Submission 035
Date received: 29/07/2011

Submission to the Senate Committee Inquiry into *Australia's biodiversity in a changing climate*, by Dr Paul Richard Williams, 29 July 2011.

Summary

I thank the committee for the opportunity to provide comments on this important inquiry. Several ecosystems of northern Australia have declined dramatically in recent decades, are particularly vulnerable to climate change and are worth special consideration. These are wet tropical eucalypt forests, seasonally dry wetlands and semi-evergreen vine thickets.

Carbon offset revegetation programs should include extra encouragement for the restoration of natural ecosystems, such as increased carbon credits, or an aligned biodiversity credit system. Carbon offsets that restore a range of trees, shrubs and grasses of natural ecosystems, rather than planting exotic trees or a few trees native to a region, will need support but will provide biodiversity benefits while capturing carbon.

Improving the management of fire, weeds and feral animals on conservation reserves and remnant ecosystems on private tenure is the key to providing ecosystem resilience in the face of climate change. Useful strategies include supporting groups that promote active conservation land management, such as NRM catchment bodies and consortiums; as well as a greater emphasis in the National Reserve System program on active management of weed, feral animal and fire management on existing reserves

Specific comments relating to the terms of reference:

- **Terrestrial, marine and freshwater biodiversity in Australia and its territories**

Some nationally important ecosystems that have declined dramatically in recent decades which are worth particular attention are:

1. Wet tropical eucalypt forests that experience approximately 2000 mm, or greater, annual rainfall (primarily of the Wet Tropics and Mackay Highlands).

These forests have declined dramatically in extent over recent decades. They include *Eucalyptus grandis* and *Eucalyptus resinifera* tall forests which have an Endangered Queensland Biodiversity Status and an Of Concern Queensland Vegetation Management Act status. Some wet tropical eucalypt forests support threatened fauna, protected under the Federal EPBC Act, such as the Vulnerable Wet Tropics population of the yellow-bellied, fluffy glider (*Petaurus australis*), the Endangered Northern bettong (*Bettongia tropica*) and the Endangered Mahogany glider (*Petaurus gracilis*).

Particular threats of wet tropical eucalypt forests are weed invasion; and the loss of tree, shrub and grass layer species which have been replaced by tropical rainforest pioneers that inhibit eucalypt forest species regeneration in the absence of regular fire. Climate change is likely to augment the threats to these ecosystems.

2. Seasonally dry wetlands of tropical Australia

These wetlands, which typically dry out in August to November each year, rely on the consistency of annual wet – dry cycles. Climate change may threaten this process, especially in the event of prolonged drought. Other threats include disturbance from feral pigs and invasion by exotic plants, especially exotic tropical pasture grasses.

3. Semi-evergreen vine thickets (i.e. dry rainforests).

Semi-evergreen vine thickets of the Brigalow Belt and Nandewar Bioregions have an Endangered status under the Federal EPBC Act. Related vine thickets of other bioregions, such as the Einasleigh Uplands, are similarly important and threatened. Significant threats to these ecosystems include the invasion of large, exotic tropical pasture grasses that draw damaging fires into the thickets. These large exotic grasses may benefit from climate change. The slow and irregular regeneration of vine thicket plants could be exasperated by climate change, especially prolonged droughts.

- **Connectivity between ecosystems and across landscapes that may contribute to biodiversity conservation**

Carbon offset revegetation programs are an excellent mitigation measure, which can also provide biodiversity benefits, including ecosystem connectivity. The re-establishment of natural ecosystems should be encouraged, rather than planting exotic trees. This involves re-establishing appropriate dominant trees, shrubs and grasses, rather than just a few trees that are native to a region. This restoration of ecosystems will provide biodiversity restoration and verifiable carbon offset credits, and can be used to connect fragmented ecosystems across a landscape.

Encouraging ecosystem restoration as part of the carbon offset programs may require refinements of criteria for recognised offset plantings. For example, the Department of Climate Change's 2009 Reforestation discussion paper included draft criteria that trees must reach two metres in height and 20% canopy cover within ten years of planting. Tropical eucalypts can take more than 10 years to reach two metres in height when recruiting amongst a natural grass layer. Some natural eucalypt forests of northern Australia have a mature forest canopy cover of only 20%. Attaining 20% canopy cover within 10 years would usually not be achievable, because saplings do not rapidly create broad canopies. Only unnaturally dense plantations are likely to ensure 10 year old saplings create a 20% canopy cover. However, unnaturally dense tree planting will not allow space for wide branching of mature trees, which is required for creating appropriate habitat for arboreal fauna (e.g. birds and gliders) and the associated diversity of grass layer plants needed by

ground fauna and granivorous birds. Although natural forests may be slower to establish to two metres in height and 20% canopy cover than some exotic trees, the long term resilience of natural forests to disturbances such as fire and floods compensates for their slower rate of growth. Providing allowances for slower initial growth rates of natural forests will be balanced by their provision of larger and longer term carbon capture and the restoration of biodiversity benefits.

I also suggest increased attention be given to promoting and funding programs that manage the regrowth of native vegetation. Encouraging natural regrowth is an effective means of ensuring appropriate species and is usually a more efficient means of rehabilitating native forests than planting trees. Promoting regrowth usually requires weed control, animal management and fire management.

Increased carbon credits, or an aligned biodiversity credit system, may be useful options for encouraging the restoration of natural ecosystems (and managing regrowth of previously cleared native vegetation), rather than the simple replanting of exotic trees, or a few native tree species. This will provide both carbon and environmental benefits.

- **Strategies to enhance climate change adaptation, including promoting resilience in ecosystems and enhancing community engagement.**

Improving the management of fire, weeds and feral animals on conservation reserves and remnant ecosystems on private land is the key to providing ecosystem resilience in the face of climate change. Actions by land managers to implement weed and feral animal control, and more frequent, but lower intensity fires, are likely to increase diversity across the landscape. Frequent, low intensity fires on the boundaries of rainforests will protect them from damage by intense fires, even though fire frequency in the adjacent eucalypt forest may increase.

Useful strategies will include supporting groups that promote active conservation land management, such as NRM catchment bodies and consortiums such as the Queensland Fire Consortium (http://www.queenslandbushfireconsortium.net.au) and the South-east Queensland Fire and Biodiversity Consortium (http://www.fireandbiodiversity.org.au/).

Special consideration should also be given to increasing Federal funding to managing our protected area estate (national parks, private conservation reserves etc.), as these parcels of land form an important basis for ensuring resilience to climate change impacts. I applaud the existing National Reserve System program and suggest greater emphasis be given to ensuring adequate active management of weed, feral animal and fire management on existing reserves, through funding and establishing a system of on-ground evaluation of the condition of existing protected areas.