Submission No 87

INQUIRY INTO 2024 ANNUAL REPORT OF THE NET ZERO COMMISSION

Organisation: Wilderness Australia

Date Received: 18 February 2025

Wilderness Australia

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About the author

My submission is informed by personal experience during the black summer bushfires including participation in a post bushfire recovery project lead by Griffith University and ANU; my work in the international climate and biodiversity policy arenas (CBD and UNFCCC Rio Conventions) on the nexus between climate change and biodiversity loss (see, *Critical Reforms for effective and timely action to prevent irreparable harm to Earth's climate and biodiversity)*; my role with the IUCN Climate Crisis Commission as Nature Thematic Lead and as an active member of the IUCN World Commission on Protected Areas Climate Specialist Group; and my experience with on ground programmes working to protect and restore ecological integrity and connectivity at a landscape scale in eastern Australia and in south western Australia.

I worked to support forest conservation outcomes during the Regional Forest Assessment (RFA) period contributing to NGO work in Tasmania, Western Australia, Queensland, NSW and Victoria.

I have a substantial depth and breadth of knowledge of the challenges facing forests and those likely to increase with climate change and contribute this knowledge as a board member of Wilderness Australia.

Understanding Net Zero and how it should be used

It is worth reflecting on the fact that neither the UN Framework Convention on Climate Change nor the Paris Agreement refer to achieving Net Zero. Rather they refer to achieving a balance of emissions and removals in the atmosphere and ensuring emissions reduction occurs in all sectors of the economy. It takes centuries to millennia for a pulse of CO_2 to be permanently removed from the atmosphere. Cycling carbon through numerous 'pools' in natural ecosystems into the deep ocean and long-lived ecosystem carbon stocks – the point

at which removals can be claimed to be permanent – likewise takes a very long time! Burning fossil fuels (geological carbon) and attempting to offset those immediate emissions through removals by the biosphere is inherently complex, high risk and from a science perspective inaccurate. From a science perspective:

"NZE is achieved when all anthropogenic (i.e., human caused) CO2 emissions (as well as other greenhouse gases) are reduced to the rate at which they can be removed and permanently stored by the natural sinks, i.e., the world's ecosystems and oceans" (Becken et al)

Achieving Net Zero through an unsustainable combination of fossil-fuel emissions and short term removals is ultimately pointless as carbon emissions and removals have only decadal times scales in which to achieve balance.

There is growing concern about Net Zero simply increasing the demand for offsets and reducing the desperately needed focus on emissions reduction. Clearly, as long as carbon credits provide a 'get-out-of-jail-free card' there is considerable risk that high emitting industries will delay or not make the structural changes required for permanent decarbonisation. It is critically important as we exceed the 1.5 degree threshold and head towards 3 degrees of warming to limit the ability of our biggest emitters to purchase offsets to delay their exit from fossil fuels. Publications by Becken et al and Griffith University contain recommendations that would ensure Net Zero policies do not act as a disincentive to decarbonize, including:

" The Five Principles put forward by the High-Level Expert Group on the Net Zero Emissions Commitments of Non-State Entities (UN, 2022) emphasise the need for ambition, integrity, transparency, credibility, and commitment. The report raises concern of the "undue reliance on the use of offsets and potential unrealistic dependence on removals (in lieu of concrete mitigation action) to reduce absolute emissions which is the priority this decade" (p. 38). The Science- Based Targets initiative (Science Based Targets Initiative (SBTi), 2021) emphasises the need to maximise emissions reductions before any neutralisation of unabated emissions via removal credits (see ISO, 2022)." (Becken & Mackey 2024)

Applying a strict 'mitigation hierarchy' before allowing the purchase of offsets by any organisation and developing separate targets for decarbonisation and permanent removals would help avoid the increasingly obvious failings of the carbon offset market.

The need to cap and phase down the use of offsets to achieve Real Zero

To force companies to do the right thing, many countries have had to set strict limits on offset use within their cap and trade systems. For example, the European Union capped offset use at 50% of emissions reductions two years into its existence. In 2021, the EU phased them out completely. In China, offset use within cap and trade schemes is strictly capped at less than 10%, and is as low as 5% in Beijing and 1% in Shanghai.

