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Australia's biodiversity crisis and the need for the Biodiversity Council

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Australia's Rich Biodiversity is in Crisis

Australia is a mega-biodiverse region. Millions of years of geographical isolation have resulted in high species diversity and endemism. So far, >21 000 species of plants, 8000 species of vertebrates, and 110 000 species of insects and other invertebrates have been described (Chapman 2009). An exceptionally high percentage are endemic; 93% of flowering plants, >80% of invertebrates, 87% of mammals, 93% of reptiles, 94% of frogs, 74% of freshwater fishes and >50% of temperate marine fishes in Australia are found nowhere else (Lintermans 2013; Cresswell & Murphy 2017).

Since European colonisation, Australia's rich biodiversity has been in rapid decline. This decline has been driven by habitat destruction and fragmentation due to land clearing for agriculture and urbanisation; the introduction of invasive plants, animals, and diseases; the disruption of First Peoples practices in caring for Country, including fire management; and the extraction of water including the modification and regulation of freshwater ecosystems. These pressures are

now being exacerbated by climate change.

One hundred Australian species have been formally recognised as extinct including 34 mammal species, representing 10% of Australia's endemic mammals at the time of European arrival. Twenty-two freshwater fish species are at high risk of extinction within the next 20 years (Lintermans *et al.* 2020). One thousand, nine hundred and ninety-five taxa are nationally listed as threatened with extinction (Australian Government 2023) and hundreds more at State and Territory levels. Many once widespread species that are important ecosystem engineers, such as digging mammals, now persist only in small fragments of former natural ranges.

The situation is likely far worse than reported, due to unresolved taxonomy (new species being discovered that are already extinct), a lack of systematic and rigorous monitoring of most species and ecosystems, and under-reporting of extinction. Declines are not abating. Population sizes of threatened birds have declined to half (47%), and threatened plants to almost one quarter (73%) of their populations, on average, since 1995 (Threatened Species Index 2022). Three

vertebrate species have been declared extinct in the last fifteen years: the Christmas Island PIPISTRELLE (*Pipistrellus murrayi*), Christmas Island FOREST SKINK (*Emoia nativitatis*) and Bramble Cay melomys (*MELOMYS rubicola*). There is a > 50% likelihood that a further 16 vertebrate taxa, for which there have been no recent verified records, are already extinct, with four almost certainly extinct (Garnett *et al.* 2022).

Mass mortality events are increasing. These include an estimated 3 billion vertebrate animals and 60 billion invertebrate animals which were killed or displaced in the Black Summer fires; four mass coral bleaching events on the Great Barrier Reef in the past seven years; multiple major fish kills in the Murray-Darling Basin; and extensive heat-related mortality in flying foxes and cockatoos which are important forest pollinators and seed dispersers (Legge *et al.* 2023). Feral and free-roaming cats and foxes kill more than 2.6 billion vertebrate animals every year, with the vast majority being native species (Stobo-Wilson *et al.* 2022).

Most ecosystems are in decline and 17 are showing signs of collapse (Bergstrom *et al.* 2021), including mangroves critical

for fish spawning in the Gulf of Carpentaria, and the tall wet forests of Victoria that store more carbon than any other forest on the planet (Keith *et al.* 2009). Since giant kelp forests were listed as Endangered in 2012, declines have continued and less than 5% of this ecosystem, that was widespread in coastal waters of southeastern Australia, remains. Ninety-five per cent of Australian shellfish reefs (Gillies *et al.* 2018) and half of our total seagrass area have been destroyed. Ecosystem processes are being eroded rapidly, with pollination by native species, soil turnover through digging, water filtration, and carbon sequestration all much depleted (Bergstrom *et al.* 2021). Extreme climatic events (2011 to 2017) have led to abrupt and extensive mortality of key marine habitat-forming organisms—corals, kelps, seagrasses, and mangroves—along over 45% of the Australian coastline (Babcock *et al.* 2019).

Biodiversity Decline and Extinction Threaten Us

Climate change combined with Australia's biodiversity decline and extinction threatens human lives and livelihoods. Biodiversity underpins all aspects of our lives. In addition to their aesthetic, spiritual, and cultural values, animals pollinate 90% of crops; 70% of medicines are derived from animals and plants; natural ecosystems remain the only viable large-scale carbon sink; and plants and animals clean our air and water and break down wastes.

Roughly half of Australia's Gross Domestic Product (49% or \$896 billion) has a moderate to very high direct dependence on nature (ACF 2022). The World Economic Forum (2023) has identified biodiversity loss and ecosystem collapse as the fastest accelerating risks to the global economy and among the top 10 risks for the next decade. Food webs are collapsing and will accelerate extinctions in the coming decades. For example, the loss of corals and the food webs they support will imperil a high diversity of coral reef-dependent organisms.

