



CLIMATE^{AND}
HEALTH
ALLIANCE

“Biodiversity: Our health depends on it”

Submission to

**House Environment Committee to examine climate
impacts on Australia’s biodiversity**

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About the Climate and Health Alliance

The Climate and Health Alliance (CAHA) is a national alliance of organisations and people in the health sector who wish to see the threat to human health from climate change and ecological degradation addressed through prompt and effective action.

The establishment of CAHA in August 2010 was prompted by rising concern in the health sector of the implications of unmitigated climate change and environmental pressures on human health.

The membership of the Climate and Health Alliance includes a broad cross section of the health sector with over 20 organisational members, representing health care professionals from a range of disciplines, health care service providers, institutions, academics, researchers, and consumers.

The Climate and Health Alliance has a committee of management to guide its work, and an expert advisory committee with senior health and climate researchers to ensure the positions of the Alliance reflect an evidence-based approach.

For more information about the membership and governance of the Climate and Health Alliance, please see Appendix A and www.caha.org.au.

Overview

The Climate and Health Alliance will make a brief submission addressing the following Inquiry Terms of Reference:

- how climate change impacts on biodiversity may flow on to affect human communities and the economy; and
- strategies to enhance climate change adaptation, including promoting resilience in ecosystems and human communities

Key points

1. Climate change is having severe adverse impacts on biodiversity, on which humans depend as a life support system (including food, clean air and medicines)
2. The value of biodiversity and of ecosystem services should be recognised in public policy decision making
3. Urgent action is needed to preserve Australia's unique biodiversity and to prevent further destruction of natural ecosystems on which hundreds of species, including humans, depend.

Introduction

Biodiversity is part of our life support system, and biodiversity is under threat.

Australia and the world are on the brink of a mass extinction event. Climate change, the impact of rapidly increasing human populations, a culture of consumption and the failure to recognise the connections between these issues has led to a dramatic decline in biodiversity.^{1,2,3,4}

A recent study identified biodiversity as one of three 'planetary boundaries' (identified by Earth system scientists as quantified boundaries within which humanity can safely exist) that has already been transgressed. (The other two were climate change and the nitrogen cycle).⁵

We are now in a new geological era, the Anthropocene, so-called because humans have become the most significant impact on Earth's systems.⁶ Part of this impact is that humans contributed to a rate of species extinction that is 100–1000 times background rates (as evidenced by fossil records) over the Earth's history.⁷ Some estimates put the rate for some species much higher – up to 150,000 times the background rate.⁸

Australia's biodiversity is particularly threatened, and is extremely vulnerable to further risk from climate change. Clearing of vegetation, introduction of pests and weeds, urban sprawl, mining and overharvesting has degraded natural ecosystems and led to the extinction of many species. Australia has the dubious record of having the highest rate of mammal extinction of any continent, and many more species are threatened or already functionally extinct (i.e. have reached "such low numbers that they no longer play an effective role in the functioning of ecosystems").⁹ Many of Australia's mammal species now have distributions covering less than 20% of their original range.¹⁰

Professor Lesley Hughes from Macquarie University told the *Four Degrees or More?* Conference in Melbourne in July 2011 that 70% of native vegetation in Australia has been cleared or modified and only nine percent is considered to be in original condition.¹¹

Australia's approach to land management and terrestrial biodiversity could be summed up by saying Australia is: a "very old continent" that has been "comprehensively trashed", Professor Hughes said.

Under a scenario of four degrees global average temperature rise (predicted for 2100 under current global commitments to emissions reductions), "broad scale extinctions are expected".¹²

An increase in the frequency and severity of bushfires from climate change poses an increasing threat to Australian biodiversity, according to Professor Hughes. While many Australian species have evolved to cope with fire, extreme fire (much more likely under future scenarios in which there is a failure to effectively mitigate against further climate change) will be a major driver of further losses of terrestrial biodiversity in Australia.

With every degree of warming, for example, between 100-500 species of landbirds are expected to become extinct. Further, these changes are non-linear, and in the event of ongoing temperature increases, rates may be higher.¹³

Climate change will also have adverse impacts on freshwater ecosystems, and marine biodiversity.

In a presentation entitled *In Hot Water* to the recent Four Degrees or More conference in Melbourne Professor Ove Hoegh Guldberg from the University of Queensland, said climate change was having a dramatic and detrimental effect on the Earth's oceans and marine ecosystems.

"The ocean provides planetary services in providing our life support system - which is what distinguishes us from hundreds of other planets," Professor Hoegh Guldberg said.

The ocean is a heat sink, and through oceanic absorption of CO₂, oceans are becoming more acidic – creating an ocean chemistry not seen for the last twenty million years, Professor Hoegh Guldberg said. He warned that on current warming trends, ocean acidification may represent an even greater threat to the Earth's biology than climate change. With around another half a degree of warming, we may be close to a situation where the conditions that permit the restructuring ability of reefs or shell formation do not exist, Professor Hoegh Guldberg said.

