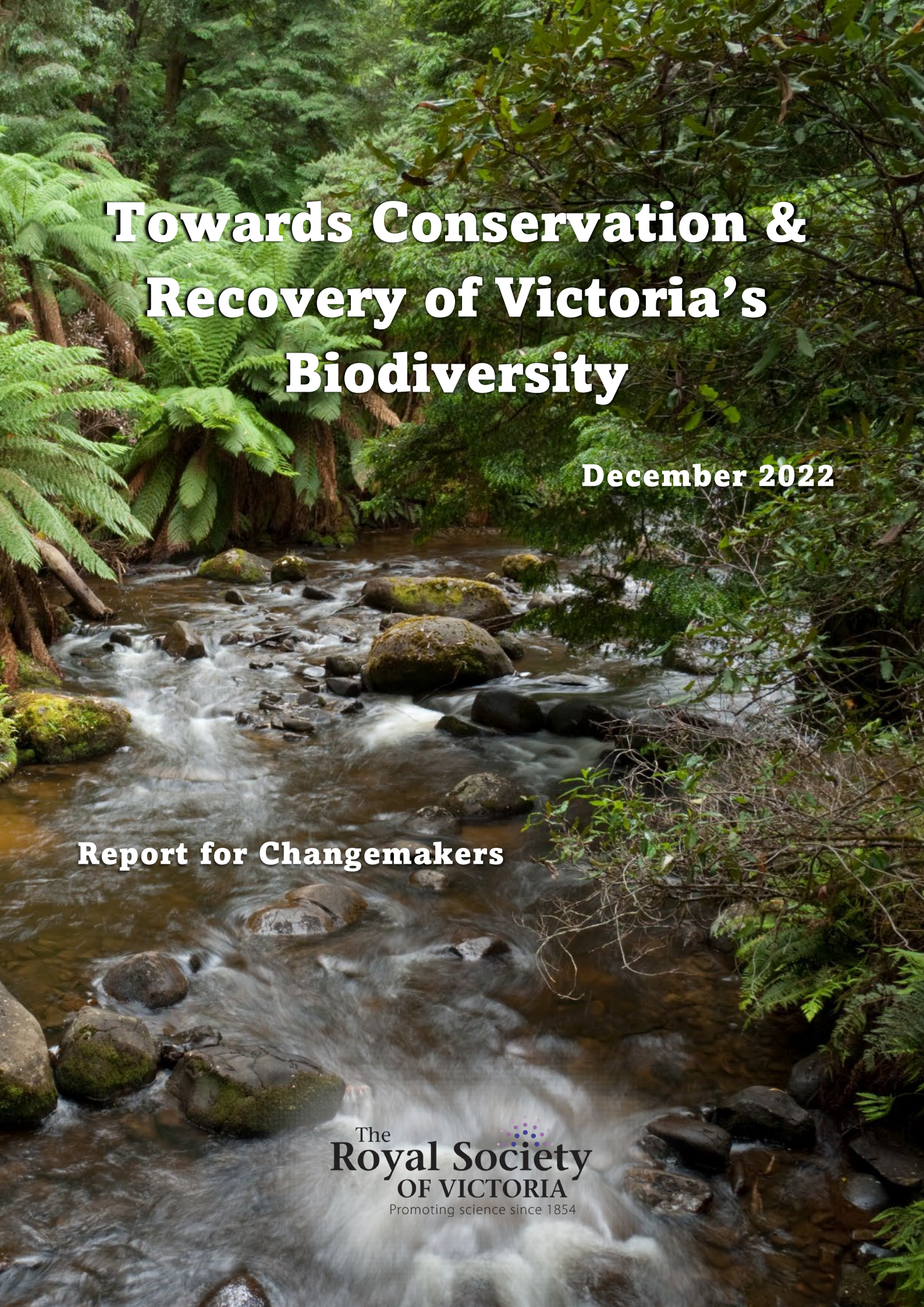

Towards Conservation & Recovery of Victoria's Biodiversity

December 2022

Report for Changemakers

The Royal Society OF VICTORIA
Promoting science since 1854

Report for Changemakers

Drafting authors: Michael Flattley, Simon Torok

Drafting contributing authors: Brendan Wintle, Fern Hames, Damein Bell, Judith Downes, Scott Reddiex, Jane Canestra, Robert Day, Gordon Noble, Jarrod Troutbeck, Dylan Brady, David Walker, Viktor Perunicic, Sasha Courville, Richard Blundell, Anthony Boxshall

Visual Design: Molly Patton

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Contents

Acknowledgement of Country and First Peoples

The Royal Society of Victoria recognises the profound significance of the Australian continent's First Peoples' cultural knowledge base, and the remarkable legacy of tens of thousands of years' worth of expertise acquired in maintaining cultural landscapes on Country. We acknowledge that the disruption and destruction of these ancient traditions through European invasion, disconnecting unceded Country from its people to impose practices developed in foreign waters, soils and ecosystems, has led to an alarming decline in the health of Country.

In a spirit of hopeful partnership, shared love for Victoria's lands and waters, and a sorrowful acknowledgement of past and enduring wrongs brought about through ignorance and bigotry against Indigenous peoples within the European tradition of scientific practice, we convey our sincere apologies and deepest respect to all Elders working to recover their legacy and pass specialised knowledge to the next generation of First Nations leaders, knowledge holders and change makers.

The Aim of this Document

This report and position paper from the Royal Society of Victoria (RSV) addresses the conservation and recovery of Australia's unique biodiversity. The paper summarises the current state of biodiversity reviews, responses and policies in Victoria in the broader Australian and global context. It seeks to establish a cross-sectoral position through consensus building, with prioritised recommendations for effective investment strategies and actions by business, government, research and the community, including Traditional Owners and other groups, to help Victorians resolve the biodiversity crisis.

From left: Mr James Todd (Chief Biodiversity Officer, Victorian Government) with Ms Monica Morgan (CEO, Yorta Yorta Nation Aboriginal Corporation)

The aim is to bring stakeholders up to speed with work already underway, and to bring together diverse groups and sectors to meet the goals set out in *Protecting Victoria's Environment - Biodiversity 2037*, Victoria's ambitious strategy to halt the decline of our State's biodiversity and ensure that our natural environment is healthy, valued and actively cared for by everyone.

We seek to generate further discussion, exploration and action by decision-makers across all sectors of Victorian society. The RSV is communicating the recommendations from the process to raise awareness of the biodiversity crisis, offer pathways for resolution and identify further work required to inform and enable a positive transformation of humanity's relationship with nature.

This RSV paper is independent, authoritative, and evidence-based, seeking practical pathways toward transforming how Victorians think about the natural world and recommended work to conserve and restore our State's unique biodiversity.

RSV cross-sector forum participants, from left: Ms Judith Downes (Chair, Bank Australia), Professor Rachel Webster (Astrophysicist, The University of Melbourne), Professor Peter Gell (Paleoecologist, Federation University).

The paper has been developed following a forum involving research expertise, First Nations knowledge holders, policy leaders, catchment management authorities, finance sector leadership and community champions at the RSV on 4 June 2022, designed and delivered by **Dr Anthony Boxshall** from Science into Action.

From left: Ms Lyn Allison (President, Westgate Biodiversity) with Uncle Dave Wandin (Wurundjeri Woi-wurrung Elder and Cultural Practices Manager (Fire and Water), Wurundjeri Woi-wurrung Cultural Heritage Aboriginal Corporation).

This paper was developed in consultation with four RSV Fellows: **Ms Judith Downes**, Chair of Bank Australia; **Mr Damein Bell**, Atlantic Fellow for Social Impact; **Ms Fern Hames**, Director of the Arthur Rylah Institute for Environmental Research; and **Professor Brendan Wintle,** Professor of Conservation Ecology at the University of Melbourne. We thank the RSV's Councillors and Committee members for their input and guidance, and our peer reviewers from across the sectors represented for their time, expertise and candour in providing critical feedback.

A Global Extinction Crisis

Biodiversity defines all life on Earth, which is itself a cosmological rarity; there has been no scientifically valid indication of life existing elsewhere in our vast universe, past or present. Biological diversity provides basic necessities and essential resources and services to all people. Over 4.3 billion people, more than half the world's population, depend on biodiversity for their livelihoods, and 70 per cent of the world's poor and vulnerable live in rural areas that rely directly on it. Today, however, 60 per cent of the world's ecosystems are degraded or unsustainably used. [1] (UNCTAD, 2022)

In 2019, a study produced by the Intergovernmental Panel on Biodiversity and Ecosystem Services (IPBES), which groups 130 countries, found that up to one million of Earth's estimated eight million plant, insect and animal species are at risk of extinction within the next few decades. (IPBES, 2019)

Alongside the devastating impacts on marine and terrestrial ecosystems from anthropogenic climate change, the IPBES global assessment identified industrial farming and fishing as major drivers of the crisis, with the current rate of species extinction tens to hundreds of times higher than the average over the last 10 million years.

The International Union for Conservation of Nature and Natural Resources (IUCN) publishes a 'Red List' of threatened species to assess the status of the planet's biodiversity. Not all taxonomic groups have been completely assessed, but considerable progress has been made on coverage already, thanks to the research contributions of scientists around the world.

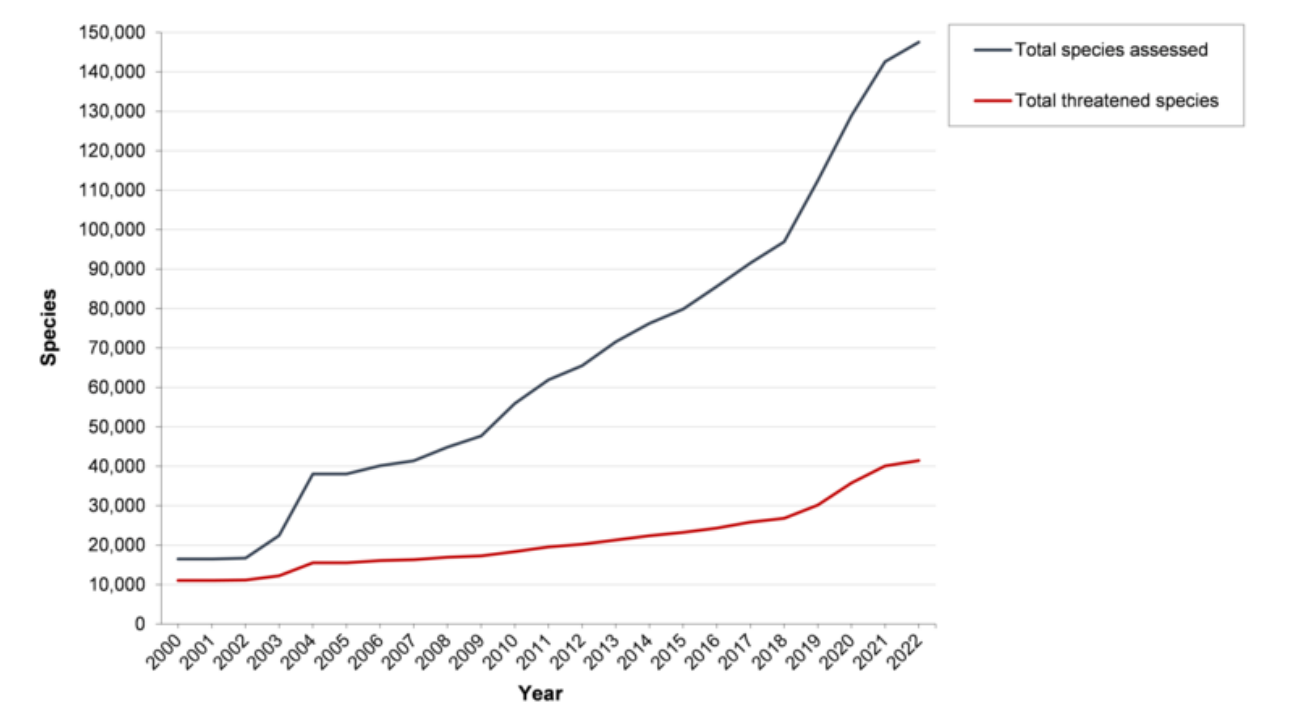


Figure 1: Increase in the number of species assessed for the IUCN Red List of Threatened Species™ (2000–2022; version 2022-1). (International Union for Conservation of Nature, 2022)

Why Should We Care?

Nothing is more important to humanity's continued existence than sustaining a healthy natural environment. The loss of biodiversity has profound ramifications for clean air and water, productive agriculture, pollination, and human well-being. The biodiversity crisis affects all aspects of society and thus requires a whole-of-society response to solve. Biodiversity is a crucial part of Australia's national identity and integral to the cultural practices of First Peoples.

Across Australia, biodiversity has been undervalued, and its loss is not measured in our economic indicators, yet it provides enormous benefits. Through pollination, air and water purification, carbon storage, energy and food, building materials, health and wellbeing benefits and tourism, biodiversity delivers billions of dollars of value to the national economy and underpins crucial sectors of our economy.

Each year, Victoria's national parks and conservation reserves add over $1 billion to Victoria's economy from tourism, save up to $200 million on health costs, and provide over $80 million of water purification, while preventing almost $100 million in damages associated with flooding and coastal erosion. (Parks Victoria, DELWP, 2015)

[1] *BioTrade, an agency of the United Nations Conference on Trade and Development, reports that '2.6 billion people draw their livelihoods either partially or fully from agriculture, 1.6 billion from forests, and 250 million from fisheries, with a total of approximately 4.3 billion.'*

Australia's Performance

Much has been reported regionally and globally about Australia's poor report card on extinctions and biodiversity decline.

