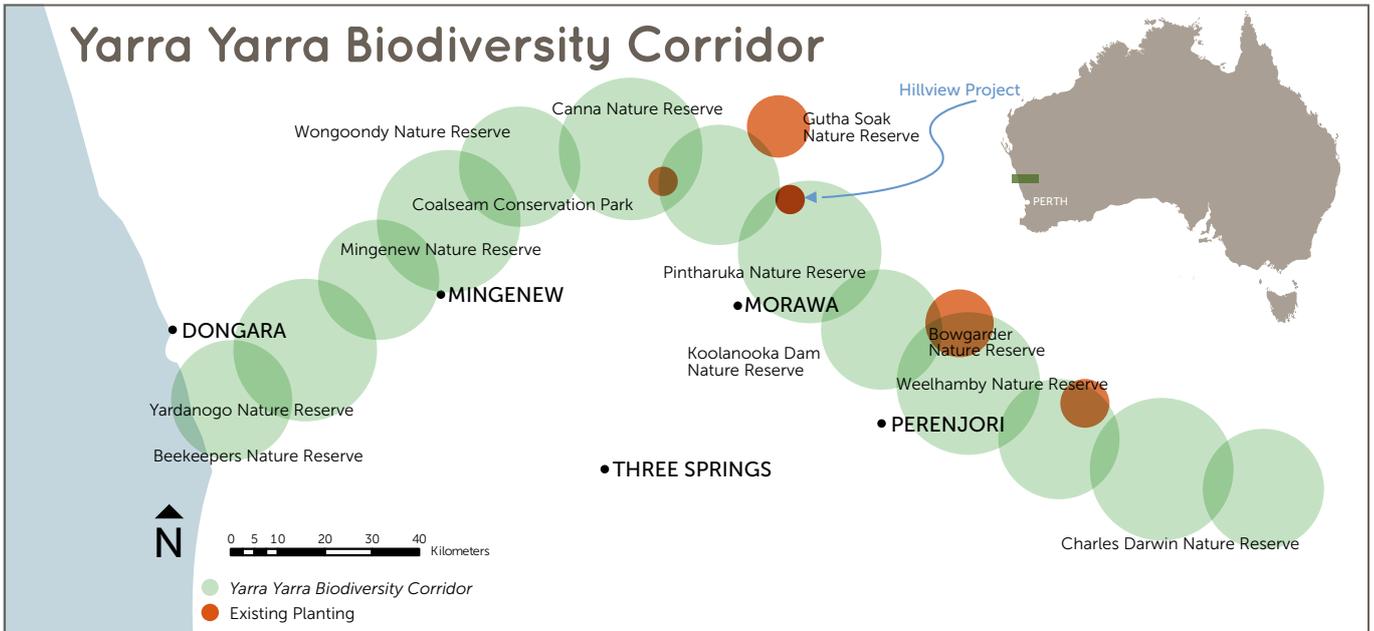


Biodiversity Works

The Hill View Story





The Hill View story

An amazing diversity of plant and animal species has been identified living in remnant bush on unused farmland in the northern Wheatbelt of Western Australia. Results of a baseline biodiversity survey highlights the potential to create a major wildlife corridor by planting a new habitat to reconnect remnant bush and nature reserves with multi-species carbon reforestation projects.

A former grazing property near Morawa in WA's northern wheatbelt, *Hill View* is now part of Carbon Neutral's *Yarra Yarra Biodiversity Corridor* project. Like much of the northern wheatbelt, *Hill View* was heavily cleared for agriculture in the early 1900s leaving small patches of bushland (remnants) on rocky ridges and the less commercially productive areas. As habitat was cleared throughout this district, there was widespread decline, loss and even extinction of native plant and animal species. The native species left today are hanging on in these small and often highly isolated remnants.

Carbon Neutral selects land that has been degraded over time and is no longer viable for agriculture – such as the land on *Hill View*. By revegetating we aim to restore the natural landscape and encourage back native plant and animal species. *Yarra Yarra Biodiversity Corridor* will eventually connect up the remnants left on properties such as *Hill View*, with nature reserves and other plantings, to make up a 10,000 square kilometre corridor.

10,000 HECTARES of land already **REVEGETATED** in the Yarra Yarra Biodiversity Corridor

Using its own seed bank Carbon Neutral has so far planted over 20 million trees and shrubs across 10,000 hectares in the *Yarra Yarra Biodiversity Corridor*. This includes 120,000 seedlings planted on *Hill View* since 2010, which has revegetated over half the property. The aim is to provide new habitat, re-connect the isolated remnants, and restore the land.



