IUCN | Australian Committee

The Road to Restoration

Restoring Australia's Degraded Ecosystems

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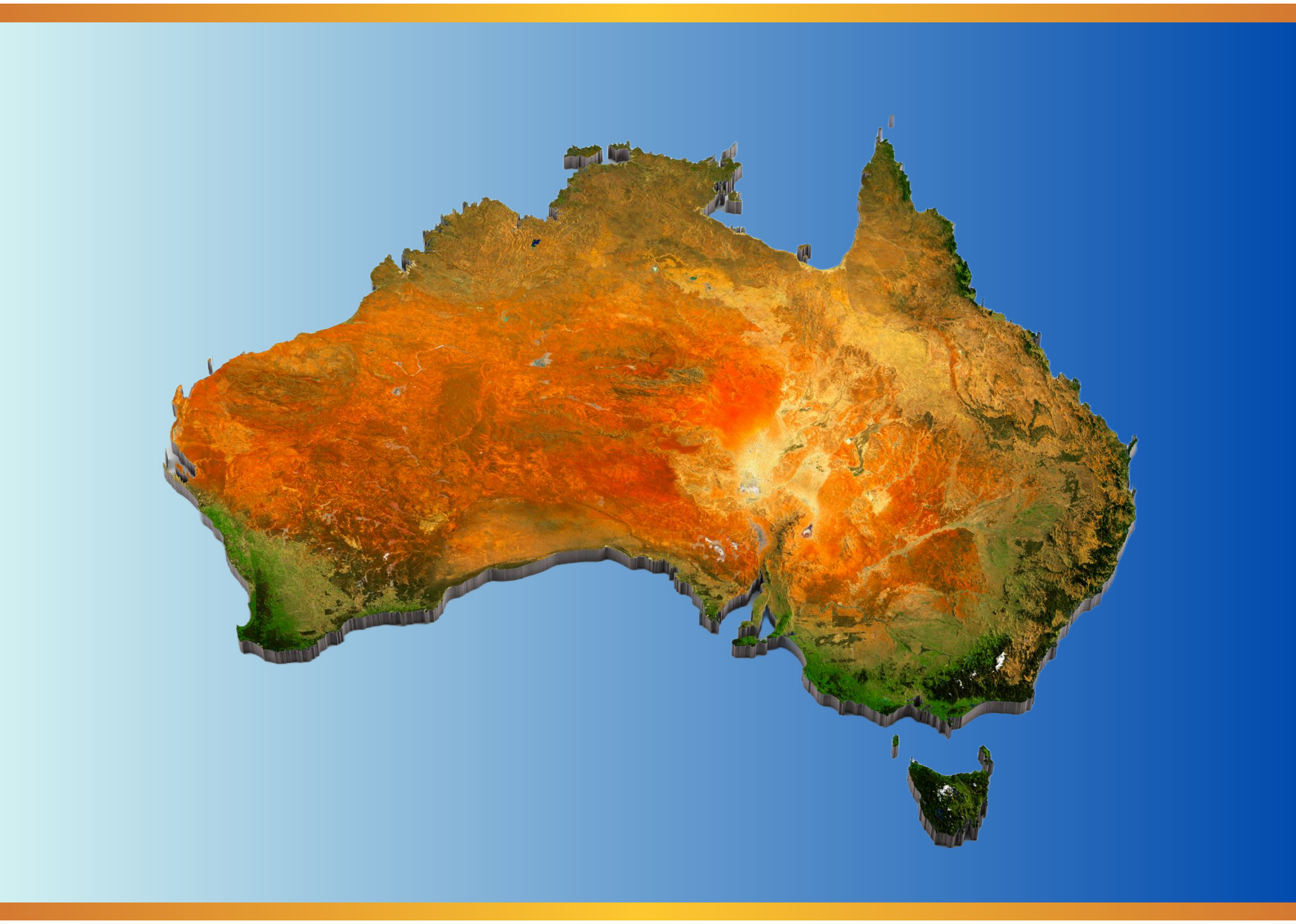

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RESTORATION DECADE ALLIANCE

SER AUSTRALASIA SOCIETY FOR ECOLOGICAL RESTORATION

The Road to Restoration

Restoring Australia's Degraded Ecosystems

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Acknowledgement of Country: Ngunnawal traditional custodian Tyronne Bell welcomed workshop participants to Country. Participants came from many different places and we acknowledge the Traditional Owners of Country throughout Australia and their continuing connection to land, sea and community. We pay our respects to Elders past, present and emerging.

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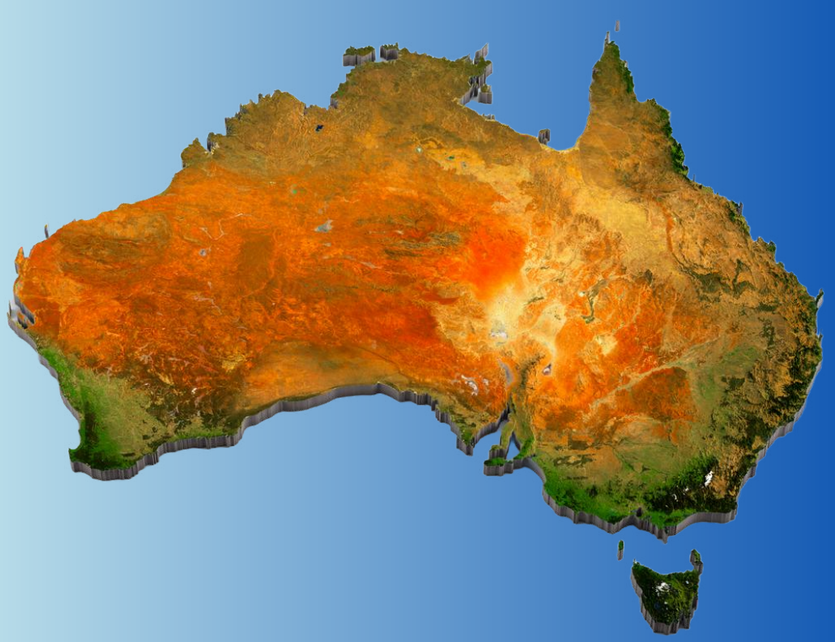

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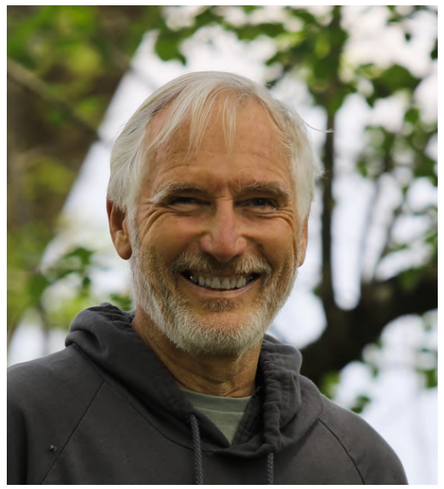


Peter Cochrane

IUCN Vice President
Regional Councillor, Oceania

I had the privilege of attending and supporting the facilitation of the 2024 ACIUCN National Ecosystem Restoration Workshop.

This gathering reinforced a critical truth: the restoration of ecosystems is no longer just an aspiration - it is a necessity.

The workshop underscored the urgent need to scale up our restoration efforts across Australia. It brought together scientists, conservationists, traditional custodians, and policymakers to share ground-breaking techniques, real-world case studies, and bold strategies that are already reshaping degraded landscapes.

The case for large-scale restoration was made abundantly clear: to protect biodiversity, combat climate change, and safeguard community resilience, we must urgently repair the damage to our ecosystems.

A particular highlight for me was the acknowledgment of Indigenous knowledge as foundational in guiding our restoration efforts.

Our First Nations peoples have cared for this land for millennia, and their understanding of natural cycles and sustainable management holds the key to our shared success in restoring ecosystems at scale.

Moreover, the workshop emphasised the importance of multi-sector collaboration—government, private enterprise, NGOs, and the community must all play their part. Ecosystem restoration cannot be siloed; it must be a whole-of-society effort.

Conservation and restoration efforts across Australia are essential for preserving and protecting Australia’s unique biodiversity. The insights gained at the workshop will undoubtedly influence our priorities as we work together towards a healthier, more resilient future for both people and nature.

The message is clear: restoration is not a luxury, but a path to survival in the face of a changing climate and biodiversity loss.

I look forward to continuing this work alongside all of you.

Together, we can make a real difference.

ABOUT THIS REPORT

This report has been produced by the Australian Committee for IUCN (ACIUCN) in 2025. It outlines 8 key steps for consideration, with corresponding goals and recommendations, to achieve the national restoration target:

Priority degraded areas (across terrestrial, inland water, coastal and marine ecosystems) are under effective restoration by 2030 to recover biodiversity and improve ecosystem functions and services, ecological integrity and connectivity.

This report reflects the input of participants who attended the National Ecosystem Restoration Workshop in Canberra in 2024, as well as key insights and recommendations from credible knowledge products on Ecosystem Restoration.

This report was developed in collaboration with workshop participants and members of the organising committee.

This document does not attempt to reflect a comprehensive suite of actions necessary to restore Australia's ecosystems - it highlights priority actions and recommendations drawn from the input of workshop participants and selected expert knowledge products.

This report does not represent a systematic attempt to identify priorities nor does it attempt to cover the full range of knowledge or perspectives. This report aims to collate and synthesise outcomes and insights from the workshop to help guide the formation of a national ecosystem restoration plan for Australia.

BACKGROUND

This report reflects the input of participants who attended the IUCN Australian Committee National Ecosystem Restoration Workshop held in September 2024, as well as key insights and recommendations from some expert knowledge products on ecosystem restoration.

National Ecosystem Restoration Workshop

In Australia's Strategy for Nature 2024-2030, all Australian governments committed to 6 National Targets to support the Kunming-Montreal Global Biodiversity Framework. A key national biodiversity target is:

Priority degraded areas (across terrestrial, inland water, coastal and marine ecosystems) are under effective restoration by 2030 to recover biodiversity and improve ecosystem functions and services, ecological integrity and connectivity.

To achieve this target, Australia needs a coordinated, specific and measurable national restoration plan that identifies priority degraded areas, clearly defines effective restoration, is integrated with conservation, inclusive of all stakeholders, based on partnerships and incorporates a 'whole-of-society' approach.

To help address these challenges and chart a way forward, the IUCN Australian Committee convened a 2-day workshop in September 2024. The workshop addressed key questions to help strengthen Australia's restoration efforts, including: where are our priority degraded areas and how are they determined; what constitutes effective restoration; how to finance and scale-up restoration; and who to engage in restoration efforts.

The workshop brought together 125 experts, practitioners and stakeholders to identify restoration priorities, gaps, needs, values, principles, tools and approaches to create a roadmap of recommended actions for the effective restoration of priority degraded ecosystems in Australia.

Over two days of interactive sessions, workshop participants were asked to:

- Share and review current knowledge and frameworks for ecosystem restoration, identifying barriers, gaps and needs.
- Make recommendations for defining effective restoration in an Australian context.
- Contribute to a proposed system of principles and factors to guide the prioritisation of ecosystems for restoration.
- Identify financial mechanisms to build capacity, resource and support restoration.
- Identify mechanisms to scale-up restoration efforts
- Identify ways to inform, motivate and engage all-of-society in ecosystem restoration
- Build a roadmap of recommended actions for Australia to achieve our national restoration target.

EXECUTIVE SUMMARY

Key steps for consideration with corresponding goals and recommendations

1 | Status Check

- Reviewing what we know about the condition of ecosystems, and restoration in Australia.
- Identifying our knowledge and capacity gaps.
- Recommending necessary actions to fill critical gaps.

Goal: adequate knowledge and capacity for restoration

Australia is in critical need of:

- A comprehensive map and assessment of the condition and value of our ecosystems.
- A strong framework that addresses threats and drivers of degradation and destruction while enabling and incentivising restoration.
- Funding and support for scaled-up restoration and material resources like genetically diverse seed, tools and other materials.
- A funded and well-trained workforce ready and able to perform restoration across the Country.

RECOMMENDATIONS

1.1 | Classify and map Australia's Ecosystems. Work with Australian experts who are developing ecosystem mapping frameworks to consistently classify and map Australia's ecosystems.

1.2 | Assess the condition of Australia's ecosystems. Use the Red List of Ecosystems categories and criteria to assess Australia's ecosystems including description, diagnosis, condition, data and risk categories.

1.3 | Identify priority degraded areas for restoration at a national level, to guide the allocation of resources and effort.

1.4 | Address threats, drivers and causes of degradation. Prepare comprehensive assessments and plans to mitigate threats to ecosystems from anthropogenic activities, natural hazards, and climate change.

1.5 | Consult and work with existing restoration organisations to learn from and scale up existing restoration actions.

1.6 | Build a national network of restoration organisations and people. Create infrastructure to enable cross-organisational and cross-regional communication and collaboration**.**

1.7 | Secure and deploy immediate government funding for urgent restoration resources. This includes genetically diverse seed and workforce training.

1.8 | Prepare to establish a minimum 30 year budget of $17.5 billion p/a for restoration, or 1% of GDP. Consider the economic value of Australia's natural capital, natural resources, and the provision of ecosystem services. Include a mix of base government funding, nature and carbon market revenue and private sector investment.

EXECUTIVE SUMMARY

Key steps for consideration with corresponding goals and recommendations

2 | Guiding Frameworks

- Existing guidance and frameworks for ecosystem restoration.
- Identifying framework gaps
- Suitable frameworks for adoption in Australia
- Recommending actions to fill framework gaps

Goal: a comprehensive & cohesive national policy framework & plan

Australia needs a comprehensive, cohesive national policy framework and national plan to guide restoration.

The framework and plan should include specific measurable goals, incentives for effective long-term restoration efforts, and disincentives to discourage further damage to the environment.

Concurrently, we need incentives, enabling mechanisms, and specific guidance for all sectors to adopt a nature-positive operating model.

RECOMMENDATIONS

2.1 | Urgently and rapidly build a cohesive national strategy and policy framework that incentivises restoration and removes perverse incentives. Prioritise passing the required Nature reform legislation.

2.2 | Incorporate the Society for Ecological Restoration Australasia's National Standards for the Practice of Restoration into policy and practice for restoration in Australia.

2.3 | Adopt a monitoring framework. Consult with Australian experts and stakeholders involved in developing global ecosystem frameworks to apply the best framework for monitoring ecosystem restoration.

2.4 | Monitor for restoration impact. Incorporate principles for monitoring of restoration impact. Develop approaches consistent with the SER / CEM Fifth Global Forum on Ecological Restoration

2.5 | Consider a mix of headline, component, complementary, and predictive indicators in the monitoring framework.

2.6 | Consider using the Framework for Ecosystem Monitoring (FERM) as a tool for storing data and monitoring restoration outcomes.

2.7 | Clearly define and quantify key terms like effective, restoration, and priority areas in the national restoration plan and policy framework, to guide effective restoration efforts.

2.8 | Develop a multi-criteria analysis (MCA) tool to identify factors for prioritisation, including ecological and socio-economic factors, and assess potential priority areas for restoration.

EXECUTIVE SUMMARY

Key steps for consideration with corresponding goals and recommendations

3 | Indigenous Perspectives

- Indigenous Perspectives and Priorities
- Incorporating Indigenous priorities in restoration planning & practice
- Recommendations for the future

Goal: Incorporating Indigenous priorities for healing Country

- Acknowledgment of Sovereignty and land tenure
- Funded and supported Indigenous leadership and management of Country
- Holistic approaches encompassing people, Country and spirituality
- Integrating Traditional Knowledge and Cultural Practices in restoration efforts
- Intergenerational Knowledge Transfer to foster the next generation of Indigenous leaders
- Collaborative partnerships built on trust, respect and fair balance of power in decision-making

RECOMMENDATIONS

3.1 | Acknowledging Sovereignty, land tenure and land access rights is a critical step to working collaboratively with Indigenous communities on healing Country.

3.2 | Embrace a holistic approach to restoration, encompassing people, relationships, Country and spirituality.

3.3 | Support and enable Indigenous leadership and management of Country. This includes supporting Indigenous leaders to navigate complex and emerging policy frameworks and funding mechanisms, as well as prioritising the employment of Indigenous land and sea managers. Include Indigenous communities at the decision-making table at the start of restoration projects.

3.4 | Build collaborative partnerships with Indigenous communities built on trust, respect, and a fair balance of power in decision-making.

3.5 | Integrate Traditional Knowledge and cultural practices in restoration efforts.

3.6 | Fund Indigenous leadership and knowledge of the management of Country, including funding intergenerational knowledge transfer to foster the next generation of Indigenous leaders.

EXECUTIVE SUMMARY

Key steps for consideration with corresponding goals and recommendations

4 | Prioritisation

- Factors to consider when identifying priority areas for restoration
- Useful systems for prioritisation

Priority Goal: Conserving Biodiversity

Preserving biodiversity is a critical goal and an important consideration when prioritising ecosystems for restoration.

Biodiversity is the foundation of a healthy ecosystem, providing essential services like clean air and water, food sources, and regulating climate, ultimately supporting human well-being and the resilience of the environment against disturbances like climate change; without a diverse range of species, the ecosystem becomes less stable and less capable of functioning properly.

RECOMMENDATIONS

4.1 | The biggest threat to ecosystems is land-clearing. Incorporate a land-clearing 'checkpoint' or 'trigger point' into state and federal legislation to ensure any significant land-clearing plan is assessed and by the Federal Government.

4.2 | The second biggest threat to biodiversity and ecosystems is invasive species. Alongside the national restoration plan, create a complementary plan to deal with the major threat of invasive species.

4.3 | Prioritise ecological factors like biodiversity, climate change resilience**,** whether an ecosystem is threatened or a habitat for endangered species, the value of ecosystem services, the condition and integrity of the site, and connectivity when deciding on ecosystems to restore.

4.4 | Prioritise cultural and social factors like Indigenous priorities, community engagement and participation, health and wellbeing, education and training, and political support when deciding on ecosystems to restore.

4.5 | Prioritise practical and economic factors like long-term viability of success, financial support, the technical and practical capacity to restore, cost and effort effectiveness, site accessibility, economic benefits and opportunities when deciding on ecosystems to restore.

4.6 | When considering priority degraded areas for restoration, refer to existing lists and databases identifying key biodiversity areas, priority habitat for threatened species, and threatened ecosystems.

EXECUTIVE SUMMARY

Key steps for consideration with corresponding goals and recommendations

5 | Effective Practice

- Defining ‘effective restoration’
- The elements of effective restoration
- Recommendations to ensure effective long-term restoration in practice

Goal: effective long-term restoration practice and outcomes

Ecosystems are complex and take time to recover.

