



29 July 2011

Committee Secretary
House of Representatives Standing Committee on
Climate Change, Environment and the Arts
PO Box 6021
Parliament House
Canberra ACT 2600

Lodged via e- ccea.reps@aph.gov.au

Dear Committee Secretary

Thank you for the opportunity to lodge a submission to the Inquiry into *Australia's Biodiversity in a Changing Climate*, specifically relating to nationally important ecosystems.

Pursuant to the Terms of Reference, the submission is supported by three relevant reports generated by Condamine Alliance as follows-

- Climate Change and Terrestrial Biodiversity
- Analysis Predicted Climate Change Impact on Agriculture and Fish
- Recognising Women Farmers' Leadership in Climate Change and Policy

As one of Queensland's regional natural resource management organisations, Condamine Alliance has a strong interest in conserving biodiversity and ecosystems in a changing climate in the Condamine catchment and beyond its borders.

Thank you again for the opportunity to provide comment on this important Inquiry into the climate change risks to ecosystems and biodiversity and the recognition of conservation strategies in a changing climate.

Yours sincerely

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Background on Condamine Alliance

Condamine Alliance (CA) aims to deliver sustainable natural resource management solutions which will protect the Condamine Catchment's natural assets for future generations. By working in close partnership with the catchment community, Condamine Alliance seeks to preserve the land, water, native plants and wildlife of the region. Located at the headwaters of the Murray-Darling Basin in Southern Queensland, the Condamine Catchment extends from Killarney in the South through to Chinchilla on the North Western Darling Downs and includes the cities of Warwick, Toowoomba and Dalby. Condamine Alliance is a credible, high performance regional body which has positively impacted on the local environment since its inception in 2000. Condamine Alliance plans for, and improves, the condition of natural resources in the Catchment area and is currently managing works focused on:

- Biodiversity
- Sustainable agriculture
- River Rescue
- Science and Evaluation
- Indigenous and community awareness and engagement

Condamine Alliance has completed an assessment of climate change effects across our theme areas and whole business with more specific work done on terrestrial biodiversity, aquatic biodiversity and agriculture. These assessments have been based on catchment scale climate change modeling commissioned by Condamine Alliance from the Australian Centre for Sustainable Catchments. Reports on this work are attached and may also be found at <http://condaminealliance.com.au/>. Specifically, the Condamine Catchment Natural Resource Management Plan 2010 Appendix D Climate Change (<http://condaminealliance.com.au/GeneralPublications>) and Condamine Alliance's Climate Change Research (<http://condaminealliance.com.au/ClimateChange>) webpages contain information relevant to this Inquiry.

Information to inform the Inquiry terms of reference

The attached reports provide some context and content for discussion on various components of the Inquiry's terms of reference and this is summarised below against each of the terms of reference.

Terrestrial, marine and freshwater biodiversity in Australia and its territories

Catchment specific climate impacts are likely to include both positives and negatives for native species. There is likely to be reduced nectar supply and soil based shelter (due to increased temperatures at key life-cycle stages). There will be benefits for the most aggressive birds which will further impact on other local birds and species moving from drying systems further inland. Invertebrate species composition changes will flow on into foraging success for insectivorous fauna with unpredictable results. In terms of fish two native species (Blackfish and Galaxiids) will have a higher probability of becoming locally extinct and larger predatory fish will have mixed response (Golden Perch increase; Murray Cod decrease). There is likely to be long term shifts in dominant species among drying ecosystems.

Processes already threatening native ecosystems and species will also be affected. Invasive woody species, tropical grasses and drought-tolerant species, are likely to be favoured by climate change while some temperate-adapted weed species (e.g. blackberry) may retreat with increasing temperatures and drier winters. Opposing this though is potential that warmer conditions may benefit the pathogens and insects that keep invasive species populations in check. Exotic grass expansion will increase fire loads while at the same time climate change is likely to increase fire weather. The predicted transition to warmer winters, with a likely reduction in the number of frost days, is likely to facilitate the spread of cane toads throughout the Condamine region; and this could result in population declines of native predators (e.g. snakes, goannas, dasyurids) and subsequent compositional changes in fauna communities. Similarly, among freshwater ecosystems, Goldfish and Gambusia will increase as they are more tolerant of the predicted changes while Trout will have a higher probability of local decline.

