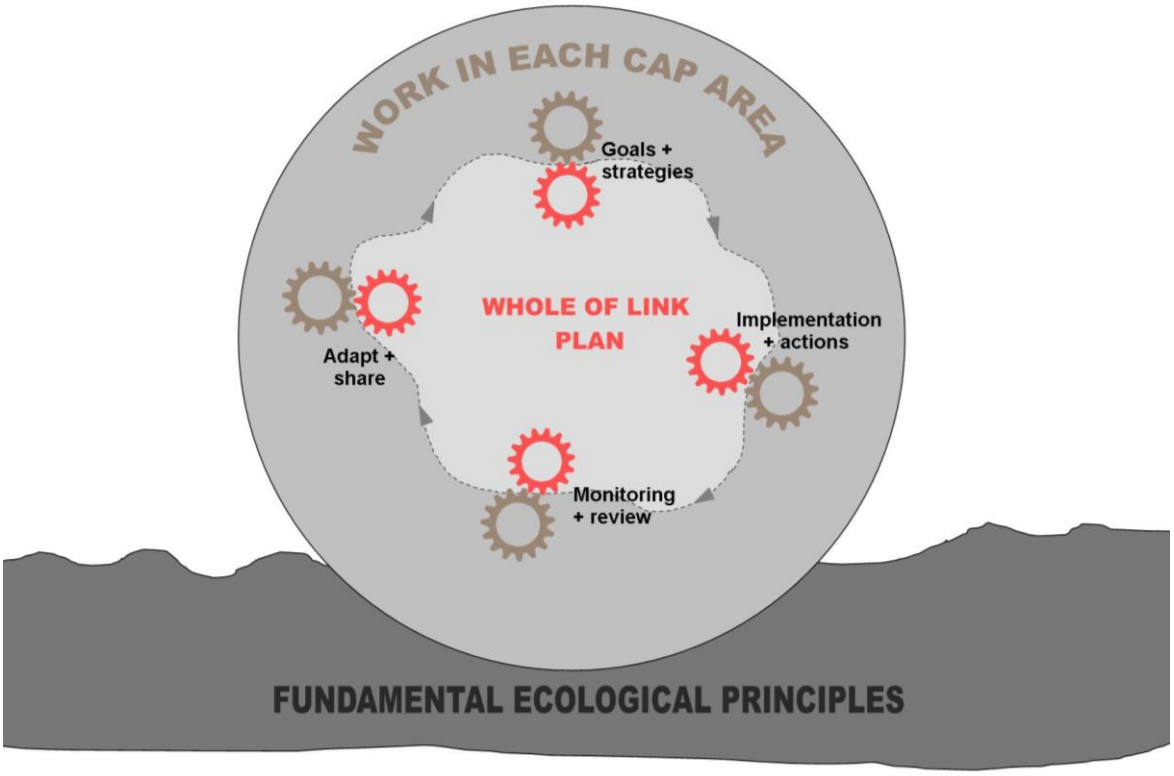
Gondwana Link

WHOLE OF LINK ECOLOGICAL GUIDE



Version 1.3

Version 1.3: This version draws from numerous discussions, workshops and planning sessions over the past decade, along with an extensive review of the published literature and the approaches adopted by colleagues in other large landscape programs. While a complete document, and ready for use providing additional guidance to work underway, it will be subject to extensive review by collaborating groups and scientific peers during 2021. We expect Version 2.0 to be a substantially improved document.

Acknowledgements

The hard yards of drawing Version 1.0 together, and wrestling with the many nuances of what ecological resilience and function mean over this particular large landscape, was admirably undertaken by Paula Deegan, working with the Gondwana Link Ltd CEO and Information Manager and drawing on the efforts and thoughts of a wide range of groups and individuals. This version is updated with comments received from a range of discussions, most particularly with Professor Dale Roberts. Wider review is planned with this Version.

Authorisation

This Version 1.3 document is authorised by the Chief Executive Officer, Gondwana Link Ltd, who accepts any responsibility for errors and misinterpretations.

Citation

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Table of contents

Gondwana Link work involves many aspects of life – the land, the people, the nature....

1. Introduction

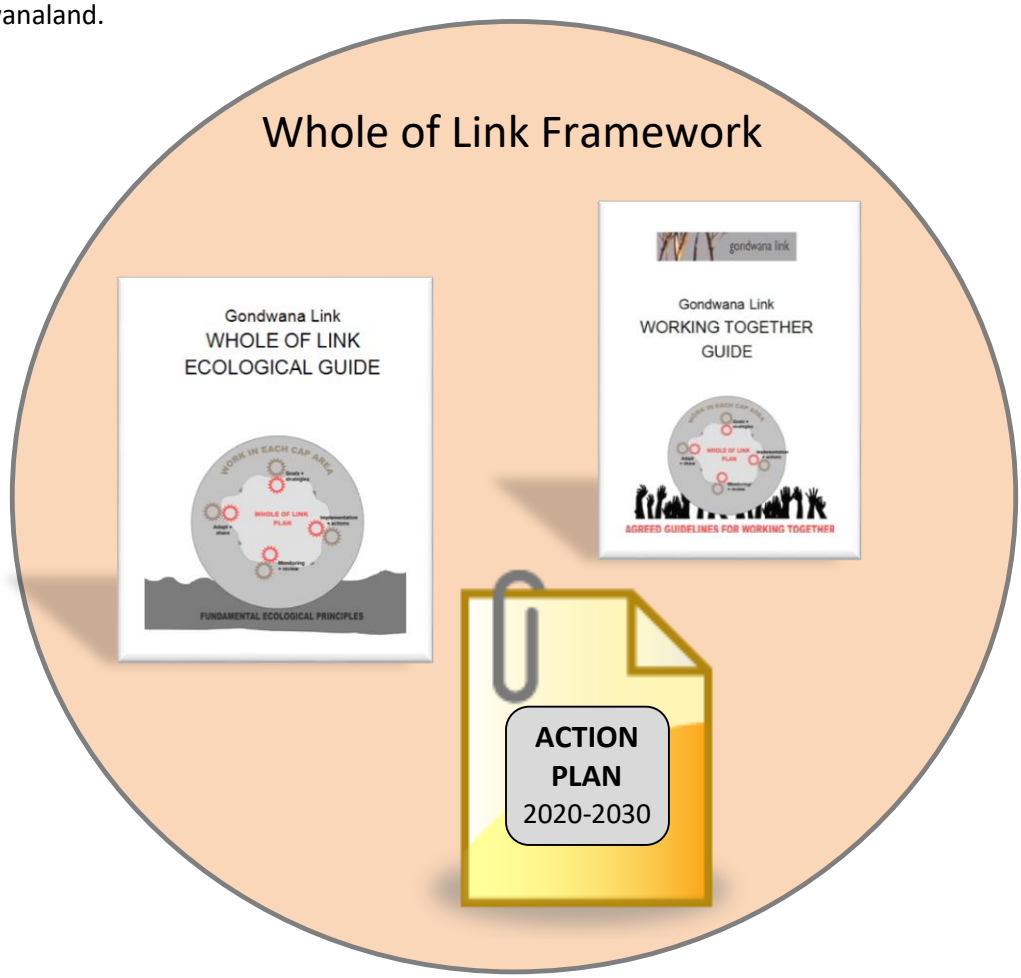
The Gondwana Link program has developed since 2002 as a collaborative venture underpinned by a cohesive, focused and strategic approach to on-ground achievement through the endeavours of a wide spectrum of organisations and individuals.

It is now moving into an exciting new organisational phase, with a strategic approach aimed at substantially achieving the vision by 2030.

The program is now being informed by three inter-related compilations of guidance and information:

- this Ecological Guide;
- a Working Together Guide; and
- a Strategic Guide which outlines key action steps (in preparation).

These three guiding documents are based on the experience to date and the on-ground plans and work programs being undertaken, plus the best ecological and business advice we can find. They are published as current versions, and will undergo constant revision and adaption as the work progresses, as the groups undertaking the work review and adjust their programs, and as new perspectives emerge into the ecological science underpinning life in our special part of the ancient Gondwanaland.



2. About this Guide

This Guide has been prepared by Gondwana Link Ltd for discussion with affiliated groups and supporters. It has been developed to:

- clearly define whole of link goals so we adopt the most effective strategies;
- improve the link between area based Conservation Action Plans (CAPs) and whole of Gondwana Link goals; and
- determine how we measure and share progress on whole of link success synergistically with area scale monitoring.

The Guide will remain a dynamic document, with regular review and adaptation of objectives and strategies and communication of these between all the groups participating in Gondwana Link.

2.1. Some important context

While the Guide provides initial overall guidance for the next ten years, it is but an early outline and there will be substantial additional work and dialogue across member groups, key scientists and involved organisations. We anticipate the production of successive updated and revised versions of the Guide, in line with the adaptive management approach we take.

In particular, as actions to implement the Gondwana Link vision proceed, we expect to be able to progressively refine and quantify objectives for protection and restoration of native vegetation, and for management of the threats to them.

Within ten years we will not see the overall ecological objectives of Gondwana Link fully realised, as regardless of when the essential repair work is undertaken the ecological systems involved will take some time to recover from the current stresses. But we do expect this Guide to help establish and confirm the structures, processes and overall directions needed to support the work needed for those objectives to be achieved in the longer term.

Australia's appalling record of species and habitat loss is well known and documented, as is the special ecological significance of the southwest of Western Australia. Throughout Australia and globally, there have been many important advances in understanding the relationships between biodiversity, ecological functions, ecological resilience and their responses to human interventions. In recent years, connectivity conservation has attracted the attention of the ecological community and has also been well documented. In preparing this Guide, we have drawn on a lot of the published material that we were aware of, but we have not attempted to include an extensive review of that material. We do however provide a very truncated summary of the review we did undertake and draw from some key principles and findings in Section 5 of this Guide.

We have also used the Open Standards for the Practice of Conservation[1], both to develop the Operational Area Conservation Action Plans, and as a process for developing this whole of Link Guide. We will continue to use that process as we further develop the monitoring and evaluation process for this Guide.

[1] The Open Standards for the Practice of Conservation was developed by the Conservation Measures Partnership to bring together common concepts, approaches, and terminology in conservation project design, management, and monitoring in order to help practitioners improve the practice of conservation. The Nature Conservancy, one of the foundation partners in the Conservation Measures Partnership, introduced the approach to Gondwana Link as Conservation Action Planning in 2004. For more information on the Open Standards approach, see http://www.conservationmeasures.org/initiatives/standards-for-project-management or http://www.conservationgateway.org/ConservationPlanning/ActionPlanning/Pages/conservation-action-plann.aspx

2.2. The process we are following

Various parts of this framework have been developed in discussion across member groups and key informants, most specifically as area CAPs have been developed. Now all 'the bits' have been brought together into Version 1.3 of the Guidebook. Below is what we have done and anticipate happening next.

Timing	Step
May 2014	Development of a Version 1.0 and Version 1.1 Guide as part of a project to demonstrate alignment with the National Wildlife Corridor Plan, based on what has been learnt during the past 12 years and from review of ecological principles and theories.
June 2014	Refinement of this Version 1.2 Guide focused on sharpening the Guide's applicability to area based programs.
July 2014	Ecological Guide Version 1.2 presented and discussed at the' What's Happening 2014' forum.
August-October2014	Workshop to strengthen the commonality of purpose and consistency across the CAPs. Groups encouraged and supported to draw from the Ecological Guide when reviewing their CAPs, to continue building synergies across the scales of operation, to complement strategies being implemented in adjacent areas and standardise nomenclature. Additional workshop for strengthening CAP monitoring plans and protocols as well as further adapting developing CAP content and processes, and sharing the learnings across CAP areas. Common nomenclature developed to utilise in planning and discussions.
July 2014-June 2016	Version 1.2 reviewed through meetings, email dialogues, scientist peer review and discussions with groups with the intention of producing a more detailed and robust Version 2.0 by the next gathering of the groups (mid 2015).
mid 2017	Agreed monitoring protocols fully developed and simple, efficient and effective monitoring database still under development. Spatial analysis across all Central Zone CAP areas.
End 2020	Quick revision based on comments, after four years focused elsewhere, and before we establish the Science Forum with GER
as required	Review of the Ecological Guide* GLL to assist with CAP reviews and assessments. GLL to assist with additional CAP development.
annually	Development of annual Gondwana Link Ltd workplan based on the current version of the Guidebook (Version 2.0). GLL annual reports that will include an assessment of progress on implementing the whole of link approach and whether the Ecological Guide requires modification or more extensive review. Groups get together event.
as we go	Sharing what we learn and celebrating the successes.

* Either the CEO of GLL or any of the member groups may initiate a Board decision on whether a review of this Guide or a specific aspect of this Guide is needed by recommending this to the Board, along with a clear case for the change. Significant dialogue across groups is likely before any significant changes are made.

3. The Vision

The Gondwana Link program is guided by the long term Vision for the ecological health of the broad region, and by guiding principles for the way in which we work (see Working Together Guide).

> ***'Reconnected country, from the wet forests of the far south west to the woodland and mallee bordering the Nullarbor, in which ecosystem function and biodiversity are restored and maintained.'***

This vision for Gondwana Link was developed in 2002 and usefully started the process of imagining a better ecological future and the steps necessary to achieve that future. Several of the groups and individuals that have become involved with the program have done so on the strength of the vision.

The vision has been well enough understood to encourage buy-in to Gondwana Link. Part of the function of this Guide is to better define what we mean by the terms 'reconnected country' and 'ecosystem function' so that we can better define what we need to do and the scales at which we need to do it.

Gondwana Link is structured as an opportunity in which local scale work is accelerated and also contributes to a larger achievement in a way that helps us to aim higher and look to the long term outcomes rather than project scale outputs. It also provides an opportunity for people and groups to see their works fitting into a national and global context.

Gondwana Link's principles are firmly based on accepted ecological science but focus on:

- what we can do now given the knowledge we currently have; and
- how to best work in a manner that incorporates new learnings and adjusts what we do as we are doing it.

Across all the link, work over the next ten years will build on the current foundations to achieve an exponential increase in on-ground achievement, along with the funding, coordination and 'mainstreaming' of the Gondwana Link principles and objectives into public and private planning, policy and management decision-making so that the work undertaken is safeguarded for the future.

4. Where we work

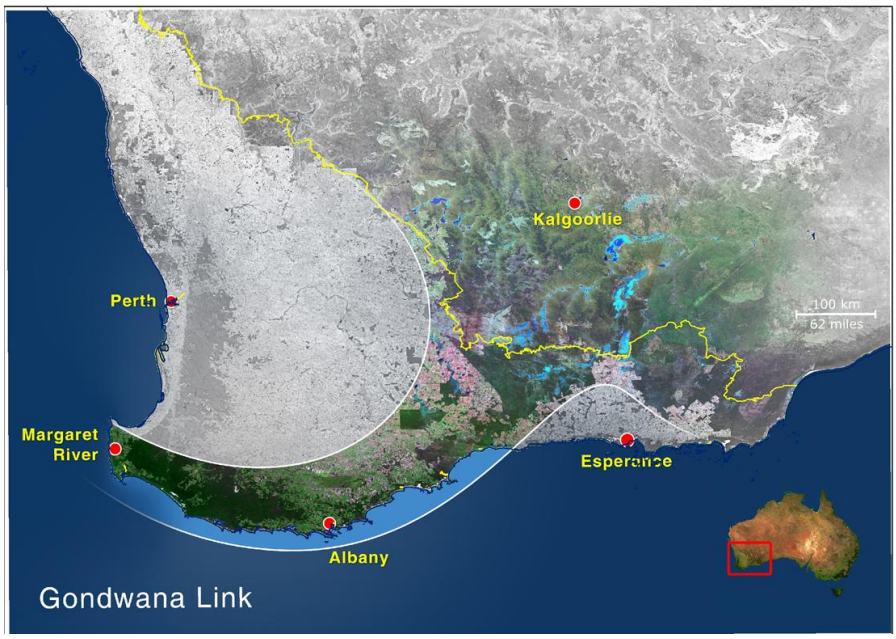


***Figure 1**: Gondwana Link area, with dotted yellow line delineating the South-Western Botanical Province and the dotted pink line delineating the Great Western Woodlands.*

The country that the Gondwana Link program works in and for encompasses the traditional lands of the Noongar, Ngadju and Wongi people. Native Title over significant public land areas is slowly being recognised, restoring some rights to the traditional owners.

The broad Gondwana Link area (Figure 1) is defined by a broad 'swish' developed early in the program. It contains the highest quality remaining habitat and the least fragmented portions of the south-western Australia biodiversity hotspot (Myers et al. 2000), and therefore has arguably the greatest opportunities for protecting and re-building functional, resilient landscapes. It also has relatively supportive political and social frameworks in place, and a number of willing conservation groups and other organisations who share the vision and are working towards its achievement.

The area straddles major climatic zones, extending from the far south-western tip of Australia, where the average mean rainfall is about 1000-1200mm and rain is recorded on a mean of 178 rain days, north eastwards across to Kalgoorlie and beyond, where the annual mean rainfall is about 270mm with a mean of about 68 rain days. Vegetation types range from the wet karri and tingle forests of the far south west, Jarrah-Marri forest, extensive areas of heathland and mallee, montane systems, extensive salt lakes and fringing halophyte communities and the world's largest remaining temperate woodland.

It is an area that encompasses many of the concentrations of biological richness within the south western Australia biodiversity hotspot[2]. Over 75% of the plant taxa in south western Australia and over 25% of Australia's plant taxa occur within Gondwana Link[3] (in about 3% of Australia's land

[2] These have been mapped botanically by Hopper and Gioia (2004)
[3] Based on species mapping and calculations by Keith Bradby, Amanda Keesing and Simon Judd in 2006, some 5,940 plant taxa occur in the Gondwana Link area. This figure is likely to change following further mapping.

area), along with some of the largest remaining native vegetation areas in southern Australia and the most complete faunal assemblages in southern WA (and possibly southern Australia). It appears to be the most climatically buffered section of the south west Australian biodiversity hotspot, with numerous climatic refugia, as well as an impressive collection of some of Australia's longest standing environmental and landcare groups: forest activists, farmers striving for sustainability, and communities working to protect and buffer their national parks.

Commercial land uses include State Forest, extensive woodchip plantations and many forms of agriculture – from some of Australia's most renowned vineyards through cattle and sheep grazing to extensive broad-acre cropping and meat production areas. The woodlands on the eastern end of the Link comprise more than 16 million hectares. As one of the world's great mineral rich provinces the woodlands currently support over 340 working mines. A large section of these woodlands is held as Exclusive Native Title Claim by the Ngadju people.

A stunning array of Eucalypt nuts courtesy of Peter Luscombe.
Photo Amanda Keesing.

4.1. Gondwana Link zones

Gondwana Link stretches across over 1000 km of country which has many different needs and characteristics. To support efficient ecological analysis and development and implementation of cohesive operational strategies we have split the Link into three broad zones:

- The south-western forests high rainfall zone
- The central fragmented zone
- The semi-arid Great Western Woodlands (GWW)

These zones are characterized by climate, ecosystems, land use types and social cohesiveness.

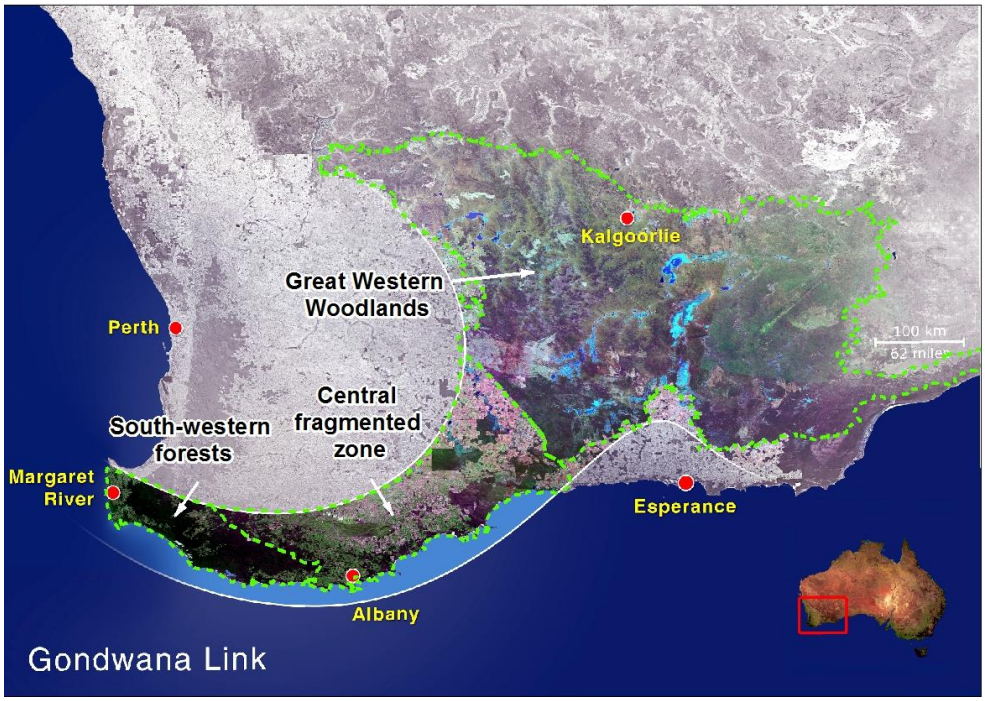


***Figure 2**: The three broad zones within Gondwana Link.*

The requirements in each zone are quite different.