Monitoring Project

Carbon Neutral Charitable Fund contracted ecologists to undertake systematic monitoring of the biodiversity of the *Hill View* property. The outcomes of this monitoring project have been nothing short of staggering, proving just how biodiverse this region can be and how effective our plantings are in the short-term, as well as confirming the long-term potential of our revegetation program.



Australian Government

Regular systematic biodiversity monitoring is not common in Australian reforestation projects. It takes a great deal of time, is expensive and requires professional ecologists to carry out the work on a regular basis. Thanks to a grant from the Australian Government's Biodiversity Fund, we were able to contract a study that monitored bird, insect and plant biodiversity at *Hill View* over two surveys in spring 2014 and autumn 2015. The outcomes provided in the full reports have supplied us with a baseline from which we can track changes over time in the abundance, composition, and use of habitat by native species.

Surveys were carried out in spring 2014 and autumn 2015 at 12 selected sites – 6 of which were located in the remnants and 6 in areas denuded from grazing and subsequently revegetated by our 5 year old plantings. Each site was selected to cover a variety of age and species mix of vegetation as well as type of location (known as topography). All monitoring used GPS coordinates for accuracy and to assist future monitoring.

Three ecologists were involved in the project and used a variety of methods to monitor birds, plants and insects. Birds were detected by sight and call using established scientific methods – area searches and line transects. Some birds were also photographed.

Their behaviour was noted (nesting, bathing, resting, feeding, foraging, breeding) as it gave valuable information about how birds used their natural habitat and how established or healthy their communities were. Plants were surveyed using standard scientific methods – quadrat, transect and edge monitoring plots.

Insects were surveyed using light-trapping, hand-netting, hand-collecting and lure traps. All insects were temporarily held in containers, cooled in a refrigerator, photographed and then released unharmed.

“the outcomes of this monitoring project have been nothing short of staggering”

A remote sensor camera was installed near a water-filled gnamma hole (a natural rock cavity that holds water) and in a shrubby gully. This captured footage of a range of native and introduced animals including Perentie, Emu, Wedge-tailed Eagle, Euro, Echidna, fox and feral cat.

Using the observations, notes, photographs and footage, the team identified all species, collated and analysed the data. The end result of this biodiversity monitoring survey includes two comprehensive reports and species lists, maps of vegetation communities, recommendations of priority actions for the future, and a photographic library of over 1,700 images.

Survey Outcomes

The number, species diversity, behaviour and activity of all animals, plants and insects recorded in the monitoring project tell a positive story of a healthy and increasingly biodiverse environment.

BIRDS: Over the two surveys 1,040 birds were recorded, from 50 native species. These included 13 bird species of conservation significance, one of which is listed as near-threatened in WA – the Crested Bellbird (*Oreoica gutturalis*). A core group of insect-eating woodland and shrubland birds were detected only in remnants and were the most abundant birds recorded in the study. They included Chestnut-rumped Thornbill, Yellow-rumped Thornbill, Zebra Finch, Southern Whiteface, White-browed Babbler, Red-capped Robin, Splendid Fairy-wren and Rufous Whistler.

PLANTS: A total of 147 plant species were recorded including 97 perennial and 50 annual species. There were 3 plant species listed as threatened and/or rare in WA – *Eucalyptus synandra*, *Melaleuca barlowii* and *Persoonia pentasticha*. A fourth rare species – *Baeckea* sp. Billeranga Hills was recorded during an earlier recent survey on *Hill View*. A further 11 conservation significant plant species including *Gyrostemon reticulatus* (threatened) could occur on or near the property. One threatened ecological community – Plant Assemblages of the Moonagin System – occurred in remnants

on ridges at *Hill View*. Plant species diversity (particularly annuals) was affected by the unseasonably dry winter and spring in 2014 with a notable absence of orchids, generally known to be found in this area.

INSECTS: There were 256 species of insects recorded in the monitoring project – a large number for the relatively small areas surveyed. The vast majority of those species were flower-visiting insects that provide an important role in pollination.

OTHER ANIMALS: Several other animals not formally included in the monitoring project, were observed by the ecologists. These included the conservation significant Perentie (*Varanus giganteus*), Western Red Kangaroo, Euro, Echidna and three introduced species – fox, feral cat and rabbit. Three other reptile species – the threatened Western Spiny-tailed Skink and Gilled Slender Blue-tongue (vulnerable in WA) and the common Yellow-spotted Monitor were not recorded but are likely to occur at *Hill View*. Additional targeted monitoring is needed to determine the presence of these and smaller reptiles such as skinks on the property.