Restoration is not a quick fix, it involves re-establishing ecological processes, rebuilding species populations and restoring ecosystem functions, all of which happen gradually over time.

A long-term approach ensures that restoration efforts are sustainable and lead to the desired outcomes.

RECOMMENDATIONS

5.1 | Define ‘effective’ restoration. Adopt the accepted definitions and descriptions of ‘effective restoration’ set by SERA, including the prioritisation of Indigenous leadership and knowledge.

5.2 | Create a robust knowledge-exchange infrastructure that incorporates Traditional Knowledge, current research, monitoring data and practical guidance on the elements of effective restoration.

5.3 | Support drivers of change towards an incentivised restoration model, including growing the restoration industry and valuing the multiple socio-economic benefits of restoration.

5.4 | Incentivise restoration using proactive approaches and enabling mechanisms, as a complement to classical punitive measures.

5.5 | Incorporate the principles of Restoring Forward into restoration education and training, and guidelines for practice.

5.6 | Prioritise future needs, ecosystem services, adaptability to climate change and resilience in the Restoring Forward principles.

EXECUTIVE SUMMARY

Key steps for consideration with corresponding goals and recommendations

6 | Funding

- The cost of ecosystems restoration
- A review of proposed funding sources
- Recommendations for financing restoration

Goal: 1% of GDP is committed to nature conservation and repair

Experts have estimated we need at least 1% of GDP or $17.5 billion per year for 30 years to restore Australia's ecosystems and habitat for threatened species.

But we cannot rely on markets or private sector investment. We need a base of long-term funding from the government to provide immediate and critical needs.

Given that nature is the source of life and underpins approximately 50% of our GDP - nature conservation should receive an ongoing, dedicated percentage of the national budget.

RECOMMENDATIONS

6.1 | Consider estimates from experts and set aside a minimum of 1% of GDP (or $17.5 billion) per annum for 30 years for ecosystem restoration and the preservation of threatened species habitat.

6.2 | Review financial subsidies and incentives for actions and entities that damage the environment, with an aim to reverse these.

6.3 | Consider the $6.4 trillion+ estimated value of Australia's natural capital, natural resources, and ecosystem services as a strong argument for more government investment in nature conservation and restoration.

6.4 | Support and enable more restoration funding mechanisms via levies, incentives, private-public partnerships, and the creation of knowledge sharing infrastructure.

6.5 | Reconsider the reliance on private investment for nature repair, as there is no guarantee of adequate funding or investment, and the incentive-to-risk ratio is currently too low.

6.6 | Private investment should be viewed as a complementary option alongside secure, base government funding for nature repair.

6.7 | Monitor the development and implementation of the Nature Repair Market, to ensure integrity, review effectiveness and overall contribution to nature repair funding.

6.8 | Mitigate potential pitfalls in private biodiversity finance to ensure environmental integrity. Shift the focus to risk mitigation and responsible governance to achieve Nature Positive outcomes.

6.9 | Immediate, committed, base government funding is critical to ensure the effective long term restoration of degraded landscapes.

EXECUTIVE SUMMARY

Key steps for consideration with corresponding goals and recommendations

7 | Scaling-Up

- Why we urgently need to scale-up
- Barriers to scaling-up restoration
- Recommendations for scaling up

Goal: Scaling-up to a national restoration system and plan

Scaling up restoration in Australia requires a multi-faceted approach encompassing strategic planning, policy shifts and investment in workforce development, as well as addressing challenges related to seed supply, land access, and implementation.

By focusing on coordinating demand, aligning incentives for landholders, building knowledge and capacity, and ensuring that funding and governance mechanisms are supportive, impactful and sustainable landscape restoration can be achieved.

RECOMMENDATIONS

7.1 | Fund and support a large, highly skilled, fairly compensated restoration workforce. Prioritise Indigenous leaders and land managers in this workforce. This necessitates expanding research-informed training programs delivered by experienced practitioners.

7.2 | Work towards strategic shifts in policy, including syncing of biodiversity and climate goals, a nature investment strategy, and a national restoration plan that includes collaboration with diverse stakeholders.

7.3 | Identify and address barriers to scaling-up, including adequately supplying seed, incentivising access to restoration sites, and providing governance to support knowledge transfer and workforce succession.

7.4 | Enable and foster community engagement in restoration by including community groups in restoration planning and building partnerships with landholders.

7.5 | Improve national education and training infrastructure by enabling knowledge-sharing. Establish a national network to share knowledge, data, models and tools, best practices and lessons learned.

EXECUTIVE SUMMARY

Key steps for consideration with corresponding goals and recommendations

8 | Engaging Society

- Overcoming challenges to communication and education
- Perspectives of Australian society
- Engaging with different sectors and stakeholders
- Recommendations for engaging all-of-society

Goal: All of society supporting and actively engaged in restoration

Ecosystem restoration is crucial for addressing environmental challenges like climate change, habitat loss, and biodiversity decline.

However, scientific understanding alone is insufficient to drive the necessary large-scale action.

Engaging society is essential for fostering widespread support, changing behaviors, and influencing policy decisions that promote ecosystem health.

RECOMMENDATIONS

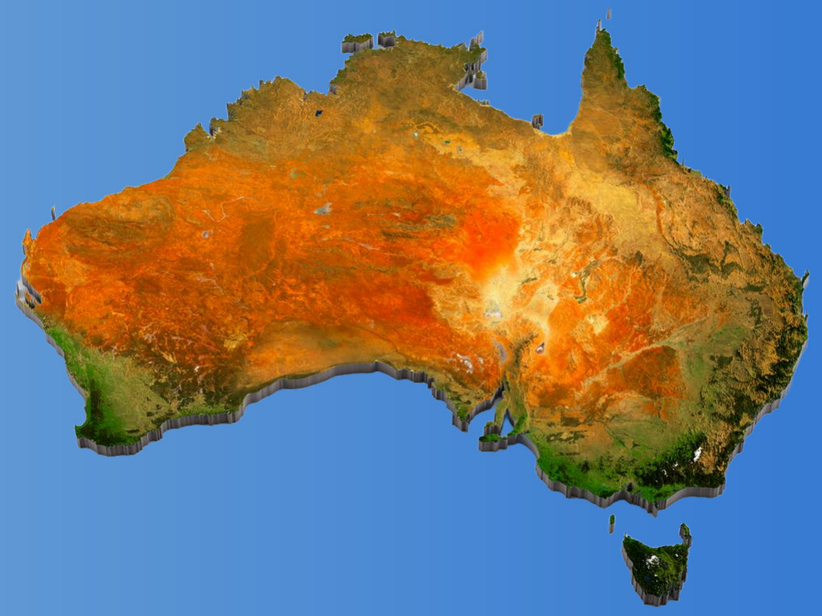
8.1 | Recognise and respond to the demands of Australian society for more spending on nature. The Australian public has made it clear they want the government to take better care of the natural environment.

8.2 | Take a strategic approach to communications and engagement with stakeholders and society, and incorporate this strategy into our national restoration plan.

8.3 | Incorporate strategies to overcome communications challenges into the national restoration plan. The public's limited engagement with environmental science will be a key challenge to overcome.

8.4 | Integrated planning and collaboration across regions needs to be enabled via knowledge exchange framework as well as designed for in national restoration plan.

8.5 | Work with established organisations who already have cross-regional integration capabilities.



1 | STATUS CHECK

- Reviewing what we know about ecosystems and restoration in Australia.
- Identifying our knowledge and capacity gaps.
- Recommending necessary actions to fill critical gaps.

1 | Status Check

Professor Emily Nicholson
Professor of Conservation Biology
University of Melbourne

The state of ecosystems and restoration in Australia

The true state of Australia's ecosystems is surprisingly poorly understood.

Australia does not currently have an adequate baseline of knowledge needed to guide conservation action, including restoration.

Fundamental knowledge gaps include a globally compatible, consistent national classification and map of its ecosystems, with detailed ecosystem descriptions, data on what state they are in and how threatened they are. Nor do we have a national database of restoration priorities or activities.

Work to address some of these knowledge gaps is currently underway. Australian scientists, led by Prof David Keith, are developing a fit-for-purpose national ecosystem typology and map, that draws together knowledge and local and state scales with international standards in the IUCN Global Ecosystem Typology, the first-ever comprehensive framework for classifying and mapping all Earth's ecosystems.

To further address these gaps, Recommendation 1.2 advises using the IUCN Red List of Ecosystems (RLE) categories and criteria to assess Australia's ecosystems. e risk, considering changes in distribution and degradation of key elements. The RLE is a recognised global standard, scientifically robust and evidence-based, for assessing ecosystem conservation status and collapse risk, considering changes in distribution and degradation of key elements.

Red List of Ecosystems assessments have been undertaken for individual ecosystem across Australia (e.g. for the Georgina Gidgee Woodlands, and Mountain Ash forests of the Central highlands of Victoria), and assessments of groups of ecosystems are currently underway (e.g. Australia Alpine ecosystems). But there is an urgent need for nationally comprehensive assessments of all ecosystems, to allow effective prioritisation of action including restoration where it is most needed.

Evidence highlights the urgency for better ecosystem knowledge and data to inform action: Australia's State of the Environment Report 2021 indicates all Australian ecosystems are deteriorating. The EPBC Act lists over 100 ecological communities as threatened, with around half listed as critically endangered. The IUCN Red List of Ecosystems has already identified 21 Australian ecosystems as threatened, and at least 19 Australian ecosystems show signs of collapse or near collapse.

Degradation stems from diverse direct drivers like deforestation, native forest logging, mining, agriculture, construction, and habitat loss/fragmentation. Indirect drivers include climate change and invasive species. These threats lead to biodiversity collapse, desertification, soil erosion, pollution, and exacerbated natural hazards like increased fires and floods. Addressing these threats through comprehensive assessments and mitigation plans is a key recommendation.

Significant capacity gaps hinder restoration efforts, including limited funding, lack of a skilled workforce, insufficient native seed availability, and poor coordination. In the face of these constraints, a network of Australian organisations like Landcare and Greening Australia lead restoration, often collaborating with government and local communities. The Australian Seed Bank Partnership works to conserve native plant diversity. There is a call to work with these established organisations and create a national network for collaboration.

Finally, urgent and substantial funding is required. However, immediate government funding is needed for resources like genetically diverse seed and workforce training. Estimates suggest AU$2 billion annually for 30 years could restore 13 million hectares of degraded terrestrial land, yielding significant carbon offset revenue.

Comprehensive restoration efforts for all ecosystems could cost AU$7.3 billion annually for 30 years, while recovering threatened species could cost AU$15.6 billion per year for 30 years to halt extinctions. Recommendation 1.7 suggests preparing for a 30-year budget of a minimum of $17.5 billion per annum for restoration, acknowledging the economic value of natural capital.

Half of Australia's GDP has moderate to very high reliance on nature. Nature's value to Australia's economy is valued at over $500 billion annually, across sectors from nature-based tourism, food production, carbon regulation to water purification. The return on this investment will not only start to reverse biodiversity loss and ecosystem degradation over the last 200 years - it will also strengthen our economy.

1 | Status Check

“One of our big knowledge gaps in Australia is about our ecosystems: what are they, where are they, and how are they faring? Australia needs a fit-for-purpose national ecosystem map and a national ecosystem assessment.” ~ Professor Emily Nicholson, University of Melbourne

1a | Identifying & assessing degraded ecosystems

Where are our degraded ecosystems and what condition are they in?

There are ecosystems experiencing collapse across the entire Australian continent, including the Antarctic and subantarctic regions.

Australia’s State of the Environment Report 2021 indicated that all Australian ecosystems are experiencing deterioration, with continual declines in native vegetation, soil, wetlands, reefs, rivers and biodiversity.

Over 100 ecological communities are listed as threatened on the EPBC act list, with around half of them listed as critically endangered.

The IUCN Red List of Ecosystems identifies 21 Australian Ecological Communities, categorised from vulnerable to critically endangered.

At least 19 Australian ecosystems have been identified as showing signs of collapse or near collapse (Bergstrom et al, 2021).

Mapping Australia’s ecosystems

Australia does not currently have a globally compatible, consistent national map of our ecosystems. However, groundbreaking work in ecosystem mapping is being led by Australian experts, to help create a globally consistent national map.

Australian expert scientists are leading the development of the **IUCN Global Ecosystem Typology** - the first-ever comprehensive classification framework for classifying and mapping all of Earth’s ecosystems, which integrates their functional and compositional features.

The **TERN Ecosystem Research Infrastructure** measures key terrestrial ecosystem attributes over time from continental scale to field sites at hundreds of representative locations and openly provides model-ready data that enables researchers to detect and interpret changes in ecosystems.

Assessing ecosystem condition

A critical knowledge gap for Australia is our lack of an assessment of our national ecosystems, with detailed condition descriptions and risk categories.

The **IUCN Red List of Ecosystems** (RLE) is a tool to assess the conservation status of ecosystems. Assessments include an ecosystem description, diagnosis, status and data. It is based on scientific criteria for performing evidence-based analyses of the risk of ecosystem collapse, including changes in geographical distribution and the degradation of the key elements of ecosystems. The RLE is a recognised global standard for assessing risks to ecosystems. It allows us to identify common symptoms (both spatial and functional) to understand the level of risk that an ecosystem is facing. The RLE is a scientifically robust, transparent, evidence-based support tool that helps us understand ecosystem dynamics, as well as assess which ecosystems are healthy, and which are at risk of collapse, either imminently or in the future, and why.

RECOMMENDATION 1.1

Work with Australian experts who are developing ecosystem mapping frameworks to consistently classify and map Australia’s ecosystems.

RECOMMENDATION 1.2

Use the Red List of Ecosystems categories and criteria to assess Australia’s ecosystems including description, diagnosis, condition, data and risk categories.

1 | Status Check

1b | Threats and drivers of ecosystem degradation

Synthesis of Threats and Drivers

Many native species and ecosystems are exposed to a diverse range of threats to the condition or existence. Almost all native ecosystems would benefit from threat mitigation strategies such as habitat restoration, invasive weed management and natural hazard management (Olivares-Rojas et al 2024).

Habitat loss and fragmentation can result from physical disturbance and longer-term modifications associated with infrastructure developments, land clearance or reclamation, and hydrological changes caused by water takes or river regulation.

Deforestation, native forest logging and other types of clearance lead to biodiversity collapse in remaining forest fragments. Vegetation loss can cause desertification, soil erosion, flooding, and increased carbon emissions.

Invasive Species prey on, compete with and displace native species, transmit disease, alter habitats and disrupt ecosystem processes.

Agriculture and grazing can degrade ecosystems by damaging soil, over-consuming and polluting water, and destroying forests.

Mining degrades ecosystems via water and air pollution, habitat destruction, land degradation, greenhouse gas emissions and contributions to climate change

Pollution causes damage to animals, plants, soil and water through contamination and erosion. It also reduces values associated with natural ecosystems and their uses.

Fire is increasing with climate change. The 2019-2020 bushfires burnt approximately 24 million hectares of land across Australia. An estimated 1.5 billion animals were killed or displaced.

Floods are increasing with climate change, and can degrade ecosystems through erosion, sedimentation, landslides, soil damage, water pollution and habitat destruction.

Desertification degrades soil, reduces water availability, disrupts infrastructure, decreases biodiversity and increases the risk of disease.

Addressing Threats and Drivers

We must take urgent action to address both direct and indirect drivers of ecosystem degradation and biodiversity loss.

Direct Drivers include immediate human actions like deforestation and pollution
Indirect Drivers are long-term problems like climate change and invasive species.

Climate change is an additional factor that will exacerbate many current issues. Climate change brings multiple cascading threats including damage to habitats, species extinction and shifts in food webs.

Addressing direct and indirect threats and drivers simultaneously will involve concerted efforts focused on ecosystem protection and restoration as well as measures to ensure nature-positive human production and consumption practices.

It is critical to identify and address the multiple threats to ecosystems from desertification, mining, deforestation, agriculture, construction and other industries.

RECOMMENDATION 1.3

Identify priority degraded areas for restoration at a national level, to guide the allocation of resources and effort.

RECOMMENDATION 1.4

Address threats, drivers and causes of degradation. Prepare comprehensive assessments and plans to mitigate threats to ecosystems from anthropogenic activities (e.g., deforestation, native forest logging, mining, agriculture, construction and other industries), natural hazards, and climate change.

1c | Capacity for restoration in practice

Australian Restoration Organisations

In Australia, ecosystem restoration is primarily carried out by a network of large organisations including **Landcare, Greening Australia, WWF Australia, Bush Heritage Australia, NRM Regions, and The Nature Conservancy Australia**, all often collaborating with government agencies and local communities to undertake restoration projects.

The Society for Ecological Restoration Australasia (SERA) is a neutral, independent, non-profit organisation that connects restoration industries across Australasia and through the peak international body for restoration (SER) globally.

The Restoration Decade Alliance Australia (RDA) is a network of 21 Australian restoration organisations and groups supporting the UN Decade on Ecosystem Restoration. In 2023, the RDA issued a statement calling for a national restoration plan. The statement was produced after the 10th World Conference on Ecological Restoration (SER2023) held in Darwin Australia on 26-30 September 2023.

Australian Restoration Practice

Guidelines: SERA establishes principles, standards and guidelines for ecological restoration practice across Australia.

Scales: Restoration is currently carried out primarily by large NGOs at a landscape scale. At a state level, our national parks service performs restoration in designated protected areas. At a local community level, by local councils and community groups.

Seed: The Australian Seed Bank Partnership includes 14 organisations conserving Australia's native plant diversity through collaborative and sustainable seed collecting, banking, research and knowledge sharing.

Climate resilience: Several large restoration organisations are actively working on restoration projects that are resilient to climate change.

Indigenous collaboration: Many restoration projects involve engagement with First Nations communities to incorporate Traditional knowledge and land management practices.

Addressing Gaps and Needs

Significant capacity gaps exist in ecological restoration, including limited funding, lack of a skilled restoration workforce, insufficient native seed availability, complex land tenure issues, and a lack of coordination across regions and between stakeholders, hindering the ability to effectively restore degraded ecosystems at a larger scale across diverse landscapes.

National oversight and support: There is currently no dedicated national team or coordination of large-scale government initiatives (including to support and facilitate activities of non-government sectors) for restoration. In order to scale-up and enable the implementation of a national restoration plan, we must first establish infrastructure to enable communication and collaboration between restoration organisations, across regions and states.

