Nature as a climate solution

Country, culture and nature-based solutions for mitigating climate change

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Cite as: Rachel A. Morgain, Sarah Bekessy, Judy Bush, Don Butler, Natasha Cadenhead, Rachel Clarke, Thami Croeser, Ariana Dickey, Megan C. Evans, James Fitzsimons, Michael-Shawn Fletcher, Rowan Foley, Jordan Gacutan, Stephen van Leeuwen, Catherine Lovelock, Peter I. Macreadie, Elizabeth McLeod, Rebecca L. Morris, Djungan Paul Neal, Cathy Oke, Raphael Viscarra Rossel, Jeremy Russell-Smith, Rebecca Spindler, Suzanne Thompson, Melissa Wartman, Michelle Young, Brendan A. Wintle. Nature as a Climate Solution, University of Melbourne, 2021.
http://conservationfutures.org.au/publications

This work has been commissioned by the Australian Conservation Foundation and supported by the Ian Potter Foundation and Hermon Slade Foundation through the Conservation Futures project. We would like to thank Paul Sinclair and Brendan Sydes from the Australian Conservation Foundation for their conception and guidance on the project.

We would like to acknowleldge Heather Christensen for substanial support facilitating the project workshops and Ben Milligan and Mandy Hopkins for connecting with networks and resources.

Cover image: Aerial of Murrumbidgee River showing intact and revegetated areas, Scottsdale Bush Heritage reserve, NSW (image credit: Annette Ruzicka). Back image: Rocky mesas at sunset, Pullen Pullen Bush Heritage reserve, Qld (image credit: Stephen Kearney)

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We would like to acknowledge the Traditional Custodians of the lands from which this work was conceived, considered and written and their elders, past, present and emerging, including the Wurundjeri, Jaithmathang, Ngunnawal, Ngambri, Ngarigo, Bedegal, Wadawurrung, Gadigal and Larrakia people.

Introduction

"Climate change and biodiversity loss are two of the most pressing issues of the Anthropocene"[1]
-- IPBES-IPCC co-sponsored workshop report on biodiversity and climate change

In Australia, climate change and biodiversity are largely dealt with independently in policy, legislation, regulation and resourcing of initiatives to tackle either challenge. Australia has been identified as a global extinction hotspot and serial under-performer in conserving biodiversity,[2,3,4] and in setting and reaching emissions reductions targets.[5] Biodiversity and climate are inextricably linked. The loss of biodiversity exacerbates climate change due to the reductions in nature's ability to absorb and store atmospheric greenhouse gases. Ongoing climate change exacerbates biodiversity loss by reducing the suitability of climatic niches and driving the disappearance of habitats. In Australia, this is most clearly observed in our recent track record of land clearing and high-emissions forest management, which lead to biodiversity losses and are responsible for 25% of total human-induced or anthropogenic greenhouse gas (GHG) emissions nationally.[6]

Dispossession of Country from its Traditional Owners is a central part of this story. Changed fire regimes,[7,8] western agriculture,[9] altered waterways,[10] urbanisation[11] and many other transformations in landscapes cause ongoing harm to Country and its people. Healing Country and people means not just learning from Traditional Knowledge, it means listening to Indigenous leadership and creating real opportunities for people to return to Country.

In addition to fixing these large and obvious policy perversities that drive emissions and biodiversity loss, there is an exciting set of opportunities to contribute to GHG emission reduction and sequestration targets through Country, culture and nature-based solutions. Ambitious implementation of land- and ocean-based actions to protect, sustainably manage and restore ecosystems have co-benefits for climate mitigation, potentially providing over a third of GHG emissions reductions and atmospheric carbon removal required under the Paris Agreement[1,12,13] provided that such actions support, and are not in lieu of, ambitious reductions of emissions from fossil fuels. In Australia, these include actions as diverse as regenerative and Traditional farming and fire practices, urban forests, feral herbivore control, and wetland rejuvenation.

Here, we detail five big ideas to bring forward nature as a climate solution with manifold benefits for Australia, including growing all Australians' connection and reconnection with Country, protecting and enhancing Australia's unique biodiversity and the ecosystems that underpin our very existence, and providing positive employment prospects for a new generation of environmental workers in all sectors from agriculture to infrastructure and energy. For inspiration, we document leading case studies where nature-based solutions are already improving our lives and reducing our carbon emissions.

Guided by the oldest culture on earth, we have the opportunity now, with the addition of positive vision, leadership, resourcing, and regulation, to stand up and secure a future rich in nature and culture that we'll be proud to endow to future generations.

1. Heal and restore land and sea Country and invest in Indigenous leadership

Australia is made up of hundreds of nations embedded in Country, cared for by its people for tens of thousands of years. Each Country is unique and precious. Strategies for reducing GHG emissions through healing and restoring Country embeds this work within enduring social and cultural relationships, of which Aboriginal and Torres Strait Islander people are, were and always will be the rightful custodians. There is an immediate opportunity to invest in Indigenous-led approaches that heal and restore Country and guide the way for how we care for our lands and seas altogether.