As we expected, the results of the project showed the remnants support more individual birds and plants than the mostly young trees and shrubs in the areas of revegetation. This was particularly evident for woodland and shrubland birds which generally require older trees, shrubs and groundcovers for foraging, refuge and breeding. Around 80% of birds were recorded in the remnants with the remaining 20% in the revegetation. Of the 50 species of birds, 90% were recorded in the

remnants and 44% in the revegetation. With several trees and shrubs species that we have planted expected to flower in the next year or so, the biodiversity of the revegetated areas is only going to increase with time.

For all the results, including the full lists of all animal and plant species identified in the study, you can read the final reports on our website.

The most abundant birds recorded were:

- Chestnut-rumped Thornbill,
- Yellow-rumped Thornbill,
- Zebra Finch,
- Southern Whiteface,
- White-browed Babbler
- Red-capped Robin
- Splendid Fairy-wren
- Rufous Whistler



White-browed Babbler



Red-capped Robin



Splendid Fairy-wren



Rufous Whistler

FINDINGS



1,040 BIRDS RECORDED

50 BIRD SPECIES recorded



13 bird species of LOCAL CONSERVATION SIGNIFICANCE recorded



800 HECTARES OF LAND revegetated at Hill View since 2010



256 INSECT SPECIES recorded

120,000 SEEDLINGS planted at Hill View



12 SITES covering **334** HECTARES

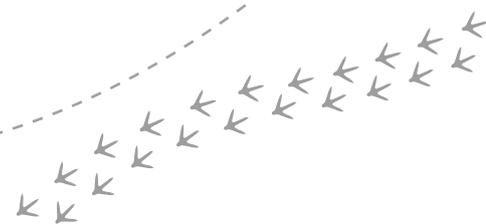


surveyed in the monitoring project

147 PLANT SPECIES recorded



3 plant species of CONSERVATION SIGNIFICANCE recorded



Biodiversity Works

Australia is home to an estimated one million species of plants, animals and micro-organisms, many of which are not found elsewhere in the world. South-western Australia is identified as one of only 35 globally significant biodiversity 'hotspots'. These hotspots account for 90% of all species on earth, which makes this region globally highly significant in terms of biodiversity.

The link between climate change and biodiversity has long been established. Our native plants and animals thrive in large, well-connected patches of high quality habitat that meet their life cycle needs – food, shelter, movement and reproduction. Rapid climate change will affect the ability for many species to adapt and biodiversity tends to decrease as a result. CSIRO research shows that by 2070 the impact of climate change on Australia's biodiversity will be widespread and extreme.

“Our native plants and animals thrive in large, well-connected patches of high quality habitat”

The results shown in the biodiversity monitoring project are significant for a number of reasons. Firstly, there is more biodiversity in the remnants than we originally realised. Secondly, in just a handful of years, there is a surprising amount of biodiversity in the revegetated areas. Nature tends to take her time so the process was never going to be immediate, however the monitoring clearly shows our plantings are well on the way to restoring the natural biodiversity of the region. We aim to reconnect these valuable remnants by planting more trees, shrubs and ground cover at selected key sites on denuded farmland. This will establish habitat stepping-stones for our biodiverse native species to move and disperse through the landscape. We look forward to tracking this continued success with future monitoring projects.



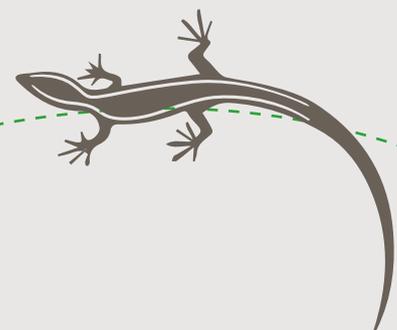
Traditional Owners

Together with our sister organisation Carbon Neutral, we are in the process of developing an Indigenous program aimed at the inclusion and participation of the Aboriginal Traditional Owners of the country east of Dongara in Western Australia's Mid West. By listening to and involving the Traditional Owners we can acknowledge, respect and hopefully learn more about the cultural heritage and Traditional Ecological Knowledge of the region.

“By listening to and involving the Traditional Owners we can acknowledge, respect and hopefully learn more...”

One of our Indigenous projects is to include the Aboriginal names of the plant and animal species in the monitoring project reports, and identify if local Aboriginal people use them for food or healing or in other cultural activities. A cultural survey of this region will also be undertaken to identify culturally significant sites within the *Yarra Yarra Biodiversity Corridor*. As information becomes available we will update the reports.

To keep up with all our latest information you can follow us on facebook or subscribe to our newsletter via our website.





