



The Blueprint to Repair Australia's Landscapes

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Funders of the Blueprint:

Ian Potter Foundation

Purves Environmental Fund

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Lord Mavor's Charitable Foundation through the Eldon & Anne

We acknowledge the First Nations peoples across Australia who have successfully stewarded Country for millennia

We pay our respect to Elders past and present



Thank you

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Tl;dr

- We know a lot about how to repair Australia's landscapes
- We can afford to do it

- BUT the cost will grow as we accrue more damage
- We must stop destroying irreplaceable things



WENTWORTH GROUP OF CONCERNED SCIENTISTS

WHO WE ARE

The Wentworth Group of Concerned Scientists is an independent group of Australian scientists, economists, lawyers, Indigenous knowledge experts and business people with a long-standing interest in the conservation of Australia's land, water and biodiversity. We were established in 2002 with the objective of connecting science to public policy.

OUR MEMBERS



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We've lost so much of what makes Australia unique

- 8 million hectares of threatened species habitat and ecological communities cleared in last 20 years
- Over 2100 threatened species – another 20 species added to the threatened list just last week
- 21 of the 23 Murray-Darling Basin catchments in poor or very poor health.
- Median annual flows into the MDB roughly half that of last century.
- Great Barrier Reef experienced six mass bleaching events since 2000.
- >90% of sediment runoff to the GBR caused by degradation of riparian areas from land clearing and livestock grazing.

But half our economy is closely dependent on a healthy and productive environment



We have promised to repair it

- Halt deforestation and land degradation by 2030
- Achieve nature positive
- Increase the area of natural ecosystems by 2050



We have a big task ahead

We have a big task ahead

The Aichi Biodiversity Targets

Strategic Goal A: Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society

By 2020, at the latest, all governments are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably.

A bit

By 2020, at the latest, biodiversity values have been integrated into national development and planning processes and national accounting, as appropriate, and reporting systems.

Not really

By 2020, at the latest, incentives, including subsidies, harmful to biodiversity are eliminated, phased or revised to avoid negative impacts, or avoided negative impacts have been minimized. Conservation and sustainable use measures are developed and applied, consistent and in harmony with the Convention and other relevant international obligations, taking into account national socio economic conditions.

Definitely not

By 2020, all governments, business and stakeholders have taken steps to reduce the impacts of unsustainable production and consumption and have kept the impacts of use of natural resources well within safe ecological limits.

So very no

Strategic Goal B: Reduce the direct pressures on biodiversity and promote sustainable use

By 2020, the direct pressures on biodiversity, including unsustainable use of resources and fragmentation of habitats, have been reduced to levels that do not threaten the maintenance of ecosystems, their resilience, genetic diversity and species.

This one's embarrassing

By 2020 all fish and invertebrate stocks and aquatic plants are managed and harvested sustainably, legally and applying ecosystem based approaches, so that overfishing and illegal plans and measures are eliminated, overfished fisheries have no significant adverse impacts on threatened species and vulnerable ecosystems and the impacts of fisheries on stocks, species and ecosystems are within safe ecological limits.

Bit of a stretch

By 2020 all forestry activities, including logging and other wood harvesting, do not contribute to land degradation and biodiversity loss.

A long way off this

By 2020, pollution, including from excess nutrients, has been reduced to levels that do not detract from ecosystem health and biodiversity.

Nope

By 2020, all invasive alien species are identified, controlled and eradicated, where necessary, to reduce their impact on biodiversity and ecosystem services.

So much more to do

By 2015, the multiple anthropogenic pressures on coral reefs, and other vulnerable ecosystems threatened by ocean acidification, overfishing, pollution, and coastal development are minimized, and their impact on biodiversity reduced.

Sorry GBR

Strategic Goal C: Improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity

By 2020, inland water bodies, freshwater ecosystems and their services are protected, restored and managed to achieve a significant reduction in pollution, and improved water quality and ecological resilience, as measured by ecologically significant indicators.

The 17%/10% thing was **not** the whole target!!

By 2020, the number of protected areas and other effective area-based conservation measures, and integrated into the wider landscape and seascapes.

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Goodbye Melomys

By 2020, the genetic diversity of cultivated plants and farmed and domesticated animals and of wild relatives, including wild ancestors, as well as of wild crops, trees, and strains of livestock, has been improved and sustained, including in on-farm and in-situ ex situ conservation, and strategies have been developed and implemented for minimizing genetic erosion and safeguarding their genetic diversity.

Stuff happening

Strategic Goal D: Enhance the benefits to all from biodiversity and ecosystem services.

By 2020, ecosystems that provide essential services, and in particular those with low resilience and recovering from degradation, are restored, where necessary, to enhance their ability to provide goods and services, and the needs of women, indigenous and local communities, and the poor and vulnerable.

Qld strikes again

By 2020, the resilience of ecosystems to current and future anthropogenic pressures, including climate change, ocean acidification, pollution, and to combating desertification, has been strengthened.