Globally and in Australia, so much habitat has already been destroyed or degraded. Over 75% of the world's land surface has been significantly altered by humans.[14] These twin crises of extinction and climate change are the direct outgrowth of settler and colonial institutions and practices in Australia and globally.[15] They require redress by the institutions - the businesses and governments, and the broader social and cultural processes - that have created them. Healing and restoring Country is a necessary feature of solutions to the climate crisis.

Healing and restoring land and sea Country requires that what are often called 'nature-based solutions' for carbon sequestration and emissions reduction are primarily culture- and Country-based solutions. These approaches to returning carbon to land and seascapes and reducing emissions must restore not just 'nature', but the relationships that settler-colonialism has disrupted. This requires investing in culture-based solutions that are Indigenous-led.[16] It entails a focus on strategies that foster Indigenous livelihoods, enable communities, ensure sovereignty and get people back on Country. These solutions may take many forms, including restoring and promoting cultural fire, land[17] and water[18] management practices, traditional and integrated farming, leadership by Traditional Owners in managing invasive and feral animals and plants, and traditional management of waterways and fish stocks.

What can be done?

1. Invest in and create more incentives and opportunities for Indigenous-led land and sea management across policy settings, including ranger programs, forest management, urban Caring for Country and ranger programs, carbon markets, industry and employment programs.
2. Provide national leadership for policy change, resourcing and credits to enable cultural land and fire practices and provide access to Country across tenures, to restore appropriate fire and land management regimes for healthy Country.
3. Provide water entitlements to Traditional Owners to support cultural flows and restoration of wetlands that also have high cultural value and carbon sequestration potential.

Images

Above: Rita Cutter implementing a cool burn at Birriliburru Indigenous Protected Area, WA (image credit: Annette Ruzicka)

Facing page: waterhole (upper) and cool burn (lower) at Turraburra Qld (image credits: Suzanne Thompson)

Guiding principles

1. Ensure adequate engagement and prior informed consent with Indigenous communities to understand their priorities; avoid further eco-colonial frameworks.
2. Bring together knowledges and practices and embed Indigenous leadership, guidance and two-way learning in management of Country by everyone.

Research has shown that there are many benefits from investing in Australian Indigenous cultural and natural resource management, including for health and wellbeing, families and social cohesion, education, governance, self-determination, livelihoods, new industries and culture.[19,20] These benefits far outweigh the costs, and can be felt across whole communities. Indeed, the benefits directly meet the goals that a wide range of government programs struggle to deliver.[19,20,21] The evidence is already in. Tropical savanna fires constitute 70% of Australia's annual fire footprint by area.[22] Over the period 2014-2019, traditional savanna burning methodologies reduced the total area burnt by 88,000sq km. That has led to avoided emission of the equivalent of around seven million tonnes of carbon dioxide.[23]

Strategies to get people back onto Country must be creative, and cross-tenure. Indigenous Protected Areas are well-recognised for the protection and care they offer cultural and natural heritage.[24] But healing and restoring Country requires creative strategies, to be implemented holistically – from urban ranger programs to private land conservation – in order to be meaningful and relevant for all Country and its peoples.

Properly resourcing and investing in Indigenous-led approaches to healing and restoring Country can lead the way to connection and understanding for Australians as a whole, connecting people to place. Guided by both the leadership and the deep knowledge of First Nations peoples, culture-based solutions help us all connect with Country in Australia, bringing together the best of all worlds to heal nature and Country.

Ngupitji Ngupitji : restoring desert and channel country - artesian waterways and rock holes of sacred significance in Iningai Country, central west Queensland

Suzanne Thompson, Elder Lore man Uncle Vincent Forrester and Graham Ambridge

Ngupitji Ngupitji means 'give-give back'. In Iningai Country, in the heart and headwaters of the Galilee Basin, custodians of the Iningai people are working to restore Country and reawaken culture. In 2019, the Indigenous Land & Sea Corporation purchased Turraburra (then called Gracevale), an 8,870 hectare property, which had been drought-declared and left heavily degraded by grazing. This has now given them the opportunity to lead through the ancient lens of caring for Country, where the restoring of artesian waterways and sacred rock holes complimented by the reintroduction of cultural burning practices has seen their country thrive and bring life back into the land.

In one project, funding from the Qld Government Pilot Land Restoration Fund is helping restore seven artesian springs and other significant sacred water places on the property. Before the project, the springs and sacred rock holes were silted up, impacted by grazing and modified for water extraction by the many previous owners of the property. Now they are starting to hold water and new life.