The Carbon Neutral Approach

Carbon Neutral Charitable Fund is a Not for Profit organisation that works with the community to reduce carbon emissions through tree plantings, research and education.

Our approach to combatting climate change is to take degraded and unused farmland and restore the natural habitat. By planting trees and shrubs we are offsetting the carbon emissions we all pump into the atmosphere just by going about our everyday activities.

For millions of years trees have been critical in maintaining safe levels of oxygen and carbon dioxide on our planet. Trees are the world's single largest source of breathable oxygen and play a vital role in addressing climate change. They filter air and provide oxygen, conserve soil and water, prevent salinity and protect and stabilise ground cover.

We now know that mass plantings of a single species of tree (called monoculture) don't optimise the reduction of carbon. Plus it does little to restore the natural biodiversity of our natural landscape. Our approach focuses on restoring biodiversity so our plantings put a wide variety of native trees and shrubs into degraded farmland.

For more information on our approach and our planting projects please check out our website www.cncf.com.au.

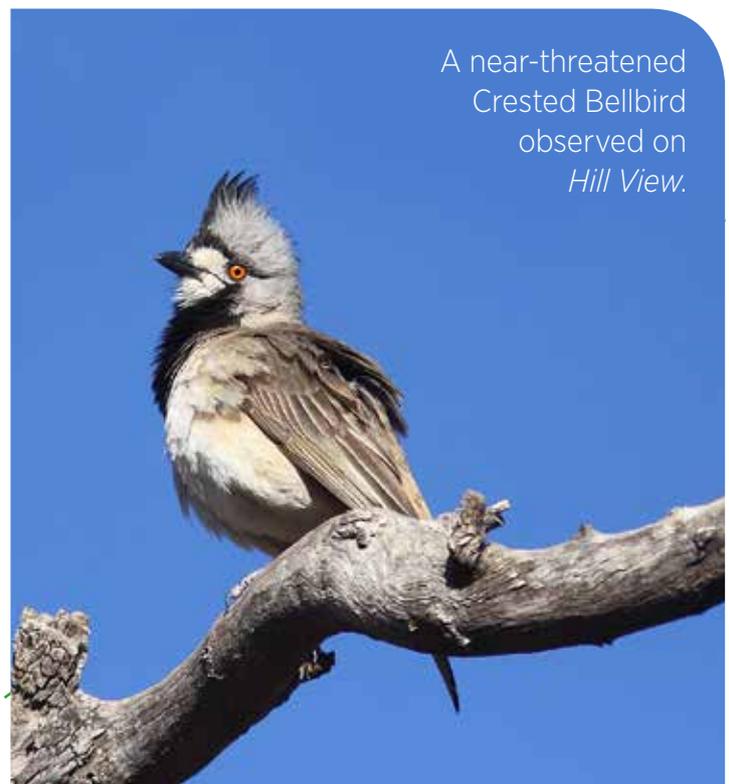
This monitoring project was a joint effort between Carbon Neutral Charitable Fund and its sister organisation Carbon Neutral which owns the land at Hill View. For more information on Carbon Neutral please go to www.carbonneutral.com.au

How You Can be Part of the Solution

Carbon Neutral Charitable Fund helps individuals, families and organisations to minimise their impact on the environment. We use money raised by people buying carbon offsets and making donations to plant trees and restore native habitat.

Every carbon offset you purchase, every tree you give, every dollar you donate, helps us to plant more trees and shrubs on land in the *Yarra Yarra Biodiversity Corridor* as well as our community urban reforestation programs.

Find out more at www.cncf.com.au.



A near-threatened
Crested Bellbird
observed on
Hill View.



As one of the internationally recognised biodiversity hot spots, Western Australia has amazing opportunities, as well as challenges, to ensure this unique biodiversity will continue into the future. It is a rich cultural heritage we must pass on to future generations. I support the revegetation of unused farmland in the Wheatbelt of WA in which some 450 species of plants and animals have already been identified at just one location. I commend the Carbon Neutral Charitable Fund approach and envisage it will become a template for others.

Lyn Beazley AO FTSE

Chief Scientist of Western Australia (2006 to 2013)
Professor of Zoology, University of Western Australia (1994 to 2013)

To talk about the *Yarra Yarra Biodiversity Corridor* monitoring project or any other aspect of Carbon Neutral Charitable Fund's activities, please contact us.

1300 857 970

www.cncf.com.au



Carbon Neutral Charitable Fund Ltd is a registered environmental charity and is endorsed by the Australian Taxation Office as a Deductible Gift Recipient.

Photographs supplied by Dr Andrew Huggett, Insight Ecology and Jenny Borger, Botanical Consultant