This one would've been so good

By 2015, the benefits from biodiversity and ecosystem services are being shared equitably and operationally, and the needs of women, indigenous and local communities, and the poor and vulnerable are being met.

Still working this out

Strategic Goal E: Enhance implementation through participatory planning, knowledge management and capacity building

By 2020, the traditional knowledge, innovations and practices of indigenous and local communities relevant to the conservation and sustainable use of biodiversity are respected, integrated and reflected in the implementation of the Convention with the full and effective participation of indigenous and local communities, at all relevant levels.

Would be a tick but for the word 'effective'

By 2020, the traditional knowledge, innovations and practices of indigenous and local communities relevant to the conservation and sustainable use of biodiversity are respected, integrated and reflected in the implementation of the Convention with the full and effective participation of indigenous and local communities, at all relevant levels.

Definitely not

By 2020, knowledge, the science base and the capacity to enhance the implementation of the Convention are being transferred, and applied.

Some good progress

By 2020, at the latest, the mobilization of financial resources for effectively implementing the Convention is being enhanced, and in accordance with the Convention, the process in the Strategy of action 10 should increase substantially from the current levels. This target will be subject to changes contingent to resources needs assessments to be developed and reported by Parties.

Global fail

Please feel free to use the Aichi Biodiversity Targets icons in your own materials. More details at www.cbd.int/sp

We have a big task ahead

- We have never met our targets before
- Turning this around can feel overwhelming
- The first step is to break it down into manageable chunks



Identifying national repair actions

- We aimed to develop a national blueprint for action
- Focus across five assets:
 - Soils
 - Native vegetation
 - Threatened species
 - Inland water
 - Coastal environments
- Well-evidenced, 'no regrets' actions
- Scaled and costed



REPAIR ACTIONS

Soils	<p>Objective S1 Improve physical and chemical condition and productivity of agricultural soils that need remediation due to long term degradation and where that remediation is not likely to occur without direct investment.</p> <p>S1.1-C Apply lime to address soil acidification on agricultural soils where damage is significant and not amenable to current management.</p> <p>S1.2-C Apply gypsum to address soil structure decline on agricultural soils with excess sodicity where amendment is likely to produce substantial improvement.</p> <p>S1.3-C Plant salt-tolerant vegetation (e.g., saltbush) on salt-affected lands to maintain soil stability and some level of production.</p>
	<p>Objective S2 Repair gully erosion hot spots across Australia to improve water quality in rivers and expand the availability of healthy land for agriculture and wildlife.</p> <p>S2.1-C Undertake remediation works of revegetation, fencing, stick traps, and rock chutes for high-risk gullies.</p> <p>S2.2-C Undertake remediation works of stick traps, rock chutes, fencing for low-to-medium risk gullies.</p>
	<p>Objective S3 Connect agricultural land management practices with broader national ambitions for biodiversity, climate change and agricultural productivity.</p> <p>S3.1-C Revitalise extension services to provide landholders with the knowledge and capacity to better optimise outcomes including maintain economic productivity, improving catchment health, sequestering carbon and improving biodiversity.</p>
Inland Waterways	<p>Objective R1 Establish and restore riparian buffer zones on all of Australia's rivers and streams to protect productive land from erosion, support biodiversity, improve water quality and enhance the productivity of fisheries and health of freshwater and marine ecosystems.</p> <p>R1.1-C Restore, conserve, and manage strips of healthy native riparian vegetation</p> <p>R1.2-C Incentivise landholders to retire their farmland along the banks of Australia's major rivers, smaller rivers and streams, and major natural and wetlands</p>
	<p>Objective R2 Restore overallocated river systems to sustainable levels of take.</p> <p>R2.1-C Return overallocated river systems of the Murray-Darling Basin to environmentally sustainable levels of surface water extraction through strategic purchase of water licences from willing sellers, on-farm investment, and other measures.</p>
	<p>Objective R3 Restore lateral and longitudinal connectivity of rivers, floodplains and their wetlands.</p> <p>R3.1-C Allow water to reach and pass safely across floodplains and wetlands in the Murray-Darling Basin by modifying infrastructure (e.g., bridges and roads), removing high-risk or unauthorised flood works, or purchasing voluntary easements on private land.</p> <p>R3.2-C Restore fish passage by removing or modifying high priority physical barriers.</p> <p>R3.3-C Install cold-water pollution control devices on priority large dams.</p> <p>R3.4-C Install fish diversion screening on all licensed irrigation pumps.</p>
Native vegetation	<p>Objective R4 Improve the efficient use and sustainability of groundwater resources</p> <p>R4.1-C Cap remaining open artesian bores and convert remaining open bore-drains to pipes and trough systems in the Great Artesian Basin.</p> <p>R4.2-C Return groundwater extractions to sustainable levels in the Murray-Darling Basin through the strategic purchase of water licences from willing sellers.</p>
	<p>Objective V1 Native vegetation covers at least 30% of pre-1750 extent in a healthy ecological condition for each of Australia's terrestrial ecosystems</p> <p>V1.1-C Restore 1.3 million hectares of degraded native vegetation to a healthy ecological condition within the protected area estate</p> <p>V1.2-C Restore 11.6 million hectares of degraded native vegetation to a healthy ecological condition on non-prime agricultural land</p> <p>V1.3-C Incentivise landholders to retire their non-prime agricultural land for the native vegetation conservation areas</p>
	<p>Objective V2 Reduce the frequency and intensity of fires impacting Australia's tropical savannas</p> <p>V2.1-C Controlled low intensity fires early in the dry season in Australia's tropical savanna lands using indigenous fire management practices.</p>
Threatened species	<p>Objective T1 Mitigate imminent extinction risk and ensure medium term survival of Commonwealth-listed threatened species.</p> <p>T1.1-C Restore habitat, address threats and undertake population interventions such as translocation and breeding programs for species listed Critically Endangered, Endangered and Vulnerable under Commonwealth legislation.</p>
Coastal environments	<p>Objective C1 Support coastal biodiversity, and improve coastal fisheries productivity</p> <p>C1.1-C Maintain or improve the condition of degraded salt marsh ecosystems</p> <p>C1.2-C Incentivise a change in management practice for salt marsh ecosystems</p> <p>C1.3-C Re-establish locally degraded seagrass communities in priority areas</p> <p>C1.4-C Re-establish shellfish reefs in priority locations</p>