> *"This is a practice for our waterways: cleaning them out so that it becomes a well-manicured garden you can walk through and share country with all that needs to survive off it. We interpret the stuff we're talking about differently. The things that we know make the world go round and make it function - waterholes, and burning Country."*
> *– Suzanne Thompson*

With grazing managed through reducing smaller grazing paddocks, the storing of carbon and soil improvement has meant that groundwater has slowed down. Fire helps keep the grasses healthy, keeps the animals healthy and helps reproduce more food. Four days after one of the cultural waterholes was cleaned out, the rains came, which broke drought. There were waterfalls from the rain filling up these waterholes. A koala showed up in a tree the following morning. This is Ngupitji Ngupitji: give to Country, and Country will give back.

This is a recognised human-induced regeneration carbon project. The application for funding had to be developed up prior to acquiring the property. The Indigenous Land and Sea Country supported and guided this work. Now the owners need to show evidence of carbon capture, setting up 118 monitoring plots across 22,000 acres.

Doing more of this will take more investment: to buy properties back and get people back onto Country, to access schemes and assistance to develop projects, and to manage landscapes. The team at YACHATDAC believe that having Country back has meant that not only Country can heal but whole communities can heal, like the opportunity to protect and restore stock routes (which are our sacred springs).

Buying properties back gets people back onto Country. It creates social enterprise and social impact. With so many properties impacted by drought, cleared, and degraded by heavy management, this is a way to restore and heal Country. It creates opportunities for connection and learning, through caring for country programs, landcare and community participation—"learning from the past while walking together"—for many generations to come.

2. Look after what we have

Retaining and restoring woodlands, forests, grasslands, waterways, aridlands, coastal and marine vegetation is by far the easiest and cheapest path by which we can reduce emissions and reap the benefits of nature. Retaining vegetation keeps local environments cooler and wetter,[25,26] prevents coastal and terrestrial erosion,[27,28] reduces costs of clean water production[29] and increases resilience to natural disasters such as bushfire, floods and storm surges.[30] Environmental accounts demonstrate the value of keeping vegetation for water[31], carbon[32], soil[33], pollinators[34], and tourism.[35] Intangible benefits such as cultural connections to Country and Australians' identification with our wildlife and special places make the case clear for looking after our cultural and natural heritage.

Land clearing and deforestation is responsible for 25% of annual carbon emissions[36] and remains the number one driver of extinction world-wide.[37] Over 75% of the world's land surface has been significantly modified. In Australia, less than 5% of Australia's temperate grassy woodlands remain in a state equivalent to before European invasion.[38] Rates of habitat destruction for agricultural and urban development reduced through the 1990s as a result of investment and regulation, but have risen again in the last 20 years, driven largely by poor regulation of vegetation clearing and habitat modification. Since 2000, 7.7 million hectares of threatened species habitats and listed ecological communities have been cleared, 93% of which took place without referral to the Federal Government, indicating a massive enforcement gap.[39] Private conservation reserves are poorly protected from mining and infrastructure development, indicating high likelihood of future loss. Nearly 20 years of biodiversity offsetting in Australia has been accompanied by a net loss of habitat and the species that rely on it. There is no tracking of offsets and no study to demonstrate their efficacy and ability to achieve desired net gain outcomes.[40] Emerging 'investments in nature' that rely on the biodiversity offsets market to finance restoration and conservation are a false economy.[41] These losses compound Australia's already infamous status as a modern extinction hot spot.[42]

What can be done?

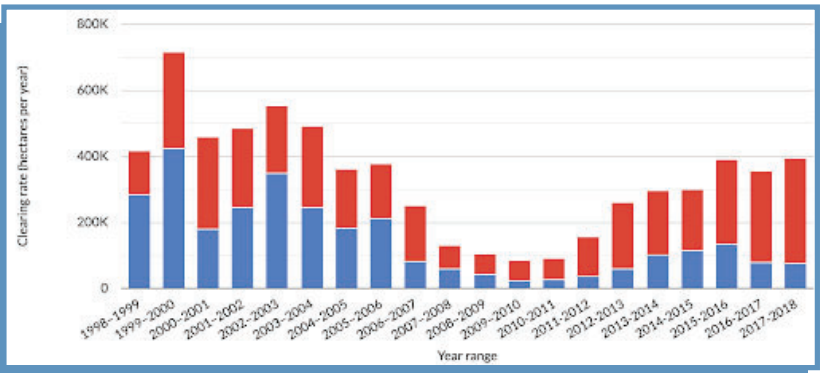
1. Tighten environmental protection laws and their regulation and enforcement to significantly reduce losses through development and land clearing, including agricultural clearing, substantially reduce the allowability of offsets, and grant full legal recognition and protection of private conservation areas, biodiversity offsets and carbon sequestration projects from mining and other development.
2. Create comprehensive, scientifically credible approaches to invest in communities and landholders whose actions care for our landscapes through stewardship and emissions reduction schemes.
3. Resource and mobilise local communities to care for, manage and restore biodiverse carbon and heritage and to tackle substantial landscape challenges such as weeds and herbivores across waterways, private land, cities and pockets of unused crown lands, road reserves and stock routes.

