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Deputy Premier

Minister for Climate Change and the Environment | Minister for Commerce

Our reference: MD09/1151

Mr David Harris MP
Committee Chair
Legislative Assembly
Standing Committee on Natural Resource Management (Climate Change)
Parliament of NSW
Macquarie Street
SYDNEY NSW 2000

Dear Mr Harris

Inquiry into Managing the Impacts of Climate Change on Biodiversity

All levels of government recognise the significance of climate change and the serious threat it poses to our natural and human systems.

Climate change is the greatest long-term threat to biodiversity and is listed as a key threatening process under the *Threatened Species Conservation Act 1995* (NSW) and the *Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth). Climate change will also affect the ability of our environment to provide natural resources and ecosystem services, and the industries which rely on these resources.

Innovative approaches and enhanced capacity to manage biodiversity will be needed to confront the challenge of climate change. The NSW Government is preparing a new Biodiversity Strategy for NSW which will cover terrestrial, freshwater aquatic and marine biodiversity. The Strategy will provide a framework for improved decision-making and investment in biodiversity conservation, including in relation to climate change adaptation.

More broadly, the Government's new Climate Change Action Plan, currently under development, will set out priorities for Government action across NSW aimed at reducing greenhouse gases, assisting NSW communities and businesses to adapt to the unavoidable impacts of climate change, and ensuring the prosperity of NSW in a low carbon economy. The Plan will include measures to support landscape resilience to the impacts of climate change.

The NSW Government is also carrying out a wide range of research programs to improve our knowledge and understanding of climate change on ecosystems and potential adaptation options.

The Government will continue to support improved biodiversity management across a range of land tenures to help build the resilience of NSW biodiversity to the unavoidable impacts of climate change.

If you have any queries regarding this matter, please do not hesitate to contact Tim Rogers, Acting Deputy Director General, Climate Change, Policy and Programs on (02) 9995 6222.

Yours sincerely



Carmel Tebbutt MP
Deputy Premier
Minister for Climate Change and the Environment

Enclosure

NSW Government submission to NSW Parliament's Legislative Assembly Standing Committee on Natural Resource Management (Climate Change)

April 2009

Terms of Reference

1. The adequacy of management strategies to address the impacts of climate change on biodiversity in New South Wales ecosystems

All levels of government recognise the significance of climate change and the serious threat it poses to our natural and human systems.

Climate change is the greatest long-term threat to biodiversity and is listed as a key threatening process under the *Threatened Species Conservation Act 1995* (NSW) and the *Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth). Climate change is predicted to eventually affect virtually all species and ecosystems.

Climate change will also affect the ability of our natural environment to provide natural resources and essential services such as plant pollination; biological cycling; climate regulation; water filtering and storage of nutrients in the soil.

Current research indicates that climate change is likely to affect the abundance and distribution of species and the composition, structure and function of ecosystems. It will also place additional pressures on conservation and production biodiversity assets that are already stressed by factors including habitat loss; competition and predation by pest species; and altered hydrological regimes, thus compounding these problems.

Examples of potential species' responses to changes in climate include: considerable changes to the floristic composition and structure of vegetation; the movement of species towards cooler and higher areas; extinctions of populations at range boundaries, climatic boundaries, in geographically restricted sites or in species that have little dispersal and adaptive capacity; and increased invasion by opportunistic or highly mobile species, including pest species.

There may also be major in-situ changes to the structural and specific composition of ecosystems due to changes in the relative abundance of most species (including extinctions), and the overall ability of the ecosystem to function. This is likely to involve a reduction in species richness as climate change impacts on a number of existing threats.

NSW's most vulnerable ecosystems include coastal ecosystems, inland riverine floodplains and wetlands, alpine areas, rainforests, fragmented and highly restricted terrestrial ecosystems and areas vulnerable to moisture stress or high fire frequency. Even some NSW ecosystems that are well represented in reserves, such as sandstone heaths, woodland and dry forests, are at a very high risk as most species within these ecosystems have little capacity to cope with anticipated climate change impacts.

