Submission 051
Date received: 01/08/2011

COAST & WETLANDS
SOCIETY INCORPORATED

P.O. Box A225, Sydney South, NSW 1235
A.B.N 84 775 415 708

House Standing Committee on Climate Change, Environment and the Arts

Inquiry into Australia's biodiversity in a changing climate.

The Coast and Wetlands Society Inc. welcomes the opportunity to make a submission to the Inquiry into Australia's biodiversity in a changing climate.

The Society has particular interests in wetlands, both estuarine and freshwater, and coastal habitats.

To address the terms of reference:

Terrestrial marine and freshwater biodiversity in Australia and its territories

Australia is renowned for its rich biota and its high degree of endemism – the latter is particularly important given that the International Convention of Biological Diversity gives priority to conservation *in situ*. While *ex situ* conservation – in zoos, botanical gardens and seed or sperm banks – is important in the last resort, the focus for conservation efforts must be on conservation in natural habitats.

However, given the inevitability of climate change, and the fact that for many organisms climate is (and will continue to be) a major determinant of distribution designing *in situ* conservation for the long term survival or organisms presents many challenges, as many organisms will, if they are to survive, need to either undergo rapid evolution or alter their geographic distribution.

Will provision for habitat corridors be sufficient to allow species to move across landscapes or should we contemplate pre-emptive assisted movement? If the latter how will species be chosen to be part of relocation programmes, and where to will they be moved? Given the global history of well intentioned species relocations which have had deleterious outcomes there will undoubtedly be strong opposition to translocations.

The Society urges caution, but agrees that the issues need extensive and well informed public debate. If relocations are to occur they should be part of a program which is well planned and documented, with monitoring of outcomes. Relocations by individuals outside formal schemes, however well intentioned will need to be strongly discouraged.

In regard to freshwater diversity we would draw attention to the generally ignored and largely unexplored stygobiota – the organisms which live, permanently, in subterranean water bodies.

Recent studies around the world have begun to reveal the richness of life underground in some localities at great depths. While much attention has been given to the often bizarre macroscopic organisms, in terms of ecological function it is likely to be the large microbial biomass which is of greatest significance.

The stygofauna of Western Australia is one of the best studied in the world (although there is still much to learn) but very little is currently known from the rest of the country.

However, there is no *a priori* reason to think that there is any less diverse biota in suitable strata elsewhere. In WA the stygofauna is taken into account in assessment of mining proposals, and on some occasions has been responsible for proposals being modified. Elsewhere in Australia stygofauna have rarely been considered.

The paucity of information about stygofauna makes it unlikely that the status of most species could be assessed (in terms of whether a species is threatened). Nevertheless stygobiota is undoubtedly a component of biodiversity and impacts of proposals on stygobiota should be assessed as part of the overall consideration of biota.

In this regard, we would express considerable concern over the expansion of the coal seam gas industry in which consideration of underground waters as habitat seem to have been completely lacking. Coal seam gas is produced by methanogenic bacteria so there is undoubtedly a biota which is immediately impacted by extraction. In addition the process may result in the release on the surface of saline and/or polluted water, with potential to contaminate other water bodies.

Coal seam gas is touted as a cleaner (in terms of greenhouse gas) alternative to coal. However, fugitive emissions of methane could add to the greenhouse effect, while even if emissions are controlled, combustion of CSG as a fuel will result in greenhouse gas production – the production might be less than coal but it is still a greenhouse gas and if total fuel burnt increases, the amount of CO_2 released will continue to rise.

As there is no general biodiversity trigger (but only one for threatened issues) in the EPBC Act the Commonwealth's powers in relation to stygobiota are limited (to be discussed later in this submission in relation to governance).

However, where a project triggers declaration on controlled action for other reasons it would be appropriate in those matters in which an EIS is subsequently required that the specification for the EIS include documentation of likely occurrence of stygobiota and possible impacts on it.

In considering groundwater it is also essential to consider interactions between ground and surface waters. This is a topic which has been raised on a variety of occasions, but in many cases we do not have quantitative understanding of groundwater behaviour, nor is there a general appreciation of the spatial scale which needs to be taken into account (for example activities on the Dividing Range might have impacts, a long-time in the future, in Central Australia).