National funding: The lack of national or large-scale funding for restoration, including funding for a trained workforce and the necessary resources, is a major barrier to implementing the critical and urgent restoration efforts needed across Australia's rapidly degrading landscapes.

RECOMMENDATION 1.5

Work with established Australian restoration organisations to learn from and scale up existing efforts and networks.

RECOMMENDATION 1.6

Establish a national network of restoration organisations. Create infrastructure to enable cross-organisational and cross-regional communication and collaboration.

In February 2025, the Australian Bureau of Statistics (ABS) released an estimated economic value of Australia's ecosystem services, based on their first set of experimental National Ecosystem Accounts. The total value is estimated to be around $85 billion in 2020-21, with key services including carbon storage valued at over $43 billion, grazed biomass valued at over $40 billion, and water provisioning valued at $1.4 billion.

1d | Funding and resource requirements of restoration

Strategic and Practical Requirements

Policy and planning: we need strategic shifts in policy, bipartisan leadership, integration of biodiversity and climate goals, and focused restoration planning.

Practical necessities include a national restoration plan, a dedicated national nature investment strategy, innovative funding models for large-scale projects, and enhanced collaboration among stakeholders including First Nations people, scientists, practitioners, and various geographical areas.

Workforce and training: we urgently need a large, skilled and fairly compensated restoration workforce.

We must expand accredited training programs delivered by knowledgeable and experienced practitioners, like Conservation and Ecosystem Management certificates. Accordant collaboration with experts is vital for knowledge exchange, research and development, innovation, and monitoring initiatives.

Material Requirements

Support for seed banks: seed banks are critical for restoration efforts, but lack sufficient capacity and funding. Less than 2% of seed collections are re-tested for viability post-banking, highlighting resource constraints.

Genetic diversity of seed: current restoration practices utilize only 20-30 species, while 150-200 species are needed for provenance and climate resilience. This highlights the need for increased seed collection efforts informed by local knowledge.

Organic matter, minerals and chemicals for soil restoration: Compost, manure, or other organic additions help increase soil fertility and improve structure. Nitrogen, phosphorus, and potassium support plant growth. Mixing sand, silt, and clay help ensure proper drainage and water retention.

Monitoring tools for tracking progress and measuring the success of restoration projects

Financial Requirements

Terrestrial: **AU$2 billion annually** for 30 years could restore 13 million hectares of degraded land without affecting intensive agriculture and urban areas. This would result in 99.8% of Australia's degraded terrestrial ecosystems reaching 30% vegetation coverage, enabling a trajectory to recover critical ecological functions, abate almost one billion tonnes of carbon dioxide equivalent and produce AU$12–46 billion net present value in carbon offset revenue. (Mappin et al, 2021)

All ecosystems: the Wentworth Group of Concerned Scientists *Blueprint to Repair Australia's Landscapes* identified 24 actions worth **AU$7.3 billion annually** for 30 years, which could repair much of the past two centuries of degradation.

Recovering threatened species and restoring their habitats will cost **$AU15.6 billion per year** for 30 years to halt extinctions for 99 priority species. it will cost more to move priority species down one threat category ($AU103.7 billion/year) or remove them from the threatened species list entirely ($AU157.7 billion/year) (Ward et al, 2025)

RECOMMENDATION 1.7

Prepare to establish a 30 year budget of $17.5 billion p/a for restoration. Consider the economic value of Australia's natural capital, natural resources, and the provision of ecosystem services.

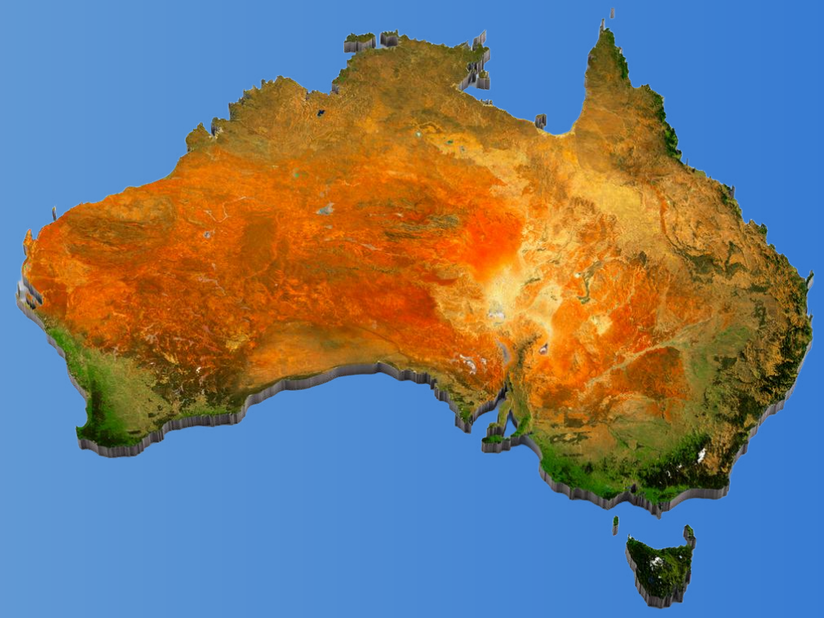
RECOMMENDATION 1.8

Secure and deploy immediate government funding for urgent restoration resources like genetically diverse seed and workforce training. Work with experts to quantify what's required.

GOAL: REACH AN ADEQUATE BASELINE OF KNOWLEDGE & CAPACITY

Australia is in critical need of:

- A comprehensive map and assessment of the condition and value of our ecosystems.
- A strong framework that addresses threats and drivers of degradation and destruction while enabling and incentivising restoration.
- Funding and support for scaled-up restoration and material resources like genetically diverse seed, tools and other materials.
- A funded and well-trained workforce ready and able to perform restoration across the Country.



2 | GUIDING FRAMEWORKS

- Existing guidance and frameworks for restoration
- Identifying framework gaps
- Suitable frameworks for adoption in Australia
- Recommending actions to fill framework gaps

Dr James Fitzsimons
Senior Advisor, Global Protection Strategies
The Nature Conservancy

Global and national frameworks for restoration

Global recognition of the need for ecosystem restoration has never been stronger.

The UN Decade on Ecosystem Restoration to prevent, halt and reverse the degradation of ecosystems on every continent and in every ocean.

The Global Biodiversity Framework's Target 2 commits parties to "Ensure that by 2030 at least 30 per cent of areas of degraded terrestrial, inland water, and coastal and marine ecosystems are under effective restoration, in order to enhance biodiversity and ecosystem functions and services, ecological integrity and connectivity". This 30% target is up from 15% in the previous decade.

The European Union has legislated targets through its Nature Restoration Law which requires member states to restore at least 20% of the EU's land and sea areas by 2030, including specific measures for different ecosystems.

Australia's response, through its Strategy for Nature 2024-2030, has not been as ambitious, committing instead to "Priority degraded areas are under effective restoration by 2030…"

The "priority degraded areas" have not been defined nor mapped and the process, budget and timeframe for doing this remains unclear. With 5 years left to meet the target, we need to make haste.

There is much restoration happening throughout Australia – Landcare has been a national program for more than 35 years. Australia's carbon market has seen large areas of the country restoring native vegetation or removing degrading processes to allow natural regeneration, bringing benefits to biodiversity.

The newly established Nature Repair Market seeks to encourage further private investment, explicitly in biodiversity restoration.

Through the Murray-Darling Basin Plan, environmental flows are seeking to restore important stretches of our rivers and wetlands, and Australia has recently signed the Freshwater Challenge to do more freshwater restoration across the country. In the oceans, federal, state and philanthropic funds have been harnessed to scale up restoration of ecosystems such as seagrass, shellfish reefs and kelp forests.

However, there is a clear and urgent need for a cohesive national restoration plan to be developed, and quickly.

This needs to be more than simply the sum of various activities and programs already running, of which there are many at Federal, state and local government levels, by NGOs, First Nations and local communities.

2 | Guiding Frameworks

2a | Australian Guidance and Frameworks

Ecological Restoration Guidance

The Society for Ecological Restoration Australasia has produced the National standards for the practice of ecological restoration in Australia (Standards Reference Group, SERA, 2021*).* The National Standards identify the principles underpinning restoration philosophies and methods, and outline the steps required to plan, implement, monitor and evaluate a restoration project to increase the likelihood of its success.

Restoration Decade Alliance Australia is a network of Australian environmental restoration groups who support the goals of the UN Decade on Ecosystem Restoration. The group produced a position statement in October 2024 *A national approach to attaining nature-positive restoration in Australia* which includes outcomes and recommendations from their restoration workshops in 2023.

National Policy Frameworks

Australia's Strategy for Nature 2030 sets targets to protect and repair the country's natural environments, aiming to halt and reverse biodiversity loss by 2030. This strategy aligns with the global Kunming-Montreal Biodiversity Framework and includes initiatives like the Nature Repair Market to incentivize restoration projects through a voluntary biodiversity market system.

What's missing:

- A monitoring framework with specific measurable goals.
- 3 bills of the proposed Nature Positive Reforms are yet to be passed, including the Environmental Protection Agency bill, the Environment Information Australia bill, and the Environment Law Amendments and Transitional Provisions bill.
- The removal of perverse incentives and subsidies. It is currently easier to get a permit to destroy nature than to repair it

Inter-related frameworks

It is important to ensure that all new developments are designed to be restorative and not undermine gains made elsewhere, thereby contributing to a holistic, nature-positive approach to ecosystem management.

- Australia's Nature Positive Plan
- Pest Animal Strategy
- Weeds Strategy
- National Reserve System Strategy
- National Representative System of Marine Protected Areas
- National Adaptation Plan
- Threatened Species Action Plan
- Natural Heritage Trust
- Reef 2050 Plan
- Sustainable Ocean Plan
- Indigenous Protected Areas
- 30 x 30 Roadmap
- National Waste Policy Action Plan
- Net Zero Plan
- State Government plans and legislation
- Impact Assessment Frameworks

RECOMMENDATION 2.1

Urgently and rapidly build a cohesive national strategy and policy framework that incentivises restoration while removing perverse incentives. Prioritise passing the required Nature reform legislation.

RECOMMENDATION 2.2

Incorporate the Society for Ecological Restoration Australasia's National Standards for the Practice of Restoration into policy and practice for restoration in Australia

Launched at COP16 in October 2024, the Global Ecosystems Atlas is the first open source, harmonised, comprehensive resource on the extent, condition, change and risk of all the world's ecosystems.
Learn more: globalecosystemsatlas.org

2b | Global Guidance and Frameworks

United Nations

Global Biodiversity Framework (GBF): Includes 23 global targets and a complementary monitoring framework. Target 2 relates to ecosystem restoration. The Ad Hoc Technical Expert Group (AHTEG) on Indicators produced the monitoring framework for the GBF.

UN Decade on Ecosystem Restoration: Aims to prevent, halt, and reverse ecosystem degradation around the world by building a strong global movement and supporting on-ground initiatives.

Framework for Ecosystem Restoration Monitoring (FERM): The official monitoring platform of the UN Decade on Restoration, including project data and geospatial data. Enables the consistent and transparent monitoring, reporting, and sharing of information on restoration initiatives and good practices.

Sustainable Development Goals: The SDGs, particularly Goal 15 (Life on Land), emphasize the need for biodiversity conservation and ecosystem restoration.

IUCN

IUCN Commission on Ecosystem Management
Promotes ecosystem-based approaches for the management of landscapes and seascapes, provides guidance and support for ecosystem-based management and promotes resilient socio-ecological systems to address global challenges.

Red List of Ecosystems: A renowned global standard for assessing risks to ecosystems.

Global Ecosystem Typology: A comprehensive classification framework for Earth's ecosystems that integrates their functional and compositional features.

Restoration Intervention Typology: Assists restoration action and monitoring with a typology of restoration interventions for all terrestrial ecosystem types including coasts and inland waters.

Restoration Barometer: Used by governments to track progress against restoration targets across all terrestrial ecosystems including coastal & inland waters.

Society for Ecological Restoration

The Society for Ecological Restoration
SER produces standards and guidance for implementing restoration. Standards-based restoration helps increase the effectiveness of restoration projects, delivering greater ecological and human wellbeing outcomes.

SER produces the **International Principles and Standards for the Practice of Ecological Restoration**, which guide on the practice of ecological restoration, and the restorative continuum (seen on next page).

SER partners with IUCN Commission on Ecosystem Management (CEM) and its **Ecosystem Restoration Thematic Group** to co-host global fora on pressing issues in ecological restoration to produce guidance and reports.

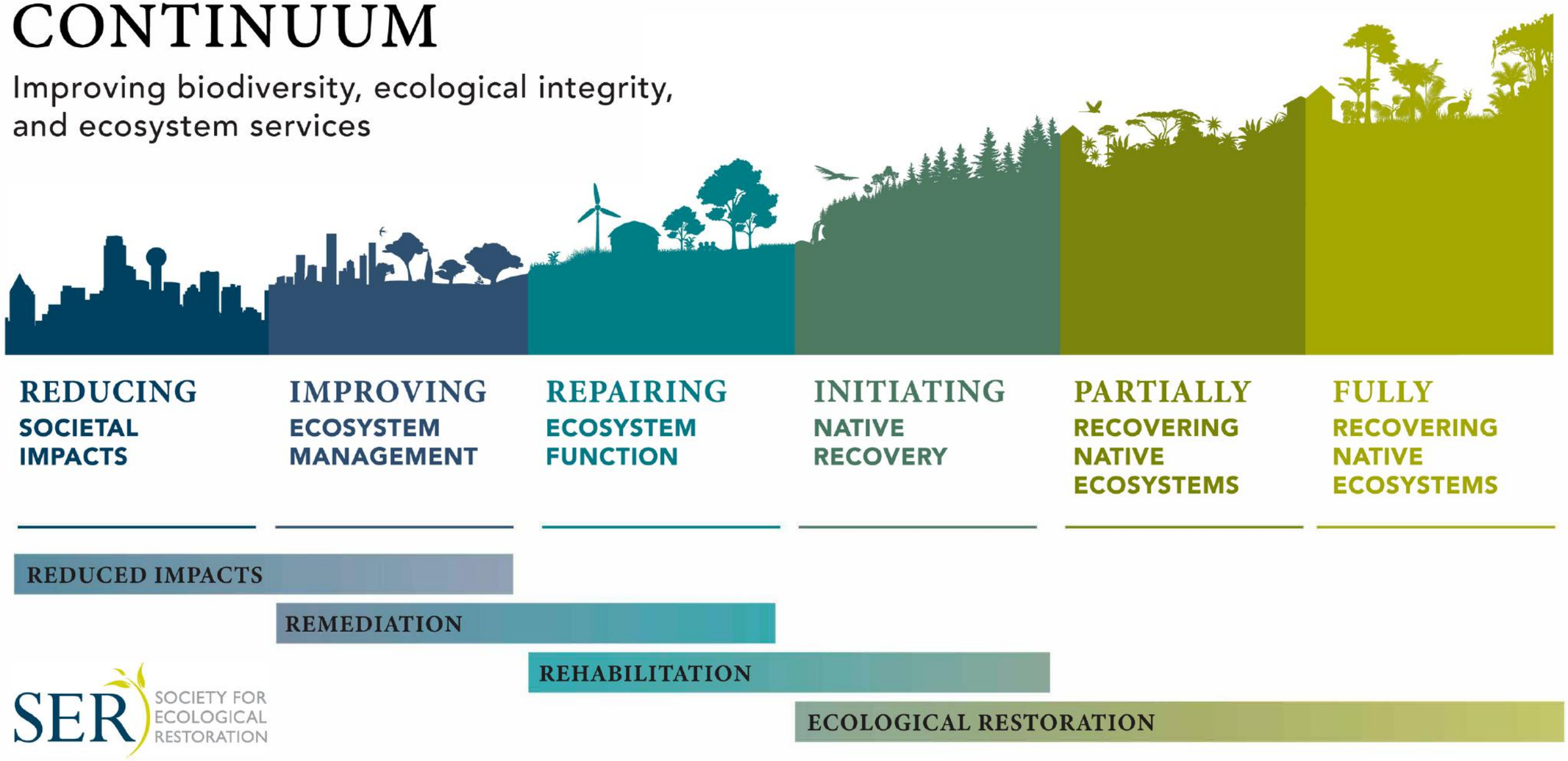
At the **SER / CEM 5th Global Forum** a new set of guidelines was produced, which addressed cultural, social and ecological approaches for assessing restoration impact.
https://www.ser.org/page/GlobalFora

RECOMMENDATION 2.3

Consult with Australian experts and stakeholders involved in developing global ecosystem frameworks to identify and apply the best framework for monitoring ecosystem restoration.

RECOMMENDATION 2.4

Incorporate guiding principles for the monitoring of restoration impact. Develop approaches consistent with the SER / CEM Fifth Global Forum on Ecological Restoration



The SER Restorative Continuum

The Restorative Continuum covers a range of activities that can improve environmental conditions and reverse ecosystem degradation. It also encourages attention to the activities best suited to each location. At each step of the continuum improvements in biodiversity and ecological health outcomes can be achieved through more ambitious actions (Gann et al., 2019).

Achieving biodiversity outcomes requires understanding the complex interactions between different targets and goals. Area-based actions for ecosystem protection, restoration, and connectivity directly influence ecosystem-level outcomes, which then affect species-level outcomes.

2c | Indicators for Measurement and Monitoring

Role and Purpose of Indicators

Achieving biodiversity outcomes requires understanding of the complex interactions between different targets and goals. For example, area-based targets for ecosystem protection, restoration, and connectivity directly influence ecosystem-level outcomes, which subsequently affect species-level outcomes.

Indicators play a crucial role in both monitoring progress towards biodiversity goals and planning effective conservation and restoration actions. Monitoring efforts should be cohesive and integrated across scales, from global assessments down to national, state, and regional levels. This approach facilitates a comprehensive understanding of biodiversity trends and enables targeted interventions.

Types of Indicators

Headline Indicators provide a high-level overview of progress but may not fully capture the complex relationships between different biodiversity components.

The headline indicator for GBF Target 2 is "Area under restoration", which essentially measures the percentage of degraded terrestrial, inland water, and coastal and marine ecosystems that are undergoing effective restoration by 2030.

Component and Complementary Indicators, including predictive indicators, help address linkages and dependencies between different targets and actions, offering a more nuanced understanding of these relationships, and can guide effective actions. Component indicators for GBF Target 2 are the extent of natural ecosystems by type; and maintenance and restoration of connectivity of natural ecosystems. Complementary indicator examples include habitat distributional range, intact wilderness, bioclimatic ecosystem resilience index and increase in secondary natural forest cover.