Australia's biodiversity declines are increasingly rapid and potentially irreversible. They will have far-reaching consequences for the economy, human health

and well-being, food systems and culture, in addition to diminishing nature itself. These declines also pose an existential risk to Australia's First Peoples who represent one of the oldest living cultures on Earth—and whose cultures were founded on reciprocal relationships with Country, including the very species and ecosystems which are being destroyed.

Ninety-seven per cent of Australians want more action to conserve biodiversity, and most consider that 'every person in Australia' has a responsibility to act, including all levels of government. Eighty-five per cent of Australians are moderately or highly concerned about threats to nature (Borg *et al.* 2023).

Current Approaches are Failing

Australia's response to the biodiversity crisis has been grossly inadequate and past failure to recognise, respect and support First Peoples cultural land management approaches has exacerbated biodiversity declines (Goolmeer & van Leeuwen 2023). Legislation, policies and planning processes have enabled ongoing biodiversity losses (Hughes *et al.* 2023). For example, more than 7.7 million hectares of threatened species habitat have been destroyed since 2000; 93% of this was not regulated under national environmental law (Ward *et al.* 2019). Policy and legislation must contain strong standards that limit ministerial discretion to harm biodiversity. Our laws must also be *resourced, implemented and enforced*.

As a wealthy nation, there is a strong moral argument that the Australian Government should be making evidence-based decisions and investing more in the protection and restoration of biodiversity. Yet Australia performs poorly by international standards, ranking second-worst for spending to recover threatened species out of 109 countries (Waldron *et al.* 2017).

Government funding is only a fraction of what is required to halt and reverse losses. The cost of conserving Australia's listed threatened species has been estimated at \$2 billion per year (Wintle *et al.* 2019), yet Australian Federal, State

and Territory governments spent just \$122 million on threatened species recovery in the 2018–2019 financial year. A further \$2 billion a year for 30 years is needed to restore 13 million hectares of Australia's degraded land (Mappin *et al.* 2022). Nature conservation spending is dwarfed by spending in other policy areas, for example, it receives less than 0.5% of the amount the Australian Government spent on health in 2022–23. This is despite the demonstrated importance of biodiversity to our physical and mental well-being (Irvine *et al.* 2023).

The Need for the Biodiversity Council

Alarmed at the lack of an effective response to Australia's biodiversity crisis, a group of leading Australian experts (including Indigenous knowledge holders) united to form the Biodiversity Council. The Biodiversity Council's purpose is to be a trusted expert voice on all aspects of biodiversity and its conservation, to the Australian people and decision-makers, motivating action that enables nature and Country to prosper. The council's vision is that Australia's biodiversity is recognised and valued nationally and globally as a priceless heritage, a foundation for our life and a defining feature of our country, and its future is recovered or secured.

While the current trajectory of Australian biodiversity appears bleak, decline is not inevitable. Species recovery is possible with appropriate protection, recovery effort and expenditure as demonstrated in the United States (Suckling *et al.* 2016). Australia has had some important success stories, including the recovery of some threatened species (e.g. Garnett *et al.* 2018). Major environmental policy shifts have occurred where there was widespread pressure from a concerned public who were able to step up and add their voices to debate. Public pressure precipitated the end of whaling in Australia, drove the protection of the Franklin River, stopped logging of Wet Tropics rainforests, massively reduced land-clearing in Queensland in the mid-2000s, and hastened the end to native

forest logging in Western Australia and Victoria. These examples show what can be achieved when advocacy and public demand lead to political change, greater government and organisational leadership, effective legal protection, and well-resourced recovery efforts.

Most Australians (74%) understand that climate change is having a direct impact on Australia's biodiversity, however, only around half of Australians are aware of the extent of biodiversity loss and 60% of people believe that the state of the natural environment in Australia is 'good' or 'very good' (Borg *et al.* 2023). Scientific censorship by governments of conservation science (e.g. Driscoll *et al.* 2021) and lack of media attention have contributed to this situation.

For the community to make meaningful contributions to protecting biodiversity, they need tools. Beyond providing information about the problem, the council recognises the importance of empowering communities to protect nature. This involves equipping them with knowledge about how to act, creating opportunities for more people to act, and more effectively supporting and celebrating those already committed to protecting nature every day.

The Council will drive transformational change in policy, government investment and corporate responsibility through the development of timely, robust and compelling evidence and solutions. As evidence from the climate debate demonstrates, policy cut-through can only be achieved by adopting a range of different approaches to communicate with different segments of society (Nerlich *et al.* 2010). Thus, *how* the Council creates change is grounded in evidence, alongside *what* it communicates.

The Structure of the Biodiversity Council

The Biodiversity Council includes leading experts in a wide variety of environmental and social sciences and Indigenous knowledge. This includes specialists in Indigenous science, Indigenous-led use of Traditional Knowledge, conservation, law, policy, economics, quantitative tools,

behaviour change and communications, terrestrial, freshwater and marine mammals, birds, reptiles, fish, frogs, invertebrates, plants, ecosystems, invasive species, fire, genetics, climate impacts and adaptation, integrated landscape management, threat interactions, nature-based solutions, urban ecology and design; and for the wide variety of Australia's regions and ecosystems including alpine, deserts, floodplains, rivers, coastal wetlands, reefs, mangroves, tropical savannas and tall wet forests.