At the time of writing, our nation ranks eighth in the world for threatened mammals, seventh for threatened fish, second for threatened molluscs, first for other invertebrates (a considerable proportion of all terrestrial and marine life on our continent) and eleventh for plants, according to the IUCN Red List. (International Union for Conservation of Nature, 2022)

For a nation boasting considerable relative wealth, currently ranked number 18 in the world in terms of Gross Domestic Product per capita, this is an appalling result – a clear indication of chronic over-extraction from the Australian continent's natural systems combined with either a lack of awareness about, or appropriate value attributed to, sustaining our nation's biodiversity in the interests of social, economic and cultural sustainability. (The World Bank, 2021)

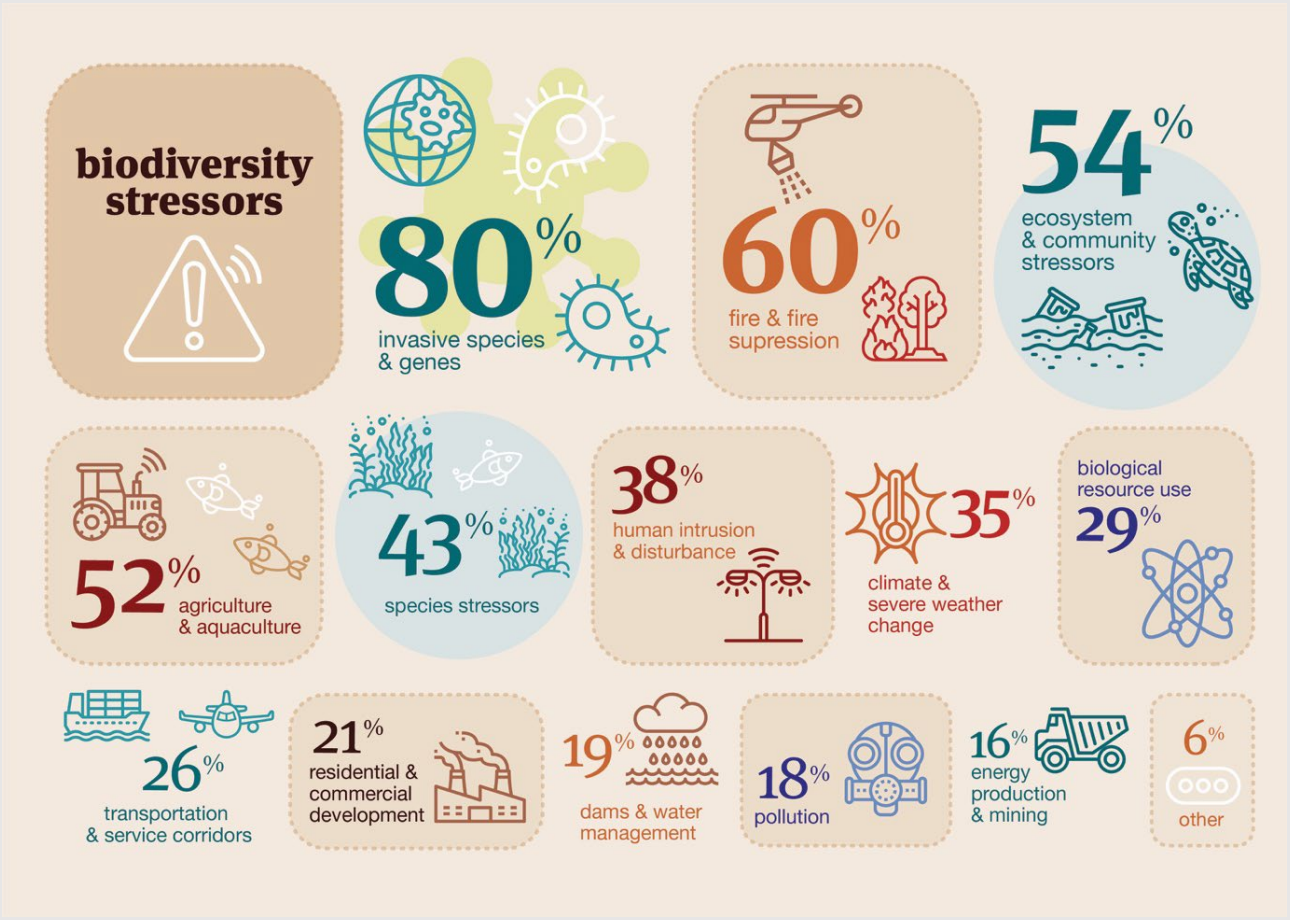


Figure 2: Proportional impacts of environmental stressors affecting threatened species listed as Nationally threatened under the Environment Protection and Biodiversity Conservation Act 1999.

We are losing more biodiversity than any other developed country, with the extinction of over 100 native species since European colonisation now formally recognised under legislation. (Bekessy & Wintle, 2022) The true number of extinctions is likely far higher due to a lack of survey effort (especially non-vertebrate animals, plants and fungi) and uncertain taxonomy (undescribed extinct species). (Ecological Society of Australia, 2019)

Average population sizes of threatened bird, mammal and plant species are, on average, half (or worse) what they were in 1985. (Terrestrial Ecosystem Research Network, 2022) There are 19 ecosystems showing signs of collapse, including the Great Barrier Reef, savannas, mangroves and tropical rainforests.

More than 1,800 species and ecosystems are threatened with extinction, including Bogong moths, Australian sea lions, grey nurse sharks, gang-gang cockatoos, and Wollemi pines. Even the koala has been listed as endangered in NSW, the ACT and Queensland, and iconic species such as the platypus and numbat are threatened. Cats alone kill 1.6 billion native animals each year and are a potential threat to 74 mammal species, 40 birds, 21 reptiles and four amphibians. (Commonwealth of Australia, 2020)

The Cost of Recovery

The cost of recovering Victoria's biodiversity is a challenge to estimate; to our knowledge, this complex analysis has not yet been undertaken. It presents a task similar to estimating the value of holdings in a major museum or library: we could analyse the cost of discrete restorative projects as representative samples and use these to extrapolate the cost of the whole.

Meanwhile, as a blunt measure based on the total expenditure legislated to address the decline of all threatened species in the United States of America, the cost of stopping species loss and recovering nationally listed threatened species in Australia would be about $1.7 billion per year. (Wintle, et al., 2019) Obviously, Australia's economy is much smaller than the USA's – 19 times smaller, in fact, which would bring the equivalent investment to roughly $89.5M per year based on GDP alone. This is not an economic argument, however: based on land mass and the sheer number of threatened species in Australia, the original figure remains roughly equivalent, despite a smaller human population.

The Australian government has pledged welcome funding of $224.5M for threatened species recovery in the October 2022 Federal Budget, but this is still less than 10 per cent of the blunt requirement measure, representing an investment of about 8 dollars per person, per year. By comparison, Australians spend 18 times that amount, about $30.7 billion, each year on our pet cats and dogs. (Animal Medicines Australia, 2021)

Further, the unique nature of our ecosystems and species compared to those on other continents require unique responses. Ultimately, we need to understand what has worked (and not worked) through past efforts, and fill our knowledge gaps with diverse, rigorous projects that test hypotheses and demonstrate where best we can derive a clear return on investment from very limited resources.

This work needs to begin immediately.

Victoria's Extinction Crisis

Victoria's biodiversity, including native flora and fauna and their habitats, has been declining since European settlement. As of November 2021, it is estimated that Victoria has lost around 80 species, with 1,991 at risk of extinction. Current and emerging threats, such as land clearing, the introduction of invasive plants and animals, and the impact of climate change continue to put our native plants and animals at increasing risk of decline and extinction. (Andrew Greaves, 2021)

In Victoria, tall mountain ash forests and snowpatch herbfields in the Victorian Alps are at direct risk from climate change and invasive species, while the vast Great Southern Reef giant kelp forests are suffering from the impacts of coastal development and pollution, ocean acidification and heating, overfishing, the spread of invasive species and increased storm severity and frequency. (Bergstrom, Ritchie, Hughes, & Depledge, 2021)

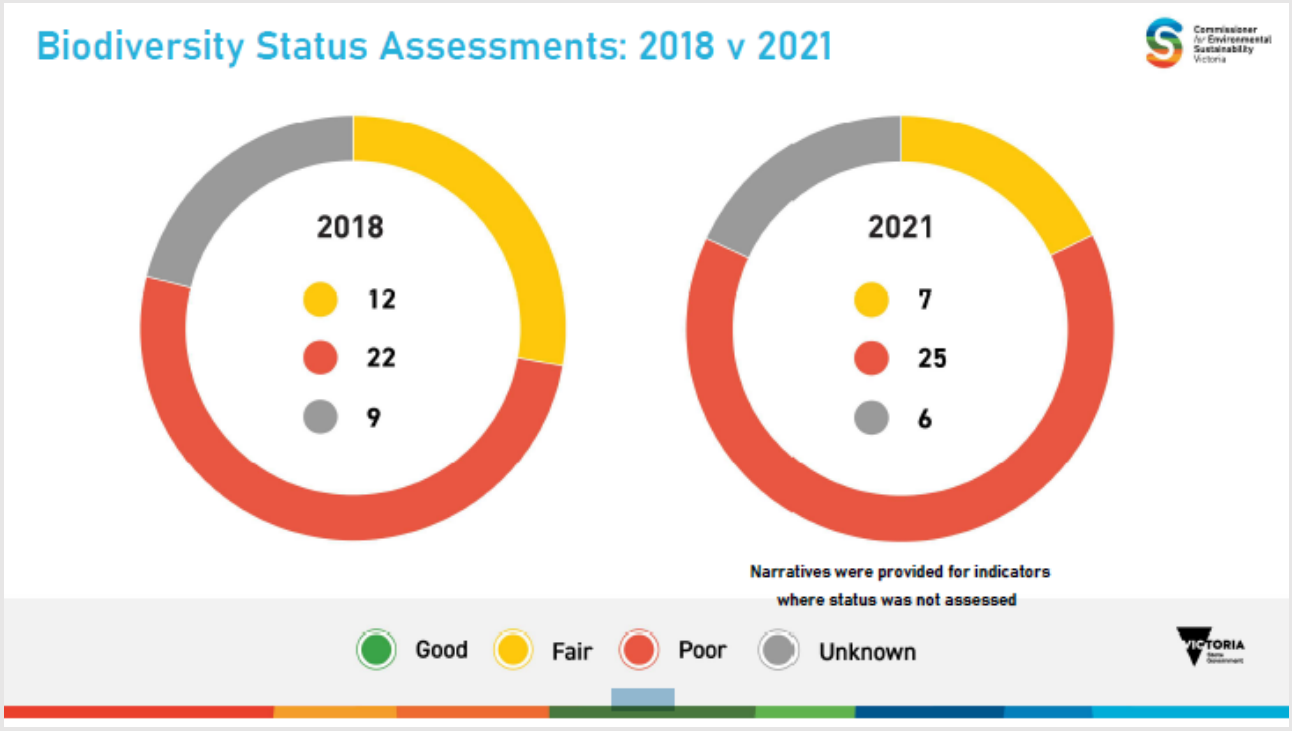


Figure 3: Victoria's biodiversity deteriorated from 2018 to 2021. (Commissioner for Environmental Sustainability, 2021)

The Commissioner for Environmental Sustainability's *State of the Environment 2018 (SoE)* report states that a third of all of Victoria's terrestrial plants, birds, reptiles, amphibians, mammals, invertebrates and ecological communities are currently threatened with extinction; the next report is scheduled for release in 2023 and will take in the further impacts of the Black Summer bushfires in 2019-20. (Commissioner for Environmental Sustainability, 2018)

An interim *Biodiversity Update* produced in 2021 compared the 2018 and 2021 assessments for all indicators. Unsurprisingly, the status of Victoria's biodiversity, already overwhelmingly poor, has deteriorated following the Black Summer bushfires. (Commissioner for Environmental Sustainability, 2021)

To expand the ecological picture from the SoE's terrestrial focus, the Commissioner recently produced a *State of the Marine and Coastal Environment 2021* report; the associated factsheet lists a loss among migratory shorebirds, significant mortality in the dolphins of the Gippsland Lakes following the bushfires, several fish species rated as

'poor status,' and a spectrum of impacts from invasive species. Seafloor integrity and health are compromised in many coastal areas, with a loss of coverage from shellfish reefs, seagrass meadows and macroalgae. (Commissioner for Environmental Sustainability, 2021)

Global Leadership Context

A new post-2020 Global Biodiversity Framework is being negotiated under the United Nations Convention on Biological Diversity.[2] The framework will define targets and pathways for the conservation and sustainable use of biodiversity for the next decade and beyond. Since early 2019, consultation workshops and meetings involving all stakeholders have been organised at the national, regional, and global levels before its planned adoption at the resumed session of the 15th meeting of the Conference of the Parties (COP 15), scheduled for 7–19 December 2022 in Montreal, Canada. (United Nations Convention on Biological Diversity, 2022)

The United States of America remains the world's largest economy, measuring US$23 trillion in nominal Gross Domestic Product in 2021. (The World Bank, 2022) On 18 August 2022, the White House released a draft strategy to 'reflect natural assets on America's balance sheet' and account for it 'in language that investors and banks understand.' The *National Strategy to Develop Statistics for Environmental-Economic Decisions* is open for public comment, and features recommendations mapped to 'Environmental Sectors' for attention over a '15-year phased approach.' (The White House, 2022) These sectors include air and emissions, water, forests, minerals and energy, pollinators and urban green space in scope for the first two Phases of Rollout. (The Interagency Policy Working Group, The White House, 2022)

Significantly, development of economic metrics on land cover, wetlands, peatlands, grasslands, deserts and tundra, wildlife, birds, freshwater fish, soils, reefs, dunes, sea grass, marine pollution and other marine assets – together canvassing the species and ecosystems most at threat from extinction – are allocated to the third and final phase. This priority is rationalised through a position that progress in these sectors depends on securing measures for those included in the first two phases, along with the realpolitik of Federal jurisdiction, expected relevance to sustainable economic development within the United States, and feasibility for success. (The Interagency Policy Working Group, The White House, 2022)

Accordingly, while we may take the lead from our international partners in establishing common measures, it will be important to adjust our expectations and priorities according to the particular circumstances facing Victoria, aiming for the most ambitious, positive intervention in the current downward trajectory in the population health of native species in south-eastern Australia.

Regulation, Incentives, and Political Will

There is research that demonstrates the most important activity required to address the biodiversity crisis is to implement legislation and increase regulation to manage, and reduce the clearing of, biodiversity-sensitive land. (Maxwell, Fuller, Brooks, & Watson, 2016) This may be further encouraged by global drivers, such as the international undertaking on forest conservation and restoration to reduce global warming. Global drivers will influence biodiversity, but locally governments need to apply environmental laws properly and effectively while making them more robust and less discretionary.

For example, in the European Union (EU), legislation is being considered to repair the 80 per cent of habitats that are in poor condition. The European Commission proposes a new law for nature, with legally binding targets for nature restoration, covering a fifth of the EU's land and sea by 2030. (European Commission, 2022) About €100 billion will be available for biodiversity, including restoration, across the EU's Member States. Similarly, a 'law to restore Victoria' may be required to meaningfully address the biodiversity crisis in this state.

Given the extent of clearing already conducted in Victoria – a national leader – it appears we may have already reached the end of the envelope for production purposes, meaning more gains are to be found through restoration than conservation.

Biodiversity losses in Victoria due to permitted native vegetation clearing, and losses detected by satellite (including permitted, exempted and illegal clearing), are relatively small compared with the broader scale ongoing decline of native vegetation from unmanaged threats and entitled uses. (Department of Environment, Land, Water & Planning, 2020) Hence increasing regulation to remove exempted activities (e.g. removal of firewood for personal use, removal of grazing) or require better threat management (e.g. control or elimination of weeds and pests) may not be effective if other unregulated (permitted) or unmeasured actions cannot be observed (e.g. removal of firewood from land) or paid for (e.g. ensuring that land owners meet a higher duty of care concerning the management of weeds and pests).

The cost-benefit of increasing (and enforcing) regulations would need to be considered in comparison with other policy tools, such as using price-based incentives to encourage landowners to restore and revegetate habitat on private land in Victoria. Ultimately, long-established land management practices are best adjusted through positive cultural and economic change.

[2] *An international UN treaty in which its goals are conservation of biodiversity, the sustainable use of the components of biodiversity and the equitable sharing of the benefits.*

Lack of political will is a significant problem. Public engagement will make biodiversity a voting issue, providing political leverage and private sector resources. If there is a genuine mismatch between what the public wants and the objectives of successive governments, then grass-roots steps to address this could include writing to the government, identifying a local champion, being strategic with communication, and building the case with the community and local government.

Australia's Strategy for Nature

Australian governments – the Commonwealth with each of the States and Territories and the Local Government Association – sustain a Biodiversity Working Group comprised of officials from environment departments across Australia, supporting environment ministers in their decision-making to implement the nation's Strategy for Nature, aligning with Australia's reporting to the Convention on Biological Diversity.

The Strategy for Nature has three priority goals, underpinned by 12 objectives. The goals are intended to work together in continuous loops designed to reinforce each other. The principle is that connecting people with nature enhances the desire to care for nature, which builds knowledge that can be shared to improve this practice and demonstrate the benefits we receive from connecting with nature. Each objective has several progress measures, which are used to track and report on the success of the Strategy. (Commonwealth of Australia, 2019)

The Samuels Review

In 2020, Professor Graeme Samuel completed a major independent review of Australia's environment law – the *Environment Protection and Biodiversity Conservation (EPBC) Act*. (Samuels, 2020) The review noted that the EPBC Act is outdated and requires fundamental reform to protect Australia's unique species and iconic places, which are in a state of decline, are under increasing threat and are insufficiently resilient to withstand unmanaged current and future threats.