Blueprint to Repair Australia's landscapes

1. Synthesis report

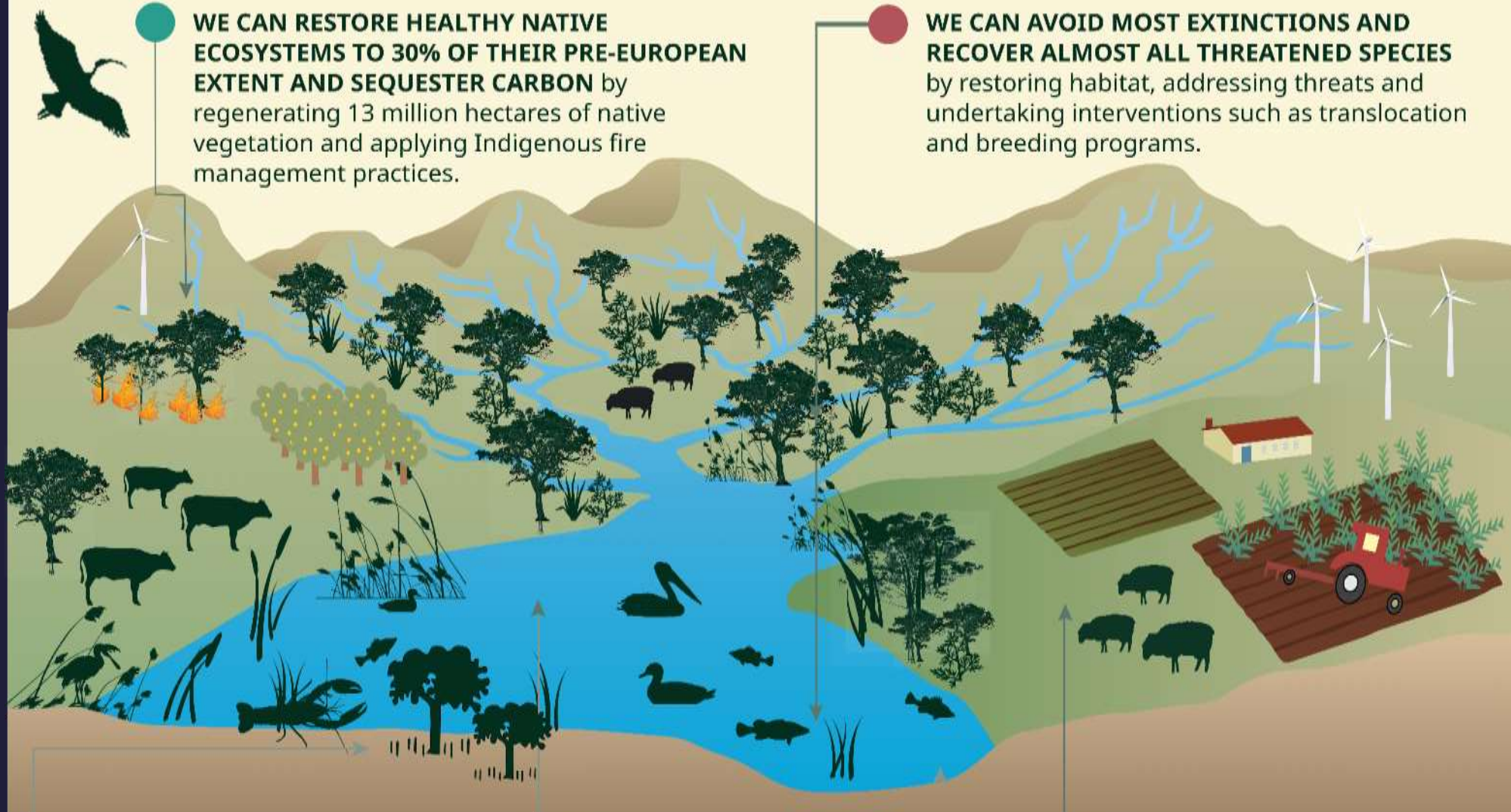
The case for a 30-year investment in a healthy, productive & resilient Australia