Images

Facing page: Data from the Queensland Government's SLATS database[43] showing the area of native vegetation cleared in the state from 1988-2018. Portion of clearing shown in red represents the regrowth area with remnant vegetation in blue.

Facing page clockwise from top-right: A diver in a restored crayweed (Phyllospora comosa) meadow (image credit: Harriet Spark); a diver planting a Posidonia shoot in a stabilizing jute mesh mat on the sea floor (image credit: John Turnbull); local Sydney Harbour citizen scientists holding up seagrass shoots detached by storms, ready to be re-planted (image credit: Leah Wood).

The power of regulatory reform



Reducing land clearing is a key climate and nature opportunity. In late 2006, the Queensland Government introduced fundamental changes to vegetation management policy, including the cessation of all broad scale clearing, and in 2009, the regulation of clearing of high-conservation value regrowth. The benefits of avoided habitat loss and avoided GHG emissions were immediate. Unpicking of regulatory reforms occurred after a change of government, and the land clearing impacts continue under the current government (see graph). By 2015 Queensland was again responsible for around 80% of Australia's GHG pollution from land-use change.[44] Widely supported return to more robust protections for natural vegetation in Queensland has been slow, and enforcement of the existing rules remains lax. However, there is a huge opportunity to dramatically reduce land use based emissions across Australia with clear rules, properly resourced enforcement, and targeted financial incentives to protect and restore native vegetation. Such changes already enjoy wide public support.[45]

Operation Cray Weed and Operation Posidonia: engaging local communities to restore underwater forests and meadows in Sydney Harbour, NSW

Seaweed forests and seagrass meadows are highly productive coastal habitats that support valuable fisheries and underpin key ecosystem functions including stabilising coastlines and capturing carbon. These habitats have been historically undervalued and are threatened by human activities including urbanisation, pollution, and boating.

'Operation Crayweed' and 'Operation Posidonia' are NSW-based projects that combine science and community engagement to restore key seaweed and seagrass species to create connection with these important marine habitats. The team has used art-meets-science collaborations to raise awareness about the significance of these ecosystems and to showcase how science can effectively reverse a long history of environmental loss and degradation.

Crayweed (Phyllospora comosa) forms large underwater forests along ~5,100 km of coastline in south-eastern Australia and Tasmania. As a foundation species that has a strong role in structuring the ecological community, crayweed supports two of Australia's most valuable fisheries: abalone and rock lobster (or crayfish, from where it gets its name). Crayweed disappeared along the Sydney coastline over 30 years ago as a result of urbanisation and sewage pollution. Operation Crayweed has shown that water quality in Sydney is now suitable for the re-establishment of crayweed. As of 2021, the team has successfully re-established populations in approximately > 4,300 m2 of reef, with the goal of restoring crayweed in all the reefs where it was once dominant along the Sydney coastline.

'Posidonia' (Posidonia australis) is a large, slow-growing seagrass species that is declining rapidly across estuaries of New South Wales, where it is listed as an endangered ecological community. Boat moorings that scour the seafloor and remove marine vegetation are currently a major threat for Posidonia.

One of the greatest challenges for revegetating the seafloor is obtaining suitable donor shoots. The team works alongside citizen scientists, using a new restoration method of collecting seagrass shoots detached during large storms.[49] This method avoids damaging existing Posidonia meadows while engaging local communities in restoration and increasing local stewardship.

Guiding principles

1. Ensure strategies for investing in conservation areas, restoration and carbon across bushland, waterways, coastlines and oceans are climate-resilient and build in protections from the effects of natural disasters, climate extremes and sea level rise.
2. Underpin programs and investments with verified environmental, social and cultural co-benefits to support local jobs for Traditional Owners and regional communities.

Additionality – the principle that carbon credits or offset investments enable a specific carbon project that would not have happened otherwise – is a critical consideration for ensuring we reduce emissions and improve the situation for ecosystems and biodiversity, but also represents a significant challenge for equity. Our current systems mean that Traditional Owners, landholders and communities who have cared for their Country and landscapes have limited access to carbon markets because there is no scope for additionality, whereas those who have degraded or demolished vegetation can generate carbon credit rewards for restoration. Redressing this requires whole-of-government programs to fully invest in protecting what we have while restoring what has been lost.