Predictive Indicators are crucial for anticipating future biodiversity trends and informing proactive conservation strategies. Examples of predictive indicators include increasing canopy cover, presence of pollinators and soil health improvements.

Data Collection and Reporting

BioCollect - Atlas of Living Australia

BioCollect is an advanced, but simple-to-use data collection tool designed for scientists, ecologists, citizen scientists and natural resource managers. The tool is a platform for restoration project data managers to collect and manage their biodiversity, ecological and natural resource management data. It is free for public use.

BioCollect provides form-based structured data collection for activity-based projects such as revegetation, rehabilitation; or weed and pest management projects.

The Framework for Ecosystem Restoration Monitoring (FERM) registry is a key tool for collecting and harmonizing restoration data.

FERM collects area-based data on restoration projects and programs and enables the visualization of restoration areas on a map, sharing restoration initiatives, and displaying aggregated country-level restoration data.

RECOMMENDATION 2.5

Consider a mix of headline, component, complementary, and predictive indicators in the monitoring framework.

RECOMMENDATION 2.6

Consider using the Australian BioCollect system or the Framework for Ecosystem Monitoring (FERM) as a tool for storing data and monitoring restoration outcomes.

2d | Defining key terms

Ecosystem Restoration

In order to satisfy the national biodiversity target of having ‘priority areas’ under ‘effective restoration’ by 2030, the definition of the key terms ‘effective’, ‘restoration’ and ‘priority areas’ must be established.

The GBF defines restoration as “the process of returning an ecosystem to its natural structure, function, and diversity after it has been degraded or destroyed”.

SERA defines restoration as “the process of assisting the recovery of an ecosystem that has been degraded, damaged, or destroyed.”

The SERA National Standards recognise that the term ‘ecological restoration’ is commonly used to describe not only an activity but also the outcome sought.

The Standards favour the term **restoration** for the *activity undertaken* and **recovery** for the *outcome sought* or achieved.

Effective Restoration

The concept of "effective restoration" emphasizes standards-based restoration that yields net gains for biodiversity, ecosystem integrity, and human well-being. **Effective restoration** should be assessed against clear goals and measurable indicators.

Restoration vs Rehabilitation

Both Restoration and Rehabilitation are incorporated in Target 2 of the GBF. Ecological restoration focuses on restoring natural ecosystems, while rehabilitation aims to reinstate ecosystem functions within transformed ecosystems, even if they don't return to a fully natural state.

Restoration: Restores an ecosystem's structure, species composition, and productivity to its natural state.

Rehabilitation: Repairs damage or disturbance to an ecosystem, and may involve putting the landscape to a new use.

Priority Areas

A priority area for restoration is, essentially, a location identified as having the highest need for ecological restoration. This identification could be based on factors like high biodiversity value, significant degradation, critical connectivity role, potential for ecosystem service benefits, and feasibility of restoration outcomes considering costs and social considerations; or areas where restoration efforts are likely to yield the most positive environmental impact with the most manageable constraints.

What are our ‘priority’ areas?

To help determine priority areas, it would help to develop a multi-criteria analysis (MCA) tool. The tool should overlay multiple ecological and socio-economic factors to identify areas with the highest combined restoration potential.

See Section 4 of this report on *Prioritisation* for a deeper exploration of this topic.

RECOMMENDATION 2.7

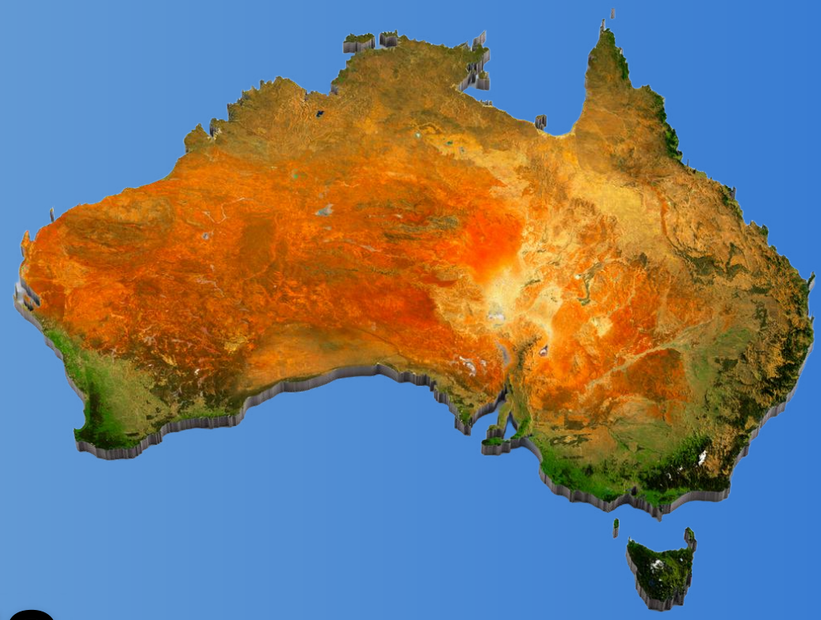
Clearly define key terms in the policy framework to guide effective restoration efforts of priority areas.

RECOMMENDATION 2.8

Develop a multi-criteria analysis (MCA) tool to identify factors for prioritisation and assess potential priority areas for restoration.

GOAL: NATIONAL POLICY FRAMEWORK

Australia needs a comprehensive, cohesive national policy framework and national restoration plan to guide restoration. The framework and plan should include specific measurable goals, incentives for effective long-term restoration efforts, and discourage further damage to the environment. Concurrently, we need incentives, enabling mechanisms, and specific guidance for all sectors to adopt a nature-positive operating model.



3 | INDIGENOUS PERSPECTIVES

- Indigenous perspectives and priorities
- Incorporating Indigenous priorities into restoration planning
- Recommendations for enabling change

3 | Indigenous Perspectives

Indigenous Priorities and Goals for Healing Country

Barry Hunter
CEO
NAILSMA

In August 2024 the North Australian Indigenous Land and Sea Management Alliance (NAILSMA) hosted the second Reimagining Conservation Forum on Djabugay Country.

At this forum, we held an interactive workshop exploring Indigenous priorities for land restoration and healing Country in Australia.

Workshop participants highlighted systemic challenges, the need for Indigenous land access and integrating Traditional Scientific and Cultural knowledge into restoration efforts.

Workshop participants also emphasised shifting from ecological metrics to biocultural indicators that incorporate both ecological and cultural factors.

The outcomes of this forum were then presented at the ACIUCN National Ecosystem Restoration Workshop in Canberra in September 2024.

Key themes and recommendations that emerged from the workshop included:

Indigenous Knowledge and Leadership

Indigenous leadership is essential to successful restoration. Workshop participants highlighted the strength of Indigenous leadership in uniting diverse groups, and stressed the importance of traditional knowledge in guiding restoration. There was a call for non-Indigenous organisations and the government to “make space” for Indigenous leadership.

Reciprocity and Holistic Restoration

Restoration is about both ecological recovery and healing Indigenous communities. Participants framed restoration as a "reciprocal relationship" that also addresses issues like health disparities and domestic violence. This holistic approach, focusing on "people, Country, and spirituality," is essential for true healing.

Shifting cultural paradigms and breaking systemic inequality

Participants critiqued economic-driven values that hinder restoration, as well as systemic inequality and barriers to accessing funding. Many called for cultural change, including empathy training and integrating Traditional Knowledge in school curriculums, to foster national commitment to caring for Country.

Rethinking Restoration Metrics

Moving beyond conventional ecological metrics, participants advocated for biocultural indicators. Instead of purely ecological measures, the focus should be on Indigenous community involvement, empowerment, and cultural restoration, particularly in terms of land tenure and reconnecting landscapes.

Giving Land Back and ensuring equitable access to Country

Giving Land Back to Traditional Owners is key to effective restoration, allowing Indigenous management and custodianship. Returning land enables traditional practices like cultural burning and reconnects Indigenous people with their ancestral lands.

Collaboration and Power Sharing

Genuine collaboration is essential, but the panel critiqued superficial "co-design" that doesn’t share power. Participants emphasised the need for a more equitable system that moves beyond competitive grants and for policy changes that empower Indigenous communities.

3 | Indigenous Perspectives

Healed People Heal Country and Healed Country Heals People. Healing Country is inseparable from healing Indigenous people. This reciprocal relationship highlights the need to prioritise the well-being of Traditional Owners and their communities as a foundation for effective land management.

3a | Overview of Indigenous Perspectives

These perspectives were drawn from panellists and participants in a separate Land Restoration workshop held at the NAILSMA Reimagining Conservation Forum, 19-22 August 2024, Djabugay Country

Healing Country

"Healing Country" goes beyond environmental restoration. It signifies a deep, interconnected relationship between Indigenous peoples and their land.

Healing Country involves healing the land, the history of damage, and the people with a connection to it - recognising that the well-being of one is intrinsically linked to the other.

It includes restoring cultural practices, knowledge, and connection to Country.

Healing Country requires acknowledging the central role of Indigenous peoples and their traditional knowledge in restoration.

Non-Indigenous Australians must move beyond spreadsheets and policies to embrace a deeper, broader understanding of how things should operate on Country. This includes recognising the complexity of Indigenous relationships and allowing time for appropriate decision-making.

Elements for Healing Country

Indigenous leadership and land tenure: We need to support Indigenous leadership and land management with stronger cultural laws and grassroots decision-making.

Integrating Traditional Knowledge: Recognising Indigenous science, and integrating Traditional Knowledge and practices is essential for healing Country.

Holistic approach: Restoration must encompass people, Country, and spirituality, moving beyond metrics and measurements to consider biocultural indicators and benefits to Indigenous communities.

Intergenerational knowledge transfer: Maintaining cultural knowledge exchange and fostering leadership in younger generations is vital for long-term success.

Respectful partnerships: Partnerships require trust, respect, and the application of *free, prior, and informed consent* principles. Restoration projects should be equitably co-designed, ensuring a fair balance of power in decisions.

Challenges and Opportunities

Invasive species: Invasive species, including the western lifestyle, are significant threats to nature, emphasising the need for education and a shift in Australian culture to foster connection to Country.

Systems and structures: The existing paradigms of conservation, including funding models and power imbalances, hinder genuine collaboration and Indigenous leadership. We need to rethink and rebuild the system to move towards true Indigenous-led design and management of nature conservation and restoration efforts.

Building genuine relationships: The foundation for effective collaboration lies in developing respectful relationships with Indigenous communities, moving beyond words to understanding and feeling their perspectives.

Long-term funding: Competitive grants and short funding cycles are counterproductive. Long-term, open funding models are necessary to support genuine collaboration and community-driven initiatives.

RECOMMENDATION 3.1

Acknowledging Sovereignty, land tenure and land access rights is a critical step to working collaboratively with Indigenous communities on healing Country.

RECOMMENDATION 3.2

Embrace a holistic approach to restoration, encompassing people, relationships, Country and spirituality.

3 | Indigenous Perspectives

3b | Incorporating Indigenous priorities

Build collaborative partnerships

Restoration project teams need to foster genuine relationships with Indigenous communities that are built on a foundation of trust, respect and understanding.

It involves always approaching Indigenous communities with respect, seeking guidance and ensuring appropriate protocols are followed. Education on the diverse cultures and experiences of different Indigenous groups across Australia is a critical first step.

Building collaborative partnerships includes creating space for Indigenous voices to be heard and understood. This might involve factoring extra time at the start of restoration project timelines to build those relationships, run workshops, and walk on Country at the invitation of Indigenous leaders.

Building meaningful connections with Indigenous communities requires ongoing engagement and commitment.

Support Indigenous Leadership

Indigenous community members should have a seat at the decision-making table from the very start of restoration and management projects, which means at the idea stage.

Aim to meaningfully support and engage with Indigenous communities, providing capacity building opportunities to navigate policy frameworks and funding mechanisms, as well as shape and direct initiatives from an Indigenous perspective.

Genuine engagement and co-design means designing projects for Indigenous leadership, which can be supported by funding and resources from non-Indigenous sources.

Support Indigenous Employment

Seek to engage and employ Indigenous guides, land and sea managers, and rangers in exploring, learning about and caring for Country.

Resources for Implementation

Reimagining Conservation Forum Reports (2024 & 2025)
The reports on the outcomes of the 2022 and 2024 Reimagining Conservation Forums detail the key themes that emerged from each forum. These themes reflect the perspectives and priorities of Indigenous communities in caring for Country.

Our Knowledge Our Way in Caring for Country (2020) Best-practice guidelines for Indigenous-led approaches to strengthening and sharing knowledge for land and sea management. These guidelines are a key output from the project *Knowledge Brokering for Indigenous Land Management*.

Free Prior and Informed Consent – An Indigenous Peoples' right and a good practice for local communities (2016)
Produced by the Food and Agriculture Organisation (FAO), this manual is designed as a guide for practitioners and provides information about the right to free, prior and informed consent, and how it can be implemented in six steps.

RECOMMENDATION 3.3

Support Indigenous leadership and management of Country. Support Indigenous leaders to navigate policy frameworks and funding mechanisms, as well as prioritising the employment of Indigenous land and sea managers. Include Indigenous communities at the decision-making table at the start of restoration projects.

RECOMMENDATION 3.4

Build collaborative partnerships with Indigenous communities built on trust, respect, and a fair balance of power in decision-making.

3 | Indigenous Perspectives

3c | Enabling change into the future

A Paradigm Shift

Reimagining Restoration

The existing paradigms of conservation, including short-term, competitive funding models and power imbalances, hinder genuine collaboration and Indigenous leadership. We need to "rethink and rebuild" the system to move towards true Indigenous-led design and management of nature conservation and restoration efforts.

We also need to move away from only looking at metrics and measurements and also look at biocultural indicators. Instead of looking at how much it costs to plant each tree and how many trees are planted, we should consider how the Indigenous community is getting involved and how they are benefiting.

We must also restore cultural pathways to improve restoration outcomes. This involves actively working to re-establish traditional Indigenous practices, knowledge systems, and connections to land that were disrupted or diminished due to colonisation.

Education and Training

School Curriculum Changes

A critical first step is the broad-scale integration of Indigenous knowledge systems, history, and stories into school curriculums across all subjects. This change should also include basic environmental knowledge like understanding your local water catchment.

Intergenerational Knowledge Transfer

Maintaining cultural knowledge exchange and fostering leadership in younger Indigenous generations is vital for long-term success. We must support the ongoing intergenerational transfer of Traditional Knowledge.

Community Workshops and Tours

Support and enable Indigenous-led workshops and tours of Country that include the history, spirtual information, and ecological information about the flora, fauna, water and ecosystems that belong there.

Social and cultural change

We can enable social and cultural change by incorporating Indigenous culture and the principles of caring for Country into all aspects of Australian society.

For example, we need to engage the masses to care for Country. We could implement a multi-channel positive national propaganda campaign to connect all people to Country. This campaign might involve animal totems for national sports teams, instead of their jerseys being only emblazoned with advertising.

In another example, immigrants in citizenship ceremonies aren't expected to commit to custodianship of Country because non-indigenous Australian citizens don't expect it of themselves. But we should change that, as everyone can be instilled with a love, respect and responsibility to care for Country.

The education and health sectors must also join the environment sector to incorporate Indigenous knowledge and culture into their operations and our way of living.

RECOMMENDATION 3.5

Integrate Traditional Knowledge and cultural practices in restoration efforts.

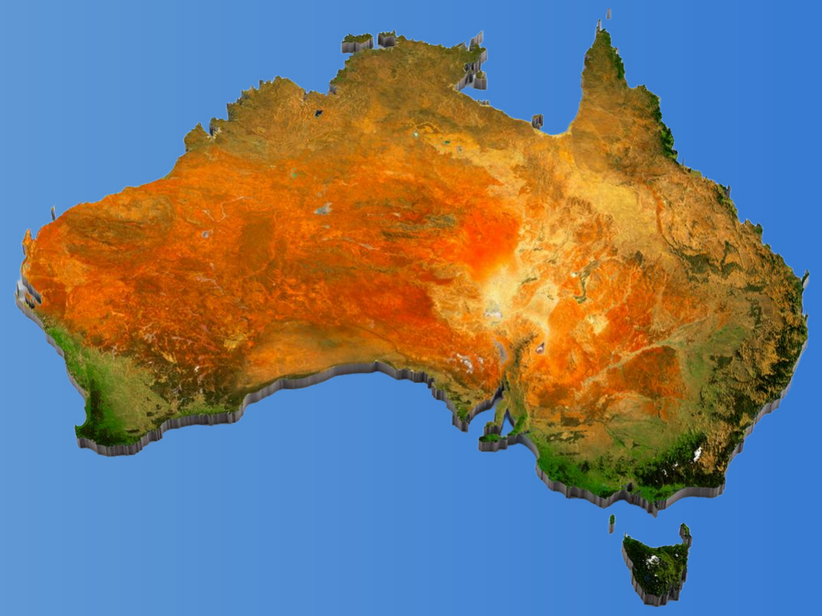
RECOMMENDATION 3.6

Fund Indigenous leadership and knowledge of the management of Country, including funding intergenerational knowledge transfer to foster the next generation of Indigenous leaders.

INDIGENOUS PRIORITIES FOR HEALING COUNTRY

- Acknowledgment of Sovereignty and land tenure
- Funded and supported Indigenous leadership and management of Country
- Holistic approaches encompassing people, Country and spirituality
- Integrating Traditional Knowledge and cultural practices in restoration efforts
- Intergenerational Knowledge Transfer to foster the next generation of Indigenous leaders
- Collaborative partnerships built on trust, respect and fair balance of power in decision-making

Images: NAILSMA
2024 Reimagining Conservation Forum



4 | PRIORITISATION

- Factors to consider when determining priorities for restoration
- Deciding on priority areas for restoration

4 | Prioritisation

Thinking Pragmatically about Prioritisation

Australia's commitment to the Global Biodiversity Framework (GBF) Target 2 emphasizes restoration in priority degraded areas across terrestrial, inland water, coastal, and marine ecosystems. As part of this, the revised Strategy for Nature stresses the importance of identifying priority areas for restoration, which allows for targeted resource deployment by governments, businesses, NGOs, First Nations peoples, and community groups.

The following pages outline key considerations raised at the ACIUCN workshop regarding the identification of these priority areas in Australia. These considerations cover ecological, social, and practical factors, many of which align with the criteria already used to allocate restoration funding in the country.