Groundwater is insulated from temperature change by overlying rocks and soil. Seasonal fluctuations of temperature are minimised and the effects of temperature change are likely to be less than and lag well behind surface temperature changes. This does not mean that subterranean habitats and their biota will be immune from the effects of climate change as changes to rainfall patterns will have impacts and these could be spread out over very long periods of time.

Issues relating to terrestrial and marine systems will be discussed in relation to governance.

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

The evidence from previous periods of climatic change is that species have responded by moving across landscapes. However, not all species will respond in the same way or at the same rate. One of the consequences of this is communities will not move as intact assemblages of species – rather there will be resorting of species such that 'new' combinations of species will emerge. This has implications for the recognition and conservation of threatened ecological communities.

The success of species in responding, for example, to the last Ice Age should not give rise to false optimism about responses to further climate change.

The world today differs from that 10,000 years ago in many significant ways, but most fundamentally in the existence today of a very large human population. The earth's surface does not provide a continuum of a natural matrix through which species can move. Rather landscapes are interrupted by barriers of infrastructure, urban areas and agricultural/forestry land. The growth of the human population and the increasing trend to urban living will, even in the absence of climate change, require intensification of agricultural likely to make agricultural land more inhospitable to

wildlife. Climate change will force further changes in agricultural practice which may also further impact on the ability of agricultural and wildlife to co-exist.

The process of creating new assemblages of species will be added to by humans moving species round the globe – either deliberately or accidentally. Feral species are one of the major threats to biodiversity, and that threat will not be diminished, and may well be increased, by climate change. Feral species will be able to take advantage of the provision of corridors, so that measures to enhance the survival of native species may be compromised by their promotion of invasive species.

It also seems likely that the rate of climate changes as a result of increased greenhouse gases will be faster than many previous changes, so that species which 'kept up' previous cycles of change may not be able to do so in the future.

The different rates of response of species are likely to stress, and possibly break, many dependency relationships. Pollinators may become out of synch with plants; the complex of interrelationships between soil organisms and plants, which sustains many ecosystems may break.

Habitat corridors are potentially a major tool to facilitate the movement of species across landscapes. We would certainly not wish to downplay the importance of maintaining corridors but would point to a number of problematic issues which may arise.

In many long settled and developed regions there may be many breaks in connections across the landscape and in many cases the breaks will be freehold land. Even where it might be possible, over time to revegetate corridors the process will require the willing participation of landholders. In many areas this will be forth coming, but a few reluctant participants could mean that unbroken networks cannot be established.

Corridors will need to be of sufficient width so as to provide core habitat – otherwise they will be 'two edges back to back' with limited value for many species.

Although corridors may provide for the movement of native wildlife, they could also be highways for the spread of non-native invasive species and pests and diseases. Under some circumstances they could permit the spread of fire.

There is a tendency for planners to see corridors as infinitely multifunctional, such that a wildlife corridor can also include a cycle track (for example). A particularly valuable existing habitat network in many regions is provided by the 'long paddock' – the Travelling Stock Reserves. Proposal for the use of TSRs as utilities corridors, for example suggestions that as the coal seam gas industry developed pipelines from well heads could be situated in TSRs could result in considerable impacts on conservation values.

How climate change impacts on biodiversity may flow onto affect human communities in the economy.

There could be many climate change impacts which would flow onto human communities. Not all the impacts would necessarily have adverse consequences – there may be some areas where there is greater rainfall increasing agricultural productivity but the evidence and modelling predictions would seem to indicate that for large areas of the continent the implications for humans could be unfavourable. Declining productivity in rangelands due to lower rainfall and high temperatures would affect biodiversity and agricultural productivity. Increased fire frequency or more intense fires could threaten human communities and components of biodiversity. Measures to mitigate the effect on human of changed fire regimes – for examples prescriptions of increasingly large cleared Asset Protection Zones might result in substantial loss of vegetation.