"Repairing Australia's landscape is essential, urgent, achievable, affordable and in the national interest."

2. Technical Report

The evidence base for 24 practical actions to substantially repair past degradation

3. Investment spreadsheet



WE CAN RESTORE HEALTHY NATIVE ECOSYSTEMS TO 30% OF THEIR PRE-EUROPEAN EXTENT AND SEQUESTER CARBON by regenerating 13 million hectares of native vegetation and applying Indigenous fire management practices.

WE CAN AVOID MOST EXTINCTIONS AND RECOVER ALMOST ALL THREATENED SPECIES by restoring habitat, addressing threats and undertaking interventions such as translocation and breeding programs.

WE CAN MAINTAIN OR IMPROVE THE CONDITION OF ESTUARIES by reconnecting freshwater flushes and tidal flows in coastal estuaries and drained peatlands to protect and restore critical habitats including tidal marsh, seagrass meadows and shellfish reefs.

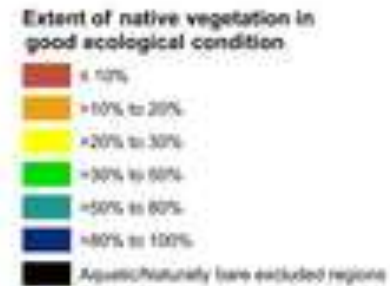
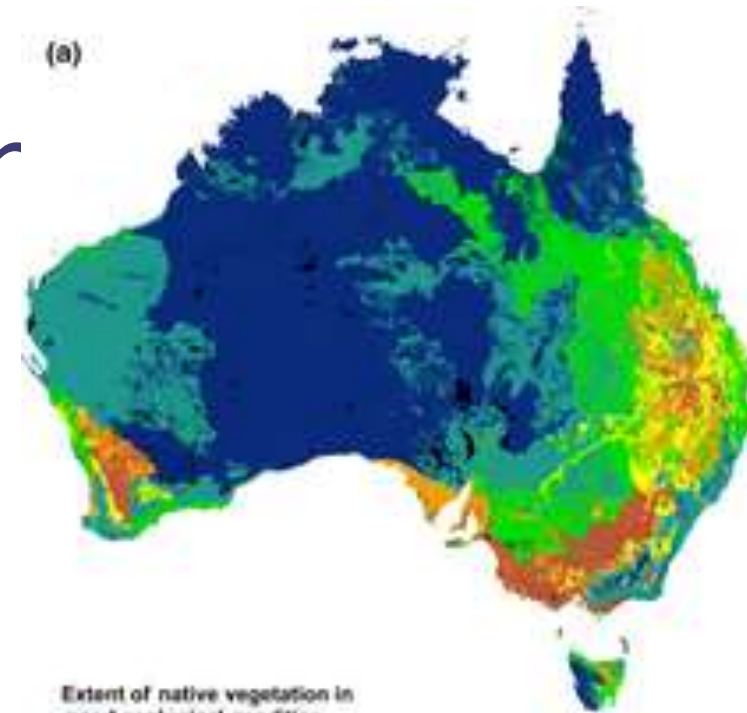
WE CAN FIX OVERALLOCATED AND FRAGMENTED RIVER SYSTEMS AND REHABILITATE DEGRADED WATER CATCHMENTS by ensuring sustainable levels of extraction, removing barriers to fish migration, and restoring native vegetation in gullies and along river corridors.

WE CAN REPAIR THE PRODUCTIVE BASE OF AGRICULTURAL SOILS by removing intractable constraints to productivity and revitalising extension services to support nature and carbon benefits.