In contrast, it is estimated that by 2030, 60 - 80% of the emissions reductions achieved by the Safeguard Mechanism will have been delivered not via fossil fuel reductions, but via offsets.

Australia's exceptionally high reliance on offsets is deeply alarming. We must reduce our reliance on offsets not increase them by developing a rapid phase down plan. (See 'Australia Institute' speech)

Minimising the risk to ecosystem carbon reservoirs and sinks

The Net Zero report touches on the increasing vulnerability to carbon storage in the land sector due to the interaction of past human use and climate change. This is worthy of significant unpacking as the carbon stocks in our most carbon dense ecosystems and especially our native forests, are at increasing risk of releasing stored carbon to the atmosphere.

Australia, together with the rest of humanity is facing an unprecedented and entwined set of escalating risks as global heating and biodiversity loss escalate. This existential threat to human wellbeing can only be prevented if we tackle the climate and biodiversity challenges together. As the first ever joint workshop of the scientific advisory bodies to the Climate Convention (IPCC) and Biodiversity Convention (IPBES) noted in 2021, the climate and biodiversity crises amplify each other and urgent synergistic action to protect and restore carbon dense and species rich ecosystems is needed. Bringing climate and biodiversity policy and practice together is now an accepted imperative as this decision taken at UNFCCC COP 28 illustrates when it emphasized:

"*…the importance of conserving, protecting and restoring nature and ecosystems towards achieving the Paris Agreement temperature goal, including through enhanced efforts towards halting and reversing deforestation and forest degradation by 2030, and other terrestrial and marine ecosystems acting as sinks and reservoirs of greenhouse gases and by conserving biodiversity, while ensuring social and environmental safeguards, in line with the Kunming-Montreal Global Biodiversity Framework;*" (Para 33 from COP 28 CMA 5)

And, in an historic decision at COP 16 in 2024 the UNCBD (decision 16/22) recognized:

- "That biodiversity and ecosystem integrity play an important role in combating climate change";
- "The essential functional role of biodiversity in underpinning the integrity of ecosystems and ecosystem services"; and
- That "protecting and restoring ecological integrity contributes to addressing both climate change and biodiversity loss, and its impacts".

Parties to the Convention were urged to "identify and maximize potential synergies between biodiversity and climate actions, including by prioritizing the protection, restoration and management of ecosystems and species important for the full carbon cycle and contributing to climate change adaptation".

However, the current 'carbon' centric focus of climate action in land, forests and ecosystems creates a problem for understanding the importance of biodiversity and ecological integrity for retaining ecosystem carbon reservoirs and achieving climate mitigation goals. Few decision makers understand the importance of improving protection and conservation management of ecosystems in order to reduce the risk of losing ecosystem carbon to the atmosphere or that sequestering and retaining carbon are two critically important ecosystem services underpinned by ecological integrity and biodiversity.

Both the Climate Convention and Paris Agreement call for the conservation of ecosystem carbon reservoirs (Article 4.1 (d) and Article 5.1, respectively). The Paris Agreement also emphasizes the need to protect and restore biodiversity and ecosystem integrity.

And despite successive decisions since 2018 in the UNFCCC encouraging synergistic climate and biodiversity action, the UNFCCC has yet to provide any guidance on how best to deliver synergistic climate and biodiversity outcomes. Nor has operational guidance been developed to give effect to the ecosystem provisions of the Convention and Paris Agreement (Griffith University Policy Discussion Paper 3/23). Developing robust guidance requires the expertise and knowledge of specialists who understand and can communicate the complex relationships between the natural patterns and components of biodiversity (including diversity at the genetic, species and community levels) and ecological integrity and why retaining and restoring ecological integrity is fundamentally important for minimizing the risks to ecosystem carbon reservoirs (stocks) and keeping our vast ecosystem carbon stores out of the atmosphere. There is a need to increase the depth of understanding among decision makers of the critically important functional role of biodiversity, in all its complexity, in helping ecosystems sequester and retain carbon, especially in the face of threats that are increasing as our planet warms (Wilderness Australia, 2024).

