



NSW INDEPENDENT INQUIRY INTO THE 2019-20 BUSHFIRE SEASON

Submission by the Royal Zoological Society of NSW, 16 April 2020

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The society

The Royal Zoological Society of New South Wales (RZS NSW) is Australia's oldest and largest zoological society, including professional zoologists and ecologists and members of the broader community passionate about the conservation of Australia's unique animals. The Society welcomes the opportunity to make a submission to the NSW Independent Inquiry into the 2019-20 bushfire season.

Our concerns

The RZS is disturbed not only about the impacts that the 2019-2020 fires have had on our native fauna, but also about our lack of preparedness through research and conservation programs, and the appalling lack of biodiversity monitoring that would have allowed us to quantify the impacts of the fires, measure recovery, and quantify the effects of management interventions that were imposed. We stress that 'fauna' includes not only the native mammals, reptiles, amphibians, birds and fish, but also the invertebrate fauna. We are concerned about how these native fauna—the vast majority of which are Australian endemics that occur nowhere else—will be impacted by the ability of some invasive species to increase in number and prey on our native species, and also make the point that we are concerned for all our fauna, not just the subset of species listed as threatened.

While we understand that the primary focus of the NSW Independent Bushfire Inquiry is on the impact and protection of human life and property, the RZS NSW maintains that we must, in parallel, consider the same impacts on our natural environment and on how we may best protect it. The 2019/2020 bushfires stretched across large areas of forest, thus impacting a considerable proportion of our native fauna and their habitats.



That we, as a state, or a nation, do not appear to be able to quantify the losses of our fauna and other components of biodiversity, highlights our lack of background knowledge and thus preparedness for such widespread fires, as well as the ineffectiveness of key aspects of our biodiversity conservation programs. These fires were unprecedented, but were predictable as a consequence of our changing climate, and monitoring programs could and should have been in place prior to this foreseeable event. Such monitoring programs would have had established fire ecology projects in place for a very wide range of species and locations, as well as long term monitoring in all bioregions.

Setting the scene

Climate change is having major impacts on the weather patterns in NSW, not just with increasing temperatures but also with declining rainfall, and these changes have been predicted for some time to modify our bushfire seasons. Lucas *et al.* (2007) predicted that as a result of climate change, dangerous fire seasons will become more common, the more extreme years will become even worse, 'marginal' years will become more dangerous and the infrequent less extreme years will remain so.

These changes, which are the new norm, were all having impacts on our native fauna even before the fires. Extended periods of hot, dry conditions combined with the onset of strong winds are a recipe for major bushfire events. The severe drought which NSW has been experiencing over the past few years has led to dry soils, dry heavier ground cover and reduced moisture content of live fuels, the exact combination which facilitated the high intensity fires which we witnessed over several months in NSW.

The extensive load of dry litter in the environment aided the very hot fire which was then reduced to barren ash, destroying a diverse and abundant, poorly studied invertebrate fauna which lives in the litter. It also destroyed the fallen logs on the forest floor which also acts as habitat for a diverse fauna both invertebrates and vertebrates. This invertebrate fauna is critically important in the maintenance of soil structure and in the food chain on which much of the vertebrate fauna depends. Post fire monitoring programs should be implemented to monitor the recovery of these critically important invertebrate



communities. Yet, too often, they are forgotten, and emphasis is given to charismatic vertebrate fauna.

Impact of fires

Besides the immediate death of individuals, those remaining are subjected to loss of food sources, habitat which has been vastly altered or diminished, be it trees with hollows, leaf litter, or flowering shrubs. Remaining intact habitats are often isolated, leading to lack of connectivity between populations and hence limited or no opportunity for post-fire recolonisation. When populations decline, there is a loss of genetic diversity and increased risk of the extinction of local populations, all compounded - in the case of small and medium-sized vertebrates - by the ability of feral animals to take advantage of the exposed remaining individuals.

Our submission

We restrict our submission to those issues in which the RZS NSW has expertise. In doing so, we draw attention to the numerous publications by the Society on a wide range of relevant topics, including climate change, fire, forests, long-term studies, threatened species and protected areas (e.g. Hutchings *et al.* 2004; Lunney 2004; Lunney *et al.* 2012, 2017. All the books, and all but the last two years of the papers in the Society's journal *Australian Zoologist*, are open access. <https://publications.rzsnsw.org.au/>). Many scientists have written well-researched articles and books to assist in understanding and managing our fauna and their habitats. The shortfall, in the Society's opinion, is not the intellectual skills in research and management of our nation's ecologists and other environmental scientists, but the capacity and will of the State and the nation to act upon the ideas and recommendations that have been provided.