However, Australia's GBF Target 2 commitment presents a unique opportunity for a unified national effort.

The Commonwealth government, in partnership with States, Territories, and regions, can develop a national system of candidate priority degraded areas that will guide investment and resource allocation for restoration efforts.

The workshop acknowledged that the Target 2 priority degraded areas should not only focus on native ecosystems but also consider surrounding production landscapes and waterscapes. Restoration in these areas could help mitigate negative impacts on ecosystems. The approach should prioritize inclusivity, ensuring that Australia's contribution to Target 2 reflects ongoing community-driven restoration efforts in areas where local priorities are already being addressed and are likely to continue.

By adopting a nationally coordinated approach, Australia can enhance its restoration efforts and ensure that resources are allocated efficiently. The identification of priority areas, supported by a clear system for guiding investment, will be crucial in achieving the goals of GBF Target 2.

The inclusive and collaborative nature of this approach, involving multiple stakeholders, will also help ensure the long-term success and sustainability of restoration projects.

The exercise should err on the side of inclusivity so that Australlia's contribution to Target 2 can also include areas where restoration priorities by communities is already occurring and is likely to continue.

This unified effort will not only address ecological degradation but also support social and cultural outcomes by engaging with local communities, particularly First Nations peoples, whose traditional knowledge and leadership are essential to successful restoration.

By embracing both ecological and social dimensions in its restoration strategy, Australia can make a meaningful contribution to global biodiversity targets while fostering a more resilient and inclusive environment.

4 | Prioritisation

There are many factors to consider when determining which ecosystems to prioritise for restoration. These include ecological, cultural, social, economic and practical factors. In small groups, workshop participants were asked to list and order **ecological, social, cultural, practical and economic** factors for consideration when prioritising ecosystems for restoration. This section summarises the multiple factors deemed important by participants.

4a | Top-line Factors for Prioritisation

Potential and need for the removal of threats and drivers of degradation

The first step for all restoration projects is to identify and cease the drivers of degradation. Therefore, one of the first considerations in identifying priority areas is to identify the best areas for threat management.

According to the 2021 State of the Environment report, the biggest threats and drivers of ecosystem degradation in Australia are **invasive species and land clearing**, the latter of which is the biggest driver of habitat loss, which is considered the most significant factor in biodiversity decline across the country.

Despite the acknowledged climate and biodiversity crisis, native vegetation in Australia continues to be cleared at an alarming rate of over 500,000 hectares per year. What's worse is, under current federal law, almost no land clearing is assessed or approved beforehand. The draft laws do not include a clear solution to the land-clearing crisis that is decimating ecosystems across the country.

Introducing a land-clearing check-point in legislation would help ensure that any plan to clear significant pieces of land is assessed and pre-approved by the Federal Government.

Climate change and resilience to it

Climate change adds complexity to restoration efforts, as it can affect the permanence of restoration outcomes. Climate effects and their implications extend beyond just the consideration of abiotic factors such as warming temperatures and rising sea levels. For example, they include attention to changing distributions of invasive species that can disrupt existing ecosystems and changing patterns of human resource use or demand in response to climatic changes. Therefore, integrating climate change projections and adaptation strategies is essential for long-term restoration success.

When identifying priority areas for restoration, considering climate change resilience is crucial because it ensures that the restored ecosystem will be better equipped to withstand the impacts of a changing climate, such as extreme weather events, altered precipitation patterns, and rising temperatures, ultimately leading to a more sustainable and resilient landscape.

Addressing the causes of climate change is also essential for the long-term success of restoration.

Holistic prioritisation model

Factors for prioritisation should be considered holistically and multi-dimensionally to ensure that diverse values and perspectives on the feasibility and benefits of restoration are considered.

As we explore further on the following pages, the multiple factors for consideration include:

Ecological factors: biodiversity, habitat for endangered species, resilience to climate change, connectivity, ecosystem services, the critical or endangered status of the ecosystem, rarity and irreplaceability.

Social and cultural factors: Indigenous priorities and perspectives, local community engagement, political advocacy and support, and co-benefits like health, wellbeing, and employment opportunities

Practical and economic factors: feasibility of success, cost-effectiveness, site or project viability,

RECOMMENDATION 4.1

Incorporate a land-clearing 'check point' into legislation to ensure any land-clearing plan is assessed and approved by the Federal government.

RECOMMENDATION 4.2

Alongside the national restoration plan, create a complementary plan to deal with the major threat of invasive species.

4 | Prioritisation

4b | Ecological factors to consider

Ecological Factors for Consideration	Important	High Priority	Med Priority
Resilience to climate change, degradation, etc	**22**	16	6
High Biodiversity	**20**	17	3
Critically endangered ecosystem	**20**	16	4
Connectivity	**15**	8	7
Ecosystem Services value / function / risk of collapse	**14**	11	3
Habitat for endangered species	**14**	11	3
Condition / integrity / Intactness / ability to rehabilitate	**11**	10	1
Irreplaceable / rarity / last footholds for species	**5**	3	2
Threat load / degradation factors / urgency	**5**	2	3
Presence of key attributes / keystone species	4	3	1
Hydrology / presence of water, wetlands, catchment	4	2	2
Representation	4	1	3
Endemism	1		1
Genetic diversity	2	1	1
Viability	1		1
Longevity	1	1	
Pollution (the need to remove hazards)	1	1	
Size of the site	2		1

There are many factors to consider when determining which ecosystems to prioritise for restoration. These include ecological, cultural, social, economic and practical factors.

In small working groups, workshop participants were asked to list **ecological factors** they deemed important for consideration when prioritising ecosystems for restoration.

Participants were then asked to rank these factors in terms of high-low priority. The first column labelled “important” signifies how many workshop groups agreed that this factor was important to include.

The priority columns signify how many groups ranked that factor in category of priority.

Some context for how these factors may influence the identification of priority areas is provided on the following pages.

4 | Prioritisation

Representativeness refers to the degree to which a site or restoration proposal is characteristic of the original ecosystems of an area. This differs from the concept of **representation** within protected area networks or other management frameworks which may also be a consideration for strategic restoration. There is also a strong argument to formally protect restoration sites to secure the benefits of restoration investments. New protection mechanisms might also be required to address drivers of degradation.

4b | Ecological factors to consider

Values

Biodiversity and habitat value.
Refers to the variety of life that is present (or could be restored) at a site. It can be measured at several levels including ecosystem, community, species, and genetic diversity. While measures of overall diversity (e.g., species richness) can be calculated, the specific diversity that is supported by a site will often be the most relevant consideration for prioritisation. Specific components of diversity may be considered further in relation to rarity, representativeness, or the cultural values that would be supported by restoration. In this sense, an assessment of habitat value might include consideration of whether the site can provide critical habitat for endangered or culturally valued species.

Irreplaceability
Considers whether the ecosystem or site is irreplaceable for its biodiversity values, or alternatively for cultural or heritage values that would benefit from the restoration actions.

Connectivity
Connectivity to other systems is critical for ecosystem and species survival as it enables essential movement of migratory species, adaptation to changing conditions (including climate change), access to food, shelter and potential mates.

Rarity
Refers to the level of scarcity of biological, physical or social-ecological features that are present or could be restored within an area. Less common features may regarded as higher priorities for restoration (and protection). Note that the measurement of rarity is scale dependent and it is important that it is interpreted in an appropriate context.

Representation
Consider whether this ecosystem and its biodiversity is represented in other systems, in good condition or in protected areas. Restoration needs to happen across terrestrial, inland water, coastal and marine environments.

Threats and risks

Integrity and condition
Consider the current state of the ecosystem or specific components.

Vulnerability
Vulnerability to stressors, or conversely, resistance and resilience to them, are key considerations for identifying restoration priorities.

Risk
Considers the current and potential future state of an ecosystem including attention to climate change.

Urgency
Is the ecosystem critically endangered or in urgent, critical need of restoration (eg due to hazardous waste)

RECOMMENDATION 4.3

Prioritise ecological factors like biodiversity, resilience to climate change, whether an ecosystem is threatened or a habitat for endangered species, the value of ecosystem services, the condition and integrity of the site, and connectivity when deciding on ecosystems to restore.

4 | Prioritisation

4c | Cultural and social factors to consider

Cultural and Social Factors for Consideration	Important	High Priority	Med Priority
Community participation, engagement, connection, advocacy	23	21	2
Indigenous priorities - rights, knowledge, expertise	19	14	5
Cultural Landscapes	12	6	6
Urban / community health and well-being	11	1	9
Education / Training / Building Nature Connection	9	7	3
Political and Stakeholder acceptance / advocacy	9	7	2
Social & Cultural Priorities, Values, Beliefs, Co-Benefits	4	1	2
Removing corruption + perverse incentives	3	1	2
Visitation / tourism value / potential	3	2	1
Food & Water Systems / Food Security	2		2
Adaptive Learning / Sharing Successes and Failures	1		1
Communication - building trust and connection	1		1
International Awareness / Frameworks / Recognition	1		
Local employment opportunities	2		2
Heritage Value	1	1	

In small working groups, workshop participants were asked to list **socio-cultural factors** they deemed important for consideration when prioritising ecosystems for restoration.

Participants were then asked to rank these factors in terms of high-low priority. The first column labelled “important” signifies how many workshop groups agreed that this factor was important to include.

The priority columns signify how many groups ranked that factor in category of priority.

Some context for how these factors may influence the identification of priority areas is provided on the following pages.

4 | Prioritisation

Workshop participants were asked to list and order **cultural and social** factors for consideration when prioritising ecosystems for restoration. This page summarises the factors deemed important by participants.

4c | Cultural and social factors to consider

Indigenous Priorities

Free, Prior and Informed Consent (FPIC) principles are followed in all aspects of Indigenous engagement including site access.

Indigenous leadership and engagement - consider the degree to which the Indigenous community is supportive and actively involved in the design and leadership of the project.

Traditional knowledge and practices should be supported and appropriately incorporated into the goals, approaches and methods of restoration.

Cultural values - restoring sites of high cultural value via the direct involvement of Indigenous people in the selection of sites and design of restoration interventions. Cultural values and practices can be incorporated into the goals, approaches, and methods of restoration.

Biocultural indicators are included in the site values for measurement. Where appropriate, should be considered in the evaluation of sites and restoration outcomes.

Engagement and Advocacy

Community engagement and participation was ranked by workshop participants as the most important social factor to consider.

Political will and support was considered a critically important factor in the success of a restoration project.

Educational value including training and the building of nature connections are additional community benefits that can be supported by restoration initiatives.

Removing corruptions. Is there potential for the project to assist in the removal of perverse incentives, or demonstrate alternative approaches.

Recognition - an additional aspect that may build upon local stakeholder process considers the potential to showcase innovation or raise the awareness of local, regional or national issues or restoration approaches.

Co-Benefits of Restoration

Employment opportunities are associated with hands-on restoration activities or indirect effects in local communities.

Health and well being reflects the potential contributions of the project or site to physical and mental well-being. This may include participation in restoration activities, or through connections with the restored site either directly (e.g., visitation) or indirectly (e.g., as a sense of place or community identity).

Visitation opportunities and benefits considers whether the restored site could attract visitors or increase tourism to the local area.

Food & water security. Does the restored site contribute to food and other natural resource availability, and or play a potential role in safeguarding or supplying freshwater resources.

RECOMMENDATION 4.4

Prioritise cultural and social factors like community engagement and participation, Indigenous priorities and perspectives, health and wellbeing, education and training, stakeholder acceptance and political advocacy when deciding on ecosystems to restore.

4 | Prioritisation

4d | Practical and economic factors to consider

Practical and Economic Factors for Consideration	Important	High Priority	Med Priority
Long term project viability / probability of success	27	22	5
Financial Support / Committed Adequate Resources	21	21	
Technical & Practical Capacity / Knowledge / Support	18	16	2
Cost + effort effectiveness / positive effort-cost-benefit	16	14	2
Economic benefits, livelihoods, opportunities	11	9	2
Data adequacy / availability (baseline, ongoing)	9	6	3
Site Accessibility	9	1	7
Legislation / regulation / incentives / enabling frameworks	8	6	2
Valuation of restored ecosystems / markets integration	6	3	3
Measuring, monitoring and reporting success / impact	5	3	2
Adaptive Management Approach	1		1
Restored site becomes a productive landscape	1		1
Scaleability	1		1
Removal of legal barriers	2		2
Complimentarity btw ecological, cultural and practical factors	1	1	
Project / site security	1		1

In small working groups, workshop participants were asked to list **practical and economic factors** they deemed important for consideration when prioritising ecosystems for restoration.

Participants were then asked to rank these factors in terms of high-low priority. The first column labelled “important” signifies how many workshop groups agreed that this factor was important to include.

The priority columns signify how many groups ranked that factor in category of priority.

Some context for how these factors may influence the identification of priority areas is provided on the following pages.

4 | Prioritisation

Workshop participants were asked to list and order **practical and economic** factors for consideration when prioritising ecosystems for restoration. This page summarises the factors deemed important by participants.

4d | Practical and economic factors to consider

Viability

The likelihood of long-term success should be a core consideration when assessing potential sites for restoration.

Technical capacity to implement the restoration methods including the availability of essential knowledge, practical skills, and equipment.

Organisational Capacity to undertake the restoration work, including workforce training and availability for key components of the restoration process, and succession planning over the lifetime of the project.

Accessibility and availability of suitable sites for the proposed restoration initiative.

Funding for resources and people to complete the necessary work, including any technical assessment or capacity building requirements.

Enabling Factors

Data availability and adequacy, including the level of uncertainty in key information that supports a proposed initiative.

Financial commitments, including level of certainty of adequate resourcing over the necessary period.

Absence of legal or institutional barriers that may create impediments for effective restoration.

Monitoring and evaluation considerations including whether a system in place or available for measuring and reporting outcomes to stakeholders to verify outcomes and enable adaptive management. Includes consideration of the funding and resourcing requirements of monitoring components,

Adaptive management approaches that are incorporated within or supported by a proposed initiative. These aspects will become increasingly important as a risk management strategy for unexpected outcomes, and to address uncertainties associated with extreme events and climate change.

Cost Effectiveness

The cost-effectiveness of the project - can you achieve positive ecological restoration outcomes for the least amount of money spent, essentially maximizing the benefits of a restoration project relative to its financial costs.

Cost-benefit expectations are positive when the full range of community benefits are considered, both monetary and non-monetary.

Scaleability can contribute to the effectiveness of individual restoration projects and may be especially relevant as a beneficial aspect of smaller-scale projects, such as those that are developing new techniques or in the proof-of-concept stages.

RECOMMENDATION 4.5

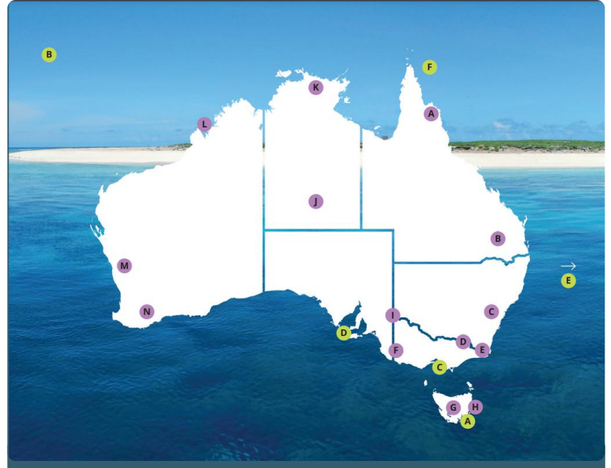
Prioritise the consideration of practical and economic factors like long-term viability of success, financial support, the technical and practical capacity to restore, cost and effort effectiveness, site accessibility, economic benefits and opportunities when deciding on ecosystems to restore.

4 | Prioritisation

4e | Useful systems for national prioritisation

Workshop participants were asked to help identify systems for prioritising degraded areas for restoration. Suggestions are outlined below

Existing Lists and Databases	Specific Areas
20 Priority Places in the Threatened Species Action Plan (pictured)	Wetlands: Riparian Areas, Rivers, Swamps and Peatlands
IUCN Red List of Threatened Species Habitat	Coral Reefs, Kelp Forests, Seagrass Forests
Sites identified on the Red List of Ecosystems	Natural Temperate Grasslands
Ecosystems identified by the CSIRO / TERN database	Box Gum and Grassy Woodlands
19 Ecosystems listed as on the verge of collapse (Bergstrom et al)	Wet Tropics
Fire-vulnerable areas (prep for 2050)	Daintree and Gondwana Rainforests
Degraded ecosystems close to urban areas	Offshore Islands
Indigenous Protected Areas - increase and expand	Rangelands
Key Biodiversity Areas identified by the National KBA Coordination Group	Agricultural land, restored with regenerative agriculture



Priority places

6 priority islands

- A Bruny Island, Tasmania
- B Christmas Island, Indian Ocean
- C French Island, Victoria
- D Kangaroo Island, SA
- E Norfolk Island, Tasman Sea
- F Raine Island, Queensland

14 priority mainland places

- A Eastern forests of Far North Queensland
- B Brigalow country, Queensland
- C Greater Blue Mountains, NSW
- D Australian Alps, NSW, Victoria and ACT
- E South east coastal ranges, NSW and Victoria
- F Southern Plains, including the Western Victorian volcanic plain and karst springs, SA and Victoria
- G Midlands region of central Tasmania
- H Giant Kelp Ecological Community, Tasmania
- I Mallee Birds Ecological Community, South Australia, Victoria and NSW
- J MacDonnell Ranges, Northern Territory
- K Kakadu and West Arnhem, Northern Territory
- L Yampi Sound and surrounds, Western Australia
- M Remnant wheatbelt woodlands, Western Australia
- N Fitz-Stirlings, Western Australia

RECOMMENDATION 4.6

When considering priority degraded areas for restoration, refer to existing lists and databases identifying key biodiversity areas, habitat for threatened species and threatened ecosystems.

