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To whom it may concern,

I have been asked to comment on the 2019 UN IPBES Global Assessment Summary for Policymakers, presumably because I have published on extinction rates and conservation. I have worked on endangered species conservation since 1981, including both fieldwork and theory. The full Assessment is unavailable at this time (16 May 2019), precluding detailed critical analysis. This timing is far from ideal from the perspective of public understanding of science, and attempts to use the Summary in policy would be premature without critique because many inevitable uncertainties are hidden. My overall assessment is that the Summary has too many subjective statements that are not representative of the opinions of many ecologists and conservationists.

1) The claim that 1 million species are at risk of extinction may give a simple, memorable message, but masks the huge uncertainty. The number of species on Earth is unknown (but probably between 2 million and 1 trillion). The proportion of species threatened is unknown. For terrestrial and freshwater habitats it is probably similar to that for birds (c. 15%). Fully marine species are likely at lower risk, with few recorded extinctions. The global number of threatened species could thus be below 300,000 or many billions, including perhaps several million multicellular species. The timeframe for extinction of these species is highly uncertain: some species listed by IUCN as globally Threatened (*ie* Endangered or Vulnerable) might be secure, because they are primarily deemed Threatened due to small ranges, not declines. Vulnerable species are not typically at imminent risk (*ie* extinction within decades). Conversely, many Data Deficient species might be at high risk. The average abundance of species in most major terrestrial biomes is unknown, and so the stated loss (20%) is incompatible with the Summary's stated uncertainty for insects.

2) The ranking of threats is highly controversial. Literature reviews are a very risky and subjective way to assess threats - dependent on timescale, search terms and the data sources chosen, as demonstrated by a flawed review of insect decline².

3) The role of climate change is, in my assessment, overstated. There have been no proven global species extinctions due to anthropogenic climate change. Many recorded population changes or losses are hard to ascribe to climate change, and there have been erroneous attempts to do so. Two problematic types of models are being combined to predict extinctions:- 1) climate models which have arguably poor fits to reliable satellite (UAH) or balloon temperature data; these also have very limited ability to predict changes in extreme events, particularly at the regional scales required in threat assessment (see IPCC AR5). 2) species climate response models which make many assumptions³. I argue all species listed as threatened by climate change in the IUCN Red List need interdisciplinary reassessment since attribution of anthropogenic climate change is very difficult at the relevant timescale or spatial scale, and some entries overstate the climate impact². 'Scenarios' are misleadingly claimed in the Summary to "show" outcomes. The opportunity costs of climate policy, with renewable energy expenditure vastly exceeding resources for effective mainstream conservation (*eg* protected areas, ex-situ conservation, biosecurity) present a further reason to seek a far wider range of opinions on conservation and the main drivers of a likely mass extinction than the Summary provides.

4) The Summary correctly identifies habitat degradation as the major proven driver of extinction, and I argue this will remain so for some time – particularly with the growing pressure from maladaptive climate policies such as use of low-density renewable energy and associated destruction of habitats by dams, palm oil, biomass, solar farms, wind farms and tidal infrastructure, which the Summary largely neglects (with the exception of noting problems with bioenergy).

5) The Summary has, very bizarrely, played down the widely-held view amongst conservationists that invasive species have been and continue to be a dominant threat to species and habitats: compare the high fraction of recorded animal and plant extinctions in part due to invasives (c. 30% in 500 years⁴) to the confirmed loss from climate change (0%). Unless there comes to be clear evidence of rapid anthropogenic climate change, I predict invasives are likely to remain a central threat for many decades, arguably second only to habitat degradation. Globalisation is likely to continue to drive invasions, including by diseases. It could be argued a much higher fraction than the stated c. 1/5th of the Earth's surface is at risk of invasion.

6) Traditional use of resources can be more benign than industrial but has often been demonstrably unsustainable⁵, causing many global and regional¹ extinctions and very widespread habitat degradation. This is downplayed by the Summary - which could be an ideological bias. 'Sustainable intensification' is likely often a better route to conservation than 'land sharing'.

References

- 1) Hambler, C., Henderson, P.A. & Speight, M.R. 2011. Extinction rates, extinction-prone habitats, and indicator groups in Britain and at larger scales. *Biological Conservation* 144, 713-721. DOI: <https://doi.org/10.1016/j.biocon.2010.09.004>
- 2) Hambler, C. & Henderson, P.A. Challenges in measuring global insect decline (March 5, 2019). Available at SSRN: <https://ssrn.com/abstract=3347055>
- 3) Lewis, O.T. 2006. Climate change, species-area curves and the extinction crisis. *Philosophical Transactions of the Royal Society of London B*, 361, 163-171. DOI: <https://doi.org/10.1098/rstb.2005.1712>
- 4) Blackburn, T.M., Bellard, C. & Ricciardi, A. 2019. Alien versus native species as drivers of recent extinctions. *Frontiers in Ecology and the Environment*. 17, 203-207. DOI: <https://doi.org/10.1002/fee.2020>
- 5) Hambler, C. & Canney, S.M. 2013. *Conservation*. Cambridge University Press.

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