- In the **high rainfall forests** and their surroundings our focus needs to be on achieving cross-tenure conservation management that protects species, ecosystems and landscapes in the long term, while strengthening the capacity of community groups and the institutional arrangements which determine management of those systems.
- In the **central fragmented zone**, there is an imperative to extend and consolidate the remaining native vegetation areas through high quality and large scale restoration, while also increasing the scale, intensity and effectiveness of conservation management across tenures.
- In the **GWW**, there is a focus on strengthening the protection of priority conservation areas, maintaining the essentially intact and relatively undisturbed woodlands and shrublands, while supporting the Ngadju and other Native Title claimants as appropriate, to develop their capacity to plan and manage their land for conservation and nature-based economic pursuits.

4.1.1. The south-western forests high rainfall zone

This is broadly defined by the 750mm rainfall isohyet[4] and includes the tall karri, tingle, jarrah and marri forests, most of which are within public land with some areas still being logged, as well as areas of horticulture, improved pasture grazing and some plantation forests. Several of the catchments are used for public and private water use.

Horticultural use is increasing, a trend likely to continue, leading to unsustainable pressure on water supply and stream flow. Urban and small holder expansion, although limited by the State Forests and reserved areas, is exerting pressure particularly around Margaret River and the southern coastal areas and is also expected to continue to increase as the Perth area becomes hotter, drier and less livable in future.

This zone includes the Warren IBRA region and the Southern Jarrah Forest IBRA subregion and many iconic forest conservation areas, such as the Walpole Wilderness Area and Shannon-D'Entrecasteaux National Park, and is home to tall forests as well as more cryptic wonders such as the endemic white-bellied and sunset frogs.

Karri-tingle forest and the Frankland River near Nornalup.
Photo Pam Lumsdan

[4] With some adjustment to match the boundaries of CAP areas.

4.1.2. The central zone

East of the forests, the rainfall drops off to the north and east from a mean annual of about 765mm at Rocky Gully, to around 380mm at Ongerup and only around 335mm at Lake Grace. Variability also increases and average number of rain days decreases sharply. While some large conservation reserves occur, notably the Stirling Range and Fitzgerald River National Parks (115,900ha and 330,000ha respectively), and there are still some significant patches of native vegetation on private land, the trend in these broadacre cropping areas is for property amalgamations and larger paddocks with less original vegetation to constrict the operation of farm machinery. Large areas of the Gnowangerup, Jerramungup, Kent and Lake Grace local government areas were only cleared for agriculture within the past 40-60 years, and some parts have proved only marginally productive except in wet years. Such areas are relatively easy, albeit costly, to rehabilitate and restore to biodiverse vegetation cover as has been shown by groups and contractors in the Fitz-Stirling operational area. Plantation forestry is another significant land-use, particularly in the west and south of the zone.

This zone includes the Esperance Sandplains IBRA region (including all of the Fitzgerald and part of the Recherche subregions), most of the Mallee region (including part of the Western Mallee and most of the Eastern Mallee sub-regions) and the most southerly part of the Avon Wheatbelt Rejuvenated Drainage subregion. It extends from the Walpole Wilderness Area across to the Stirling Range and Fitzgerald River national parks, which are global icons for the conservation of Mediterranean ecosystems, and includes mallee and kwongkan systems richer in plant species than many of the world's rainforests. Many fauna species, once widespread in the central and southern wheatbelt further north, are now confined to the larger vegetated remnants in this zone.

Fragmented landscape with farmland, salt lakes, plantations and the Stirling Range. Photo Airpix

4.1.3. The semi-arid Great Western Woodlands

The State Barrier Fence that runs in a south east – north west direction marks the edge of the agricultural land and a sharp transition into the mostly intact native vegetation of the Great Western Woodlands (Figure 2). The northern and eastern boundaries have been defined by vegetation change, but relatively unbroken and intact habitat extends from the GWW into central Australia.

The GWW comprises the Coolgardie IBRA region including all of the Mardabilla, Southern Cross and Eastern Goldfields subregions, and sections of the Eastern and Western Mallee sub-regions. It is the largest and most intact temperate woodland left on earth.

The GWW itself is 16 million ha of woodlands, shrublands, heathlands, granite and greenstone complexes and large salt lake chains. About 17% is under pastoral leases, many now owned by mining companies, and only 16% is within the public conservation estate, with only 3.6%[5] protected as 'A' class conservation reserve. Around 4.2% of the GWW is under active mining tenements[6], principally within the highly mineralized greenstone belts which currently supports around 340[7] active minesites and has many more abandoned mines. A significant additional area is under exploration leases. The mineral prospects are the main reason for numerous recommendations for nature reserves, some dating back more than 40 years, not having been enacted.

Large parts of the GWW have been under Native Title Claim. The Esperance Nyungar claim has been settled through an ILUA (Indigenous Land Use Agreement) with the West Australian Government. The Ngadju Native Title Area covers much of the southern GWW, and this claim was recognized by the Federal Court in December 2012, an appeal against this judgment dismissed in November 2013, and an Indigenous Protected Area established in 2020. Some areas along the western edge of GWW are subject to the South West Noongar native Title settlement, which is still being resolved.

The WA Government has produced a Biodiversity and Cultural Conservation Strategy for the GWW (Government of Western Australia 2010), but apart from some initial funding this remains largely un-resourced and unimplemented. Key issues facing the woodlands are the increased frequency, intensity and extent of fire, particularly in the woodland areas over 200 years old (Gosper *et al.* 2013a, Gosper *et al.* 2013b), and the impact of invasive species. Recreational use and disturbance associated with mining exploration is increasing, and both bring their own set of issues.

The next sections develop the approaches for the three zones and the whole of link further.

[5] Watson *et al.* 2008, p56
[6] Calculated in 2012 by Amanda Keesing of Gondwana Link Ltd, using data from WA Department of Mines and Petroleum.
[7] This number was derived in 2010 but the mining industry is subject to fluctuations in activity driven by commodity pricing and comparative costs, so mine site numbers can change rapidly.

5. From vision to action

'The practices we now call conservation are, to a large extent, local alleviations of biotic pain. They are necessary, but they must not be confused with cures.'

Aldo Leopold, 1941

The Gondwana Link Vision gives a very broad and 'simple' long term statement of what we want to achieve in the long term. Until now, the Vision and associated principles and support programs has provided sufficient guidance for the CAPs to be developed within the operational areas and for on-ground actions to start the process of change. In this next phase however, we need to provide:

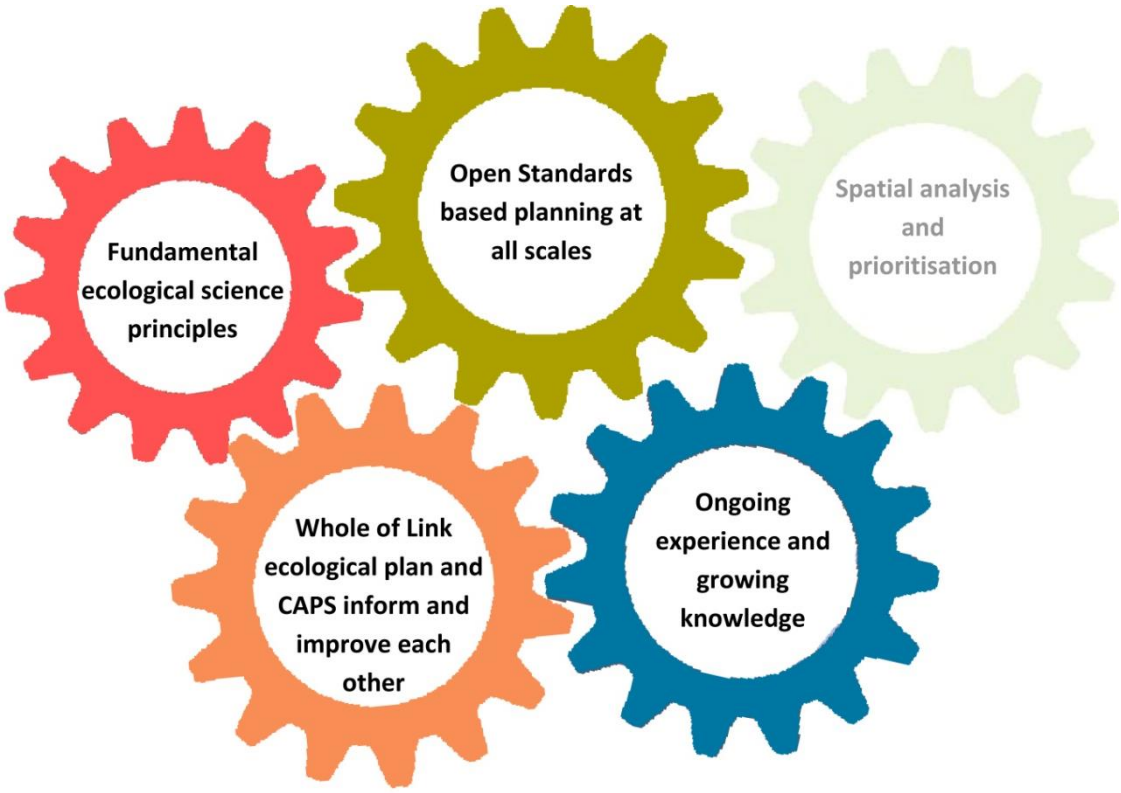
- clearer objectives at the whole of link scale;
- improved linkage between the CAPs and the whole of link vision; and
- an effective monitoring framework across the scales.

We have attempted to do this by coming at it from two synergistic directions:

- Reviewing the CAPs for common themes that have emerged in the identification of targets and threats and for gaps in targets and strategies that may need to be included in the next iteration of the CAPs. We have also looked at the monitoring requirements and how these can be best coordinated across the different areas to provide the best indicators of progress towards ecological outcomes across the link, without an unsustainable commitment of time and resources.
- Reviewing the scientific literature, talking with scientists and experienced land managers and identifying key objectives and strategies for maintaining ecological processes across the link.

As we describe in the following sections, we have then brought the whole of link and CAP area targets, objectives and strategies into an adaptive management framework based on the Open Standards for the Practice of Conservation. We will use this to update and adapt the Guide and the linked CAPs, with an important next stage being the detailed spatial planning needed to assist in developing sections of the whole of link plan and the CAPs further. This will be done as soon as resources allow.

Curry flower. Photo: Lochman Transparencies



These all keep the wheels turning, with fundamental ecological science informing objectives and strategies at both whole of link and area CAP scales.

5.1. Planning and action underpinned by ecological science

"If you don't synthesize knowledge, scientific journals become spare-parts catalogues for machines that are never built. Until isolated and separated pieces of information are assimilated by the human mind, we will continue to rattle around aimlessly'.

Art Marshall, cited by Boyle and Mechem , (1981)
There's trouble in paradise. Sports Illustrated 54 (6): 82-96.

While there are many factors contributing to degradation of ecosystems and on-going species loss, we need to recognise that the fundamental cause of the catastrophic species losses we have seen in

south-western Australia and elsewhere is the total amount of habitat lost. This is most obvious where there has been almost complete removal of native vegetation for agriculture and other human uses. Significant additional habitat degradation has resulted from the cascading effects of remaining habitat areas being isolated and inadequate for the long term conservation of the species they contain (Kitchener *et al*. 1980a; Kitchener *et al.* 1980b), and the reinforcing feedback of multiple impacts from stresses such as changes in fire regimes and introduction of invasive species (Wayne 2006; Brook *et al.* 2008; Ford *et al.* 2009; Wardell-Johnson 2009).

There is an increasing body of evidence to support the view that the protection of 'assets', such as ecosystem portions left within isolated reserves or threatened species managed through individual recovery projects, will not be effective on their own unless the ecological processes that sustain them are maintained (eg Soulé *et al*. 2004; Bennett *et al*. 2009). These include climatic processes, spatial and temporal variability in primary productivity, hydrological processes, formation of biophysical habitats, interactions between species, movements of organisms, spatially dependent evolution and natural disturbance regimes. Threats to conservation act by modifying or disrupting these processes (Bennett *et al.* 2009).

The maintenance or restoration of the processes that underpin ecological functions and maintain ecosystems rests with the protection or restoration of large, structurally complex[8] patches of native vegetation (e.g. Fischer et al 2010, Bennett et al 2009, Soulé et al 2004, Mackey et al 2010), connected in ways that maximise the opportunity for movement of organisms and that expand the total habitat area available (eg Bennett et al 2009, Soulé et al 2004, Hodgson et al 2009), and managed to minimise other environmental stresses.

These types of strategies become even more important with climate change (Heller and Zavaleta 2009). As Hodgson et al (2009) state, strategies that are expected *'to remain robust in the face of climate change include maintaining and increasing the area of high quality habitats, prioritizing areas that have high environmental heterogeneity and controlling other anthropogenic threatening processes*" (Hodgson et al 2009).

Fischer et al (2010) take a similar approach and have identified what they describe as ten key strategies[9] to maintain or restore biodiversity in highly altered landscapes. They grouped these strategies as being pattern-oriented (ie concerning the size, shape and composition of landscape elements) or process-oriented (ie concerned with interactions between components):

<u>Pattern-oriented strategies</u>
(Concerning the size, shape and composition of landscape)

- Strategy 1: Maintain and create large, structurally complex patches of native vegetation
- Strategy 2: Maintain structural complexity throughout the landscape
- Strategy 3: Create buffers around sensitive areas
- Strategy 4: Maintain or create corridors and stepping stones
- Strategy 5: Maintain landscape heterogeneity and capture environmental gradients

[8] We use this term to cover habitats where the arrangement of vegetation is highly varied , with trees and shrubs of different sizes, height, and age, as distinct from a cultivated forest, such as a plantation monoculture grown primarily for timber, with single species similar in age and size, are spaced out evenly.

[9] See next section for an explanation of terminology that we use within Gondwana Link.

Process-oriented strategies

(Concerned with interactions between components)

- Strategy 6: Maintain key species interactions and functional diversity[10]
- Strategy 7: Apply appropriate disturbance regimes
- Strategy 8: Control aggressive, over-abundant, and invasive species
- Strategy 9: Minimise threatening ecosystem-specific processes
- Strategy 10: Maintain species of particular concern

While these are all valid for one or more of the zones in the Gondwana Link program, and useful as broad goals, if we are to focus on these we need to further define them, tease out the implications of these strategies and be much better able to define the critical elements involved. Some of that work may lead to a substantial revision of some strategies. How large do the patches need to be? What are the sensitive areas that might need buffering? Where are corridors and stepping stones needed? What are the key species interactions that we need to maintain and how do we do that?

And perhaps the two most important questions: How will we know that we have improved the chances of biodiversity and ecosystem processes being maintained in the long term? What are the practical steps we can take to achieve this?

We can't easily answer these questions, but can use our current understanding of how landscapes function to focus work on managing and restoring the most ecologically critical components while developing a framework to regularly assess whether our assumptions stand up to the test.

To do this, we have adapted the Open Standards process with ecosystem functions as our targets, recognising that this poses difficult questions as to what constitutes a function, and recognizing that difficulty tried to identify surrogates for the functions that will be more readily measured and translated into tangible and achievable on-ground management actions taken at a range of scales. This will be regularly updated as we work through it further, so we have not reproduced it in full in this Guide. A priority is to further develop the spatial component of the planning at the whole of link scale and at finer scales within the operational areas where this has not already been undertaken[11].

In the next sections we expand on some of the main objectives and strategies identified so far through this approach.

5.2. Scales and dynamic systems

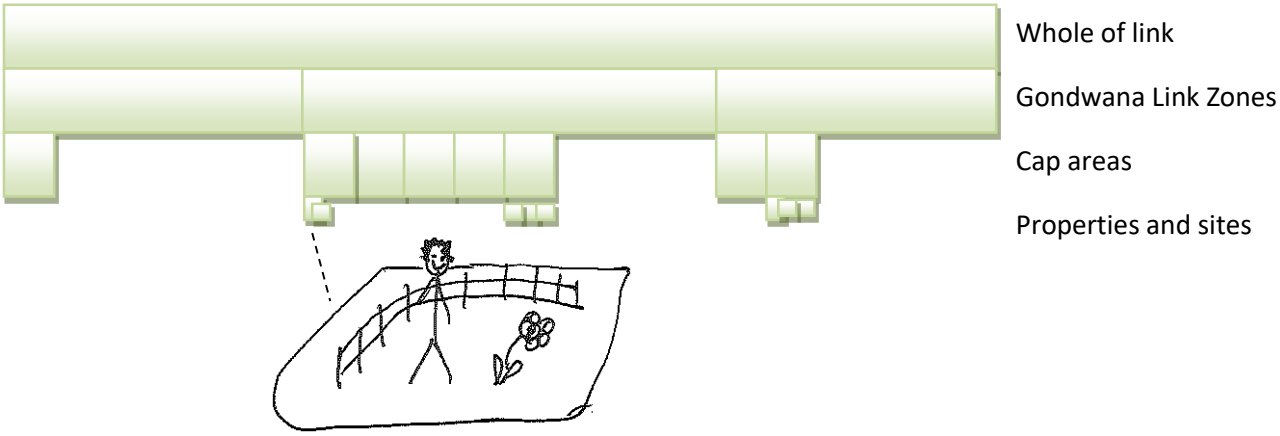
Most of this Guide deals with regional scale objectives and strategies for the whole of Gondwana Link. However, achieving the objectives requires working at a range of spatial, temporal and ecological scales: from single sites to properties, to catchments to regions; and from populations of species, to communities and extensive ecosystems. *It is vital that management activities are applied at the scale of the system or the stress that is being addressed*.

It is also crucial to consider the spatial and temporal dynamism of Australia's environments. This demands that more emphasis is placed on conservation of large scale, ecologically functional

[10] Which is of course difficult in south-western Australia where these are so poorly known

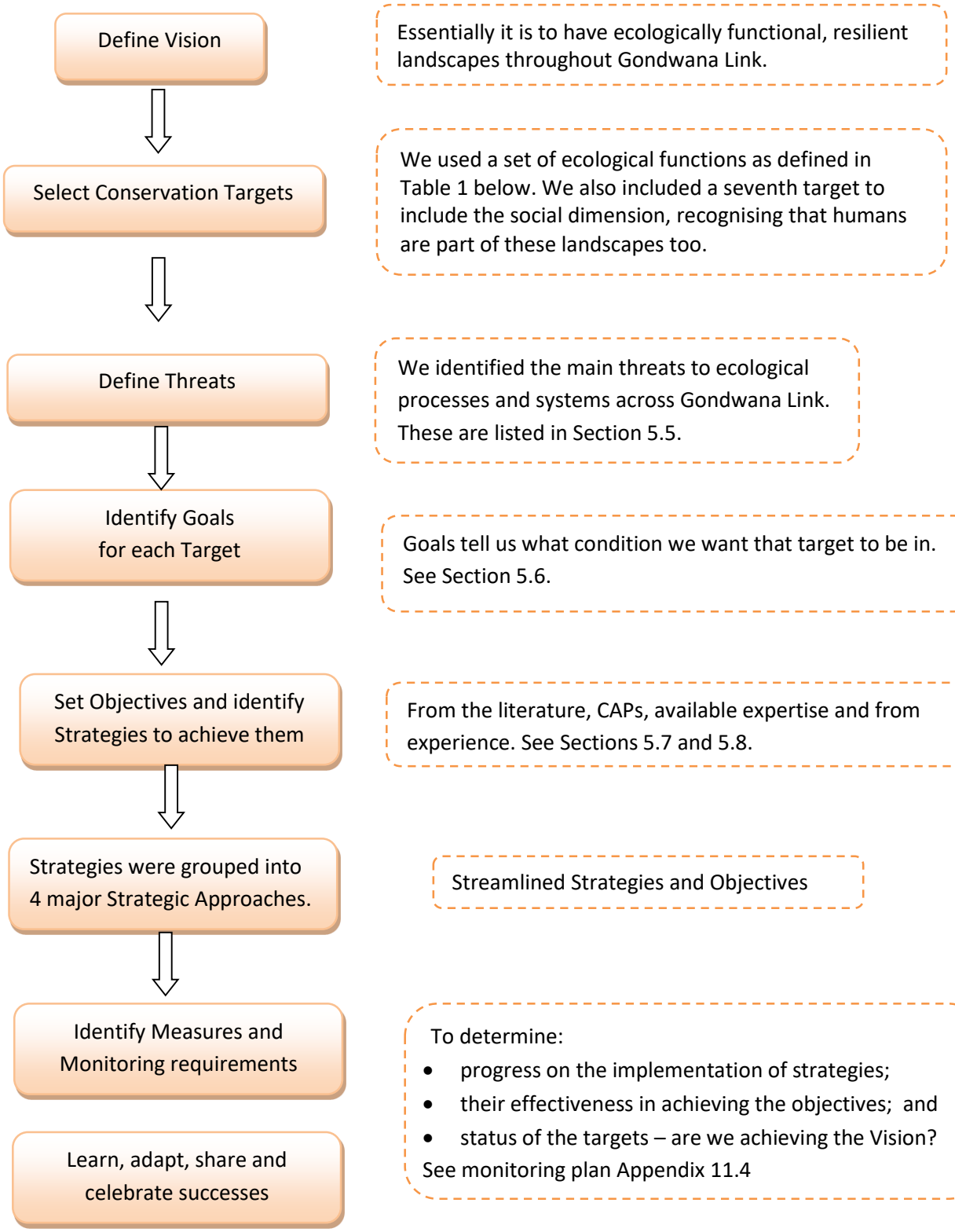
[11] For example, in the Fitz-Stirling area a spatial plan to support restoration and property purchase was developed, using MCAS-S (Multi-Criteria Analysis Shell for Spatial Decision Support) with criteria developed in the CAP. For more information on the process see the Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES) website http://daff.gov.au/abares/pages/data/mcass.aspx?wasRedirectedByModule=true)

landscapes that maintain ecological processes and therefore increase the ability of ecosystems to adapt to disturbances while decreasing the risk of a single disturbance event leading to catastrophic loss of biodiversity and ecosystem function.