Without serious mitigation efforts to mitigate against climate change, the Great Barrier Reef (currently worth \$6 billion annually for the tourist sector) could be reduced by rubble by 2050, Professor Hoegh Guldberg said.

Freshwater ecosystems face similar threats. Climate change is leading to increasing periods of drought in many parts of Australia with severe consequences for flora and fauna and ecosystem health.¹⁴

The rate at which climate change is occurring may simply overwhelm the capacity of current ecosystems to adapt, according to the Australian Government's Biodiversity and Climate Change Expert Advisory Group in their 2009 report.¹⁵

If the current trajectories of emissions increases continue, the report warns that we are headed for a mass extinction event – the sixth great extinction event in the Earth's history.

The report states:

“It took millions of years for biodiversity to recover from these past massive extinction events. If Australian society wishes to minimise the risk of an unprecedented wave of extinctions over the next 100–200 years, mitigation of climate change must be undertaken vigorously, rapidly and globally.

“Global average temperature increases of 1.5 or 2.0°C above pre-industrial levels will likely lead to a massive loss of biodiversity worldwide. Thus, the mitigation issue is central to biodiversity conservation under climate change.

“To avoid an inevitable wave of extinctions in the second half of the century, deep cuts in global greenhouse gas emissions are required by 2020 at the latest. The more effectively the rate of climate change can be slowed and the sooner climate can be stabilised, the better are the prospects that biodiversity loss will be lessened.”¹⁶

Economic impacts of biodiversity loss

The economic implications of climate change on biodiversity loss are often overlooked in policy discussions. There are compelling reasons to act on climate change on biodiversity grounds alone, and to place a value on the services afforded to us by the ecosystem.

At present, the vital connection between the choices we make about the use of natural resources, the status of the ecological system and the wellbeing of people is poorly recognised in public policy development.¹⁷

There are however profound economic consequences for failing to do so. For example, the (1997) estimated annual value of global ecosystem services was over \$US 33 trillion, however it is estimated that the annual global loss of land-based ecosystem services alone is €50 billion and unless this decline is arrested, may be costing us as much seven per cent of GDP by 2050.¹⁸

Biodiversity and human health

Human health depends on biodiversity.

As a recent (2010) United Nations policy brief on biodiversity and health states:

“Biodiversity is the foundation for human health. By securing the life-sustaining goods and services which biodiversity provides for us, the conservation and sustainable use of biodiversity can provide significant benefits to our health. In contrast the continuing loss of biodiversity on a global scale presents a direct threat to our health and wellbeing. Without a global environment that is healthy and capable of supporting a diversity of life, no human population can exist.”¹⁹

Human health and wellbeing are being adversely affected by the decline in the state of the natural environment. The importance of biodiversity for human health is being overlooked however by the health community and those concerned with biodiversity conservation.²⁰

Human health is dependent on healthy food systems, for example, which require genetic diversity to maintain resistance to disease and resilience to environmental stressors. A diet which includes a diverse range of foods is important in the maintenance of human health and can protect against disease and poor nutritional status.²¹

Biodiversity provides the foundation for world food production and human nutrition. Declines in agricultural biodiversity have significant implications for human health, the sustainability of livelihoods and food security.²²

Medical research is dependent upon biodiversity for important insights into anatomy, physiology and biochemistry.²³ Many advances in medical and health sciences, including treatments for diseases, and many modern drugs (including pain killers, cardiac medicines, and treatments for diabetes), would not have been possible without the powerful pharmaceuticals derived from biomedical research.²⁴

Biodiversity loss is attributed to the spread of many infectious diseases and contributes to outbreaks of disease, with concomitant human suffering and economic losses.^{25,26,27}

Ecosystems provide protection for human populations from natural disasters such as floods and drought.^{28,29}

There are also psychological and mental health implications for human communities affected by a loss of biodiversity, including for Indigenous people and others with a strong connection to the land.³⁰

Rural communities are largely dependent on ecosystems and biodiversity for economic security and well-being and face higher risks to health and wellbeing from biodiversity loss.^{31,32}

Shifts in human demography and a disconnection from natural biodiversity may also be contributing to a rise in the incidence of lifestyle diseases such as diabetes, obesity and cardio-pulmonary disease.³³

Access to healthy natural environments is associated with better health outcomes, provides protective and positive mental health benefits,³⁴ and is associated with reduced anti-social behaviour among children and young people.³⁵

The protection of biodiversity is therefore vital for the maintenance and protection of human health.

As Eric Chivian and Aaron Bernstein, editors of the 2008 book *Sustaining Life: How Human Health Depends on Biodiversity*, say:

“...we humans act as if we were totally independent of nature... as if it were designed to be an infinite source of products and services for our use alone and an infinite sink for our wastes.”

