



Australian Academy of Science

Submission to the Department of Environment and Primary Industries: Wonnangatta Valley Research Trial

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The proposed application should be refused permission to proceed because it will likely to have unacceptable adverse impacts on a National Heritage Place (as set out in EPBC Act 1999 Section 15B&15C) and unacceptable adverse impacts on Listed Threatened Species (Section 18&18A). The proposed application cannot deliver any net benefits, in either of these two specific areas, or more broadly cannot advance scientific knowledge or bushfire management. The proposed activities, as set out in the Experimental Design and other related documents, are scientifically flawed, and as a result is likely to have adverse impacts on a National Heritage Place and to Listed Threatened Species.

As a requirement of the EPBC Act, the Victorian government has been required to invite public comments on the preliminary documentation relating to its application to undertake a research trial on domestic cattle grazing in the Victorian Alps National Park. Only 10 working days¹ are being allowed for the public to view, and provide informed comment on, the documentation. These documents amount to over 750 pages of scientific, legal and ecological information. While time for due reading, consideration, review and consultation has not been afforded, the Academy has nevertheless attempted to review the documents in good faith to attempt to salvage scientific aspects of the process, and aid public engagement with the EPBC process.

This submission outlines three areas where the proposed program is likely to have an adverse impact contrary to the protections outlines in the EPBC Act (1999). It will have an adverse impact on:

1. the scientific heritage values of the Australian Alps National Park,
2. the biodiversity heritage values of the Australian Alps National Park,
3. the listed threatened species and communities in the Australian Alps National Park.

Furthermore, in addition to the above three points, we note in passing that the project design is currently flawed. It should specify in its design that the null hypothesis (p. 11) is that grazing is the inferior treatment. We also note that any experiment involving animals and field trials should be subject to an appropriate approval process by an appropriate animal ethics committee.

1 The proposed program will have an adverse impact on the scientific heritage values of the Australian Alps National Park

The proposed site to undertake the program lies within the Australian Alps National Park (AANP). The AANP is a National Heritage Place having been included on the National Heritage List. Under the EPBC Act (1999) activities that are likely to have an adverse impact on National Heritage Places are prohibited. A significant component of the AANP's outstanding heritage is its outstanding heritage

¹ This lack of opportunity for comment has been further compounded by the unavailability of the consultation webpage and supporting documents. The webpage and supporting documents inviting the public to comment was made unavailable on Friday 21 February 2014

value for scientific research, and this is set out in the official Commonwealth of Australia Gazette notice to list the AANP as a National Heritage Place. The notice states:

“The AANP has outstanding heritage value for the scientific research that has taken place since the 1830s, demonstrated by the density and continuity of scientific endeavour. Research sites within the AANP include those relating to botanical surveys, soil conservation exclosures, karst research, fauna research, meteorology, fire ecology plots, arboreta and glacial research sites.”

Commonwealth of Australia (2008)

The proposed program put forward by the Department of Environment and Primary Industries (DEPI) is likely to have adverse impacts on the AANP as a National Heritage Place because it will negatively impact on its heritage values for scientific research. This makes the proposed activities prohibited under the sections 15B and 15C of the Act. The primary reason why this is the case is that, whilst the trial purports to be a three-year scientific research trial², the proposed program set out by DEPI is not a scientifically credible program. A government department undertaking unscientific activities in the name of science or research is incompatible with the heritage values of the AANP.

1.1 The Experimental Design is unsatisfactory because it does not consider the existence of data from prior studies

The Experimental Design does not consider in its introduction, or in the development of the design, the existence of data from prior studies that would help proponents to estimate the terms within the models. This is of fundamental importance for the development of power calculations, measurement details and sample allocation. This is an unacceptable oversight and is scientifically indefensible, indeed debilitating to the whole proposed program. This can only be remedied through a thorough literature review.

