

# Submission to the Parliamentary Inquiry into Ecosystem Decline in Victoria.

August 2020



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## **About Doctors for the Environment Australia**

Doctors for the Environment Australia (DEA) is an independent, self-funded, non-government organisation of medical doctors in all Australian states and territories.

DEA is focused on the complex interaction between human health and our natural environment and is therefore interested in environmental protection and restoration to promote human health and social stability. We advocate to protect health through care for our natural environment and to address the diseases caused by damage to it.

DEA's work is supported by a distinguished Advisory Committee of scientific experts whose knowledge of medical and public health issues is fully contemporary. Our members work across all specialties in community, hospital and private practices.

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## Executive Summary

DEA welcomes the opportunity to make a submission to the Senate inquiry into ecosystem decline in Victoria.

It is DEA's stance that human health is indivisible from healthy, biodiverse ecosystems. When we allow biodiversity and ecosystems to decline or be lost, we compromise the essentials for survival - our food security, our water resources, the air we breathe and the stability of our climate. We also undermine the vital contribution our natural environment makes to our physical and mental health and wellbeing.

The dire state of biodiversity and ecosystems in Victoria is clear. It is also clear that current remedial efforts are not sufficient to make up for past damage and ongoing pressures or to cope with future challenges, particularly the unprecedented and escalating threat of climate change. Unless urgent efforts are made to better protect our environment, we will see accelerating species and ecosystem loss, with accompanying impacts on the future health, wellbeing and prosperity of all Victorians.

There is no single silver bullet to solve Victoria's biodiversity and extinction crisis. This will require strong leadership, whole of government and cross-sectoral buy-in, strong community engagement, law and policy reform and substantial and sustained increases in funding. The key drivers of species loss must be specifically addressed, particularly deforestation, invasive species and climate change. Given the high proportion of Victoria's landscape that is managed by private land landholders, conservation efforts must target both public and private land.

Addressing biodiversity and ecosystem decline in Victoria is an enormous challenge. However, it is DEA's view that the potential consequences to human health and wellbeing of not addressing it, and the range of benefits to current and future generations of Victorians that will undoubtedly flow from improved biodiversity and ecosystem health, make the case for action clear.

The submission is divided into three main parts. The first outlines the relationship between biodiversity, ecosystems and human health while the second discusses the current state of Victoria's environment. The third focuses on a range of specific issues relevant to biodiversity and ecosystem decline in Victoria, including the *Flora and Fauna Guarantee Act 1988*, threatened species and ecological community management, invasive species, Victoria's forests and Regional Forestry Agreements, private land conservation, Victoria's grasslands, the involvement of First Nations people in biodiversity conservation, nature-based health interventions, and climate change.

Key recommendations of this submission are summarised below.

## **Recommendations**

### ***Biodiversity as a health issue***

Recommendation 1: That biodiversity and healthy ecosystems are recognised as foundational for human health and wellbeing. This will help facilitate commensurate action and lay the foundation for a response capable of truly protecting our environment.

### ***The Flora and Fauna Guarantee Act 1988***

Recommendation 2: That the *Flora and Fauna Guarantee Act 1988* is further amended to make implementation and enforcement of its key provisions mandatory rather than discretionary.

Recommendation 3: That the *Flora and Fauna Guarantee Act 1988* is further amended to require public authorities to make decisions consistent with its provisions, rather than simply requiring them to consider (and then potentially ignore) the impact their actions might have on biodiversity conservation.

Recommendation 4: If further amendments are not made to the Act, that the Victorian Government takes concrete steps to ensure it is implemented and delivers on its promise to guarantee the survival of all of Victoria's flora and fauna. Concerted effort must also be afforded to ensuring that public authorities are aware of their duty under the FFG Act to consider potential biodiversity impacts when exercising their functions.

### ***Threatened species and ecological community management***

Recommendation 5: That the Victorian Government establish a state-wide program to coordinate threatened species and ecological community protection in Victoria, modelled on the NSW Saving our Species Program and supported by a similar level of funding.

### ***Invasive species***

Recommendation 6: That a dedicated government body is established to drive and coordinate invasive species management across Victoria.

Recommendation 7: That funding for invasive species research, surveillance, eradication and control programs is substantially increased.

### ***Victoria's forests and Regional Forestry Agreements***

Recommendation 8: That due recognition is given to the ecological devastation caused by the summer's bushfires and the urgent need to protect what remains of Victoria's native forests.

Recommendation 9: That post-fire commercial logging activities are immediately ceased due to their negative impact on the chances of recovery of burnt ecosystems.

Recommendation 10: That native forest logging is urgently phased out.

Recommendation 11: That Regional Forestry Agreements are abolished.

### ***Private land conservation***

Recommendation 12: That additional government investment is made into the Trust for Nature Revolving fund.

### ***Funding for Victoria's national parks***

Recommendation 13: That funding for Victoria's national parks is substantially increased.

### ***Victoria's grasslands and grassy woodlands***

Recommendation 14: That the protection of Victoria's critically endangered grasslands and grassy woodlands is recognised as vital for the survival of many species, as well as for soil health, land productivity and human health and wellbeing.

Recommendation 15: That the Victorian Government takes immediate steps to deliver on its promise to establish the Western Grassland Reserve and the Grassy Eucalypt Woodland Reserve and to implement the range of recommendations made by the Auditor General.

Recommendation 16: That a freeze is put on any further removal of critically endangered grasslands in urban growth areas until there is certainty that the Government will deliver on this promise.

Recommendation 17: That approval powers for projects that impact matters of national environmental significance remain with the Federal Government.

### ***Ecosystem decline and First Nations people***

Recommendation 18: That the interests and rights of First Nations people of Victoria are considered in all decision making relating to their traditional lands.

Recommendation 19: That the Government and other decision makers recognise the potential for dual health and environmental benefits from increased involvement of First Nations people in land and water management in Victoria.

Recommendation 20: That the Government undertake targeted consultation with First Nations people to establish the most effective ways to expand and support their involvement in land and water management in Victoria.

### ***Nature prescriptions and forest bathing***

Recommendation 21: That the Victorian Government establish a 'Nature Prescriptions' program as means of both connecting Victorians with nature and improving health outcomes.

Recommendation 22: That the Victorian Government considers opportunities to develop the practice of forest bathing in Victoria.

### ***Climate change***

Recommendation 23: That recognition is paid to the fact that stemming ecosystem decline will require the urgent implementation of effective climate change policy in Victoria and Australia more broadly.

Recommendation 24: That the impact of climate change on biodiversity and ecosystem decline is considered in all government decision making.

Recommendation 25: That the post-COVID19 economic stimulus package invests in technologies and projects that conserve and restore biodiversity and ecosystems in Victoria rather than harming them.

## The relationship between biodiversity, ecosystems and human health

Human beings are fundamentally dependent on biodiverse ecosystems and “ecosystem services”, which are the benefits people obtain from nature. These include the provisioning services of food, water, timber, and fibre; regulating services such as pollination, water purification, climate regulation and pest and disease control; cultural services such as recreation, aesthetic enjoyment, and spiritual fulfillment; and supporting services such as soil formation, photosynthesis, and nutrient cycling<sup>1</sup>. Without biodiversity and healthy ecosystems, human beings quite simply could not survive.

There is also an extensive and growing body of literature demonstrating that spending time in healthy natural environments has tangible mental and physical health benefits. For instance, we know that nature exposure can reduce stress, moderate anxiety and depression and improve attention and self-esteem<sup>2</sup>. Time in nature has also been shown to reduce blood pressure and risk of cardiovascular disease as well as improve immune function and blood glucose control in diabetics<sup>3</sup>. Children appear to particularly benefit from having contact with nature from an early age, with research showing associations of this with improved concentration, gross-motor skills, emotional and cognitive development and sense of self-worth<sup>4</sup>.

Furthermore, natural ecosystems are the original source of more than half of all medicines in use today and a potential source of many more for the future<sup>5</sup>. Biophysical diversity of microorganisms, flora and fauna provides extensive knowledge which carries important benefits for biological, health, and pharmacological sciences. Biodiversity remains an important resource for future medical research and development, while loss of biodiversity creates risk of losing many potential new treatments.

The value to human health and wellbeing of a healthy environment and ecosystem services is immeasurable. As noted in *Protecting Victoria's Environment - Biodiversity 2037*, the Victorian Government's biodiversity strategy, replacing the ecosystem services we rely on would be extremely costly, if not impossible<sup>6</sup>. Protecting the environment must be recognised as both a requisite for human health and wellbeing and a least-cost way of ensuring it.

**Recommendation 1:** That biodiversity and healthy ecosystems are recognised as foundational for human health and wellbeing. This will help facilitate commensurate action and lay the foundation for a response capable of truly protecting our environment.

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<sup>1</sup>Millennium Ecosystem Assessment. Ecosystems and Human Well-being: Biodiversity Synthesis. <https://www.millenniumassessment.org/documents/document.356.aspx.pdf>

<sup>2</sup>Townsend M and Weerasuriya R. Beyond Blue to Green: The benefits of contact with nature for human health and wellbeing. [https://www.deakin.edu.au/\\_data/assets/pdf\\_file/0004/310747/Beyond-Blue-To-Green-Literature-Review.pdf](https://www.deakin.edu.au/_data/assets/pdf_file/0004/310747/Beyond-Blue-To-Green-Literature-Review.pdf)

<sup>3</sup>World Health Organization and the Secretariat of the Convention on Biological Diversity. Connecting global priorities: Biodiversity and human health. <https://www.cbd.int/health/SOK-biodiversity-en.pdf>

<sup>4</sup>Ibid at 2

<sup>5</sup>Ibid at 3

<sup>6</sup>Victorian Government. *Protecting Victoria's Environment - Biodiversity 2037*.

[https://www.environment.vic.gov.au/\\_data/assets/pdf\\_file/0022/51259/Protecting-Victorias-Environment-Biodiversity-2037.pdf](https://www.environment.vic.gov.au/_data/assets/pdf_file/0022/51259/Protecting-Victorias-Environment-Biodiversity-2037.pdf)

## The current state of biodiversity and ecosystems in Victoria

Victoria is privileged to house incredible biodiversity, with a wider range of land and freshwater ecosystems found here than in any other area of a similar size in Australia<sup>7</sup>. Collectively, these ecosystems support over 3300 native species or sub-species of vascular plants, 750 mosses and liverworts, 99 mammals, 499 birds, 48 freshwater and estuarine fish, 136 reptiles, 53 amphibians and an unknown number of invertebrates, fungi and algae<sup>8</sup>.

However, despite this rich natural inheritance, Victoria's environment has suffered immensely since colonisation. Victoria is the most highly cleared state in Australia with over 60% of its native vegetation lost to agriculture, mining and urban development since 1750<sup>9,10</sup>. Sixty-seven percent of Victoria's wetlands have been destroyed or degraded, while nearly 80% of waterways in Victoria are estimated to be in poor or moderate condition<sup>11</sup>. Nearly 80% of Victoria is now classified as consisting of fragmented landscapes.

This landscape change has been accompanied by extensive biodiversity loss, to the extent that Victoria, like the rest of Australia and the world, is now in the grips of biodiversity and extinction crises. Since colonisation, 18 mammals, 2 birds, 1 snake, 6 invertebrate and 51 plant species are known to have become extinct in Victoria. Under the *Flora and Fauna Guarantee Act 1988*, an additional 688 fauna and flora species and ecological communities are currently listed as threatened<sup>12</sup> – this represents between a quarter and a third of all known Victorian species<sup>13</sup>. Many more are included in DELWP's Threatened Species Advisory Lists, specifically 1943 plants, 293 animals and 178 invertebrate species<sup>14</sup>. According to Victoria's Biodiversity Strategy to 2037, Victoria has the highest number of threatened species by subregion in Australia<sup>15</sup>.

The Victorian State of the Environment (SoE) Report 2018 provided additional comprehensive evidence of the dire state of biodiversity and ecosystems in Victoria<sup>16</sup>. In it, not one of the state's key biodiversity indicators were assessed as "good": seven were "fair", 21 "poor", and seven "unknown". Furthermore, over half of the biodiversity indicators (18 of 35, or 51%) were assessed as deteriorating, with seven stable, nine unclear and just one improving (private land conservation).

Of central importance, since the time of this report, Victoria's environment has been exposed to the devastating bushfires of the 2019-20 summer. A preliminary report from the Victorian Government estimated that over 1,300,000 hectares of land was

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<sup>7</sup>Victorian Government. Victoria's biodiversity – our living wealth. [https://www.environment.vic.gov.au/\\_data/assets/pdf\\_file/0012/50232/Victorias-Biodiversity-Our-Living-Wealth-1997-.pdf](https://www.environment.vic.gov.au/_data/assets/pdf_file/0012/50232/Victorias-Biodiversity-Our-Living-Wealth-1997-.pdf)

<sup>8</sup>Trust for Nature. Statewide Conservation Plan. <https://www.trustfornature.org.au/images/uploads/conservation/SCP/Trust-for-Nature-Statewide-Conservation-Plan.pdf>

<sup>9</sup>Ibid

<sup>10</sup>Bradshaw CJA. Little left to lose: deforestation and forest degradation in Australia since European colonization. *Journal of Plant Ecology*. 5:109–120 (2012)

<sup>11</sup>Ibid at 8

<sup>12</sup>Department of Environment, Land, Water & Planning. Flora and Fauna Guarantee Act 1988 Threatened List. [https://www.environment.vic.gov.au/\\_data/assets/pdf\\_file/0024/115827/20191114-FFG-Threatened-List.pdf](https://www.environment.vic.gov.au/_data/assets/pdf_file/0024/115827/20191114-FFG-Threatened-List.pdf)

<sup>13</sup>Victorian State Government. Threatened species overview. <https://www.environment.vic.gov.au/conserving-threatened-species/threatened-species-overview>

<sup>14</sup>Victorian Government. Threatened species advisory lists. <https://www.environment.vic.gov.au/conserving-threatened-species/threatened-species-advisory-lists>

<sup>15</sup>Ibid at 6

<sup>16</sup>Commissioner for the Environmental Sustainability of Victoria. State of the Environment 2018. <https://www.ces.vic.gov.au/reports/state-environment-2018>



burnt in these fires, with high biodiversity value areas disproportionately affected<sup>17</sup>. The fire extent included at least 60% of Victoria's national parks and nature conservation reserves and 70% of Victoria's warm temperate rainforests. One hundred and eighty-five of Victoria's rare and threatened animals and plants had over 50% of their known habitat destroyed<sup>18</sup>. Much of this will never recover.

These fires were a clear manifestation of climate change in action. They demonstrated the catastrophic impact a single climate-fuelled extreme weather can have on our environment and provided a stark reminder of the size and complexity of the challenge we face to protect it.

They also highlighted the devastating dual impacts of climate change and biodiversity loss on human health. Thirty-three people died in the fires, while thousands lost homes and properties and many more were displaced. A recent study has estimated that the smoke pollution over eastern Australia was responsible for 1305 presentations to emergency departments with asthma, over 3000 hospitalisations for heart and lung problems, as well as 417 excess deaths<sup>19</sup>. As large swathes of our forests were vaporised, we lost a vital carbon sink, and the contribution that these forests made to the clean air and water that we rely upon.

From the perspective of mental health, the impacts of the fire and smoke as well as from the loss of wildlife and the places we love are likely to be substantial and evident for decades.

Victoria's Biodiversity Strategy to 2037 noted that we should expect further intensification of bushfire conditions from climate change in the future, as well as increased drought, more extreme rainfall events and coastal inundation, changes to waterway flows and levels, alteration of growing seasons and changes to species distributions, to name just some of its impacts<sup>20</sup>. Importantly, these add to ongoing pressure on Victoria's biodiversity and ecosystems from population growth and development, land-use change, habitat loss and degradation and invasive plant and animal species.

In its current state, the Victorian environment is not sufficiently resilient to withstand these threats. Unless they are swiftly addressed, there will be ongoing and accelerating biodiversity and ecosystem decline in Victoria, with profound consequences for Victorians. As noted above, human health is indivisible from environmental health. As our environment is increasingly degraded, the essential services that nature provides to humans are increasingly compromised and human health and wellbeing suffers. We must better protect our natural environment for its inherent value but also for the sake of our health and wellbeing.

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<sup>17</sup>Victorian Government. Victoria's bushfire emergency: Biodiversity response and recovery. [https://www.wildlife.vic.gov.au/\\_data/assets/pdf\\_file/0034/449746/Victorias-bushfire-emergency-Biodiversity-response-and-recovery-Version-1-23-January-2020.pdf](https://www.wildlife.vic.gov.au/_data/assets/pdf_file/0034/449746/Victorias-bushfire-emergency-Biodiversity-response-and-recovery-Version-1-23-January-2020.pdf)

<sup>18</sup>Ibid at 17

<sup>19</sup> Borchers Arriagada N, et al. Unprecedented smoke-related health burden associated with the 2019–20 bushfires in eastern Australia. *Med J Aust*. doi: 10.5694/mja2.50545. [Epub ahead of print] (2020)

<sup>20</sup>Ibid at 16

## Key issues relating to biodiversity and ecosystem decline

### *The Flora and Fauna Guarantee Act 1988*

The *Flora and Fauna Guarantee Act 1988* (the FFG Act) is the primary legislation providing for conservation of threatened species and ecological communities and the management of the processes that threaten them in Victoria. This was recently amended, with the *Flora and Fauna Guarantee Amendment Act 2019* taking effect as of June 1<sup>st</sup> this year.

DEA is supportive of many of the changes that have been made to the FFG Act, for instance, the introduction of a consistent national approach to assessing and listing threatened species that aligns with international guidelines, the requirement for all government bodies to consider the FFG Act in the way they do their work, the introduction of principles to guide the implementation of the FFG Act including consideration of the rights and interests of Traditional Owners and the impacts of climate change, and increased penalties for many offences. However, none of these addresses the primary reason the FFG Act has failed to protect Victoria's species over last 30 years, which is that successive governments, including the current government, have failed to implement and enforce key parts of it. The implementation and enforcement problems of the FFG Act have been extensively documented previously<sup>21,22,23</sup>.

It is a major problem that under the amended FFG Act, whether or not to apply many of the conservation tools available for species protection remains at the discretion of the Minister or her department. Even when there is real danger of a particular species reaching extinction, there is still no obligation for the government to act. As long as this lack of obligation remains, protection of species will always depend on the level of political will.

It is also a concern that under the amended act, ministers and public authorities need only *consider* the objectives of the FFG Act when performing functions that might impact biodiversity, rather than having to act in ways that are consistent with them. This creates a situation where, for instance, it is perfectly acceptable for a public authority to proceed with an action that creates risk for biodiversity, provided that they have made prior note of the risk.

We acknowledge that the amended FFG Act has only just come into force. However, it is DEA's view that further amendments are required to make implementation and enforcement of key parts of it mandatory rather than discretionary. We also support further amendments to the Public Authority duty authority so that public authorities are *required* to comply with the provisions of the FFG Act, rather than simply consider them.

In the absence of further legislative reform, there must be cultural change within government in the administration of the FFG Act – i.e. the Government must take concrete steps to ensure that the legal conservation tools that exist to protect flora and fauna are actually used. This will undoubtedly require an increase in resourcing including more funding. Substantial effort must also be given to ensuring public

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<sup>21</sup>Victorian Auditor-General's Office. Administration of the Flora and Fauna Guarantee Act 1988. <https://www.audit.vic.gov.au/sites/default/files/flora-fauna-full-report.pdf>

<sup>22</sup>Places You Love Alliance. Assessment of the adequacy of threatened species & planning laws. [https://d3n8a8pro7vhm.cloudfront.net/edonsw/pages/1668/attachments/original/1410138351/Assessment\\_of\\_the\\_adequacy\\_of\\_threatened\\_species\\_planning\\_laws-V5.pdf?1410138351](https://d3n8a8pro7vhm.cloudfront.net/edonsw/pages/1668/attachments/original/1410138351/Assessment_of_the_adequacy_of_threatened_species_planning_laws-V5.pdf?1410138351)

<sup>23</sup>Croggon N. 'Victoria's Flora and Fauna guarantee - its future?'. Park Watch, 24 (2011)

authorities are aware of their duty to consider biodiversity conservation and the objectives of the FFG Act and strongly encouraged to only proceed with actions that are consistent with them.

Recommendation 2: That the FFG Act is further amended to made to make implementation and enforcement of its key provisions mandatory rather than discretionary.

Recommendation 3: That the FFG Act is further amended to require public authorities to make decisions consistent with its provisions, rather than simply requiring them to consider (and then potentially ignore) the impact their actions might have on biodiversity conservation.

Recommendation 4: If further amendments are not made to the Act, that the Victorian Government takes concrete steps to ensure it is implemented and delivers on its promise to guarantee the survival of all of Victoria's flora and fauna. Concerted effort must also be afforded to ensuring that public authorities are aware of their duty under the FFG Act to consider potential biodiversity impacts when exercising their functions.

### *Threatened species and ecological community management*

Victoria's flagship biodiversity conservation program is its Biodiversity Response Planning Program. As outlined in the Victorian Government's Biodiversity Strategy to 2037, this program was developed to address 'a lack of adequate alignment, coordination and connection between those involved in the conservation effort across Victoria' and 'to drive a shift towards more cost-effective landscape scale biodiversity actions'<sup>24</sup>.

DEA is supportive of the collaborative approach to biodiversity conservation that underpins this program, albeit noting that stakeholder perceptions of the quality and extent of collaboration that actually occurred during its first phase varied widely<sup>25</sup>. DEA is also supportive of the notion of moving away from only planning for species one at a time towards landscape scale interventions that are likely to secure the greatest benefit for the most species over the longer term.

However, such a shift must not occur at the expense of the protection of threatened species and ecological communities. As noted above, between a quarter and one third of all Victoria's species are currently listed as threatened under the FFG Act. A substantial number of these will require specialised interventions that will not be delivered by Biodiversity Response Planning.

The deficiency in threatened species management in Victoria is long-standing. In 2009, a damning report from the Auditor General showed that that less than half of Victoria's threatened species had an action statement in place, despite this being a mandatory requirement of the FFG Act<sup>26</sup>. Today, this statistic remains unchanged<sup>27</sup>. Achieving the Victorian Government's Biodiversity Strategy to 2037 targets of no vulnerable or near-threatened species becoming endangered and all critically

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<sup>24</sup>Ibid at 6

<sup>25</sup>Rooftop Social. Summary report. Evaluation of biodiversity response planning Phase 1. [https://www.environment.vic.gov.au/\\_data/assets/pdf\\_file/0017/405224/RS146-Summary-Report-for-BRP-Evaluation-FINAL.pdf](https://www.environment.vic.gov.au/_data/assets/pdf_file/0017/405224/RS146-Summary-Report-for-BRP-Evaluation-FINAL.pdf)

<sup>26</sup>Ibid at 20

<sup>27</sup>Victorian Government. Conserving threatened species: Action statements. <https://www.environment.vic.gov.au/conserving-threatened-species/action-statements>

endangered and endangered species having at least one option available for being conserved ex situ or re-established in the wild will require a major increase in effort and investment, starting now.

DEA would like to draw attention to the NSW Saving Our Species Program, which facilitates a strategic, coordinated approach to species protection in NSW. This program utilises a systematic and robust method for categorising threatened species into 'management streams', identifying risks to species, and ensuring that each has a conservation plan in place<sup>28</sup>. Within the Saving Our Species program, conservation projects aimed at protecting threatened species are prioritised and designed by teams of technical species experts, and rigorous and transparent methods are used to monitor, evaluate and report on the effectiveness of them. Most importantly, the Saving Our Species Program has been backed by \$100 million in State Government funding over 5 years to ensure it is able to achieve its aims<sup>29</sup>.

DEA is of the view that the existence of such a program in Victoria would complement, and fill a major gap left by, Victoria's Biodiversity Response Planning Program. It would also vastly increase the chance of Victoria's Biodiversity Strategy to 2037 threatened species targets being met.

Recommendation 5: That the Victorian Government establish a state-wide program to coordinate threatened species and ecological community protection in Victoria, modelled on the NSW Saving our Species Program and supported by a similar level of funding.

### *Invasive species*

Invasive animal and plant species are one of the most potent, persistent and widespread threats to the Victorian environment<sup>30</sup>. Feral cats and foxes have already contributed to the extinction of a number of small native marsupials and are exerting extreme pressure on many remaining threatened species. More than one million deer run rampant across Victoria, causing grazing and trampling damage to habitats and competing with native herbivores for food. Weed species also compete with native species across Victoria and are a major cause of land and water degradation and reduced agricultural productivity.

Importantly, of the six indicators in the Victorian SoE report relating to invasive species, five were assessed as "poor" and "deteriorating" (invasive terrestrial plants, invasive terrestrial animals, carp, deer and horses) while 1 was "unknown" (invasive freshwater plants and animals)<sup>31</sup>. The SoE report also identified major deficiencies in understanding and knowledge about invasive species, commenting on the "difficulty in establishing the distribution and abundance of invasive plants and animals due to the lack of data".

The 2017 Inquiry into the control of invasive animals on Crown land also identified lack of data as a major barrier to invasive species management in Victoria, both in relation to the extent of invasive species and the effectiveness and relative costs and

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<sup>28</sup>NSW Government. Saving our species management. <https://www.environment.nsw.gov.au/topics/animals-and-plants/threatened-species/saving-our-species-program/threatened-species-conservation>

<sup>29</sup>Victorian Government. Biodiversity 2037 Implementation Framework Progress Report. [https://www.environment.vic.gov.au/\\_data/assets/pdf\\_file/0032/395294/Biodiversity\\_ProgressReport2018\\_fin.pdf](https://www.environment.vic.gov.au/_data/assets/pdf_file/0032/395294/Biodiversity_ProgressReport2018_fin.pdf)

<sup>30</sup>Ibid at 16

<sup>31</sup>Ibid

benefits of different control methods in the Victorian context<sup>32</sup>. It also commented on the complicated division of responsibility for invasive species management in Victoria, with this divided between multiple parties with often overlapping roles.

DEA is of the view that a dedicated government body is required to coordinate threatened species management in Victoria. This body would be responsible for mapping numbers and impact of invasive species populations, identifying priority invasive species, establishing the most effective intervention strategies and developing state-wide plans for managing the most threatening invasive species.

Improved invasive species management will also require a substantial injection of funding. While DEA acknowledges that addressing invasive species can be very expensive, it is also the case that action is generally less costly than inaction<sup>33</sup>. This is particularly so when action is taken at an early stage in the invasion process. It is vital when making decisions about funding for invasive species to remember that damages and losses from them in Australia have been estimated to be in excess of \$13.6 billion annually<sup>34</sup>.

**Recommendation 6:** That a dedicated government body is established to drive and coordinate invasive species management across Victoria.

**Recommendation 7:** That funding for invasive species research, surveillance, eradication and control programs is substantially increased.

### *Victoria's forests and Regional Forestry Agreements*

As noted above, approximately 66% of Victoria's native vegetation has been cleared since European colonization, leaving only 34% of the state's land area covered by native forests. This makes Victoria the most heavily cleared state in the country<sup>35</sup>. However, the native forests that do remain contain areas of extraordinarily high biodiversity value and provide habitat for numerous threatened species. It is therefore highly concerning that Victoria's native forests continue to be logged at a rate of approximately 3,000 hectares per year<sup>36</sup>.

As doctors, we wish to draw attention to the myriad of ways that Victoria's forests support our health. They release oxygen to the atmosphere and draw down pollutants and carbon dioxide to maintain our air quality. They also act as vital carbon sinks in the face of climate change, with Victoria's mountain ash forests known to be the most carbon dense in the world<sup>37</sup>. In addition, forests increase the amount of water entering the soil thereby regulating the water table. In Melbourne, there is good evidence that the forested catchment area regulates water flow, maintaining a more constant supply in times of drought<sup>38</sup>. In contrast, it has been shown that continued logging in Melbourne's water catchments could reduce the

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<sup>32</sup>Environment, Natural Resources and Regional Development Committee. Inquiry into the control of invasive animals on Crown land. [https://www.parliament.vic.gov.au/file\\_uploads/ENRRDC\\_Control\\_of\\_invasive\\_animals\\_on\\_Crown\\_Land\\_Summary\\_Booklet\\_1fJQPrGT.pdf](https://www.parliament.vic.gov.au/file_uploads/ENRRDC_Control_of_invasive_animals_on_Crown_Land_Summary_Booklet_1fJQPrGT.pdf)

<sup>33</sup>Parliament of Victoria. Cost of responding to invasive species. [https://www.aph.gov.au/Parliamentary\\_Business/Committees/Senate/Environment\\_and\\_Communications/Completed\\_inquiries/2004-07/invasivespecies/report/c04](https://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Environment_and_Communications/Completed_inquiries/2004-07/invasivespecies/report/c04)

<sup>34</sup>Hoffmann BD and Broadhurst LM. The economic cost of managing invasive species in Australia. *NeoBiota*. 31:1-18 (2016)

<sup>35</sup>Ibid at 10

<sup>36</sup>Victorian Association of Forest industries. Industry Review 2018. <http://www.vafi.org.au/wp-content/uploads/2019/08/VAFI049-Industry-Review-2018-final.pdf>

<sup>37</sup>Keith H, Mackey BG and Lindenmayer DB. Re-evaluation of forest biomass carbon stocks and lessons from the world's most carbon-dense forests. *Proceedings of the National Academy of Sciences*. 106:11635-11640 (2009)

<sup>38</sup>Stolton S & Dudley N. Managing forests for cleaner water for urban populations. <http://www.fao.org/docrep/010/a1598e/a1598e10.htm>

city's water supply by the equivalent of 600,000 people's annual water use every year by 2050<sup>39</sup>.

Forests also serve as vital places for recreation, physical and psychological restoration and spiritual fulfillment<sup>40</sup>. In Victoria, there are around 23 million visits to our forests for these purposes each year<sup>41</sup>.

Currently, forests in Victoria are managed according to Regional Forest Agreements (RFAs), which are twenty-year-long agreements between State and Commonwealth Governments that hand over assessment, approval and regulatory powers relating to forests to the Victorian Government. They entirely exempt public native forest operations from the application of the federal environment law, which means that the Commonwealth Government has no power to intervene, even when, for instance, logging involves threatened species habitat. No other industry has this kind of exemption.

Over decades, RFAs have abjectly failed to protect wildlife threatened by logging and to secure environmental values more broadly. This was highlighted by a 2013 legal review of RFA regimens which showed<sup>42</sup>:

- inadequacy of State threatened species protections accredited by RFAs;
- insufficient provision for adaptive management;
- inadequate reviews;
- deficient monitoring, compliance and enforcement; and
- limited third-party participation rights.

The review ultimately concluded that 'RFAs have never delivered the benefits claimed for them, for a mix of political, economic, cultural and legal reasons.'<sup>43</sup>

The failure of RFAs in Victoria was again highlighted by a recent Federal Court judgement that ruled that logging by VicForests in 41 areas of habitat for the critically endangered Leadbeater's possum and the vulnerable Greater Glider contravened federal law<sup>44</sup>. It found significant negative impact of VicForests' past forestry operations on these species and also that proposed forestry operations in 41 coupes not yet fully logged were likely to have further negative impacts. As noted in the case summary:

"Not only do VicForests' forestry operations damage or destroy existing habitat critical to the survival of the two species, they also prevent new areas of forest from developing into such habitat in the future"<sup>45</sup>.

<sup>39</sup>Taylor C, et al. Resource Conflict Across Melbourne's Largest Domestic Water Supply Catchment. <https://openresearch-repository.anu.edu.au/bitstream/1885/149441/5/Resource%20Conflict%20in%20Forested%20Water%20Catchment%2020181108.pdf>

<sup>40</sup>Doctors for the Environment. Biodiversity Policy. <https://www.dea.org.au/wp-content/uploads/2019/11/DEA-Biodiversity-Policy-11-19.pdf>

<sup>41</sup>Commissioner for the Environmental Sustainability of Victoria. State of the forests 2018 report. <https://www.ces.vic.gov.au/sites/default/files/State%20of%20the%20Forests%20Report%202019.pdf>

<sup>42</sup>Feehely J, Hammond-Deakin N and Millner F. One Stop Chop: How Regional Forest Agreements streamline environmental destruction. [https://www.envirojustice.org.au/sites/default/files/files/Submissions%20and%20reports/One\\_Stop\\_Chop.pdf](https://www.envirojustice.org.au/sites/default/files/files/Submissions%20and%20reports/One_Stop_Chop.pdf)

<sup>43</sup>Ibid

<sup>44</sup>Environmental Justice Australia. The case to stop VicForests logging critical habitat for our threatened possums. [https://www.envirojustice.org.au/our-work/nature/forests/possums-case/#:~:text=A%20huge%20win%20with%20national%20significance&text=Friends%20of%20Leadbeater's%20Possum%20\(FLBP\)%2C%20successfully%20arqued%20that%20logging,Leadbeater's%20Possum%20contravenes%20federal%20law](https://www.envirojustice.org.au/our-work/nature/forests/possums-case/#:~:text=A%20huge%20win%20with%20national%20significance&text=Friends%20of%20Leadbeater's%20Possum%20(FLBP)%2C%20successfully%20arqued%20that%20logging,Leadbeater's%20Possum%20contravenes%20federal%20law)

<sup>45</sup>Federal Court of Australia. Friends of Leadbeater's Possum Inc v VicForests (No 5) [2020] FCA 705. <https://www.judgments.fedcourt.gov.au/judgments/Judgments/fca/single/2020/2020fca0705>

In this context, it is deeply concerning that the Victorian Government recently agreed to extend five Victorian RFAs for 10 years<sup>46</sup>. This is particularly so in the wake of the devastation caused by 2019-20 bushfires, which as noted above, burnt over 70% of Victoria's warm temperate rainforests in the East Gippsland region. To return to a 'business as usual' approach in the face of these fires is, quite simply, an unfathomable response.

DEA did welcome the announcement late last year from the Andrews Government that the logging of old growth forest logging in Victoria was to cease immediately and that 96,000 hectares of high conservation value forest were to be protected in 'Immediate Protection Areas'<sup>47</sup>. DEA also welcomed the commitment to end all logging of native forests by 2030. However, while positive steps forwards, these commitments do not go nearly far enough, particularly in light of the summer's fires. Major gaps in protection remain under the Victorian Government's current plan, for instance, large areas of mountain ash forest in the Central Highlands will continue to be heavily logged until at least until 2024, despite this ecosystem being designated as critically endangered on the IUCN's Red List since 2015 and representing vital remaining habitat for the critically endangered Leadbeater's Possum. Habitat for the threatened Greater Glider in the Central Highlands and East Gippsland also remains open to logging, despite an estimated 90% of the Immediate Protection Areas set aside last year to protect this species being lost in the fires<sup>48</sup>.

Moreover, the current government plan makes it likely that logging will not just continue but in fact dramatically increase in unprotected areas of forest over the next five years to enable the desired timber quota to be reached. As noted by the Victorian National Parks Association, the legacy of decades of over-logging and fire in some areas (for instance, in the Central Highlands) is that there are simply not be enough trees to last if logging continues for another 10 years as planned<sup>49</sup>.

As well as allowing logging of intact forests to recommence since the summer's fires, the Victorian Government has also permitted post-fire "salvage" logging in devastated forest areas. This is despite clear scientific evidence showing that this is the most damaging form of logging in native forests and a form that can impair the recovery of birds, plants, insects, soils and microbes for decades or even centuries afterwards<sup>50,51</sup>. Fire risk is also increased following post-fire logging for up to 40 years after the event<sup>52</sup>.

**Recommendation 8:** That due recognition is given to the ecological devastation caused by the summer's bushfires and the urgent need to protect what remains of Victoria's native forests.

**Recommendation 9:** That post-fire commercial logging activities are immediately ceased due to their negative impact on the chances of recovery of burnt ecosystems.

**Recommendation 10:** That native forest logging is urgently phased out.

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<sup>46</sup>Victorian Government. Regional Forestry Agreements. <https://www2.delwp.vic.gov.au/futureforests/what-were-doing/victorian-regional-forest-agreements>

<sup>47</sup>Victorian Government. Additional Environmental Protections. <https://www2.delwp.vic.gov.au/futureforests/what-were-doing/additional-environmental-protections>

<sup>48</sup>Tomaazin F. Logging protection zones for greater glider ravaged by bushfires. <https://www.theage.com.au/national/victoria/logging-protection-zones-for-greater-glider-ravaged-by-bushfires-20200106-p53pbh.html>

<sup>49</sup>Victorian National Parks Association. An end to logging of Victoria's native forests? <https://vnpa.org.au/an-end-to-logging-of-victorias-native-forests/#:~:text=But%20large%20areas%20of%20ash,of%20protection%20for%20Leadbeater's%20Possum.>

<sup>50</sup>Thorn S, et al. Impacts of salvage logging on biodiversity: a meta-analysis. *J Appl Ecol.* 55:279-289 (2018)

<sup>51</sup>Bowd EJ, et al. Long-term impacts of wildfire and logging on forest soils. *Nature Geosci.* 12:113-118 (2019)

<sup>52</sup>Taylor C, McCarthy MA, Lindenmeyer DB. Nonlinear Effects of Stand Age on Fire Severity. *Conservation Letters.* 7:355-370 (2018)

**Recommendation 11:** That Regional Forestry Agreements are abolished.

### *Private land*

As noted in the Victorian Government's Biodiversity Strategy to 2037, private landholders manage two-thirds of the Victorian landscape (the highest proportion of any state and territory in Australia) and private land hosts some of the state's most threatened species and important and irreplaceable native vegetation<sup>53</sup>. This makes private-land conservation critically important in protecting biodiversity and ecosystems in Victoria.

While there have been substantial gains made in the protection of native habitat on private land in Victoria over time, Victoria continues to lose native vegetation quality and extent on private land at a rate of more than 4,000 hectares each year<sup>54</sup>. The Victorian Government's Biodiversity Strategy to 2037 has identified that 200,000 hectares of new permanently protected areas on private land will be required by 2037 to deliver state-wide targets in biodiversity conservation<sup>55</sup>.

Of the progress that has been made in private land conservation in Victoria, much can be attributed to the Trust for Nature Revolving Fund, which is a market-based conservation instrument that involves capital investment from the state into a fund managed by Trust for Nature but retained on the Victorian Government balance sheet without depreciating<sup>56</sup>. The fund buys high biodiversity value land, protects it via a Conservation Covenant on title and then sells it to community members who wish to care for it. The sale proceeds are then returned to the fund at little or no reduction of capital. The Trust for Nature Revolving Fund has a 15-year track record of achieving protection of the highest priority habitat while also growing the fund<sup>57</sup>.

Given the success of this fund, DEA supports further investment into it. In terms of the appropriate amount to invest, we make note of Trust for Nature data suggesting an injection of \$36 million would enable the long-term protection and management of 70,000 hectares of critical biodiversity private land over the next 20 years, which is equivalent to approximately 1/3 of the Victorian Government's 200,000-hectare target. We also make note of the NSW Government commitment of \$240 million over five years to support conservation on private land, with a plan for further \$70 million each year after that, subject to performance reviews<sup>58</sup>.

**Recommendation 12:** That additional government investment is made into the Trust for Nature Revolving fund.

### *Additional comments about funding*

DEA acknowledges and welcomes the \$86.3 million investment made by the Victorian Government to facilitate the implementation of the its Biodiversity Strategy to 2037<sup>59</sup>.

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<sup>53</sup>Ibid at 6

<sup>54</sup>Trust for Nature. Statewide Conservation Plan. <https://www.trustfornature.org.au/images/uploads/conservation/SCP/Trust-for-Nature-Statewide-Conservation-Plan.pdf>

<sup>55</sup>Ibid at 6

<sup>56</sup>Ruchel M. Policy ideas to protect nature: Funding for Trust for Nature's Revolving Fund. *Park Watch* 272:17 (2018)

<sup>57</sup>Trust for Nature. Annual report 2017-18.

[https://parliament.vic.gov.au/file\\_uploads/Trust\\_for\\_Nature\\_AnnualReport2018\\_v9\\_Cvpm991Z.pdf](https://parliament.vic.gov.au/file_uploads/Trust_for_Nature_AnnualReport2018_v9_Cvpm991Z.pdf)

<sup>58</sup>NSW Government. More plants and animals to be saved from extinction. <https://www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Animals-and-plants/Threatened-species/saving-our-species-2016-2021-more-plants-and-animals-to-be-saved-20160332.pdf>

<sup>59</sup>Victorian Government. Biodiversity response planning. <https://www.environment.vic.gov.au/biodiversity/biodiversity-response-planning>



However, at the same time, we note that this occurred on the backdrop of substantial cuts to environmental funding in 2010 that were never reinstated<sup>60</sup>. We also note that despite this investment, budget papers demonstrate that environmental funding in Victoria is currently near its lowest level ever.

As outlined in the Victorian Government's Biodiversity Strategy to 2037, the benefits that Victoria's national parks and conservation reserves provide to Victorians are valued at well in excess of one billion dollars every year<sup>61</sup>. From a health perspective, visits to parks are estimated to save Victoria between \$80 million and \$200 million from avoidance of disease, mortality and lost productivity annually. Victoria's Biodiversity Strategy quotes a Future Economy Group report that has estimated that by 2028, healthier natural capital could provide between \$15 and \$36 billion in economic benefits for Victoria, while on the other hand, continuing decline of natural capital could result in an economic loss of between \$16 and \$78 billion<sup>62</sup>. It is vitally important that the Government and all Victorians recognise that investment in protecting biodiversity and addressing threats is money well spent.

In addition to allocating funds to programs targeting threatened and invasive species, as recommended above, DEA supports the Victorian National Parks Association in its call for a doubling in parks funding<sup>63</sup>. Parks Victoria manages 18% of Victoria and approximately 5% of our marine waters, yet receives less than 0.5% per cent of State Government expenditure. Given that our national parks are foundational for biodiversity conservation, ecosystem protection and the health and wellbeing of Victorians, they must not be allowed to decline in condition due to inadequate resourcing.

**Recommendation 13:** That funding for Victoria's national parks is substantially increased.

### *Victoria's grasslands and grassy woodlands*

Within this inquiry into ecosystem decline in Victoria, attention must be given to the situation that exists with Victoria's natural temperate grasslands and grassy eucalypt woodlands, as recently exposed by a report from the Victorian Auditor General<sup>64</sup>.

These grasslands and grassy woodlands constitute two of Victoria's most important and biodiverse ecological communities. As with forests, they provide habitat for numerous threatened species, store carbon, improve water infiltration, reduce soil erosion and provide green spaces for Victorians to enjoy.

Prior to European settlement, they covered approximately 1/3 of Victoria, but today, as a consequence of decades of land clearing and weed invasion, less than 5% remain<sup>65</sup>. Both of these ecological communities are now listed as critically endangered under the Federal Government's *Environment Protection and Biodiversity Conservation Act 1999*.

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<sup>60</sup>Environment Victoria. Environment protection and programs slashed in State Budget.

<https://environmentvictoria.org.au/2014/05/06/environment-protection-and-programs-slashed-in-state-budget/>

<sup>61</sup>Ibid at 6

<sup>62</sup>Ibid at 6

<sup>63</sup>Victorian National Parks Association. Caring for parks – by the numbers. <https://vnpa.org.au/caring-for-parks-by-the-numbers/>

<sup>64</sup>Victorian Auditor General's Office. Protecting Critically Endangered Grasslands. <https://www.audit.vic.gov.au/report/protecting-critically-endangered-grasslands?section=#33498--audit-overview>

<sup>65</sup>Ibid

In 2010, the Victorian Government signed an agreement with the Federal Government that committed it to establishing a 15,000-hectare Western Grassland Reserve and a 1,200-hectare Grassy Eucalypt Woodlands Reserve by 2020 to offset ongoing destruction of remaining grasslands and grassy woodlands from urban expansion<sup>66</sup>. In exchange, federal oversight of development proposals was removed, leaving environment assessments for individual projects within Melbourne's urban growth area to the State Government.

The recent audit found that since 2010, Victoria has acquired just 10% of the land needed for the grassland reserve, and none at all for the woodland reserve<sup>67</sup>. The report also highlighted gross failures of governance and risk management on the part of the State Government, inadequate monitoring and reporting of the grasslands program, and substantial increases in program costs as result of the delays, mostly due to rising land values over time.

This situation shows the major risks inherent in the Federal Government handing over approval powers to the States who often serve to benefit financially or otherwise from projects requiring assessment. It is yet another example of the environment being pushed aside for development, which will ultimately be to the detriment of people.

Recommendation 14: That the protection of Victoria's critically endangered grasslands and grassy woodlands is recognised as vital for the survival of many species, as well as for soil health, land productivity and human health and wellbeing.

Recommendation 15: That the Victorian Government takes immediate steps to deliver on its promise to establish the Western Grassland Reserve and the Grassy Eucalypt Woodland Reserve and to implement the range of recommendations made by the Auditor General.

Recommendation 16: That a freeze is put on any further removal of critically endangered grasslands in urban growth areas until there is certainty that the Government will deliver on this promise.

Recommendation 17: That approval powers for projects that impact matters of national environmental significance remain with the Federal Government.

### *Ecosystem decline and First Nations people*

Biodiversity and healthy ecosystems are particularly integral to the health and wellbeing of the First Nations people of Australia. The relationship of First Nations people to Country is often profoundly spiritual, connecting them to their ancestors and providing identity, validation and meaning in life<sup>68</sup>. Country provides them with ceremonial objects and meaning, sacred names, kinship and languages.

It follows from this that when Country is not maintained, the health and wellbeing of First Nations people can be profoundly compromised. This is reflected in words such as the following:

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<sup>66</sup>Ibid at 65

<sup>67</sup>Ibid at 64

<sup>68</sup>Sangha KK, et al. Ecosystems and indigenous well-being: An integrated framework. *Global Ecology and Conservation*. 4:197-206 (2015)

"Country constitutes identity, and loss of land is tantamount to loss of one's self..."<sup>69</sup>.

"If the land's sick, we're sick"<sup>70</sup>.

Viewed from the other side, however, there is substantial evidence to show that participation in Caring for Country activities can lead to health benefits for First Nations people. For instance, in one study, involvement of First Nations people in land management activities was associated with lower body mass index<sup>71</sup>. In another study, such involvement was shown to reduce risk of diabetes, kidney disease and hypertension<sup>72</sup>. Demonstrated social benefits from Caring for Country programs include reduced anti-social behaviour of young people and increased access to housing and employment<sup>73</sup>.

The participation of First Nations people in Caring for Country activities also has the potential to lead to improved environmental outcomes in Victoria. First Nations people hold extraordinary expertise in biodiversity and sustainable land and sea management – their ways of interacting with the environment and responding to threats and challenges are shaped by systems of knowledge, historical association, practical experience and social institutions. As noted in a briefing document on Indigenous Land and Sea Management prepared by individuals from the Centre for Aboriginal Economic Policy Research, Australian National University, it is vitally important that Indigenous knowledge is recognised for its "unique potential to improve understanding of critical ecological processes and to offer insights into an alternative and more sustainable future"<sup>74</sup>.

Recommendation 18: That the interests and rights of the First Nations people of Victoria are considered in all decision making relating to their traditional lands.

Recommendation 19: That the Government and other decision makers recognise the potential for dual health and environmental benefits from increased involvement of First Nations people in land and sea management in Victoria.

Recommendation 20: That the Government undertake targeted consultation with First Nations people to establish the most effective ways to expand and support their involvement in land and sea management in Victoria.

### *Nature prescriptions and forest bathing*

DEA commends the focus in Victoria's Biodiversity Strategy to 2037 on the fundamental contribution of nature to the health and wellbeing of Victorians. We are

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<sup>69</sup>McKnight D. People, Countries, and the Rainbow Serpent: System of Classification among the Lardil of Mornington Island. Oxford University Press; New York, NY, USA (1999)

<sup>70</sup>Rigby CW, et al. Aust J Rural Health. If the land's sick, we're sick: the impact of prolonged drought on the social and emotional well-being of Aboriginal communities in rural New South Wales. 19:249-54 (2011)

<sup>71</sup>Burgess CP, et al. Development and preliminary validation of the "Caring for Country" questionnaire: Measurement of an Indigenous Australian health determinant. Int. J. Equity Health. 26:1-14 (2008)

<sup>72</sup>Campbell D, et al. Potential primary health care savings for chronic disease care associated with Australian Aboriginal involvement in land management. Health Pol. 99:83-89 (2011)

<sup>73</sup>Hill R, et al. Indigenous land management in Australia.

<https://www.agriculture.gov.au/sites/default/files/sitecollectiondocuments/natural-resources/landcare/submissions/ilm-report.pdf>

<sup>74</sup>Altman J and Yarbakhsh E. Giving Green Briefing Note – Indigenous land and sea management. Centre for Aboriginal Economic Policy Research, Australian National University on behalf of the Australian Environmental Grantmaker Network. [https://www.aegn.org.au/wp-content/uploads/2012/08/1000\\_AEGN\\_ISP-IssSusIndigLand\\_v3.pdf](https://www.aegn.org.au/wp-content/uploads/2012/08/1000_AEGN_ISP-IssSusIndigLand_v3.pdf)

also highly supportive of Goal 1 of the plan which is to ensure that "Victorians value nature" through increasing their connection to it<sup>75</sup>.

DEA would like to draw attention to Nature Prescriptions as a way of both improving health outcomes and nature connection. A Nature Prescription is a health professional's written advice to a patient to spend time in nature as part of their health management.

The therapeutic use of nature prescriptions is well developed in many parts of the world including the US and New Zealand<sup>76,77</sup>. This year in Australia, the ACT Government has partnered with the Australian Medical Association to launch a 'Green Prescription' program which involves Canberra doctors prescribing patients time outdoors with an ACT park ranger<sup>78</sup>.

Research exists to show that nature prescriptions can increase activity levels, improve cardiovascular fitness, reduce body mass index and improve quality of life for both adults and children<sup>79,80,81,82</sup>. They have also been identified as a highly cost-effective means of achieving these health outcomes, with a cost-utility ratio comparable to many currently-funded pharmaceutical therapies<sup>83</sup>.

The development of a similar program in Victoria would be an ideal way of building collaborations between the environment, parks and health sectors to improve environmental and health outcomes. It would also serve to increase the number of Victorians who understand that a healthy environment underpins their own health and therefore increase the likelihood that they will actively care for it.

Forest bathing is another nature-based health intervention with proven therapeutic benefits. This is a practice that involves walking very slowly through a forest, using all the senses and taking care to breathe deeply. A robust body of scientific literature has shown this can lower heart rate and boost immune function, reduce anxiety and depression, attenuate the inflammatory response and accelerate recovery from illness, among other benefits<sup>84,85</sup>.

In Japan, forests are protected and accredited for forest bathing or 'shinrin yoku' and physicians refer patients at high risk of stress related illness to these forests for specified periods of time. Forest bathing has become a major component of preventive health care and healing in Japanese medicine as well as a source of 'green jobs' is the Japanese forest sector<sup>86</sup>.

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<sup>75</sup>Ibid at 6

<sup>76</sup>Institute at the Golden Gate. Parks Treatment. <https://www.parkrx.org/about>

<sup>77</sup>New Zealand Ministry of Health. Green prescriptions. <https://www.health.govt.nz/our-work/preventative-health-wellness/physical-activity/green-prescriptions>

<sup>78</sup>O'Mallon F. Canberra doctors could be giving out "green scripts" to get you outdoors.

<https://www.canberratimes.com.au/story/6192225/canberra-doctors-could-prescribe-patients-time-outside/>

<sup>79</sup>Garrett S, et al. Are physical activity interventions in primary care and the community cost-effective? A systematic review of the evidence British Journal of General Practice. 61:e125-e133 (2011)

<sup>80</sup>New Zealand Ministry of Health. Key studies. <https://www.health.govt.nz/our-work/preventative-health-wellness/physical-activity/green-prescriptions/green-prescription-research/key-studies>

<sup>81</sup>New Zealand Ministry of Health. Green prescription patient survey. <https://www.health.govt.nz/our-work/preventative-health-wellness/physical-activity/green-prescriptions/green-prescription-research/green-prescription-patient-survey>

<sup>82</sup>Lawton BA et al. Exercise on prescription for women aged 40-74 recruited through primary care: two year randomised controlled trial. BMJ 337:a2509 (2008)

<sup>83</sup>Ibid at 72

<sup>84</sup>Oh B, et al. Health and well-being benefits of spending time in forests: systematic review. Environ Health Prevent Med. 22:71 (2017)

<sup>85</sup>Food and Agriculture Organisation of the United Nations. Green jobs in the forest sector.

[https://www.greengrowthknowledge.org/sites/default/files/uploads/Alicia%20Kacprzak%20%e2%80%93%20Green%20Jobs%20in%20the%20Forest%20Sector\\_1.pdf](https://www.greengrowthknowledge.org/sites/default/files/uploads/Alicia%20Kacprzak%20%e2%80%93%20Green%20Jobs%20in%20the%20Forest%20Sector_1.pdf)

<sup>86</sup>Ibid

Recommendation 21: That the Victorian Government establishes a 'Nature Prescriptions' program as means of both connecting Victorians with nature and improving health outcomes.

Recommendation 22: That the Victorian Government considers opportunities to develop the practice of forest bathing in Victoria.

### *Climate change*

As noted at multiple points in this submission, the threat that climate change poses to the Victorian environment and to human health is unparalleled and accelerating. If it is allowed to continue unchecked, there is little hope for stemming biodiversity and ecosystem decline here or elsewhere, no matter what measures are taken.

While it is beyond the scope of this Inquiry to consider in detail the most appropriate pathways towards climate change mitigation, it can draw attention to the need for ambitious and effective climate change policy for biodiversity and ecosystem protection. Such policy should not only drive a rapid transition away from all fossil fuel usage in Victoria, but also ensure the protection and restoration of forests and other natural landscapes because of the vital role they play in carbon sequestration.

Increased cross-talk between government departments is also vitally important to ensure that the impact of climate change on our environment is factored into all decision making. In addition, as Victoria moves towards economic recovery from the COVID-19 pandemic, investment must be directed towards projects and technologies and the creation of jobs that preserve and restore, rather than harm, biodiversity and ecosystems in Victoria.

Recommendation 23: That recognition is paid to the fact that stemming ecosystem decline will require the urgent implementation of effective climate change policy in Victoria and Australia more broadly.

Recommendation 24: That the impact of climate change on biodiversity and ecosystem decline is considered in all government decision making.

Recommendation 25: That the post-COVID19 economic stimulus package invests in technologies and projects that conserve and restore biodiversity and ecosystems in Victoria rather than harming them.

### **Summary**

Biodiversity and ecosystems in Victoria are in an overall state of decline and under increasing threat. Unless this problem is urgently and effectively addressed, there will be major negative impacts on the future health and wellbeing of all Victorians.

Properly addressing this will require substantial increases in effort and investment over the long-term. Focus must be on addressing the key underlying drivers of biodiversity decline, particularly deforestation, invasive species and climate change. There is also a vital need for law and policy reform, and improved private land conservation.

Attention must also be paid to initiatives with the potential to improve health and environmental outcomes simultaneously. These include those that increase participation of First Nations people in land and water management in Victoria as well as nature prescriptions and forest bathing programs.