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Supplementary submission to the Senate inquiry into Australia's faunal extinction crisis

Sustainable Population Australia welcomes the opportunity to submit some supplementary material to the Senate inquiry into Australia's faunal extinction crisis, in addition to our earlier submission dated 10/9/18.

The focus of this supplementary submission is on the causal dynamics ('root causes', or 'key drivers') of faunal extinction and species loss in Australia. The etiology of faunal extinctions is not listed as a specific term of reference for the inquiry, so it should best be considered as a 'related matter', as per the terms of reference. This appears to be the approach that the inquiry has already taken, by including a section on 'key drivers of faunal extinction' in chapter 2 of the Interim Report.

It is disappointing, however, that the section in chapter 2 does not, in fact, discuss the key drivers that are accepted by Australia's 2016 *State of the Environment (SoE) Report*, which states unequivocally in the following extracts (emphasis added):

- 'Globally, the human-caused drivers of change to the environment are demographic, economic, socio-political, scientific, technological, cultural and religious. *In Australia, the key drivers of environmental change are population and economic activity*'.¹
- 'If we are to prevent and remediate environmental degradation, policy and management actions *need to focus on the drivers rather than only on the pressures*, as has been the tendency of past approaches'
- 'The distribution of threatened species around the nation generally related to the distribution of the human population and the intensity of our activities'.
- 'Urban growth is already driving land-use change in Australia, *with expansion in peri-urban areas (on the outskirts of cities and large towns) having direct impacts on the natural environment and some of the most biologically productive lands currently used for agriculture*. This trend is expected to continue and escalate.'

We agree with the expert authors of the SoE that population and economic activity are **both** causal drivers which work in conjunction with each other. As mentioned in our earlier submission,

¹ While acknowledging environmental change is not identical with species extinction, we note it is strongly related.

this is not a matter of 'either/ or', of population **or** consumption. It is population **and** consumption (i.e., consumption as a proxy for economic activity).

I am sure you are aware that the authors of the SoE Report are completely independent and well-regarded in their fields of expertise. With statements such as those above it is peculiar that the Committee's interim report has failed to recognise population as a **driver** and appears to be doing the opposite of the SoE report's recommendations, focusing instead on the **pressures**.

By comparison the Committee's Interim Report appears to have selectively quoted the SoE report at paragraph 2.53 (emphasis added):

2.53 According to the state of the environment report, the key *pressures* of habitat clearing and fragmentation, invasive species and climate change remain high on the list of *pressures* that threaten listed species and ecological communities, and biodiversity in general. Evidence received by the committee also pointed to a range of threatening *processes*, both singly and in combination, driving biodiversity loss in Australian including:

- habitat loss, degradation and fragmentation;
- invasive species including cats and foxes;
- changes to fire management;
- climate change; and
- disease.

It is as if the Committee has read a different report to the one SPA quotes. But here it is on the SoE website: <https://soe.environment.gov.au/theme/drivers>. How is it that the Committee has managed to not see the more significant and over-riding statements in that report? Or is the Committee inferring that these esteemed scientists and commentators are wrong?

The 'pressures' which the Interim Report lists, such as habitat loss, are indeed pressures. But we feel bound to ask: what causes the pressures? A deeper level of causal explanation is required. In order to arrive at policy options that can effectively reduce the rate of faunal extinctions and species loss, surely it is necessary to understand (based on scientific principles) the root causes of the problem?

Is the Committee also aware that in omitting a discussion of underlying drivers, and of population in particular, it overlooks the view of the OECD report on Australia's environmental performance, as quoted in paragraph 2.11 of the Interim Report: "Small initiatives and limited investment are insufficient to fully address a legacy of land clearing *combined with growing pressure from population growth, expanding development*, invasive species and climate change..." (emphasis added).

It should be uncontroversial to say that the root cause of the alarming increase in faunal extinctions in the past 200 years or so is *human activity* – which manifests in various ways such as habitat loss, overexploitation and so on. It is almost self-evident that the intensity and magnitude of the impacts of human activity will be dependent on (i) the number of humans, (ii) the human capability to transform and consume nature using technology, and (iii) the distribution of human populations and their technological capabilities around the planet.

