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STANDING COMMITTEE ON CLIMATE CHANGE, ENVIRONMENT AND THE ARTS
House of Representatives
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RE: Submission to the inquiry on Australia's Biodiversity in a Changing Climate

Dear Julia,

Greening Australia would like to thank you for the opportunity to contribute to the recently announced inquiry on Australia's Biodiversity in a Changing Climate.

Submission Summary

Climate change is one more threat to the conservation of Australia's biodiversity. Climate change increases the urgency, as well as the opportunity to act at scale. Mitigating the impact of climate change should include large scale establishment of biodiverse carbon offsets through revegetation of native forests, woodlands, shrublands and grasslands.

Mitigating climate change through revegetation will provide multiple environmental and social benefits including: regional employment, reduction of the urban heat island effect, and restoration of wildlife habitat. Biodiverse carbon plantings will also assist businesses and landscapes adapt to climate change.

Well planned biodiverse carbon plantings will improve regional scale ecological connectivity, improve water quality, restore catchment scale hydrological balances and improve agricultural sustainability. A price on carbon is a critical element in realising the multiple benefits of large scale plantings of biodiverse carbon.

Australian Government investment is also needed to ensure biodiverse carbon is established in the right places and with the right species. Government investment needs to include coordinated planning and the establishment of the necessary infrastructure to restore native vegetation at scale.

Kind Regards

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Background to Greening Australia

Greening Australia is Australia's largest environmental NGO with offices in all states and territories and many rural and regional locations around Australia. We have been established for 28 years with a staff of 270 and a turnover of \$35M per annum. Our work is focused on the large scale transformation of degraded landscapes. This is achieved through the restoration, expansion and establishment of biodiverse native forests, woodlands and other vegetation systems.

Inquiry Terms of Reference

Connectivity between ecosystems and across landscapes

Greening Australia is a pioneer in the establishment of landscape conservation initiatives that include the improvement in ecological connectivity. Greening Australia is a founding partner in *Gondwana Link* established over 10 years ago. We are also founding partners in the *Great Eastern Ranges*, *Habitat 141°*, *Bunya Biolink* and *Nature Links*. These connectivity conservation initiatives are described in detail in the 2011 CSIRO report *A compendium of existing and planned Australian wildlife corridor projects and initiatives, and case study analysis of operation experience* for the Department of Sustainability, Environment, Water, Population and Communities. Greening Australia, as a co author of this report, made it clear that connectivity conservation linked to the National Reserve System is well advanced in much of Australia, thanks to the efforts of many volunteers, community groups and NGOs, with substantial support from philanthropy and corporations, as well as modest support from governments.

Greening Australia is supportive of the Australian Government's *National Wildlife Corridor Plan*. However, the current quantum of funding (\$10 M over three years) is insufficient to achieve significant on ground improvements in ecological connectivity. Our strategic plans for these existing landscape scale initiatives indicates at least \$20M per annum for 10 years is required in each landscape in order to achieve connectivity to substantially improve conservation of native biodiversity in the face of climate change. We recommend that the *National Wildlife Corridor Plan* supports, as an urgent priority, coordination and integrated planning that is required for these large initiatives to survive in the face of current limited funding for these activities.

Climate change impacts on biodiversity and flow-on to human communities

Peri-Urban Growth Centres

Greening Australia is active in all the major peri urban growth centres of Australia's capital cities. We promote the use of native vegetation in suburban developments by working with land developers and with new residents. Large scale investment in improving urban tree cover is needed to reduce the increasing effects of the Urban Heat Island Effect. Furthermore, an increasing number of scientific studies are showing that public access to a diversity of flora and fauna within urban catchments improves human well being (e.g. Fuller and Gaston 2009).

Riparian Vegetation

Riparian revegetation can be seen as a catchment scale tool that can have a beneficial effect on flooding in lowland areas. At catchment scale, the cumulative effect of riparian revegetation is to increase flood stage and duration in headwater streams where flooding is usually not a problem, but decreases flood stage in larger streams further downstream where flooding in the past has been a problem (Rutherford et al. 2007). Broad scale revegetation can slow the loss of soil and promote water infiltration by providing beneficial pathways to help bind the soil (Polglase and Hairsine 2003).

Air pollution reduction

Particulate pollution can cause severe and damaging health effects. Particles exist in the atmosphere in many forms from sub micron aerosols to clearly visible grains of dust and sand. Particles are removed from the atmosphere when they are entrapped by terrestrial surfaces. Particles in an airstream are most readily entrapped onto moist, rough or electrically charged surfaces. Vegetation is effective at trapping and absorbing many pollutant particles due to their high surface roughness which results in turbulent atmospheric mixing. This mixing promotes efficient deposition of pollutant materials (Beckett et al. 1998) and a reduction of particulate pollution downwind of plantings.