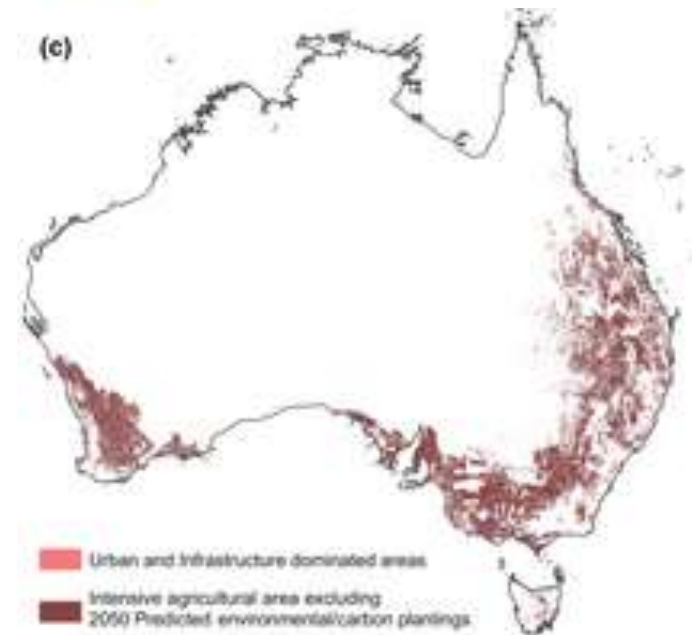
E.g.: Native vegetation

It is possible to:

- Increase nearly all of Australia's degraded terrestrial ecosystems to 30% of their pre-European extent*
- While preserving prime agricultural land and urban areas



Journal of Applied Ecology



RESEARCH ARTICLE

UN Decade on Ecosystem Restoration

The costs and benefits of restoring a continent's terrestrial ecosystems

Bonnie Mappin^{1,2,3} | Adrian Ward⁵ | Lesley Hughes⁴ | James E. M. Watson^{1,3} | Peter Cosier^{5,6} | Hugh P. Possingham^{1,2}

E.g.: Native vegetation

- Restore 12.9 million hectares of degraded land
- Abate 1 bn tonnes CO2 equivalent
- At a cost of ~ 2 bn/year
- Costings being updated (by Michelle Ward & co) – but very similar results