Professor Samuel found that the EPBC Act, and how it is implemented, results in piecemeal decisions unaligned with state environmental management responsibilities and is a barrier to holistic environmental management. The review stated that the environment has suffered from two decades of failure to improve the law and its implementation, with businesses also suffering due to added costs.

The review made 38 recommendations to reverse environmental decline, including rigorous national environmental standards, and enforcement of environmental regulations. As yet, very few of the recommendations have been implemented. (Bekessy & Wintle, 2022)

In 2021, the federal Auditor-General reviewed the government's implementation of Australia's threatened species legislation, finding limited evidence of desired outcomes due to the lack of monitoring, reporting and support for the implementation of conservation advice and recovery plans. (Bekessy & Wintle, 2022)

In 2019, the federal senate reported on an inquiry into Australia's faunal extinction crisis. (Senate Environment & Communications References Committee, 2019) The report recommended that the Federal government develop new environmental legislation to replace the EPBC Act to limit the drivers of faunal extinction, and that they also establish an independent Environment Protection Agency with sufficient powers and funding to oversee compliance with Australia's environmental laws.

Overall, across state and federal assessments of governance and administrative performance on biodiversity, there have been some consistent themes:

- lack of transparency
- too much ministerial discretion
- no independent regulator
- lack of contemporary data and data systems
- inadequate funding for recovery
- inadequate resourcing of regulatory enforcement.

With the recent change in Federal Government, the time is ripe to action the recommendations of the Samuels Review.

Victorian Leadership on Biodiversity

The solution to declining biodiversity may seem obvious: we must transition from a net extractive to an additive, reciprocal relationship with the natural world, investing more while destroying less.

That is not a straightforward transition; it requires investment and significant cultural change.

The Victorian Government has programs, plans and policies to address Victoria's biodiversity crisis; however, insufficient resources are allocated to enact them. In addition, the funding requirements and anticipated impacts are not yet articulated in ways that can usefully drive investment decisions by both private and public sectors.

Government Has a Defining Responsibility

Governments are responsible for driving all sectors to think about the desired future and what needs to be done in order to best enable it. Election campaigns, media cycles and the associated political theatre tend to disrupt this future focus, yet the responsibility remains.

As a collective of our elected representatives, the Victorian Government functions to steward biodiversity conservation measures as the foundation of our State's social and economic resilience to the shocks and stresses of our highly disrupted new era, whether through effective legislative tools, education and training programs, intergovernmental cooperation, trade relationships, regulation and enforcement, market instrumentation or targeted financing.

Through the work of the Victorian Public Service, this transparent and ideologically neutral work involves setting goals and making plans to respond to biodiversity decline, as well as formulating policies and investment stimuli for achieving beneficial ecological outcomes that are equitably distributed in both geospatial and socioeconomic terms.

The strategic direction or scaffolding needed from the government includes setting the priorities for biodiversity conservation, compiling advice, bringing people together for collective impact, collaborating to define a shared vision, identifying standard measures, and ensuring good communication on the path to achieving the strategic goals within the established timelines.

Biodiversity 2037

The Victorian Government outlines its vision for conserving the State's natural heritage in *Protecting Victoria's Environment – Biodiversity 2037* (State of Victoria, Department of Environment, Land, Water and Planning, 2017). The plan's implementation was subject to a review by the State's Auditor General in October 2021, finding the current level of investment by the Victorian Government is insufficient to meet its objectives. (Andrew Greaves, 2021)

Inquiry into Ecosystem Decline in Victoria

A further, comprehensive Inquiry into Ecosystem Decline was completed by the Victorian Legislative Council's Environment and Planning Committee in December 2021. The Inquiry supported the Auditor General's findings and substantially extended VAGO's recommendations. (Legislative Council Environment and Planning Committee, 2021)

The Government is required to respond within six months of the Committee's report being tabled – which is 2 June 2022 based on calendar months. At the time of writing (late September 2022), the Government response is three months late.

Structural Progress, Funding Shortfalls

Despite the clear requirement for further funding, further research and the community's expectation to protect all threatened species, DELWP has not yet been adequately resourced to satisfy the goals of *Biodiversity 2037.*

It is well understood that the public purse is finite, with manifold competing claims. However, as biodiversity conservation is considered foundational to securing the continued well-being of our human population, it is imperative to invest strategically where the impact is greatest, whether through direct intervention with government programs or by leveraging further investment through intersectoral partnerships that demonstrate mutual benefit and return on investment.

The recently announced $10 million Nature Fund is a welcome philanthropic stimulus that may prove structurally valuable for driving further investment by governments and industry, but as yet the quantum of the Fund is patently unequal to the scale of investment required to successfully address the decline of biodiversity in Victoria by orders of magnitude. DELWP's $77 million Bush Bank initiative provides cause for further encouragement; however, the scale and scope of the program are insufficient to comprehensively address this complex co-investment challenge. The Victoria Nature Festival is a valuable community engagement initiative with an encouraging foundation of social research methodology, and a base from which to build community ownership and celebration of regional ecology and natural systems, but it is just a start to what is required.

The United States has legislation requiring that critical habitats of endangered species are protected. The resources to recover the species are determined by scientists, and then the government is obliged to fund the recovery. In 2017, over US$2 billion was spent on the US list of threatened species, which is a smaller list than Australia's. The US has now de-listed 65 species that are no longer threatened. In contrast, Australia has de-listed just one (the Eastern Barred Bandicoot, which persists behind predator-proofed fences and island sites rather than thriving in their original habitats). (U.S. Fish & Wildlife Service, 2022)

To achieve the same result with limited public funding, Australian governments must collaborate effectively with other sectors while coordinating collaboration and communication between government agencies. The problem belongs to the whole of our society; our government's role is to convene, learn, and light the path to collective endeavour.

Business has a Leadership Opportunity

We acknowledge that viewing the natural world and its biodiversity values in purely economic terms is politically, ethically and functionally problematic. Yet, given the scale and urgency of the issue, it appears valid to intervene in the extinction crisis from all available angles; in this case, as a macroeconomic issue, given the complex financial systems and tools comprehensively in place to help human collectives manage and sustain their place in the world. There is simply no time available to us to conceive of, much less implement, an ideal value system, social order or method of intervention beyond the blunt instrument of government funding, so we explore private sector

funding in the spirit of pragmatism and the imperative for immediate investment in real action.

Conservation efforts driven by corporate leadership and investment are essential. The shortfall in funding to conserve biodiversity globally is estimated to be between US$598 and US$824 billion each year. Governments can provide leadership, strategy and catalyst funding to stimulate investment, but private sector capital is vital to close this funding gap. (KPMG, 2021)

We must accept the for-profit sector – particularly the banking and finance sector – requires instrumentation that integrates with business tools and models in order to engage with a "biodiversity market." However, the recent announcement of a new "biodiversity credits" scheme by the Commonwealth Government has given rise to consternation; the conceptually similar carbon credits scheme is widely considered flawed, providing opportunities to perpetuate further damage to the planet's climate systems as a cost of doing business and not a measure of last resort, as intended.

Acknowledging the Environmental Impacts, Responsibilities & Requirements of the Business Sector

A key driver of the loss of terrestrial habitat to support biodiversity is property development and the expansion of agricultural enterprises through land clearing, which have been shown to secure and clear private land in response to economic opportunities presented by favourable market signals. (Tilman, et al., 2001) Forested areas are particularly vulnerable to these economic forces due to increasing global food demand from Australian agriculture, a major export industry.

> *"During the next 50 years, which is likely to be the final period of rapid agricultural expansion, demand for food by a wealthier and 50% larger global population will be a major driver of global environmental change. Should past dependences of the global environmental impacts of agriculture on human population and consumption continue, 109 hectares of natural ecosystems would be converted to agriculture by 2050. This would be accompanied by 2.4- to 2.7-fold increases in nitrogen- and phosphorus-driven eutrophication of terrestrial, freshwater, and near-shore marine ecosystems, and comparable increases in pesticide use. This eutrophication and habitat destruction would cause unprecedented ecosystem simplification, loss of ecosystem services, and species extinctions. Significant scientific advances and regulatory, technological, and policy changes are needed to control the environmental impacts of agricultural expansion." (Tilman, et al., 2001)*

On the government side, outcomes from policy interventions have been very limited. Better integration with agricultural policy, including careful examination of the effects of agricultural subsidies, will be required to balance market opportunities with deforestation practices. (Heagney, Falster, & Kovač, 2021)

On the "business end," we must acknowledge two things:

- The market has been seen to favour offsetting instruments as an early port of call rather than a course of last resort;
- The banking sector is a dominant contributor of finance for land acquisition and clearing for residential, agricultural and other business development.

> *"Offsetting land proposed to be cleared fails to consider natural ecosystem processes, species interactions, microhabitat requirements of all species in a community, and population genetics. Most importantly, it encourages the approval of land-clearing because it can be offset. The overall consequence is more protected (environmentally managed) habitat through the creation of biodiversity offset areas, but significantly increased clearing, fragmentation, and degradation of habitat outside offset areas and other protected conservation areas. This leads to disruption and potential collapse of ecosystems and overall, less habitat for native biodiversity." (Ambrose, 2022)*

Ultimately, we must consider an optimum agricultural carrying capacity for our continent in balance with the health of the diverse and unique lifeforms our nation must support. Yields and offsets can be further optimised through scaling up the proven regenerative farming methods we see increasingly embraced by smaller farm operators and many members of the Landcare movement.

Natural systems are complex, so economic instruments for land acquisition and management must respond to this complexity with gearing that favours an additive relationship to biodiversity, whether in our region or globally. Governments and the finance sector must collaborate to secure an effective and sustainable market for biodiversity conservation.

Natural Capital Investment

The economics of natural capital investment have proven difficult to define, much less implement. There is a clear call to overcome this hurdle so that governments and companies can act with confidence and effect demonstrable, beneficial change that yields a return on investment. It has become clear from our various inquiries and discussions that the private sector is still searching for tractable, consistent measures and robust projects to demonstrate the efficacy and economics of natural capital investment. Many appear to be waiting for global indicators to arrive to minimise the impact of rolling changes to metrics, accounting practices and reporting regimes, while others simply do not know where to begin without encountering prohibitive consultancy costs.

Encouragingly, however, investor demand for biodiversity is growing. The business, industry and finance sectors want to invest in a sustainable future and make a more substantial impact on biodiversity conservation. Investing in biodiversity allows businesses to direct funds away from nature-negative toward nature-positive activities. (TNFD, 2022) Non-financial biodiversity information that was irrelevant a few years ago in business, investment and lending decision-making is now being considered by the business sector. The economic case for including nature in business planning is strengthening. Considering biodiversity in business strategies can increase financial resilience, reduce risks, enable emerging opportunities, improve reputation – and, importantly, preserve nature.

> *"A key challenge to placing a monetary value on biodiversity is that it does not have a universal, agreed and fungible unit that facilitates its valuation, trade and/or investment – and there may never be a universal metric for biodiversity." (Lewis, Dettmann, & Lindorff, 2022)*

Nature-related risks to business profitability are becoming visible to investors. The Taskforce on Nature-related Financial Disclosure (TNFD) for biodiversity, similar to the Taskforce on Climate-related Financial Disclosures (TCFD) for climate change, aims to provide businesses with a picture of nature-related risks and dependencies to integrate nature into decision making. (TNFD, 2022) A consultative grouping of over 550 institutional supporters, 16 scientific and standard-setting organisations, and a range of informal consultation groups, the TNFD seeks a way to disclose and manage nature-related risks, resulting in benefits for biodiversity. (KPMG, 2021) The TNFD will require participating businesses to disclose and report on the impact of their supply chains on nature, the impact biodiversity loss would have on their supply chains, and what this means for their business. Companies that do not comply may be subject to legal challenge, so the TNFD can change how businesses consider and protect biodiversity.

> *"Overall, Australia has lost nearly 40% of its forests, but much of the remaining native vegetation is highly fragmented. As European colonists expanded in the late 18th and the early 19th centuries, deforestation occurred mainly on the most fertile soils nearest to the coast. In the 1950s, southwestern Western Australia was largely cleared for wheat production, subsequently leading to its designation as a Global Biodiversity Hotspot given its high number of endemic plant species and rapid clearing rates. Since the 1970s, the greatest rates of forest clearance have been in south-eastern Queensland and northern New South Wales, although Victoria is the most cleared state." (Bradshaw, 2012)*

These developments offer a valuable opportunity to apply global metrics to a regional approach, opening Victoria to international collaboration on natural capital investment and partnerships.

Financial Regulation and Incentives for Private Biodiversity Restoration

Ultimately, it must be acknowledged that investment in biodiversity by financial institutions is a reputational matter – a cost of doing business. There is limited scope for returning a direct profit to businesses from this kind of investment, other than improving or protecting shareholder and customer sentiment; a little like advertising. Without an attendant regulatory and compliance framework, the market's performance in this domain will be inconsistent and difficult to measure, thus uncompetitive.

The free market is yet to deliver a robust response to the climate, biodiversity loss and biochemical pollution; in such circumstances, the standard and reasonable escalation measure is to impose regulation to channel behaviour. For example, we might consider incorporating biodiversity values into various financing hurdles while providing lower rate incentives for eligible borrowers, particularly with regard to larger scale, institutional banking.

Conservation covenanting schemes show great promise as a genuine market mechanism. There are already tax incentives provided by the Australian government to protect land of high conservation value through making an agreement with a covenant scheme provider such as Victoria's Trust for Nature. (Australian Taxation Office, 2020)

> *"Overseas experience suggests that a covenant may lead to a slight increase in the surrounding land value because of the superior land management practices that often result. It is recognised that the property may take longer to sell since the number of prospective purchasers could be reduced. For example, the property will not attract people wanting to graze or develop the covenanted land, but instead will attract mainly sympathetic purchasers who simply wish to enjoy an area of bushland which has been recognised as having conservation value."*
>
> *(Department of Biodiversity, Conservation & Attractions, 2013)*

The tax scheme provides a safety net for landowners who anticipate losing value on their investment through covenanting. However, landowners who first improve the ecological performance of their land, then covenant that intervention in perpetuity through legal instrumentation ahead of resale, could also receive a gain through what is essentially a form of capital improvement. Mandating reduced interest rates for borrowers who commit to a covenanting business plan, and associated milestones, through financial institutions could further incentivise restoration ecology work on privately held land; as with installing

solar panels or water tanks, this is an investment the next property owner no longer needs to make. Further, expansion of the Trust for Nature model to states and territories beyond Victoria could scale this market framework to the national level.

Property development at scale by corporate bodies could first satisfy new regulatory requirements – imposed by governments and enforced through financial institutions – before receiving project finance. A biodiversity-positive regulatory framework for major property development can be incorporated into existing planning regimes, including satisfaction of milestone requirements throughout the lifecycle of projects and ongoing property management by governing resident and business associations.

Regulating Waste Management and Product Stewardship

Environmental pollution by the business sector remains pervasive, either directly through industries like construction, or indirectly through inadequate consideration and regulation of product lifecycles, from petrochemicals through to pharmaceuticals.

On the land, overuse of products such as pesticides, herbicides and fertilisers is detrimental to overall ecological health and, ultimately, the pollinators, soil microbes and other elements of Victoria's natural systems that support agricultural yields.

The Status and Role of First Peoples in Victoria

There are two key goals to Victoria's *Biodiversity 2037* plan: to ensure Victoria's natural environment is healthy, and that Victorians value nature. It is recognised that achieving the latter will help achieve the former. Much of the effort undertaken by colleagues within DELWP has been to foster a cultural connection between people and the natural world, to foster a reciprocal relationship to supplant the overwhelmingly extractive approach taken since colonisation. This takes place in the important context of a First Peoples' Assembly of Victoria being established to adjudicate the journey to Treaty in our state, and the broader national development of a First Nations' Voice to Parliament in Canberra.