Relatively small changes in climate over recent decades may have already had an impact on species distributions, life-cycles, genetic make-up and ecosystem processes. Examples of observed changes to species as a result of climate change include native

and feral animals from lower elevations colonising alpine ecosystems, mass mortalities of some species such as flying foxes during extreme heat events and putative expansion of mangroves into saltmarsh habitats.

Given that current greenhouse gas emissions are tracking above the highest projections outlined by the Intergovernmental Panel on Climate Change (the IPCC), and there are indications that impacts may be occurring faster than originally predicted, the impetus for action to address the impacts of climate change on biodiversity has never been more compelling.

The NSW Government is taking action to improve information and research on the impacts of climate change on biodiversity and potential adaptation options. There are also a range of management strategies employed across agencies which contribute to building biodiversity resilience. More resilient biodiversity and ecosystems will help strengthen the ability of biodiversity-dependent industries to cope with the impacts of climate change.

i) Information and research

There is still considerable uncertainty about the nature and timing of climate change impacts on biodiversity. For instance, potential changes to species' interactions due to climate change and the relative capacity of species to adapt to a changing climate are not well understood. There are also basic information gaps regarding the ecology of populations, how existing threats impact on biodiversity, how climate change will exacerbate these threats, and how novel climate changes (increases in temperature and CO₂) will affect plants and animals.

The NSW Government is committed to accessing the best available information on climate change to ensure that adaptation responses for biodiversity are targeted and effective.

For instance, the NSW Government is systematically accessing leading expertise from Australia and around the world to develop better information on climate change and its impacts at a regional scale for NSW.

The Government has established the Climate Change Science Research Network to provide independent technical advice on climate change and to help shape our climate change science agenda. This Network comprises leading academic researchers from a range of disciplines. This partnership is allowing NSW to develop a collaborative research program to address gaps in regional information for NSW.

In partnership with Professor Andy Pitman at the Climate Change Research Centre at the University of NSW, the NSW Government has also developed information on projected changes to temperature, rainfall and evaporation across each of the State Plan regions. Professor Pitman was a lead author for the Fourth Assessment Report of the IPCC.

These projections are being assessed for their impacts on physical processes such as fire, flooding and coastal hazards, and the subsequent effects on NSW ecosystems, soils and hydrology.

The preliminary results of this work were released in 13 public community forums held around the State from September-November last year, and a full report will be released in mid 2009. The report will provide more refined information at a regional scale to local government to better inform them of the risks in their local area.

The Government is also implementing a range of climate change research programs which will help to set management priorities for both biodiversity conservation and production in NSW. This includes:

- the Climate Change Impacts and Adaptation Research Program, which is examining the impacts of climate change across a number of areas such as biodiversity, invasive species and aquatic ecosystems. A study on the impacts of climate change on bushfire risk in the Sydney Basin was completed in October 2008;
- undertaking collaborative research with CSIRO into sustainable development of marine and freshwater ecosystems, monitoring the impacts of climate change on the ecological health of marine and freshwater ecosystems and evaluating proposed adaptation strategies;
- modelling the coping ranges for key primary industry systems in order to develop effective mitigation and adaptation strategies;
- researching the impacts of climate change on production biodiversity and developing and promoting production systems which are more resilient or adaptive to climate change;
- researching the potential impacts of climate change on weeds, pests and diseases and the resulting impacts on plants and animals;
- undertaking collaborative research with Australian and overseas Universities through funding schemes such as the Australian Research Council Linkage Funding to evaluate extinction risk for species under climate change; and
- undertaking collaborative research to improve understanding of projected impacts on biodiversity and the effectiveness of alternative adaptation strategies.

ii) Management strategies

NSW participated in the development of the *National Biodiversity and Climate Change Action Plan (2004-2007)*, which was the first national natural resource management and climate change adaptation strategy in Australia. The National Action Plan provided direction for natural resource and conservation agencies in initial planning and research actions for the early, unavoidable impacts of climate change on biodiversity.