Whilst no literature review has been undertaken, DEPI has submitted three select reports within its supplementary documentation without explanation of their relevance to the proposed trial. These documents are irrelevant to the proposed Experimental Design, and they have neither been reviewed nor had their relevance or influence on this proposed trial explained. It is unacceptable that relevant literature has not been consulted or incorporated into the Experimental Design. It is wholly unsatisfactory to ignore literature that is inconvenient to a particular project. The Experimental Design should have acknowledged the Williams et al. (2006) and the Williamson et al. (2013) studies, which show fire severity in grazed areas is not lower than in comparable ungrazed areas.

The commitment to a three year study severely limits considerations of power. The Experimental Design does not indicate how the design will be adjusted if the initial assessments conclude the study is underpowered. Previous research has shown that the effects of grazing on fire probability were equivocal, even after five years. However the proposed study lacks detail in how adjustments will be made. Any future approval to undertake this trial should be contingent on satisfactory results

² For example DEPI (2014) describe the program as a “...proposed three-year scientific research program, to be run by the Department of Environment and Primary Industries, will closely monitor and assess the effectiveness of using different combinations of livestock grazing and planned burning to reduce bushfire fuels in the Wonnangatta Valley.”

from assessments of power, and be approximated based on existing data, before any experimental work is undertaken.

1.2 The Experimental Design is unsatisfactory because its results cannot be replicated

The proposed study is for a single region and time period. The results of this study would only be relevant for that specific location and time period, and could not be extrapolated to other sites. The Background section of the document (Section 2, page 5) states that the purpose of the study is to improve the Department's understanding of bushfire management options on public land. This indicates that the proponents of the study expect to be able to extrapolate the results from this study to more general prescriptions or recommendations. However, the results generated through this Experimental Design could not be replicated, making any pseudo-replication of the proposed results beyond the specific trial sites invalid.

1.3 The Experimental Design is unsatisfactory because no rationale is provided for the trial

Both in the Experimental Design and in all the other documentation relating to this consultation, no scientific rationale has been provided as to why the trial grazing-program is required, including from the perspective of managing bushfires. A scientific trial needs a strong rationale, yet both the referral and supplementary document have not provided one. No biodiversity or nature conservation problem has been identified, and the explanation of a problem with bush fire fuel loads is not explained. A select number of prior reports are mentioned in the Referral Documentation as a way to try and justify the cattle trial, but they are neither discussed nor reviewed. Of the reports covering the 2003 and 2006-08 bushfires mentioned in the Referral Documentation, only the least comprehensive and least technical of these reports considered cattle grazing research as a potential way to reduce fuel loads (Nairn *et al* 2003). None of the other reports (such as Ellis *et al* 2004, Esplin 2003 *et al*) determined that livestock cattle grazing and reduced fire risk. None of the other reports recommend that further research is required in this area.

1.4 The Experimental Design is unsatisfactory because the results of the trial will not be subject to peer review

The Experimental Design states that the results from data analyses will be published annually for the duration of the trial. This is an inappropriate way to report the findings from the proposed trial. For the trial to be scientific, and for it to be viewed as valid research, the findings from the trial must be subject to rigorous peer review, preferably in a respected peer-reviewed scientific journal.

1.5 The title and purpose of the Experimental Design are misleading

The Department of Environment and Primary Industries (DEPI) is proposing to undertake an *Investigation of bushfire fuel management in the Wonnangatta Valley using strategic grazing of domestic livestock*, describing this as a 'three-year scientific program'. The nature of the proposed actions by DEPI are still unclear because the Experimental Design document (within the Supplementary Documentation) has been labelled as a draft on the inside of the document, and as a discussion document on the front page. As such DEPI have at this stage put forward a series of intended actions in draft form only, and for discussion. This makes a positive Ministerial decision about the compliance of the proposed trial with the Act impossible to determine at this stage, since an assessment of the actual proposed actions is not being undertaken. Furthermore, the presentation of the documents in this 'draft' form removes the right of persons to comment on the

final proposed program and its likely impacts on National Heritage Places and Listed Threatened Species and its compliance with the EPBC Act.

