

Submission to the Inquiry into Ecosystem Decline in Victoria

I welcome the opportunity to submit to the above enquiry. I will focus on three main points:

1. The long term historical view
2. The importance, and limits, to incorporating indigenous ecological knowledge to the future management of Victorian ecosystems under climate change
3. The scale of investment required to avert ongoing ecological decline

Preamble

Vincent Serventy's 'A Continent in Danger' warned, in 1966, of the ongoing demise of Australia's ecosystems. Having undertaken sediment-based research into the long term affects of European settlement on Australia's ecosystems, and particularly those in Victoria, I recognise well that Serventy presented only part of the tale. While Australia's poor extinction record, and wetland loss record too, provide clear insight, the longer term perspective provided by palaeoecology attests to a very early, and now comprehensive, transformation of our natural systems. As I state on my LinkedIn page, if you embark in paleoecology, you never underestimate the magnitude of the impact of people on our ecosystems. On account of this, I might add, I am no longer surprised by the accounts of decline that are appearing in our papers nor by the despair of community members who have more recently discovered the demise of our ecological heritage.

Long Term Understanding

Palaeoecology involves the reconstruction of ecological change from fossil remains (pollen, algae, crustaceans, pigments, C & N isotopes, DNA) buried in continuous sedimentary (or other) records. This line of research has revealed considerable change in Victorian ecosystems over the last 10,000+ years including the widespread replacement of sheoak woodland by eucalypts across western Victoria 7000years ago. However, in nearly all cases the greatest changes occurred after European settlement. So, the human (European) footprint, in what we know as the Anthropocene, is as great if not greater in some facets, than that of the natural cycles of climate change. Many wetlands became salinised and filled with sediment, beginning in the 1880s. The ecological character of all wetlands studied have been transformed through excessive loads of nutrients, salts and sediments. In our forest estate frequent burning by squatters transformed their character and clearfell harvesting lead to unprecedented reductions in catchment water yields. Evidence for extinction debt demonstrates that it is not enough to just arrest the drivers of decline, we need to rapidly reinstate high quality habitat. The drying climate is well underway yet the resilience of ecosystems to climate shocks has been compromised by human pressures.

Cultural Burning for Management

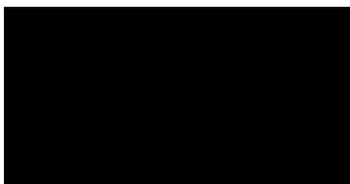
The extreme wildfires of 2019/20 has brought energy to calls to involve indigenous Australians in landscape management through cultural burning. I am a strong advocate for Traditional Owners to be given licence to embark upon cultural burns and water management in order to facilitate their attachment to land and to reinforce their cultural authority. However, with respect to the advocacy for cultural burns for landscape management and the protection of property, the long term view provides some clear warnings. This is (or will be) the warmest climate ever experienced by humans

on this continent. Of the ~ 65,000 years that humans have been in Australia, temperatures were > 5°C less than today for most of them. Of the 65,000 years western Victoria was (eucalypt) forested for 7,000. Ice age forests were mostly confined to the east of the Snowy River. Of those 7,000 years, the climate was at least 30% wetter than today (or at least mid-century) for almost 6,000 years. So, indigenous burning practices evolved in western Victoria in steppe vegetation, fire sensitive, grassy sheoak woodlands, or in cooler, wetter forests. So, never before has western Victoria had the combination of ~ 1M humans, eucalypt forests as fuel, rainfall this low, and temperatures this high. The lesson from the past is that cultural burning mostly evolved in grassland or open woodland in climate conditions much more amenable to management than that encountered this century. If it is debatable that fuel reduction burning mitigated the conflagrations of 2019/20, then cultural burning practices, highly justifiable on cultural grounds, are not our first line of defence for climate adaptation with respect to fire risk. So, I would suggest we need to be a little more circumspect advocating for cultural burning practices under the new climate, as this has emerged from a position of cultural advocacy (which I strongly support) rather than a critical analysis of the benefits of these practices at the scale required. Cultural burning has a place, in concert with biodiversity management, in setting fire regimes that are sensitive to the needs of ecosystems.

The Need for a New Level of Investment

I have recently worked to establish a local landscape alliance aimed at restoring regional ecosystems. Our principles involve the incorporation of a landscape scale perspective, designing approaches that will have ecological benefit, and using and undertaking research and monitoring to provide for evidence based planning, to demonstrate benefits from investment and to adapt approaches as lessons are learned. After 20 years of substantial volunteer Landcare effort, the restoration GIS layers reveal a poorly co-ordinated patchwork of planting that is unlikely to yield much ecological rehabilitation and generate a new industry, informed by the emerging science from benefit. Given the legacy effects described above, including extinction debt, on top of a warming, drying climate, it is no longer sufficient to leave the maintenance of our ecological heritage to an army of volunteers worn out by applying for ever diminishing pots of money. Victoria needs to scale up its efforts at landscape our institutions, that slows the path to degradation and provides refuge for our biota to prepare them for the ecological shocks that will inevitably come under a warming climate.

Again, thank you for the opportunity.



Prof Peter Gell