Settler Australians of both politically progressive and conservative stripes are finding this process confronting in many ways. For example, the culture within the environmental conservation movement generally is receiving a philosophical challenge from First Nations people, both in Australia and North America. (Clarke, 2017) There has been a general and persistent assumption that Australia's natural world should be 'left to itself' in order to strike and sustain an ecological balance – a kind of 'Magic Pudding' proposition for the benign neglect and eternal self-repair of a realm that is intrinsically "other" to mainstream human society.

Challenging "Wilderness" as a Colonial Fiction

There is a valid criticism of this point of view emerging that includes an uncomfortable association of the concept of 'wilderness' with the infamous doctrine of '*terra nullius*,' a legal fiction by the British Empire that the Australian continent was devoid of people during colonisation and thus not subject to the legal requirement of a fair treaty between the invading power and the long-established inhabitants of the continent's many nations and landscapes. (Fletcher, Dressler, Palmer, & Hamilton, 2021) In this context, the concept of 'untouched wilderness' is an implicit denial that Australian landscapes and ecosystems have been managed and shaped by humans for tens of thousands of years, and are now pervasively reliant on this relationship to sustain a healthy ecology.

While conjecture remains about the extent to which discrete Australian ecosystems have been shaped or otherwise impacted by long-term human habitation on the continent, the argument runs that to leave 'wilderness' to care for itself is to abandon and neglect humanity's role as custodians or stewards of the Earth's natural systems, failing to acknowledge how deeply our species has already impacted systems that will not 'come good' without considerable assistance and ongoing management. We are a part of nature.

A Fundamental Cultural Relationship with Country

Geological, paleontological and other cultural evidence clearly shows that for tens of thousands of years, Australia's First Peoples have lived with Country and managed the environment for food, tools, materials, medicines, and access through culturally embedded purpose and practices. Indigenous knowledge of landscape management has accumulated and been refined through generations of First Peoples in story, song, art, dance and other cultural practices. A range of cultural management practices have been developed to care for land, sea and freshwater Country. Accordingly, the terrestrial and marine systems have adapted to sustained human presence and management.

In a vanishingly small amount of time compared to the vast epoch through which this globally remote civilisation of remarkable cultural resilience has persisted, colonisation has inflicted considerable injury on our State's First Peoples. Alongside the well-documented Frontier Wars and massacres of First Peoples by European invaders, the cultural genocide attempted through the destruction of language, dispersal of clan groups and prevention of cultural practice on Country during the past two centuries of colonisation has exacerbated the destructive effects of climate change, primary industries and land development on Australian ecosystems and the species they support.

Engagement of Traditional Owners (and local communities) to achieve the shared goal of best practice land management and biodiversity conservation in Australia is not without strong

scientific and economic support. Emilie Ens *et al.* demonstrated that biodiversity projects co-designed between Indigenous landowners and ecologists not only filled a '*complete void in scientific knowledge*' relating to genetic diversity and evolutionary history, but also yielded greater recognition and protection of cultural resource management, and positive community engagement. (Ens, Scott, Rangers, Moritz, & Pirzl, 2016)

> *"Biodiversity benefits of the cross-cultural project included new public records for a relatively poorly known but species rich area that are being used to inform local Indigenous land management, as well as specimens and tissue samples with which to explore the genetic diversity and evolutionary history of the region. Cultural benefits included compiling a local field guide that contains ten different languages and engaging young people to facilitate intergenerational transfer of threatened traditional knowledge. Promotion of the work at local to national fora addressed the third objective and enhanced Indigenous involvement. We demonstrate that top-down policy directives can be implemented to deliver on-ground mutual benefits for science and Indigenous communities."*
>
> *(Ens, Scott, Rangers, Moritz, & Pirzl, 2016)*

The co-benefits of these collaborative programs have been further identified, categorised, and evaluated with a scientific framework. In addition to achieving the primary 'best practice' target, co-benefits to health and well-being, social, cultural, political, and economic outcomes have been detailed, and highlights the value of Indigenous environmental management programs. (Barber & Jackson, 2017)

In Victoria, First Peoples have asserted their rights, interests and passion for caring for Country. While there are increasing calls for ecological leadership from First Peoples, there are also limits to the cultural resources and collective capacity of individual groups that must be understood and addressed before proceeding.

Formal Recognition

In Victoria, there are three different processes through which Aboriginal people can seek the formal recognition of the State as Traditional Owners of their ancestral Country:

- Native title determination under the *Native Title Act 1993*
- Traditional Owner settlement under the Victorian Traditional Owner Settlement Act 2010
- Registered Aboriginal Parties under the *Aboriginal Heritage Act 2006* (Heritage Act).

As of 2019, Native Title is recognised across 14,899 square kilometres of land in Victoria, while a further 30,766 square kilometres of land is recognised under Traditional Owner Settlement Act agreements. (First Peoples - State Relations, 2019)

The area of Crown land with native title determinations or Recognition and Settlement Agreements has increased dramatically since the enactment of the *Traditional Owner Settlement Act 2010* and is expected to continue to rise as Traditional Owner groups negotiate new settlements.

The Heritage Act recognises Aboriginal people as primary guardians, keepers and knowledge holders of Aboriginal cultural heritage. (First Peoples - State Relations, 2019)

Whole of Country Plans

Whole of Country Plans are overarching, long-term visions, developed by Traditional Owner groups, that set clear goals and priorities, principles of engagement and measures of success in caring for Country. In 2018, two new Whole of Country Plans were published, bringing the total in Victoria to nine. An additional three Whole of Country Plans are currently in production in 2019.

Country Plans support biodiversity and relationships and are an essential way to improve broader community understanding. These can guide relationships with private landholders and help advise on required work on biodiversity management. Improving and sharing knowledge appropriately through Country Plans can help manage biocultural values sensitively.

As of June 2019, there are 65 active and ongoing partnership agreements between Aboriginal Traditional Owner groups and key water catchment agencies to promote Aboriginal values and traditional ecological knowledge in water planning and management. This remains an area of significant growth; of these 65 active and ongoing partnership agreements, at least 47 were established over the last five years.

Further, 'Joint Management Plans' have been initiated to recognise and respect Aboriginal land, water and cultural rights and work to embed Aboriginal knowledge in the everyday management of parks and reserves. (First Peoples - State Relations, 2019)

Cultural Landscapes: Country Needs People

Reconnecting ancient, much-disrupted cultures with the Country that provides identity and purpose is aligned with the social justice and self-determination imperatives of the Native title movement; however, more pragmatically, this represents a group of Victorians who are exceptionally interested in undertaking this vitally important work in the interests of everyone, if given the capacity to do so.

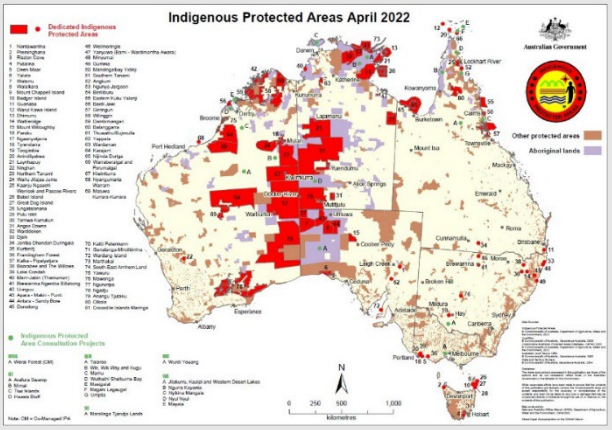
The *Victorian Traditional Owner Cultural Landscapes Strategy*, launched in August 2021, sets out a way to enable and empower Traditional Owners to lead planning and use cultural knowledge and practices to care for, restore and redress harms to Country in Victoria. It also guides the Victorian Government, DELWP and Parks Victoria on future forest and parks

management and decision-making, including policy and legislative reform. (Federation of Victorian Traditional Owner Corporations, 2021)

Underpinning the strategy is a Traditional Owner strategic framework for managing Country, with 10-year objectives to restore the knowledge system; strengthen Traditional Owner Nation resilience; enable Traditional Owner cultural landscape planning; embed Traditional Owner knowledge and practice into policy, planning and the management of Country; and allow the application of Traditional Owner cultural objectives, knowledge and practice in the management of public land. (Federation of Victorian Traditional Owner Corporations, 2021)

Indigenous Protected Areas

Initiatives like the Indigenous Rangers program offer a way to commission First Peoples to actively manage and protect Australian landscapes from feral animals, invasive weeds and destructive bushfires. Rangers work on Indigenous Protected Areas (IPAs), in national parks, on privately held land and on the sea. (Country Needs People, 2022)



The map above of Indigenous Protected Areas shows Indigenous Rangers working across the nation and in a wide range of environments. Note the relative absence of Indigenous Protected Areas in Victoria: there are five IPAs in the south-west of the State. (Department of Climate Change, Energy, the Environment and Water, 2022)

IPAs are areas of land and sea that are declared by First Nations and managed by Indigenous groups according to Traditional Owners' objectives. There are 81 IPAs encompassing over 85 million hectares. (Cooke, Davison, Kirkpatrick, & Pearce, 2022) This represents about 2 per cent of Australia, and over half of Australia's protected land estate. However, there are few IPAs defined in the State of Victoria; these are at Deen Maar (Gunditjmara) and Framlingham Forest (Eastern Maar), with Kuronitj, Lake Condah and Tyrendarra being components of the Budj Bim Cultural Landscape (Gunditjmara). There are currently no evident, formal IPAs beyond these Gunditjmara-Eastern Maar endeavours in south-west Victoria.

There is a need to seek advice from Traditional Owners on whether there are further areas in Victoria that could become IPAs. Gippsland may present a viable region for consideration with the Gunaikurnai peoples, for example.

It is important to document the advantages and disadvantages of having IPAs in Victoria. There is merit in establishing Victorian legislation to parallel Commonwealth Government IPA legislation, including the capacity to secure land in preparation for a Treaty with Traditional Owners in Victoria. The Commonwealth Government will need to commit to financing the expansion of IPAs in Victoria.

Discrete projects need to be funded, with management via IPAs. Land is needed for rescued animals from, for example, Zoos Victoria. Traditional Owners can help identify land to purchase that covers critical biodiversity areas. The approach will require the ability to use fire, control water, and recognise Intellectual Property (IP) owned by Traditional Owners while passing on that knowledge to younger people to keep culture and Country strong.

Satisfaction of the First Peoples should be a key metric. Working with First Peoples requires cultural literacy combined with a co-design and planning approach. Important questions include:

- who is the owner of each element?
- how do the relationships work?
- how will disagreements be managed?
- what happens at project completion?
- how do we move towards a maintenance phase, what does that mean for First Peoples, and will they still be allowed to hunt, fish and live on Country?

Traditional Owner Land Management

Biodiversity responses need to include the cultural values of landscapes as well as the natural values, and an understanding of how Traditional Owner communities work and their perspectives on landscape management. This can include listening to local stories about human interaction with the landscape.

Registering Traditional Owners as land and water managers would represent a valuable step. Legislative reform is required to ensure genuine rights for Traditional Owners to manage Country. Traditional Owner management rights need to be included in land zoning provisions.

An action could be to consider a body or process similar to Trust for Nature that takes a covenanting approach to private land to re-establish biocultural values with Traditional Owners, or to establish transition partnerships to resource Traditional Owners to lead the repair of Country with the support of DELWP, Parks Victoria, Landcare, NGOs and LGAs.

In undertaking this work, paid positions are critical to supporting younger members of First Nations in particular. Funding will be necessary to enable Traditional Owners to be legitimate and equivalent land and resources (water, soil, biodiversity) managers. The Victorian Government's Treaty process will likely intersect with discussions regarding IPAs.

Business administration training of Indigenous people is required to enable parallel work programs to improve land management programs in national parks and other areas and facilitate sharing cultural practices and Indigenous knowledge. This is needed to diversify and scale-up business opportunities for Indigenous people and build capacity to acquire contracts. For example, Conservation Certification enables the development of land management plans.

The most crucial thing to remember is that caring for and healing Country is not the sole role of Traditional Owners; as with governments, we cannot shift responsibilities to any one particular sector or group to manage while the remainder of our society continues to either ignore or contribute to the deterioration of our state's biodiversity. We must sustain healthy partnerships and be clear that this is a collective responsibility.

Community Inclusion and Partnerships

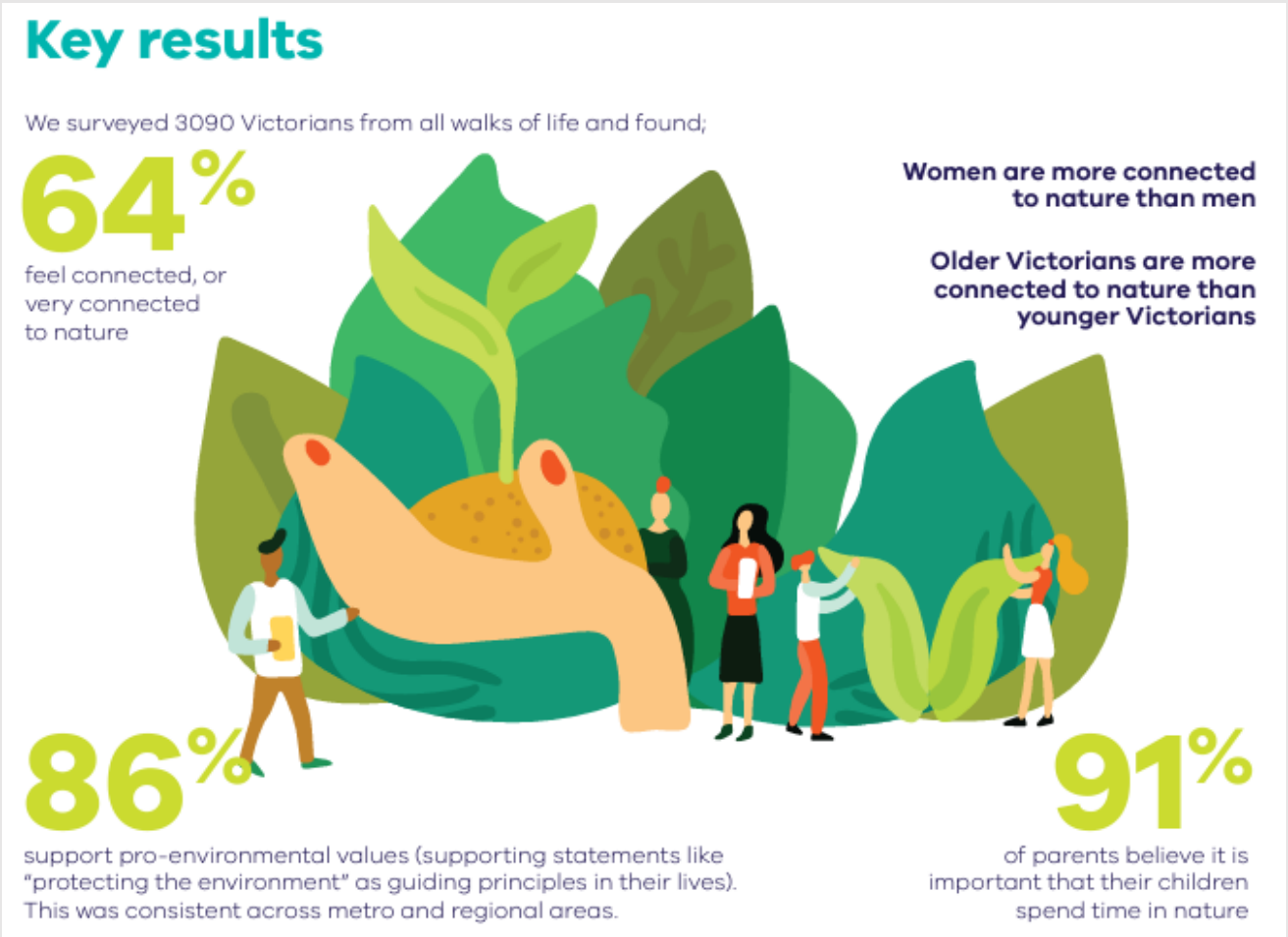


Figure 4: Results from the Victorians Value Nature survey conducted in 2018.