Without such guidance, climate action to protect and restore carbon dense ecosystems, including our native forests, will remain ineffectual and do little to change the business-as-usual focus on net annual sequestration established through climate rules designed to suit plantations, highly modified forests and planting more trees. Current LULUCF rules are blind to the management actions that influence the stability and risks to ecosystem carbon stocks; the importance of ecosystem integrity for retaining carbon storage over the long term; and the functional role of biodiversity in underpinning ecological integrity.

Ecosystem integrity refers to an ecosystem's capacity to maintain its characteristic composition, structure, functioning and self-organisation over time within a range of natural variability. It is underpinned by its natural patterns of biodiversity including diversity at the genetic, species and community levels. High-integrity ecosystems have greater stability,

resilience, capacity to adapt, and provide higher quality ecosystem assets and services that contribute to human wellbeing.

The functional roles in an ecosystem of biodiversity at all levels (genetic, species and community) is the product of natural selection that yields the characteristic species and community assemblages best suited to prevailing environmental conditions, including fluctuating resource inputs, extreme events, periods of stress and natural disturbances and thus underpins ecological integrity. Ecological integrity is fundamental to maximising an ecosystems capacity to adapt to change as well as retaining its most important climate mitigation value, securing long-lived and relatively stable carbon storage, together with improving the security of other important ecosystem services. (Rogers et al, 2022).

The ability of ecosystems to retain carbon is their most important climate mitigation service.

Forests and Climate Change

Our native forests contain the largest terrestrial carbon stock in NSW. Their future management, together with limiting warming to well under 2 degrees, will determine whether they retain their high carbon stocks and are able to recover lost carbon stocks.

All ecosystems are dynamic and dependent on their full complement of native species for healthy functioning. In forests: soil biota, invertebrates and fungi break down coarse woody debris on the forest floor, thereby increasing water and carbon accumulation and retention in forest soils; pollinators and seed dispersers help maintain their natural vegetation composition which influences resistance to insects, disease, drought and fire; and many vertebrate species support and help determine their composition and structure. In primary and other natural forests undisturbed by modern industrial activities, natural species composition, patterns and structure of biodiversity, including the presence of BIG old trees help the forest resist drought and fire thanks to moisture retention under a closed canopy. The bigger the trees in a forest, the harder it is to set alight. Minimising industrial disturbance in forests is critically important for sequestering, storing and retaining carbon over the long term.

Compared to young regrowth, plantation and degraded forests, high-integrity forest ecosystems, such as old growth forests, are more resistant to threats, have more stable long-lived carbon stocks, provide higher quality and more consistent fresh water and have greater resistance and resilience to disturbances.

Every time we push a road into an area of long unlogged forests or log them (even 'lightly') we reduce the forests integrity and resilience, generate GHG emissions and increase the risk that the forest will release more of its remaining stored carbon in the future. Loss of big old trees (which make up 1-5% of trees globally but store 25-50% of the above ground carbon in forests) and other critical elements of biodiversity, combined with edge effects from roads

and other impacts from logging disturbance, increase the vulnerability of forests to severe drought, heatwaves and fire as well as other human-induced threats such as insect predation and disease. All these threats are increasing with climate change and interact with logging to increase fire severity and the risk of forest ecosystems reaching tipping points. Damaged forests are at much greater risk of losing carbon to the atmosphere than undamaged forests.

Too often the assumption is made that climate change is the only driver of increased drought and fire severity when the science is clear that damaged forests are far more vulnerable to drought and fire than long unlogged and old growth forests and that past damage interacts with climate change to increase the severity of both threats. (Bushfire Recovery Project, 2021)

Policy failure on forests

If there is a single misstep that led to the failure of government policy to realise the full climate mitigation benefits of native forests and enhance their resilience and adaptive capacity, it is blindness to the importance of retaining and recovering forest ecosystem integrity. Simply assessing the extent of forest cover and focussing on net annual fluxes of GHG reveals very little about the climate value of our native forests or their ability to resist and recover from severe drought and fire.

Failure to recognise that the integrity of forest ecosystems determines their stability, i.e. their resistance and resilience to threats that are increasing with climate change means we have strayed far from protecting forest ecosystem carbon reservoirs - reservoirs that hold billions of tonnes of carbon and could if allowed to recover, sequester and store, billions of tonnes more (Mackey et al, 2008).