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

Connectivity has been cited as a potential for adaptation to climate change by facilitating the movement of species in response to changing local conditions. There may also be negative implications associated with increased connectivity, however, with the increased movement of pests, weeds and diseases where these have previously been held in check by a more fragmented landscape.

Climate change is also likely to have a direct impact on connectivity in terms of both drought and higher intensity flooding removing riparian vegetation, and higher altitude ecosystems gradually lost as temperature warms and rainfall declines and intensifies.

How climate change impacts on biodiversity may flow on to affect human communities and the economy

Loss of biodiversity is likely to lead to loss of ecosystem services (e.g. pollination, soil nutrient cycling, beneficial organisms in integrated pest management, amenity). Likely expansion of existing pests and weeds – both spread and impact – will increase the burden on land managers across all land tenures and enterprises. These effects will have unknown impacts on agriculture, tourism and general liveability of the catchment.

Strategies to enhance climate change adaptation, including promoting resilience in ecosystems and human communities

Strategies identified for ecosystem adaptation to climate change include:

- Identify mesic and temperate habitat refugia and plan for protection and management of these
- Determine factors affecting spatial and temporal availability of nectar and plan for protection and management of woodlands to ensure continued nectar supply
- Improve invasive species prioritisation based on ecological significance and focus control on priority habitats
- Determine climate change impacts on widespread, dominant species

- Maintaining wetland connectivity and maintaining or creating drought refugia will enhance fish survival.
- Maintaining and building resilience in the riparian vegetation will improve feed stocks, provide shading and breeding sites and refuges for fish.

Separate strategies were identified for climate change adaptation among human communities:

- Improved understanding and agreed position across the stakeholders
- Collaboration across the stakeholder groups, grounded in the right (agreed) science
- Identify and model (predictive) the interventions to manage declining soil health
- Investment in the management capacity to implement, including changed systems (adapting land use to land capacity and current climate regime)
- Support for improved management as land currently being cropped moves to pasture production, the productivity from the remaining cropping lands will have to increase to maintain the supply of grains (and cotton) required for the region's supply chains

Mechanisms to promote the sustainable use of natural resources and ecosystem services in a changing climate

- Identify and implement appropriate interventions
- On-going monitoring of species to track effectiveness of interventions and potential for success (e.g. sufficiency of genetic diversity)
- On-going monitoring of species and communities to track impacts of new and expanded threats (including previously unidentified threats)
- Proactive engagement in water resource operation plan processes
- Invest in research into knowledge gaps
- Championing environmental water purchases
- Championing environmental use of water saved through water use efficiency practices
- Refocus options for species protection outside the threatened species system
- Attract sufficient funds to implement mitigation measures
- Facilitate the implementation of ecological offset programs targeted at critical vegetation assets
- Protect and enhance critical nectar resources
- Maintain and enhance structural complexity in woodland habitats
- Protect refugia for mesic- and temperate-adapted species and communities
- Reduce fire hazard to fire-sensitive communities and threatened species habitats
- Improve fire and grazing management on public lands
- Develop and implement mechanisms to promote the maintenance and rehabilitation of structurally complex woodlands

- Maintain “rabbit free” status in the region
- Improve vigilance and control of weed vectors

Mechanisms to enhance community engagement

- Work on catchment community perception of ‘resilience’ and ‘persistence’ and identify priorities where human intervention can improve resilience
- Work with organisations across appropriate geographic range
- Work with organisations currently working on ex-situ conservation
- Work with organisations that can influence the threats
- Increase community capacity to interact with 3 levels of government
- Provide incentives for invasive species control in priority habitats

Concluding statements

The preceding points are drawn from recent work on identifying climate change implications in the context of the Condamine Catchment. There are a larger range of implications across the broad natural resource management issues that CA would like to have more consideration of. Regarding biodiversity specifically, further exploration is needed in the area of impacts on biodiversity from climate change induced land use change. This includes changes to decision making tipping points brought about by a combination of increased mining development, definition of strategic cropping land (QLD) and the application of the clean energy future policy package alongside climate change. All of these combine to create potential for new land use arrangements and proportions with unknown impacts on remaining biodiversity.

Condamine Alliance appreciates the opportunity to supply this information to the Inquiry and looks forward to the final report on Australia's Biodiversity in a Changing Climate.