Personal submission to Senate Standing Committee on Environment and Communication:
The effectiveness of threatened species and ecological communities' protection in Australia

STATEMENT OF BACKGROUND:

Since February 2010, I have been undertaking full-time PhD research with the University of Melbourne (Department of Forest & Ecosystem Science) on the responses of invertebrate biodiversity to bushfire-induced habitat changes. Prior experience includes work on community nature conservation initiatives (in the UK, with a particular focus on "veteran trees" – trees that are of particular value as biodiversity habitat due to their age and senescent condition); environmental education roles; and work in the commercial sector to improve to minimise environmental impacts of product supply chains (particularly in relation to paper and other forest-origin materials). My undergraduate studies were at the University of Edinburgh: BSc in Ecological Science, with Honours in Forestry.

Views expressed in this document are my own, and should <u>not</u> be inferred as those of the University of Melbourne or any other institution or associated persons.

STATEMENT OF VALUES:

Australia's native species, threatened and non-threatened, collectively constitute a unique, irreplaceable and immensely valuable national asset. The intrinsic and aesthetic values of this asset are frequently cited, as are –increasingly – the commercial values: as a resource for the leisure/tourism sectors and (potentially) as a biochemical and genetic resource for the biotech, pharmaceutical and agricultural sectors. Other submissions to the Senate will no doubt expand on these points so I shall not dwell on them further. However, it would be remiss not to recognise in these opening remarks some of the most important values of all: the integral and crucial role of native biodiversity in indigenous heritage. Countless native species were, traditionally, essential for subsistence, health and culture. Additionally, many individual species held particular cultural value for particular groups, as 'totems' or as part of creation stories. That the native biodiversity inherited by modern Australia has shaped – and been shaped by – the cultures of the nation's first people, and cannot possibly be divorced from their cultural heritage, ought to be reason enough to afford a better respect for our threatened species and ecological communities.

On a personal level – I value Australian biodiversity as a source of fascination and pleasure, as a focus of my scientific research, and as a substantial part of what makes Australia so special. As this diversity deteriorates, bit by bit, Australia becomes less special.

RESPONSES TO TERMS OF REFERENCE:

In line with my own areas of experience, and as far as that experience allows, I will focus on the following areas within the enquiries terms of reference:

- Management of key threats to listed species and ecological communities
- Management of critical habitat
- Regulatory and funding arrangements
- Listing processes

MANAGEMENT OF KEY THREATS AND CRITICAL HABITATS:

Effective management of key threats and critical habitats is dependent upon three crucial pre-requisites: *Knowledge* of threatening processes (and how to manage their impact) and of critical habitats (and how they can be retained); *Application* of that knowledge; and *Capacity* to act effectively.

Knowledge:

Australia is endowed with a strong ecological research sector. However, there remain substantial gaps in our knowledge of threatening processes – gaps which, unless resolved, are likely to hinder effective management. For example, inappropriate fire regimes are recognised as a threat within the Commonwealth's *SPRAT* profiles for several listed species, and as a "threatening process" under Victoria's *Flora and Fauna Guarantee Act, 1988*. However, although a reasonable amount of research has been undertaken in relation to the fire ecology of Australian plant communities, much less peer-reviewed scientific knowledge is available on the relationships of *animal* species and assemblages with various (and varying) elements of the fire regime (Clarke 2008; MacHunter *et al.* 2009). Those hoping to identify what an "inappropriate" fire regime might be for threatened animal species, and how to manage it, are therefore attempting to do so in a data-deficient context. This unfortunate position is beginning to change, as several Australian institutions are now undertaking high-quality research programmes addressing aspects of faunal responses to fire. However, the task is substantial, and not all research being undertaken is necessarily focussed on listed species. Indeed, there is a case to be made for focussing at least some of the research effort onto non-threatened species, given that they also play important roles in ecosystems, and given that early intervention may prevent currently non-threatened species *becoming* threatened.

With regards knowledge on critical habitats for threatened species, information on habitat requirements for the more well studied species is available thanks to many years of effort by ecologists and natural historians. However, there are is substantial uncertainty about how these habitat requirements can continue to be met in an era of environmental change. Attempts to consider how climatic changes may impact biodiversity have begun (Williams *et al.* 2009), but are in their infancy. Other changes, such as the substantial increases in planned fire that are now being implemented in some jurisdictions, may also have implications that we cannot yet fully anticipate for critical habitat. For example, although we know that (in some circumstances) fire can destroy hollow trees (Haslem *et al.* 2012; Lindenmayer *et al.* 2012), and although we know that such trees are essential habitat for many Commonwealth- and State-listed threatened species, existing research on the effects of planned fire on these habitats is extremely limited and insufficient for broad-scale application (Parnaby *et al.* 2010).

Further development of high-quality scientific knowledge of how threatening processes and critical habitats can be managed adequately will require continued financial support for ecological research, and continued recruitment/retention of skilled ecological research staff and students.

Application:

Preventing the extinction of threatened species will require governments (Commonwealth, State and/or Municipality, as appropriate) to translate the best available knowledge, as it becomes available, into committed and timely action.