Agricultural Productivity

Building carbon stores in the landscape through biodiversity enhancement and restoration can have numerous benefits to the agricultural sector, from improved productivity to farmlands through erosion and salinity mitigation, provision of shelter for livestock and reducing the impact of extreme weather conditions.

While ecological processes have been compromised by extensive clearing for agriculture, the reverse does not apply. Long term agricultural productivity depends on maintaining and enhancing remnant native vegetation (LWRRDC 1995).

Native vegetation has an important role to play in protection of agricultural activities and land from extreme weather events. By converting as little as 2% of a landscape to tree windbreaks can achieve a 30% reduction in wind speed across a region (Kimber et al. 1999), with this protection during windy, wet and cold weather reducing lamb mortality by 50% (Bird et al. 1992; Wakefield, 1990). The provision of shade in hot periods may lead to improved fertility with heat stress reducing ram fertility, and reducing ovulation, oestrus, conception and embryo survival in ewes. Heat stressed cows produce smaller calves and longer intervals between calving (Bird et al. 1992).

By retaining and increasing native vegetation cover across a landscape, the ecosystem service of pest control can be improved. Native vegetation is likely to harbour beneficial fauna that prey upon invertebrate pests of crops and pastures. For example, numbers of predatory mites and spiders were higher in shelterbelts and in adjacent pasture when there was a high cover of tall grass in the shelterbelts. Research indicates that shelterbelts contribute to the provision of natural enemies of pasture pests to the extent that earth mite populations can be suppressed (Tsitalis 2006). Furthermore, tree belts and blocks can trap

diseases attached to airborne particles and reduce the spread of other windborne pests (Kimber et al. 1999).

The value of pollination to agriculture in Australia has been calculated as \$1.2 billion per annum (PMSEC 2002). Pollination services are provided by native bees, butterflies, moths, flies, beetles and wasps, as well as birds and mammals. These native pollinators complement the pollination services by commercially managed bee species (Kremen et al. 2007). Conserving and enhancing native vegetation can improve the pollination activity from insects such as native bees (Cunningham et al 2002) and provide shelter from wind and heat for domesticated bees.

Economics of vegetation restoration

In addition to the improvements in landscape, urban and agricultural health, native vegetation restoration also offers a unique opportunity to build regional economies through job creation and wealth transfer. The emerging carbon market will enable investment into long term activities that will create jobs across a range of sectors.

Up to 80% of any investment into biodiverse carbon sinks flows directly to on ground activity and thus would involve a direct injection of funds to the regional economy. Only a small proportion of costs would require skills from law practices and operations that are based in urban areas – for instance initially the majority of the more complex legal issues would be driven towards larger legal practices that have developed the skills and experience in the carbon industry, although with some of these skills requiring in depth knowledge of regional issues it is likely that over time these activities would transfer away from larger urban practices into smaller local and regional practices. Thus not only would these activities drive economic improvements, but potentially also a net transfer of high level skills to regional areas.

Sustainable use of natural resources and ecosystem services

Greening Australia is involved with nearly 20 landscape scale projects across Australia. Each project involves participatory planning and implementation processes involving a wide diversity of stakeholders. All of these projects include farmers and pastoralists who are actively improving ecological and social connectivity through their own revegetation and remnant protection practices. Our experience shows that improving connectivity is highly complementary to improvements in sustainable agricultural practices.

Landscape Connectivity

Greening Australia is fully committed to the restoration of native vegetation to improve landscape scale connectivity. In the highly fragmented landscapes of southern Australia, this will require hundreds of thousands of hectares of revegetation on degraded and marginal agricultural land. The scientific evidence is unequivocal, landscape scale loss of habitat and fragmentation of habitat by nearly 200 years of clearing is an all pervasive threat to native biodiversity. Climate change simply increases the urgent need to de fragment the landscapes of southern Australia.

Greening Australia sees a price on carbon as an important means of leveraging the large financial investment needed for large scale connectivity conservation. We have piloted the establishment of biodiverse carbon sinks within critical gaps in connectivity in both *Gondwana Link* and *Habitat 141^o* (see photos below). These voluntary carbon plantings were established through corporate voluntary carbon investments and through donations for offsets from the public.

The proposed Biodiversity Fund, established through the Clean Energy Future Land package, has the potential to support the development of a biodiverse carbon industry through enabling “start up” capital for the infrastructure, training and brokering services needed to attract carbon emissions offsets into biodiverse plantings on degraded agricultural lands. For example, initial public investment is needed to build the necessary skills and infrastructure to deliver large quantities of appropriately sourced native seed needed to improve connectivity through revegetation.

