

Submission to Parliamentary Inquiry into Ecosystem Decline in Victoria

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Introduction

We are making a submission to the enquiry in part as members of the public who are very concerned by decline in Victorian ecosystems generally, but we will focus on stream ecosystems and the risks posed to them by urban land use, which is our area of expertise.

In our positions as research fellows at the University of Melbourne, we study the drivers of biodiversity in streams and rivers of the Melbourne region, and prioritization of management actions for their conservation and restoration. Our work has identified the alarming loss of biodiversity and ecosystem function caused by conventional urban development, but more importantly identified management solutions to minimise, and potentially reverse those losses.

General Comments

Before turning to streams and rivers, we first acknowledge two over-riding threats to Victoria's environment that need to be addressed by more effective legislation and regulation.

1. Climate change. The threats posed by climate change are profound and far-reaching, including to the health of and ecosystem services provided by our rivers. While there is considerable uncertainty in climate change projections, new high resolution simulations predict higher mean temperatures and more severe heat extremes, and reduced mean annual rainfall and streamflows across Victoria (Clarke et al. 2019; DELWP 2020 *in prep*). These broad-scale climatic and biophysical changes present substantial threats to riverine biodiversity. Policies aimed at stopping the burning of fossil fuels, including gas, by 2030, and aimed at reducing other sources of emissions (such as transport and agriculture) in Victoria are required to equitably contribute to the global challenge of limiting the impacts of global heating, and mitigating losses to the Victorian environment.
2. Logging of native forests and clearing of native vegetation. Forests, woodlands and grasslands need protection and restoration across Victoria, not only for their own environmental and biodiversity values, but because the health of our rivers and streams is determined strongly by catchment vegetation cover, especially on land near rivers, streams, gullies and wetlands. There is a strong argument for Victoria to cease logging of native forests (while providing support to help the logging workers and industry to transition to other activities). Investment and planning in re-forestation of cleared land across the state should also be a priority.

Streams and Rivers

Their biodiversity and importance

The biodiversity of our rivers and streams is immense and immensely under-appreciated. For instance, we found 895 species of macroinvertebrates in a recent single survey of 45 stream reaches across Melbourne: 99 species from just one 20-metre reach in Armstrong Creek in the upper Yarra catchment.

Macroinvertebrates are insects, crustaceans and worms that are large enough to be caught in a net with 0.25-mm mesh. If we were to also identify smaller invertebrates, and vertebrates, plants, fungi and bacteria, the total number of species living in this short reach of a healthy forested stream would likely number 10 times the 99 we identified. And of course, highly diverse, healthy stream ecosystems like Armstrong Creek support a healthy population of the iconic platypus which has recently been recommended for listing as 'Vulnerable' under the *Flora and Fauna Guarantee Act 1988* by the government's Scientific Advisory Committee.

Such ecosystems also provide our cities and towns with clean drinking water, and serve to reduce the export of nutrients and other contaminants, keeping our bays and coastal waters healthy.

The threat of urban stormwater drainage

Standard approaches to planning, constructing and managing stormwater drainage from human constructions in and around urban settlements severely degrades streams. Streams with as little as 1 or 2% of their catchments covered by roofs and roads with conventional stormwater drainage become eroded, and polluted with frequent flashy flows of stormwater, resulting in channel erosion. These effects of 'urban stream syndrome' reduce the ability of streams to retain contaminants and provide clean water, and greatly reduce the number of in-stream species (Walsh et al. 2005).

Most of the species found in streams such as Armstrong Creek are sensitive to the effects of stormwater runoff and are not found in streams with even small amounts of conventionally drained urban constructions.

Urban expansion and infill in Victoria, if standard stormwater practices continue to be used, is therefore a growing threat to the biodiversity and ecosystem function of many of Victoria's streams. There are, however, opportunities for better urban development approaches that can greatly mitigate degradation of streams and potentially restore them, while providing co-benefits to Victorians.

The opportunities for better cities and in-stream biodiversity protection

Standards for stormwater management that are specifically aimed at stream protection are required. We, with international collaborators, have published principles for what such standards should include (Walsh et al. 2016). There are substantial co-benefits that can be achieved by properly managing stormwater for the protection of streams (e.g. improved flood mitigation, urban cooling, a large alternative water supply). Much of the current development of 'water-sensitive urban design' (WSUD) approaches are targeted toward such co-benefits, often missing the opportunity of applying standards that will significantly contribute to stream protection, because performance standards for WSUD do not specifically target the ecological health of streams and rivers.

Such standards need to be implemented, and be part of stronger regulation of stormwater management at the planning, building and operating stages.

Better integration is needed between environmental protection legislation and the water act so that harvesting stormwater to keep it from receiving waters is recognised as an environmentally beneficial use of water (and not using it is recognised as a degrading action).

Many opportunities for stream protection are lost at the planning stage. Stronger requirements for capability assessments for all new development areas are needed. Precinct plans that ensured the reservation of all drainage lines as open space that can be incorporated into trains of stormwater control measures are critical. Use of drainage pipes at large scales should be unnecessary if sufficient land along drainage lines is reserved. (The total land-take of such a planning action is no greater (usually much less) than standard public open space requirements).

A recent legal analysis of five areas of law for addressing the cumulative environmental effects of stormwater runoff identified the large and complex range of legal measures across: i) Crown Land tenure and public protected area laws, ii) land use planning laws, iii) building laws, iv) environmental laws, and v) water laws that could be applied (Nelson 2020). Relevant legal mechanisms include both intentionally protective instruments (e.g. through planning and building laws) and other unintentionally protective mechanisms (e.g. Crown land arrangements). Both types have important weaknesses and gaps which Nelson (2020) explains in detail, along with some potential remedies. She also identifies options for using existing mechanisms (e.g. environmental overlays and local stormwater policies) to more comprehensively control stormwater effects across development types without requiring legislative amendment. This important analysis does a great service of clearly setting out the profusion of policies and legal mechanisms relating to waterway health and stormwater generation and could guide better integration and coordination of the full range of legal mechanisms that could protect urban and urbanising streams.

References

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