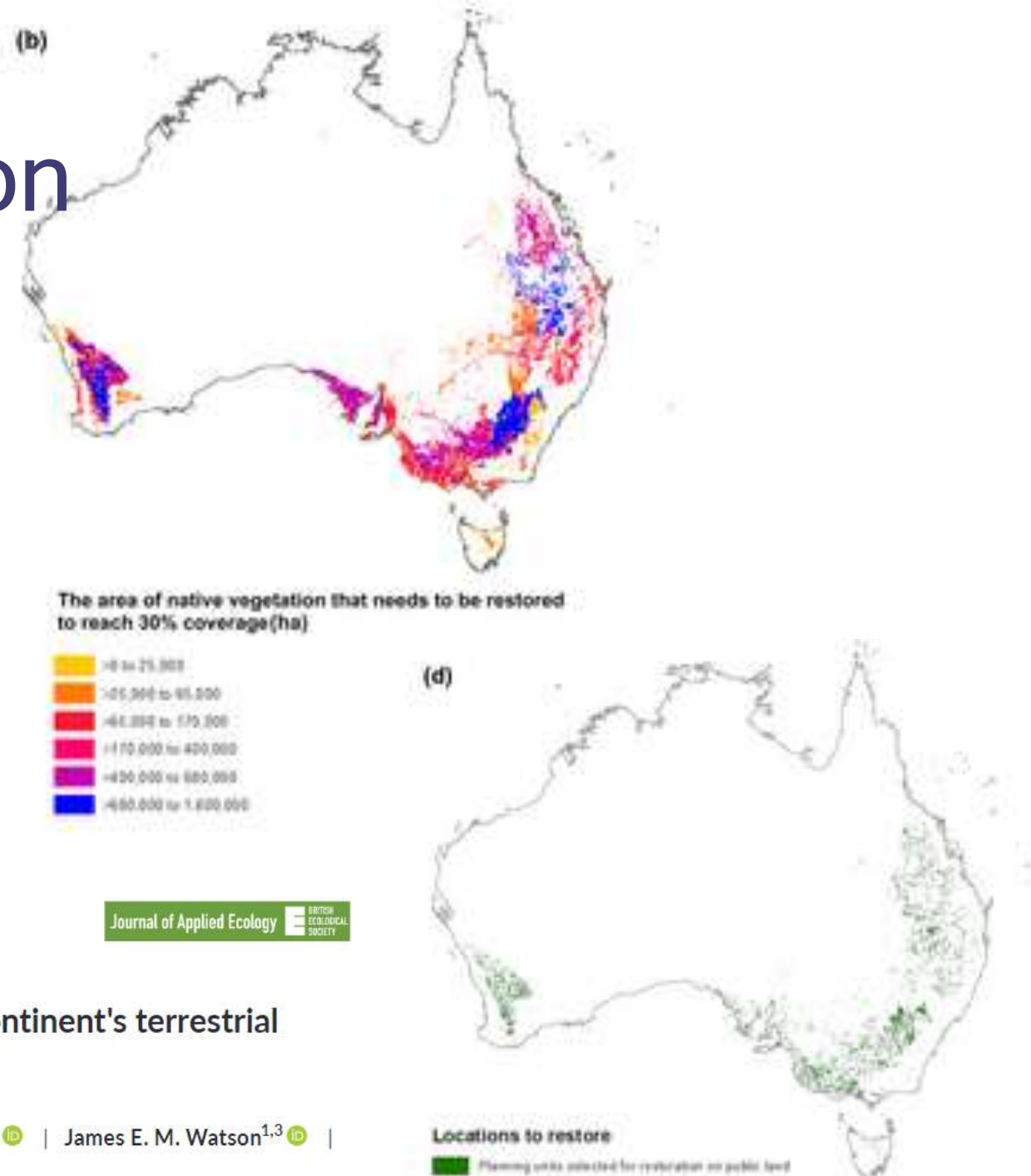


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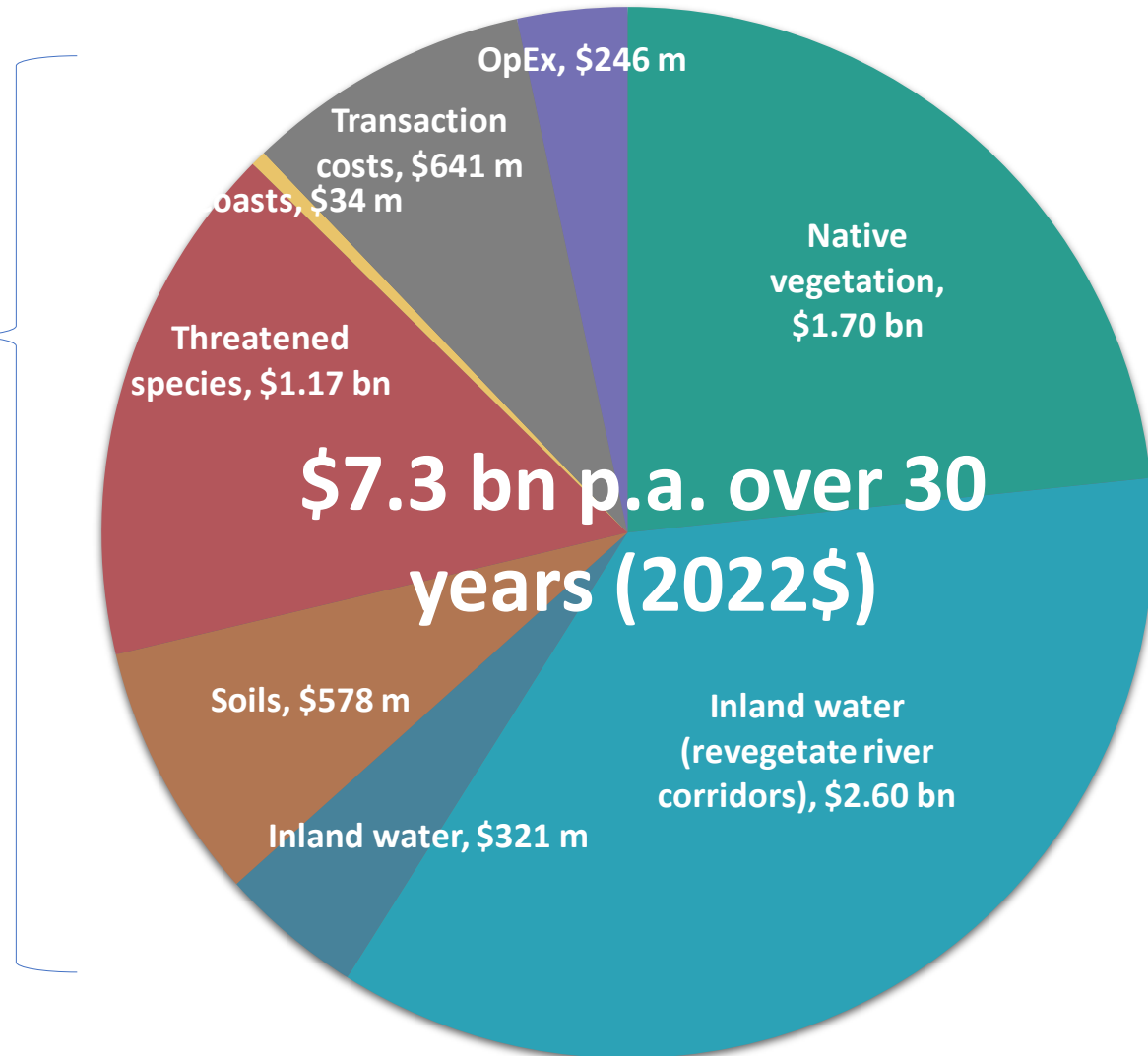
Investment needed to repair degraded landscapes

Public funding & incentives

Private sector investment

Blended finance

Philanthropy



Carbon market revenue from **high integrity, genuinely additional** native vegetation actions (\$0.5 – \$1.1 billion)

Further carbon market opportunities e.g. revegetation of river corridors, savanna burning, blue carbon etc.