We commend the pioneering projects like ‘Eco Fire’ in northern Australia that are improving fire management in collaboration with cattle companies, Indigenous communities, government agencies and NGOs. Long term and large scale integrated land management across all tenures is critical for the conservation of the flora and fauna of northern Australia – the largest relatively intact tropical savanna in the world. Again, long term funding for large scale coordination and planning is critical.

Governance arrangements in a changing climate

Greening Australia promotes a price on carbon is a critical component in the strategy to improve landscape connectivity as well as reducing carbon pollution and its effects on climate. The implementation of governance arrangements for both voluntary and compulsory reductions in carbon pollution are long over due.

Mechanisms to enhance community engagement

Greening Australia has a 30 year history in engaging urban, rural and Indigenous communities in land conservation and repair. This engagement has been supported by a diversity of funders, including Alcoa Australia who has been a partner with Greening Australia since its inception. The Australian Government has also played a significant role in supporting our community engagement programs including the One Billion Trees program, The Natural Heritage Trust, Green Corp and more recently Caring for Country. Considerable Government funding for community engagement is also proved to the 57 NRM organisations. Supporting both NRMs and NGOs is needed. We have different constituencies, partnerships and experience.

References

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Examples of improving landscape connectivity in Australia

Figure 1. The 'Fitz-Stirling' section of Gondwana Link

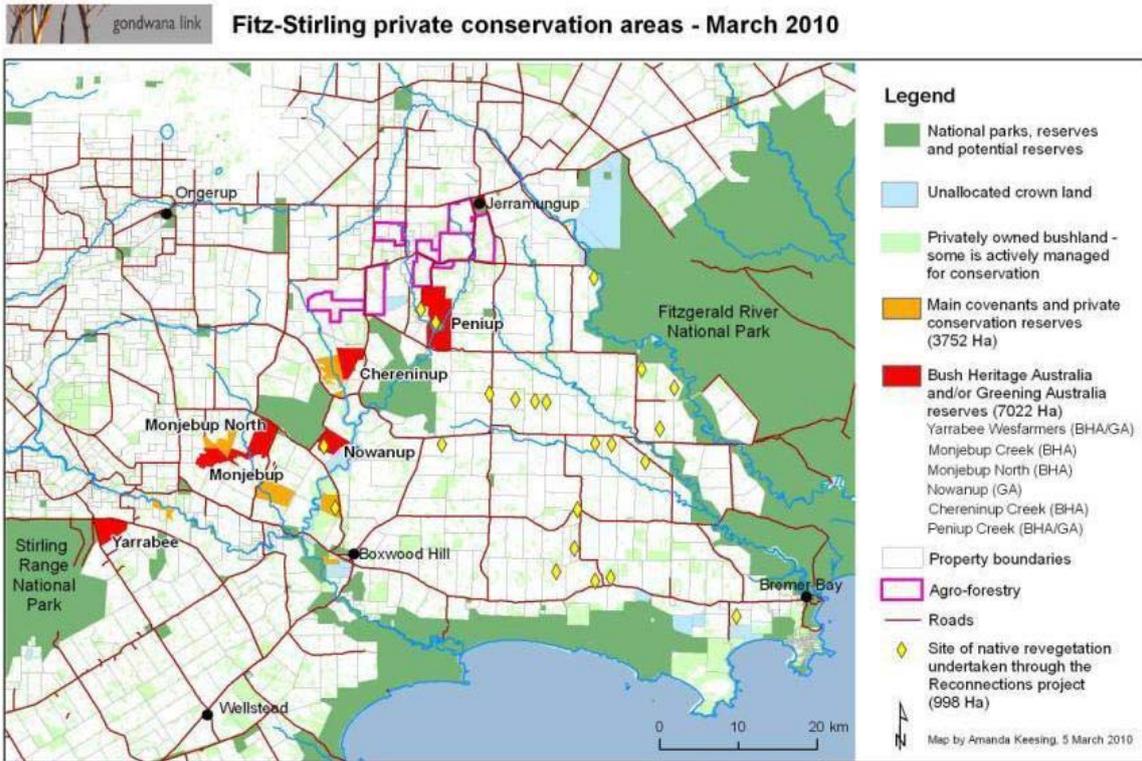


Figure 2: The development of the biodiverse carbon sink established within the Fitz-Stirling section of Gondwana Link.

P101h: Peniup photo monitoring point, 34.08997, 118.8602 (WGS84)
Planted July 2008, see J. Jonson 2010 *Ecological Management & Restoration* 11: 16–26



July 2008



April 2010



April 2011