There is room for improvement in this regard. For example, although it is known that Victoria's 'Black Saturday' bushfires of February 2009 burnt over 40% of the forest reserves designated for the conservation of Leadbeater's Possum (*Gymnobelideus leadbeateri*) , rendering much of this reserve system unsuitable for that species for the foreseeable future, these substantially changed circumstances have not yet been reflected in the action plan for the species, or the forest management guidelines for the region in which it occurs, almost four years later. As a consequence, operational, regulatory and judicial decisions regarding the management of that species' habitat continue to be based on a strategy that may no longer be fit-for-purpose.

Committed and timely action, necessary to adequately conserve a threatened species, will incur costs (directly or indirectly). The willingness of governments to take such steps will therefore be a considerable factor in determining success. This is particularly the case for species whose range lies entirely (or mostly) within the public estate (such as the Leadbeater's Possum), and for species that occur on private land but require adequate protection from processes that governments are empowered to regulate (e.g. property development).

Capacity:

My experience with staff from various conservation-related governmental agencies has been overwhelmingly positive. I feel assured that the staff of those agencies are highly skilled, and enthusiastically committed to the task at hand. It is highly unfortunate that these agencies are currently facing severe financial and personnel pressures, because I feel confident that these agencies could achieve results that Australia could be incredibly proud of, if they were to remain well-resourced and well-staffed. Undertaking necessary management actions and regulatory processes will require governments to retain skilled staff (under manageable workloads) and provide adequate operational funding.

REGULATORY AND FUNDING ARRANGEMENTS:

Regulation

Senators will be fully aware that environmental regulation in Australia currently takes an almost 'bicameral' form, with the involvement of both Commonwealth and State, and that there has been discussion of replacing that arrangement with one in which States assume greater responsibility for a streamlined regulatory process. Although I understand the desire to improve the efficiency of bureaucratic processes, I share the concerns held by some that replacing the 'bicameral' system will remove an important check and balance within the system. It is not my intention here to disparage either the Commonwealth or State side of the current regulatory framework- I merely wish to suggest that good environmental decision-making probably benefits from the input of *both* tiers of government (Just as good decision-making in Parliament benefits from the input of both Senate and House).

Funding

The need to provide adequate funding for conservation management, and relevant ecological research, has already been alluded to. Field research and conservation can be very costly in Australia, even where extensive use is made of volunteers. Much of this cost arises as a function of geography: where species occur in remote, rugged areas, the vehicle costs alone can be substantial. My own experience suggests that even in comparatively accessible areas, such as Victoria's Otway Ranges, the need to make extensive use of 4-wheel-drive vehicles creates a substantial financial impost upon operating budgets. Numerous listed species, such as the Lord Howe Island stick insect (*Dryococelus australis*) and the Mala *(Lagorchestes hirsutus,* a small marsupuial also known as the Rufous hare-wallaby), exist in locations that are considerably more remote than the Otways!

Survey work (either for research or for the purposes of monitoring population trends), and practical actions to manage habitats and control threats, will therefore always carry some irreducible costs – if those activities are to be conducted at all. It would be a mistake to think that budgets for field conservation and ecological research can be reduced without affecting front line delivery.

LISTING PROCESSES:

It would be remiss for an ecologist currently research invertebrates (animals without backbones, e.g., insects, spiders, shellfish, corals) to fail to note that invertebrate species are disproportionately under-represented on the threatened species lists. The Australian Museum suggests that insects account for approximately 75% of all animal species (Australian Museum and Britton 2009), and yet they do not form a similar proportion of listed animal species: of animals recognised as "Endangered" under Commonwealth legislation, 126 are vertebrates (mammals, birds, reptiles, amphibians and fish) and only 17 are "other" (invertebrate) animals.

Although some invertebrate species are incredibly common and widespread, many are likely to be subject to similar threats as vertebrates. It is therefore likely that many Australian invertebrate species are threatened in a real sense, but not a legal sense (and therefore unprotected). A clear challenge is that listing processes (understandably) require a certain a degree of information to be available on a species, its distribution and ecology, population trends, etc. For many deserving species this is going to be an insurmountable challenge, especially given that many unique invertebrate life-forms have not yet been given a species name and described scientifically, let alone had their ecology, distribution and population trends evaluated. Invertebrate

biodiversity is so substantial that it is exceedingly improbable that such information will ever be available for all known invertebrate species in Australia.

It is therefore clear that the process of formally recognising some species as "threatened", and leaving all other species without legal protection, while possibly adequate for vertebrates, is wholly inadequate for invertebrates – i.e., for the overwhelming majority of animal species. Senate would do well to consider what legal protections and other government actions may help reduce the risk of losing the countless invertebrate species that may be falling through the gaps of existing biodiversity legislation. Ensuring better protection of a comprehensive and substantial representation of all vegetation types, especially those that are known to support a particularly great diversity of different invertebrate life-forms (e.g. tropical rainforests, coral reefs) may reduce losses a little, although not entirely given that some very localised species may well be missed by the reserve system. Ensuring that within managed landscapes (such as production forests) a proportion of habitat resources that are known to support unique and rich assemblages of invertebrates (e.g. fallen logs) are retained may also help- but again some species may be missed (especially those with very specialised requirements).

The key point to emphasise here is that the listing of species, and the conservation of those listed species, cannot credibly be seen as the only strategy for conserving threatened biodiversity: It is a start, but very far from an adequate end.

[*References on separate page*]

Andrew Heaver, 14th December 2012

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