Blueprint recommendations

1. A long-term nation-wide strategic plan to repair Australia' s landscapes
2. A national body (e.g. a National Council) responsible for overseeing the initiative, delivering the strategic plan and enabling policy, law and governance reforms.
3. A regional approach to planning and delivery
4. Ongoing sustainable sources of finance for the repair effort
5. Increased Aboriginal and Torres Strait Islander participation and leadership.
6. Support for communities and businesses to drive the repair actions.
7. A system of national, regional and property scale environmental accounts
8. Policy, law and governance reforms, including to prevent future degradation of Australia' s landscapes

CAVEAT: The price increases as the damage mounts

- The 30% keeps getting bigger
- At what pace are we growing the scale of the restoration challenge?



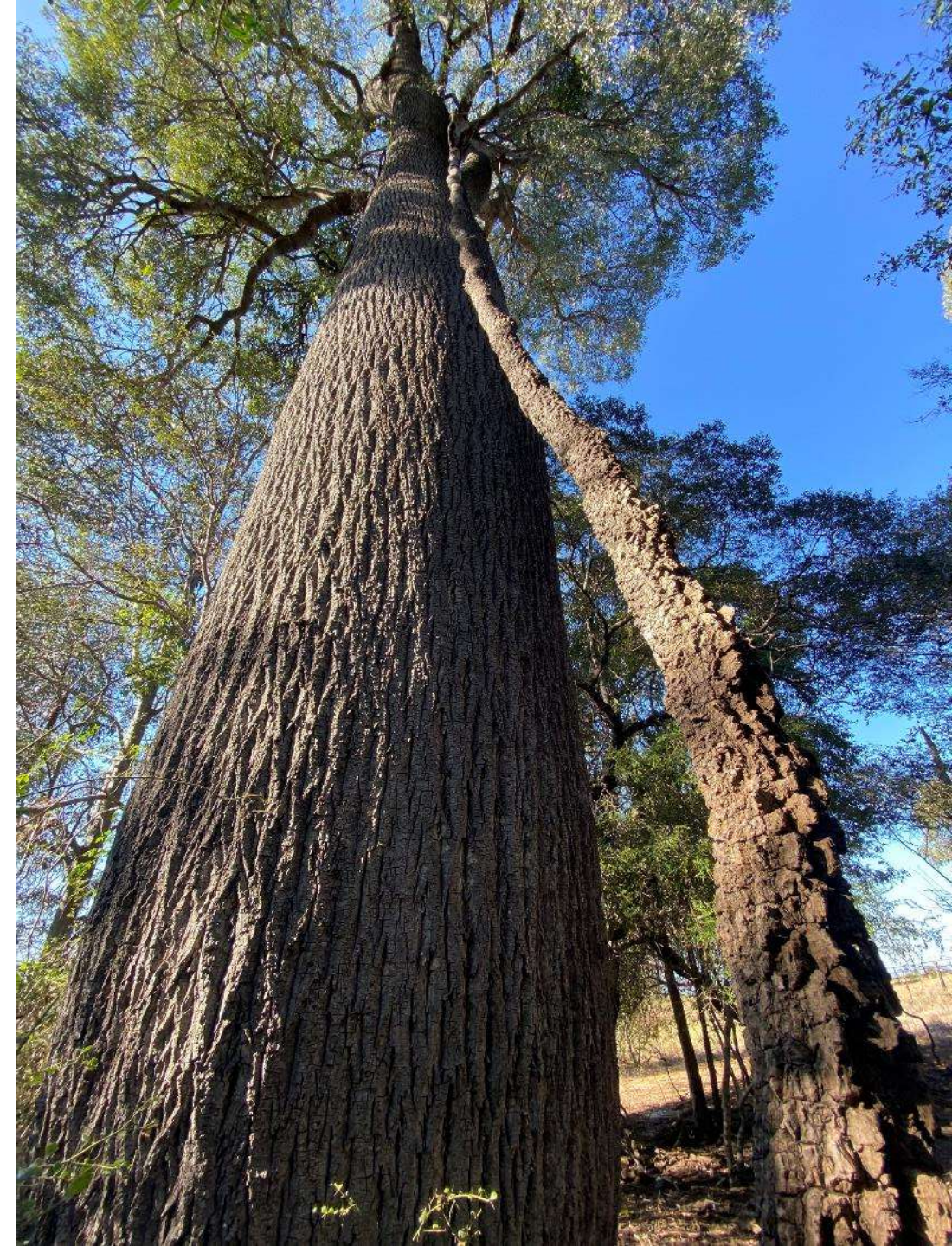
Regeneration isn't keeping pace

- Most clearing is of regrowing native vegetation
- BUT regrowth added is less than of vegetation cleared
- E.g. Qld: **net** reductions:
 - 238,334 ha in 21-22
 - 289,745 ha in 20-21
 - 296,569 ha in 19-20