5.3. Using the Open Standards approach

The Open Standards approach was used to develop the Whole of Link Ecological Guide using the following sequence to link our vision, targets, goals, objectives and strategies.



There are limitations on our current understanding of the effectiveness of different management approaches in producing desired ecological outcomes. The adaptive management approach of the Open Standards will allow us to assess whether actions are producing the desired ecological results and to adapt them as necessary. Part of this adaptive process will be to further develop the cross-scale measures and monitoring that help us determine how the individual actions across Gondwana Link are contributing to whole of link outcomes. This will not be a short term process: some of the processes and outcomes we are aiming for will be slow to realise, so we need to ensure that we have some robust interim indicators of progress.

Our approach therefore is to:

- be guided by empirical evidence if and where it exists;
- where there is little or no empirical evidence available to tell us how much habitat is needed to restore and protect ecological functions and communities, recognise the substantial losses that have already occurred and aim to re-instate as much as possible of pre-European habitat extent and condition; i.e. because of the overwhelming evidence for the cascade of effects following native habitat loss and degradation we aim to retain and restore the maximum rather than setting minimalist criteria - **we will continue to aim for as much as we can practically achieve because all the theory and the evidence confirms this is needed to produce a healthier ecological outcome than at present**; and
- employ adaptive management by carefully assessing and responding to observed changes: review our approaches regularly; use external third party review where possible; and encourage third party research and experimentation where it can usefully advise management.

Ranges Link group proved that tea and scones improve CAP progress.
Photo from Paula Deegan

5.4. Conservation targets

Across the diverse country of the Link there are few ubiquitous species and systems that provide useful conservation targets for the whole Link. After much review of literature, some hard thinking and

A note on terminology

The Open Standards for the Practice of Conservation uses some specific terminology which we have adopted, but as different organisations use some of these terms differently, an explanation of the way in which we use them will reduce any confusion.

Vision: A general summary of the desired state or ultimate condition of Gondwana Link that we are working to achieve.

Target: A limited suite of species, communities and ecological systems that are chosen to represent and encompass the full array of biodiversity within the Gondwana Link area (eg wetlands and hydrological processes). They are the basis for setting goals, carrying out conservation actions and measuring conservation effectiveness. In theory – and we anticipate in practice – conservation of the targets will ensure conservation of most if not all of the biodiversity within ecologically functional landscapes.

Stress/Source/Threat: Consistent with the Open Standards for the Practice of Conservation and The Nature Conservancy's Conservation Action Planning, we refer to *stresses* as those aspects of a conservation target that are impaired, usually as a result of some human action (eg changed groundwater levels and salinity is a stress on wetlands). The *source* of that stress is the proximate cause (eg clearing of deep-rooted vegetation from the catchment of the wetland), which can also be referred to as a *threat*. While in general terminology a threat is often understood as having the potential to cause harm in future without some form of intervention, we clearly understand environmental 'threats' to be damaging conservation targets now.

Goal: A goal is a statement of our desired end result, outcome or the future status for one or more conservation targets (eg Wetlands and the hydrological processes that support them are healthy).

Objective: Objectives are formal statements of the desired outcomes of a project or set of actions, such as the reduction of a critical threat (eg 50% of native vegetation cover in the catchment of a wetland is restored or protected within fifteen years). Although we often start with broad objectives, they need to be SMART (Specific, Measurable, Actionable, Realistic and Timebound) to focus our strategies on achieving the vision.

Strategy: A strategy is a broad course of action that results in one or more objectives being realised. It is usually made up of a series of actions or activities and can be focused on restoring targets, reducing threats, or building the capacity to do these more effectively (eg Strategy: Re-plant 6000ha of a specified catchment according to Gondwana link Restoration Standards. Actions: Acquire land; plan planting; collect seed etc).

Objectives and Strategies are inextricably linked: every strategy is developed around a specific objective.

NOTE: This note on terminology relates to Open Standards terms. We need a similar glossary for terms like 'function', structurally complex, resilience, threatening processes and more

discussion with other landscape scale conservation practitioners it was decided that the most useful conservation targets were the ecological processes that underpin a functional, resilient landscape in south-western Australia.

Functional, resilient landscapes are those in which ecological processes are sufficiently intact to sustain their ecosystems, communities and species. Stresses on the biodiversity of an area act through disrupting the ecological processes on which the ecosystems, communities and species depend. To identify the ecological processes that we need to maintain and restore across Gondwana Link, we used a modification of the work by Bennett et al (2009) and Soulé et al (2004).

***Table 1**: Ecological processes used by Gondwana Link in this plan and their relationship to essential ecological processes identified by Bennet et al. 2009 and Soule et al. 2004.*

Gondwana Link 2014 ***Ecological Processes used in Whole of Link Guide***	**Bennett et al 2009** *Summarised ecological processes under these seven categories to show ways in which they contribute to and sustain biodiversity*	**Soulé et al 2004** *Reviewed seven categories of "ecological phenomena …that require landscape permeability and that must be considered when planning for the maintenance of biological diversity and ecological resilience in Australia*
Climatic processes and variability considered under Human-forced rapid change is included as a threat in Open Standards analysis.	Climatic processes	Climate variability in space and time and human-forced rapid climate change
Natural biological and physical heterogeneity	Space/time variability in primary productivity	
(Included above)	Formation of biophysical habitats	
Hydrological processes	Hydrological processes	Hydroecological relations and flows at all scales
(Coastal zone mostly not included within the Gondwana Link area; water, nutrient and energy fluxes considered under other targets)		Coastal zone fluxes of organisms, matter and energy
Trophic interactions *(While closely related, other interactions between organisms – pollination, herbivory etc – are considered under other targets)*	Interactions between organisms	Trophic relations at regional scales
Wildlife populations and movements *(Plant pollinator movement, seed dispersal is included as just as important for plant evolutionary/ecological processes – and performance might be better measured by plant genetic outcomes than by looking at animal movements)*	Movements of organisms	Animal migration, dispersal and other *large* scale movements of individuals and propagules
Evolutionary processes *(Includes movements of genetic material, propagules)*		Spatially dependent evolutionary processes at all scales
Natural disturbance regimes *(interacts with hydrological processes, such as major flood events)*	Natural disturbance regimes	Fire and other forms of disturbance at regional scales

For the Whole of Link Guide our Conservation Targets are a set of ecological functions as defined in Table 1 above. We also included a seventh target (Living with Country) to include the social dimension, recognising that humans are part of these landscapes too. The Conservation targets are:

Whole of Link plan
CONSERVATION TARGETS

- Natural biological and physical heterogeneity
- Hydrological processes
- Trophic interactions
- Wildlife populations and movements
- Evolutionary processes
- Natural disturbance regimes
- Living with country

From the literature and discussion with people experienced in conservation management in this part of the world, we applied the Open Standards for the Practice of Conservation and identified some of the conditions[12] that are most likely to maintain them (Table 2).

It should be noted that the conditions that support the ecological functioning and resilience of landscapes are strongly interrelated, as can be seen from the ten key strategies suggested by Fischer et al (2010) and listed in the Section 5.1. Maintenance of large structurally complex blocks of native vegetation, for example, can help to ensure heterogeneity is maintained, assist evolutionary processes to be maintained, help maintain hydrological functions and facilitate wildlife movement. Therefore in Table 2 we list some of the "enabling conditions" against one or more targets but have not rigorously repeated the same condition against all of the targets it can assist.

Ecological restoration is the process of assisting the recovery of an ecosystem that has been degraded, damaged or destroyed (Society for Ecological Restoration 2004).

Ecological resilience is the capacity of a system to undergo disturbance and maintain its functions and controls, and may be measured by the magnitude of disturbance the system can tolerate and still persist (Wallington, Hobbs & Moore 2005).

[12] Some of these "conditions" are linked to the Key Ecological Attributes we have used in applying the Open Standards at the Whole of Link level often also called Key Ecological Attributes.

***Table 2**: Ecological Targets (ecological processes) and the conditions for their maintenance.*

***NOTE**: Column 1 has been adapted from Table 1, Bennett et al (2009).*

***Target 1*: NATURAL BIOLOGICAL AND PHYSICAL HETEROGENEITY**

Examples and comments	***Conditions favouring maintenance of the target (process) and its expression***
Biological heterogeneity is a result of abiotic (principally climatic processes, including variability, and landforms) and biotic (selection, predation, pollination, competition, genetic flows, disturbance and succession etc) factors – that is it *results* from a number of ecological processes but also *supports* many processes so is an important contributing factor to ecological resilience.	• Maintenance of large extents of native habitat and/or maintenance of replicated viable vegetation blocks across landscapes allows for variability in primary productivity and subsequent availability of resources for dependent species. • Maintenance of full diversity of habitat types, based on landform types, soils, vegetation, age and environmental gradients, decreases risk of species or community loss.
Climatic variables such as precipitation, evaporation and temperature influence the distribution of plant and animal species, both directly (e.g.physiological tolerances) and indirectly (e.g. spatial patterns of vegetation cover, availability of food) *Lyons (2002), Narisma and Pitman (2003), Ray et al (2002), Nair et al (2007) and others have described the impact of conversion of large amounts of the south west from native vegetation to homogeneous agricultural cover and the impacts on cloud formation and rainfall. Lyons (2004) suggested that restoration of blocks at least 20km or so wide would be needed to encourage cloud and rain and Pitman (2004) has suggested that 'the costs of large-scale reforestation strategies in SWWA would be substantially offset by increasing rainfall' (Pitman et al. 2004).* *Berry et al (2010) estimated the standing biomass of the GWW to be in the order of 312 million tons of carbon, and further estimated that this amount could be as much as 3 times higher without the impacts of wildfire, mining exploration and historical logging. In the central Zone estimates of carbon figures per ha have been made based on carbon loadings*	• Maintenance of large extents of native vegetation favour cloud formation and precipitation (Lyons 2002; Esau & Lyons 2002) • Maintenance of large carbon stocks within standing native vegetation limits carbon emissions release (e.g., Berry et al. 2010) • Maintenance of large extents of connected native habitat provide some ability for plant and animal species to adapt their distributions as climates change. • Broadacre planting of native vegetation can sequester significant carbon while delivering biodiversity benefits if properly planned and implemented (Jonson & Freudenberger 2011) • Maintenance of large extents of structurally complex systems is more likely to include the range of ecosystems defined by climatic and microclimatic variables. • Maintenance of microclimatic "niches" (e.g. granite outcrops, topographic extremes, deep valley floors etc) is likely to assist in conservation of short-range endemic species and provide refugial habitats.
Climate influences seasonal and inter-annual availability of resources such as nectar and seeds. For most of the Gondwana Link area, inter-annual climate variability is naturally high.	• Maintenance of large extents of native habitat and/or maintenance of viable vegetation blocks across landscapes allows for inter-annual variability in climate and subsequent availability of resources. • Increasing the resilience of existing ecosystems by improving conservation

Examples and comments	*Conditions favouring maintenance of the target (process) and its expression*
	management (ie removing or reducing other stresses such as extreme wildfire regimes, invasive species, anthropomorphic disturbances etc) can increase the potential for adaptation or mitigation of climate induced changes. • Increasing the patch size of remnants can reduce adverse microclimate conditions associated with edges of patches.
Formation of biophysical habitats: Small-scale processes at the ground surface (e.g. formation of soil crusts, infiltration of water, accumulation of leaf litter) enhance micro-habitats	• Avoidance, minimisation and/or careful management of activities that disrupt small scale processes, such as over grazing, soil compaction, inappropriate fire and fire management activities • Avoidance of any activities that lead to loss of species and organisms that facilitate small-scale processes (eg fungi, other microorganisms, bandicoots and other soil-turning native fauna)
Soil properties influence vegetation composition, which in turn provides habitat components (shrub cover, logs, hollows) *Some of the factors contributing to diversity in species and communities across Gondwana Link and their implications include:* • *Age and (evolutionary) isolation and lack of disturbance* • *Fine soil mosaic within otherwise low relief landscapes, except for granite outcrops, quartzite ranges, ironstone breakaway formations provide topographic relief and evolutionary refugia (eg Keppel et al 2012, Keppel & Wardell-Johnson 2012)* • *Based on analysis of vegetation patterns in the East Roe Botanical District, Burgmann (1988) suggested that the reserve system should include replicates of stands within the same broad formations and soil types at intervals less than 15 km in order to fully conserve flora including rare species*	• Maintenance of variety of habitat components, including different vegetation structural components and densities, hollows, logs and other ground habitat • Maintenance of diversity of vegetation in areas large enough to accommodate small to large scale processes
In aquatic environments, the type, complexity and variability of substrates (sand, silt, rock) and structural features (boulders, logs) determine local habitat diversity	• Maintenance of physical substrates and features within aquatic habitats • Maintenance of diversity of aquatic habitat types at small to large scales (ie diversity within individual water bodies, and diversity across the environmental and biological gradients within Gondwana Link)

Examples and comments	*Conditions favouring maintenance of the target (process) and its expression*
	• Maintenance of connectivity along watercourses improves the resilience of communities to adapt to seasonal variability and to recolonise areas when favourable conditions return.

***Target 2*: HYDROLOGICAL PROCESSES**

Examples and comments	*Conditions favouring maintenance of the target (process) and their expression*
Flow regimes in streams (magnitude, seasonality, rate of flow) influence the connectivity and physical condition of aquatic habitats. *The loss of native vegetation from catchments and its resulting groundwater impacts and dryland salinity are well documented for southern WA (eg Beresford et al 2001. Precise relationships between catchment cover and flow attributes have not been studied for most southern systems and will depend on the geology and hydrogeology. EPA (2000) and ANZECC recognises a 30% cover threshold for biodiversity below which species loss accelerates exponentially, but state that for maintenance* of *hydrological function in the wheatbelt around 60-70% cover needed to have been maintained, and that to restore hydrological function may require around 85% cover to be reinstated in some catchments.* *There is a general consensus that continuous stream buffer widths of at least 200m either side are needed (EPA 2000, LWA, Newton 2012 etc) but this depends very much on the purpose of the buffer. For fauna movement for example, 200-500m is recommended, while to protect groundwater drawdown and protect inflowing groundwater quality to wetlands a buffer of up to 2000m may be more appropriate (Newton 2012)*	• Maintenance of deep-rooted perennial vegetation over significant portions of catchments (30-50% minimum) maintains ground and surface water interactions • Maintenance of healthy riparian zones (minimum 200m each side; 500m for fauna protection; 2000m to maintain groundwater inflow quality) along creeks, rivers and around wetlands buffers stream flows, provides connectivity and protects water quality.
Surface and subsurface flows on land distribute water and nutrients and modify local patterns of primary productivity	• Maintenance of deep-rooted perennial vegetation over significant portions of catchments (30-50% minimum) maintains ground and surface water interactions • Maintenance of ground cover reduces water and wind erosion that can radically alter water and nutrient flows • Avoidance of anthropogenic introduction of nutrients and water where these will impact negatively on ecosystems, through riparian buffers and good land management practices • Avoidance of physical barriers, including roads and dams that interrupt or divert water and nutrient flows

Target 3: EVOLUTIONARY PROCESSES

Examples and comments	***Conditions favouring maintenance of the target (process) and their expression***
Interactions between individuals determine the spatial distribution and demographic structure within populations. *Kitchener et al (1980a) compared the conservation value for mammals (excluding bats) in the Wheatbelt and found 72% of the variation was accounted for by reserve size. They found a minimum reserve size of 40,000ha was required and that they should have large areas of the main vegetation formations and maximise the number of vegetation associations.* *Kitchener et al (1980b) found that for reptiles a minimum reserve size of 1500ha was indicated, and woodland formations were particularly significant.* *A similar study for bird assemblages (Kitchener et al. 1982) found that:* *reserves of the order of 30,000-94,000 ha were required to preserve most of the Wheatbelt avifauna;* *that 1500ha was the minimum size; and* *woodland formations and plant floristics were also highly significant.* *For some passerine species, numbers of plant species, vegetation associations, and plant life form and density classes in each vegetation stratum were all highly significant. All three of the Kitchener papers also indicate that reserves as small as 30ha are still valuable for all three fauna groups.*	• Maintenance or restoration of viable populations of plant and animal species across their full spatial distribution • Maintenance of conditions that support reproduction, germination, recruitment and survival of populations (eg sufficient extent and/or connectivity of habitats to support adequate genetic exchange within populations; freedom from introduced predators that limit survival of young fauna; etc) • Minimising disturbance minimises the risks of introducing and spreading invasive species and pathogens. • Increasing connectivity between remnant patches of vegetation will increase both effective habitat size and exchange between organisms and populations, which improves population viability.

Target 4: **TROPHIC INTERACTIONS**

Examples and comments	***Conditions favouring maintenance of the target (process) and their expression***

Interactions between species (e.g. predation, herbivory, competition, parasitism, mutualisms) alter the structure of communities and facilitate processes such as pollination, seed dispersal and nutrient cycling.	• Maintenance of predator-prey relationships within 'natural' historical range that supported viable native fauna populations
	• Avoidance, minimisation or control of introduced species that out-compete native species, cause diseases or otherwise alter habitats negatively (eg through changing soil characteristics, choking waterways, etc)
	• Avoidance of physical or other barriers to native seed dispersal (such as by fauna, wind, flood etc)
	• Inclusion of a range of functional guilds as either targets or nested targets, in planning for protection and restoration of habitat, will increase diversity and resilience - for example:
	  ○ native predators (eg chuditch, dunnarts, antechinus, raptors, goannas, pythons etc)
	  ○ critical weight range species (ground dwelling mammals, reptiles; ground nesting birds etc)
	  ○ resident and semi-nomadic birds;
	  ○ pollinators;
	  ○ seed dispersers;
	  ○ soil bioperturbators (i.e soil turning fauna such as echidnas, woylies, malleefowl, burrowing reptiles and amphibians, detritivores; etc)
	  ○ symbiotic species (eg parasites and host species)

Target 5: **WILDLIFE POPULATIONS AND MOVEMENTS**

Examples and comments	***Conditions favouring maintenance of the target (process) and their expression***
Organisms move at different scales and for many purposes: to find food and shelter, for social interactions, to track resources that vary irregularly in space and time, for seasonal migration, and to disperse and establish in new locations.	• Maintenance of large, intact areas of diverse habitat to optimise movement capacity at different scales and by different organisms • Avoidance of barriers to movement of organisms at a range of scales (eg barriers such as inhospitable land uses, lack of refuges from predators, increased distance to food, constructed barriers, and other seasonally required resources) Note that these are often taxon specific • Consideration of different spatial and temporal scales of movement: eg short term movements for food and shelter; longer term evolutionary movements of genetic material and potential changes in distributions of species; seasonal long distance movement by species, eg cockatoos for breeding and feeding, emus for drought avoidance.
Movements of propagules (e.g. seeds, pollen, eggs or larvae of aquatic taxa) may be facilitated by animal vectors, or wind and water flows (which may be rare and unpredictable events).	• Maintenance of large and intact extents of diverse habitat to optimise the capacity for movement at different scales • Avoidance of barriers to movement of propagules or their vectors at a range of scales (eg barriers such as inhospitable land uses, fencing that divides populations)

Target 6: **NATURAL DISTURBANCE REGIMES**

Examples and comments	***Conditions favouring maintenance of the target (process) and their expression***
Natural disturbances (fire, floods, drought, storm waves) and severe weather events (cyclones, frost, extreme temperatures) alter ecosystems by creating spaces for colonisation, re-setting to an earlier successional stage, releasing and redistributing resources, and altering mortality rates of species.	• Maintenance of disturbance regimes within their historical range, noting the likelihood of changed climatic regimes) • Management of fire according to ecosystem-specific prescriptions • Maintenance and restoration of large intact extents of native habitat to allow recovery and re-colonisation following disturbance by fire, storms or drought • Avoidance of management activities that limit recovery post-disturbance
Disturbance regimes (i.e. the combination of frequency, duration, intensity and extent of disturbance) may have greater long-term influence than single events (some single events can have lasting consequences, such as Cyclone Alby (1978) and the 1937 forest wildfires.	• Maintenance of disturbance regimes within their historical range

5.5. Stress/Threats

Eight main threats that impact adversely on natural values and ecological function across the entire link have been identified through:

- the ongoing impacts of historical broadacre clearing, including hydrological changes and fragmentation and isolation of habitats;
- continuing fragmentation of native vegetation and habitats through activities including timber harvesting, infrastructure development and urban incursions;
- increased extent, intensity and frequency of fire;
- impact of feral animals, particularly foxes, cats, rabbits and goats;
- weed invasions, particularly in disturbed areas;
- for areas above 400mm rainfall, the devastating impact of invasive fungal diseases across large swathes of otherwise intact systems;
- ongoing hydrological impacts of poorly managed land uses, such as through secondary salinity; and
- inadequate and/or uncoordinated land planning and management approaches that largely disregard long term and cumulative ecological impacts.

