

Senate Standing Committees on Environment and Communications

Committee Secretary

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By:

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Submission to Inquiry into the effectiveness of threatened species and ecological communities' protection in Australia, including:

- (a) management of key threats to listed species and ecological communities;**
- (b) development and implementation of recovery plans;**
- (c) management of critical habitat across all land tenures;**
- (d) regulatory and funding arrangements at all levels of government;**
- (e) timeliness and risk management within the listings processes;**
- (f) the historical record of state and territory governments on these matters; and**
- (g) any other related matter.**

This submission relates to some extent each of the elements listed for inquiry by the Committee, but illustrates particularly items (a), (b) and (c).

The submission draws upon the experience of two examples of work directed at recovery of critically endangered box-gum grassy woodland. Each illustrates some principles or elements that can be considered to be essential to guide the generation,

transfer and implementation of knowledge required for recovery actions. These are:

- Partnerships between the key knowledge/research generators and public and private landholders on whose land recovery actions are to be undertaken.
- Secure land tenure for locations of long-term monitoring and research.
- Funding for innovative approaches to monitoring and research directed at recovery of endangered ecological communities at the landscape scale.
- Mechanisms or processes for knowledge transfer and changed management by public and private landholders.

We have also uploaded a number of supporting documents cited in this submission. If the Committee wishes to see at first hand the ecological experiment at Mulligans Flat and Goorooyarroo referred to in this submission, or wants further information about any aspect of the projects referred to, a visit can be readily arranged, given the proximity of Mulligans Flat to Parliament House, Canberra.

The Mulligans Flat – Goorooyarroo Woodland Experiment

The submission is informed directly by a ‘ground-breaking’ research partnership between the ANU (Fenner School of Environment and Society) and the ACT Government through the ACT Parks and Conservation Service (Territory and Municipal Services Directorate and Environment and Sustainable Development Directorate). The research is funded by Australian Research Council Linkage grants (LP0561817, LP110100126) and cash and/or in-kind from the research partners and CSIRO and the James Hutton Institute (Scotland) have also joined the research team.

The partnership and funding is directed into a long-term ecological experiment that is integrating restoration and research to provide evidence for sound conservation management (www.mfgowoodlandexperiment.org.au, see also the uploaded flyers).

The Mulligans Flat–Goorooyarroo Woodland Experiment is located in the Mulligans Flat and Goorooyarroo nature reserves in northern ACT.

The aim of the experiment is to find ways of improving critically endangered box-gum grassy woodland for biodiversity. It has been designed in collaboration with

expert statisticians, and provides the ideal experimental framework for investigating ecological communities across multiple spatial scales (Manning et al. 2011).

A set of key ecosystem manipulations have been chosen to investigate how to reverse the decline in woodland biodiversity. These manipulations are: (i) *the addition of 2000 tonnes of dead wood to increase structural complexity (four treatments: (a) zero, (b) 20 tonnes in dispersed pattern, (c) 20 tonnes in clumped pattern, (d) 40 tonnes;* (ii) *the exclusion of kangaroos to reduce grazing pressure;* (iii) *the application of fire as a key disturbance (twenty four one-hectare sites in Goorooyarroo);* (iv) *exclusion of digging effects of reintroduced bettongs (twelve one-hectare sites in Mulligans Flat).*

The partnership with the ACT Government was critical in successfully planning and implementing the experimental treatments (Manning et al. 2011; Shorthouse et al. 2012). The manipulations have been applied in a design that maximises the accuracy with which the effects and interactions can be estimated (Manning et al. 2011). Response variables include: birds, small mammals (Manning et al. 2011), reptiles (Manning et al. 2013), invertebrates (Barton et al. 2009; 2010) plants (McIntyre et al. 2010), soils, soil microbes and fungi.

Emerging out of the research partnership with the ACT Government was the idea of building a predator-proof sanctuary at Mulligans Flat (www.mulligansflat.org.au). This resulted in the construction of a 11.5 km predator exclusion fence that has provided a unique opportunity to examine the effects of the reintroduction of a locally extinct ecosystem engineer, the Tasmanian bettong (*Bettongia gaimardi*) on ecosystem restoration (media releases and videos on the translocation can be found at (www.mfgowoodlandexperiment.org.au). The successful translocation of bettongs from Tasmania to the ACT involved many staff from the partners organizations and the Tasmanian Government. The research team, including two PhD researchers, is asking two questions:

- (1) how does the reintroduction of an ecosystem engineer affect the woodland ecosystem and the restoration process?
- (2) how do the current state of the ecosystem and management treatments affect bettongs?

The experimental framework has attracted further collaboration, and the site is developing into an ‘outdoor laboratory’ for woodland research. In the future, further reintroductions and monitoring of the ecosystem effects of treatments will help inform adaptive management and restoration of box-gum grassy woodlands in the long-term

The Greater Goorooyarroo Project

Complementing the *Mulligans Flat–Goorooyarroo Woodland Experiment* is a bold cross-border box-gum woodland restoration initiative, the ‘Greater Goorooyarroo’ project, that has received initial funding through the Government’s Clean energy Future Biodiversity Fund (see Goorooyarroo - Flyer_20Sept12). This project, focussed in northern ACT and neighbouring NSW, aims to consolidate and connect the largest remaining box-gum grassy woodland landscape in Australia (60,000 ha), enhancing a biodiverse and carbon storing landscape, resilient to climate change. Key elements of the project include the Mulligans Flat and Goorooyarroo nature reserves and the *Mulligans Flat–Goorooyarroo Woodland Experiment*. Diverse stakeholders in the ACT region have met to develop a shared restoration vision, that will be implemented through targeted on-ground restoration and regeneration works that harness proven and effective methods, and community capacities. The project will directly tackle key threats to the critically endangered box-gum grassy woodland and will be an exemplar of innovative cross-border, cross-tenure and community engagement approaches. It will encompass the best conservation and carbon storage outcomes for this large endangered woodland landscape and its threatened species.