The Society is particularly concerned that there may be a perception that as temperatures increase there will be greater incidence of human disease spread by wildlife. In some cases (but not all) such a perception may have substance, but what is an appropriate response may be difficult to determine. One area where the perception might occur is in relation to the spread of arboviruses by

insects associated with wetlands. This could result in the application of control measures such as spraying insecticide or physically altering the habitat so it is less suitable for insect populations (for example through drainage). This would result in substantial collateral damage to biodiversity for possible little reduction in risk.

Some risk to humans could be reduced by prohibitions on development near wetlands, but the reality is that many existing developments exist in close proximity to wetlands so management measures will need to be implemented to reduce risk to acceptable levels (although there is unlikely to be agreement as to what constitutes 'acceptable' in this context.

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

One of the consequences of global warming will be sea level rise. Initially this will be driven by thermal expansion of seawater, although in the longer term, greater rises consequent on melting of polar icecaps may occur. The consequences of the global eustactic sea level rise will not be uniform, but will be affected by local conditions. Nevertheless it is likely that much of the Australian coast will experience relative sea level rise.

Over geological time relative sea level has changed many times. Intertidal communities (saltmarsh and mangrove) and coastal communities (such as sand dunes) have obviously been resilient in the face of sea level change, with communities migrating backwards and forwards. If this has been the case is there any reason for concern about the future?

We would argue, yes – previous major fluctuations of sea level occurred when there were either no humans, or much smaller, less technologically advanced human populations than now. Many stretches of the world's coastline are now occupied by urban, industrial or valuable agricultural land, protected from sea level rise by various forms of sea defence works. Thus for much of the coastline intertidal communities are at risk of been lost, drowned by rising sea levels and unable to retreat into vacant land – a phenomenon referred to as 'coastal squeeze'.

Intertidal communities are recognized as being important because of their role in sustaining fisheries, and at least in some circumstances, providing a degree of protection to the hinterland absorbing the energy from severe storms.

Climate change is likely to involve changes in storm regimes (although modelling these aspects of change is more difficult than that of temperature change). Coastal developments will thus be at risk from wind damage and erosion.

Existing coastal development has in some locations changed the pattern of sediment movement along coastlines, resulting in some stretches of coast being 'starved' of sediment and thus unable to recover from erosion events. (This is a widespread phenomenon around the world and has been recognised for many decades. Unfortunately some of the engineering solutions have exacerbated problems, or when they involve recharge of beach sand, have been expensive and required repeat re-application.)

Upstream developments within catchments may alter the supply of sediment into estuaries, again affecting the ability of shorelines to respond to storm erosion and sea level rise.

In Australia we are fortunate that the coast of the tropical north is largely underdeveloped and opportunities for natural retreat of salt flat, saltmarsh and mangrove still exist on a large scale. (Indeed tropical Australia offers some of the best opportunities in the world to secure long term conservation of large areas of mangrove). In southern Australia, however, the prospects for many habitats in the coastal zone are far less rosy.

Coastal real estate – be it residential, recreational, industrial or infrastructure is extremely valuable, and we are likely to see many attempts to keep the sea at bay, attempts which are either likely to be

as successful as King Canute's, or, if successful locally, will aggravate problems elsewhere, and which in either case will result in loss of important components of biodiversity.

Although the nature of the problems is well understood there has been reluctance on the part of planning authorities to recognize the need for action, and at best we have had piecemeal local solutions, rather than regional solutions which acknowledge the interrelations between coastal processes at a large scale.

In Europe there has been widespread adoption of policies of managed realignment of coastlines. A major driver of these has been recognition that maintenance of existing coast defences is economically unfeasible, but the policies also result in the restoration or re-establishment of intertidal communities, with long term benefits to biodiversity conservation. (For an inventory of managed realignment sites see the website http://www.abpmer.co.uk/).

Managed realignment is one approach to promoting resilience in ecosystems and human communities. It is not appropriate for all coastlines, but we suggest that it is an approach worth considering, but to be successful would required many existing barriers to integrated coastal zone management to be broken down,

Coastal zone management has been a catchphrase for a long time, but there is a long way to go to make it an integrated successful reality.