These threats are summarised as:

Whole of Link plan
THREATS

- Habitat fragmentation
- Fire regimes
- Invasives and other pest species
- Loss of deep rooted perennials
- Inappropriate land management
- Inappropriate development and land uses
- Dispossession of Indigenous land managers
- Human population increase
- Climate change

Compounding all of these is climate change, which is already impacting on systems across south-western Australia. We take the view that by focussing on the stresses listed above, and other more localised and specific stresses identified through area based plans, the ecological resilience of ecosystems will be increased. This approach is the most effective strategy for maximising their chances of effective adaptation to climate change, consistent with that advocated by Prober et al (2012) for the Great Western Woodlands and more broadly by Lindenmayer et al (2010), and is supported by both the extensive review of recommendations for biodiversity management in the face of climate change by Heller and Zavaleta (2009) and the paleoecological analysis reported by Moritz and Arugo (2013).

An additional compounding factor likely to result from climate change may well be increased land use competition along the Gondwana Link pathway, as human populations and industries move

south. While this specific impact can be reduced by accelerating the adoption of secure conservation measures, such as purchase for conservation of strategically critical properties and expanding the public protected area estate, effective institutional measures are also required, such as the adoption by all levels of government of planning schemes and statutory controls that give greater recognition to the importance of connectivity and other key ecological functions.

5.6. Goals

As outlined in Section 4, the Gondwana Link program straddles three major zones, the south-western forests, the central fragmented zone and the Great Western Woodlands. The conditions for maintenance of ecological processes summarised in Table 1 apply across all of Gondwana Link, but within each of the zones there will be differences in the ecological and spatial surrogates for the processes, and in the strategic actions that are required to restore or maintain these.

For each of the Targets we developed one or more broad Goals as outlined below. Timescales have not been added because, as noted earlier, there will significant time lag between when conditions are established to restore and/or strengthen ecological function and resilience (the outputs of our work) and when ecological function and resilience improves (the outcomes). The Guide needs further refinement before we can start adding more specific time-bound goals.

Whole of Link
GOALS FOR EACH TARGET

Biological and physical heterogeneity

Goal 1: Heterogeneity, expressed as the mix of vegetation associations, floristic patterns, structural complexes, plant animal and fungal species, landforms and environmental gradients resembling historical levels, is being protected and maintained across Gondwana Link.

Evolutionary processes

Goal 2.1: The permeability of Gondwana Link landscapes to gene flow are improved and being maintained, allowing natural evolutionary processes to continue with minimal impedance.

Goal 2.2: Landscape connectivity is increased and maintained at scales from inter-regional to local sites.

Hydrological processes

Goal 3.1: Wetlands across Gondwana Link are healthy.

Goal 3.2: Groundwater dependent ecosystems are identified and being managed for protection of their ecological values.

Natural disturbance regimes

Goal 4.1: Disturbance regimes are being maintained within natural historical levels (according to best ecological knowledge)

Goal 4.2: The extent, condition and connectivity of habitats is sufficient to allow for recovery and recolonisation following natural disturbances (eg storms, floods, fires, drought etc) and for adaptation to seasonal and inter-annual variability.

Trophic interactions

Goal 5: Viable populations of identified target and indicator species (including species of critical weight range mammals, native predators, fauna species from different functional groups) are protected and maintained across Gondwana Link.

Wildlife populations and movement

Goal 6: Viable populations of all wildlife assemblages across Gondwana Link (to the extent we know what mix of species comprise these assemblages).

Living with country

Goal 7: Nature and culture are valued across the public and private sectors within the Gondwana Link areas and we live within ecologically sustainable means

5.7. Objectives

The following 17 objectives were then developed using the Open Standards methodology. These are not yet "SMART": further work is required to define the objectives.

Whole of Link plan
OBJECTIVES

1. Habitat fragmentation across Gondwana Link is reduced.
2. A network of conservation areas is developed for the Central Fragmented Zone of Gondwana Link, including large (>100,000ha) patches linked by wide (>2km) links.
3. Smaller patches of extant vegetation are expanded to provide stepping stones with minimum area and maximum gaps to be defined by multi-criteria spatial analysis.
4. Protect large undisturbed areas from further disturbance.
5. Reduce the extent, frequency and intensity of wildfires.
6. Reduce the extent/abundance of invasive plants.
7. Reduce the distribution and/or abundance and impacts of invasive animals.
8. Increase the extent of mature/old growth woodlands and forests.
9. Protect undisturbed and uninfected (by *Phytophthora cinnamomi*) patches of native vegetation.
10. Gondwana Link program continues to address objectives and produce ecological outcomes.
11. Each priority area has a group or groups with the skills, capacity and resources to develop, implement and adapt the Conservation Action Plans.
12. The capacity and participation of indigenous people is increased.
13. The support and membership base is diversified and expanded.
14. Significant additional funding is achieved and long term funding is secured.
15. Programs provide tangible benefits to local communities.
16. The knowledge base of effective conservation management actions is expanded.
17. Gondwana Link objectives and goals are "mainstreamed" into other regional, state and national planning and management processes.

5.8. Strategies

Four major strategic approaches have been identified. They are:

Whole of Link
STRATEGIC APPROACHES

1. Habitat restoration at large scale.
2. Target-driven conservation management in all priority areas.
3. Build capacity for conservation at scale:
   - People and groups
   - Skills and knowledge
   - Resources, including funds
4. Increase institutional and societal support.

Each of these strategies plays a role in achieving the goals for each of the targets.

In Table 4, we have related the major strategic approaches for Gondwana Link to Objectives developed through use of the Open Standards. These are largely achieved through actions to be undertaken by or with Gondwana Link Ltd, with more detailed area focused strategies being developed and implemented by groups and others through the CAPs. Additionally, they provide a degree of guidance for the area CAPs that are developed or in progress.

Some objectives may not yet be easily actionable at present, and require significant increases in funding and involvement.

A major gathering of all the groups involved in Gondwana Link (Nov 2009).
Photo courtesy Basil Schur.

***Table 4**: Strategies and Objectives for the whole of link plan.*

Strategy	Actions for Gondwana Link Ltd, in conjunction with member groups and scientific peers	Guidance for CAP development and implementation	Objectives addressed by this strategy	Targets
Strategy 1. Habitat restoration[13] at large scale	• Use the criteria developed in this plan (and accompanying Open Standards documentation) to undertake spatial analysis of CAP operational areas to define priority restoration areas. • Broaden the Gondwana Link Restoration Standards to better cover all areas, and then regularly update and improve them.	• Include restoration strategies in all CAPs in the Central Fragmented Zone and as appropriate in other zones. • All priority areas to be restored to at least 3-5 star standard (Gondwana Link Restoration Standards 2010). • Land to be secured for restoration in accordance with the priority areas identified through the spatial analysis.	**O1.** Habitat fragmentation across Gondwana Link is reduced **O2**. A network of conservation areas is developed for the Central Fragmented Zone of Gondwana Link, including large (>100,000ha) patches linked by wide (>2km) links. **O3.** Smaller patches of extant vegetation are expanded to provide stepping stones with minimum area and maximum gaps to be defined by multi-criteria spatial analysis.	**all**

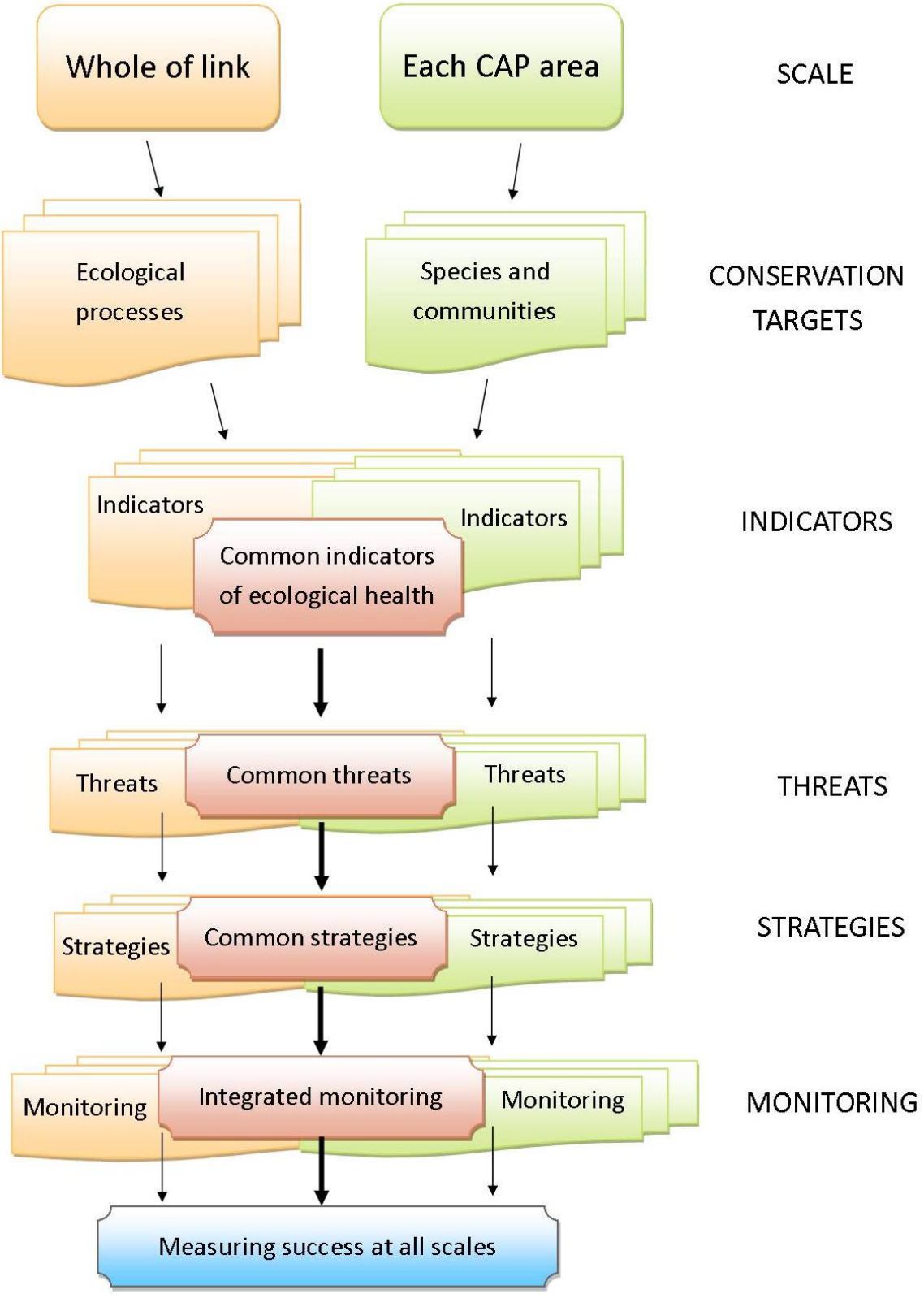
Strategy 2. Target-driven conservation management in all priority areas	• Support the development, implementation and regular update of CAPs for each priority area
	• Include spatial analysis (using MCAS-S or similar) to support each CAP
	• Identify harmful land uses and management practices and advocate for stronger action to address them by government agencies and NRM bodies
	• Support and participate in development of industry codes of practice
		• Use the guidance in this Guide in developing CAPs (criteria for assessing priority areas, restoration etc)
		• Include in CAPs:
		  ○ Ecologically based fire management
		  ○ Rapid response to wildfire
		  ○ Integrated feral control
		  ○ Integrated invasive plant control of priority species
		  ○ Protection mechanisms for disease-free native vegetation
		• Identify harmful land uses and management practices and advocate for stronger action to address them by government agencies and NRM bodies.
			O4. Protect large undisturbed areas from further disturbance
			O5. Reduce the extent, frequency and intensity of wildfires
			O6. Reduce the extent/abundance of invasive plants
			O7. Reduce the distribution and/or abundance and impacts of invasive animals
			O8. Increase the extent of mature/old growth woodlands and forests
			O9. Protect undisturbed and uninfected (e.g. by *Phytophthora cinnamomi*) patches of native vegetation
				all

[13] Note: *We accept the definition of restoration as 'the process of assisting the recovery of an ecosystem that has been degraded, damaged, or destroyed' (SERI 2004). This applies to work across all three zones, but for simplicity it is taken here as referring to ecologically designed 'replanting' in areas where the original habitat has been removed.*

Strategy	Actions for Gondwana Link Ltd, in conjunction with member groups and scientific peers	Guidance for CAP development and implementation	Objectives addressed by this strategy	Targets
Strategy 3. Build capacity for conservation at scale: • People and groups • Skills and knowledge • Resources, including funds	• Develop processes and structures to strengthen the application of adaptive management across whole of link and in operational areas. • Provide training and support on: ▪ Open Standards ▪ Data and spatial analysis ▪ Monitoring ▪ Fundraising and innovative structures that support a substantial increase in on-ground resources ▪ Development where necessary of institutional arrangements for securing land (such as local land trusts) ▪ Protocols and standards ▪ Communication and marketing skills ▪ Library and other knowledge bases • Conduct partnership scoping to identify and fill partnership and supporter gaps. • Use third party review and advice to keep testing our assumptions and improving our methods.	• Adaptive management requires ongoing review and revision of CAPs as more information, resources and results become available.	**O10**. Gondwana Link program continues to address objectives and produce ecological outcomes. **O11**. Each priority area has a group or groups with the skills, capacity and resources to develop, implement and adapt the Conservation Action Plans. **O12**. The capacity and participation of indigenous people is increased. **O13**. The support and membership base is diversified and expanded. **O14**. Significant additional funding is achieved and long term funding is secured. **O15**. Programs provide tangible benefits to local communities. . **O16**. The knowledge base of effective conservation management actions is expanded.	**all**
Strategy 4. Increase institutional and societal support	• Analyse and identify critical points of opportunity and hindrance. • Advocate and lobby for changes. • Develop and implement broad communication strategies that increase popular support.	Strengthen focus on local policies that affect implementation, such as local government planning schemes, DFES policies etc.	**O17**. Gondwana Link objectives and goals are "mainstreamed" into other regional, state and national planning and management processes.	**all**

6. Meshing the Whole of Link and area Conservation Action Plans

The Diagram below indicates the points where the Whole of Link and CAP area plans mesh together.



6.1. Relating Whole of Link Targets to CAP area targets

Seven CAPs have been produced within the Gondwana Link area by June 2014, with another (Ngadju area of the Great Western Woodlands) finished by 2016, and a Healthy Country Plan for Esperance Tjaltjraak completed in 2018. All of these CAPs are best regarded as "credible first iteration" plans, with the exception of the Fitz-Stirling Functional Landscape Plan (CAP) which commenced in 2004 and was externally peer reviewed by scientists and land managers in April 2008, externally audited by The Nature Conservancy in September 2008, and internally peer reviewed and revised in August 2010.

They have catalysed the collaboration of groups and individuals within each of the CAP areas to identify strategic actions needed to improve ecological outcomes within those areas. Over time, as CAPs progress through the adaptive management cycle of the Open Standards for the Practice of Conservation, conservation targets and actions to conserve them are expected to evolve and to increasingly address larger scale outcomes across Gondwana Link.

Although they have been developed separately, there are some clear consistencies between them. Between six and nine conservation targets have been identified in each CAP (see Appendix 11.1) including:

- All CAPs include one or more Eucalypt-dominated vegetation associations (including Jarrah-Marri forests and woodlands; Yate woodlands; Wandoo woodlands and Wandoo outliers; Karri outlier communities; Eucalypts of the Great Western Woodlands)
- Six CAPs include Proteaceous-dominated or Proteaceous-rich communities as targets, although descriptions of these communities vary. The recent listing of proteaceous-dominated Kwongkan shrublands as a Threatened Community under the EPBC Act may help to further define the CAP targets for some areas.
- All CAPs have included wetlands and/or waterways as targets, reflecting the importance of hydroecological health.
- Three CAPs have identified granite complexes or vegetation communities that occur high in the landscape.
- All CAPs have included at least one fauna species that is likely to be predated by or competing with foxes and cats (Black-gloved wallaby, Honey possum, Chuditch, Malleefowl[14])
- Four CAPs have included one or more of the Black Cockatoo species that are semi nomadic, following seasonal flowering and also dependent on old growth trees with hollows.

CAP targets are therefore considered to include at least the major systems, species and communities that reflect ecological processes and characteristics of ecologically resilient landscapes, including heterogeneity, evolutionary processes, resilience to disturbance, hydrology and nutrient cycling, wildlife movement and trophic relationships. Ongoing refinement is required of the attributes of the targets, the indicators used to measure them, and the objectives for their long term protection to

[14] Note that at least two of these species, Honey possum and Mallefowl, as well as possibly the Black gloved wallaby, are likely to be habitat limited more than they are predation limited, Chuditch limitations are largely unknown)

strengthen the progress made on-ground and towards achieving the overall Gondwana Link vision. A more explicit consideration of restoration requirements to increase total habitat extent and improve connectivity should be considered in most of the Central Fragmented Zone CAPs, but will need to be supported by additional spatial analysis (preferably using MCAS-S).

6.2. Conservation targets: Gap analysis

There are two types of gaps within the current CAPs: geographical areas for which a CAP has not yet been developed, and gaps in the targets or strategies of those CAPs that have commenced.

6.2.1. Geographic gaps requiring CAP development

The Gondwana Link 'swish' (see Figure 1) defines the broad area within which strategically focused large scale change will provide maximum benefit to the ecological richness of south-western Australia. Conservation Acton Plans exist over key parts of this area. Most were developed because the areas they cover were clearly of critical strategic importance, while some progressed because of a mix of strategic importance and the enthusiasm of groups working in that area to increase their effectiveness.

To substantially achieve the Gondwana Link vision, improved conservation efforts are required in a number of additional areas, listed below in order of perceived priority. It is expected that the priority list will be refined once the whole of Link spatial analysis is completed.

- **Ravensthorpe Connection**, which includes the significant area of crown land between the Fitzgerald River National Park and the Great Western Woodlands. Preparatory work has been done to underpin a CAP once resources are available. A CAP should be relatively easy to produce for this area if an organisation willing to drive the planning and implementation process can be identified, failing which Gondwana Link Ltd may need to take the initial lead.

- **Remainder of the Great Western Woodlands.** The overall planning scenario for these woodlands (Del Marco 2010) was developed with other conservation and mining industry groups and some of the main local government authorities. On that basis we are progressively developing with key partners more detailed conservation plans for specific areas. As set out in Figure 3 a CAP has already been developed in the central west (Granite to Woodlands area) with another (Ngadju area of the Great Western Woodlands) finished by 2016, and a Healthy Country Plan for Esperance Tjaltjraak completed in 2018.

- **The Lake Magenta – Dunn Rock** area includes substantial areas of native vegetation on public land, has very high intrinsic conservation values and is an important connecting link from the central fragmented zone to the Great Western Woodlands. Lake Magenta Nature Reserve is the largest remaining natural area in the inland wheatbelt, and met the 1980 WA Museum criteria for being able to sustain a full complement of mammals in the long term (Kitchener *et al.* 1980b). Connecting it with Dunn Rock would double the area, and the prospect for building other connectors, south and north is worthy of closer analysis. It is a high priority for CAP development and subsequent on-ground actions.

- **The forest estate.** Maintenance of ecological resilience and function does not feature strongly in existing statutory plans governing the management of State Forest in WA, leading to an ongoing, though possibly slow, degradation through lack of appropriate management

and, where logging still continues, incidental loss of connectivity values. Over-use of prescribed fire in a drying climate is rapidly emerging as a main, if not the main, cause of forest degradation. The forest area is made up of a number of well recognised Land Management Units (Mattiske and Havel 1998) and these provide a sound basis for development of CAP or other ecologically focused planning and implementation process.

- **National Parks and Nature Reserves** across the Link generally have management plans in place, but these are often decades old and implementation is increasingly focused on servicing an 'industrial tourism' approach focused on recreational values, with minimal expenditure on their ecological values. In the past this focus on tourism rather than ecological management has led to severe degradation of ecological values, such as occurred when dieback was spread through the Stirling Range by tourist road construction. Mechanisms need to be developed to enable improved planning and resourcing to protect ecological values, including through more active involvement of public land managers in CAP planning and implementation.