The stability and risk of losing that carbon to the atmosphere and indeed of reaching forest ecosystem tipping points, as is happening in parts of the Central Highlands of Victoria, is dependent on both reducing gross emissions from all sources (fossil fuel and logging) and allowing forest carbon stocks to recover.

Unlogged forests, on average, store 50% more carbon than logged forests but this loss of carbon is not revealed in state or federal GHG accounts. This is because gross emissions from logging in the relatively small areas logged each year are netted out against sequestration occurring elsewhere in the larger forest estate. Yet the maths is simple, if you log any area of forest older than 30 years it cannot recover its lost carbon stock by 2050. Also hidden is the carbon recovery potential of allowing previously logged forests to keep

growing. And few, if any, policy makers ever consider the risks to long term forest carbon storage posed by ever reducing the ecological integrity of our native forests.

The GHG accounting problems in forests are discussed in the Mackey et al paper *'Net carbon accounting and reporting are a barrier to understanding the mitigation value of forest protection in developed countries'.* Among this papers' findings was that "*Analysis of reports at a sub national level revealed that the state of Tasmania delivered negative emissions due to a large change in forest management – a large and rapid drop in native forest logging 22mt.$CO_{2-}yr^{-1}$ over the reporting period 2011/12 – 2018/19."*

It's urgent that we refocus climate policy on forests to maximise their resilience and resistance to threats that are increasing with climate change to both retain existing carbon stocks and more safely recover their lost carbon stocks. (DellaSala et al, 2024)

Solutions

The downwards spiral between the climate and biodiversity crises - where each crisis amplifies the other - must be understood and halted. We need to do two things simultaneously: rapidly reduce gross emissions from fossil fuels; and rapidly improve the protection and restoration of ecosystem integrity, especially of our most carbon dense ecosystems. Doing so is absolutely essential to achieving the goals and targets of the K-M GBF and the Paris Agreement.

From a biodiversity perspective it is imperative to retain all areas of high ecological integrity, increase effective protection and restoration of natural ecosystems, avoid incentives and subsidies for actions that fragment landscapes and damage biodiversity and ecological integrity and ensure all our actions help reverse the extinction trajectory we are on (as per the Kunming-Montreal Global Biodiversity Framework).

If we embrace the connectivity, protection and restoration goals and targets of the K-M GBF we would take a big step towards maximizing the long-term resistance, resilience and adaptive capacity of our carbon dense natural ecosystems – a step that will be essential if we are to retain and recover the carbon reservoirs needed to limit warming to as close as possible to 1.5 degrees.

Protecting and restoring biodiversity and ecosystem integrity would not only maximize the ecosystem services of carbon retention and sequestration and minimize the risk of emitting ecosystem carbon into the atmosphere, but it would also delay the point at which ecosystem tipping points are reached. The protection and restoration of our most carbon dense ecosystems should be a high priority in order to help avoid catastrophic climate change.

Adopting a landscape approach that integrates climate mitigation, adaptation, biodiversity

and ecological integrity goals through Connectivity Conservation Initiatives like that are being led by the Great Eastern Ranges Initiative, offer a scientific framework and community lead pathway to success. (Policy Discussion Paper 1/23; Policy Discussion Paper 2/23)

However, the most rapid, and relatively low risk pathway to recovering forest ecosystem carbon stocks, reversing the extinction trajectory of species like the Koala and Greater Glider and improving forest ecosystem integrity and resilience, would be to cease native forest logging.

As a matter of urgency, we could and arguably must:

- Immediately cease logging in all core habitat, fire refugia and areas essential for ecological connectivity and add these areas to the National Parks estate;
- Develop a forest ecosystem recovery plan utilising the best available science and ecological knowledge and traditional and local knowledge; and
- Explore funding and community involvement and regional job opportunities to support forest recovery that do not result in a zero-sum outcome for either Greenhouse Gas emissions or biodiversity loss, i.e. avoid biodiversity and carbon offsets

Thank you for considering this submission.

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Additional references:

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