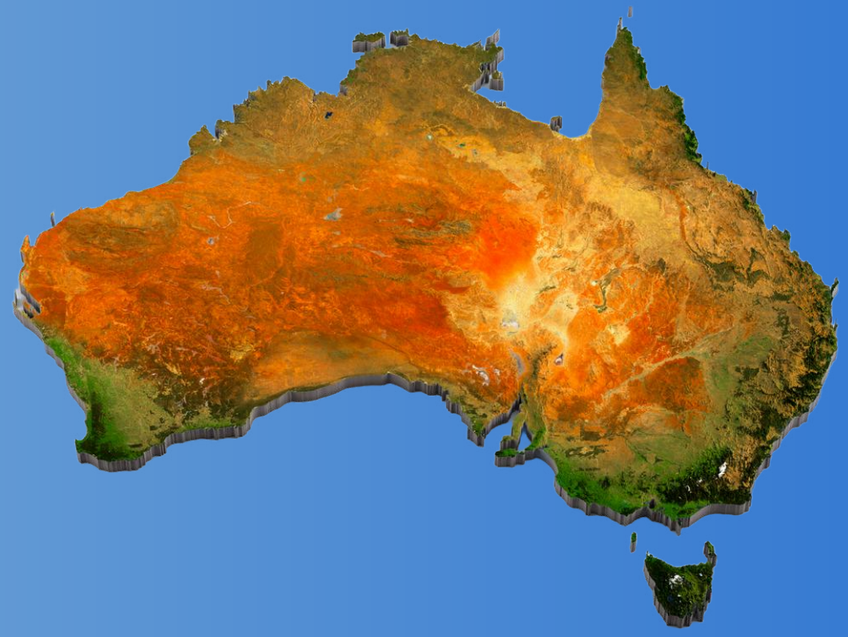
RECOMMENDATION 4.7

Consider ecological, social, cultural, practical & economic factors alongside these lists when choosing sites

PRIORITY GOAL: PRESERVING BIODIVERSITY

Preserving biodiversity is a critical goal and an important consideration when prioritising ecosystems for restoration.

Biodiversity is the foundation of a healthy ecosystem, providing essential services like clean air and water, food sources, and regulating climate, ultimately supporting human well-being and the resilience of the environment against disturbances like climate change; without a diverse range of species, the ecosystem becomes less stable and less capable of functioning properly.



5 | EFFECTIVE PRACTICE

- Key elements of effective restoration
- Recommendations to ensure effective long-term restoration in practice

5 | Effective Practice

Professor William Glamore
Professor of Nature-Based Engineering
UNSW Sydney

Creating an effective restoration economy is the key

Ecosystem restoration in Australia is at a crossroads.

For decades, local practitioners have been developing methods and implementing pilot projects. These projects have provided lessons and insights into how ecosystem restoration can be successfully upscaled across entire landscapes and catchments.

Armed with these learnings, and a growing urgency to address the biodiversity and climate crises, we must now decide if we can continue with our piecemeal approach to restoration or if we should foster a broader restoration economy.

However, the development of a successful restoration economy is reliant on positive incentives (e.g. carrots) and structural change (e.g. sticks).

Ecosystem restoration must be viewed as a viable alternative to existing land-use and the pathway towards restoration must be achievable.

At present, nature-based markets are in their infancy with many hurdles, including economic return on investments, social and cultural barriers, planning and policy impediments, and scientific rigour.

Governments can play an important role in addressing these market barriers, but they need to work collaboratively with industry and society to overcome potential failings. We must move beyond the existing paternalistic view of government's role and accept that alternative approaches are urgently required.

Moreover, we need to accept that mistakes may be made along the way, but these concerns should be seen as an opportunity for improvement not as a rationale for inaction.

Simply put, we need to actively upscale and foster ecosystem restoration while there are ecosystems left to restore!

Effective restoration and the growth of a restoration economy is reliant on robust linkages across science, society, and the economy.

The concept of 'Restoring Forward' ensures that the community, including Indigenous voices, can be supported by scientific methods and economic incentives to design and implement ecosystem restoration projects purpose-built for the future.

Successfully bridging these disciplines is pivotal to the future of ecosystem restoration in Australia.

5 | Effective Practice

While on-ground activities are crucial, restoration success hinges on establishing a robust knowledge infrastructure. By integrating scientific research, genetic and climate considerations, practical guidance, and long-term monitoring, we can transition to long-term strategies that foster resilient and thriving ecosystems for the future.

5a | ‘Effective’ Restoration: definition and elements

What does ‘effective restoration’ mean?

The concept of "effective restoration" signifies standards-based restoration that yields net gains for biodiversity, ecosystem integrity, and human well-being. It should be assessed against clear goals and measurable indicators.

The Society for Ecological Restoration defines effective restoration as “standards-based restoration underpinned by agreed principles that results in appropriately balanced sustainable net gain that benefits and enhances biodiversity, ecosystem integrity and human well-being.”

Elements of Effective Restoration

Effective restoration is realistic and pragmatic, considers climate change and genetics, and improves the capacity of a landscape to support biodiversity. Crucially, it prioritizes community engagement and collaboration with First Nations People.

Long-Term Thinking: Successful restoration requires a shift from short-term, quantity-focused approaches to long-term strategies prioritizing quality and resilience.

Practical Application: adaptable approaches tailored to specific contexts to ensure a restoration project is feasible.

Climate Change Integration: Restoration efforts must consider the impact of a changing climate on project success and long-term sustainability. This includes identifying seed sources genetically suited to future climatic conditions at the restoration site.

Genetic Considerations: Recognise the impact of low genetic diversity on long-term population health and resilience. Harness genomic data to avoid monocultures and ensure genetic diversity.

Stakeholder Engagement: Balancing diverse interests, including government, industry, NGOs, traditional owners and communities.

People-Centric Approach: Building a strong team and fostering community acceptance, particularly from First Nations People, is critical for achieving impactful and enduring outcomes.

Excellent Guidance: Integrating current research with on-ground activities is vital. Restoration knowledge needs to be translated into practical guidance for practitioners. Providing clear and user-friendly resources on seed sourcing and best practices. Equipping practitioners with the knowledge and skills to implement restoration.

Connectivity: Connectivity is crucial for dispersive fauna, maintaining critical micro-habitat networks, facilitating species response to climate change and achieving coordinated, multi-scale conservation outcomes.

Measuring Success: Third-party verification, compliance audits, and Accounting for Nature are potential mechanisms. Moving beyond simple metrics like habitat suitability to assess factors like genetic diversity, reproductive fitness, and species adaptation.

RECOMMENDATION 5.1

Adopt the accepted definitions and descriptions of ‘effective restoration’ set by SERA, including the prioritisation of Indigenous leadership and knowledge.

RECOMMENDATION 5.2

Create a robust knowledge-exchange infrastructure that incorporates Traditional Knowledge, current research, monitoring data and practical guidance on the elements of effective restoration.

5 | Effective Practice

We need a paradigm shift in restoration, moving away from punitive measures towards a system driven by positive incentives and collaboration among diverse stakeholders. By embracing a holistic approach that integrates scientific research, market-based mechanisms, Indigenous knowledge and values, and community engagement, we can achieve effective restoration at scale and ensure the long-term health and resilience of vital ecosystems.

5b | Ensuring Effective Long-Term Restoration

Incentivise effective restoration

Historically, restoration efforts have been primarily driven by negative incentives, such as:

- Reactive responses to environmental damage
- Government-driven regulations focused on maintaining the status quo

Experts advocate for a shift towards positive incentives, characterized by:

- Proactive approaches
- Government regulation combined with market-based scalability
- Potential for urgent and impactful restoration

Monitoring effective restoration

At the SER / CEM 5th Global Forum a new set of guidelines for restoration was produced, addressing cultural, social, and ecological approaches for assessing restoration impact. https://www.ser.org/page/GlobalFora

Drivers of change

Growing restoration industry: Increased expertise and capacity. Collective workforce growth will also improve efficiency and sustainability of community projects,

Shifting community views: Greater general appreciation for the value of ecosystems, including learning to value intangible ‘cultural’ ecosystem services, will lead to societal change.

Political will: Growing support for environmental protection and restoration.

Tested methods: Development and refinement of effective restoration techniques.

On-ground outcomes: Demonstrated success of restoration projects.

Valuing multiple benefits: Recognition of the ecological, economic, and social co-benefits of restoration.

Key elements of effectiveness

Workshop participants identified the following key elements for effective restoration:

Key Elements of Effectiveness
Political advocacy and support
Long-term funding commitment
Forward thinking vision and methods
People - workforce, community
Clear, measurable, feasible goals
Tecnhnological capacity and support
Accessible up to date education & training
Simple effective monitoring methods - EMSA
Holistic approach including incentives, Indigenous cultural values and practice, social considerations and ecological outcomes

RECOMMENDATION 5.3

Support drivers of change towards an incentivised restoration model, including growing the restoration industry and valuing the multiple socio-economic benefits of restoration.

RECOMMENDATION 5.4

Incentivise restoration using proactive approaches and enabling mechanisms, as a complement to classical punitive measures

5 | Effective Practice

"Restoring forward" means adopting a proactive, future-oriented approach that focuses on understanding how an ecosystem would naturally evolve, strengthening ecosystem resilience and possibly including creating options for future benefits. This involves moving beyond simply restoring ecosystems to their historical state and instead aiming for a state that is adapted to future challenges, such as climate change, and the provision of ecosystem services.

5c | Restoring Forward

Restoring Forward

"Restoring forward" in ecosystem restoration means actively manipulating an ecosystem to create a future state that is more ecologically functional and resilient.

Restoring Forward often involves looking beyond simply recreating the past conditions of a degraded ecosystem, potentially incorporating new species or adapting to changing environmental factors like climate change, rather than strictly trying to return to a historical reference point.

Restoring forward is often considered the best method because it allows for adaptation to current environmental conditions, incorporates natural processes, and promotes resilience in the face of changing climate, rather than strictly trying to return an ecosystem to a past, potentially outdated state, which is the approach of restoring backwards.

Principles of Restoring Forward

Focus on future needs: prioritizes creating an ecosystem that can thrive in the current and future environmental conditions.

Considering ecosystem services: Restoring forward can prioritise the restoration of ecosystem services that are most beneficial to humans, like clean water or carbon sequestration, even if it means deviating from a purely historical reference.

Adapting to change: This may involve introducing new plant species that are better suited to a changing climate or modifying the landscape to facilitate natural processes like floodplains or migratory patterns. For example, in an area experiencing hotter and drier conditions, instead of planting only historically native trees, "restoring forward" might involve introducing drought-tolerant species that can thrive in the new climate. Or, in a previously drained wetland area, "restoring forward" could involve designing new wetland features that better support wildlife diversity and water quality in the current landscape.

Why Restore Forward

Adaptability to changing climate: By not solely focusing on recreating a historical ecosystem, restoring forward allows for the inclusion of species better suited to current climate conditions, potentially enhancing the ecosystem's ability to adapt to future changes**.**

Natural processes: This approach prioritises facilitating natural regeneration and successional pathways, allowing the ecosystem to develop organically with minimal human intervention, leading to a more resilient outcome.

Biodiversity enhancement: By considering the broader ecological context and potential for new species to establish, restoring forward can lead to a more diverse and functional ecosystem.

Cost-effectiveness: Relying on natural processes and locally adapted species can sometimes be more cost-effective than actively manipulating an ecosystem to match a historical reference

RECOMMENDATION 5.5

Incorporate the principles of Restoring Forward into restoration education and training and guidelines

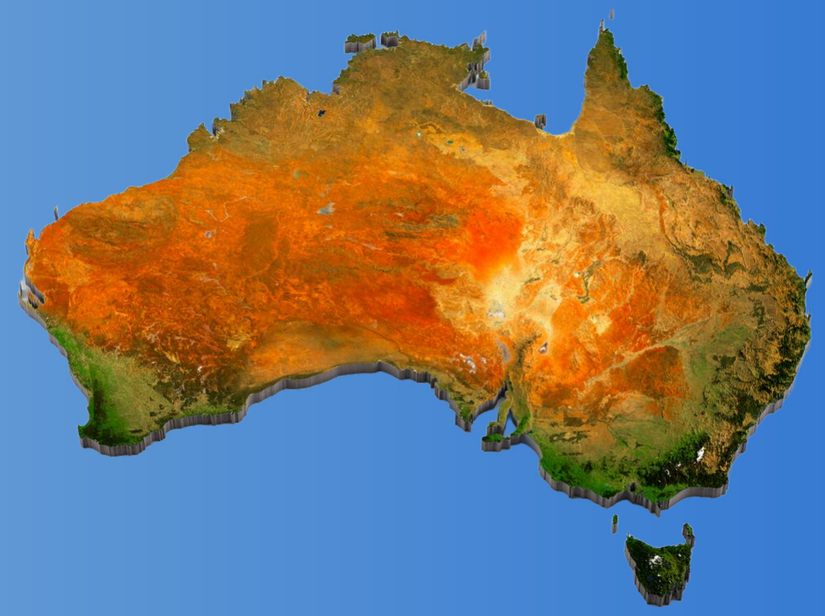
RECOMMENDATION 5.6

Prioritise future needs, ecosystem services, adaptability to climate change and resilience in the Restoring Forward principles

GOAL: LONG-TERM EFFECTIVE RESTORATION

Ecosystems are complex and take time to recover. Restoration is not a quick fix, it involves re-establishing ecological processes, rebuilding species populations and restoring ecosystem functions, all of which happen gradually over time. A long-term approach ensures that restoration efforts are sustainable and lead to the desired outcomes.

Image credit: Dietmar Rabich. Sand dune “Big Drift” in Wilsons Promontory National Park, Victoria, Australia (2019)



6 | FUNDING

- The cost of ecosystems restoration
- A review of proposed funding sources
- Recommendations for financing restoration

Reasons and avenues to invest in restoration

Professor Martine Maron
Professor of Environmental Management
University of Queensland

The Blueprint to Repair Australia's Landscapes

The Blueprint to Repair Australia's Landscapes, the result of a large collaborative effort led by the Wentworth Group of Concerned Scientists, outlines a plan to restore degraded landscapes in Australia over 30 years.

The report recommends 24 practical actions, funded by an estimated **annual investment of $7.3 billion**, to improve soil health, restore rivers and waterways, recover threatened species, and regenerate native vegetation.

The authors argue that repairing Australia's landscapes is essential, achievable, and in the national interest, emphasizing the importance of a whole-of-landscape, regionally-based approach that prioritizes Indigenous land management and knowledge.

Blueprint Findings and Insights

State of the Environment: Successive Commonwealth State of the Environment reports show that many parts of our environment are in a poor and declining condition. The report highlights the urgency of action, stating that "While we cannot accurately measure the true cost of degradation, it far outweighs the modest cost to substantially repair nature."

Actionable Solutions: The blueprint identifies 24 practical actions focusing on restoring agricultural soils, rehabilitating inland water systems, increasing native vegetation cover, protecting threatened species, and maintaining healthy estuaries.

Achievable Goals: Restoration of nearly all degraded terrestrial ecosystems to 30% of their pre-1750 extent is achievable while maintaining and even increasing agricultural production through strategic land use and management practices.

Leveraging Net Zero Transition: The report emphasises the opportunity to link landscape repair with Australia's net zero emissions goal by 2050. Restoring 13 million hectares of native vegetation could sequester a billion tonnes of CO_2e, offsetting 18% of national emissions over 30 years.

Investment and Returns: The estimated annual investment needed is $7.3 billion over 30 years, with carbon market revenue potentially contributing 7% to 15%. This investment will generate long-term economic benefits through job creation, enhanced agricultural productivity, and improved resilience to extreme events and climate change.

Systemic Decline: The report provides examples of Australia's environmental decline, including extensive land clearing, soil acidification, degradation of Ramsar-listed wetlands, and the impact of climate change on the Great Barrier Reef

Regional and Indigenous Stewardship: The blueprint emphasises the importance of a regionally-based approach recognising the unique characteristics and needs of different landscapes. It also highlights the crucial role of Indigenous knowledge and leadership in the repair process. Empowering Aboriginal and Torres Strait Islander people to manage and repair Country is critical for achieving both environmental and social justice goals. Recognizing the 60,000-year history of Indigenous land stewardship, the report urges increased Indigenous land and water ownership, integration of Traditional Knowledge, and expansion of Indigenous ranger programs.

Redefining Relationship with Land: The report acknowledges successful adaptation measures, such as the Landcare movement and Indigenous land management practices. These offer a foundation for the broader repair effort.

Whole-of-Landscape Approach: The blueprint advocates for a shift away from a siloed approach considering separately the different components of a healthy landscape towards a more holistic approach. This requires matching land use with its characteristics, identifying areas for multiple benefits, and prioritising agricultural productivity on suitable lands.

Financing Mechanisms: The report recommends a diverse financing strategy including increased public investment, re-orienting environmentally harmful subsidies, leveraging private sector investment through green bonds and the nature repair market, and encouraging philanthropic contributions.

6 | Funding

Reside et al. (2024) estimate the cost of restoring Australia's threatened species back to their known historical ranges - including undoing all damage and overcoming all known threats across their known range - would cost A$583 billion per year, every year, for at least 30 years.

6a | The Cost of Restoration

Estimating annual costs

According to experts, the annual cost to restore Australia's degraded ecosystems, and threatened species habitat, varies depending on the scope and ambition of the restoration efforts. The estimates range from approximately AU$2 billion per year for terrestrial ecosystem restoration to over AU$150 billion per year for full recovery of all priority threatened species habitat.

Mappin et al (2021) estimate that restoring 13 million hectares of degraded terrestrial land to achieve a minimum of 30% native vegetation coverage across Australia would cost AU$2 billion annually for 30 years.

The inaugural year's cost for this effort would be **AU$2.1 billion per annum**. The estimated Net Present Value (NPV) of the total investment required from 2020 to 2050 is AU$41.5 billion.

Landscape Repair

The Wentworth Group's 2024 *Blueprint to Repair Australia's Landscapes* identifies 24 actions and an indicative investment of $7.3 billion per annum over 30 years to repair much of the past two centuries of degradation.

This annual investment aggregates to $219 billion over 30 years. If funded on an annualised future basis, accounting for inflation and time value of money, the total investment required would be between $11.8 billion and **$19.4 billion per annum**, with an average of $14.8 billion per annum.

The Blueprint estimates that carbon market revenue from native vegetation could generate $0.5 to $1.118 billion per annum within 30 years, reducing the annual investment needed to between $6.2 and $6.8 billion. This revenue is estimated to cover 7% to 15% of the total investment needed.

Restoring threatened species habitat

Reside et al. (2024) estimate the cost of restoring Australia's threatened species back to their known historical ranges. They calculated that, to undo all damage and overcome all known threats across their known range, would cost A$583 billion per year, every year, for at least 30 years. Controlling weeds accounted for 81% of the total costs. This is because weeds cover such large areas of Australia and impact so many species.

Ward et al. (2025) calculate that it will cost $AU15.6 billion per year to ensure there are no extinctions for 99 priority species. It will cost more to move these priority species down one threat category ($AU103.7 billion/year) or remove them from the threatened species list entirely ($AU157.7 billion). Habitat restoration was identified as the most expensive action, and a key action required by most priority species. To halt species extinctions for the 99 priority species assessed, habitat restoration is estimated to cost AU$8.3 billion per annum.