Effective inclusion of First People's expertise and perspectives is fundamental for the Biodiversity Council. Aboriginal and Torres Strait Islander Peoples' rights and interests in land are formally recognised over around half of Australia's land mass. Traditional Custodians in all parts of Australia have deep connections, valuable knowledge and cultural obligations to care for culturally-important species and places (United Nations (General Assembly) 2007). It's time for governments, conservationists and researchers alike, to recognise the enduring tangible and intangible value of the Indigenous Estate (Gore-Birch *et al.* 2022). To ensure First People's perspectives and expertise are effectively included in the priorities and work of the Biodiversity Council, First People are included at all levels of decision-making (Goolmeer & van Leeuwen 2023), including two representatives on the Board, a Co-chief Councillor, and making up one third of the Council. First Peoples are supported to deliver an Indigenous-led work plan.

The Council has 37 Councillors and this number is expected to increase as regional and expertise areas are strengthened. In addition to one third of First Peoples representation, the Council strives for gender balance. The founding Council is composed of mid- and later-career experts but there are plans to bring in early career members.

Councillors come from university, environmental non-government and First Peoples organisations, or are independent. The Council recognises the wealth of relevant ecological knowledge held by practitioners that work within government agencies, but has not appointed any

Councillors that are staff within government agencies, as Councillors must be able to speak freely on issues, including critiquing government decisions and policies.

The Council is supported by a small executive team with expertise in organisational development, media and communications, stakeholder engagement and policy innovation. The Council is currently hosted by The University of Melbourne with additional oversight from an advisory board. It receives financial support from philanthropists.

The Work of the Biodiversity Council

The Biodiversity Council engages with the public, government and business decision-makers directly and through the media and public forums to:

- enhance public understanding of the importance of biodiversity for human health and well-being, economic prosperity and cultural identity.
- shape and add value to public discourse about nature and Country, through amplification of science and Indigenous knowledge.
- raise awareness of threats to biodiversity, and bring scrutiny to damaging policies and practices.
- hold agencies to account for ineffective actions, policies and outcomes such as habitat and species loss.
- promote opportunities for biodiversity-positive actions.
- acknowledge and celebrate good policies, initiatives and meaningful progress.

The Council interacts with government ministers, political advisers and policy makers and makes submissions. The Council is politically neutral and works in a cross-partisan way to promote evidence-based policies and solutions that will help halt nationwide biodiversity loss. Initial policy-related priorities include providing scrutiny and evidence-based recommendations regarding the reform of national environmental laws, including the need for culturally-significant species and

places to be recognised to ensure that Traditional Custodians can fulfil their ongoing connection with, and care for, species (Goolmeer *et al.* 2022); holding the Australian Government accountable to internationally agreed commitments under the Convention on Biological Diversity's Global Biodiversity Framework; reducing the threats of invasive species, inappropriate water resource developments, land clearing, degradation and climate change; and drawing attention to the current inadequacy of funding to solve Australia's biodiversity crisis.

The Council also seeks to inform and motivate the Australian community to take steps to halt biodiversity loss, through their own advocacy, action and daily decision-making, such as pet and waste management, consumption, supporting local restoration initiatives by contributing time or financial resources.

How Ecologists, First Peoples Groups and Conservation Practitioners Can Become Engaged

Australia has world-class expertise in ecological management and restoration, as evidenced by the success of this journal. The Biodiversity Council seeks to amplify and maximise the impact of all of Australia's biodiversity expertise, including their research and translation work, whether or not they are Council members. Any expert with something important to say about biodiversity who has the evidence to back it up can draw on Council resources and networks to amplify their story. Deploying and assessing ecosystem restoration interventions, and indeed encouraging the investigation of more intensive and controversial interventions, such as accelerated adaptation, culturally-led science, the application of Indigenous Knowledge and the construction of functional ecosystems on degraded land, is something the Council encourages.

Staying silent will not achieve the changes that Australian nature desperately needs now, and that are essential to underpin the quality of life of future generations. The Biodiversity Council is not the

only voice speaking for biodiversity. The Council aims to motivate and equip many individuals and groups to speak up for biodiversity and become biodiversity champions. This includes activities such as collating the best available science so that groups can speak with confidence and providing science media training to early career biodiversity experts.

We very much welcome insights from ecologists and practitioners on biodiversity topics that require a greater profile in the media and politics. People can find our contact details or sign up for our newsletter at <https://biodiversitycouncil.org.au/> and follow us on social media to see our analysis, activities and opportunities to contribute.

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Conflict of Interest

The authors declare no conflicts of interest.

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