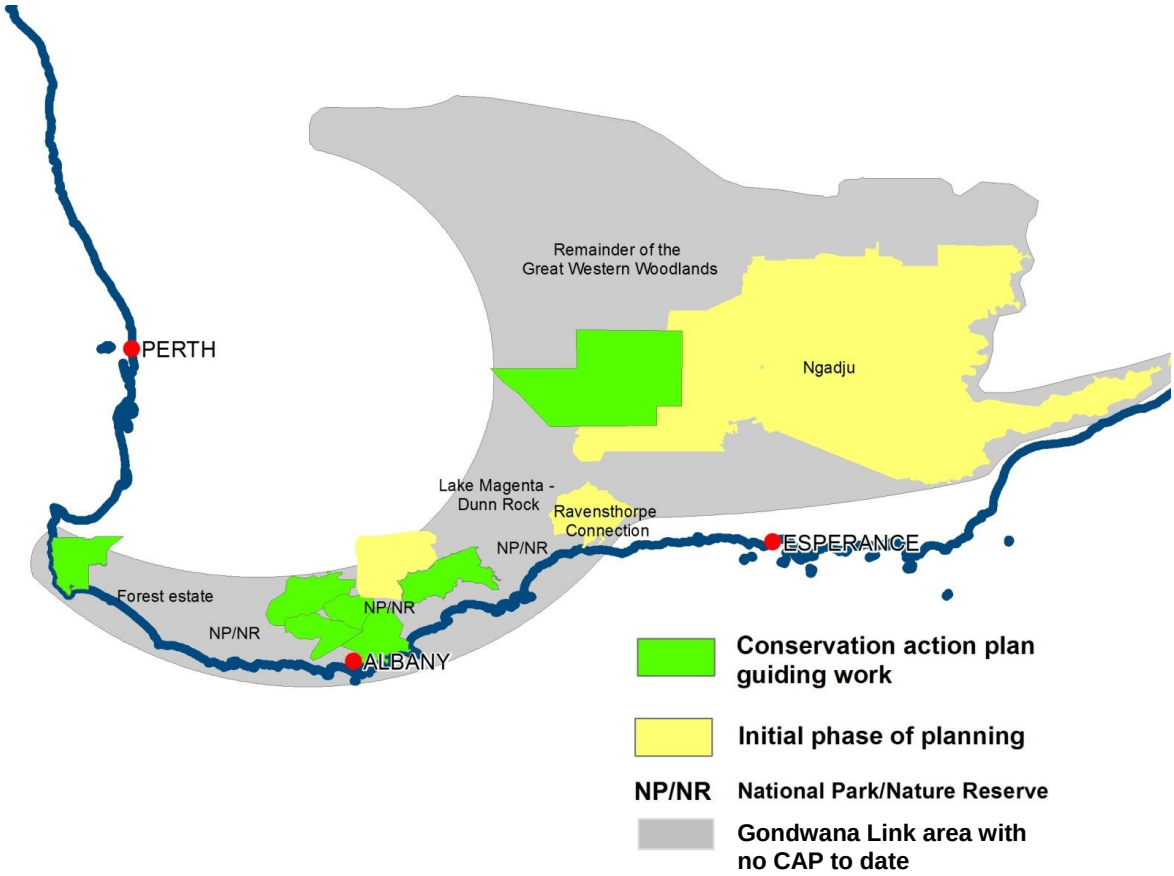


***Figure 3**: Existing CAPs, current planning and geographic gaps in the planning approach*

6.2.2. Gaps in conservation targets in area CAPs

The CAP process deliberately aims to avoid inventory based approaches to planning and the common planning fault of attempting to develop strategies for every possible action when available resources need to be strategically focused.

Nonetheless, having seven CAPs arrayed geographically, and with links to the Gondwana Link vision as a common objective, provides an opportunity to usefully and collaboratively review the CAPs to determine whether:

- a diversity of habitat types and environmental gradients has been considered;
- there is potential for better use of indicator species for ecological processes including resilience to disturbances such as fire, introduced weeds and introduced predators and herbivores;
- potential climate and evolutionary refugia have been adequately considered; and
- where greater efficiencies can be achieved through better information share between CAP areas and involved groups.

The current alignment of targets is set out below but also larger in Appendix 11.1. Further discussion and analysis across the groups and areas will be undertaken in 2014-15 to address possible gaps in targets as can be seen below.

NOTE: In those CAP areas where those targets and priority stresses on those targets, that can be mapped but, have not yet been mapped, doing so is a matter of priority, along with a spatial analysis to more accurately focus implementation strategies and monitoring efforts.

Restoration begins at Peniup, 2008. Photo: Ami Vitali.

6.3. Threats and threat rankings in CAPs

In each of the CAP areas, the threats to conservation targets have been identified and rated (see Appendix 11.2). In Table 4 below threats and ratings for each area CAP and the whole of link have been compared. While there is general consistency across the CAPs in the types of threats identified and in their relative ratings, these ratings are for the most part based on a collective view of the CAP team members and should be reviewed regularly and, where possible, more objective measures of actual threat impacts on each of the targets established. This also needs to be addressed as part of the Gondwana Link monitoring plan and, preferably, undertaken in cooperation with other agencies and organisations (eg Department of Parks and Wildlife, Department of Water, and the four natural resource management regions). There is also room for standardisation of terminology so that comparisons across the link can be made more reliably.

Table 4: *Threats across the seven CAP areas and the whole of link.*

All of Link	**CAP Area**							
	AMR	FSt	LL	RL	MP	FzS	GW	WOL
Climate change/Drying climate	VH	VH	H	VH		H	H	VH
Fragmentation		VH	H	H	H	H		VH
Weeds	M	M	H	H	H	M	L	H
Wildfire	H	H	H	H	VH	H		H
Phytophthora	M	H	H	H	H	H		H
Historical clearing (hydrology)		M	VH	M	VH	M		H
Current clearing, development	M	M		M	M			M
Grazing		M	VH		M	M		M
Invasive predators	M	M	VH		H	H	M	H
Cropping practices		M				M		M
Marri canker	M	M		M				M
Mining & mining exploration							M	M
Water abstraction, dams	M				H			M
Recreation					H		M	M
Roads, Tracks							M	M
Nutrients from land management			H					M

Key Ratings: VH Very High; H High; M Medium; L Low; No entry = not applicable or not identified in CAP**.**

CAP Area: AMR = Augusta-Margaret River; FSt = Forest-Stirling; LL = Lindesay Link; RL = Ranges Link; MP = Manypeaks; FzS = Fitz-Stirling; GW = Granites and Woodlands (Kondinin-Dundas); WOL = Whole of Link (based on CAP areas assessments).

7. Situation analysis

Using the Miradi software (https://miradi.org/), we analysed the situational context in which we are working and developed conceptual models to help identify some of the limiting factors and best intervention points for developing strategies, and to relate them across the scales at which we need to work. We have used these models to clarify the relationships between the whole of link strategies and activities, and those primarily developed within the area CAPs. One of the conceptual diagrams is shown below (Figure 4), and relates the major strategies we have identified with the threats that we need to address to ensure that the ecological processes we have identified as targets are protected or restored.

The full situation analysis is best viewed and worked with using Miradi. Published in this document, without the ability to highlight out key connectors, it would present as the ultimate 'horrendagram'.

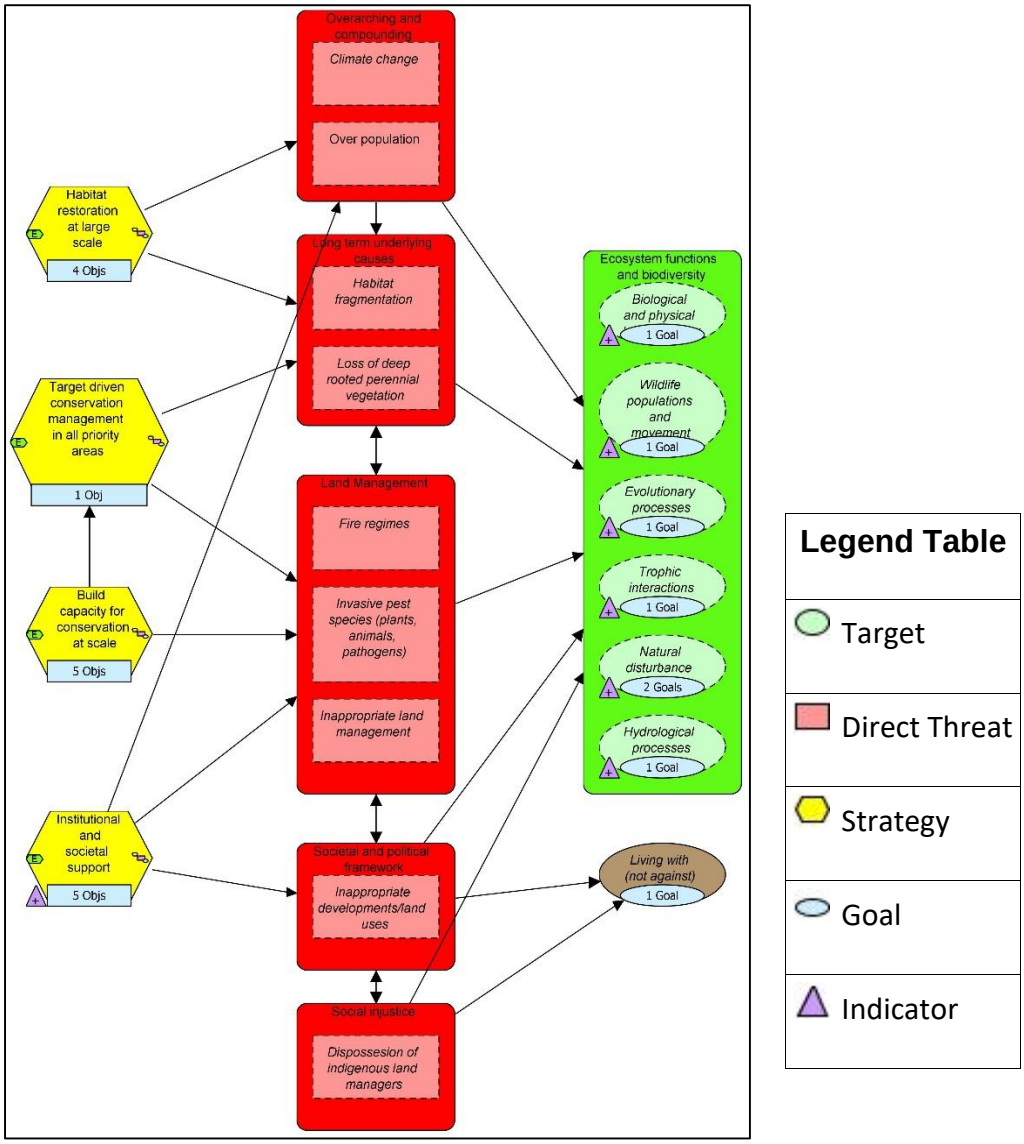


***Figure 4**. Conceptual model: Major Strategies, Threats and Targets.*

Using these conceptual models and the Miradi software, we also tested our logic by developing Results Chains (see Appendix 11.3) and used them to identify interim objectives and indicators to measure our effectiveness. The monitoring plan we have developed is discussed further in Section 7 below, and is attached as Appendix 11.4.

8. Measuring progress

"In nature's economy the currency is not money, it is life."

Vandana Shiva (2005) *Earth Democracy: Justice, Sustainability, and Peace.* Southend Press, Cambridge, MA.

To measure progress towards achieving the Vision, we need to develop an affordable and feasible monitoring program that tells us:

- how well we are *implementing the strategies* identified at both whole of link (ie this Guide) and operational area (ie the CAPs) scales;
- how *effective* the strategies are at producing the changes we want to see (ie are we meeting objectives at whole of link and CAP scales); and
- whether the status or condition of targets (the ecological processes identified as targets at whole of link scale, and the systems and species identified as targets at CAP scales) is improving.

Ecological measures have been identified to some degree in the area CAPs and some have also been identified in the whole of link CAP (the Miradi based plan), but standardising both the indicators and the methods by which they are measured will improve the Gondwana Link-wide collation and interpretation of results and potentially lead to some efficiencies in combining monitoring efforts across the link.

A monitoring plan was developed using the Open Standards for the Practice of Conservation, supported by Miradi software. Further details are contained within the Miradi file, but for use by a wider audience, the current version has been simplified by omitting detailed methodology (which in some cases is still under development) and minimising duplication (where one indicator, for example, is part of the monitoring for a number of targets, objectives or strategies). The current whole of link monitoring plan (derived from the Miradi analysis) is presented in Appendix 11.4.

The ecological indicators that have been identified need to be further reviewed and refined, and currently include statistics on remnant areas of native vegetation, areas under effective conservation management, areas under restoration, and fragmentation statistics (patch analysis). Further whole of link metrics will be considered to improve our ability to measure 'ecosystem functionality' trend measures at whole of link scale (Mackey et al 2012) against the criteria of:

- landscape integrity (degree of modification of the environment);
- extent of habitat fragmentation (comparative size of current patches relative to historical conditions);

- the proportion of native species present in an area's flora and fauna (i.e. native vs non-native);
- current habitat complexity relative to historical conditions; and
- presence or absence of key functional groups.

Each area based CAP identifies several possible indicators of conservation target viability and threat ratings. Ongoing review is needed of these indicators to develop further standard methods and recommendations for monitoring within CAP areas, which can then be "rolled up" to whole of link scale. Currently the standard target indicators include:

- percentage of pre-European extent of vegetation association remaining;
- percentage of pre-European extent of vegetation with legally binding protection;
- degree of disturbance ('intactness') within systems and patches;
- connectivity between systems and patches; and
- presence/absence, extent/trend measures for specified key functional guild and seral stages.

Where specific CAP actions are funded under third party funding programs monitoring is generally required at the project scale, and some organisations conduct monitoring for their internal purposes. To the greatest extent possible Gondwana Link Ltd will support groups to use the monitoring identified in CAPs for project reporting and internal purposes.

8.1. Effectiveness and capacity monitoring

The CAPs are an adaptive management tool. As we learn more and as capacity increases, the targets, objectives and strategies evolve. To maintain a high standard within the CAPs and ensure their evolution, a component of the monitoring will be an annual self-assessment of the CAPs themselves, based on a self-audit assessment developed initially by The Nature Conservancy as part of its Conservation Audit process.

This uses a simple 4-scale assessment of the *adequacy* and *rigour* of each of the steps within the Open Standards process, and can also be used in a peer review process. Recognising that the groups developing the CAPs so far have had very different levels of capacity during the CAP development, the initial baseline assessment will be used to set objectives for the CAP plans themselves. The goal overall is for all CAPs to be at level 3 or 4 for at least 80% of the steps within 3 years of commencement.

A copy of the self-assessment criteria is attached (Appendix 11.6).

As well as formal monitoring and reporting, the innovative nature of work underway in Gondwana Link means that a lot of the experience and learning from each of the areas and actions can be shared across the whole of the link to great benefit, along with similar technique exchanges with other large connectivity projects throughout Australia. Opportunities for this sharing of stories (in written, oral or visual formats) is included as a vital part of the Gondwana Link communications strategy.

Additional capacity and effectiveness measures are identified in the Monitoring Plan (Appendix 11.4).

8.2. Limiting Factors Analysis

Limiting Factors Analysis (Gullison and Hardner 2009) is a fairly simple methodology developed to rapidly assess whether the conditions under which a conservation program operates is likely to achieve its long term objectives. Where the CAP-derived indicators and measures will allow assessment of conservation outcomes, the use of Limiting Factors Analysis helps to show whether the enabling conditions to maintain those conservation objectives in the long term are being realised. Annual review of the Limiting Factors will also provide a check on whether we have the right balance of strategies within the Gondwana Link program.

We start with a broadly defined set of generic factors as identified by Gullison and Hardner (2009) but these may be refined over time as we further engage donors, supporters and members in evaluating the factors. Each of the Limiting Factors will be assessed on a four point scale:

1. Not limiting
2. Manageable problem
3. Serious impediment to work
4. Impasse in the majority of areas

The Limiting Factors are:

- *Scientific understanding* that is insufficient to formulate appropriate management actions to sustain the conservation targets, with three sub categories:
    - Understanding of fragmentation and disturbance thresholds for ecological processes and the consequences for management;
    - Understanding of biological monitoring methods that can be applied and interpreted at appropriate scales; and
    - Understanding of the most effective restoration practices and their impacts.
- *Legislation and public policy* that does not support conservation at the scales and intensity required. We will assess this against:
    - Federal legislation and policies;
    - State legislation and policies; and
    - Local government planning schemes and policies
- *Institutional capacity* that is inadequate to perform conservation activities. We will consider the institutional capacity of:
    - Gondwana Link Ltd to perform its defined roles;
    - Gondwana Link member groups to perform their roles, particularly in developing and implementing their CAPs; and
    - Other institutions performing or expected to perform conservation activities (eg State agencies, NRM organisations, NGOs etc)
- *Technical capacity* that is inadequate to undertake restoration activities at the required scales or to implement other conservation management activities, such as control of introduced invasive species;
- *Economic pressures* causing destruction of conservation targets;
- *Stakeholder support* that is inadequate to conserve the targets or allow implementation of conservation actions;

- *Short term funding* that is insufficient to establish an adequate level of conservation management, including capital expenditures on equipment and infrastructure; and
- *Long term funding* that is inadequate to support the recurrent costs of conservation management activities.

A 'first pass' Limiting Factors Analysis will be developed and updated in each Gondwana Link Ltd Annual Report, and will guide ongoing adjustment and implementation of implementation strategies. Some of the same indicators developed within the CAP/Miradi process can also be used in the Limiting Factors Analysis.

9. Next steps

9.1. Improving this Guide

Various parts of this Guide have been developed in discussion across member groups and key informants, most specifically as area CAPs have been developed. The use of the 'Open Standards' approach, including the continuing circle of planning, implementation, monitoring and adaption has been paramount.

Now that all 'the bits' have been brought together, it's time to go back to the beginning. Section 2.2 outlines the process we will be following over the next 18 months to further improve this Guide, and in Section 1.0 we outline how related volumes make up a broader implementation program.

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Yarrabee photo monitoring site before (Apr 2006) and after (July 2010) revegetation was undertaken. Amanda Keesing

11. APPENDICES

11.1. Conservation targets and viability ratings from area CAPs

All of Link	Area CAP Targets: Target Viability : Poor; Fair; Good; Very Good						
	Augusta – Marg River	**Forests - Stirling**	**Lindesay Link**	**Ranges Link**	**Manypeaks**	**Fitz-Stirling**	**Kondinin-Dundas**
Heterogeneity	Leeuwin – Nat Ridge	Proteaceous- rich shrub/ woodlands	Alb blackbutt & Banksia woodlands	Mallee heath	Prot-dominated comms incl Mallee heath	Proteaceous- rich communities	Mallee heath & shrublands
Evolutionary processes	Jarrah-Marri systems	Jarrah-Marri assoc veg communities	Jarrah-Marri forests	Jarrah & Marri woodland	Jarrah associated communities	Yate systems	Eucalypt woodlands
Resilience to disturbance		Stirling Range outliers	Granite outcrops & ridges	Rock Sheoak		Mallet & Moort woodlands	Granite exposures, breakaways
	Scott Coastal Plain			B. attenuata shrubland			Ironstone Hills
		Wandoo communities	Karri & wandoo outliers	Wandoo woodlands	Karri forests		
Hydrology	Wetlands	Upper Kent wetland suite	Wetlands incl rivers, creeks	Kalgan River, tribs & wetland	Freshwater systems	Freshwater occurrences	Lake Cronin
Nutrient cycling	Waterways	West Balicup wetland Suite			Shorebird habitat	Creeks	Salt lakes
Trophic relationships	Black-gloved wallabies	Black-gloved wallabies	Black-gloved wallabies	Black-gloved wallabies	Healthy habitat fauna	Tammars, Black-gloved wallabies	Chuditch
Wildlife movement		Carnaby's Black Cockatoo		Carnaby's Black Cockatoo	Black cockatoos		Carnaby's Black Cockatoo
			Honey possums				Malleefowl