Provision of 'space to move' will be essential for survival of coastal communities but equally will be important to many terrestrial communities, through provision of corridors and connectivity. Resilience will also be assisted by reducing the many other threats which ecosystems face so that they are more generally strengthened. Particularly important will be the need to maintain and enhance the control of invasive species.

An assessment of whether current governance arrangements are well placed to deal with the challenges of conserving biodiversity in a changing climate.

Management of biodiversity is currently spread across all levels of government. Given the nature of the constitution this is unlikely to change. However it does create a number of problems, in that the Commonwealth does not have the hands on management role that applies to state and local governments in terrestrial environments. In addition a great deal of the consideration of biodiversity issues by and within states is in the context of planning processes, which allow proactivity. Through the triggers in the EPBC Act the Commonwealth has the ability to block or modify developments but has less opportunity to be involved at earlier stages in planning and development.

While the number of cases in which the Commonwealth has intervened is small, and arguable could, and perhaps should have, been greater, we also recognized that the potential for state and Commonwealth decision makers to reach conclusions creates uncertainty for developers and land mangers.

At the local government level we acknowledge the commitment of many LGs to community education, management of local reserves (including, in many cases, strong involvement in bush regeneration), monitoring biodiversity and assessment of biodiversity impacts in consideration of development approvals. However, the increased responsibilities that have flowed to local governments as a result of commitments by higher levels for government have not been accompanied by equivalent extra funding.

In NSW there was a community backlash against the previous Labor government's application of Part 3A of the *NSW Environmental Planning and Assessment* Act to a range of major developments, removing then from the scrutiny of local government. The new NSW Government has foreshadowed major changes to the planning legislation and has already returned some developments to councils for assessment and determination. It is important for local opinion to be heard, and where appropriate acted upon, but for very large developments we would be concerned that councils, and,

in particular, relatively small rural shires, do not have the technical resources for making assessments. In addition developments which cross local government boundaries are not easily assessed. Although the issues are very much to the fore in NSW there is a more general issue of Councils being able to afford necessary staff, let alone being able to hire and retain them in a highly competitive market. Mechanisms for developing regional partnerships involving consortiums of local and state government on particularly areas of expertise could be one avenue worth exploring.

The various regimes currently in place for assessing potential impacts of development on biodiversity make reference to the need to assess cumulative impacts. We agree that this is clearly essential, but would suggest that in practice it is a difficult task, and we are not alone in grappling with the challenges. Nevertheless it is an area of concern where further work is needed.

In the marine environment the Commonwealth has a much more direct role, as beyond 3 nautical miles from the shore it has the sole jurisdiction over a vast area of ocean within the nation's Exclusive Economic Zone (EEZ). The Commonwealth has taken a strong leadership role in fisheries management, although our ability to police the EEZ against incursion of illegal commercial fishers is unfortunately limited. What will clearly be a major challenge for the future will be the regime for regulating offshore minerals explorations and extractions (including, but not restricted to oil and gas) so as to provide maximum safeguarded for marine biodiversity.

Australia's role in the conservation of Antarctica biodiversity is a major one, which is likely to assume greater importance as global warming continues.

As we have discussed earlier the main mechanism for the Commonwealth to be involved in biodiversity conservation is through the operation of the EPBC Act. Sometime ago the Government commissioned an inquiry in the EPBC Act and the resultant Hawke report made a number of recommendations for amendments to the legislation. It is a matter of concern to the Society that there has been very little action to date to introduce any amendments to the Act. It is our understanding that the current Minister is undertaking another round of discussions and consultations, but the prolongation of uncertainly is certainly undesirable, particular given the range of public consultation that was undertaken by Dr. Hawke, and the comprehensiveness of his report.

The Government has recently announced a package of measures associated with the intended introduction of carbon pricing. These are clearly aimed at addressing the causes of climate change. Part of the package is a substantial sum to address biodiversity issues. The details are still being worked out but we commend the commitment as a necessary part over overall climate change initiative.

Yours faithfully,

Ellen O'Brien

President

Coast and Wetlands Society Inc.