Addressing the terms of reference

ToR 1: The causes of, and factors contributing to, the frequency, intensity, timing and location of, bushfires in NSW in the 2019-20 bushfire season, including consideration of any role of weather, drought, climate change, fuel loads and human activity.



While the media has given voice to climate change deniers, and those who choose to ignore the increasingly grim warnings of climate scientists, we submit that climate change is a root cause of these massive fires. We do not intend to dwell on this point, it will be made by many others, but as zoologists we do emphasise that climate change, major droughts and land clearing, have caused fauna and their habitats in many areas to be in poor ecological condition and ill-prepared to withstand the fires. We note here only that 2019 was the hottest and driest year on record in Australia, and this combination of conditions almost certainly led to the 2019-20 fire season being the worst on record in terms of fire extent, coverage and intensity.

ToR 2: The preparation and planning by agencies, government, other entities and the community for bushfires in NSW, including current laws, practices and strategies, and building standards and their application and effect.

Our biodiversity policies and laws, and the multiple agencies that run them, were seemingly under-prepared for this major fire season with respect to the conservation of wildlife. We do acknowledge that these agencies were, judging from the media, well organised to fight the fires. That is not the point that we are making here. Our focus is on the fauna. We take the silence in the media (with the notable exception of reporting on the koala), and lack of statements from any government department, to reveal a narrow focus on threatened species and a serious lack of robust monitoring across a broad range of species and locations.

While receiving an inflated amount of reporting in the media, the koala is an example of how the current biodiversity laws and programs have fallen grievously short. It was the koala rehabilitation groups that captured and held the media attention during the fires, with millions of dollars pouring into their funding appeals. In contrast, State agencies were relatively silent. Fauna and fire should be a speciality of State agencies, but it was not apparent from the media. The RZS NSW considers it appropriate for this enquiry to assess what research programs and management plans were in place before the fire, and after the fire, that were resourced by the State government. This inquiry should extend to include all relevant state agencies. The RZS NSW also makes the point that fire is not the only threat to



the survival of our fauna, there is a suite of other threats, and any studies must examine these multiple threats to be able to manage each species, each ecological community and the habitats that they depend upon.

What the fires have exposed is the lack of depth of knowledge and expertise at a State and national level to both understand the impact of the fires and the other concurrent threats to our fauna. Slow declines are not discernible on just one day, one month or even a year, but what the fire has done is to throw the problems facing our fauna into sharp focus. Bushfires are not the only threat to our fauna, but they do provide a wake-up call to the need for more substantial research-led management if all our native wildlife is to survive in the short to the longer term.

The case being put here can be read in the NSW government's State of the Environment report, the most recent was published in 2018 (SOE 2018). Despite the gentle words, and assurances that some programs are underway, and other matters are being looked into, it reads as a blunt statement of the decline of our fauna. Thus, before the 2019-2020 fires, there was sufficient cause for alarm to have initiated an inquiry as to why so much of our fauna is declining. The strong statements in our submission here echo so many other calls for more to be done (just one recent example being Dickman *et al.* 2020). The fires have now given impetus to these calls and the RZS NSW contends that we should not let this opportunity pass to considerably lift our game to understand and then manage our fauna to prevent further losses.

Among the key findings of the most recent Commonwealth State of the Environment report of 2016 in relation to biodiversity are: *"There is no indication that the major pressures on biodiversity outlined in the state of the environment (SoE) 2011 report have decreased. The key pressures of habitat clearing and fragmentation, invasive species and climate change remain high on the list of pressures (identified by jurisdictions) that threaten listed species and ecological communities, and biodiversity in general."* And *[The lack of data and information from long-term monitoring of biodiversity is universally acknowledged as a major impediment to biodiversity conservation.](https://soe.environment.gov.au/theme/biodiversity/key-findings?year=96#key-finding-120171)*

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In short, the RZS NSW is not saying anything new about the parlous state of our knowledge of our fading fauna. What we are saying that is new is that matters are getting worse more rapidly than was apparent in 2016 and 2018 at the Commonwealth and State levels, respectively. We make this claim because the recent fires were so widespread and so extensive that we were all shocked, the media was shocked, the governments were shocked that one major catastrophe could so overwhelm our forests, and by implication, the populations of wildlife and their habitats, the forest habitats, that the fauna depends upon. We argue that if there is not an immediate and measurable increase in effort to research our wildlife and ways to manage it, then culpability for not acting may well be an issue even before the next, and predictable, grim fire season.

What can the inquiry do to recommend that we are prepared for the next catastrophe?