RECOMMENDATION 6.1

Consider the estimates from experts on the cost of restoration, and aim to set aside 1% of GDP (or $17.5 billion) per annum for 30 years for ecosystem restoration and the preservation of threatened species habitat.

RECOMMENDATION 6.2

Review financial subsidies and incentives for actions and entities that damage the environment, with an aim to reverse these.

6 | Funding

Thompson et al. (2025) estimate nature to be worth more than $511 billion per year to the Australian economy. At approximately 20% of GDP, this is on par with the combined economic output of the mining and finance sectors. Investing 1% of the Federal Budget in nature could boost Australia's annual productivity growth by over 40%

6b | Value of ecosystems, sources and enabling mechanisms of funding

Value of Australia's natural capital

According to the Australian Bureau of Statistics (ABS), as of June 2017, the total value of Australia's natural capital, including land, minerals, energy, and timber resources, was estimated at around $6.4 trillion.

Australia has a high value of natural capital due to its abundant landmass, mineral resources, and agricultural potential. This natural capital significantly contributes to the Australian economy through sectors like agriculture, forestry, fishing, and tourism.

In 2024, the Australian Department of Industry, Science and Resources estimated the value of our natural resource exports to be around $417 billion

Value of ecosystem services

In February 2025, the Australian Bureau of Statistics (ABS) released an estimated economic value of Australia's ecosystem services. The total value is estimated to be around $85 billion in 2021, with key services including carbon storage valued at over $43 billion, grazed biomass valued at over $40 billion, and water provisioning valued at $1.4 billion.

Sources and mechanisms of funding

Government: Federal and state governments offer funding through programs such as the Natural Heritage Trust and the Environment Restoration Fund. The government is committing a total of $1.1 billion to the Natural Heritage Trust from 2023 until the end of June 2028. The trust covers a broad scale of projects addressing climate change, habitat loss, and invasive species. The government could provide more funding mechanisms via levies, incentives, initiatives, and investments.

Private and Philanthropic Funding: Private and philanthropic funding opportunities for restoration are limited to a small pool of organisations willing to invest in restoration projects. This sector is limited and poses challenges for both investors and recipients.

Nature Repair Market: Australia's Nature Repair Market is intended to be a regulated system where approved projects that are shown to improve biodiversity receive tradeable biodiversity certificates. The nature repair market encourages voluntary private sector investment in biodiversity conservation.

Enabling funding

Enablers of restoration funding include but are not limited to:

Drivers: Regulatory compliance frameworks, policy and legislation, the Taskforce on Nature-Related Financial Disclosures (TFND), other voluntary ESG drivers, and emerging markets for natural capital and ecosystem services are all positive drivers of funding.

Partnerships: Combined government and private sector funding for restoration projects, run in collaboration with Indigenous communities and not-for-profit restoration groups, would provide security and reputational incentives for more private sector investment.

Knowledge Sharing Infrastructure: Creating communication networks for restoration community building and knowledge sharing would not only improve restoration practice but enable potential investors to view the potential and progress on projects.

RECOMMENDATION 6.3

Consider the $6.4 trillion+ estimated value of Australia's natural capital, natural resources, and ecosystem services as a strong argument for more government investment in nature conservation and restoration.

RECOMMENDATION 6.4

Support and enable more restoration funding mechanisms via levies, incentives, private-public partnerships, and the creation of knowledge sharing infrastructure.

Private investment in nature involves numerous limitations and challenges, including: high initial costs with long-term returns, measurement and verification, regulatory and legal factors, land ownership and rights, market risks, access to capital, reputational concerns, ecological complexity, scaling up and replication, reliance on public support, reliance on policy, climate change and natural disasters.

6c | Reviewing Private Funding

Private Funding Limitations & Challenges

High Initial Costs with Long-Term Returns: Nature repair projects often require significant upfront investment with returns that might not be realised for many years or even decades. This mismatch in investment timelines can deter private investors who typically seek shorter-term, more predictable returns.

Measurement and Verification: It is difficult to quantify benefits like increased biodiversity or carbon sequestration. To accurately measure success, we need reliable and widely accepted metrics, but implementing these can be expensive and complicated. The resulting uncertainty makes these investments less appealing because it's hard to assess their value and prove their impact.

Regulatory and legal factors can increase risk. Changes to environmental regulations, land use policies, or political priorities can all impact the success of nature repair projects. For example, a shift in government could lead to changes in conservation policies, which would affect investments in certain areas.

Land Ownership and Rights: Land rights can be problematic and securing long-term land rights for conservation can be complicated by disputes over ownership, Indigenous rights, and the need for local community consent. These issues can cause conflicts as well as project delays or even failures.

Market Risks: Market risks exist because the market for ecosystem services is still developing. Demand for things like carbon credits, biodiversity offsets, and water rights can fluctuate, leading to unstable prices and uncertain revenue.

Access to capital: This is limited by the fact that traditional financial instruments may not be suitable for nature repair projects. Although innovative financial tools like green bonds, impact investment funds, and blended finance mechanisms are emerging, they are not yet common, which restricts the availability of large-scale capital.

Reputation is a key concern for investors, who must be careful about public perception. Projects can face criticism if they are seen as greenwashing or if they don't genuinely benefit local communities or ecosystems. Negative publicity can damage both the project and the investor's overall reputation

Ecological Complexity: Dealing with intricate ecological systems is a part of nature restoration. Even the most well-funded initiatives might fall short of ecological objectives, and beneficial solutions can have unforeseen detrimental effects.

Scaling-up and Replication: In certain ecological or sociopolitical contexts, it might be challenging to duplicate or scale up successful small projects. What works in one location might not be effective in another area.

Reliance on Public Support and Policy: Another issue facing private funding is its reliance on governmental support and policy. Government money or policy support is still required for many nature repair initiatives, and this support can be erratic, particularly during recessions.

Climate Change and Natural Disasters: These threats jeopardise conservation efforts by making natural disasters more frequent and severe and by causing changes in climate patterns. These events can harm the physical infrastructure and ecological outcomes of projects.

RECOMMENDATION 6.5

Reconsider the reliance on private investment for nature repair, as there is no guarantee of funding and the incentives-to-risk ratio is currently too low.

RECOMMENDATION 6.6

View private investment as a complementary nice-to-have option alongside secure, base government funding for nature repair.

6 | Funding

There are many limitations to the nature repair market, and we must address the inherent trade-offs between financial returns and environmental integrity in conservation markets. There are different investor expectations and challenges to achieving nature positive outcomes, combined with the limitations of offsetting. Effective governance will play a crucial role in preventing failure.

6d | Reviewing the Nature Repair Market

The Nature Repair Market

Australia's Nature Repair Market involves a regulated system where projects enhancing biodiversity receive certificates (not credits or offsets), which are tradable assets. The nature repair market encourages voluntary private sector investment in biodiversity conservation.

The Nature Repair Market has been established with robust standards and governance structures, and is one pillar of nature repair funding - ie, it is not intended to be the only tool for funding nature repair in Australia. The Nature Repair market is also not intending to address large-scale environmental issues like climate change or habitat fragmentation, requiring comprehensive policy interventions beyond market mechanisms.

Key Limitations of the Market

Lack of demand: It's unclear if the private sector will voluntarily purchase enough certificates to make the market function. Demand for voluntary certificates is likely overestimated.

Complexity: The complexity of nature repair biodiversity certificates can lead to implementation problems. It's unclear what claims certificate holders or buyers can make.

Measurement: Accurately measuring biodiversity benefits to generate credible certificates is difficult due to the vast array of species and ecosystem functions, making it difficult to value and trade.

Market manipulation risk: Concerns exist about potential for greenwashing or manipulation of the market by companies seeking to offset their environmental impacts without genuine conservation efforts.

Reliance: Relying on a nature repair market could shift the responsibility of protecting nature away from government, potentially leading to insufficient funding or enforcement of environmental regulations.

Uncertainty: The benefits of protecting biodiversity aren't valued by existing markets. Uncertainty variables can highly affect the investment sector.

Funding constraints: Significant financial investment is needed for large-scale restoration projects, which may not be readily available through a voluntary market alone.

Ecological complexity: Ecosystems are complex and interconnected, making it challenging to accurately value and trade individual components of biodiversity through a market-based system.

Land tenure issues: Complex land ownership patterns can hinder the implementation of restoration projects and limit the availability of land for conservation purposes.

Inadequate availability of plants and seeds: This significantly restricts the scale and effectiveness of restoration projects due to the lack of readily accessible materials needed for planting.

In conclusion, while a nature repair market can potentially incentivise conservation efforts, it should be considered a complementary tool alongside government funding and robust policies and regulations.

RECOMMENDATION 6.7

Monitor the development and implementation of the Nature Repair Market, to ensure market integrity, and review its effectiveness and overall contribution to nature repair funding.

RECOMMENDATION 6.8

Mitigate potential pitfalls in private biodiversity finance to ensure environmental integrity. Shift the focus to risk mitigation and responsible governance to help achieve Nature Positive outcomes.

6 | Funding

Government funding for nature repair is essential to address market inefficiencies, ensure long-term environmental health, uphold international and national commitments, and promote equitable access to nature's benefits, all of which contribute to broader societal well-being and sustainability.

6e | Reviewing Government Funding

Government Funding is Critical

Government funding of nature repair initiatives is crucial for several reasons, each addressing different dimensions of environmental, social, and economic sustainability:

Public Good and Long-term Benefits: Nature repair provides benefits that are often public goods. These benefits include cleaner air and water, biodiversity preservation, climate regulation, and disaster risk reduction. Since these benefits accrue to society as a whole, public funding ensures these services are maintained regardless of market failures where private investment might not be forthcoming due to the non-excludable nature of these benefits.

Addressing Market Failures: The true value of ecosystem services isn't reflected in market prices. Forests might be undervalued if only considered for timber rather than their roles in carbon storage or water filtration. Government intervention can correct these market failures by funding projects that private sectors might deem unprofitable but are essential for well-being.

Regulatory and Policy Implementation: Governments have the authority to implement and enforce policies that necessitate nature repair, such as laws requiring habitat restoration after industrial activities or policies promoting sustainable land use. Public funding supports the enforcement of these regulations, ensuring compliance and the restoration of damaged environments.

Equity and Access: Nature repair projects often need to consider equity, ensuring that benefits from restored ecosystems are accessible to all segments of society, including marginalized or economically disadvantaged communities. Government funding can prioritize projects in areas where private investment might not venture due to low immediate financial return, thus promoting social equity.

Encouraging Private Investment: Public investment can act as a catalyst for private investment by reducing perceived risks or by co-financing initiatives. This can be through mechanisms like public-private partnerships, where government funds might cover initial costs or provide guarantees, thereby attracting private capital into nature repair projects.

Long-term Commitment: Nature repair often requires long-term commitments that exceed typical business cycles or political terms. Governments, with their long-term perspective and responsibility for future generations, are better positioned to fund projects that might not yield immediate financial returns but are crucial for sustainable development over decades.

Research and Innovation: Governments can fund research into new methods of nature repair, ecological restoration techniques, and technologies for monitoring and evaluating ecosystem services. This research can lead to innovations that both the public and private sectors can leverage, improving the efficiency and effectiveness of conservation efforts.

National and International Obligations: Australia is a signatory to the Convention on Biological Diversity, which requires actions towards climate and biodiversity targets. Government funding is often necessary to meet these commitments, which are beyond the scope or interest of private entities alone.

Economic Stability and Job Creation: Investing in nature repair can stabilise local economies by creating jobs in conservation, ecotourism, or sustainable agriculture. These activities can be particularly important in rural or economically depressed areas, providing both environmental and economic benefits**.**

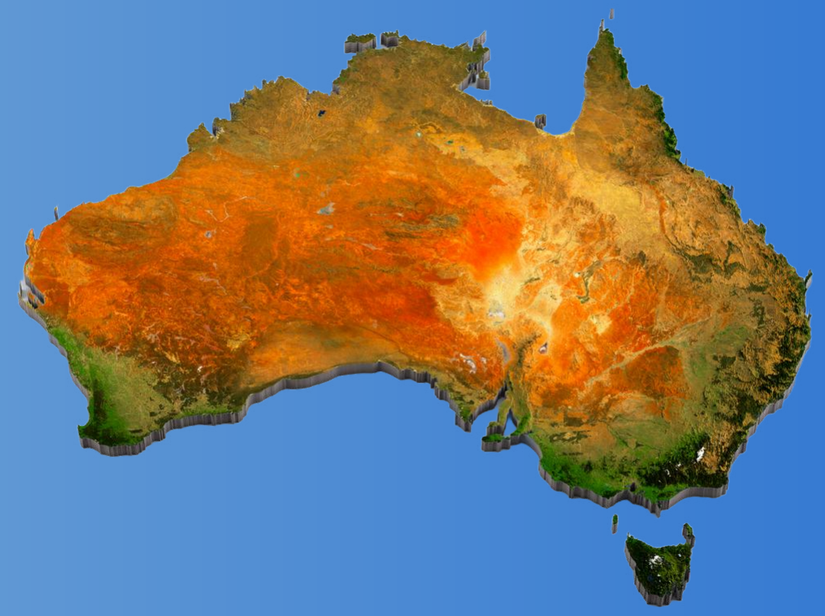
Emergency and Disaster Response: Post-disaster recovery often includes nature repair to restore ecosystems that serve as natural defences against future events. Government funding is crucial here as emergency responses typically require immediate and substantial resources beyond what private entities might be willing to allocate.

RECOMMENDATION 6.9

Immediate, committed, base government funding is critical to ensure the effective long term restoration of degraded landscapes.

GOAL: 1% of GDP PER ANNUM FOR 30 YEARS

Experts have estimated we need 1% of GDP or $17.5 billion per year for 30 years to restore Australia's ecosystems and habitat for threatened species. But we cannot rely on markets or private sector investment. We need a base of long-term funding from the government to provide immediate and critical needs. Given that nature is the source of life and underpins approximately 50% of our GDP - nature conservation should receive an ongoing, dedicated percentage of the national budget.



7 | SCALING UP

- Why we urgently need to scale-up
- Barriers to scaling-up restoration efforts
- Recommendations for scaling up

7 | Scaling-Up

Dr Elizabeth Pryde
Manager, Restoration
Greening Australia

Needs, challenges and opportunities for scaling up restoration

A Critical Decade for Restoration

Australia faces a massive restoration challenge and a major opportunity. To meet international and domestic biodiversity commitments, including restoring 30% of degraded lands and waters by 2030 under the Nature Positive Plan, an estimated 11–13 million hectares need restoration. However, current efforts are far short of this target. Despite increased awareness, innovative projects, and strong commitments, restoration is not happening at the scale or pace required.

This decade is pivotal. Climate change, land degradation, and invasive species are rapidly accelerating biodiversity loss, while economic and policy systems fail to support the necessary restoration efforts. Achieving large-scale restoration will require coordinated national action, long-term investment, inclusive governance, and a well-supported workforce.

Persistent Barriers, Well-Known Solutions

The barriers to scaling restoration are not new, including limited seed supply, access to restoration sites, workforce shortages, and fragmented policies. While these challenges are well understood, they remain unresolved at a national level.

Addressing barriers requires leadership, not reinventing the wheel. Coordination across jurisdictions and land tenures is vital, as fragmented governance undermines the efficiency of restoration programs.

Restoration initiatives often lack clear roles and responsibilities, making it difficult to align funding, landholder incentives, and ecological priorities. Short-term funding, uncoordinated policies, and underinvestment in on-ground capacity continue to impede progress. Restoration work, requiring specialized knowledge and local relationships, is frequently undervalued. The private sector's role is also limited by funding and ecological misalignment.

Foundations for Scaling

Australia must invest in the systems that enable restoration. This includes securing seed supply chains, improving land access, and building a skilled, fairly compensated workforce. These often-overlooked foundations are critical to large-scale restoration.

A stronger enabling environment is needed, integrating ecological science, Indigenous knowledge, and practitioner expertise. This requires long-term, predictable funding and a shift from project-based to continuous strategies.

Recommendations 7.1 and 7.2 highlight the need for better seed access, site availability, and a capable workforce.

Clearer governance structures are also essential and must be embedded. A national restoration plan, aligned with biodiversity and climate goals, would provide policy support, consistency, and coordination across regions and jurisdictions, as outlined in Recommendation 7.3.

Enabling Collective Impact

While restoration is place-based, scaling it requires systemic change. Stronger partnerships between governments, landholders, Indigenous groups, NGOs, and scientists are vital.

Recommendations 7.4 and 7.5 focus on community engagement, knowledge-sharing, and improved education and training to build capacity across the system.

Scaling restoration is not only a technical challenge but a political and institutional one. It requires viewing restoration as critical infrastructure for biodiversity, climate adaptation, and community well-being.

Success depends on embedding restoration into mainstream policy, planning, and investment as a core national priority.

This section outlines the essential needs, barriers, and opportunities for scaling restoration in Australia, emphasizing the importance of coordination, investment, governance, and workforce development.

7 | Scaling-Up

7a | Barriers to Scaling-Up

RECOMMENDATION 7.1

Identify and address barriers to scaling-up, including adequately supplying seed, incentivising access to restoration sites, and providing governance to support knowledge transfer and workforce succession.

Seed

There is a lack of demand coordination across the native seed industry. Seed collection is primarily project-driven, leading to ad-hoc and reactionary approaches.
This results in:
Supply risk due to the inability to forecast collection needs.
Low native seed storage, limiting diversity (both species and genetic) and the capacity for biodiverse and climate-resilient restoration.
A high-risk, specialized seed industry facing an ageing workforce.

We can address these challenges via:
Coordination & communication of demand signals across the sector, potentially through a dedicated government body overseeing restoration networks.
Untied funding to support seed collectors and establish restoration seed banks, especially for rarer species and genetic diversity.

Accessing restoration sites

Stakeholders with existing property or resource use rights must be worked with to access to new sites for restoration.
Securing land for restoration often hinges on individual landholder decisions.
Aligning restoration goals with stakeholder objectives is crucial.

Stakeholders often prioritize:
Profitability: Understanding the costs involved.
Resilience: Long-term benefits for their land and family.
Productivity: Ensuring restoration doesn't negatively impact land use.

Complications for land access decisions include:
Uncoordinated policies: Creating confusion for landholders.
Immature markets: Uncertainties around financial risks and returns.
Family legacy and consensus: Potential intergenerational implications.

