Nature Conservation Council of NSW
The voice for the environment since 1955

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Standing Committee on Natural Resource Management (Climate Change)
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To: the Legislative Assembly Standing Committee on Natural Resource Management (Climate Change)

Re: **Managing Climate Change Impacts on Biodiversity Inquiry**

The Nature Conservation Council of NSW (**Nature Conservation Council**) is the peak environment organisation in NSW. We work closely with 120 member groups, local communities, government and business to ensure a positive future for our environment. The Nature Conservation Council welcomes the opportunity to comment on the Standing Committee on Natural Resource Management's Inquiry into Managing Climate Change Impacts on Biodiversity.

Developing adequate management strategies to address the impacts of climate change on biodiversity in ecosystems in NSW is crucial, in order to ensure that these ecosystems are as resilient as they can be in the face of the likely impacts of climate change.

Although the definite outcomes of climate change are impossible to predict, we can be sure that climate change will affect abundance and distribution of many species (including invasive species) and their life cycle events, as well as ecosystem composition and health. Impacts such as these present considerable implications for the task of conserving biodiversity, and necessitate a new focus for conservation policy and practices at the national through to the local scale.

Uncertainty regarding specific outcomes of climate change suggests that strategies need to be multi-faceted, as those that address just one potential change could be inefficient and possibly counter productive.

Increasing Invasion of Weed Species

Current predictions suggest that the effect of many invasive species on native species will worsen as climate change progresses, and that potentially negative effects will be triggered from invasive species that are currently considered harmless. More extreme weather is also likely to worsen the effects of invasive species. Immediate and cohesive action is needed if we are to make landscapes more resilient and limit the potential harm inflicted by invasive species on native biodiversity and its ability to adapt to climate change.

A sound understanding of how climate change will impact on the broad-scale distribution of invasive species will be a key factor in formulating strategies for reducing the impact of climate change on native species.

As a priority, efforts should be made to reduce the introduction to Australia of any possible new invasive exotic species through enhanced biosecurity and especially tightening of restrictions on the legal import of new species for domestic uses.

Changes to Species' Distribution and Ecosystem Composition

A key concern in climate change scenarios is whether species are able to move in response to a changing climate as opposed to staying and surviving in the local area. Due to a lack of certainty regarding outcomes, it is necessary that biodiversity conservation strategies include a range of measures, from minimising habitat loss through to managing in situ threats and dispersal. We can do this by ensuring that native species are able to employ their own natural adaptation strategies which include; adjusting their ranges according to changing environmental conditions; altering population sizes to match changes in local habitat quality; or shifting timing of events such as breeding to match local climatic changes. Facilitating connectivity will help species to successfully utilize these adaptation strategies.

Connectivity should not be applied universally however, even in spite of its obvious advantages. Its potential to introduce invasive species to a broader area means that it should be managed on a case-by-case basis, rather than as a default course of action, in order to ensure its overall effectiveness. A high diversity of habitat types is paramount in providing the best opportunity for species diversity at a local, regional and national scale.

Changes to Species Life Cycle Events

The impacts of climate change on biodiversity are likely to be complex and involve a range of issues. They will most certainly have an effect on the life cycle events of species, including timing of reproduction and germination. The most urgent issue for NSW is the expected rise in frequency and intensity of both drought and fire along with shifts in the flowering and fruiting sequence of trees and shrubs. The combination of these two factors will alter the pattern of feeding by nectar and blossom-dependent species which in the long-term could cause shifts in the distribution of tree species and subsequent patterns of interactions among both plants and animals.

All the issues that were important for native forest mammals prior to the threat of climate change are being exacerbated by it, indicating that research and management will need to include adaptation to increased impacts from already known threats.

Other Threats to Species or Ecosystem Health

Although often overlooked, the potential of privately held land plays a crucial role in biodiversity conservation. Landholders need to be encouraged to assist in fighting the decline in Australia's biodiversity. There is low awareness and participation in the few programs that do exist. There are a range of incentive mechanisms such as land acquisition, security, establishment, active management, accreditation, tax concessions, offsets, training and stewardship, that are currently available. However these need to be expanded to create a broad national program that provides a consistent long term incentive system to landholders to participate in biodiversity conservation on private land.