In addition to the SoE Report, other recent scientific studies put forward related explanatory models for species loss and extinctions. For example Venter et al use a human footprint

framework which identifies eight variables of human activity: (1) extent of built environments; (2) crop land; (3) pasture land; (4) human population density; (5) night-time lights; (6) railways; (7) roads; and (8) navigable waterways.² This and related approaches are being used to map, at a detailed scale, the threats to biodiversity on a global basis.^{3 4}

For Australia, research by Allek et al analysed threats to species defined as threatened under the EPBC Act 1999. The authors found that threats associated with (1) invasive and other problematic species and (2) habitat loss (sub-divided into urban and residential development, and agriculture and aquaculture) are *the most common threats* across all areas of Australia, although biological resource use (harvest of wild populations), natural system modification, and climate change and severe weather are also prominent threats. Birds constitute the single largest proportion of threatened species in all areas except the Northern Territory, where mammals make up the largest proportion.⁵

Allek et al go on to say:

In our analysis, five threat categories representing *urban development, the energy industry, invasive species and pathogens, pollution and climate change*, co-occurred with six or more other threat categories. In addition, *human disturbance threats⁶ co-occurred significantly more often than expected with climate change and pollution*, among all species and among all individual groups of terrestrial species. Interestingly, *for mammals, human interference was the largest threat when they were free from invasive species pressure.*⁷ (emphases added)

Kearney et al, using a similar typology of threats for Australia's fauna and a larger number of threatened species under the EPBC Act 1999, found that invasive species, ecosystem modifications (e.g. fire), and agricultural activity were the three largest threats, followed in order by human disturbance, pollution, energy production, urban development, overexploitation, transportation and climate change.⁸

² Venter, O., Sanderson, E.W., Magrath, A., Allan, J.R., Beher, J., Jones, K.R., Possingham, H.P., Laurance, W.F., Wood, P., Fekete, B.M. and Levy, M.A., 2016. Sixteen years of change in the global terrestrial human footprint and implications for biodiversity conservation. *Nature Communications*, 7, p.12558. (Note: this human footprint framework is not the same framework as used for the popularly understood 'ecological footprint').

³ Geary, W.L., Nimmo, D.G., Doherty, T.S., Ritchie, E.G. and Tulloch, A.I., 2019. Threat webs: reframing the co-occurrence and interactions of threats to biodiversity. *Journal of Applied Ecology*.

⁴ Allan, J.R., Watson, J.E., Di Marco, M., O'Bryan, C.J., Possingham, H.P., Atkinson, S.C. and Venter, O., 2019. Hotspots of human impact on threatened terrestrial vertebrates. *PLoS biology*, 17 (3), p. e3000158.

⁵ Allek, A., Assis, A.S., Eiras, N., Amaral, T.P., Williams, B., Butt, N., Renwick, A.R., Bennett, J.R. and Beyer, H.L., 2018. The threats endangering Australia's at-risk fauna. *Biological conservation*, 222, pp. 172-179, pp. 174, 173.

⁶ Human disturbance threats are those from human activities that alter, destroy and disturb habitats and species associated with non-consumptive uses of biological resources. For example, recreation and tourism, and military uses.

⁷ Ibid. p. 177.

⁸ Kearney, S.G., Cawardine, J., Reside, A.E., Fisher, D.O., Maron, M., Doherty, T.S., Legge, S., Silcock, J., Woinarski, J.C., Garnett, S.T. and Wintle, B.A., 2018. The threats to Australia's imperilled species and implications for a national conservation response. *Pacific Conservation Biology*.

Without going into too much detailed analysis, it should be clear that many of the threats identified in these studies by Allek et al and Kearney et al – for example the threats of habit losses from agriculture and urban development, transport networks, human disturbance, energy production and pollution – are directly or indirectly affected by Australia’s human population size, population growth rate, and population density, as well as the level of economic activity.