Encourage landholder participation via:
Effective communication of the cost-benefit context, sharing successful case studies and evidence of natural capital benefits for farms.
Access to Natural Capital Accounting tools to assess economic and environmental benefits.
Connecting landholders to relevant markets and benefit-sharing mechanisms, such as carbon credits or revenue from restored areas.
Co-designing restoration projects with a people-centric approach, focusing on shared value and aligning project outcomes with a collective vision.

Implementation challenges

Restoration is increasingly difficult due to:
Climate Change: Changing seasons and unpredictable weather patterns hinder planning and implementation.
Multiple Threats: Unprecedented frequency of shocks and increasing invasive species and pests require adaptive management strategies.
Limited Knowledge Transfer: Short-term projects often prioritize delivery over monitoring and research, leading to limited knowledge sharing and adaptive capacity. An aging workforce exacerbates this issue.
Private-sector Funding Limitations: Market-based funding often targets marginal lands and may not align with ecological needs. Existing funding instruments often fall short of addressing spatial and temporal threats.

To address these challenges, we need:
Governance that supports restoration success: Landscape-scale strategies are necessary to address threats beyond individual project boundaries.
Science and practice-informed regulations and standards: Integrate scientific knowledge and practical experience into policy development.
Funding that rewards best practices and effective restoration: Develop a conceptual framework for best practices, including:
Theory of change models.
Enhanced knowledge transfer.
Predictive time-bound "success" targets for ecological evaluation.
Clear communication of opportunities, uncertainties, and guiding principles.

7 | Scaling-Up

A larger, highly skilled, and adequately compensated restoration workforce is crucial. This necessitates expanding training programs delivered by experienced practitioners. Increased collaboration with researchers is vital for knowledge exchange, research and development, innovation, and monitoring initiatives.

7b | Needs for scaling-up

Acknowledging urgency

Australia's environment faces increasing pressures from habitat loss, climate change, invasive species, pollution, and unsustainable usage, pushing numerous species and ecosystems toward extinction.

Australia's biodiversity is significantly threatened by habitat loss and degradation, primarily due to land clearing for agriculture and urbanization, alongside the introduction of invasive species and the growing impacts of climate change, which together are causing declines in native plant and animal populations and pushing many species towards extinction

This echoes global calls for action, including the UN Decade on Ecosystem Restoration and the Kunming-Montreal Global Biodiversity Framework (GBF) aiming to restore 30% of degraded land and water by 2030. Australia's own Nature Positive Plan for Australia (30x30) aligns with these goals, recognizing that protection alone is insufficient.

Strategic and Practical Needs

We need strategic shifts in policy, integration of biodiversity and climate goals, and focused restoration planning prioritizing valuable ecosystems. Practical necessities include a national restoration plan, a dedicated national nature investment strategy, innovative funding models for large-scale projects, and enhanced collaboration among stakeholders including First Nations people, scientists, practitioners, and various geographical areas.

Building a Skilled Workforce: A larger, highly skilled, and adequately compensated restoration workforce is crucial. This necessitates expanding training programs delivered by experienced practitioners. Increased collaboration with universities and researchers is vital for knowledge exchange, research and development, innovation, and monitoring initiatives.

Effective Planning, Diverse Approaches

Detailed, site-specific restoration plans are fundamental, requiring comprehensive analysis of ecosystem disturbances, resilience assessments, and understanding of connectivity and habitat requirements.

Plans should guide on-ground works, integrate fire and pest management, and incorporate diverse restoration techniques.

Large-scale native seed production is also essential.

Facilitated Natural Regeneration: Emphasising Facilitated Natural Regeneration (FNR) alongside traditional revegetation through planting maximizes resource efficiency. FNR leverages the natural resilience of ecosystems, demonstrating significant cost savings and improved outcomes.

RECOMMENDATION 7.2

Fund and support a large, highly skilled, fairly compensated restoration workforce. Prioritise Indigenous leaders and land managers in this workforce. This necessitates expanding research-informed training programs delivered by experienced practitioners.

RECOMMENDATION 7.3

Work towards strategic shifts in policy, including syncing of biodiversity and climate goals, a nature investment strategy, and a national restoration plan that includes collaboration with diverse stakeholders.

7 | Scaling-Up

To scale up restoration efforts in Australia we need a coordinated, large-scale approach including community involvement, Indigenous knowledge, committed funding, improved data sharing, climate change adaptation strategies, and targeted restoration programs for different ecosystems, all while fostering collaboration between government, the private sector, and non-governmental organisations across various levels, from local to national.

7c | Recommendations to enable scaling-up

Key Actions to Consider

Policy and Governance:

- Establish a national restoration plan with clear targets and priorities, aligned with Australia's biodiversity goals and climate change commitments.
- Streamline permitting processes and create incentives for landholders to participate in restoration projects.
- Develop robust monitoring and evaluation frameworks to track progress and identify areas for improvement.

Funding and Investment:

- Secure dedicated funding sources for large-scale restoration projects, including potential carbon market mechanisms.
- Explore innovative financing models like restoration bonds and impact investing.
- Allocate funds to support research and development of restoration techniques tailored to specific ecosystems.

Community Engagement:

- Actively engage local communities, including Indigenous groups, in restoration planning and implementation.
- Build capacity through training programs and knowledge sharing initiatives to empower communities to lead restoration efforts.
- Foster partnerships between landholders, NGOs, and government agencies to leverage collective expertise and resources.

Education & Training:

- Incorporate the latest scientific knowledge on restoration ecology to ensure projects are effective and adaptable to climate change.
- Utilise data analysis and modeling to identify priority restoration areas and optimize project design.
- Establish a national network to share best practices and lessons learned across different restoration projects.

Key Challenges to Address

Fragmentation of land ownership: Coordinating restoration efforts across diverse land tenures can be complex.

Limited funding: Securing sufficient funding to undertake large-scale restoration projects.

Lack of knowledge and capacity: Building expertise in restoration practices across different ecosystems.

Historical land management practices: Addressing legacy issues such as invasive species and degraded soil health.

By implementing a comprehensive approach that addresses these challenges, Australia can significantly scale up restoration efforts and contribute to the recovery of its natural ecosystems.

RECOMMENDATION 7.4

Enable and foster community engagement in restoration by including community groups in restoration planning and building partnerships with landholders.

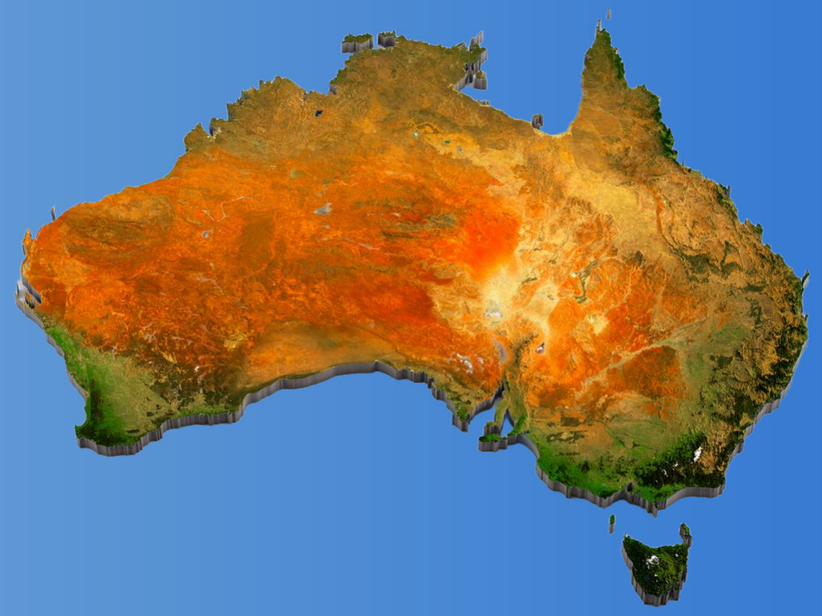
RECOMMENDATION 7.5

Improve national education and training infrastructure by enabling knowledge-sharing. Establish a national network to share data, models and tools, best practices and lessons learned.

GOAL: SCALING-UP RESTORATION

Scaling up restoration in Australia requires a multi-faceted approach encompassing strategic planning, policy shifts and investment in workforce development, as well as addressing challenges related to seed supply, land access, and implementation.

By focusing on coordinating demand, aligning incentives for landholders, building knowledge and capacity, and ensuring that funding and governance mechanisms are supportive, impactful and sustainable landscape restoration can be achieved.



8 | ENGAGING SOCIETY

- Overcoming challenges to communication and education
- Perspectives of Australian society
- Engaging with different sectors and stakeholders
- Recommendations for engaging all-of-society

8 | Engaging Society

Overcoming challenges of communicating environmental science

Professor Euan Ritchie
Professor of Conservation Science
Deakin University

This report outlines some of the challenges related to engaging the public in environmental conservation in Australia. While it highlights a strong public desire for increased environmental action, stronger laws, and greater budget allocation for nature, it also notes an incorrect perception of improvement in environmental conditions, leading to some complacency.

The following pages outline key challenges in engaging society, such as limited public engagement with science and discrepancies between scientific consensus and public opinion, and proposes strategic communication and integrated approaches to overcome these hurdles. Challenges in engaging society with environmental science include limited public engagement with scientific findings (academic journal articles are read by only about 10 people on average), discrepancies between scientific consensus and public opinion (e.g., on climate change or evolution), and instances where scientists are prohibited from communicating information.

Ultimately, the goal is to foster whole-of-society support and active engagement in restoration efforts through tailored messaging, community involvement, and collaborative regional planning. Engaging society is essential for fostering widespread support, changing behaviours, and influencing policy decisions that promote ecosystem health and address environmental challenges.

Changing Perceptions

Australians demonstrate overwhelming public support for nature conservation, with 97% demanding increased action, 95% supporting a better budget, and 73% wanting stronger national environmental laws.

There is strong endorsement for specific policies such as strengthening environmental laws, protecting culturally significant wildlife, and ensuring government duty of care for future generations. A significant portion of Australians, particularly younger demographics and those in rural areas, support allocating more than 5% of the federal budget to nature conservation and repair.

The perception of responsibility for nature protection is also broadening to include governments, businesses, communities, and scientists.

Despite this strong desire for action, there is a perceived improvement in national environmental conditions, leading to a decrease in the perceived urgency for environmental action and potential complacency.

Furthermore, the strength of people's implicit connection to nature, a key driver for pro-environmental attitudes, shows signs of slight decline.

Overcoming Apathy

To overcome these challenges and achieve a whole-of-society restoration culture, we recommend a strategic approach to communication and engagement, which includes:

- Leveraging existing public concern and highlighting ongoing threats to counter complacency.
- Tailoring messages to specific audiences and combining scientific evidence with compelling narratives and emotional appeals.
- Promoting honesty and transparency about the challenges and costs associated with ecosystem restoration.
- Reframing language, for example, shifting "costs" to "investments" and "habitat loss" to "habitat destruction," to positively influence public perception.
- Harnessing social connectivity and actively working with communities by listening to their concerns and collaborating on solutions.
- Adopting an integrated approach that considers social and economic factors across scales, emphasizing strong national leadership, and using diverse communication methods to highlight nature's value by connecting it to issues like health, well-being, and economic prosperity.
- Empowering communities through participatory planning and establishing appropriate governance arrangements that ensure local voices are heard.
- Fostering collaboration across regions and working with established organisations to scale outcomes and amplify impact.

8 | Engaging Society

While Australians maintain a strong intrinsic connection to nature, a sense of complacency regarding the environmental situation may pose a challenge to driving urgent action. Advocacy efforts should leverage the existing public concern and highlight the ongoing threats to biodiversity to counter this complacency. We should also respond to the public's demand for stronger environmental action and allocate adequate resources for nature protection.

8a) Perspectives of Australian society

Public Perspectives in 2024

The Biodiversity Council's 2024 survey exploring Australian perceptions and concerns regarding biodiversity builds upon previous data collected in 2022 and 2023, providing valuable insights into trends and shifts in public opinion.

Key findings reveal strong public support for increased environmental action, budgeting, and stronger laws. While Australians perceive national environmental conditions as improving, there's a disconnect between this perception and the desire for more government action.

The surveys also analyzed demographics and political alignment with environmental concerns and policy support, showing varying levels of support across different groups for specific policy proposals. The report concludes with recommendations for targeted messaging to different audiences.

The key themes and findings of the report are detailed on this page.

Strong Public Support for Conservation: An overwhelming majority of Australians (97%) demand increased action to protect nature. There is widespread support for a better budget for nature (95%) and stronger national environmental laws (73%). 97% of Australians want more 'action' for nature.

Improved Perception of Environmental State, Leading to Complacency: While acknowledging the need for continued effort, Australians perceive the environment as performing better compared to the previous year. This improved perception coincides with a decrease in the perceived urgency for environmental action. People think the environment is doing better than last year, so not as much action is needed.

Connection to Nature shows signs of decline: Implicit connection remains the strongest driver for pro-environmental attitudes, highlighting the importance of personal experiences with nature. However, the survey reveals a slight decline in the strength of this connection, evidenced by fewer respondents "strongly agreeing" with statements reflecting a deep connection to nature.

Recognition of Shared Responsibility: Australians acknowledge the shared responsibility for nature protection, extending beyond individuals to encompass various stakeholders including governments, businesses, communities, and scientists. The survey highlights a broadening perception of responsibility compared to the 2022 survey.

Support for Specific Policies: The survey gauged public support for a range of specific policies, revealing high endorsement for strengthening environmental laws, protecting culturally significant wildlife, ensuring government duty of care for future generations, and implementing mandatory climate emissions assessments for developments

Spending on Nature: A significant portion of Australians across all demographics support increasing government spending on nature, with a preference for allocating more than 5% of the budget. This sentiment is particularly strong among younger demographics (18-34) and those residing in rural areas. Political alignment plays a role, with Greens and Labor supporters demonstrating higher levels of support for increased spending compared to Liberal and National supporters.

RECOMMENDATION 8.1

Recognise and respond to Australian public sentiments about nature, the desire for stronger environmental laws, and the strong preference for allocating more than 5% of the federal budget to nature conservation and repair.

Science is humanity's best method for objectively understanding our world. But, when science, art and storytelling combine we can change the world. The fusion of science, art, and storytelling can be a powerful catalyst for positive change.

8b) Overcoming challenges to engaging society

Challenges

Limited Public Engagement with Science: An average academic journal article is read in its entirety by about 10 people. This is a key challenge of disseminating scientific findings to a wider audience.

Discrepancy Between Scientific Consensus and Public Opinion: While 87 percent of scientists accept that natural selection plays a role in evolution, only 32% of the public agree." Scientific consensus on climate change (87%) significantly outweighs public agreement (50%).

Barriers to Communicating Science: 52% of government respondents, 38% from industry, and 9% from universities were prohibited from communicating scientific information. This indicates a concerning trend of silencing scientific voices, potentially hindering informed decision-making.

Strategies for Engagement

The GAMPER Framework: a strategic approach to communication to help guide effective engagement, involving: Goal, Audience, Message, Platform, Evaluation, Refine & Reality

Understanding the Audience: Tailoring messages to the specific needs and values of the target audience is crucial for achieving impact.

Storytelling and Emotion: Combining scientific evidence with compelling narratives and emotional appeals can be a potent tool for swaying minds and inspiring action.

Honesty and Transparency: Honesty in communication is important, we need to be transparent about the challenges and costs associated with ecosystem restoration.

Harnessing Social Connectivity: Leveraging social networks and community champions can amplify the reach and impact of restoration efforts.

Working with Communities: Engaging directly with communities, listening to their concerns, and collaborating on solutions is essential for building trust and driving meaningful change.

Shifting Language: Reframing "costs" as "investments" and "habitat loss" as "habitat destruction" can help shift public perception and encourage support for restoration efforts.

Strategic Approach for Societal Change: Effective communication strategies are essential for engaging society in ecosystem restoration and influencing collective behavior change.

RECOMMENDATION 8.2

Incorporate a strategic approach to stakeholder and society communications and engagement into the national restoration plan.

RECOMMENDATION 8.3

Incorporate strategies in the national restoration plan to overcome challenges related to the public's limited engagement with environmental science.

8 | Engaging Society

A shift towards more diverse communication strategies is essential to effectively convey the importance of nature. This will involve the mainstreaming of nature by connecting it to issues that resonate with the public, such as health, well-being, and economic prosperity; as well as strong national leadership to champion these communication efforts and provide clear direction.

8c) Engaging across regions for integration

Benefits of integrated restoration

An integrated approach aims to achieve environmental goals while considering social and economic factors across scales.

Success depends on a national leadership role and investments in coordination that can improve the adoption of effective restoration strategies and actions and related nature-based solutions.

Key strategies include creating a whole-of-society restoration culture, diverse communication methods to highlight nature's value, empowering communities through participatory planning, and optimising regional planning to address diverse local contexts.

A national restoration plan should emphasize collaboration across regions and between regional organisations and partners.

Features of an integrated approach

Regional planning that can support prioritisation of efforts, leverage resources effectively, and drive concrete action.

Acknowledges and incorporates the local context of restoration, considering factors like social dynamics, economic considerations, and the impact of extreme events.

Communicating Nature's Value:
A shift towards more diverse communication strategies is essential to effectively convey the importance of nature. This will involve the mainstreaming of nature by connecting it to issues that resonate with the public, such as health, well-being, and economic prosperity; as well as strong national leadership to champion these communication efforts and provide clear direction.

Strategies for integrated restoration

Success hinges on empowering communities to actively participate in environmental stewardship.

This includes:

Establishing governance arrangements at appropriate scales to ensure local voices are heard and decision-making reflects community needs.

Implementing place-based participatory planning that encourages community involvement in shaping local environmental strategies.

Investing in coordination efforts to scale outcomes and amplify the impact of community-driven initiatives.

RECOMMENDATION 8.4

Integrated planning and collaboration across regions needs to be enabled via knowledge exchange framework as well as designed for in the national restoration plan.

RECOMMENDATION 8.5

Work with established organisations like NRM Regions Australia who already have cross-regional integration capabilities.

GOAL: ALL OF SOCIETY SUPPORTING AND ACTIVELY ENGAGED IN RESTORATION

Ecosystem restoration is crucial for addressing environmental challenges like climate change, habitat loss, and biodiversity decline. However, scientific understanding alone is insufficient to drive the necessary large-scale action.
Engaging society is essential for fostering widespread support, changing behaviors, and influencing policy decisions that promote ecosystem health.

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