The role of Fire

The Nature Conservations Council's Hotspots Fire Project is concerned with the way we think about fire, the bush and how regional communities can plan for and manage fire. Fires can breathe new life into our landscapes but can also cause untold devastation. For

many land managers and communities the responsible use of fire for biodiversity conservation presents ongoing challenges. One common challenge is balancing the ecological needs of the bush with the needs of those that live and utilise the land. As the catalytic relationship between climate change and fire starts to emerge, the need for well-informed policies and programs, which address ecologically sustainable fire management, becomes increasingly evident.

Fire plays an integral and irreplaceable role in sustaining many of Australia's natural ecosystems[1]. In fact, contemporary fire regimes resulting in the loss of vegetation heterogeneity and biodiversity are currently being considered a key threatening process under the EPBC Act 1999. Exacerbating the negative impacts of inappropriate fire regimes, climate change models predict more frequent and intense bushfires for eastern NSW[2].

At this time when climate change models predict an increase in the number of days when fire danger ratings are very high to extreme and the window of opportunity available for prescribed burning is narrowing[3], there is a clear need for more proactive approaches to fire management, including a better understanding of the multiple drivers of fire regimes and how these may change in different ways in the future.

Landholders and land managers require programs that build confidence in managing fire under a changing climate.

Motivated by the urgent need to develop an integrated fire and Natural Resource Management (NRM) approach, the Nature Conservation Council's Hotspots Fire Project research and training program has developed a model that delivers sustainable fire management practices to protect biodiversity and cultural values while at the same time providing protection for life and property. This involves working with communities to develop and apply fire management practices cooperatively across tenure and jurisdictions supported by the best available science.

<u>Hotspots - A fire management model in the face of climate change:</u>

Biodiversity conservation can be maximised, in a changing climate, by managing to:

1. Create or protect biodiversity of species:

   Fire is a vital ecological process in much of the Australian bush. Encouraging fire regimes compatible to the conservation of native flora and fauna is an important and useful management tool.

2. Create a tapestry of habitats:

   Variability in fire regimes, within ecologically-sound thresholds, creates habitat diversity: this point, which emerges loud and clear from the literature. Landscape mosaics reflecting patches in different stages of post-fire development, and the more subtle but vital influence of different fire frequencies, overlay and interact with the

[1] Beeton, R., Buckley, K., Jones, G., Morgan, D., Reichelt, R, and Trewin, D. 2006. Australia State of the Environment Report 2006. Independent report to the Australian Government Minister for the Environment and Heritage, Department of the Environment and Heritage, Canberra/

[2] Dunlop, M and Brown, P. 2008. Implications of climate change for Australia's National Reserve System: A preliminary assessment. Report to the Department of Climate Change, February 20058. Department of Climate Change, Canberra, Australia.

[3] Hennessy K., Lucas C., Nicholls N., Bathols J., Suppiah R. and Ricketts J. (2005). Climate change impacts on fire-weather in south-east Australia. Commonwealth Scientific and Industrial Research Organisation (CSIRO), Australia.

more familiar mosaics created by climate, topography and soils. By encouraging habitat diversity, we can help ensure maximum opportunities for plants and animals. Importantly, this tapestry of habitat assists species to migrate as paths will not be blocked by large areas in particularly states or stages which are suitable for only a subset of taxa.

3. Help reduce the risk and impact of bushfire:

   Where vegetation is continuous, there is always a risk of bushfire. Hot, extensive bushfires can damage property and may impact biodiversity e.g. through creating large areas of uniform habitat. Sound fire management can help break up fuel loads across the landscape, enhancing opportunities for bushfire control.

4. Landscape-scale cooperation:

   Landholders are encouraged to work on landscape scaled planning – working with their neighbours, who may be private landholders, National Parks, State Forests, local council or other public lands. Our training program starts at the property level but importantly links into larger scaled planning processes e.g. the NSW Bush Fire Risk Management Plans, CMA Property Vegetation Plans and DECC's Great Eastern Ranges Initiative.

The Nature Conservation Council of NSW would like to thank the Standing Committee on Natural Resource Management (Climate Change) for its interest in the issues of climate change and biodiversity and hopes this submission will be of assistance in regards to the inquiry.

Yours sincerely,

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Executive Director
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