2 The proposed program will have an adverse impact on the biodiversity heritage values of the Australian Alps National Park

Under the EPBC Act (1999) activities that are likely to have an adverse impact on National Heritage Places are prohibited. Another significant component of the AANP's outstanding heritage is its entire biological heritage of the region, as set out in the official Commonwealth of Australia Gazette notice to list the AANP as a National Heritage Place. The notice says:

“The Alps are one of eleven sites recognised in Australia by the IUCN as a major world centre of plant diversity”

Commonwealth of Australia (2008)

The effect of the inclusion of the biological heritage of the region within the AANP's listing as a National Heritage Place means that **all communities and species within AANP of flora and fauna are subject to protection under the EPBC Act within the AANP** (covered by sections 15B & 15C, as they have been deemed a significant part of its National Heritage), and not just threatened species.

Previous scientific literature, which has been disregarded by the DEPI, shows the potential and actual effects of cattle grazing on soils and vegetation in Australian high mountain catchments (for example see Williams et al. 2014; Australian Academy of Science 1957, Costin 1954; van Rees and Hutson 1983; Williams and Ashton 1987b, 1988; Williams 1990). The research shows that domestic livestock graze and trample vegetation, and that this process results in the removal of vegetation cover, leaving bare ground susceptible to soil erosion. Furthermore, because the domestic cattle graze selectively, they alter the composition of plant communities and can introduce and spread weeds. This means that the proposed program has an unacceptably high risk of damaging the biological heritage of the AANP, through removal of vegetation cover, erosion of soil, and introduction and spread of weeds associated with domestic cattle grazing, which will likely have an impact on existing flora and fauna. The latter of these adverse impacts is likely to affect both the proposed trial site in the AANP, and also beyond because there is no way to confine the impact of the spread of seeds and resultant weeds to within the trial site.

There has been no field-based assessment of the flora and fauna within the proposed sites. The *desktop* flora and fauna assessment documents that were submitted in the referral documentation do not provide sufficient information to make a determination on the impact of the proposal on any flora and fauna, including listed threatened species (See the Referral document - Ecology and Heritage Partners 2011). This inadequate assessment was undertaken in July 2011, two and a half years ago, using data of unspecified age and accuracy. The report authors state that the:

“assessment was undertaken over a short period of time (2 weeks)... [and] this has resulted in a limited examination of historical records, in particular records held by private individuals and companies, and other data that is not in the public domain”

Ecology and Heritage Partners (2011), page 13-14 (Referral document)

Given the potential impact of cattle grazing as shown by the *scientific evidence* (including impact on the areas outlined in sections 15B+15C and sections 18+18A in the EPBC Act), it is alarming that only a rushed two week desktop assessment of flora and fauna has taken place, and that in the intervening 32 months DEPI has not undertaken a field-based assessment. The absence of an

adequate field survey disregards the research on the need to undertake adequate survey effort (Garrard et al. 2008; Wintle et al. 2012) before proceeding with such a project.

The potential worth of the Ecology and Heritage Partners desktop report with regards to potential impact on flora and fauna, including threatened species, is very low. In the report's own words it states that "Overall, however it [the desktop survey] is likely to have led to an underestimation of both the numbers and types of significant species within the study areas". The conclusion of the report states that the proposed trial is unlikely to have significant impacts on EPBC Act listed flora, fauna and ecology. However, this should be rejected when assessing the trial, since this claim was not credible two and half years ago, and moreover, takes no account of any changes in flora and fauna representation in the intervening time.

Given the inadequate desktop flora and fauna survey, and the absence of a field survey, DEPI have not provided any assurances that this proposed trial will not have an adverse impact on biodiversity heritage values of the AANP (afforded protection under sections 15B+15C of the EPBC Act 1999), or listed threatened species (afforded protection under sections 18+18A of the Act).