In relation to the matter of population density, although on average Australia has a low population density, the areas most suitable for human habitation are close to the coast, away from the semi-arid interior, and these preferred areas such as Sydney, Melbourne and Brisbane and surrounds are experiencing significant growth in population densities as well as in absolute size. This growth includes increasing densities at the peri-urban fringes, which impacts upon surrounding ecosystems.⁹

Even the threat of invasive species, which would seem to be somewhat independent of human population size and growth, needs to be viewed in historical context and with some nuance. A case study by Greenwell et al of threatened Fairy Tern colonies near Mandurah in Western Australia offers some relevant insights.¹⁰

According to Greenwell et al, human impacts, including coastal development and intense use of near-shore environments have made many former Fairy Tern colony sites unsuitable for the formation of breeding aggregations. These impacts, coupled with predation by domestic and feral animals, have reduced tern recruitment and adult survivorship over the past few decades. Following an estimated 24% population decline in eastern Australia between 1974 and 2007 and no evidence that their main threats to survival were abating, Fairy Terns were listed as vulnerable in 2011 by the Australian government.

The authors note that, as in other parts of the world, ‘managed sites’ for tern breeding are typically established *“in areas where coastal development and human population pressures have greatly reduced the number of secure, natural nesting areas”* (emphasis added). In Western Australia, managed sites are being used to overcome a lack of suitable nesting habitats available to Fairy Terns in historically important breeding areas. The mouth of the Peel-Harvey estuary in Mandurah is an important breeding location for Fairy Terns due to its close proximity to a reliable supply of baitfish. *“However, the development of the Mandurah Ocean Marina (Stage 1 completed in 2001) has eliminated former nesting areas”* (emphasis added).

Purely by chance, the researchers discovered that in one of these managed sites, “predation (either direct or indirect) by a single semi-feral cat, resulted in the deaths of at least 40 chicks and six breeding adults from a colony of 111 pairs over a period of only 23 days, and the effective predator defences of the colony against a small raptor (Nankeen Kestrel, *Falco cenchroides*) broke down.”

⁹ For data on population densities in Australia’s cities (including useful animations to show growing densities on the peri-urban fringes), see <https://chartingtransport.com/2019/04/21/how-is-density-changing-in-australian-cities-2nd-edition/>

¹⁰ Greenwell, C.N., Calver, M.C. and Loneragan, N.R., 2019. Cat Gets Its Tern: A case study of predation on a threatened coastal seabird. *Animals*, 9(7), p. 445. The summary provided here borrows liberally from the authors’ account.

Not only does this case study show how urban encroachment and subsequent development (e.g. the marina), caused by population growth, destroyed bird breeding areas, making it necessary for humans to establish inferior managed sites close to human habitation. It also shows how an invasive species such as the domestic cat expands its range *in conjunction with* this urban sprawl. In this case, it was a semi-feral (stray) cat that was at least partially provisioned by people (deliberately or incidentally through garbage).

Sustainable Population Australia is not the only submitter to recognise population as a driver. Others include Doctors for the Environment Australia (submission #3), Steady State ACT (submission #40), CASSE NSW (submission #16), and public policy specialist Ms Edwina Barton (submission #178).

Around the world an increasing number of international scientific bodies are recognising population as a principal driver of faunal extinction. As an example, in 2017 the World Scientists' Second Warning to Humanity <http://www.scientistswarning.org/> stated: 'we are jeopardizing our future by not reining in our intense but geographically and demographically uneven material consumption and **by not perceiving continued rapid population growth as a primary driver behind many ecological and even societal threats**' (emphasis added).

Based on the evidence presented in this and our previous submission, we conclude that human population size and growth must be included as a key driver of faunal extinction and species loss. To conclude otherwise is flying in the face of the evidence. We further submit – as argued in detail in our earlier submission – that population size and growth in Australia must be considered as a policy-relevant factor in the design of policies to reduce faunal extinction and species loss. Australia's population size and growth is largely determined by Australian government immigration policy settings.

By all means, as per our earlier submission, we agree there is a need for much stronger environmental protection and species conservation legislation and much more funding for species protection, management and recovery programs. Such long-overdue measures are the bare minimum required if our Commonwealth Parliament is serious about caring for the natural heritage of our ancient continent. However, such measures can only have limited efficacy while the key drivers are not reined in.

Yours sincerely



Hon. Sandra Kanck
National president
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