The RZS NSW offers some recommendations:

- 1) In the first instance, greatly expand the focus of government from a limited list of threatened species, to include monitoring of the status of all species, ecosystems and biodiversity more generally.
- 2) Ensure that agriculture, industry and other stakeholders comply with laws that are designed to protect native species, ecological communities and their habitats. Compliance is currently feeble or non-existent, as shown by recent work on the koala. Perhaps Australia's most iconic mammal, the koala, was listed formally at the national level in 2012 as a species that is vulnerable to extinction. In NSW the clearing of koala habitat actually increased from 11,153 ha per year in the period from 2004 - 2012 to 14,695 ha per year in the period 2012 - 2017 (Taylor 2020). Despite the ostensible increase in protection that should have been afforded the koala in 2012, the escalation in deliberate clearing of its habitat provides a stark and disgraceful indictment of the disregard shown by the State (and the Commonwealth) for ensuring compliance with its own environmental legislation.
- 3) Formally increase the monitoring of biodiversity and animal populations on solid bases, such as by using adaptive management and research. The research should be especially long-term so that recovery or decline of populations of a wide range of species can be determined, not just guessed at, or be limited to computer predictions based on limited



data. We do recognise the valuable roles of computer modelling, GIS, and fire mapping in contributing to our knowledge of the issues, but argue that such information must be integrated with monitoring on the ground so that populations of different species and ecological communities can be effectively tracked. At present, in NSW, we have virtually no systematic monitoring that allows us such tracking to occur; aerial counts of kangaroos and high profile species, such as the mountain pygmy-possum, are perhaps the main exceptions. Opportunistic record keeping occurs, such as via Bionet, but monitoring otherwise is largely *ad hoc* and occurs as projects that are largely run by university students or NGOs. What we are endeavouring to emphasise is the urgent need for statutory support for a broad range of scientists, such as ecologists, taxonomists, specialists in insects, snails, bats and in fact, all the zoological disciplines, and all the fauna, to be engaged in the monitoring of our biodiversity.

4) Increase the inventory of biodiversity in state agencies. This will be of immense value in future decades, and many state agencies, including museums, can be involved. In fact, it is the diversity of researchers across agencies that will help propel new ideas and increase our options. This point has already been made by Byron *et al.* (2014). The question now being asked, has this occurred to the extent necessary to deal with the post-fire world?

Biodiversity provides critical green infrastructure, which delivers a wide range of ecosystem services. From the perspective and extensive knowledge base of the RZS NSW, such an inventory is vital and has not been started in any systematic way, except for a stocktake of vertebrate fauna that took place in 1992.

5) Greatly expand the research capacity of state agencies for wildlife studies, and require presentations and publication of the findings, irrespective of whether or not they reflect well on existing State or national policies.

6) Conduct an audit of what research and management has been/and is being conducted on our fauna in NSW, who has done the work, whether it be State agencies, universities or conservation groups (NGOs), who funded the work, what were the results and, as is the intent of audits, to make recommendations for improvement.



ToR 3: Responses to bushfires, particularly measures to control the spread of the fires and to protect life, property and the environment.

Because we were ill prepared at the State level for the bushfires, the focus for fauna moved very quickly to wildlife care and rehabilitation (e.g. *go fund me* for the Port Macquarie Koala Hospital raising over \$7M). Even though wildlife rescue and rehabilitation garnered significant resources and public attention, there was a lack of adequate process to identify and mobilise available experts in wildlife rescue and recovery, as well as those with specialised wildlife rescue equipment and appropriate licenses. While wildlife rehabilitation is an important and humane part of the response, this should not become the focus – indeed, rehabilitation of a few individuals of very few species has very little ecological effect.

The way forward needs to include more and better science; acquiring better data to be prepared for unexpected events; focus on biodiversity and ecological processes rather than just threatened species; ensure that human/property protection measures do not impact on biodiversity to the extent this is possible. A recent blueprint for a more informed ecological response to the bushfires has made these and other points in detail but, in particular, has emphasised the key role of science in guiding how we can better protect the environment against megafires in future (Dickman *et al.* 2020).

Concluding remarks

We again stress that for much of our biodiversity we do not have long-term studies against which to assess the impacts. While much of the press coverage during the recent fire season was on the most iconic Australian fauna, we have witnessed alterations of entire ecosystems and associated biota. Given the likelihood that the new norm is reduced rainfall and higher temperatures, will the period between these high intensity fires be sufficient to allow communities to recover and, if so, to what level? We need to be able to answer these questions. Among the many lessons learned is that we need to understand the impacts of both high and low intensity fires through research, including monitoring, and to reduce the



levels of land clearing. We need to acknowledge the need for systematic monitoring of biodiversity and fund it appropriately so that impacts and recovery from extreme events and other anthropogenic changes can be properly assessed.

The RZS NSW contends that we have the intellectual capacity and training in the State and the nation to conserve our fauna and faunal habitats through targeted programs of research and management. Such endeavours must be set up and undertaken so that we are ready to respond in an informed and adaptive manner to the inevitable next fire. It is imperative that we act upon these insights.

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