Human-driven ecosystem decline is essentially a social problem. No matter how skilled or otherwise, public education and inclusion in decision-making and interventions are vital to building a sense of ownership and responsibility for the health of our natural systems across Victoria's diverse regions and cultures.

Environmental regulation is readily decried by opponents as 'green tape' and has failed to positively engage with many ordinary citizens being asked to change behaviours or business practices. As local people are best placed to advise about local action, community engagement is essential, particularly if local governments are to be supported in regulating regional development or funding local biodiversity initiatives.

Based on the *Victorians Value Nature* survey conducted in October 2018, most people agree it is important to protect nature; there are concerns about the extinction of plants and animals and knowledge that a healthy environment is critical to the Australian economy, clean food, air and water, and our own wellbeing. (Meis-Harris, Saeri, Borg, Faulkner, & Jorgensen, 2019)

There is clearly a groundswell of people wanting to make a change to their relationship with nature, but they need clear information on how to most meaningfully enact it, contributing to a collective effort to help the planet. It appears the main barrier for people is not simply a lack of time or motivation to get involved, but a lack of political alignment, opportunity, clear direction and palpable assistance with what can be a challenging task.

Decades of research has been conducted on Victorian ecosystems and species; information is available about what to do to address biodiversity decline, but this is yet to be summarised into accessible, tractable guides for land managers drawing on the accumulated evidence base. Further, communication activities need to clarify *how* people can be involved. We can illustrate how relatively little it might cost to solve a local or regional problem, that choices on consumption have impacts, that simple behaviour changes can help, and that every effort collectively conserves species.

Participation and involvement must be rewarded with demonstrated impact if it is to be sustained. A way to make regionally-relevant progress visible to people remote from government or academic leadership, without requiring their dutiful monitoring of announcements and reading of elaborate reports, is needed so local leadership and success can be recognised and celebrated.

Building Social License for Biodiversity Conservation

Enhanced public engagement must make biodiversity an economic and electoral issue, providing much-needed political leverage and private sector alignments. We need to be better at positioning biodiversity in the political realm, and reframe the problem as a bold, creative opportunity for the government to lead with electoral support.

Different communication approaches are required for different audiences to instil hope but not reinforce complacency. As well as targeting a variety of audiences, we need to keep in mind the goals and messages of communication before thinking about platforms and how to communicate. Effective communication and engagement should be informed by communication theory, and an evidence-based understanding of the Victorian community, its different typologies, and their respective connections with and actions for nature (as well as barriers).

Communication should draw on stories and inspire hope and agency. Facts and messages of gloom and doom don't inspire people; they can, in fact, do the opposite. We need to be engaged through stories at a human level.

If empowered to do so by processes that ensure cultural safety and resource capacity, Traditional Owners could help people to understand the importance of stories, art and ritual as tools for embedding ecological practices in culture.

Citizen Science

Citizen science projects and programs help raise awareness through active involvement and "learning by doing." They present an opportunity for community, public and private sectors to work together to add to our collective knowledge base, with suitable input and oversight from professional scientists to ensure due rigour and reliable results.

Having more people involved in science leads to more interest and action, as people value new knowledge, adjust their worldview and share information to build a new social norm. Increased science literacy can also support wider support for ongoing research and a recognition of the need for contemporary knowledge to inform decision-making.

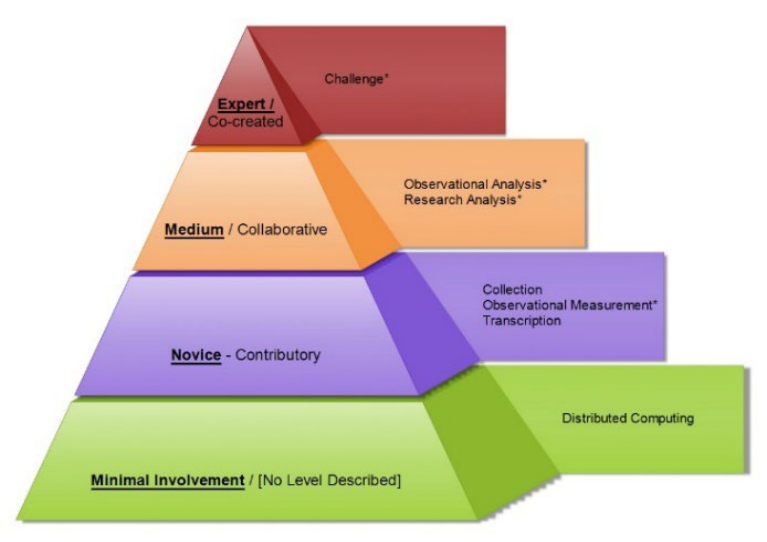


Figure 5: Citizen Science Categories and Participation Levels (Open Scientist, 2013)

Communication and action should involve diverse groups, the Country Women's Association and the Victorian Farmers Federation, along with culturally and linguistically diverse people, schools and faith communities. The national and state-based Landcare program is a vibrant example of local people engaging with a knowledge base to effect positive change and should be an early port of call for partnerships and capacity building.

In response to feedback from the Victorian Auditor-General's Office (VAGO), DELWP is developing a Monitoring, Reporting and Evaluation Framework for *Biodiversity 2037*, and we encourage partners to amplify all efforts to engage people with the related public portal and opportunities to get involved, cognisant that citizen scientists are not free labour for conservation projects nor research field work; people must be respected as collaborators and co-contributors with a stake in the outcome.

Situational Awareness, Roles and Responsibilities

To minimise the duplication of effort and expense in this sparsely financed domain, we must maintain awareness of new initiatives and the roles we play according to the sectors we operate within. To encourage holistic thinking, we have attempted to map the roles and interactions between the four sectors identified – Business, Community, Research and Government. This is offered below as a starting point for cross-sector initiatives to better articulate and establish roles and responsibilities for the different elements of any high-level, collaborative venture in the hope it may provide a basis for better understanding each other's efforts and foster more effective collaboration as we collectively confront a complex, whole-of-society challenge.

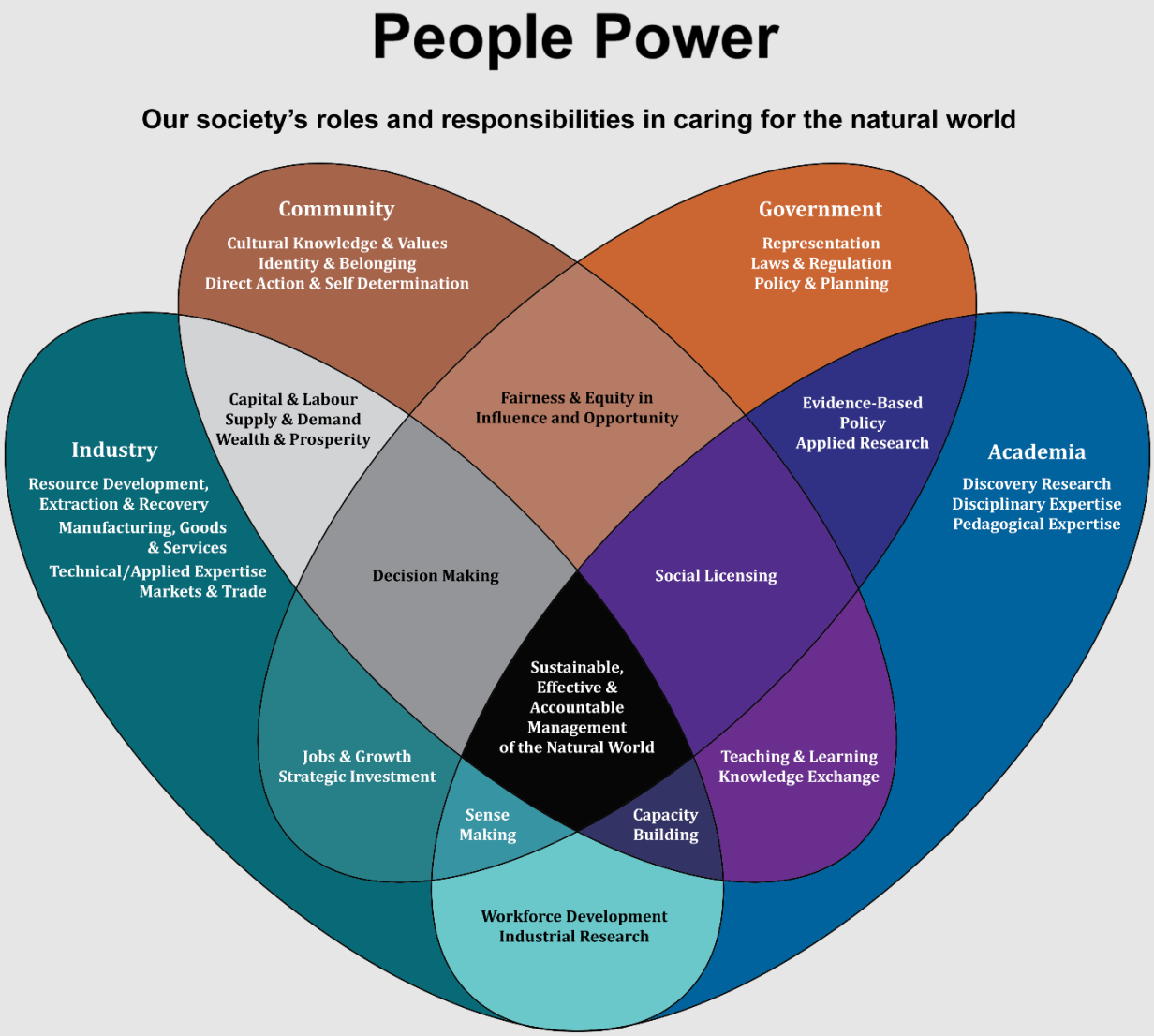


Figure 6: The roles and interactions between business, community, research and government.

Partnerships and Alignments

Biodiversity conservation requires a systems approach with multiple perspectives and diverse voices. Traditional Owners, governments, businesses, researchers and the community must play a role in solving the biodiversity crisis. However, these parts of society need to work in partnership to address problems as complex as biodiversity conservation and the survival of the natural world.

An integrated response to the crisis can be enabled through partnerships. Building on relationships between First Nations people, scientists, fire authorities, farmers and private landowners is essential but takes time, as there are historical conflicts to resolve, and common ground can prove difficult to demonstrate. Establishing such relationships can help reduce barriers, increase understanding, and aid the reconciliation process. Structural and cultural barriers for private landowners to engage and collaborate with Traditional Owners on privately held land must be resolved.

Providing a strategy is the most important role of government, but this needs to be done in partnership with other sectors to raise resources in service of strategic goals, achieve a systems approach with multiple perspectives, and overcome barriers. Government must take responsibility to govern and

provide structural support and tools for implementation, even if others deliver action.

Diverse Knowledge Bases and Skillsets

The biodiversity crisis needs a transdisciplinary approach to provide transformative solutions. This approach will force us to look at the knowledge we need, how to share it, and what to do with it.

We need to consider the definition of knowledge, including Traditional Owner knowledge, and understand that multiple types of knowledge with different elements are required to contribute to solutions and a new form of knowledge.

For example, cultural burning is important for the management of, and benefits to, Country and biodiversity. Indigenous-led burning practices and land management can make Country safer and keep carbon-storing forests and ecosystems intact. (Trust for Nature, 2020) Fuel reduction burning and "cool" cultural burning need to be distinguished in fire regulations.

Indigenous management of Country could be integrated into Victoria's employment, industry and health policies. For example, Indigenous Ranger programs have been successful in helping Country and its people, and could be expanded into new places, including cities.

Collaborative Pilot Projects

There needs to be a move away from relying solely on government funding. The *Biodiversity 2037* strategy is self-focussed, requiring the government to maintain all the responsibility, all the expense, and all the power. Projects will benefit from industry engagement to support and enhance ongoing public funding. Co-design and co-delivery are important.

A comprehensive overview effort will be needed to generate major programs in which industry can invest and see results. For environmental projects to be attractive to businesses, they must be well defined, have clear outcomes that can be measured easily and cost-effectively, and positively impact the environment. Biodiversity conservation projects need to be defined in ways businesses define projects – with clear benefits and a Return on Investment (RoI).

The return from funded environmental activities may be a financial RoI (such as government-issued bonds), another non-monetary form of RoI (for example, benefits to staff, customers or marketing support), or a return that is a contribution to the broader community. Restoring land solely to make a long-term financial gain on real estate values has limited commercial impact. Businesses need to consider, and have the opportunity to take up, different kinds of investments in biodiversity, through:

- lower development footprints
- waste and pollution minimisation
- philanthropic activity
- social license to operate
- programs providing assured commercial returns on investment.

The Potter Farmland Plan is a good example of a successful pilot project. Another is Bank Australia's conservation reserve, governed in partnership with the Trust for Nature and Greening Australia, which provides an example of action that can start now and have a long-term impact. The Bank's reserve is a working model that other, larger corporates could replicate and adapt to fit their own circumstances. The reserve commits Bank Australia to a direct investment in conservation, strengthening the connection between addressing climate change and biodiversity conservation and restoration. The conservation reserve embeds Traditional Knowledge in activities by involving, implementing and celebrating Indigenous Land Management techniques, such as using Traditional fire risk management practices, actively protecting cultural heritage as part of conservation, and involving Indigenous expertise in biodiversity planning.

Focusing efforts on a species level (especially less-charismatic species) has enabled innovation and allowed funding to have more significant impact. Planting endangered plants in appropriate spaces, for example, is easier, less expensive and less controversial than culling feral horses.

An Adaptive Approach

Effective pilot projects should be small to have a high chance of success, noting that we can still learn valuable lessons from ones that fail. Including diverse groups, such as Traditional Owners, Landcare groups and schools, is important. The pilot projects should build on previous work, be conducted in a way that adds to our scientific knowledge base and be part of a broader strategy that includes community cohesion and resilience.

However, carrying out conservation associated with any pilot project is challenging. Climate change will limit success. Governance and law present difficulties. Addressing these difficulties could represent a pilot project *per se*. The objective would be how to prevent state and federal governments from enabling or causing destruction and creating a framework that supports recovery and repair.

Government must provide or otherwise stimulate distributed leadership, meaning key activities may be conducted by groups and sectors other than the government. In the absence of government leadership, activities overseas may drive changes by businesses in Australia that lead to governments following. But there are ways to drive change in Australia, such as by scaling up investment in biodiversity on farms through rebates and tax incentives and an awareness that, in many cases, caring for species improves farming outcomes. (Ritchie, Tulloch, & Evans, 2022) Nature and businesses need to co-exist, meaning business activities must provide economic value – but not at the expense of biodiversity.

Supporting Transitions, Managing Impacts

Farmers need information on overcoming pests and soil degradation, and the value of ecosystem protection for everyone's future. Twenty thousand

commercial farmers manage half of Victoria. Land clearing increases as farms increase in size.

Population growth and demographic changes are linked to biodiversity threats. Population increases add to pressures on ecosystems. So, population planning needs to be considered and managed when addressing biodiversity solutions, including decisions regarding appropriate locations for human settlements and housing developments.

Other short-term actions that organisations can take include:

- shaping the development of carbon and biodiversity markets that recognise the importance of investing in nature
- engaging customers, staff and other stakeholders in the conservation, thus building awareness and engagement
- supporting selected action by organisations seeking to promote restoration and conservation of biodiversity.

Research Offers Evidence, Tools and Networks

Researchers have refined the questions we need to ask to better support biodiversity, developed techniques for monitoring and managing threatened species, and created a suite of decision-making tools. These are all crucial to support policymaking, improve management of our environment, and drive recovery. Scientists have determined best-practice investment methods and models and established multiple collaborative networks, including with Traditional Owner groups. Researchers within universities, government and industry contribute evidence, tools and networks. These resources await more activation and extension, but we need more effort in knowledge translation and 'boundary spanning', and to transfer knowledge and skills into proper planning and actions by business, government and the community.

Scientists can help inform a government, community group or business on what biodiversity to prioritise, where investment will bring the most benefit, and what will be most efficient and effective in stemming biodiversity loss and ecosystem decline – but only where research to date has delivered this certainty. There are significant knowledge gaps remaining, and more work to be done to translate scientific research into action.

The Importance of Measurement

There is a need to consider how success is measured, and to ensure that the right metrics are used while maintaining accountability. Robust monitoring is required to ensure biodiversity conservation projects deliver the benefits they claim. A credible measurement system must provide transparency, accountability and evidence to support claimed benefits.

If the private sector is to invest in government goals, then clear, measurable impacts will be needed to inform Environmental, Social and Governance (ESG) reporting, along with investments that demonstrate a return on investment – either financially, or through another measure of impact.

Unlike tracking carbon for accountability of carbon farming, biodiversity measurement involves a variety of animals, plants and systems. These measured entities need to be combined into a standardised metric for global markets and comparison.

Tracking should identify – over the short to medium term – how much (e.g., individuals, hectares) has been saved, how much has been lost, how many linkages and relationships have been created, and how many people and organisations have been involved.

Restoration Ecology

"Restoration ecology is the scientific study of repairing disturbed ecosystems through human intervention.

Ecological restoration aims to recreate, initiate, or accelerate the recovery of an ecosystem that has been disturbed. Disturbances are environmental changes that alter ecosystem structure and function. Common disturbances include logging, damming rivers, intense grazing, hurricanes, floods, and fires.

Restoration activities may be designed to replicate a pre-disturbance ecosystem or to create a new ecosystem where it had not previously occurred. For example, future climates may not support certain species, and some species may have already gone extinct in an area. Under these circumstances practitioners may decide to create an ecosystem that did not exist historically at the project site, but which corresponds to current or projected future conditions.

It is a defining characteristic of ecological restoration that many projects are locally initiated and implemented by community volunteers. Because restoration projects generally involve complex collaborations and negotiations among a diverse group of interested parties, social science is an integral part of restoration at all scales.

There has been a strong push to formalize the science and practice of restoration, linking it explicitly with ecological theories. In fact, ecological restoration can be used as a practical test of our ecological understanding. Conversely, failures in ecological restoration can reveal gaps in our understanding of ecology." (Vaughn, et al., 2010)

As well as biodiversity metrics, measurement should include the human dimensions of conservation, to guide behaviour change programs and recognise the interrelationships in our socio-cultural-ecological systems. Accountability must be culturally appropriate and measure the most important benefits of a project.

Projects should report on cultural, social and biodiversity benefits to ensure projects deliver for Indigenous people, the community generally, and the environment. (Morgain, Wintle, Bush, Fletcher, & Croeser, 2021)

Government can help identify the common measurements required, how to measure, and the types of data, host data storage, and provide tools and training.

Measurements need to be standardised, structured and coordinated, with science-based metrics, targets and outcomes. They need to be based on rigorous research, rather than being solely qualitative or merely anecdotal. Businesses, in particular, require robust, science-based evaluation and tracking.

Monitoring needs to be achievable. While funding bodies may want to see evidence that spending on action has had an impact, funding research into the measurements themselves is rare. More technical research into biodiversity monitoring is required. Measurement processes may be able to capitalise on technological improvements in collecting biodiversity data.

For example, the Threatened Species Index (Terrestrial Ecosystem Research Network, 2022), the first of its type in the world, provides reliable and robust measures of how the populations of Australia's threatened and near-threatened species are changing at national, state and regional levels. Rather than monitoring extinctions, which is of course too late, it is better to track populations to measure management performance. A decline in population shows the need for intervention (to do something or stop doing something), while an increasing population demonstrates that action is helping.

More Environmental Data, More Environmental Science

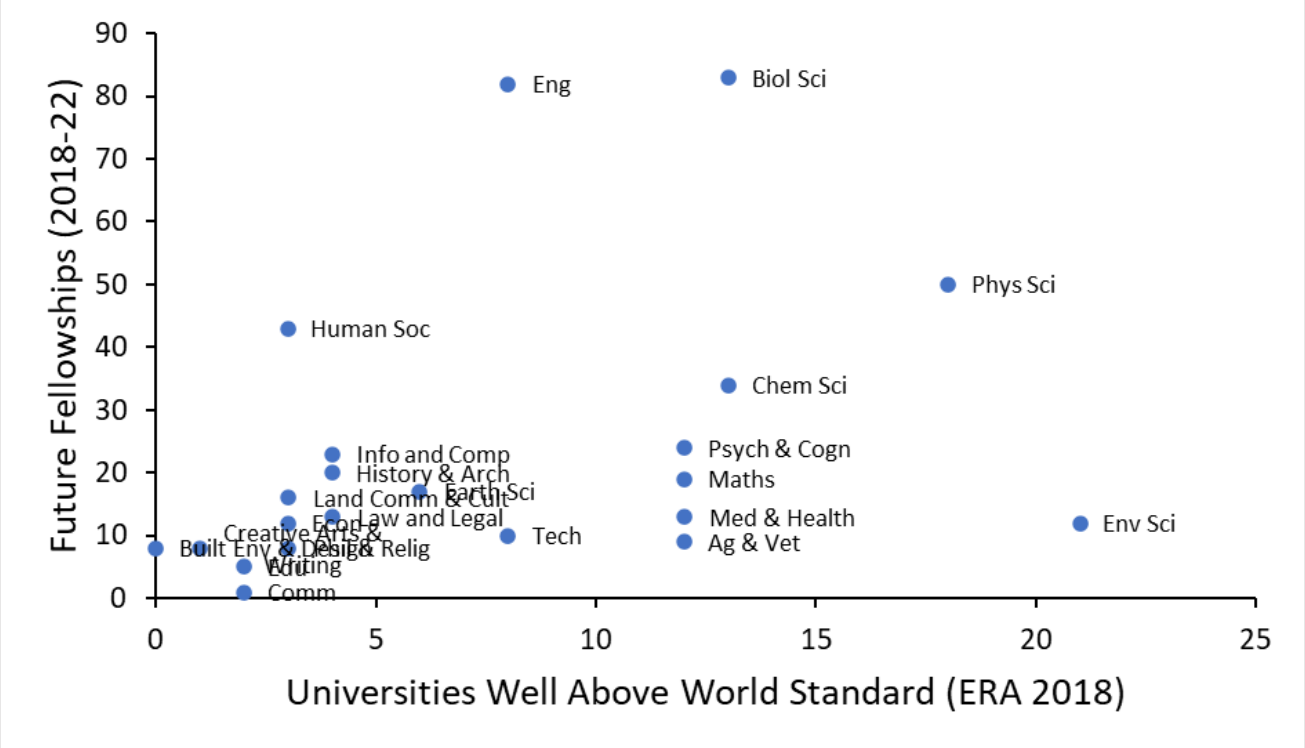


Figure 7: The number of ARC Future Fellowships awarded in different disciplines between 2018 and 2022 versus the number of Australian universities judged to be well above world standard. (Excellence in Research for Australia, 2022) 1

Monitoring change over time means first establishing baselines. With so many species to monitor for population trends, it is more important than ever to release research funding for the environmental and biological sciences in particular. With just one environmental scientist receiving an ARC Future Fellowship out of 100 successfully awarded in 2022, it appears the settings for the Commonwealth's Science and Research Priorities are clearly not delivering the right expertise to confront the biodiversity crisis. (Perfetto, 2022)

"Environmental Science is one of Australia's leading research areas. It is a field with Australia's highest representation of highly cited authors. And for all the foibles of the Excellence in Research for Australia (ERA) ratings, it is the field with the most universities 'well above world standard.'"

"Twenty-one Australian universities were rated as being well above world standard in 2018 by the ARC, yet this field has only received 12 Future Fellowships in the 5 years since then. I have no idea why, but it seems very odd."

- Professor Mick McCarthy MRSV (McCarthy, 2022)

The Challenge of Monitoring Victoria's Biodiversity

The latest efforts by the Commissioner for Environmental Sustainability to account for the status of Victoria's biodiversity list the following 'critical obstacles to improving biodiversity outcomes':

- various investment programs across multiple land management units have created different, inconsistent data sources and terminologies for reporting on the state of biodiversity, land and forest assets in Victoria
- data are inadequate to answer many of the critical questions about biodiversity science in Victoria
- Victoria's biodiversity science and data capability are undermined by a lack of coordination and a strategic approach to investing in the critical research that will enable an ecosystems approach to decision-making and policy interventions. (Commissioner for Environmental Sustainability, 2021)

We need to fund more professional scientists and field managers to design and coordinate population data surveys with consistent metrics and terminologies from a position of meaningful expertise. We need more citizen scientists in the field to assist with conducting these surveys, employing consistent methodologies to ensure due rigour from the results. We need these projects to be iterative, with direct and consistent feedback to citizen science groups to impart the impact of their efforts to build co-ownership and further commitment to the health of regional ecology.

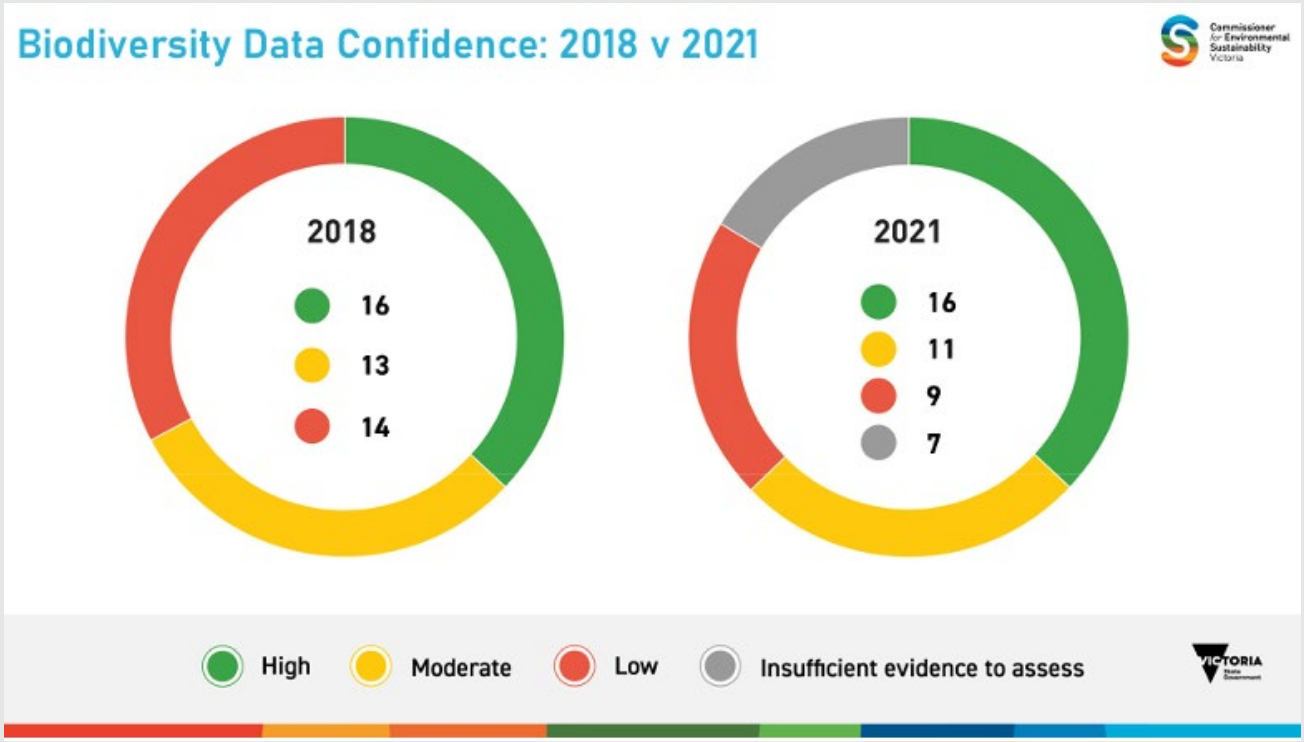


Figure 8: Biodiversity data have shown little improvement in recent years and are inadequate to answer important questions about biodiversity in Victoria. (Commissioner for Environmental Sustainability, 2021)

Resourcing Biodiversity Conservation and Recovery

Biodiversity conservation is a public good. Work on recovery needs to scale up dramatically and immediately. This means a serious investment that is not currently being made by either the Victorian or Commonwealth Governments.

With biodiversity recovery maintaining a low political ebb, other sources of investment will need to be secured if we are to address the crisis in a time-sensitive fashion. New and existing projects could benefit from industry engagement to support, enhance and stimulate commitments to adequate public funding.

Co-design and co-delivery are important. Biodiversity conservation projects need to be defined in similar ways to how businesses define projects – with clear, demonstrable benefits that reward investors – whether public or private – and drive financing for further beneficial interventions. Our recommended actions explore early options for funding sources and instrumentation.

Starting from Here

Pilot projects should be small and have a high chance of success to be effective, noting that we can learn from ones that fail. These projects should build on previous work and be part of a broader strategy.

Farmers are working to integrate ecosystem values into productive land but need considerable support in overcoming pests and soil degradation without recourse to excessive fertiliser and pesticide use. These can be mutually-reinforcing goals, but we acknowledge many pest threats do not recognise fence lines – meaning collaborations between all categories of "land manager" to restore ecological systems at the landscape scale. Over 21,000 commercial farmers manage half of Victoria's land area – 11.3 million hectares – and we cannot achieve our goals for ecological recovery without the

agricultural sector taking a leading role. (Agriculture Victoria, 2021)

> *"Native vegetation is well adapted to the harsh Australian environment and provides essential ecosystem services such as integrated pest management, healthy soils and landscapes."*
>
> *"Striving towards ecologically healthy and diverse farming systems provides more resilience to climate change and can improve both profitability and biodiversity values." (Agriculture Victoria, 2022)*

Human population increases and consequent changes to settlement patterns add pressure on Victoria's ecosystems. We must question the impact on regional biodiversity from changes to population sizes, resource needs and behaviours, and mitigate this through our planning frameworks before proceeding with various projects and schemes, including stronger regulation to avoid or mitigate development in locations inappropriate for housing or industrial activities due to impacts on regional ecology.

Researchers within universities, government and industry contribute evidence, tools and networks. However, more effort is required to transfer this knowledge and skill base to accessible planning tools and coordinated actions by businesses, governments and the community. Scientists can help inform governments, community groups or businesses on prioritising ecosystem interventions, where investment will bring the most benefit, and the most efficient and effective actions to stem biodiversity loss and ecosystem decline – but only where research to date has delivered this certainty. So, understanding and prioritising further research will be important to address identified knowledge gaps.

Decision-making tools need to be developed, taking the complexity of the natural world and delivering this in a way that connects to human-based decision systems – informing policy, planning and on ground decision-making, and enabling users to demonstrate the benefits of different actions in a standardised way. Providing highly accessible field guides for local people seeking to make a difference in their own region will be essential to reducing reliance on governments or scholars on local management of restorative projects.

Robust monitoring is required to ensure biodiversity conservation projects deliver the benefits they claim. A credible, publicly accessible, user-friendly measurement system must provide transparency, accountability and evidence to support claimed benefits. Governments can help identify the common measurements required, how to measure, and the types of data, host data storage, and provide tools and training.

Measurements need to be standardised and based on rigorous research. Businesses, in particular, require the assurance of robust, science-based evaluation and tracking. Presently, Victoria's biodiversity science and data capability are undermined by a lack of coordination. A research strategy is required for investing in an ecosystems approach to decision-making and policy development.

Everyone's Problem, Everyone's Responsibility

To contribute to the development of recommendations and innovative solutions to Victoria's biodiversity crisis, knowledge holders and leaders representing scientists, First Peoples, government officers and business leaders from across Victoria gathered at the RSV on Saturday 4th June 2022 to discuss Victoria's challenges and opportunities in biodiversity conservation and recovery. The workshop considered the urgency of the need to establish an independent Biodiversity Taskforce for Victoria comprised of intersectoral leadership, to be guided by the data and the science of environmental conservation, and discussed numerous other potential recommendations, which were further refined by RSV Fellows. The following recommendations flow from the proceedings of this cross-sector forum.

The RSV's Cross-sector Forum on Biodiversity Conservation and Recovery, 4 June 2022 (Photo: Molly Patton).

Recommendations

Transformation is urgently required, not more of the same. We need a fundamental shift in how we think and talk about biodiversity, how we fund its conservation, how we change our behaviour to support it, and how we connect our collective efforts. This is fundamentally a cultural change; it will be difficult, it will be disruptive, and it will require substantial investment.

The Royal Society of Victoria seeks:

- a response from the Commonwealth Government to the October 2020 recommendations of the *Independent Review of the Environment Protection and Biodiversity Conservation Act 1999* (Samuels Review).
- a response from the Victorian Government to the Legislative Council's Environment and Planning Committee's December 2021 report for the *Inquiry into Ecosystem Decline in Victoria.*
- a detailed study of the methodologies and results of conservation projects in Victoria over the past 30 years to be clear about what has worked, and what has not.
- planning, then investment in a diversified, scientifically rigorous program of conservation projects that posits hypotheses for effective interventions in different landscapes by different groups, sets controls, and tracks rates of success and failure to inform further investment.
- invigorated public sector and corporate leadership collaboration to design and support effective market mechanisms, activating cross-sector partnerships to co-invest in this diversified conservation and recovery program.
- a regulatory response to the relationship between the finance sector, property development and agribusiness to ensure compliance with biodiversity positive outcomes in investment, lending, planning and delivery.
- establishment of a Community of Practice for Traditional Owner Corporations and Elders to collaborate with environmental scientists, exchanging expertise and building a contemporary cultural knowledge base to heal a much-changed Country.
- sustained cross-sector collaboration to identify and deliver the structural and behavioural alignments required to achieve success.

> *"To avoid the risk of purchasing ineffective and therefore non-compliant offsets, water corporations need to take steps to screen out non-performing offset projects to ensure that offsets they consider for purchase do in fact meet the integrity principles required by CACNS. Offset projects can also be associated with social and environmental harm – offset selection needs to scrutinise offset projects to ensure they do not cause such harm. The social and environmental harm that offset projects can cause can also lead to significant reputational damage to the offset purchaser. " (VicWater, 2020, September)*

Guiding Principles

The RSV recommends the use of the following principles in identifying the actions we must take:

- use science and research to guide actions
- include measurable biodiversity conservation or recovery outcomes from actions
- work across biologically relevant geographic scales
- collaborate with local communities
- work across participant scales, from large organisations taking on broad goals to individuals working locally
- connect sectors, disciplines, data, expertise, knowledge systems and actions
- demonstrate the value of corporate leadership
- ensure identification of barriers and impediments to actions (e.g., bureaucracy, costs of action, complexity of conservation decisions) and ways of overcoming these.

These guiding principles should be reviewed through the lens of Australia's First Peoples' needs, knowledge and concepts. Each Victorian First Peoples group has Country plans that serve as valuable resources.

Criteria for Solutions

Ownership and solutions to the biodiversity crisis must be multi-sector, multi-disciplinary and culturally empowering. They cannot exist solely within one sector nor focus solely on a scientific or engineering solution.

The attributes of appropriate solutions, in no particular order, are as follows:

- Practical: solutions must be practical for implementation.
- Tractable: solutions suggested need to be feasible, manageable, teachable or practicable.
- High impact: solutions are demonstrably likely to lead to the highest impact on biodiversity outcomes.
- Scientifically robust and defensible: solutions suggested must have a strong weight of scientific evidence.
- Objective and apolitical: solutions should not be intended as political, despite the inherently political nature of the biodiversity crisis.

- Inclusive: solutions need to be applicable in similar situations, sectors, locations and issues.
- Not favour the most popular or palatable issue: solutions should consider all issues in the public consciousness and accept these may prove unpopular with many.
- Translate science into use: solutions should translate great science into tools that empower local groups to solve major societal issues **now**.
- Equitable: solutions cannot generate injustice or inequity.

Collective Actions

While there are many possible actions to address Victoria's biodiversity extinction crisis, the RSV has chosen to highlight the following actions as the most critical and likely to lead to elevation of the biodiversity crisis as a unifying social cause with targeted funding for a successful intervention.

These actions aim to:

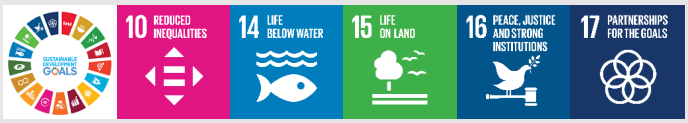
- ***elevate recognition of the biodiversity crisis in Victoria and Australia as a political, social, and economic priority, parallel to addressing climate change and environmental pollution.***
- ***inspire cross-sector leadership of a series of regulatory, research, funding and communication activities that will drive the effective conservation and recovery of native plants, animals and ecosystems in Victoria and Australia.***

Action 1: RECOGNISE First Nations' Leadership in Ecological Management

Significant cultural change in Victoria is needed for the benefit of our natural systems, acknowledging this will take a sustained effort over a long period of time. Our uniquely adapted ecosystems must inform the regional identities of all Victorians to create a deeper relationship with Country. Acknowledging the Treaty process underway, and in keeping with the principles of social and environmental justice:

- The RSV calls on politicians, public servants, businesses, academics, non-government organisations, community groups, and the people of Victoria to recognise and respect the claim of First Peoples to cultural custodianship of our State's many landscapes and ecosystems.
- The RSV calls on First Nations' knowledge holders to engage in regional action to help balance the many demands on Country to recover and sustain healthy ecological communities.
- The RSV calls on the Victorian Government and Victorian industry groups to resource Indigenous leadership capacity in species conservation and environmental health on Country for all Victorians.

> *"We express our deep concern regarding the triple global crisis of climate change, biodiversity loss and pollution, recognising that these challenges are inextricably interlinked and mutually reinforcing, and that they are driven largely by human activity and by unsustainable patterns of consumption and production. We therefore commit to immediate, short- and medium-term action in this critical decade, leveraging the synergies between climate and biodiversity action, the clean energy transition and environmental protection, which should inform long-term transformative change." (G7 Germany, 2022)*



Action 2: RESOURCE Local Ownership & Leadership of Restoration Ecology Projects

The State Government cannot drive the agenda nor implement the scale of change required to recover Victoria's diverse ecological systems and the species that comprise them. We must resource local leadership as a "subsidiarity" initiative that places key decision making as close as possible to the field of action. Building on DELWP's *Victorians Value Nature* report, communication and education activities must guide a necessary shift in how Victorians regard nature, transitioning from a resource perspective to a reciprocal relationship, reinforcing personal responsibility and an appreciation of the value of flora and fauna indigenous to Victorian regions over destructive invasive species and human activities.

While initiatives such as the BushBank program provide a welcome financial stimulus for conservation on private land, it is clear there are few materials available that summarise research findings into tractable, accessible guides for land managers seeking to restore ecological values in their specific region.

Given the scarcity of government funding available for staff-based interventions and the private ownership of the majority of affected land, we seek an investment in translating decades of research into accessible field guides for local people to initiate ecological restoration projects as citizen scientists and conservation volunteers, matched up with recognised expertise in restoration ecology, who can offer professional consultation and guidance on projects as required, and funding in support of field work.

Action 3: APPOINT an Independent Regulator to Govern Biodiversity Values in Victoria

The health of our natural world supports all other activities in our state. Much has been extracted from our natural systems for far too long without due voluntary constraint or sufficient reinvestment. We seek a reallocation of Victoria's biodiversity and ecological system health as a first order priority for economic and social sustainability.

This issue is intimately concerned with land and water, two of the most valuable resources on offer to any human activity, including the commercial sector. The Society considers there are too many powerful, competing interests at play in our political and economic system for biodiversity conservation to be maintained as a priority issue within the broad Victorian electorate. Likewise, it is difficult to imagine the health of our natural world can be maintained as a first order priority within Ministerial and Departmental agendas over time.

> *"The economy is a wholly owned subsidiary of the environment. All economic activity is dependent upon that environment and its underlying resource base of forests, water, air, soil and minerals. When the environment is finally forced to file for bankruptcy because its resource base has been polluted, degraded, decapitated and irretrievably compromised, the economy goes into bankruptcy with it. The economy is, after all, just a subset with the ecological system."*
>
> *Gaylord Nelson (Nelson, 2002)*

We seek an independent regulator – such as an ombudsman - to be appointed or restructured from existing roles and agencies within the Victorian Government, suitably realigned, resourced and empowered.

Defined, supported and supplied under State legislation, this regulator would possess due powers of review and veto of applications submitted for development within the State's planning system referred to the office for unacceptably impacting biologically sensitive land or failing to add sufficient ongoing support for biodiversity values in design, construction and ongoing land use. The following measures would be required:

3.1: A Conservation Significance Classification Layer to the State's Planning System

Work with a Board of subject matter experts and stakeholders with appropriate cultural authority to assess, certify and govern a conservation significance layer to Victoria's land management system, assigning a robust, scientifically-assessed conservation status to whole landscapes and waterways classified in accordance with IUCN Red List categories irrespective of title status. This must include aspirations to recover degraded regional ecosystems in addition to conserving remnant and intact biological diversity.

3.2: Regulation of the Finance Sector to Restrict Biodiversity Negative Investment

Restrict lending by institutions operating within Victoria's jurisdiction to companies and individuals seeking to develop or otherwise utilise land in a manner that damages or destroys its biodiversity values on properties holding high conservation status under the State's Planning System.

3.3: No Net Loss: Reform and Constrain Offset Programs to Operate Within Sites of Impact

Reform and constrain "offset" programs to avoid the destruction of biodiversity values through property development and industrial activities as a "cost of doing business." At a minimum, all "offsets" must guarantee no net loss of ecological system function on directly-affected properties and waterways, rather than augmenting or protecting biodiversity values elsewhere as a compensatory measure. This will require review and amendment of the State of Victoria's *Planning and Environment Act 1987*, DELWP's *Guidelines for the removal, destruction or lopping of native vegetation*, and the Commonwealth Government's *Environment Protection and Biodiversity Conservation Act 1999.*

An early opportunity may be a reframing and broadening of the powers, capacities and objectives of the Conservation Regulator, in accord with the compliance role of the Victorian Government Land Monitor, the data gathering and reporting role of the Commissioner for Environmental Sustainability, and the enforcement role of the Environment Protection Authority Victoria.

Penalties for non-compliance must act as a genuine deterrent, as smaller fines without criminal charges and the loss of license to operate have been historically treated as "the cost of doing business" by the unscrupulous. We recommend making new provisions for biodiversity sensitive land under the *Planning and Environment Act 1987* (Vic), similar to the reforms made to protect heritage buildings from unlawful demolition and neglect. (State of Victoria, 2021)

Action 4: ESTABLISH Funding Diversity for an Intersectoral Nature Fund

We seek the appointment of influential leaders within the research, business, community, First Nations, and philanthropic sectors as Trustees to govern a science-backed Nature Fund for Victoria, financing pilot projects that seek to restore and recover the State's biodiversity. To ensure confidence is maintained in the program's integrity for all stakeholders, this must be an intersectoral initiative that attracts finance from both public and private investment, building and expanding on the example provided by the Nature Fund established within the Victorian Government (DELWP) in 2022, and operating with full transparency to sustain trust in the Fund's actions.

There is considerable interest from all sectors in biodiversity and the restoration, conservation and preservation of species and vegetation. There are many options for activating funds from the business sector; direct collaboration is recommended. As examples, ideas proposed at our June 2022 Forum are provided below.

4.1: Voluntary EFT Transactions

Our Forum proposed working with major banks to provide customers with the option of donating an amount to the Nature Fund with every electronic transaction (say, $0.05), noting that periodic microtransactions of this nature can be easier for household budgets to accommodate than larger, one-off donations.

Current technology gives banks the ability to manage many transactions with little cost. The Reserve Bank of Australia's Payments System Board reports that, on average, Australians made approximately 625 electronic transactions per person in 2021, up from 275 per person in 2011. (Reserve Bank of Australia, 2021)

The trend to electronic transactions, rather than paper or cash, continues to grow through market forces and increased government regulation of the cash economy. A 5-cent donation per transaction would equate to around $30 per customer, per year.

There is considerable groundwork to be done to investigate the feasibility of this idea, including:

- review data on types of electronic transactions (debit cards, credit cards, automatic bill payments) and determine where the option will be offered
- assess the market reaction to the scheme
- decide which amount to suggest for an optional donation (e.g., 5 cents, 10 cents, 20 cents)
- ensure availability of year-end statements of the total amount donated per customer
- obtain tax deduction status for the Fund (which could be stewarded in partnership with an existing not-for-profit with Deductible Gift Recipient status)
- review the existing Fund, prescribe how the Fund can be used, and appoint an independent Board to manage the Fund
- consider regulation, such as legally binding restoration targets (a model may be the EU's proposal for a Nature Restoration Law (European Commission, 2022))

4.2: A State Levy on Pet Care Products

With invasive species and genes identified as a leading cause of biodiversity decline in Australia, we seek to balance the explosive growth in pet ownership in our State through imposing a related levy on pet care products – food and domestic care items - raising funds from a significant private market to explicitly address the impacts of invasive plants, fungi and animals on regional ecosystems, with flow-on biosecurity benefits for the agricultural sector.

A strong precedent is provided by the Sustainability Fund managed by DELWP, a hypothecated trust instrument established by the *Environment Projection Act 2017*, which gathers proceeds from local government landfill levies, which in turn supports "projects, programs, services or technologies that will benefit Victoria environmentally, socially and economically." (State of Victoria, 2022)

4.3: Reform the Sustainability Fund

The Sustainability Fund could also be the recipient of proceeds from the proposed pet care products levy, with these funds earmarked to address invasive species management in the State of Victoria. Currently the Sustainability Fund does not address ecological restoration or conservation, which is overwhelmingly concerned with the related priorities of sustainable waste management and mitigating climate change. Either this Fund's scope must change to recognise there are three concurrent crises affecting our environment, or the Victorian Government can otherwise direct pet care product levies for management by the independent governors of the Intersectoral Nature Fund.

We seek further discussion with the government, business, community, and philanthropic sectors to co-govern and review diverse funding options for the Nature Fund and/or seek reform of the Sustainability Fund governed by an independent Committee appointed by the Secretary of DELWP.

Action 5: BUILD Effective Investment Instruments for the Business Sector

> *"Countries have set new national biodiversity targets for 2030, much sooner than the net zero targets of 2050. The EU is leading the way, extending mandates on organic farming, increasing quality standards for waterways and soils and legislating measures that support sustainable fishing and aquaculture management. It is also developing a Taxonomy to define what types of investments actually address biodiversity loss."*
>
> *David Thomas, Robeco*

Instruments that help businesses and governments to track their performance as an element of cost accounting, demonstrating the value of investment in biodiversity conservation and recovery, must be developed. This will lay the foundation for companies to assess what measures they can take to invest in nature in ways that counter the anticipated impact of – and on – their business.

It can also help identify what governments need to do to stimulate further investment (e.g., regulation, legislation, information systems, scientific monitoring design, resources for threat management), and provide confidence to communities of concern that investment is made transparently in projects that demonstrate a genuine contribution to Victoria's ecological health.

5.1: Reform of the Treasury Corporation of Victoria's Sustainability Bond Framework

The Treasury Corporation of Victoria's (TCV) Sustainability Instruments are employed for the financing, and re-financing, of Green and/or Social projects and assets ('Eligible Projects') across Victoria, which are funded through TCV 'Participating Authorities,' Victorian Government Departments and State related entities. (Treasury Corporation of Victoria, 2022)

Strengthening the governance, management, and transparency of the TCV's Sustainability Bonds Instruments, managed by the Victorian Funds Management Corporation (VFMC), offers an opportunity for impactful reform. A review of the various international guidelines referenced by VFMC to govern funds management are overwhelmingly focused on social benefits and emissions reduction to mitigate disastrous climate change; there is no discussion of ecological restoration nor biodiversity conservation as investment priorities.

The VFMC had $74.5 billion in Funds Under Management as of 30 June 2021, but as yet provides no indication on where, how and if these funds are being invested to promote the ecological health of Victorian landscapes and the many species they sustain through the TCV Sustainability Bonds Instruments.

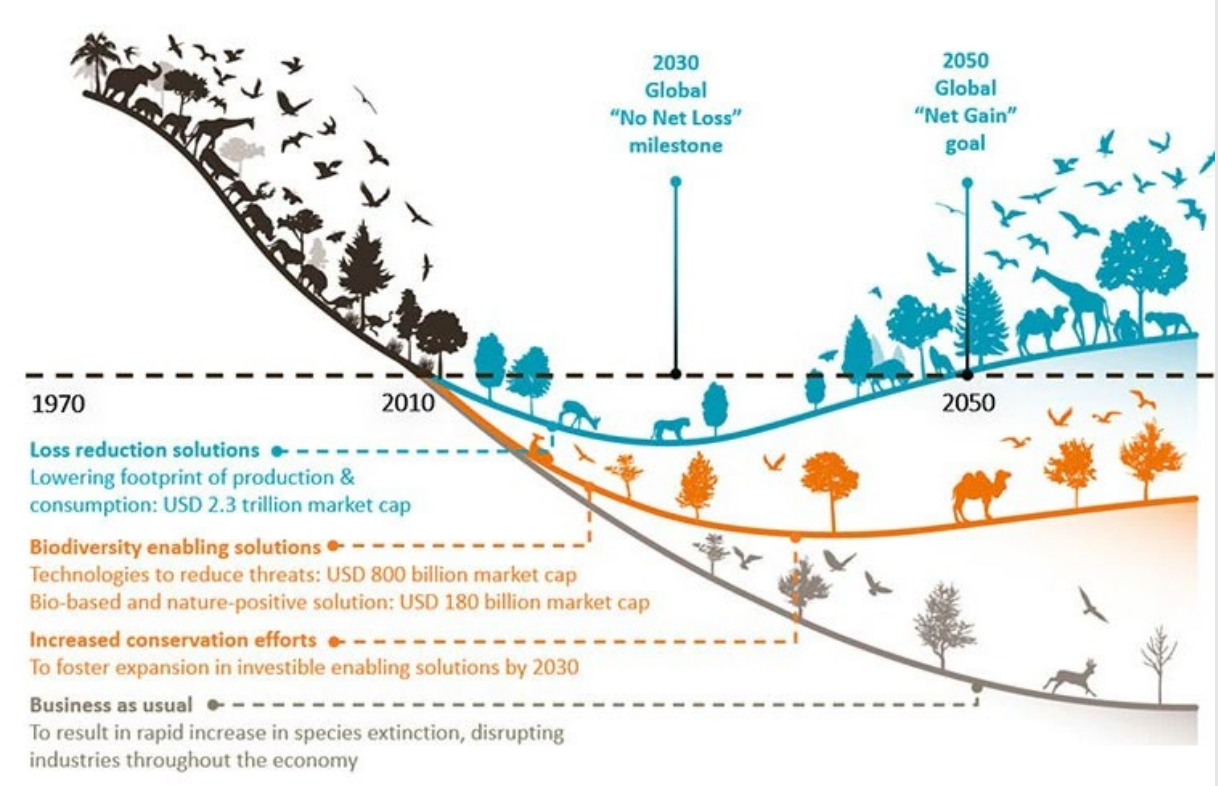
> *"The TCV Sustainability Bond Framework sets out the process by which TCV intends to issue and manage sustainability instruments on an ongoing basis to finance, and re-finance projects and assets across Victoria, which are consistent with delivering a low carbon and climate resilient economy and/or delivering positive social outcomes for Victorian communities."*
>
> *"The TCV Sustainability Bond Framework may be subsequently updated at TCV's discretion as relevant market standards and best practice continue to evolve over time."*
>
> *(Treasury Corporation of Victoria, 2022)*

We note there are private sector equivalents to the VFMC who have developed explicit investment strategies to target companies that can benefit from the transition to a nature-positive world. For example,

international asset manager Robeco launched their Biodiversity Equities strategy on 31 October 2022. (Thomas, 2022)

Accordingly, we recommend the following specific actions for the Treasury Corporation of Victoria and the Victorian Funds Management Corporation:

- Adoption of Sustainability Bonds guidelines that recognise projects and programs addressing the biodiversity crisis as a leading priority for investment
- Appointment of VFMC Board Members with recognised expertise in biodiversity recovery and conservation to inform ESG decision making and guide investment opportunities to impactful interventions
- Creation of a Chief Sustainability Officer role to provide expert advice
- Separate, visible and equal status for "Sustainability Bonds" in listed asset classes, promoted beyond a subset of "Non Traditional Strategies" (State of Victoria, 2022)
- Separate and equal status for "biodiversity" as an ESG theme – currently, neither the urgency nor complexity of biodiversity management is clearly recognised, reduced to a subset of climate risk management in the most recent *Responsible Investment Update* (State of Victoria, 2022)
- Inclusion of a detailed ESG investment section in the VFMC annual report, disclosing the projects supported and their impact against the Key ESG Themes of Climate Change, Modern Slavery and Occupational Health and Safety, and including Biodiversity as a fourth ESG theme (State of Victoria, 2021)



Reversing the biodiversity threat by 'bending the curve' of biodiversity loss brings huge investment opportunities. Source: Robeco, Bloomberg. Illustration adapted from Leclère et al, Nature, 2020

We recommend the creation of incentives for the finance sector to produce highly competitive, biodiversity-positive investment products to expand the conservation covenanting effort; this could be accompanied by a redirection of state or federal subsidies from or investments in nature-negative industries to an ethical finance scheme for the property sector.

5.2: Create a Template Case for Sustainable Practices in Business

Develop a template business case that collates existing data and builds on emerging market frameworks to demonstrate the value to businesses of investment in biodiversity conservation and recovery. This will lay the foundation for business leaders to assess what measures they can take to invest in nature-positive schemes in ways that directly counter the anticipated impact of – and on – their business.

The business case could consider value creation via:

Tangible Biodiversity Outcomes

- biodiversity recovery and protection
- resilience of species and natural assets from climate change and other human activity impacts

- increased conservation covenanting

Tangible Economic Outcomes

- the role of future carbon and biodiversity markets
- reduction in negative impacts from a lack of biodiversity (food security from improved protection of pollinators, importance of soil health for carbon sequestration) and from natural hazard mitigation (i.e., floods and bushfires)
- long-term budget and resource commitment

Intangible Corporate Leadership Outcomes

- customer, employee attraction and satisfaction
- inclusion of First Peoples and diverse communities in conservation partnerships
- collaboration with other sectors to build buy-in and strengthen outcomes
- brand leadership, partnerships and influence on the market

The Template Business Case would demonstrate a case for corporates valuing and investing in nature. It can also identify what government needs to do to assist (e.g., legislation, information systems, scientific monitoring design, resources for threat management).

5.3: Develop and Deliver Business Awareness and Engagement Campaigns

Victoria's business sector is yet to pervasively engage with natural capital and other biodiversity or climate-related financing tools.

Leading companies can convene a community of practice, creating a multi-stakeholder platform for like-minded partners and corporates to drive engagement with awareness-raising campaigns in the private sector, including calls to action, industry guides, and fundraising for the Intersectoral Nature Fund.

A campaign can involve or be directed towards employees of participating businesses, customers or their supply partners. The collective push by corporates can result in greater momentum towards a specific delivery organisation or partner.

Calls to action can be embedded in the campaign, including industry guides and fundraising requests for a specific cause. A guide could be developed with small to medium-sized enterprises to enhance their positive impact while minimising destructive practices.

Action 6: CREATE an Independent, Intersectoral Taskforce for Biodiversity Recovery and Conservation in Victoria

Recognising a whole-of-society crisis requires a whole-of-society response, the RSV seeks resourcing to establish an independent and intersectoral taskforce on biodiversity conservation and recovery to oversee implementation of these and further actions. Operating as an open and authentic partnership between all sectors, the taskforce will:

- build a system-wide understanding and ownership of effectual biodiversity programs and outcomes
- help all concerned to track and communicate progress to the broader population
- build fruitful partnerships between policy-making, natural capital investment schemes and projects in the field with demonstrated impact driven by researchers, First Nations, citizen scientists and conservation volunteers
- stimulate engagement and participation
- build on the recommendations of the Samuels Review and the Victorian Inquiry into Ecosystem Decline
- identify the biodiversity impacts of activities and development planned by government, and recommend biodiversity-positive alternatives
- develop electoral support for public investment and market support for private investment in projects that demonstrably repair and conserve ecological systems to safeguard biodiversity in Victoria.

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Cross-Sector Forum Participants – 4th June, 2022

Ms Lyn Allison, President - Westgate Biodiversity

Professor Andy Bennett, Professorial Fellow & VP Ecological Society of Australia - The University of Melbourne

Professor Andrew Bennett, Professor of Ecology - La Trobe University

Dr Bill Birch, RSV Fellow - Curator Emeritus (Geosciences), Museums Victoria

Dr Jane Canestra, Councillor - The Royal Society of Victoria

Mr Jeremy Cheeseman, Director - Marsden Jacob Associates

Mr Steven Cusworth, Managing Director - FPL Advisory

Associate Professor Robert Day, Marine Ecologist - The University of Melbourne

Dr Catherine de Burgh-Day, RSV Vice-President - Research Scientist, Bureau of Meteorology

Mr Tim D'Ombrain, Coordinator, Biodiversity Services - Ballarat Environment Network

Dr Nicholas Downes, Honorary Senior Fellow in Medicine - Peter MacCallum Cancer Centre

Dr Stephen Endicott, Co-Director - Carbon Landscapes

Mr Mike Flattley, CEO - The Royal Society of Victoria

Dr Sophia Frentz, Data Platform Product Developer - Wesfarmers

Mr Doug Frood - Pathways Bushland & Environment

Professor Peter Gell, Professor Emeritus, Paleoecology - Federation University

Mr Rob Gell, President - The Royal Society of Victoria

Professor Jenny Graves, RSV Fellow, Geneticist - La Trobe University

Dr Jenny Gray, CEO - Zoos Victoria

Dr Megan Hirst, Postdoctoral Fellow - Seed Science - Royal Botanic Gardens Victoria

Professor Tom Johnstone, Director of Neuroimaging - Swinburne University of Technology

Mr Lincoln Kern, Managing Director - Practical Ecology

Dr Ingo Kumic, Strategic Partnerships - The University of Melbourne

Professor Pauline Ladiges, RSV Fellow, Botanist - The University of Melbourne

Mr Bruce Lindsay, Senior Specialist Lawyer Justice - Environmental Justice Australia

Dr Ian Mansergh, Environmental Scientist - La Trobe University

Ms Ellen Maybery, Senior Specialist Lawyer Ecosystems - Environmental Justice Australia

Professor Michael McCarthy, Ecosystem & Forest Sciences - The University of Melbourne

Mr Andrew McLean, CEO - Landcare Victoria

The Hon Simon Molesworth, Barrister-at-Law - The Victorian Bar

Ms Monica Morgan, CEO - Yorta Yorta Nation Aboriginal Corporation

Mr Gordon Noble, Research Director - Institute for Sustainable Futures, University of Technology Sydney

Professor Graeme Pearman, RSV Fellow, Climate Scientist - The University of Melbourne

Dr Viktor Perunicic, RSV Councillor & Senior Solutions Engineer - Q-CTRL

Mr Scott Reddiex, Associate Editor, The Royal Society of Victoria

Professor Euan Ritchie, Wildlife Ecology & Conservation - Deakin University

Mr Matt Ruchel, Executive Director - Victorian National Parks Association

Professor Graeme Samuel, Independent Chair - Monash Business School

Ms Lynette Smith, Consultant - Gramma

Mr Gary Stoneham, Centre for Market Design - The University of Melbourne

Dr Joanna Sumner, Manager, Genetic Resources - Museums Victoria

Mr James Todd, Chief Biodiversity Officer - DELWP

Dr Simon Torok, Director - Scientell

Mr Jarrod Troutbeck, Sustainability Manager - Bank Australia

Mr Siddharth Verma, RSV Treasurer - Founder and Director, BrainSTEM

Professor David Walker, Neurodevelopmental Physiologist - RMIT University

Uncle Dave Wandin, Elder - Wurundjeri Woi Wurrung Cultural Heritage Aboriginal Corporation

Professor Rachel Webster, RSV Fellow, Astrophysicist - The University of Melbourne

Professor Geoffrey Wescott, Honorary Research Fellow - Deakin University

Ms Mellissa Wood, Chairperson - Victorian Environment Assessment Council

This one-day workshop featured subject matter leaders from four different sectors demonstrating how their domain of experience, expertise and responsibility is reflected in the task at hand, seeking a consensus position with recommendations for further work and effective investment towards the goals of *Biodiversity 2037* across the sectors.

The forum featured deliberative components to help our team develop this position paper for the Royal Society of Victoria, with recommendations for further work across the industry, government, academic and community sectors and developing effective investment strategies to help Victorians meet the goals of *Biodiversity 2037.*

We were led in discussion by our 2022 RSV Fellows (above, from left):

- Ms **Fern Hames** FRSV, Director, Arthur Rylah Institute for Environmental Research (Department of Environment, Land, Water and Planning)
- Mr **Damein Bell** FRSV, Atlantic Fellow and previously CEO, Gunditj Mirring Traditional Owners Aboriginal Corporation
- Ms **Judith Downes** FRSV, Chair, Bank Australia, immediate past Chair of the Global Alliance for Banking on Values Governing Board Forum, and a Director for ImpediMed
- Professor **Brendan Wintle** FRSV, Conservation Ecologist and previously Director, Threatened Species Recovery Hub