The NSW Government's response to the National Action Plan is outlined in the *NSW Biodiversity and Climate Change Adaptation Framework 2007-08* and the Department of Environment and Climate Change (DECC) *Adaptation Strategy for Climate Change*

Impacts on Biodiversity 2007-08. The DECC Strategy outlines priority focus areas and actions that forms the basis of DECC's initial biodiversity adaptation planning.

Examples of current NSW Government programs in place in NSW that will help build biodiversity and ecosystem resilience to climate change are listed at Appendix 1.

Resilient ecosystems will improve the resilience of industries that depend on them. Actions being undertaken by the NSW Government to improve the capacity of primary production systems to cope with the impacts of climate change include:

- assessing and managing the biosecurity risks of climate change, such as the likely behaviour of both endemic and exotic pests, weeds and diseases. Reducing the impact of existing threats will improve species resilience to the impacts of climate change;
- developing, breeding, and testing new plant varieties and other species in relation to agriculture and forestry, to identify species with a wider tolerance of climate variability such as warmer and drier conditions, shorter seasons, increased rainfall intensity and reduced frosts; and
- promoting sustainable production systems that improve biodiversity values and are more likely to be adaptive and resilient to climate change. This includes support for a growing organics market.

2. Any options for improving these strategies.

Climate change and the policies established both nationally and internationally to mitigate and adapt to it will mean significant changes for everyone, including in NSW. The NSW Government is developing a new Climate Change Action Plan which will set out priorities for Government action across NSW aimed at reducing greenhouse gases, assisting NSW communities and businesses to adapt to the unavoidable impacts of climate change, and ensuring the prosperity of NSW in a low carbon economy. The Plan will include actions relating to biodiversity and natural ecosystems.

Climate change impacts will be experienced at regional and local levels. In many cases local organisations will have a better understanding of community needs and will be better placed to respond and adapt to climate change pressures. Partnerships with regional and local bodies will continue to be vital in ensuring we can capitalise on local knowledge and ensure that adaptation responses for biodiversity are appropriate.

The Government is currently consulting extensively with local government, industry, environmental, agricultural and other stakeholders in the development of its Climate Change Action Plan, which will be finalised later in the year.

The Government is preparing a Statement of Intent in response to the listing of climate change as a key threatening process under the *Threatened Species Conservation Act 1995* (NSW). The Statement of Intent will be a summary of specific actions that DECC will undertake to improve the resilience of biodiversity to climate change over the next five years. It will draw on new research and build on initial Government planning actions for biodiversity adaptation. The Statement is expected to be released later in the year.

The Government is also preparing a new Biodiversity Strategy for NSW. The Strategy will cover terrestrial, freshwater aquatic and marine biodiversity and will provide a framework for improved decision-making and investment in biodiversity conservation, including in relation to climate change adaptation. A discussion paper on the development of the Strategy was circulated for public comment with the comment period closing on 13 February 2009. A total of 59 submissions were received and these are currently being analysed and will provide useful input into the development of a draft Strategy. The intent is also to circulate a draft Strategy for public comment as the next step.

Innovative approaches and enhanced capacity to manage biodiversity will be needed to confront the challenge of climate change. Enhanced and long-term studies are needed to measure trends in biodiversity related to climate change and to assess the efficacy of adaptation measures. Research needs to target populations that can show how climate change is occurring, in addition to covering threatened species and pests, and to monitor the response of biodiversity to the impacts of climate change on fire regimes. DECC is developing the previously referenced research program as well as a proposal for a fire-biodiversity monitoring framework in this regard.

The NSW Government is working on improving biodiversity conservation beyond individual property scales and across a range of public and private land tenures. Biodiversity incentive mechanisms for private landholders can deliver conservation gains and offset management costs. NSW considers that options to encourage and reward private stewardship of ecosystem services and biodiversity values should be considered at the national scale. In particular, there is scope for the Commonwealth to develop incentive mechanisms and to acknowledge biodiversity co-benefits which could be delivered through other national schemes such as the Carbon Pollution Reduction Scheme.