We have a critical opportunity to avoid carbon emissions by keeping it in the forests, grasslands, mangroves, woodlands, wetlands, peatlands, reefs, and waterways in which it is currently held. This requires transformative changes.[46] This is not a simple matter of 'set and forget' regulation, as so much habitat has already been destroyed or degraded. Proliferating threats to habitats, including feral herbivores, invasive weeds, and changing climates and fire regimes, require active management. Direct investment in local, on-ground work could be greatly expanded. In addition, the Australian Government's Emissions Reduction Fund (ERF) could develop methods for controlling feral animals and their emissions, either from enteric methane emissions (buffalo, feral cattle), or due to damage to wetlands, soils and vegetation. This would reap significant return on investment through mobilising local communities. This means employment and engagement opportunities for thousands of Australians working in positive land management, including wider use of traditional land management practices, with all the benefits of health, wellbeing and education to regional and rural communities that entails.[47,48]

3. Provide an enduring strategic vision and leadership, with culture-and-nature-based pathways to below zero

The 'Australian Way' plan[50] for reducing emissions net zero by 2050 does not provide a clear pathway to implementation and misses an opportunity for comprehensive and strategic direction-setting, including for culture-and-nature-based climate change mitigation strategies. Our ecosystems have limited capacity to withstand the ongoing pressures we impose; investment and strategic leadership is needed if we are to ensure this situation does not worsen and that culture-and-nature-based solutions are able to do their part in reducing Australia's emissions. Global mechanisms to protect biodiversity and natural values are growing in importance. Without a visible strategy, vision and leadership to reverse biodiversity loss and ecosystem degradation and reduce emissions, Australia risks further tarnishing our reputation and losing access to global markets.

National leadership is also needed to bring coherence to disparate jurisdictional policies regarding tenure and access to carbon markets, particularly beyond freehold land. Rights to carbon are inconsistent across legislative frameworks in respective jurisdictions, creating disparities and confusion in navigating who can generate emissions reduction and sequestration projects such as savanna burning.[51] This presents particularly complex challenges for Native Title rights where projects for carbon, cultural, social and biodiversity benefits projects are being undertaken.[51] There are also significant restrictions for pastoral lease holdings, preventing 'enterprise diversification' which would allow carbon restoration projects to be undertaken.[52] These issues could be addressed through developing a strong, national policy vision in consultation with Indigenous communities, other landholders and with state and territory governments.

What can be done?

1. Develop and fully resource an ambitious, integrated and comprehensive government-wide national policy and pathway towards net zero emissions and beyond, providing national coordination, coherence and leadership to streamline approaches across jurisdictions and generate public investment commensurate with the challenge.
2. Implement a strategic approach to carbon sequestration and avoided emissions to ensure investments are linked across catchments and landscapes and prioritised where they are needed most for Country, biodiversity and people.
3. Embed Country, community, culture and nature-based emissions reduction and carbon projects with verified co-benefits as foundational to strategies for adaptation, community development, green infrastructure, urban forests and natural resource management by government corporations (e.g. water corporations).

Guiding principles

1. Ensure local communities and Traditional Owners are fully involved in designing the national strategy, identifying strategic priorities and mapping carbon opportunities linked to place.
2. Look for new opportunities across government programs for connecting people and place in emissions reduction approaches across diverse tenures, land and seascapes.

Images

Above: Nardoo Hills Bush Heritage reserve climate ready project initial work in May 2019, seedling ready to plant (image credit: Kate Thorburn)

Facing page Left: A researcher measures soil carbon decomposition using tea bags in a recently-fenced saltmarsh wetland. Right: A saltmarsh coastal wetland in Western Port, Victoria, showing the benefits of fencing (image credits: Melissa Wartman)

Cultural Fire Credits and Southern Forest Fire methods

Aboriginal Carbon Foundation and Firesticks Alliance

The first virtual conference 'Activating Aboriginal Fire Solutions and the Pathways Forward' was facilitated by Barry Hunter, Chair of the Aboriginal Carbon Foundation, with Firesticks Alliance, on 4-5th December 2020. The virtual conference saw over 170 rangers and Traditional Owners participating from all over Australia, engaging in robust conversations and introducing and progressing the concept of a cultural fire credit.

This program is fully owned and implemented by Traditional Owners, so is not linked to national markets for ACCUs. However, it represents a serious step towards the development of a Forest Fire methodology for southern Australia similar to that in place for northern Australia. The activity of implementing cool burns to mitigate the impact of huge bushfires aims to reduce GHG emissions, protect cultural sites, improve biodiversity, and save a lot of property destruction and lives.

A national plan would encourage approaches that cross tenures and landscapes, from cultural fire in southern forests to novel ecosystems in cities. Evidence suggests that urban greening can sequester and hold as much per unit area as some forest ecosystems[53] and has the potential to reconnect urban residents with nature and deliver health,[54,55] wellbeing, productivity and educational benefits. Strategies such as coastal wetland or shellfish reef restoration would encourage us to embed climate adaptation into our mitigation work, through the provision of co-benefits such as reducing erosion and flooding, increased recreational fishing opportunities and improved water filtration.[56]

A visionary national plan that embeds looking after our land and seascapes within a strategy that sets us on a course towards zero emissions and beyond would restore Australia's global reputation as a nation rich in cultural and natural heritage that we care for. It would enable significant scaling up, strategic planning and resource allocation, so that benefits from carbon investments go to the places and people who need it most.

Restoring saltmarsh and coastal wetlands in Victoria and South Australia

The Victorian Coastal Wetland Restoration Program (#VicWetlandRehab) involves people from research, government, industry, and Traditional Owners who are working to restore critical coastal wetlands.