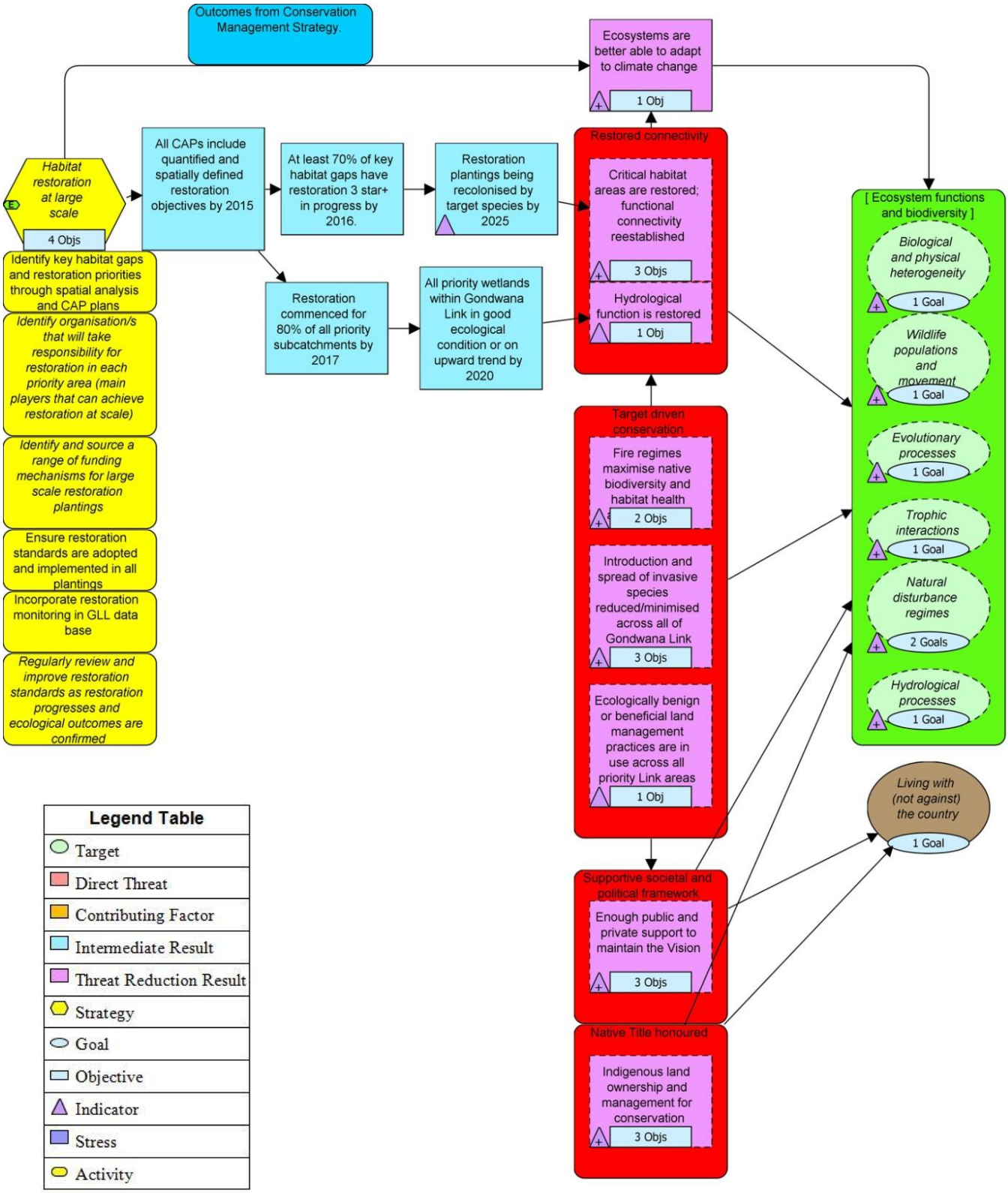
11.2. Threat ratings from area CAPs

All of Link	Area CAP Threats, Threat status of project Very High, High, Medium, Low						
	Augusta –Marg R	Forests -Stirling	Lindesay Link	Ranges Link	Manypeaks	Fitz-Stirling	Kondinin- Dundas
Climate change	Drying climate						
Fragmentation							
Weeds							
Wildfire							
Phytophthora							
Historical clearing (hydrology)					(Altered hydrology – water abstraction)		
Current clearing, development					"Clearing by machine"		Mining & mining exploration
Grazing							
Invasive predators	Introduced animals (ferals)						
Cropping practices							
Others:	Water impoundment, abstraction	Loss of food sources near nest sites	Land mgmt practices (excess nutrients);		Recreation	Unknown Yate decline	Recreation; Proliferation of Tracks;
	High water use; Marri decline	Marri canker; loss of paddock trees; roadkills; Comp for hollows		Marri canker; loss of paddock trees; roadkills; Comp for hollows			

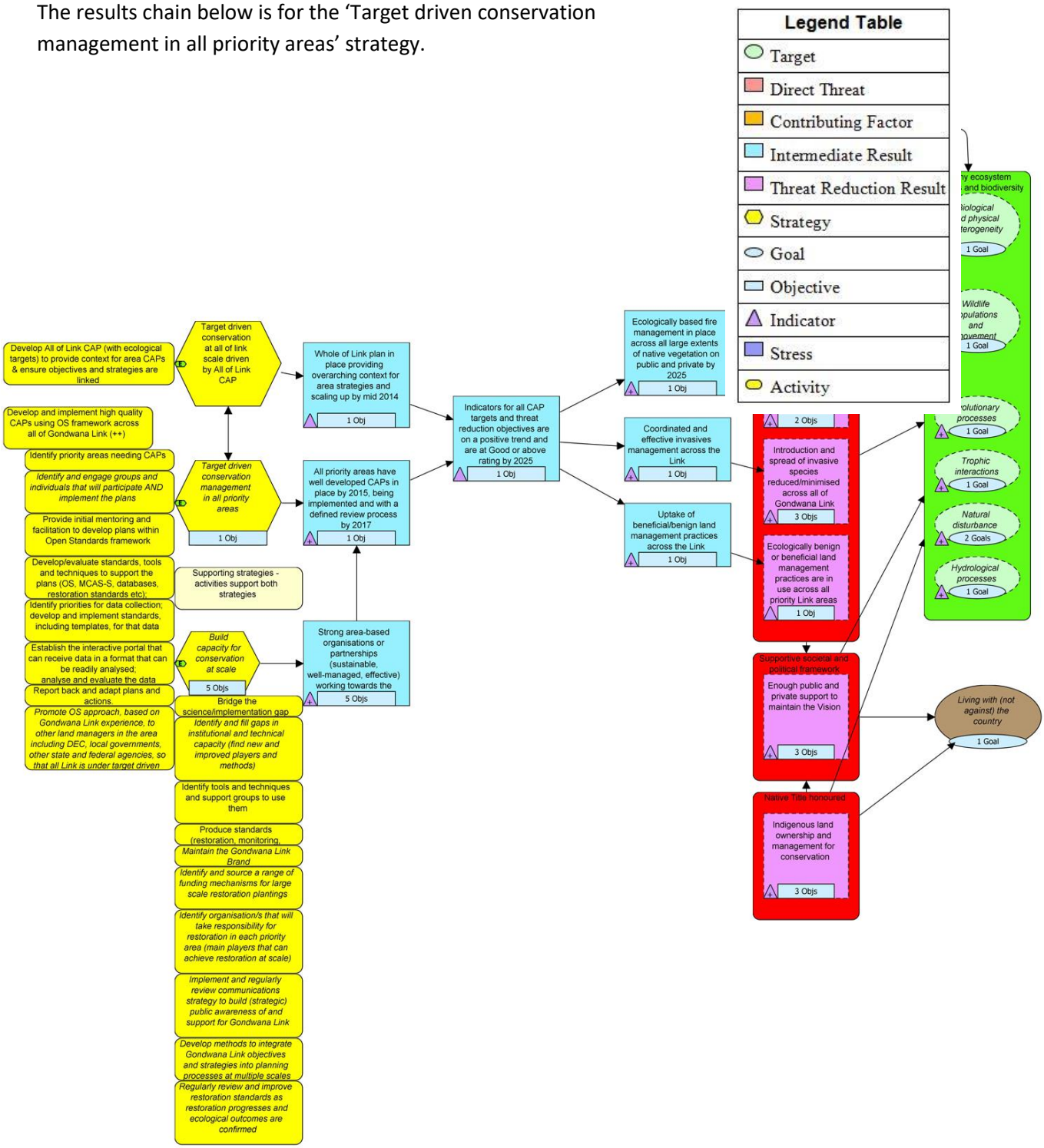
11.3. Results chains

We have used Miradi Results Chains to identify interim objectives and indicators to measure our strategy effectiveness. Following are two examples.

Below is the results chain for the 'Habitat restoration at large scale' strategy.



The results chain below is for the 'Target driven conservation management in all priority areas' strategy.



11.4. Monitoring plan v1.0

NB: This is extracted from the Whole of Link Plan as developed using the Open Standards for the Practice of Conservation supported by Miradi software. Further details are contained within the Miradi file, but for use by a wider audience, this version has been simplified by omitting detailed methodology (which in some cases is still under development) and minimising duplication (where one indicator, for example, is part of the monitoring for a number of targets, objectives or strategies.)

Key to table: = Signifies a Goal related to Target condition = Objective = Indicator

Goal for target condition Objective Indicator	Who	When	Details
Biodiversity Goal			Physical and biological heterogeneity of natural ecosystems is maintained.
Area and proportion of pre-European extent under conservation protection and management	GLL	Annual	GIS. Area under reserve, conservation covenant, other (verified) conservation management
Community, species and phenotype diversity "hotspots" under conservation protection and management	GLL (coordinator) External assistance required for mapping	ASAP (once off)	The measure at the whole of link scale is that these types of diversity have been mapped, they are available through the GLL database and are included in considerations of priority areas for protection and restoration (buffering) in CAPs (include in CAP self assessment criteria).. Flora diversity mapping has been done (Gioia & Hopper) for all but the GWW. Some fauna mapping is available. Phenotypic mapping is limited, but Margaret Byrne (DPaW), Dale Roberts (UWA) and others have data for some species that may allow some extrapolation.
Outliers and ranges under conservation protection and management	GLL	(One off)	The measure at the whole of link scale is that these have been mapped, they are available through the GLL database and are included in considerations of priority areas for protection and restoration (buffering) in CAPs (include in CAP self assessment criteria). Mostly available for central and southern areas; not for GWW.
Structural and seral stage mapping; inclusion in priority areas	GLL	5 yearly	A combination of vegetation formations and fire history mapping will give adequate starting point with later ground-truthing. GLL has fire mapping available and being regularly updated (through DPaW and others). As for items above, the measure is then incorporated in CAP assessments to ensure all criteria for priority areas and strategies have been addressed.
Healthy wetlands (including waterways)			By 2023, all lentic and lotic wetlands (ie flowing, non-flowing) wetlands are in a healthy condition, as measured by agreed standards (incorporating South Coast Wetlands Assessment, ANZECC and UWA South Coast Rivers Assessment). Requires catchment cover, intact and buffered riparian zones.

Goal for target condition Objective Indicator	Who	When	Details
Presence/abundance of indicator species identified in CAPs	CAP coordinators	As determined in CAPs (annual-biannual)	Specific indicators to be identified in CAPS and may include one or more species or assemblages of macroinvertebrates, native crustacea, native fish, water rats etc
Proportion of catchment/subcatchment under deep rooted perennial vegetation (and proportion of that which is native)	GLL	Annual	From GIS, annual updating of remnant vegetation layer.
Width and continuity of riparian zone within Class A or B condition	CAP coordinators	5 yearly	Based on methodology established for Fitz-Stirling CAP
Landscape permeability enabling gene flow			Increased connectivity and removal of barriers to gene flow
Connectivity indicators (patch dynamics)	GLL	Annual/ 5 yearly	Application of patch analysis to remnant vegetation and restoration layers
Population levels of indicator species identified in area CAPs	CAP coordinators	TBD	Target/indicator species identified in CAPs for their dependency on increased connectivity (eg Black gloved wallabies in most areas at present) NB June workshop will review method for selecting indicator species for this purpose.
Species dependent measures of reproductive success	CAP coordinators/ 3rd party	TBD	Additional support needed from UWA, Curtin, CSIRO on a subset of indicator species that are likely to be sensitive to fragmentation and lowered viability in isolated patches. Breeding success of these species would then become the indicator.
Maintenance of disturbance regimes within natural historical ranges.			
Extent as proportion of pre-European vegetation association in good condition (Vegmachine)	GLL/CAP coordinators	Annual	Relate changes in condition (as identified through Vegmachine analysis) to disturbance. Need some further assistance from CSIRO to ensure we can do this within likely resource availability
Proportion of vegetation formation and association burnt outside ecologically based regime	GLL	Annual	GIS. Based on annual updates of fire mapping.
Nature and culture are valued and we live within our ecological means			Increase the importance of conservation and culture in all facets of life within the region to reduce the time and resources spent on remediation and the values foregone by lack of consideration.

Goal for target condition Objective Indicator	Who	When	Details
Sufficient extent, condition and connectivity between habitats to allow for recovery and recolonisation following natural disturbances (storms, floods, fire, droughts etc) and for adaptation to seasonal and inter-annual variability.			Strong and irrefutable evidence exists for the inadequacy of many existing reserves and extant vegetation remnants to allow recovery from irregular disturbance events (including fires, storms, drought etc). Inter-seasonal and inter-annual variability is high, particularly in the northern and eastern parts of the region but increasingly across all of the Gondwana Link area, so larger extents, condition and connectivity offer the best opportunities for recovery and recolonisation.
Extent as proportion of pre-European vegetation association in good condition (Vegmachine)	As above	As above	As above
Proportion of vegetation formation and association burnt outside ecologically based regime	As above		As above
Viable populations of all species assemblages across Gondwana Link			
Connectivity indicators (patch dynamics)	As above		As above
Presence / absence of species and guilds as identified through CAPs	CAP coordinators	(TBD)	CAPs will (or have already) identified indicator species for a number of purposes and the CAP review has started to filter them to ensure that they include a range of species or guilds that will tell us most about ecological health while being feasible for a monitoring program. Functional groups to be considered include native predators, critical weight range mammals, pollinators, soil workers (eg bandicoots, malleefowl) and, for flora, obligate seeders, re-sprouters, etc.
Seral stages indicators	GLL (fire history) CAP coordinators (species indicators)	Annual (fire history) 5 yearly (indicator species)	Fire history : As for structural and seral stage mapping (above) Seral stage indicators: Identify system-specific indicators (using eg Barrett et al 2009[15] work on south coast fire sensitive ecosystems and species, and similar work for south west and Avon[16]; and for GWW the work of Gosper et al 2013a, 2013b provides a solid ecological basis for indicator development)
Specialist habitats occurrence and extent	CAP Coordinators (and external advisors)	TBD	Identify in each CAP area a "specialist" list of habitat types: e.g older woodlands and forests with tree hollows and ground litter; thickets; granite outcrops; etc. Determine ability to monitor remotely (LIDAR option)

[15] Barrett S, Comer S, McQuoid N, Porter M, Tiller C & Utber D (2009). Identification and conservation of fire sensitive ecosystems and species of the South Coast Natural Resource Management Region. Dept of Conservation and Land Management, South Coast Region, WA.

[16] Shedley, E (2007) Fire and biodiversity guidelines for the Avon Basin: Consultant Report to the Avon Catchment Council and the Department of Environment and Conservation, August 2007.

Goal for target condition Objective Indicator	Who	When	Details
Vegetation association indicators (extent, connectivity)	GLL	Annual	GIS based on Beards vegetation and remnant vegetation mapping
Viable populations of critical weight range species and other (identified) target species (including native predators) across Gondwana Link by 2050.			Native predators and prey populations in healthy balance.
Habitat occupancy measures for specified predators	CAP coordinators and/or third parties	Annual or as feasible	Additional advice is needed on how, where and what species will be best and most practical indicators
Habitat occupancy of specified indicator species (in CAPs)	CAP coordinators and/or third parties	Annual or as feasible	Additional advice is needed on how, where and what species will be best and most practical indicators
A network of conservation areas is developed for the Central Fragmented Zone including large (>100,000ha) patches linked by wide (>2km) links.			
Connectivity indicators (patch dynamics)	As above		As above
Extent of native vegetation associations by area and as proportion of pre-European	As above		As above
At least 80% of all Target and Threat indicators from Area CAPs and the Whole of Link Guide are on a positive trend and/or at Good/Very Good by 2025			
CAP area and All of Link indicators	CAP coordinators	As identified in CAPs	Each of the CAPs has developed indicators of target health and threats. The monitoring protocol for Gondwana Link (under development; draft due by 30 June 2014) will establish a process for collating and evaluating the monitoring outcomes from each of the CAP areas and a process for scheduled review of all monitoring outcomes (internal and with 3rd party review).
At least x% (TBC) of land within Gondwana Link under traditional ownership and			NB Area % figure to be based on consideration of NT issues and Ngadju and Noongar wishes. We are aiming for this to be a substantial part of GWW plus most public land in the remainder

Goal for target condition Objective Indicator	Who	When	Details
being managed for conservation by 2023			of Gondwana Link, but will respectfully await the final outcome of current Native Title determinations and settlement processes.
Area under Native Title and being managed primarily for conservation	GLL	Annual	Areal extent of land under Native Title and mapping available now. Areas being managed primarily for conservation with indigenous consent, participation and leadership based on IUCN categories to allow for compatible land uses. Will work further with Ngadju and Noongar groups to confirm a definition that they are comfortable with.
Number/quality of 'partnerships' between indigenous groups and GLL	GLL, Indigenous groups	Annual?	Based on modification of TNC Partnership Scoping and Assessments process
CAPs			All priority areas of Gondwana Link have a high quality plan consistent with Open Standards but which need ongoing review. Priority areas are Margaret River, SW Forests, Forests-Stirling, Ranges Link, Lindesay Link, Manypeaks, Fitz-Stirling, Ravensthorpe, Kondinin-Dundas, Ngadju land.
Complete All of Link CAP with 'Success indicators'			
All of Link CAP complete	GLL and member groups	??	First Draft to be discussed with groups and then revised. Thereafter the "annual review" will consist of annual evaluation of any minor adjustments needed as a result of monitoring evaluation or new evidence or opportunities becoming known. Further and more detailed review will be after 5 years if GLL and groups consider it necessary, but otherwise after 10 years.
Credible first iteration CAPs in all priority areas	GLL, Groups (CAP Coordinators)		All priority areas of Gondwana Link have a high quality plan consistent with Open Standards which is being implemented and monitored, a review and adaptation process in place with all having completed the full adaptation cycle at least once. Priority areas are Margaret River, SW Forests, Forests-Stirling, Ranges Link, Lindesay Link, Manypeaks, Fitz-Stirling, Ravensthorpe, Kondinin-Dundas, all of GWW.
Diverse operational support across the Link	GLL (and Groups)	Ongoing	Across the whole Link, there are diverse groups/organisations that are firmly committed to supporting the achievement of the Gondwana Link Vision. There is participation from different sectors including traditional owners; these diverse groups are implementing the CAPs. Ideally there is adequate 'functional redundancy' to ensure works don't stop because of organisational whims.
Funding (long term and short term)	GLL, Groups	Ongoing	Funding is adequate for the tasks; time spent chasing funds is utilising funds which come with high transaction costs is reduced. NB Long and short term funding are two of the parameters included in GLL's annual Limiting Factors Assessment.

Goal for target condition Objective Indicator	Who	When	Details
Mechanisms and techniques available for implementation of Gondwana Link	GLL, Groups	Ongoing	Best measured as the number of gaps or impediments in methods or techniques available to implement strategies (for example lack of appropriate land trusts to acquire and hold land for restoration; need for a revolving fund to restore and then manage or on-sell land; technical or logistical barriers to restoration at the scale required; lack of feasible monitoring methodologies). This indicator is part of the GLL Limiting Factors Analysis (Technical and on-ground methodologies)
Number and diversity of participants implementing CAPs	GLL, Groups	Ongoing	All areas have a diverse range of organisations and individuals involved in implementation
Time spent dealing with policy and legislative threats to Gondwana Link activities	GLL, Groups	Ongoing	This is also part of the Limiting Factors Analysis and may be best assessed through the regular groups communications and assessment of time spent on processes such as NRM or agency meetings etc, responses to development applications or perceived poor decision-making (eg fence proposal erecting a barrier to wildlife movement at southern end of GWW). Inclusion as an assessment factor is to ensure that we strengthen our strategies for changing policies and legislation to more effectively work for long term conservation.
Ecologically based fire management across Gondwana Link			Most of the area CAPs have identified inappropriate fire management and wildfires as a threat to biodiversity; for the GWW is it is the highest threat. While each of the area groups need to develop and implement area-scale strategies, a higher level strategic approach is also needed at All of Link scale. As the ecological outcomes of changed fire regimes will differ across the Link, the objective is best stated in terms of the ecological basis for management of wildfire and prescribed burning. 'Ecologically based fire management' is defined as management that informed by the most appropriate ecological information derived specifically for that area, in which objectives and indicators for ecological outcomes have been identified and are regularly and openly made accessible for discussion, evaluation and review by independent and reputable ecologists and conservation managers.
Area being managed for fire according to ecologically based fire management plans.	GLL, Groups	Annual?	This indicator may need further discussion with some of the GL groups and others to determine how we distinguish between a plan being in place and the plan actually being implemented.
Fire sensitive communities indicators for priority systems	CAP coordinators	Post fire frequency TBD	Further work needed in CAPs to identify a suite of species with differing fire responses appropriate to each of the areas. Monitoring may then consist of presence/absence data at selected reference sites. Some external assistance is needed.
Gondwana Link objectives and goals are "mainstreamed" into other regional, state and national planning and management processes			

Goal for target condition Objective Indicator	Who	When	Details
Indicator: Number and diversity of participants implementing CAPs	As above	As above	As above
Indicator: Number/area of organisations/individuals improving their practices	GLL/ Groups	Annual/Bi annual	This encompasses a range of industries and practices so will need ongoing adaptive processes to analyse and document. The plantation sector is already engaged with Gondwana Link and has industry sector guidelines and certification that they are open to expanding to assist the Gondwana Link vision. Some members of the mining industry have shown similar willingness, but industry wide uptake (particularly junior to mid-sized companies) is a challenge. The changes required within the agricultural sector are critical and will be further developed with landcare and catchment groups plus key agricultural investors. . LGAs are another important sector (gravel pits, sand pits, roading, local planning and development) and this proceeds best when they become part of area CAPs teams. Major infrastructure agencies are another sector that we need further dialogue with: powerlines, major roadworks, gas and water infrastructure. This has been constrained to date by resources, but we are endeavouring to work with the keenest ones and use their support to tackle others. NB This will also feed into Limiting Factors Analysis (economic pressures/ stakeholder support / public policy and legislation).
Indicator: Time spent dealing with policy and legislative threats to Gondwana Link activities	As above	As above	As above
Objective: Habitat fragmentation across Gondwana Link is reduced			
Indicator: Connectivity indicators (patch dynamics)	As above	As above	As above
Indicator: Extent of native vegetation associations by area and as proportion of pre-European	As above	As above	As above
Objective: Increase the extent/proportion of mature/old growth forests and woodlands			
Indicator: Area being managed for fire according to ecologically based fire management plans.	As above	As above	As above
Indicator: Frequency, extent and intensity of wildfires	GLL, CAP coordinators	Annual	From fire mapping updates
Indicator: Persistence of different vegetation guilds (measured by indicator species)	As above	As above	As above (Fire sensitive communities indicators for priority systems)

Goal for target condition Objective Indicator	Who	When	Details
Increased participation by indigenous people of all ages in self-managed programs and projects for conservation by 2023			
Area under Native Title and being managed primarily for conservation	As above	As above	As above
Number/quality of 'partnerships' between indigenous groups and GLL	As above	As above	As above
Indigenous participation in all Gondwana Link CAPs by 2015			
Area under Native Title and being managed primarily for conservation	As above	As above	As above
Number/quality of 'partnerships' between indigenous groups and GLL	As above	As above	As above
Integrated, effective pest species management in place across at least 50% of Gondwana Link by 2019, and all of Gondwana Link by 2025			As for fire management, the different area CAPs all address their priority pest species; this objective is about having that happen seamlessly and to a high standard across the Link.
Area being managed at high standard for control of pest species	GLL, groups	TBD	Coordination and consistency of control is an issue that has hindered management for a long time. CAPs offer a potential way to improve on this if the right stakeholders are involved. Further discussion is needed with groups on how to scale up those programs that are working well in local areas (eg weeds in Porongurup Range) and extend them across other areas. First task may be to establish a baseline of what effective programs are in place and where. This is hampered by few projects under NRM having effectiveness measures in place or available (monitoring is mostly of implementation of actions).
Populations and distributions of invasive species	Gll, groups	TBD (species and area dependent)	Some of these indicators are already in area CAPs. GLL role (preferably in collaboration with NRMs) is to ensure all priority species are covered; assist in larger scale interpretation of trends; ensure target status monitoring (eg of wallaby numbers, vegetation community health etc) is evaluated with pest species data; interpret and report at All of Link scale
Integration, learning and sharing is increasing the effectiveness of conservation management			This objective is about GLL providing the coordination of the processes that add value and lift the ambitions and standards of conservation action within the priority areas. This plan is the first step in building the more effective adaptation and sharing process that will lead to improved conservation effectiveness.

