Bettongs as Ecosystem Engineers - learnings from the Mulligans Flat-Goorooyarroo Woodland Experiment

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The Mulligans Flat-Goorooyarroo Woodland Experiment is located near Canberra in south-eastern Australia. This 'outdoor laboratory' provides an opportunity to trial a range of restoration techniques to inform the conservation of critically endangered box-gum grassy woodlands, including the reintroduction of several locally extinct species within a predator-proof sanctuary.

Digging mammals such as bettongs, bandicoots and bilbies are known as ecosystem engineers because they modify habitats and resource availability for other species. Once widespread across Australia, the loss of many of these species is believed to have contributed to the decline of Australian ecosystems. Since the successful reintroduction of eastern bettongs (Bettongia gaimardi) to Mulligans Flat Sanctuary in 2012, their digging behaviour has had a marked effect on ecosystem processes in the reserve. The bettongs have been estimated to dig around 200 pits per individual per night, adding up to 3 tonnes of soil turnover each year. The digs influence soil nutrients, temperature and moisture levels, and provide microsites for seed germination.

While the positive effects of ecosystem engineers are widely documented, possible negative impacts must also be considered. Since the reintroduction of the bettongs, herbivory rates of up to 20% have been observed for some species of native forbs, particularly the early nancy (Wurmbea dioica). Understanding these complex ecological relationships will have implications for management of bettongs within the reserve, as well as future reintroductions.