And much of what we are losing cannot be replaced

- The crisis is urgent: things that take a long time to create are essentially irreplaceable
- Old growth ecosystems cannot be made within ecologically relevant timeframes
- Recent figures are 50K – 180K ha of remnant clearing annually in Qld alone



Some biodiversity is easy to replace, in some situations

- Degraded habitats
- Anthropogenic habitats and the species that use them
- Ecosystems with fast recovery times



<https://blog.arribasail.com/2014/11/anchoring-in-seagrass-please-dont.html>

... but a lot of it is difficult, unquantifiable, expensive

- Poorly-understood species and ecosystems where restoration is unproven
- Ecosystems that are very scarce or on expensive/contested land
- Habitats for species with complex life cycles



And some of it is impossible

- High-condition ecosystems
 - Very rare and depleted systems/species
 - Old-growth ecosystems and habitat elements
- = must be avoided, or nature positive not possible, regardless of how much restoration we



Without reform, restoration is a Sisyphean task

- We can increase ecosystem area, but there are limits to restoring condition
- No matter how much investment, some things are not restorable
- A foundational principle if we are to preserve any chance of meeting the 2050 goals of the GBF or nature positive:

Let's not destroy what we can't replace

So,

- We know a lot about how to repair Australia' s landscapes
- We can afford to do it
- BUT the cost will grow as we accrue more damage
- We must stop destroying irreplaceable things



Thank you

The Blueprint can be accessed on our website:
www.wentworthgroup.org

If you'd like to reach out and talk to us:
information@wentworthgroup.org



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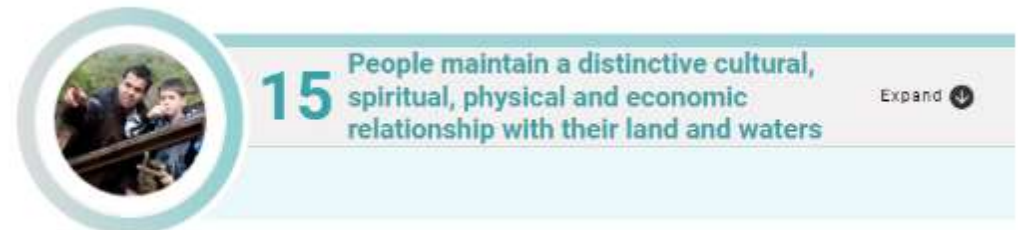
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The role of First Nations

The Blueprint proposes four key measures to unlock the potential for Aboriginal and Torres Strait Islander people to take leading roles in the landscape repair agenda proposed.

1. Increase Indigenous ownership and management of land and water
2. Unlock broader socio-economic benefit from the repair and stewardship of Country
3. Recognise the value of traditional knowledge to repair and manage Country
4. Establish and expand programs to employ Aboriginal and Torres Strait Islander people to repair and manage Country



Why now?/what are these big-picture goals good for?

- Australia has national ambitions and goals to:
 - reach net zero emissions by 2050,
 - protect and restore 30% of land and water areas by 2030,
 - and deliver more sustainable, productive and resilient food systems.
- There is increasing international pressure on Australian markets and businesses, e.g.
 - EU deforestation-free
 - Taskforce for Nature-related Financial Disclosure
- Climate change will put increasing pressure on environment, communities and economy

- TARGET 1 Ensure that all areas are under participatory, integrated and biodiversity inclusive spatial planning and/or effective management processes addressing land- and sea-use change, to bring the loss of areas of high biodiversity importance, including ecosystems of high ecological integrity, close to zero by 2030, while respecting the rights of indigenous peoples and local communities.
- TARGET 2 Ensure that by 2030 at least 30 per cent of areas of degraded terrestrial, inland water, and marine and coastal ecosystems are under effective restoration, in order to enhance biodiversity and ecosystem functions and services, ecological integrity and connectivity.

The scale of clearing



All conversion of natural systems

Loss of threatened species habitat/TECs (~78%)

Probably requires referral/assessment (~67%)

Referred/assessed
(~6%)

Requires offsets ~1.5%

Repairing degraded soils

- Agriculture occurs across 55% of Australia
- About two-thirds of this land suffers from acidification, contamination, nutrient and organic matter depletion, and salinity
- Climate change is increasing vulnerability of soils
- This will increasingly affect farm profitability and future prosperity
- Leading farmers are demonstrating that you can lift constraints to agricultural productivity.
- Improving on-farm soil management can have significant co-benefits for nature

Objective S1.	Improve physical and chemical condition and productivity of agricultural soils that need remediation
Objective S2.	Repair gully erosion hot spots across Australia to improve water quality in rivers and expand the availability of healthy land for agriculture and wildlife.
Objective S3.	Connect agricultural land management practices with broader national ambitions for biodiversity, climate change and agricultural productivity