These wetlands are home to some of Victoria's most endangered birds, frogs and other threatened plants and animals. The #VicWetlandRehab Program has successfully restored 130 hectares worth of saltmarsh (enough for 65 MCGs!) in the Western Port and Gippsland regions of Victoria, restoring this beautiful coastline and sequestering carbon.

This program shows that fencing is a low-cost, effective action for protecting saltmarsh. When livestock have access to these delicate wetlands they damage soils and vegetation. This leads to GHG emissions, loss of carbon storage, and decreased biodiversity. The project has installed over 1200m of fencing to prevent grazing on saltmarsh, and undertaken 100 hectares of weed management to improve brackish tussock vegetation, an important waterbird habitat. Citizen scientists will monitor the sites to understand the long-term benefits to biodiversity and carbon.

The program could be extended all along the coastline. The Blue Carbon Lab is developing a land-use model and spatial heatmaps to capture how saltmarsh distribution changes over time and figure out priority areas to fence. This accounts for future sea-level rise for the different regions along the coast, so that future saltmarsh is included in current efforts. The team aims to include local landholders and Traditional Owners in helping to map the priority areas and possibilities for restoration along the coastline.

In South Australia, The Nature Conservancy, the South Australian Government and COmON Foundation will be restoring up to 2,000 hectares of blue carbon wetlands across 700 kilometres of coastline in Gulf St Vincent and Spencer Gulf. The $1.2 million partnership is likely to be a pioneer for the promised blue carbon methods under the ERF. In order to reap the full benefits of restoration, members of the project team will be working to establish a long-term sustainable financing fund and carbon insurance model to protect and restore more than one million hectares of blue carbon ecosystems.

4. Measure the things we value and demonstrate success

Programs for culture and nature-based climate solutions need to be accountable for achieving what they set out to do, not just because they are often recipients of public funds, but more importantly because it is essential to ensure that our systems as a whole are effectively reducing emissions and minimising the damage and risks from human-induced climate change. Effective monitoring and reporting of the values and benefits achieved from these initiatives creates transparency, and can help attract investment from global carbon markets through a 'premium' product.[57] At the same time, accountability mechanisms must be culturally appropriate and encode the benefits considered most important to the circumstances. They must measure the right things in the right ways. There is an urgent need to establish and resource coordinated, national scale assessment of natural and cultural values and monitor the way that they are changing in response to (or in the absence of) proactive action.

In general, cultural, social and biodiversity benefits should be embedded as core measures against which nature-based emissions reduction projects and incentive schemes deliver. This will hold projects accountable for the benefits they claim to provide and will incentivise projects to deliver for Indigenous people, the wider community, and the biodiversity on which we all depend.

What can be done?

1. Create a national-level system for properly accounting all loss and degradation of vegetation, waterways and natural systems, habitat losses and gains from biodiversity offsets, and closing loopholes in emissions reduction and avoided loss reporting so that we do not lose more than we gain.
2. Embed a transparent, streamlined outcomes-based approach to assess cultural, social, biodiversity and carbon benefits of carbon storage and emission reduction programs and invest in simple, affordable methods and technologies for measuring carbon, biodiversity and community benefits, including resourcing methods developed and led by Indigenous communities such as the peer-to-peer strengths based approach.
3. Tighten legislation to ensure consistency of carbon farming projects with Caring for Country and regional NRM plans.

Significant work has been done on developing Indigenous-led methods for valuation of carbon-based cultural and Country credits. The Aboriginal Carbon Foundation, for example, has pioneered a peer-to-peer learning and strengths-based approach, building on Indigenous ways of recognising benefits and verifying outcomes, and drawing on international and Australian experiences of culturally appropriate and decolonising approaches.[58] Here, cultural and social outcomes are of paramount importance, with biodiversity and carbon framed as co-benefits of programs designed to support people to get back on Country. Peer to peer impact measurement in the Core Benefits Verification Framework has been recognised as a method within the Queensland Government's Land Restoration Fund to verify the cultural, social and environmental value of Aboriginal carbon farming projects.[59]

Carbon project developers under the ERF are currently required to state whether their projects are consistent with regional NRM plans that describe the collective goals developed for integrated benefits at a landscape/catchment scale, but are not required to demonstrate this alignment or report on outcomes. The legislation could be tightened so that carbon project developers have to demonstrate how their project will support regionally relevant priorities, and so that projects are assessed for eligibility based on this, and are required to report against these goals. This would help better ensure projects achieve regionally-relevant social, cultural and natural heritage benefits. Likewise, requirements for projects to demonstrate benefits to Traditional Owners and Indigenous people should also be accountable to the communities they claim to benefit, and deliver on community-defined priorities, such as those articulated in Caring for Country plans.

