandoo is known to be at severe risk from Wandoo crown decline, etc etc. Patches may be very small - even five trees - birds can use these as stepping stones - not necessarily size of patches but the connectivity - what is a critical distance apart for birds ,for insects it may be that patches 2 km apart from one another are fine (Peter Luscombe) Look at Stirlings Management stuff - SW Sitrlings to get values for what is GOOD

46. Need to develop GIS based connectivity tool suitable for Wandoo Woodland systems

Back to Top

Strategy Effectiveness

Objective: 90% of landholders & local authority representatives and 75% of visitors to the Ranges Link (Stirling to Porongurup) area exposed to information on the value of the area's unique biodiversity and opportunities to restore ecologically stronger systems by 2015

Percent Complete: 0%

Objective: 95% of Kalgan River fenced from livestock by 2012 & 95% of tributaries & wetlands fenced from livestock by 2015

Percent Complete: 0%

Objective: 95% of Kalgan River fenced from livestock by 2012 & 95% of tributaries & wetlands fenced from livestock by 2015 : (Target = Kalgan River, tributaries and wetlands)

Percent Complete: 0%

Indicator: Foreshore assessment

Methods:

1. Stream foreshore assesment (Pen-Scott method)

Measurement Report:

Measure	Date	Source	Trend	Comments
TBD once new baseline assessments are completed - 1997 report is 19% A grade	Jan 1, 1997	Not Specified	Not Specified	

Indicator: Percentage of catchment with perennial vegetation cover

Methods:

1. GIS analysis of vegetation, possibly incorporating Vegmachine (CSIRO) data on condition

Measurement Report:

Measure	Date	Source	Trend	Comments
% of remnant vegetation in subcatchments - current estimate 34%	Jul 7, 2010	Expert Knowledge	Flat	

Indicator: Physical, chemical and biological Ausrivas indices

Methods:

1. Ausrivas biological indices as per the ecological values report on South Coast Waterways by Cook et al. (2008)

Measurement Report:

Measure	Date	Source	Trend	Comments
TBD: Ratings to be determined with CENRM and Department of Water to ensure consistency with wider south coast databases	Jul 1, 2007	Not Specified	Not Specified	

Indicator: Pools affected by sedimentation

Measurement Report:

Measure	Date	Source	Trend	Comments

Back to Top

TBD - likely to vary from poor to good within micro catchments. Status will need to be established by subcatchment.	Jul 7, 2010	Not Specified	Not Specified	

Objective: Apiarists contracted to undertake feral honeybee control over 40ha of key vegetation areas by 2013'

Percent Complete: 0%

Objective: Baited areas mapped by 2012, regional co-ordination meeting held by 2013 and input into SCNRM regional strategy, and increase in predator control to large proportion (TBD) of Ranges Link area by 2014.

Percent Complete: 0%

Objective: Best practise guideline compiled by 2012.

Percent Complete: 0%

Objective: By 2013 a draft revegetation/restoration guideline is developed and by 2014 high quality restoration (Gondwana Link 3 star and above rating) is the norm.

Percent Complete: 0%

Objective: By 2013 landholders with remnants are engaged to undertake on-ground works and by 2014 key revegetation/restoration projects have been implemented.

Percent Complete: 0%

Objective: By 2013 landholders with Rock Sheoak remnants have been engaged undertake on-ground works.

Percent Complete: 0%

Objective: By 2013 planning and liason has been undertaken so that by 2014 a co-ordinated rabbit baiting program is in place in 80% of farmland in the Ranges Link area.

Percent Complete: 0%

Objective: By 2013 sites for potential wandoo restoration identifie and revegetation of key areas is underway.

Percent Complete: 0%

Objective: By 2013, best practise guidelines for hygiene and native bush are sources and compiled and by 2015 the Shire has adopted key recommendations in day to day works program.

Percent Complete: 0%

Objective: By 2014 90% of landholders with riparian sites have been engaged. By 2015 revegetation/restoration has been implemented at key sites.

Percent Complete: 0%

Objective: By 2014 bounty hunting is able to be assessed as to how effective it has been as part of strategy for fox and cat control, with possible continuation of this method if results are positive.

Percent Complete: 0%

Objective: By 2014 the Shire have investigated alternative sites to the current tip site and implemented key conservation measures at the site.