Goal for target condition Objective Indicator	Who	When	Details
Area being managed at high standard for control of pest species	As above	As above	As above
Area being managed for fire according to ecologically based fire management plans.	As above	As above	As above
Mechanisms and techniques available for implementation of Gondwana Link	As above	As above	As above
Number, area and quality of CAP plans being implemented	As above	As above	As above
Number/area of organisations/individuals improving their practices	As above	As above	As above
Number of CAPs meeting 80% level 3 or above through self assessment process	Groups, GLL	Annual	The self- assessment process is a chance to review the rigour and completeness of each of the steps within the Open Standards/CAP process and is a 4-grade rating for each step.
Minimise negative ecological impacts of land management practices across the Link			This objective will need to be further defined by practice and sector-specific objectives; eg agricultural (nutrient management, wind and water erosion, stubble burning, paddock tree removal, pest species management impacts on native fauna etc); forestry (management of plantations and native forests); mining (exploration and operations); local governments (roadworks, gravel pits etc). It will be closely linked with some of the societal/political framework objectives, especially where legislative/policy changes are required (eg development assessments and regional planning).
Number/area of organisations/individuals improving their practices	As above	As above	As above
No further spread of *Phytophthora cinnamomi* into areas undisturbed and disease free as at 2014			
Area being managed at high standard for control of pest species	As above	As above	As above
Populations and distributions of invasive species	As above	As above	As above. Includes areas where *Phytophthora cinnamomi* is known to occur.
Priority catchments/subcatchments have at least 50% cover of deep rooted perennial vegetation by 2025			

Goal for target condition Objective Indicator	Who	When	Details
Proportion of catchment/subcatchment under deep rooted perennial vegetation (and proportion of that which is native)	As above	As above	
Reduce the extent, frequency and intensity of wildfires			Most of the area CAPs have identified inappropriate fire management and wildfires as a threat to biodiversity; for the GWW is it is the highest threat. In the fragmented zone property level management is proceeding, but each of the area groups need to develop and implement area-scale and multi-tenure strategies. In GWW a 'rapid response' approach has been determined as most effective, and both CAP areas have strategies being implemented successfully. A higher level strategic approach is also needed at All of Link scale. As the ecological outcomes of changed fire regimes will differ across the Link, the objective is best stated in terms of the ecological basis for management of wildfire and prescribed burning. 'Ecologically based fire management' is defined as management that informed by the most appropriate ecological information derived specifically for that area, in which objectives and indicators for ecological outcomes have been identified and are regularly and openly made accessible for discussion, evaluation and review by independent and reputable ecologists and conservation managers.
Area being managed for fire according to ecologically based fire management plans.	As above	As above	
Frequency, extent and intensity of wildfires	As above	As above	
Persistence of different vegetation guilds (measured by indicator species)	As above	As above	As above
Reduced distribution and/or abundance and impacts of invasive animals			
Area being managed at high standard for control of pest species	As above	As above	As above
Populations and distributions of invasive species	As above	As above	As above
Reduced extent/abundance of invasive plants			
Area being managed at high standard for control of pest species	As above	As above	

Goal for target condition Objective Indicator	Who	When	Details
Populations and distributions of invasive species	As above	As above	As above
Smaller patches of extant vegetation are expanded to provide stepping stones of at least (area TBD) with gaps of no more than (1km TBC)			Spatial analysis to be used to define the objective more precisely. This may result in re-wording to put more emphasis on changing FRAGSTATS parameters.
Connectivity indicators (patch dynamics)	As above	As above	As above
Extent of native vegetation associations by area and as proportion of pre-European	As above	As above	As above
Supportive policy framework in place			
Time spent dealing with policy and legislative threats to Gondwana Link activities	As above	As above	As above

11.5. Strategy effectiveness criteria

These criteria are adapted from the Strategy Evaluation Criteria in The Nature Conservancy's Conservation Action Planning resources.

Benefits

Benefits of strategies are assessed against the number of threats that they address, the number of conservation targets (and their attributes) that are improved, the relative contribution of the strategy, the duration of the impacts of the strategy and the leverage of the strategy in helping to make other strategies more effective.

Benefits Criteria	**Score**			
	4 (Very High)	3 (High)	2 (Medium)	1 (Low)
Threat abatement: The number of threats (to all targets) that can be reasonably expected to be reduced by one or more ranking levels in the next 10 years if the strategy is successfully implemented.	Three or more	Two	One	None
Viability enhancement: The number of ecological attributes of conservation targets that could be reasonably expected to improve over the next ten years if the strategy is implemented successfully.	Three or more	Two	One	None
Contribution: The degree to which the proposed strategy, if successfully implemented, will contribute to the achievement of the objective.	The strategy in itself achieves one or more objectives	The strategy makes a substantial contribution towards achieving one or more objectives, but is not by itself sufficient.	The strategy makes an important contribution towards achieving one or more objectives	The strategy makes a relatively small contribution towards achieving one or more objectives.
Duration of outcome: The degree to which the strategy, if implemented successfully, is likely to secure a long lasting outcome.	If successfully implemented, the strategy is likely to achieve an enduring, long lasting outcome.	If successfully implemented, the strategy is likely to achieve an outcome with a relatively long (c. 10 years) duration	If successfully implemented, the strategy is likely to achieve an outcome of moderate duration (c. 3 years)	If successfully implemented, the strategy is likely to achieve an outcome with a very short duration.
Leverage: The strategy will provide leverage for the implementation of other high impact strategies.	Immediate, visible, tangible results and high leverage towards another high impact strategy.	Immediate, visible, tangible results or high leverage towards another high impact strategy.	Moderate leverage	No apparent leverage

Feasibility

Feasibility criteria assess whether there is likely to be the leadership, skills to implement and stakeholder support to allow the strategy to be readily implemented.

Feasibility criteria	**Score**			
	4 (Very High)	3 (High)	2 (Medium)	1 (Low)
Lead individual/institution:	A lead individual ("champion") with sufficient time, proven talent, substantial relevant experience and institutional support is reasonably available and committed to lead implementation of the strategy.	An individual with sufficient time, promising talent, some relevant experience and institutional support is reasonably available and committed to lead implementation of the strategy.	An individual with sufficient time and promising talent is reasonably available but lacks relevant experience or institutional support.	-
Ease of implementation	Implementing the strategy is very straightforward; this type of strategy has been done often before.	Implementing the strategy is relatively straightforward but not certain; this type of strategy has been done often before.	Implementing the strategy involves a fair number of complexities, hurdles and/or uncertainties; this type of strategy has rarely been done before.	Implementing the strategy involves many complexities, hurdles and/or uncertainties; this type of strategy has never been done before.
Ability to motivate	The key constituencies and their motives are well understood and the strategy is likely to appeal to their key motives.	The key constituencies are well understood and the strategy may appeal to their key motives.	The key constituencies are somewhat understood and the strategy may appeal to their key motives.	The key constituencies and their key motives are not well understood.

Costs

These criterion consider all costs – labour, in-kind, operating, resources – for the 10 year period.

Cost criterion	**Score**			
	4 (Very High)	3 (High)	2 (Medium)	1 (Low)
Cost over 10 years	Total cost is less than $10,000	Total cost is $10,000 or more	Total cost is $100,000 or more	Total cost $1,000,000 or more

11.6. Key Ecological Target considerations for the zones

These were documented in the early stage of developing the Guide, and are included here as a starting point in collective thinking on important characteristics for the respective zones

11.6.1. FOREST ZONE

A large extent of structurally intact forest interspersed with small towns, agriculture and an increasing amount of horticulture and visitor based industries.

Ecological Process	Considerations
Biological and physical heterogeneity	• There has been extensive loss through clearing of a number of specific communities, such as Scott River and Leeuwin Ridge • By increased effort to protect and restore large and diverse expanses of habitat these will be capable in 20-30 years of supporting reintroductions of previously widespread species such as numbats, quokkas, chuditch, Western Ringtail Possum and avian and aquatic species.
Evolutionary processes	• Extensive tall forests of Karri, Jarrah, Marri and Tingles (Red, Yellow, Rates) remain • Main habitat area across the Link for limestone cave fauna and mound forming microbial communities, relictual Gondwanan arachnids including the Tingle Moggridgea • There are concentrations of endemic species on the Scott River Plains, the Leeuwin Naturaliste Ridge and the area around Walpole; high endemism in aquatic fauna including freshwater crayfish, invertebrate species associated with forests and wetlands, particularly peat swamps.
Hydrological processes	• Includes the only freshwater perennial rivers in the region, several of which are considered wetlands of national significance, as are systems such as Mt Soho Swamps, Owingup, Maringup and the Jingilup-Jasper system. Others have regional conservation significance. • Native fish and invertebrate species endemic to WA are found in several of the west and south flowing waterways. • Some waterways systems are highly allocated for public and private water supplies, and further inroads are possible (such as tapping the Yarragadee and stripping the lower Blackwood of major fresh water inputs).
Natural disturbance regimes	• Intensive and regular prescribed burning over some decades is likely to have caused fundamental habitat changes • A main disturbance regime at present may well be continued forestry operations.
Trophic interactions	• The size and extent of the public land estate enables comprehensive fox control (though not cat at this stage)
Wildlife populations and movement	• While the State Forest areas are relatively intact, parts are still subject to fragmentation through logging and burning practices that may reduce populations and movement opportunities in, at least, the short to medium term. Other enclaves of private land are likely to be potential limitations on maintenance of connectivity.

Living with country	• There has been decades of highly polarising debate about ongoing use of the timber resource from the forests, without much demonstration of how to make timber extraction and associated forests management really ecologically sustainable. • There are significant economic benefits likely from ecologically based fire management that conserves the carbon stocks of the forests zone. • The forests are a major part of the public land estate subject to Native Title settlement. • This will presumably be achieved through a process that leads to forest management plans including a clear requirement for maintenance of ecological resilience, along with a sound basis for determining this. • Current statutory plans for forest management take little account of ecological function and resilience and do not establish Structural goals for the respective land management units that define the acceptable level and category of disturbance
An additional factor to be borne in mind: **Refugia and refuges**	• Highly buffered climatically from drier periods and contains refugia with relict taxa of previous milder periods, including groups and species of vascular and cryptic flora and invertebrates normally associated with the rainforest Nothofagus forests of SE Australia. Examples are relictual invertebrate species within the Tingle forests and peat/organic wetlands. (Biodiversity Audit 2001) • Tingle trees are associated with moisture gaining sites around granite outcrops. The thick bark and litter around these sites is habitat for endemic invertebrates and lower plants. • Limestone cave and karst features are rare in WA. Those in this zone contain fossil evidence for WA's climatic past as well as living species and communities that are found nowhere else. • This is the richest area in WA for bryophytes because of the relatively cool and moist conditions

CENTRAL FRAGMENTED ZONE

This zone is clearly where habitat loss and degradation has been greatest and where there is most likely to be a continued loss of species unless the trend is reversed. Increasing the on-ground achievements and momentum developed in the past ten years, and translating that into increased engagement of existing landholders in conservation management, securing further land for conservation management and restoring critical linkages to expand effective habitat remains the highest priorities.

This zone is clearly where habitat loss and degradation has been greatest and where there is likely to be a continued loss of species unless the trend is reversed.

Ecological Targets	Considerations
Biological and physical heterogeneity	• Intensely fine grained soil mosaics within this zone support a high diversity of species and communities. • Important to maximise the diversity of habitat types (including waterways, wetlands, granite complexes, kwongan heaths and eucalypt woodlands) and the full range of environmental gradients (landforms, topography, soils types etc) within all consolidated areas and buffers.
Evolutionary processes	• High floristic species diversity and endemism, with the richest concentrations around the Stirling Range, South Stirling/Wellstead, west of the Stirling Range, northern parts of the Fitzgerald River National Park and the Ravensthorpe Range. • High species turnover across the landscape; e.g. only 40% overlap between the Stirling Range and Fitzgerald River National Parks' flora species (around 1500 species within Stirling Range NP and 2000 in Fitzgerald River National Park; the parks are about 75km apart. (need to check this with a reference or to run the stats) • The largest connectivity gaps in the Gondwana Link pathway are (from west to east) the southern forests to the western Stirling Range and the Porongurups; the Stirling Range to Fitzgerald River National Parks; and the Ravensthorpe Connection – Lake Magenta – Dunn Rocks to the Great Western Woodlands. • The north-south orientation of waterways such as Corackerup Creek is associated with southern extensions of drier wheatbelt and Yilgarn species into the southern coastal region. • There is a tight climatic gradient, particularly north-south. • Global warming is likely to lead to a substantial southward shift from Perth in the human population, leading to extensive coastal development, further fragmenting the remaining coastal linkages.
Hydrological processes	• Considerations and objectives for the Central Fragmented Zone: • Annual rainfall has decreased by around 15% in the past 30-40 years and this trend is expected to continue • Extensive clearing has increased salinity in surface and groundwater. For the south coast catchments, a figure of 20% deep rooted perennial vegetation catchment cover has been used to indicate waterways at a high risk of salinisation and nutrient pollution, with an upper threshold of 80% indicated "near pristine" conditions (Department of Water 2004).

	• For many parts of the central zone, such as Corackerup catchment and west of the Stirlings, the localised aquifers are likely to respond rapidly to revegetation. • Small and isolated freshwater pools have been most degraded either through salinization or physical destruction. • Although the south coast waterways have been poorly studied overall, a CENRM study of macro-invertebrates has found that the Pallinup River system marked the divide between two distinct aquatic biodiversity regions (ref). • In order to protect downstream values it seems necessary to have supportive land-uses in the 'headwaters' of all catchments in the operational areas, recognising that this may be best achieved through improved agricultural practices, commercial revegetation, restoration or a mixture of these. • Connectivity restoration is best placed in those zones where waterways are incised into the landscape and at right angles to the main connectivity belt. This minimises the risk of wide, ecologically impassable salt flats.
Natural disturbance regimes	•
Trophic interactions	• At this stage the central zone is subject to heavily disturbed interactions, with little likelihood of 'self-balancing' systems able to be re-established. • There is a critically urgent need to reduce fox and cat predation.
Wildlife populations and movement	• While knowledge is still poor, it seems likely that for a number of vertebrate species (mainly birds?) there is significant seasonal movement, with much being inland to coastal. Longer term movement patterns are uncertain.
Living with country	• Farm based populations are thought to be falling, as part of a long term trend • Inland agriculture is under intense 'cost/price' pressures • Government strategies aiming at 'transformational' economic growth will be unbalanced and unsustainable unless complemented by similar transformational change environmentally • Native Title settlements are likely to improve the ability of traditional owners to connect with and live in rural areas
An additional factor to be borne in mind: **Refugia and refuges**	• This zone contains many of the higher points in the otherwise subdued south western landscapes. Relictual flora and invertebrate species are associated with many of these. Locally endemic species are also associated with breakaways and granite complexes. • The waterways and wetlands provide refuge during droughts as well as harbouring their own suites of species.

11.6.2. GREAT WESTERN WOODLANDS

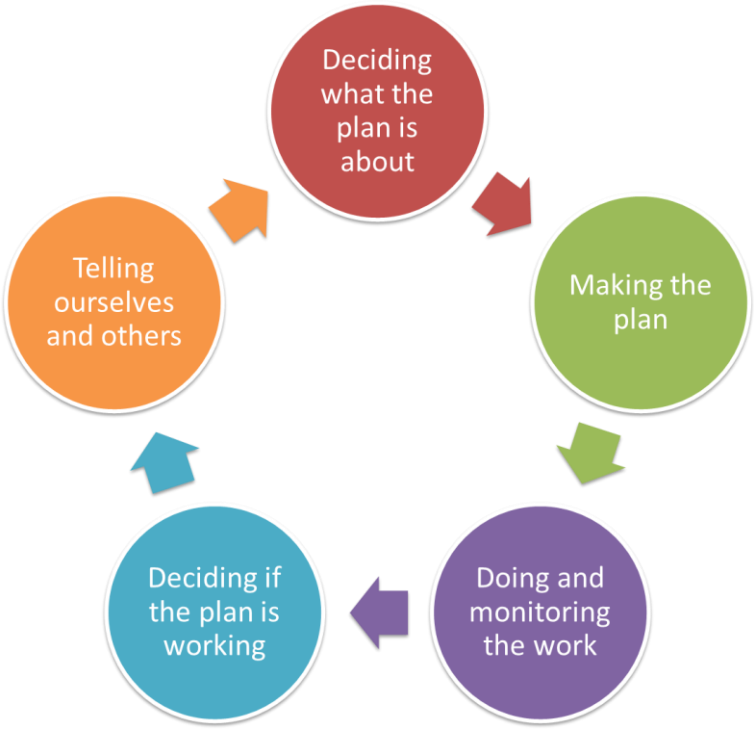
These comprise the largest remaining area of intact temperate woodland and shrubland on earth and contain many of the bird species lost from temperate woodlands cleared elsewhere in Australia. Some parts are highly mineralised and attract considerable mining and exploration.

Ecological Process	Considerations
Biological and physical heterogeneity	• It's still nearly all there, and strongly connected to the intact vegetation of inland Australia. • There is a rapid turnover of species and habitats across the area.
Evolutionary processes	• GWW is a major centre for Eucalypt and Acacia species richness and endemism (highest in Australia) • The granites and greenstone complexes show high rates of endemism and species and community diversity. The greenstones, including banded ironstone formations, are highly mineralized and very poorly protected in any Class A reserves so are the most highly threatened systems in the region. • The extensive heaths and shrublands of the sandplains are poorly surveyed but are expected to also have high rates of endemism and diversity. • While the GWW are mostly intact, there are increasing levels of disturbance from mining, tracks, fires, recreation and invasive species. There are no clearly identifiable threshold levels at which these disturbances will cause ecological processes to be disrupted, although changed fire regimes have already caused marked changes in vegetation structure and distribution and species composition, particularly of Eucalypt woodlands.
Hydrological processes	• There are few freshwater sources in the GWW but Lake Cronin is a wetland of national significance and one of few 'semi-permanent' freshwater lakes in or near the wheatbelt retaining a mostly intact catchment. Other freshwater sources are associated with gnammas on granite outcrops. • Apart from the traditional use by Aboriginal people, many granite outcrops have been used as water catchments since Eurpoean settlement. Around all granites, the presence of ephemeral pools and the concentration of runoff around the rocks following rainfall supports characteristic communities including endemic flora and fauna. • The large chains of salt lakes that are characteristic of the area mark the courses of ancient rivers. When they hold water, they can be important for migratory bird species. Their invertebrate fauna have not been extensively surveyed as yet. They are extremely vulnerable to physical disturbance through recreational vehicles and through their use for disposal of waste water from mining operations.
Natural disturbance regimes	• The extent, intensity and frequency of wildfire is thought to have increased exponentially in the past 30-40 years

Trophic interactions	• Retains the possibility of restoring close to optimal trophic conditions, though significant work would be needed to maintain stable dingo populations that suppress fox, cat and goat populations (and possibly also suppress wild dogs?). To achive that the start would be to build on the current understanding of the important role of dingoes in managing introduced predators to achieve invasive predator management for wild dogs, foxes and cats that maintains dingoes in those areas where they still exist (i.e. end to indiscriminate programs that don't differentiate between dingoes and wild dogs, and also impact on chuditch). • Southern areas seem to have viable chuditch populations
Wildlife populations and movement	• While the overall GWW is largely intact, specific habitat types are being lost through frequent fires, mining and some recreational and pastoral activities. Securing large and representative areas of greenstone communities, granite complexes and mature woodlands are a priority, but degradation of other habitat types also needs to be avoided. • Large mammals and emus are likely to be increasingly restricted by barrier fences designed to assist specific farmers and pastoralists.
Living with country	• GWW represents a globally significant opportunity to demonstrate how significant wealth creation can co-exist with retaining ecological function and resilience over a vast area • There is significant opportunity to improve carbon stocks through wildfire control. • The recognition of Native Title over large areas is imminent and provides the greatest opportunity to 'rebalance' the inability of 'UCL' designation to provide meaningful management and social benefit
An additional factor to be borne in mind: **Refugia and refuges**	• Granite and greenstone complexes provide moisture-gaining sites and are centres of diversity and endemism. • Primary productivity may provide indicators of other refuge areas. • All remaining unburnt habitats should be considered fire refuges and be given high priority for protection.