Images: Left: Birriliburu team monitoring (image credit: Jessica Chapman)

Guiding principles

1. Encourage all carbon storage and emission reduction programs to address benefits for Traditional Owners, Country and biodiversity, and ensure accounting measures are rigorous and feasible to implement by Indigenous communities.
2. Reduce the proliferation of third party certification schemes by non-Indigenous parties that generate confusion or enable 'cherry-picking', while ensuring Indigenous-led schemes remain Indigenous-led.

Concerns have been raised about achieving additionality in some avoided deforestation carbon investments under the ERF[61] and with some other methods used for monitoring and reporting emissions reduction in nature-based schemes.[62] Established global mechanisms for monitoring, reporting and verification of emissions,[63] which the Australian Government has signed up to through commitments to the UN Framework Convention on Climate Change, provide a framework for robust reporting. Ensuring consistent use of standardised reporting methods, with consequences for non-delivery, would strengthen the ability to hold programs and projects to account and provide more certainty for investments into nature-based solutions.

Taking outcomes-focused approaches to verification would provide transparency to ensure projects and programs deliver what they set out to achieve. A nature-based approach to outcomes-based verification would go beyond carbon, to assess and report on the wider cultural, social and biodiversity values that a comprehensive, sustainable, equitable program of work aims to improve. This could be embedded, for example, by using SEEA-compatible approaches within a wider scheme of natural capital accounting for businesses and consistent, national carbon stock and flow accounts, to answer questions such as how much carbon is stored within the bio/geosphere and how much we stand to release through management decisions that also impact biodiversity and other values. This would strengthen our understanding of the links between reducing emissions and preserving and achieving benefits to nature and Country.

There are potential tensions between these global institutions of accounting and Indigenous-led approaches. This could be addressed through investing in and supporting mechanisms for two-way translation of Indigenous-led approaches so that their strengths and values are recognisable for international accounting audiences and contexts.[60,64]

Cultural, social, biodiversity and carbon abatement benefits of savanna burning West Arnhem Land Fire Abatement project[60]

The West Arnhem Land Fire Abatement project uses mosaic burns early in the dry season and at times of heavy dew and low wind to manage healthy fire in savanna country. It ensures 'the right people for country' plan and deliver fire management. Ranger groups have diverse goals for savanna burning, including healthy fire that Traditional Owners direct and undertake appropriate for their own country, fewer wildfires, protecting biodiversity and important sites, maintaining and transferring knowledge, and carbon abatement.

The projects deliver diverse customary livelihoods, help manage food resources, and protect cultural and environmental sites. They have delivered a significant reduction in average area burnt, extent and frequency of late dry season wildfires. Ceremony and events on Country with groups like elders and school children are helping maintain and transfer knowledge.

These social and cultural benefits and benefits for Country are often the primary goals for many of the groups involved, but the projects are also highly successful at carbon abatement, which provides an income source. This landscape-scale project provided the model that underpinned the approved savanna burning method under the ERF, now widely used by Traditional Owners across Northern Australia.

5. Improve access to carbon markets and nature-based incentive schemes

Generating high quality carbon credits that credibly deliver carbon abatement requires a level of complexity and rigour that can create barriers to entry and participation, especially for small organisations and projects. This raises substantial questions of equity and governance. Methods under the ERF and equivalent state-based programs can be costly, complex, time-consuming, and require specialist expertise to navigate. The range of programs available and the different methods used can be confusing for anyone other than large, well-resourced market players. Banks do not always provide mortgagee consent to landholders interested in developing a carbon project, which are still often viewed by banks as an encumbrance, rather than a profitable investment. These barriers of knowledge, capital, resources and time associated with new projects are widely prohibitive for small carbon sequestration and avoided emissions projects.

Development of methodologies under the ERF tend to occur where activities can be counted in the Greenhouse Gas Inventory[65] because these can then contribute to achieving Australia's GHG emission reduction targets. The inventory includes emissions from a limited range of sources for which there is IPCC guidance and for which data are adequate for reporting. For example, there is no IPCC guidance on how to account for carbon dioxide emissions reductions from seaweed, and there is limited national data for changes in seagrass extent. The range of activities allowable under the ERF needs to be expanded to create opportunities for a greater number of projects that benefit culture, Country and nature, such as removing threats to wetlands by fencing out feral or grazing animals and vehicles, planting seagrass, or habitat creation by landward retreat with sea level rise.

In the marine environment, restoration is made even more challenging due to complex regulations and approval mechanisms.[56] Current blue carbon methods under ERF development will require projects to undertake hydrological assessments, which substantially increase costs. Likewise, the soil carbon method under ERF requires use of new technologies, remote and proximal, for measuring and monitoring, to define the carbon estimation areas and to measure and quantify the change. The method is highly prescriptive, complex, and inaccessible for many landholders.

What can be done?