Percent Complete: 0%

Back to Top

Objective: By 2015 awareness about the sustainable farming strategy options is widely known about by landholders (80%) and a large proportion (TBD) are implementing these options.

Percent Complete: 0%

Objective: By 2015 key weed species have been reduced to the lowest cover classes (density reduced by 95%? from 2011) in key sites and infestation showing species, density and extent are captured spatially in a GIS,

Percent Complete: 0%

Objective: Condition and priority map for restoration of Rock Sheoak Woodlands completed by 2013

Percent Complete: 0%

Objective: Configuration of optimum black-gloved wallaby habitat areas for restoration designed by 2013, and key sites being started to be fenced by 2014.

Percent Complete: 0%

Objective: Configuration of optimum black-gloved wallaby habitat areas for restoration designed by 2013, and key sites being started to be revegetated by 2014.

Percent Complete: 0%

Objective: Discussion with key people and groups at an advanced stage by 2013.

Percent Complete: 0%

Objective: Ensure that by the 2012-2013 fire season, an adequate response (information, incentive funding) is available to reduce grazing pressures in the event of a fire at key vegetation sites.

Percent Complete: 0%

Objective: Ensure that by the 2012-2013 fire season, an adequate response (information, incentive funding) is available to reduce weeds in addition to grazing pressures in the event of a fire at key vegetation sites.

Percent Complete: 0%

Objective: Ensure that by the 2012-2013 fire season, an adequate response (information, incentive funding) is available to reduce weeds in addition to grazing pressures in the event of a fire at key vegetation sites.

Percent Complete: 0%

Objective: Ensure that enabling strategies (in particular for funding & capacity building) for the Ranges Link & Oyster Harbour Catchment groups are scoped and developed by 2012, to ensure the effective implementation of conservation strategies through to 2020 and beyond

Percent Complete: 0%

Objective: Fencing and revegetation of key Rock Sheoak sites implemented by 2014

Percent Complete: 0%

Objective: Identify feeding sites and nesting sites by 2013 with the view to improving the habitat and conservation status of black cockatoos in the Stirling to Porongurup Functional Landscape by 2015. : (Target = Black Cockatoos)

Percent Complete: 0%

Indicator: Availability of hollows for breeding and nearby food sources

Methods:

1. Carry out survey in spring to identify areas in which breeding is taking place following the methodology of Birdlife Australia. (Birds Australia. Undated. Volunteer Nesting Survey Guide. Unpublished 13 page booklet, Carnaby's Black-Cockatoo Recovery Project. Floreat, Western Australia.)
2. Map all known, suspected and potential breeding hollows on a GIS.

Back to Top

Measurement Report:

Measure	Date	Source	Trend	Comments
Number of hollows utilised for nesting	Jul 15, 2010	Expert Knowledge	Flat	Difficult to generalise across species - was rated poor for Carnaby's cockatoos - does this hold for the other two species as well? There were comments at a meeting of 1 Nov 2010 with the Ranges Link group that Red Tailed black numbers were actually increasing at one property For the moment - leave the rating as per the Carnaby's assessment, assuming that the lack of hollows goes for all three species

Indicator: Discrete populations within critical range

Measurement Report:

Measure	Date	Source	Trend	Comments
TBD	Jul 15, 2010	Expert Knowledge	Flat	

Indicator: Map of proteaceous-dominant vegetation

Measurement Report:

Measure	Date	Source	Trend	Comments
Hectares of proteaceous-dominant vegetation	Jul 15, 2010	Expert Knowledge	Flat	

Objective: If deemed appropriate, warning signs about black cockatoos on roads and roadsides in place at "cockatoo blackspots" by 2014.

Percent Complete: 0%

Objective: Initial baseline on black gloved wallaby distribution through community survey completed by 2012, in depth survey planned in 2013 for implementation in 2014 at which stage detailed baseline of distribution pattern has been developed.

Percent Complete: 0%

Objective: Investigate the need for repairs/artificial hollows in key sites informally during 2012 & 2013 and systematically from early 2014 following the results of coordinated survey.

Percent Complete: 0%

Objective: Key black cockatoo feed species (of a sufficient quantity and quality) included in all revegetation/restoration projects by 2013.