NSW is continuing to participate in cross-jurisdictional and national processes in relation to biodiversity management and climate change such as:

- the development of the National Adaptation Research Plans for Marine and Terrestrial Biodiversity, and the Commonwealth's vulnerability assessment of Australia's biodiversity;
- the Natural Resources Management Ministerial Council, which is developing national priorities for biodiversity conservation management, including adaptation responses;
- the COAG Working Group on Climate Change and Water, with the aim of reaching national agreement on long-term adaptation to climate change, including accelerating implementation of actions under the agreed Climate Change Adaptation Framework (2007) across all jurisdictions; and
- the National Climate Change Research Strategy for Primary Industries ("CCRSPI"), a collaborative program between industry and government aimed at facilitating sound adaptation and mitigation responses and avoiding duplication of costs for research investment.

NSW supports continued investment by all jurisdictions to improve biodiversity resilience to the impacts of climate change.

Appendix 1

Current NSW Government programs that will help build biodiversity and ecosystem resilience to climate change include:

- building and managing the protected area system (including expanding the reserve system by over 2.5 million hectares during the last decade and undertaking pest, weed and fire management programs) pursuant to the NSW *National Parks Establishment Plan 2008*. Protecting more habitat and maximising protection of diverse ecosystems will give species and ecosystems the best possible chance of coping with climate change and needs to be continued as a priority. NSW is also working with the Commonwealth, States and Territories to develop a new Strategy for the National Reserve System;
- supporting the establishment of aquatic reserves and a representative system of marine parks along the NSW coast. The Government has also developed strategic partnerships to rehabilitate aquatic habitat and ensure that fish species and aquatic ecosystems are more resilient to the impacts of climate change;
- supporting private land conservation initiatives to identify ecologically significant links for restoration and conservation management. Initiatives include the Great Eastern Ranges Initiative, the Biodiversity Banking and Offsets Scheme, Conservation Partnerships Program, programs under the Nature Conservation Trust and partnerships with Catchment Management Authorities (CMAs) and local government;
- buying water for the environment (including the establishment of the NSW RiverBank Fund to purchase and manage water for environmental benefits);
- managing the major threats to biodiversity across the landscape;
- providing information on vulnerable species and ecosystems to councils to use in the development of their comprehensive Local Environmental Plans;
- setting state-wide natural resource management targets and regional incentive schemes to protect and restore remnant vegetation and assist landholders to adapt conservation management actions;
- regulating native vegetation clearing through the *Native Vegetation Act 2003 (NSW)*. The protection of remnant native vegetation will play a key role in the capacity of biodiversity to persist under a changing climate;
- managing State Forests for multiple uses including biodiversity and water catchment protection. This includes managing dedicated flora reserves, an internationally significant RAMSAR wetland, and purpose-built wildlife refuges;
- managing reserved and dedicated Crown land for multiple uses including biodiversity and water catchment protection. This includes land managed directly by the Department of Lands, local government and community trusts; and

- conditions on tenured Crown land under private management, particularly in the Western Division of the State, together with conservation covenants placed over former perpetual leases that have been converted to freehold, are also used to protect biodiversity and conservation values and to build resilience across the landscape.

A selection of material relevant to managing the impacts of climate change on biodiversity is set out below. Hard copies are included for items 1-5, internet links are listed for items 6-7.

- i) National Biodiversity and Climate Change Action Plan 2004-2007
- ii) NSW Biodiversity and Climate Change Adaptation Framework
- iii) DECC Adaptation Strategy for Climate Change impacts on Biodiversity
- iv) Introducing the NSW threatened species priorities action statement (PAS)(DECC)
- v) Summary of Climate Change Impacts Sydney Region (DECC)
- vi) Implications of Climate Change for Australia's National Reserve System - A Preliminary Assessment:
<http://www.climatechange.gov.au/impacts/publications/nrs-report.html>
- vii) The Impacts and Management Implications of Climate Change for the Australian Government's Protected Areas:
<http://www.climatechange.gov.au/impacts/publications/pubs/protected-areas.pdf>