Our impact on biodiversity and nature has been profound.

Chivias and Bernstein again:

“During the past fifty years or so, for example, our actions have resulted in the loss of roughly one-fifth of the Earth’s topsoil, one-fifth of its land suitable for agriculture, almost 90% of its large commercial marine fisheries, and one-third of its forests.

“...We have dumped millions of tonnes of chemicals onto soils and into fresh water, the oceans and the air.... We have changed the composition of the atmosphere... and increased the concentration of atmospheric carbon dioxide to levels not seen in 600,000 years.

“We have done all things – our species, Homo sapiens, one species out of perhaps ten million on Earth.....behaving as if these alterations were happening someplace other than where we live, as if they had no effect on us whatsoever.

“Ultimately, our behaviour is a result of a basic failure to recognise that human beings are an inseparable part of nature and that we cannot damage it severely without severely damaging ourselves.”

Recommendations

The Climate and Health Alliance endorses the recommendations of the Australian Government Biodiversity and Climate Change Expert Advisory Group in 2009 in their report to the Natural Resource Management Ministerial Council.³⁶

These recommendations include the explicit recognition in strategies to address biodiversity management that maintaining all species in their present locations and ecosystems may no longer be possible. The priority must be to maintain a diversity of well-functioning ecosystems, and this may require new approaches to enhance the resilience of our ecosystems which may include species relocation.

Enhancing the resilience of ecosystems is vital, and this requires efforts to significantly improve connectivity of fragmented ecosystems and protection of key refugia through significantly increased protection and preservation of native habitat, better control of invasive species, and appropriate fire management regimes.

The expert advisory group identified risk assessment as vital in identifying especially vulnerable species and ecosystems.

Better integration of current biodiversity policy and legislative frameworks is needed, to improve governance while being sensitive to regional differences and the need for locally relevant approaches.

However the final recommendation of the expert advisory group is the most important:

Urgent action of climate change is vital to preserve biodiversity – as without rapid and effective mitigation, Australia will experience “an accelerating wave of extinctions throughout the 21st century and beyond”.

The Climate and Health Alliance therefore calls for:

1. Urgent action on climate change to be taken by Australian governments, industry and the community to preserve biodiversity and human health by contributing to the global effort of emissions reductions at a level consistent with the science of climate change
2. Explicit recognition of the implications for human health from biodiversity loss in public policy development
3. For all biodiversity policy development processes to include health impact assessments to evaluate the implications for human health.

APPENDIX A

Climate and Health Alliance Committee of Management

Fiona Armstrong (CAHA President and Convenor)
Erica Bell (Australian Rural Health Education Network)
Bret Hart (Alliance for Future Health)
Michael Moore (Public Health Association of Australia)
Elizabeth Reale (Australian Nursing Federation)
Kristine Olaris (North Yarra Community Health)
Grant Blashki (Doctors for the Environment, Australia)
Julia Stewart (CRANApplus)

CAHA Organisational Members

The following organisations are financial members of the Climate and Health Alliance:

Australian Association of Social Workers (AASW)
Australian College of Rural and Remote Medicine (ACRRM)
Australian Council of Social Service (ACOSS)
Australian Hospitals and Healthcare Association (AHHA)
Australian Health Promotion Association (AHPA)
Australian Institute of Health Innovation (AIHI)
Australian Women's Health Network (AWHN)
Australian Nursing Federation (ANF)
Australian Psychological Society
Australian Rural Health Education Network (ARHEN)
CRANApplus
Doctors for the Environment Australia (DEA)
Doctors Reform Society
Friends of CAHA
Health Consumers' Network (Qld)
Public Health Association of Australia (PHAA)
Royal Australasian College of Physicians (RACP)
North Yarra Community Health (NYCH)
Services for Australian Rural and Remote Allied Health (SARRAH)
Women's Health in the North
World Vision

Expert Advisory Committee

The following people provide advice about climate change and health research to assist CAHA take a robust evidence-based approach in its public statements and activities:

Dr Erica Bell, University Department of Rural Health, University of Tasmania
Jane Carthey, expert in the effects of climate change on health care infrastructure
Associate Professor Grant Blashki, Nossal Institute for Global Health
Professor David Karoly, Federation Fellow in the School of Earth Sciences, University of Melbourne
Professor Stephan Lewandowsky, School of Psychology, University of Western Australia
Dr Peter Tait, RACGP General Practitioner of the Year 2007, Alice Springs
Professor Anthony Capon, National Centre for Epidemiology and Population Health, Australian National University
Professor Simon Chapman, Professor of Public Health, University of Sydney
Dr Susie Burke, Senior Psychologist, Public Interest, Environment & Disaster Response, Australian Psychological Society
Dr Marion Carey, Senior Research Fellow, Monash Sustainability Institute.

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