In contrast, the peer-reviewed scientific literature shows that cattle grazing in Alpine National Parks has an adverse impact on native flora and fauna. Therefore this proposal should be rejected on the grounds that it is likely to have an adverse impact on the biodiversity of AANP flora and fauna, contrary to the protections for being within this National Heritage Place, and on the grounds it is likely to have an adverse impact on the flora and fauna on the List of Threatened Species within the park.

3 The proposed program will have an adverse impact the listed threatened species and communities in the Australian Alps National Park

The risk of impact of the proposed trial extends beyond adversely affecting biodiversity heritage values of the AANP, to flora and fauna on the List of Threatened Species and Communities. All of the above points outlined in section two with regard to the absence of a field survey apply to the threatened listed species discussed below. DEPI do not have an understanding of the range and extent of threatened species in the proposed area, and cannot provide any assurance as to whether the proposed trial will harm them. On the contrary, the scientific evidence shows that it will have an adverse impact on listed threatened species. Australia already has the highest rate of fauna extinctions in any developed country and should not be undertaking activities that will make this situation even worse.

This next section outlines just a few of the specific threatened listed species and communities which are likely to adversely impacted on by the proposed trial.

The peer-reviewed scientific literature shows that selective grazing and trampling by domestic cattle can threaten listed species and communities. The following listed threatened species are at risk of impact from this trial.

3.1 Adverse impact of the proposed trial on listed threatened communities

The proposed trial should be rejected because it is likely to have an adverse effect on the following listed threatened communities contrary to section 18+18A of the EPBC Act 1999.

3.1.1 Alpine *Sphagnum* Bog

The proposed trial should be rejected because it is likely to have an adverse effect on the threatened ecological community Alpine *Sphagnum* Bog, contrary to the protection it is afforded under the EPBC Act (Department of Environment 2009)³. There is 1 ha of Alpine *Sphagnum* Bog within the perimeter of the proposed trial. Scientific evidence shows that cattle grazing has a deleterious effect on *Sphagnum* Bog (see Williams et al 2014).

3.2 Adverse impact of the proposed trial on listed threatened flora and fauna

3.2.1 *Themeda* grassland habitat

The proposed trial should be rejected because it is likely to have an adverse effect on the listed threatened flora Pale Golden Moth (*Diuris ochroma*), contrary to the protection it is afforded under the EPBC Act (Department of the Environment 2009a). *Diuris ochroma* will be threatened through this trial in two ways. First, domestic cattle stock may eat the orchid while grazing. Second, *Themeda* grassland, which is essential habitat for *Diuris ochroma*, has been shown to be negatively affected by domestic cattle grazing (Dell'Acqua et al. 2013). The selective grazing of *Themeda* by domestic cattle was demonstrated in the 2010-11 grazing trial in the Alpine National Park, and this adverse impact is documented in the URS (2011) report (provided as a Supplementary Document by DEPI). However, how this adverse impact, and its consequent impact on *Diuris ochroma*, would be managed is not discussed or mentioned in the Experimental Design.

3.2.2 *Pseudomys fumeus*

The proposed trial should be rejected because there is an unknown (but non-zero) risk that it is likely to have an adverse effect on the listed threatened native species Smoky Mouse (*Pseudomys fumeus*) through trampling and grazing, contrary to the protection it is afforded under the EPBC Act (Department of Environment 2009a).

3.3 Adverse impacts of the proposed trial on other listed threatened species

The proposed trial should be rejected because it is likely that it will have an adverse impact on threatened species in addition to those already mentioned. Because there has been no field survey, and only a very limited and now out of date desktop survey based on historical data of unknown age, there is a risk that the proposed trial will impact on other threatened species that are afforded protection under the EPBC Act.

³ EPBC Act List of Threatened Ecological Communities - <http://www.environment.gov.au/cgi-bin/sprat/public/publiclookupcommunities.pl>

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