11.7. Self-Assessment Tool

A tool for the use of teams to check their progress in the development and implementation of their Conservation Action Plans.



Acknowledgements

This document is based on an original CAP Self-Assessment Tool by CCNet. It has been modified and amplified after many discussions and as a result of a workshop in Melbourne, Australia, December 2014 with a few additional comments by Gondwana Link Ltd. Thank you to Paula Deegan for providing the document for Gondwana Link's use.

Instructions for Use

This tool is best used in a team for regular reflection on the progress of your planning and plans, and to see what areas of the plan and its use could be improved.

The tool will give you three things:

1. An indication of what is 'best practice' for a step in the Open Standards
2. An assessment of where you are as a team against that 'best practice'
3. A way of tracking your improvement over time in your planning and the use of your plan.

To use the tool:

1. Bring your planning team together
2. Discuss each step. Be as honest as you can – the purpose of this is to help you improve
3. Decide what 'rank' you have achieved for each step
4. Record the good things you have completed
5. Decide if you need to do any more to improve
6. Record the changes you need to make to move to the next level

The true value of the tool is when:

1. The team reflects on the results and is committed to being responsive
2. Recommendations are acted on
3. The tool is used regularly as part of the adapt, learn, share phase of CAP work.

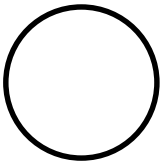
1. Pre-Planning

Define the initial project team

Key Questions	Why do we need a plan? Who is it for? Is there a project team with clear jobs? Who else should be involved in the planning and implementation? What are the main steps to develop the plan? What resources are needed and available?

				
PURPOSE	All the planning team understands why the plan is being done and who for	All the planning team understands why the plan is being done and who for	The purpose of the plan is mostly clear	The purpose of the plan is not clear
TIMETABLE	All parties have agreed a timetable and budget to make the plan	All parties have agreed a timetable and budget to make the plan	A timetable and budget to make the plan is not agreed and missing key steps	The steps to develop the plan have not been identified
RESOURCES	All the funds and people to support the planning are available.	Most of the funds and people to support the planning are available	The funds and people required to support the planning are not available/secured	No / very few resources
LEADERSHIP	There is a clear project leader and team with clearly assigned jobs	There is a project leader and team with jobs	A team is not clear and missing key people	A team is not clear and missing key people
PARTNERS	Partners and stakeholders are engaged, and understand their roles	Partners and stakeholders are there as advisors	There are gaps in representation of stakeholders/ partners	Stakeholders not known / engaged
COMMUNITY	Project has strong local community relations	Project has some local community relations	Poor community relationships	No community relationships
AGREEMENT	A written Project Charter / Agreement is available and understood			

Our Rating:



Positive Findings:

Opportunities for improvement:

Recommendations:

Notes:

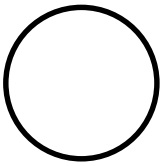
2. Vision/Dream, Scope & targets

Define Scope, Vision and Targets

Key Questions	Does the project have a clear scope? Does it it into a regional picture? Is there a clear vision/dream? Have targets (important things) been selected?

				
VISION	A clear Vision/dream is stated for the project and reflects the main reason this project area was chosen	A Vision/dream is stated for the project, but it may not meet all criteria of being general, brief, and achievable.	An overarching vision/dream is stated for the project, but it may not be inspiring, general, brief, or achievable	Overall vision/dream is lacking or unclear
SCOPE	There is a clear map(s) and description of the project and understood by the Project Team.	There is a clear map(s) and description of the project and understood by the Project Team.	There is a general idea of scope/ area of project but a map or description may not be widely-shared,	Scope not agreed
TARGETS	The reason for selecting the targets to represent the project is well recorded	The reason for selecting the targets to represent the project is well recorded	Targets are selected, but the reason may not be given or is unclear	
NESTED TARGETS	Nested targets are linked to targets, and how the nested targets are connected to the targets is clear and written	Nested targets are linked to targets, and the relationship of nested targets to targets is clear	Nested targets are not listed or relationship of nested targets to targets may not be evident	
MAPPING	Maps are effective and show location of targets (important things), other features			

Our Rating:



Positive Findings:

Opportunities for improvement:

Recommendations:

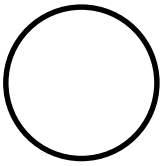
Notes:

3. Assess health of targets

Key Questions What defines health (viability)? How far off is the current health from what we want? Which targets (important things) are most in need of attention?

				
ATTRIBUTES SELECTED	Team has selected at least one attribute for **each** target.	Team has selected at least one attribute for **most** targets	Team has selected one or more attribute for **some** targets	Attributes / Indicators have not been selected for most of the targets
ATTRIBUTES QUALITY	Attributes represent a reasonable and mix of key environmental needs and cultural perspectives. Nested targets were thought about when selecting attributes	Attributes represent a reasonable and mix of key environmental needs and cultural perspectives. Nested targets were thought about when selecting attributes		
INDICATORS SELECTED	At least one indicator for **each** attribute / target.	At least one indicator for many attributes or targets	Indicator(s) are selected for some attributes or targets	
INDICATOR QUALITY	Indicators are brief, consistent, at a good scale, with an acceptable range of variation	An acceptable range of variation is defined for many indicators	Acceptable range of variation may be missing for many indicators	
INDICATOR STATUS	When available, a best estimate of current and desired status is given for **most** indicators	When available, a best estimate of current and desired status is given for **many** indicators, even if it is a guess	Current and desired status may be missing for many indicators.	
DOCUMENT-ATION	Literature used, experts interviewed, and rationale for choice of attributes, indicators, indicator ratings, and current and desired status is documented	Literature used, experts interviewed, and rationale for choice of attributes, indicators, indicator ratings, and current and desired status is documented		

Our Rating:



Positive Findings:

Opportunities for improvement:

Recommendations:

Notes:

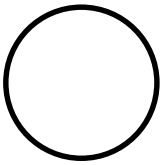
4. Critical threats – problems & causes

Define Critical Threats

Key Questions What are the problems that stop the targets being healthy? What are the causes of the problems? What are the most critical ones?

				
PROBLEMS	A comprehensive list of problems is given for **each** target.	A comprehensive list of problems is given for **each** target	A comprehensive list of problems is given for **some** targets	Threats are poorly identified if at all.
CAUSES	A comprehensive list of causes of problem is given for **each** target (or at least a distinction between problems and causes of problem).	A comprehensive list of causes of problem is given for **each** target (or at least a distinction between problems and causes of problem).	A comprehensive list of causes is given for **some** targets	
PROBLEMS V CAUSES	At least one cause is given for **each** problem	At least one cause is given for **each** problem	Problems /causes may not be separated /distinguished by the Project Team	
RANKING	The causes of problem affecting each target are ranked and the critical threats affecting the overall project identified	The causes of problem affecting each target are ranked and the critical threats affecting the overall project identified	Some ranking of which threats are most critical has been made, although it may not be systematic ranking	
AGREEMENT	Rankings are clearly agreed to by the Project Team, including partners			
DOCUMENT-ATION	Documentation of information and assumptions made is presented in the workbook or plan text.			

Our Rating:



Positive Findings:

Opportunities for improvement:

Recommendations:

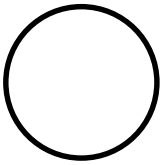
Notes:

5. Conduct Situation Analysis

Complete Situation Analysis

Key Questions	How are threats and opportunities related to each other and to stakeholders? Do we understand how things impact our targets well enough to design good strategies? Can we see points where we can intervene?			
				
ANALYSIS COMPLETED	One or more diagrams or descriptions of the situation shows how targets, critical threats, causes, opportunities and stakeholders are linked	One or more diagrams or descriptions of the situation shows how targets, critical threats, causes, opportunities and stakeholders are linked	One or more diagrams or descriptions of the situation only shows how some targets, critical threats, causes, opportunities and stakeholders are linked	No situation analysis
SIMPLICITY	Diagram is simple and does not show too much detail, but helps understand the situation and identifying strategies and monitoring	Diagram too complex		
UNDERSTAND -ING	Team members understand and can communicate the situation well.	Team members understand and can communicate the situation well.	Team members cannot communicate the situation well.	Team members have a weak understanding of the situation
TEAM	A team with different skills and Stakeholders/ partners helped develop the analysis			
COMMUNICA TION	The analysis could be used to help communicate the situation and our work to key stakeholders.			

Our Rating:



Positive Findings:

Opportunities for improvement:

Recommendations:

Notes:

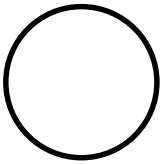
6. Goals & Strategies

Develop Strategic Plan

Key Questions Have SMART goals been set? Will goals and strategies make sure that the biggest threats are fixed and targets are maintained or made healthier? Are the goals written so the project team will be able to know if they are successful?

				
GOALS	Goals for all critical threats and degraded targets are presented	Goals for **most** critical threats and degraded targets are presented	Goals for **some** critical threats or degraded targets are presented	Critical threats or degraded targets are not addressed
SMART	Goals meet SMART criteria and are politically, socially, and ecologically appropriate	Goals meet **most** of SMART criteria	Goals may not meet several of SMART criteria	Goals are not SMART
ACHIEVABLE	The number of goals is feasible given project resources.	The number of goals is feasible given project resources		
PARTNERS	Partners are involved in the development of at least some goals			
LINKED	Goals are explicitly linked to the situation analysis, if one is available			
STRATEGIES	Each goal has one or more strategies linked to it	Each goal has one or more strategies linked to it	Some goals may not have strategies linked to them	Strategies not identified
LINKED	All strategies are linked to goals	All strategies are linked to goals	Strategies are identified, but may not be linked to goals	
PARTNERS	Partners are involved in the development of at least some strategies			
FEASIBLE	Strategies are high-leverage and feasible			
RANKED	Strategies are ranked for benefits, cost, and feasibility			

Our Rating:



Positive Findings:

Opportunities for improvement:

Recommendations:

Notes:

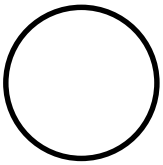
7. Results Chains–The Theory Of Change

Develop Strategic Plan

Key Questions What specific steps are you going to take to achieve your Goals? Why do you think the steps in your plan of action will work? What do you want to happen when you complete each step? How will you know when you are done?

				
CLEAR STEPS	Results chains are developed for nearly all strategies including the steps needed to get them to work.	Results chains are developed for nearly all strategies including the steps needed to get them to work.	Results chains have been developed for some strategies, including some steps	Results chains have not been developed
LOGICAL	There are clear and easily understood results chains outlining how **all** strategies will actually help to reduce threats or make targets healthier	There are clear and easily understood results chains outlining how **most** strategies will actually help to reduce threats or make targets healthier	The results chains have some gaps and are not clear on how they will achieve project goals	Team members have a weak understanding of how strategies will ultimately lead to achieving the project goals
ASSUMPTIONS	The assumptions in the result chain are clearly identified and understood	The assumptions in most result chains are identified and documented	Some assumptions in the results chains have been identified, but there are still critical gaps in understanding	
MONITORING	The critical areas where the chain is uncertain have been identified and prioritized for monitoring	The critical areas where the chain is uncertain have been identified for monitoring		
MILESTONES	Objectives have been identified where appropriate to make milestones	Objectives have been identified where appropriate to make milestones	The results chains do not have interim goals or indicators identified	
INDICATORS	Indicators for monitoring have been identified	Indicators for monitoring have been identified		

Our Rating:



Positive Findings:

Opportunities for improvement:

Recommendations:

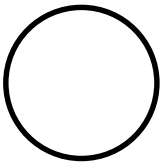
Notes:

8. Establish Measures

Develop Monitoring Plan

Key Questions	Will it be clear if progress is being made? How will we know if threats are better or worse? How will we know if targets are better or worse? Do the indicators link actions and Goals? How are we going to tell people about the results?			
				
IDENTIFIED	Indicators are described for: - All goals (strategy effectiveness) - Key threats and targets (status).	Indicators are described for: - All goals (strategy effectiveness) - Key threats and targets (status).	Indicators are described but many goals, critical threats, and targets are not the subject of monitoring	Indicators and monitoring, if described, are not tied to essential plan elements
LINKAGE	Indicators are closely linked to goals, threats, or targets	Indicators are closely linked to goals, threats, or targets	Indicators are linked to some goals, threats, or targets	
METHOD	Monitoring includes a description of monitoring methods for nearly all high priority indicators	Monitoring includes a description of monitoring methods for nearly all high priority indicators	The monitoring plan may include very little or no detail on proposed methods	
APPROPRIATE	Nearly all indicators are sensitive, measurable, precise, consistent, cost-effective, timely in response, at an appropriate scale	Most indicators are sensitive, measurable, precise, consistent, cost-effective, timely in response, at an appropriate scale		
FEASIBILITY	The monitoring is feasible given project resources.	The monitoring is feasible given project resources.		
PRIORITIS-ATION	Monitoring indicators are prioritized	Monitoring indicators are prioritized		
PARTNERS	Partners are involved in the development of indicators			
SOCIAL ELEMENTS	Monitoring program incorporates social and other sciences as appropriate			
RESULT CHAIN	Monitoring indicators are explicitly linked to the results chain			

Our Rating:



Positive Findings:

Opportunities for improvement:

Recommendations:

Notes:

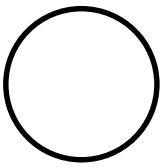
8. Establish Measures

Develop Monitoring Plan

Key Questions	Will it be clear if progress is being made? How will we know if threats are better or worse? How will we know if targets are better or worse? Do the indicators link actions and Goals? How are we going to tell people about the results?

				
IDENTIFIED	Indicators are described for: - All goals (strategy effectiveness) - Key threats and targets (status).	Indicators are described for: - All goals (strategy effectiveness) - Key threats and targets (status).	Indicators are described but many goals, critical threats, and targets are not the subject of monitoring	Indicators and monitoring, if described, are not tied to essential plan elements
LINKAGE	Indicators are closely linked to goals, threats, or targets	Indicators are closely linked to goals, threats, or targets	Indicators are linked to some goals, threats, or targets	
METHOD	Monitoring includes a description of monitoring methods for nearly all high priority indicators	Monitoring includes a description of monitoring methods for nearly all high priority indicators	The monitoring plan may include very little or no detail on proposed methods	
APPROPRIATE	Nearly all indicators are sensitive, measurable, precise, consistent, cost-effective, timely in response, at an appropriate scale	Most indicators are sensitive, measurable, precise, consistent, cost-effective, timely in response, at an appropriate scale		
FEASIBILITY	The monitoring is feasible given project resources.	The monitoring is feasible given project resources.		
PRIORITIS-ATION	Monitoring indicators are prioritized	Monitoring indicators are prioritized		
PARTNERS	Partners are involved in the development of indicators			
SOCIAL ELEMENTS	Monitoring program incorporates social and other sciences as appropriate			
RESULT CHAIN	Monitoring indicators are explicitly linked to the results chain			

Our Rating:



Positive Findings:

Opportunities for improvement:

Recommendations:

Notes:

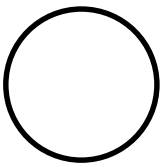
9. Work Plans – Actions, Time & Budget

Develop Short-term work plan / Budget

Key Questions Is there a detailed plan outlining actions and monitoring? Who is responsible for each step? What is the timeline for the plan? What resources are needed, including people and money? Are there enough resources allocated for the implementation of actions and monitoring?

				
ACTIONS	Lists of major actions and monitoring tasks are presented in the planning documents	Lists of major actions and monitoring tasks are presented in the planning documents	Some actions have been identified	Actions and monitoring tasks have not been identified
ALLOCATION	Steps and tasks are assigned to specific individual(s) with a timeline. Roles and responsibilities for tasks are agreed by people that will be performing them	Most steps and tasks assigned to specific individual(s) with a rough timeline. Roles and responsibilities for tasks are agreed	Few assignments made or steps budgeted.	
CAPACITY	Assessment of funding, staffing, leadership, and external resources exists and is current	Assessment of funding, staffing, leadership, and external resources exists and is current		
BUDGET	A detailed project budget exists and is used on a regular basis	At least a rough project budget has been developed		
DATA	Data management and analysis is planned in advance			
COMMUNICA-TION	Communication of results planned including audiences and communications products for each			
ADAPTING	Steps include a process for adjusting plan elements if monitoring results show a need for change			

Our Rating:



Positive Findings:

Opportunities for improvement:

Recommendations:

Notes:

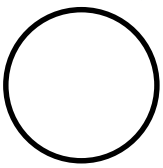
10. Implement

Implement Plans

Key Questions	Is the plan being implemented? Does it get support from partners/ stakeholders/ upper management/ funding causes?

				
IMPLEMENT ACTIONS	Actions follow strategies and plan is adjusted as necessary and with good rationale	Key actions in plan are being implemented (or have been implemented)	Some of actions in plan are being implemented (or have been implemented).	Actions and monitoring identified in plan have not been implemented to any degree
MONITORING	Monitoring program follows indicators and methods described in plan and/or plan is adjusted as necessary and with good rationale	Priority monitoring is being implemented (or has been implemented).	Some of monitoring in plan is being implemented (or has been implemented).	
COMMUNICATE	Partners/ stakeholders/ upper management/ funders are continually educated about the plan and are involved with, or at least informed of, implementation and monitoring status			
SUSTAIN	Sustainable causes of funding are available and planned			

Our Rating:



Positive Findings:

Opportunities for improvement:

Recommendations:

Notes:

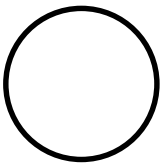
11. Review the Plan

Analyse, Use, Adapt

Key Questions What are our monitoring data telling us about our project? What should we be doing differently? How will we capture what we have learned? How can we make sure other people benefit from what we have learned?

				
ANALYZE	Data has been analysed and used to update health and threat assessments, and modify to your goals, strategic actions and work and monitoring plans	Data has been analysed and used to update and refine goals and strategies	Some data has been analysed, and may have been used to update and refine goals or strategies	No review of the plan has taken place
UPDATE	Project documents are updated regularly	Project documents have been updated	Project documents have not been updated	
SUMMARIES	Summaries of what you have learned, focusing on both process and results have been developed	A summary of what you have learnt, has been developed	No summary has been developed of what has been learnt	
COMMUNICATE	Appropriate communication outputs for each key audience	Some communication of results has occurred	There has not been any coordinated communication of outputs	

Our Rating:



Positive Findings:

Opportunities for improvement:

Recommendations:

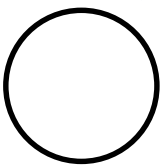
Notes:

12. Learn & Share

Analyse, Use, Adapt

Key Questions	Are results being regularly and clearly communicated with partners, stakeholders, supporters and other audiences? Does the team periodically review and communicate lessons learnt?			
				
VARIETY	A variety of communication mechanisms are used to reach a broad range of supporters and potential supporters	Communication products are tailored for each key audience. Interpretation is made as clear and practical as possible to all audiences, but conclusions are not overstated	Monitoring data may be summarized, but not adequately shared or not communicated in a manner suitable to different audiences.	Project outputs and outcomes results not summarised and communicated
SHARING	Joint meetings with project partners, stakeholders and supporters are held periodically	Progress and results are regularly shared with key audiences	Modifications to Objectives and actions may be made, but rationale not shared.	Monitoring data not shared with appropriate audiences
REGULAR REVIEW	The team periodically reviews lessons learned and incorporates findings into updates of the plan, and clearly documents results in a way that can be shared with other teams and organisations	The team periodically reviews lessons learned and incorporates findings into updates of the plan, and documents results	Some documentation of the lessons learned	No documentation of the lessons learned

Our Rating:



Positive Findings:

Opportunities for improvement:

Recommendations:

Notes: