Submission to
Legislative Council Environment and Planning Committee
Inquiry into Ecosystem Decline in Victoria

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Thank you for the opportunity to make a submission to this Inquiry into Ecosystem Decline in Victoria.

Terms of reference

(a) The extent of the decline of Victoria's biodiversity and the likely impact on people, particularly First Peoples, and ecosystems, if more is not done to address this, including consideration of climate change impacts

Last year a global assessment of biodiversity by the UN reached the conclusion that "[t]he biosphere, upon which humanity as a whole depends, is being altered to an unparalleled degree across all spatial scales. Biodiversity – the diversity within species, between species and of ecosystems – is declining faster than at any time in human history" (Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services [IPBES], 2019 p10).

Australia has particularly unique and rich biodiversity, and is one of 17 'mega-diverse' countries which together account for 70% of global biological diversity (Australian Government Department of Environment, 2014).

Victoria has a good share of Australia's biodiversity, and we are still learning to fully appreciate some our unique ecosystems. For example, the Great Southern Reef wraps around the Victorian coast and has biodiversity of equivalent significance to the Great Barrier Reef with an extraordinarily high proportion of species that are endemic (Bennett et al., 2015). Similarly, we are only just learning to appreciate the unique native grasslands and grassy woodlands of the volcanic plains in the south west, which were once extensive. Victoria has wetlands of global conservation significance, the world heritage site of Budj Bim and many beautiful, wild and intact natural areas. As a State and a nation, we have responsibilities to act as a custodian of these natural treasures for the whole of humanity, including future generations.

Extent of decline of Victoria's biodiversity

Australia has a high rate of species extinction (Geyle et al., 2018; Lindenmayer, 2015; Woinarski et al., 2015) and successive State of the Environment assessments show declining biodiversity and ecosystem health in Victoria, and at the national level. This is reflected in the current review of the EPBC Act:

> "The evidence received by the Review is compelling. Australia's natural environment and iconic places are in an overall state of decline and are under increasing threat. The pressures on the environment are significant—including land-use change, habitat loss and degradation, and feral animal and invasive plant species. The impact of climate change on the environment is building, and will exacerbate pressures, contributing to further decline. Given its current state, the environment is not sufficiently resilient to withstand these threats. The current environmental trajectory is unsustainable." (Samuel, 2020, p3)

A recent report on Australia's environmental performance by the OECD found that Australia has the second highest rate of biodiversity decline in the world and current efforts to address this are insufficient (OECD, 2019). Australia is not on track to meet obligations under international agreements such as the Convention on Biological Diversity (Senate Standing Committee on Environment and Communications References, 2019).

The trend of species extinction and environmental decline in Australia is deplorable for a country with our wealth, political stability and governance systems, and for a country that is home to Indigenous peoples who sustained and built up the natural capital of this continent over thousands of years.

In October last year, prior to the devastating megafires, the Chief Conservation Scientist for Parks Victoria, Dr Mark Norman, appeared at a hearing of the Parliamentary Inquiry into Tackling Climate Change in Victorian Communities and said that:

> "we are seeing unprecedented changes across ecosystem transformations and massive species losses on terrestrial systems, in waterways, in marine systems" …
>
> "[t]he New South Wales drought has completely killed the bogong moths that fly across Queensland and New South Wales to feed the mountain pgymy possums. They will probably be extinct in the wild in three years time. Now that stuff is happening everywhere. We have got staff that go out and used to see a hundred legless lizards and little native mammals, and they have not seen one now for three surveys" (Legislative Assembly Environment and Planning Committee, 28 Oct 2019, pp29-30).

Dr Norman was speaking *prior to* the bushfires in which it is estimated that about three billion animals were impacted (WWF, 2020), and untold ecological damage occurred. The anguish of people witnessing this catastrophe and their need to do something tangible to help was evident, for example in the worldwide community effort to sew, knit and crochet thousands of joey pouches, blankets, bat wraps and bird nests. There is a lot of readiness amongst the general public to get organised and take practical action. The availability of reliable information, well-founded in ecological knowledge, is critical to ensure these efforts are well-directed. There is a role for governments to provide ongoing education, information and other mechanisms of support for communities looking after Australian native species.

As is the case with environmental impacts, the impacts of the 2019/20 megafires will not be fully known for some time.

> "The full impacts on biodiversity will not be fully understood for years to come as extinction debts are realised. Some coarse surrogates paint a stark picture: 327 (272 plants, and 55 animals, including five invertebrates) of the ~1800 listed threatened species in Australia had a significant portion (>10%) of their known distribution within the fire footprint, of which 31 were already critically endangered. Among the significantly impacted species, 114 have lost at least half of their habitat and 49 have lost over 80%.
>
> Although these numbers are still being refined, this is likely to result in significant population losses. The conservation status of many species [e.g., gang gang cockatoo (*Callocephalon fimbriatum*) and yellowbellied glider (*Petaurus australis*)] previously considered secure, will now need to be reconsidered. Impacts will be longlasting, because many of the fire-affected species were dependent upon long unburnt habitats that take decades to re-establish and many have slow reproductive output and, thus, it will take many years for populations to re-establish.
>
> Thousands of less well-known species, including invertebrates and plants, many yet to be described and many with very localised distributions, will have suffered dramatic impacts. Some may even have become extinct before being discovered or named." (Wintle, Legge & Woinarski, 2020).

<u>Limits of our knowledge</u>

Our understanding of the extent of ecosystem decline is limited because there is a lot we do not know about ecosystems due to their inherent complexity and inadequate investment in research and monitoring. An estimated 75% of Australian species are undescribed or unknown to science (Chapman, 2009) and there are many aspects of ecological systems that remain a mystery and possibly always will.

The OECD assessment found that lack of data and systematic monitoring pose severe limitations on our ability to identify trends, determine priorities and develop cost-effective targeted conservation measures (OECD, 2019).

It is probably hubris to think that we could (or should) ever attain complete knowledge of ecological systems. We need to be more mindful of the limits of our knowledge. We need to be more strategic about our pursuit of knowledge, more cognisant of the knowledge systems and wisdom of Indigenous Peoples, and invest more in long-term knowledge-building programs. There is also the danger that we can get distracted into accumulating data as an end in itself rather than confronting the more difficult challenges of environmental management in a world characterised by complexity and incomplete knowledge.

The marine environment

The marine environment is one of the many areas in which there are significant knowledge gaps that need to be addressed. In 2018, a panel of scientific experts, commissioned by the Victorian Coastal Council, assessed the knowledge gaps about climate change and the coastal and marine environment (Holper et al., 2018). They referred to other similar assessments that had occurred in 2006 and 2011 and found that despite the urgent need to acquire knowledge in many areas, there had been little progress addressing knowledge gaps that were identified over a decade earlier.

Since then, the Victorian Environment Assessment Council has compiled information on the values of the coastal and marine environment (VEAC, 2019). They too pointed out substantial knowledge gaps that limit our ability to detect ecosystem decline, manage threatening processes and understand ecosystem resilience. The VEAC report comments that although there are 172 species and four marine/coastal ecological communities that are listed as having conservation significance, the real figures of threatened species are likely to be much higher because of the gaps in our knowledge. (See pages 265-268 of VEAC's report for a summary of key knowledge gaps.)

The marine biodiversity of Australia's southern temperate waters is particularly vulnerable to temperature increases because the south-facing coastline occupies a fairly narrow range of latitude, which means that there are no suitable areas of habitat at a cooler lower latitude for species to migrate to. Warm temperate waters are extending into Victorian and Tasmanian waters leading to species outside of normal ranges, including native species becoming over-abundant. An extremely high proportion of the marine biodiversity in the Southern temperate region is endemic and so there is a very high risk of extinctions as the climate continues to warm. As an example, Giant Kelp Marine Forests are endemic to South Eastern Australia and have national conservation significance, but they require cool waters and have already been lost from some of their historical range to the extent that they are now listed as endangered.

In marine ecosystems, as in terrestrial ecosystems, invertebrates make up the vast majority of species. When speaking of marine ecosystems here, this includes sandy beach ecosystems which are often overlooked for their habitat values because the majority of the biota is made up of tiny invertebrates that inhabit the sand. Invertebrates perform essential ecological processes without which marine ecosystems would collapse, and yet very little is known about them and we often fail to recognise their importance.

> "Of the known fauna, a large percentage of the invertebrates found in Australian waters (including the [Exclusive Economic Zone]) are endemic to the region. … The state of taxonomic, biological and ecological knowledge regarding marine invertebrates is generally poor. … There are large gaps in our understanding of even the relatively well-studied macrofaunal groups while many taxa are very poorly known to virtually completely unstudied. … Many more marine invertebrate taxa remain undescribed than have names." (Ponder, Hutchings & Chapman, 2002, p8).

This was echoed by the more recent VEAC assessment, which found that more work is needed on identifying, classifying and describing marine species, particularly subtidal species and invertebrates in general (VEAC, 2019). This sort of work relies upon taxonomic expertise which has been declining for some time (Ponder et al., 2002; Butler et al., 2010). Without this type of work, it is not possible to understand the complex

relationships within ecosystems (e.g. interdependencies, linkages and ecological processes), or to identify hotspots, evaluate vulnerabilities and predict the consequences of climate change and other human impacts (VEAC, 2019).

The important thing is for us to have an adequate understanding of how an ecological system functions and this doesn't necessarily entail identification of every individual species. However, at the moment our knowledge about marine species and ecosystems is inadequate and this is compromising our planning, decision-making and management of these high-value ecosystems.

The following excerpt from Dr Graham Edgar's appearance at a hearing of the Parliamentary Inquiry into Australia's Faunal Extinction Crisis illustrates how little we know about the extent of decline in the marine environment:

> "Twenty years ago, we undertook a study to try and work out what changes have happened through the past century in marine communities and, uniquely, we did that in the Australian context using sediment cores. We placed sediment cores and then we sliced them and then we dated each of the slices to effectively go back in time. Using the mollusc community—the shells that were embedded in the sediment—we could work out changes in the community through time. We did that around south-eastern Tasmania. We included the Derwent, the lower Huon, the D'Entrecasteaux Channel and Storm Bay in that process.
>
> Every single core that we took showed that over the last 100 years there had been a catastrophic decline in the marine community in the system. So from an average of 23 species per slice of the core around 1900, we were down to around seven species today, of which four were introduced species.
>
> So basically the whole system has collapsed but with no recognition and nothing other than this study to show for it. This study has not been extended anywhere else but it is clearly important to understand what the scale of these losses are and to try and categorise them properly." (Senate Standing Committee on Environment and Communications References, 2019, p2).

Dr Edgar also points out that despite their economic importance, the marine ecosystems of southern waters generate very little public funding for research.

It's important to invest in more research and knowledge-building, aimed at building our understanding of ecosystems and their resilience. It's also important not to forget that we are always operating in the context that our knowledge is incomplete – there is much that we know we don't know, and there is also the unknown unknown.

A systems perspective

To address ecosystem decline it's important to take into account more than just those species that are recognised as being at risk of extinction. We need to adopt a systems perspective that looks at the overall functioning of ecosystems, paying attention to processes and inter-dependencies.

A systems perspective would give due attention to species that have relatively high levels of abundance, which is something that we tend to overlook at the moment. Scientists are calling for attention and investigation of species that have a relatively high abundance and the role these species play in the functioning of ecosystems. They state that a decline in abundance of common species may have catastrophic impacts on the functions of ecosystems even if this doesn't trigger mechanisms that are designed for threatened species (Baker et al., 2019).

Anecdotal and other evidence indicates that relatively common species are declining. Our current governance structures and management systems may not be adequate to register and respond to this. In my former role as Landcare Facilitator, farmers and rural residents of the Geelong region commented about a long-term decline in species that used to be much more common such as koalas and platypus. Once widespread and

common, species such as Silver Banksias and Sweet Bursaria are also quietly disappearing from inland areas. On the coast, Jacky Lizards, Crayfish, Abalone and Pipis are some of the species that long-term residents have seen disappear or decline with increasing urbanisation. Paul Sullivan, CEO of BirdLife Australia, notes that:

> "[d]ata collected by thousands of our volunteers also shows that many so-called common bird species are declining in abundance and distribution. … you can see the example of the rainbow bee-eater and the steep declines of birds like that and kookaburras and magpies. They are all on the decline. We anticipate the rate of new EPBC listings and uplistings will accelerate over the next 10 to 50 years." (Senate Standing Committee on Environment and Communications References, 2019, p2).

Changes to environmental legislation in Victoria over recent years have introduced references to ecological function, ecosystem-based management and ecological processes. These are positive changes but there is a lot of work yet to be done to fully implement these changes. The need to adopt and institutionalise a systems perspective that focusses on ecological processes[1] as well as biophysical 'assets' is something that experts in Australia have been raising for over 15 years. This expertise should be drawn on to look at what further work needs to be undertaken (e.g. Soule et al., 2004; Traill, 2009; McGregor et al., 2011).

There is a need for people in leadership roles to focus much more on explaining the interconnections and processes of ecological systems – telling the story of nature that is not just about individual species, but about the connections and inter-dependencies. In the absence of this, many people struggle to make sense of why removing seaweed from a beach might affect shorebirds that breed in the Northern Hemisphere, for example. We need voices of leadership to tell a narrative that explains the connections in terms of the bigger ecological picture. It is disappointing that the Government has delayed their response to the recommendation by the Commissioner for Environmental Sustainability for the appointment of a Chief Biodiversity Scientist as this is the sort of thing that may assist in raising ecoliteracy.

We need to modify our governance and management systems to accommodate an ecosystem perspective, as well as focussing on individual species. This also needs to be reflected in the way we communicate about nature, to raise the general level of ecoliteracy and engage people's interest in the connectedness of the natural world.

Likely impacts of ecosystem decline

The health of the biosphere is inseparable from the health and wellbeing of people. We can't afford to wait for greater certainty or details about the likely impact of ecosystem decline on humanity. We already know enough to know that swift action is needed without delay, in fact it is well overdue. In addition to the impacts on human health, the biotic homogenisation that is occurring with the loss of biodiversity has a deeper-level impact on people's sense of identity, home and belonging and therefore the stability and resilience of communities. As stated in the Interim Report on the review of the EPBC Act, "[t]he overwhelming message received by the Review is that Australians care deeply about our iconic places and unique environment. Protecting and conserving them for the benefit of current and future generations is important for the nation" (Samuel, 2020).

As a non-Aboriginal person, it's not my place to talk about how ecosystem decline impacts upon First Nations Peoples (addressing the Terms of Reference), however in my opinion this is of utmost importance and should be given priority.

[1] Traill (2009) defines ecological processes as "*The interactions and connections between living and non living systems, including movements of energy, nutrients and species.* Or in more poetic lay terms: *The natural machinery that connects living and non living things and keeps nature healthy."*

Terms of reference:

(b) the adequacy of the legislative framework protecting Victoria's environment, including grasslands, forests and the marine and coastal environment, and native species;

&

(c) the adequacy and effectiveness of government programs and funding protecting and restoring Victoria's ecosystems;

According to the IPBES, the strengthening of existing governance mechanisms and conservation programs is important but insufficient to address the rate and severity of deterioration in ecosystem health and biodiversity. Transformative systemic change is needed across economic, social, political and technological domains (IPBES, 2019; Diaz et al., 2019). This entails profound change in societal values, a shift from the paradigm of unlimited growth and consumption to a respect for the limits of nature, respect for the intrinsic value of other (non-human) living beings, and the dismantling of the notion that quality of life is dependent on material consumption (Martin et al., 2016).

The twin crises of climate change and biodiversity extinction are recognised as presenting profound governance challenges. The IPBES and the IPPC recommend focussing on adaptive governance, strong mechanisms for public participation, capacity-building and conflict resolution, and recognising the importance of education and multiple knowledge systems including traditional science, Indigenous knowledge and local knowledge. In addition, we must strengthen "'good governance' norms' about the importance of inclusivity, fairness, deliberation, reflexivity, responsiveness, social learning, the co-production of knowledge, and respect for ethnic and cultural diversity" (IPCC, 2019, p32).

In the Australian context, it is widely agreed that stronger legislation and more effective implementation are needed (Ecological Society of Australia, 2019; Radford et al., 2019; Senate Standing Committee on Environment and Communications References, 2019). In Victoria we have legislation that is intended to "guarantee that all taxa of Victoria's flora and fauna ... can persist and improve in the wild and retain their capacity to adapt to environmental change" (*Flora and Fauna Guarantee Act 1988* (Vic), s4(a)) and yet there is continual environmental decline.

Strategic bioregional planning for conservation

We need to be undertaking strategic planning at the (bio)regional scale for conservation of ecosystems, biodiversity, and other natural resources. And we need to mandate and prioritise the implementation of such plans so that development, land-use and settlement patterns are required to align with those conservation plans. This needs sustained commitment and prioritising, and needs to be strongly linked to strategic planning for land-use to protect areas for food and fibre production and to provide certainty about which future areas may be considered suitable for infrastructure for renewable energy - these are not things that can be left to the market to determine.

This sort of strategic holistic planning at a regional scale is essential to build a system that is capable of accounting for and addressing the cumulative, indirect and short- and long-term environmental impacts.

The EPBC Act

To state the obvious, although the EPBC Act is Commonwealth legislation, the operation of this Act significantly influences on-ground environmental outcomes in Victoria and the efficacy of Victoria's overall legislative framework for environmental protection. It would appear that State Governments' responsibilities and powers under this Act are about to increase. For these reasons the EPBC Act seems relevant to the Terms of Reference for this Inquiry.

Research that hit the headlines a year ago revealed the extent of failure of the EPBC Act (Ward et al., 2019). The shortcomings of the EPBC Act have also been highlighted by the Interim Report of the Samuel review. The research by Michelle Ward and her colleagues revealed that out of 7.7 million hectares of forest and woodland habitat cleared during the seventeen-year period of analysis, only seven percent went through a process of assessment (Ward et al., 2019). However, what is often overlooked in media reports based on this research is that these figures do not represent the total of all habitat removal – the research was based on analysis of

woodlands and forests (with the exception of Mallee woodlands) and therefore does not account for how the EPBC Act is performing in protecting the other 49 EPBC-listed ecological communities.

Areas in pink and bright green in the map below were excluded from the analysis by Ward and colleagues. (The marine environment was also excluded.)

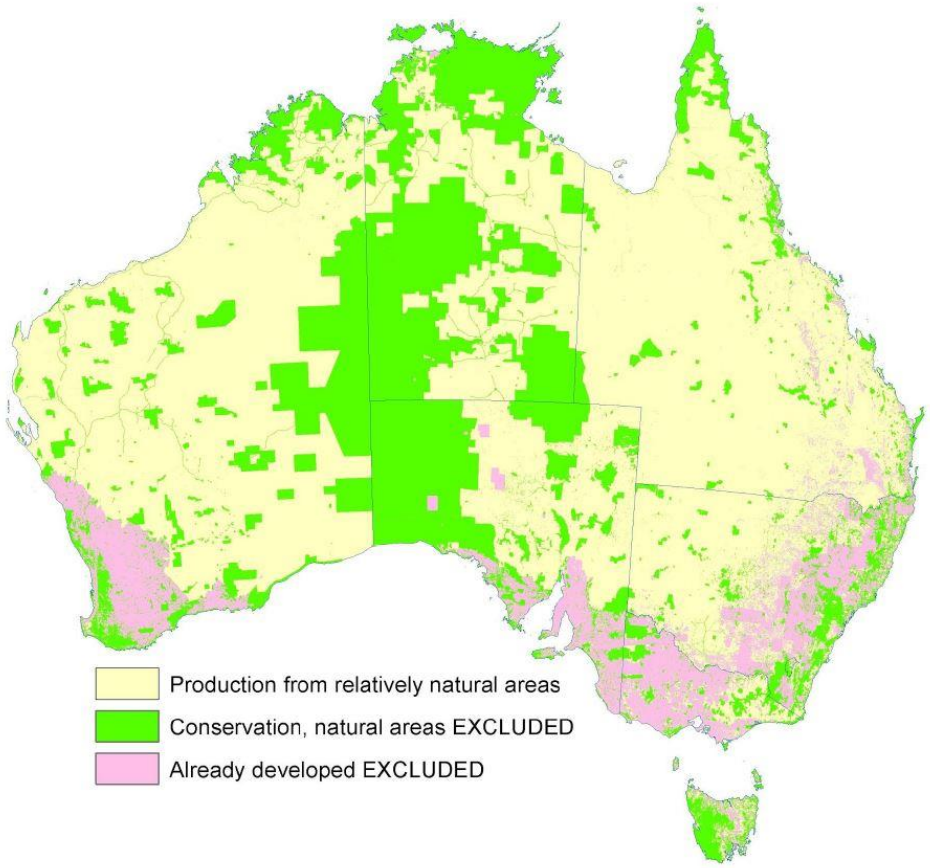

Figure 1. Map from supplementary information published with the article by Ward et al., 2019. (*Figure S5. Final land use mask applied to forest and woodland loss).*

For Victoria (particularly in the west), there is no equivalent analysis about the rates of habitat destruction/impacts for EPBC-listed ecological communities such as grasslands, saltmarsh and wetlands or individual species. The Samuel review of the EPBC Act has found that monitoring and implementation is very poor, and similarly the recent OECD assessment of Australia's environmental performance found that monitoring and the availability of data are in general very poor (OECD, 2019). This raises questions about how much is actually known about the on-ground realities of loss of habitat and species in Victoria when it comes to matters of national and international significance.

The National Reserve System

The establishment of protected areas such as National Parks, Marine Sanctuaries and Nature Conservation Reserves are widely regarded as a primary mechanism for biodiversity conservation and sustainable management of natural resources. All Australian governments have commitments to establishing and maintaining the National Reserve System. Over the last decade, although there has been an increase in the total area of land protected under the National Reserve System, the protection of biodiversity within those reserves is being undermined by insufficient management (Prowse et al., 2019) and by decisions to enable commercial development and usage of the natural resources within areas that are ostensibly set aside for the primary purpose of biodiversity conservation (Ritchie et al., 2013; Lindenmayer & Possingham, 2013).

The reserve system in both terrestrial landscapes and the marine/coastal environment is not yet adequate to fulfil its aim of establishing and maintaining a comprehensive, adequate and representative system of protected areas that are effectively and equitably managed, well connected and integrated into the wider landscape (May, 2017; VNPA, 2019).

The existing reserve system cannot serve its purpose while simultaneously being used for high impact and/or high volume recreational activities. Currently, there is insufficient prioritisation and funding for environmental management and restoration within the reserve system. Rapid and irreversible degradation is occurring due to high volume and high impact recreational activities (e.g. rock climbing at Gariwerd; mountain bike trails through nature reserves). Some of these activities are illegal, some are sanctioned and facilitated by the land managers tasked with managing the reserve system.

Policies and programs aimed at increasing the numbers of people using and accessing natural areas for recreational activities such as fishing, off-road driving and cycling are too simplistic and often at cross-purposes with the need to protect, enhance and restore ecosystem health. These policy settings feed people's expectations for unrestricted access to nature without consciousness or responsibility for impacts on environmental and Indigenous cultural values. There is a trend to construct 'iconic trails' and visitor infrastructure by land managers, using the rationale that such infrastructure is necessary to connect people to nature and thereby encourage environmental stewardship, as well as having economic benefits. However, these developments almost invariably prioritise visitor experiences (e.g. scenic views) over biodiversity conservation and the net result is loss of irreplaceable habitat and values. These sorts of policy settings also reinforce socio-cultural attitudes about access to nature that are leading to increased problems with illegal recreational use of public land and environmental degradation. The Office of the Conservation Regulator lists 'illegal recreational impacts on public land' as one of their future priority areas, which is one indication of the intensity of this problem.

Policy settings that facilitate unrealistic expectations for access to conservation areas are also at odds with other (less well-funded) policy objectives aimed at increasing environmental volunteering and environmental stewardship. This is further compounded by the inadequacy of education and investment in long-term programs to build up basic levels of ecoliteracy amongst the general population.

<u>Legislative improvements & better implementation</u>
Over recent years, there have been some improvements to legislation that go some way towards addressing the biodiversity crisis, however we have a fair way to go to properly implement these changes.

The protection of Indigenous cultural heritage and cultural values is integral to the conservation of biodiversity and the sustainable management of the natural environment. The strengthening of the *Aboriginal Heritage Act 2006 (Vic)* in 2016 has been important, however a lot more needs to be invested in measures to achieve the purposes of that legislation:

> "(a) to provide for the protection of Aboriginal cultural heritage and Aboriginal intangible heritage in Victoria; and
> (b) to empower traditional owners as protectors of their cultural heritage on behalf of Aboriginal people and all other peoples; and
> (c) to strengthen the ongoing right to maintain the distinctive spiritual, cultural, material and economic relationship of traditional owners with the land and waters and other resources with which they have a connection under traditional laws and customs; and
> (d) to promote respect for Aboriginal cultural heritage, contributing to its protection as part of the common heritage of all peoples and to the sustainable development and management of land and of the environment**.** (*Aboriginal Heritage Act 2006* (Vic) s1).

The recent amendments to the *Flora and Fauna Guarantee Act 1988* introduced obligations relating to the restoration of biodiversity (as well as the protection and enhancement), a focus on ecological processes (as well as species and ecological communities), and obligations to address the underlying causes of biodiversity

decline such as cumulative impacts, indirect impacts, short- and long-term impacts. These changes are welcome and it remains to be seen how well they are implemented. Examining a draft 10-year environmental strategy put out recently for consultation by the City of Greater Geelong suggests that so far there is little awareness or intention to undertake the sorts of fundamental changes that are required to implement these amended FFG obligations.

Many of the blockages to biodiversity conservation are embedded within the planning system. The State Government needs to thoroughly review of the Victorian Planning Provisions to support the implementation of the amended FFG Act.

Ecological literacy

There is an alarming lack of ecoliteracy that is very evident in public discussions about environmental issues. For example, in the public discussion about removing feral horses in the Alpine National Parks there was a substantial number of people of the opinion that horses belong in the National Parks and do no damage.

> "Few people have an understanding of ecological processes, let alone, ecology or environmental management. Ecological literacy, defined as 'a basic functional education for all people which provides them with the necessary knowledge, skills, and motives to cope with environmental needs and contribute to sustainable development' (UNESCO 1989) matters because people (including political, public sector, and business leaders and advisers) make decisions that can have major implications for biodiversity and associated ecological processes" (McGregor et al., 2011, p198).

There needs to be improved long-term investment into educational initiatives. Educational material needs to incorporate more of a focus on ecological processes, food webs, interdependencies between different species and components of ecosystems, and on cooperative, symbiotic relationships.

Educational material also needs to focus on explaining the distinctiveness of Australian ecosystems and the particular threat that non-native species pose to our unique ecosystems. The public discussions about horses in national parks highlighted the passion and empathy that people have for wild creatures and animal welfare, however it also highlighted the dearth of understanding about the very particular threat posed by non-native species in the Australian environment.

> "Australia's isolation has resulted in its remarkable biodiversity distinctiveness but also the extraordinary vulnerability of its biota to novel threats." (Woinarski et al., 2015)

Terms of reference:

(d) legislative, policy, program, governance and funding solutions to facilitate ecosystem and species protection, restoration and recovery in Victoria, in the context of climate change impacts;
&
(e) opportunities to restore Victoria's environment while upholding First Peoples' connection to country, and increasing and diversifying employment opportunities in Victoria; and

Models of biodiversity conservation

In looking for solutions and examples of programs that are addressing ecosystem decline, it is recommended that the Committee look into the following initiatives:

- Pang-ngooteekeeya weeng malangeepa ngeeye Project: Remembering our Future – Bringing old ideas to the new.
  This is a project led by Eastern Maar Aboriginal Corporation in collaboration with Cape Otway Conservation Ecology Centre and partners.
  "This project will examine and reintroduce the cultural land and water management of the Maar nation. It

will use the creation stories .. to inform EMAC of the management objectives of each Country and how to implement them."

- Bruce Pascoe's renewal of Traditional Ecological Knowledge and Indigenous agriculture at Mallacoota
  See https://www.theguardian.com/artanddesign/2020/may/13/its-time-to-embrace-the-history-of-the-country-first-harvest-of-dancing-grass-in-200-years

Other examples include:

- Joint management partnerships between the State and Traditional Owner groups for management of terrestrial and marine areas
- Wurdi Youang and Budj Bim National Heritage Landscape which are managed for ecological and cultural heritage values by Traditional Owner groups
- Cape Otway Conservation Ecology Centre https://www.conservationecologycentre.org/
- Mt Rothwell Biodiversity Interpretation Centre https://www.mtrothwell.com.au/
- Trust for Nature, Bush Heritage, Landcare.

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