Percent Complete: 0%

Objective: Key wandoo woodland sites identified and fenced off by 2015

Percent Complete: 0%

Objective: Planning Department have included needs of key conservation targets and habitat linkages in planning tools and guidelines by 2015.

Percent Complete: 0%

Objective: Problem birds in the Ranges Link area reduced to manageable numbers by 2014.

Percent Complete: 0%

Back to Top

Objective: Ranges Link to trial filling hollows with clay against feral bees in hollows in at least 5 trees by 2012.

Percent Complete: 0%

Objective: To improve the condition and connectivity of Banksia attenuata shrubland vegetation communities in the Stirling to Porongurup Functional Landscape by 2015. : (Target = Banksia attenuata shrubland)

Percent Complete: 0%

Indicator: Fire age mosaic

Methods:

1. Develop GIS fire data layer (DEC & Gondwana Link have some of this information). Fire mapping may be a surrogate for condition from DEC data layer as per DEC fire sensitive ecosystems report (Barret et al., 2009)
2. GIS analysis of vegetation, possibly incorporating Vegmachine (CSIRO) data on condition

Measurement Report:

Measure	Date	Source	Trend	Comments
Banksia nutans (abundance?)	-	Expert Knowledge	Flat	

Indicator: Seed set

Measurement Report:

Measure	Date	Source	Trend	Comments
TBD	-	Expert Knowledge	Mild Decrease	

Indicator: Vegetation condition

Measurement Report:

Measure	Date	Source	Trend	Comments
Condition score/rating	-	Expert Knowledge	Mild Decrease	

Objective: To improve the condition and connectivity of Jarrah/marri associated vegetation communities in the Stirling to Porongurup Functional Landscape by 2015. : (Target = Jarrah & Marri Woodland)

Percent Complete: 0%

Indicator: Crown condition

Measurement Report:

Measure	Date	Source	Trend	Comments
Modify from Wandoo crown condition as follows:C1, (75-100% crown cover), C2 (45 - 65% crown cover), C3 (20-30%), C4 (10% crown cover)	-	Expert Knowledge	Mild Decrease	

Indicator: Healthy understorey (Proteaceae in mix)

Measurement Report:

Measure	Date	Source	Trend	Comments
Condition rating/ flora survey values	-	Expert Knowledge	Mild Decrease	

Back to Top

Indicator: Range of tree ages

Measurement Report:

Measure	Date	Source	Trend	Comments
Number of individuals per size/age class	-	Expert Knowledge	Mild Decrease	

Indicator: Size and extent of the vegetation system

Methods:

1. GIS analysis of vegetation, possibly incorporating Vegmachine (CSIRO) data on condition

Measurement Report:

Measure	Date	Source	Trend	Comments
Hectares of this vegetation type	-	Expert Knowledge	Flat	

Objective: To improve the condition and connectivity of Mallee Heath vegetation in the Stirling to Porongurups Functional Landscape by 2015. : (Target = Mallee heath)

Percent Complete: 0%

Indicator: Presence of proteaceous obligate seeders

Measurement Report:

Measure	Date	Source	Trend	Comments
TBD	Jul 7, 2010	Expert Knowledge	Not Specified	P.Luscombe W. Bradshaw, D. Redreau expert advice local knowledge

Indicator: Total area of (healthy) target vegetation

Methods:

1. GIS analysis of vegetation, possibly incorporating Vegmachine (CSIRO) data on condition

Measurement Report:

Measure	Date	Source	Trend	Comments
Hectares & fragmentation index	-	Expert Knowledge	Flat	P Luscombe (pers. com.)

Objective: To improve the condition and connectivity of Rock Sheoak vegetation in the Stirling to Porongurups Functional Landscape by 2015. : (Target = Rock Sheoak)

Percent Complete: 0%

Indicator: Presence of fertile trees and recruitment

Measurement Report:

Measure	Date	Source	Trend	Comments
Number of trees per age class	-	Expert Knowledge	Mild Increase	

Indicator: Species richness and composition

Measurement Report:

Measure	Date	Source	Trend	Comments
	-	Expert Knowledge	Mild Increase	

Back to Top

Indicator: Total area of (healthy) target vegetation

Methods:

1. GIS analysis of vegetation, possibly incorporating Vegmachine (CSIRO) data on condition

Measurement Report:

Measure	Date	Source	Trend	Comments
Hectares & fragmentation index	-	Expert Knowledge	Mild Increase	

Objective: To improve the condition and connectivity of Wandoo associated vegetation communities in the Stirling to Porongurup Functional Landscape by fencing all remnants and undertaking revegetation and improved management by 2015 : (Target = Wandoo Woodland Ecosystem)

Percent Complete: 0%

Indicator: Range of ant activity

Measurement Report:

Measure	Date	Source	Trend	Comments
TBD	Jul 7, 2010	Expert Knowledge	Flat	

Indicator: Size and extent of the vegetation system

Methods:

1. GIS analysis of vegetation, possibly incorporating Vegmachine (CSIRO) data on condition

Measurement Report:

Measure	Date	Source	Trend	Comments
Connectivity index and area (hectares)	-	Expert Knowledge	Flat	

Indicator: Suite of fauna

Measurement Report:

Measure	Date	Source	Trend	Comments
Presence of key indicator species - (e.g. rufus tree creeper)	Jul 7, 2010	Expert Knowledge	Flat	

Indicator: TBD

Measurement Report:

Measure	Date	Source	Trend	Comments
TBD	Jul 7, 2010	Expert Knowledge	Flat	

Indicator: Tree crown cover

Methods:

1. Crown cover ratings. Based on existing work on Wandoo trees, using photographs of tree crowns in different categories as a quick reference. Also look at methods developed by Angela Sanders (2012) for Yate monitoring in the FitzStirling area.

Measurement Report:

Measure	Date	Source	Trend	Comments
% crown cover	-	Expert Knowledge	Mild Increase	

Back to Top

Indicator: Understorey & recruitment

Measurement Report:

Measure	Date	Source	Trend	Comments
Flora survey condition ranking (e.g. Kaesehagen scale)	-	Expert Knowledge	Flat	

Objective: To improve the habitat and conservation status of black gloved wallabies (and fauna with similar habitat requirements/threats) in the Stirling to Porongurup Functional Landscape by 2015. : (Target = Black Gloved Wallaby)

Percent Complete: 0%

Indicator: Measuring the affect of fences to restricting movement

Measurement Report:

Measure	Date	Source	Trend	Comments
Ability of wallabies to get through standard ringlock fences	-	Expert Knowledge	Flat	Need to check how fences affect movements - cant get through ring lock - but can get through plain wire but so can sheep - suggestion to investigate further with remote cameras. Heather' Adams has a patch of bush 50 ha & Kamballup reserve (with wallabies) - same sort of size - but Judy Hunt's bush - no wallabies. Do a map of current distribution - where they currently are - may indicate that they are in the larger patches only - compare with wheatbelt research - 100ha cut off.

Indicator: Number/ percentage of potential suitable habitat occupied

Methods:

1. % of suitable habitat occupied as per the methodology developed by Gilfillan (2010) in the FitzStirling

Measurement Report:

Measure	Date	Source	Trend	Comments
Number of potential sites occupied	-	Expert Knowledge	Flat	Biggest threat to the south of the Ranges Area packs of dogs just North of the Porongurups, but no so at the northern end just south of the Stirling Ranges. Northern part of the range is less likely to have feral dogs - also more shooting north, less baiting to the south. Note if there is a strategy to increase fox baiting the dogs will be taken as well.

Objective: To undertake a mapping exercise to produce a new vegetation map for the Stirling to Porongurup Functional Landscape by 2012 that can be used further to refine and measure the extent of target vegetation systems.

Percent Complete: 0%

Objective: To undertake a mapping exercise to produce a new vegetation map for the Stirling to Porongurup Functional Landscape by 2012 that can be used further to refine and measure the extent of target vegetation systems.

Percent Complete: 0%

Objective: Undertake fencing of key Jarrah-Marri and Banksia attenuata sites during 2012-2014 and revegetate 50 ha of strategic proteaceous dominant vegetation by 2013

Percent Complete: 0%

Objective: Undertake initial survey in spring 2012, co-ordinated survey in spring 2013 with mapped nesting sites by early 2014.

Percent Complete: 0%

Back to Top

Objective: Wallaby gates trialled by 2013 for roll out (if successful) at 10 sites by 2014

Percent Complete: 0%