1. Create entry-level emissions reduction pathways for small projects, including methods to aggregate across catchments, land and seascapes, an increased range of eligible management activities recognised in carbon abatement methods, development of new methods including for blue (marine) and teal (freshwater) carbon, streamlined permits and recognised Treaty processes for marine restoration, and incentives schemes such as green roof retrofit and urban greening.
2. Develop culturally appropriate and accessible methods for assessing small and start-up projects and invest in trusted agencies to enable and empower Indigenous and community-based emission reduction and carbon sequestration projects that are good for communities and biodiversity.
3. Facilitate and back streamlined funding mechanisms that provide ongoing streams of funding that financial and banking systems can relate to as viable investments.

Empowering local people to care for their landscapes and Country will grow the number of carbon projects that are good for communities and nature. A pilot currently being developed by the Clean Energy Regulator to streamline registration and crediting, provide access to a fixed price Australian Government purchasing desk for small projects in addition to ERF auctions, and reduced auditing requirements, could help reduce the administrative burden for landholders if adopted more widely.[66] Developing methods for catchment-level and landscape-level aggregation of blue, teal (freshwater) and green carbon that individual landholders can buy into would increase uptake by smaller landholders. Facilitating registration of potential blue carbon projects through Treaty negotiations with respective state and territory governments, acknowledging Native Title rights and interests to the inter-tidal zone, would remove barriers to uptake and reduce legal and administration costs.

Murray Wetland Carbon Storage Project[68,69]

The Murray Wetland Carbon Storage Project is a partnership between scientists, landowners, regional communities, natural resource managers and government to build the capacity of regional communities to manage wetlands and respond to climate change. So far, 26 landholders and project partners have restored over 3,700 hectares of wetland across 41 sites for conservation and carbon capture, with work ongoing across the region.

Each suite of actions is tailored to the landholders' long-term vision for their wetlands and to maximizing the carbon capture and biodiversity gains. Project officers work with landholders to understand this vision, ascertain the condition of the site and determine what rehabilitation works are appropriate. On-ground actions have included revegetation of wetland, riparian and terrestrial vegetation, installing exclusion fencing for grazing, increasing environmental water delivery, weed and pest control, and measures to engage local communities with the space, such as signage, bird hides, and stewardship visits.

Creating investment schemes that operate on scale, such as subsidies for green roof retrofitting would build on widespread global precedents.[67] Bringing these smaller-scale investment opportunities into cities can encourage localised economic stimulus, urban renewal and improved urban disaster resilience, particularly to flooding and heatwaves. Local governments tend to have limited budgets and could be substantial beneficiaries of this kind of program, if barriers to entry are minimised.

Developing culturally appropriate and accessible methods for assessing small and start-up projects, and investing in trusted agencies to enable and empower Indigenous and community-based projects, would help increase awareness, improve accessibility for smaller and start-up projects, and enable many more Indigenous communities, landholders and community organisations to participate. This would not only significantly expand the scale and reach of emissions reduction and carbon sequestration activities, it also has the potential to provide enormous benefits for the bush and for communities, of livelihoods and connection to Country, place and nature for many, many people across all our land and seascapes.

Images

Left: Flourishing vegetation following stock exclusion provides habitat for birds around a farm dam near Yass, NSW (image credit: Suzannah Macbeth, Sustainable Farms)

Facing page: Kylie Crouch, Partha Susarla, Greg Burnett from Unitywater at Yandina Creek Wetland (image credit: UnityWater)

Guiding principles

1. Ensure broader community awareness of and access to the opportunities available.
2. Recognise the importance of locally and culturally trusted networks (e.g. Indigenous Land and Sea Corporation, Natural Resource Management agencies) as not-for-profit enablers of smaller-scale, start-up and community-based projects.

Blue Heart floodplain and coastal adaptation, Sunshine Coast

The Blue Heart Sunshine Coast spans more than 5,000 hectares on a natural floodplain in the Maroochy River catchment; 1,400 hectares of this is public land. The floodplain acts as a critical flood storage area for the lower Maroochy catchment. Sunshine Coast Council, the Queensland Government's Department of Environment and Science and Unitywater, a local water and sewage treatment provider, are working together to establish a regionally significant complex of wetland and floodplain ecosystems that can support nature, help manage floods, provide water filtration, and generate community and recreation opportunities through regional parkland, open space and trails.

Coastal wetlands that once covered the Blue Heart area have mostly been cleared and drained. This means it currently contains much less carbon than it could. Restoring native vegetation to the Blue Heart wetlands will increase carbon storage, reduce the need for costly infrastructure, and help manage risks from coastal hazards like tidal inundation associated with sea level rise.

Wetlands provide habitat for wildlife such as fish and birds. In turn, this supports recreational activities like fishing and bird watching. Nutrient management and sediment reduction works will contribute to enhancing water quality in the Maroochy River. Wetland restoration will allow more water to be held for longer, which can also improve water quality.

This floodplain is already impacted by tidal inundation. It is expected to continue transitioning due to climate change and sea level rise. The Blue Heart project seeks to manage the land and water through this transition to provide better futures for the environment, community and economy.

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