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Managing habitat for endangered species: Carnaby's black-cockatoo, food resources and time since last fire

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Habitat loss is often the primary factor contributing to a decline in the range or abundance of threatened species. Management of threatened or endangered species is often focused on acquisition of remnant habitat, with little focus on habitat quality, in terms of resource provisioning. We investigated the influence of time since last fire on food resources in banksia woodlands for the endangered Carnaby's black-cockatoo (*Calyptorhynchus latirostris*) in southwest Western Australia.

Carnaby's black-cockatoo is an endangered species, endemic to southwest WA. Since the 1950s, the range of Carnaby's Black-Cockatoo has contracted by more than 30%, the species has disappeared from more than a third of its former breeding range, and the population is estimated to have halved (Garnett and Crowley 2000). These dramatic reductions in range and number have warranted the species to be listed as 'Threatened' under State (*Wildlife Conservation Act 1950*) and Commonwealth (*Environment Protection and Biodiversity Conservation Act*) legislation

In ecosystems where fire is a significant ecological process, burning is an important management tool, with prescribed burning employed to achieve specific land management objectives, most commonly to reduce fuel loads. The banksia woodlands of the Swan Coastal Plain are one such ecosystem. Increased knowledge on the affects of time-since-fire on biodiversity attributes will be essential for informed management decisions in banksia woodland. We investigate the influence of time since last fire on food resources for the endangered Carnaby's black-cockatoo in banksia woodlands.

Methods & Results

We measured tree density and fruit productivity (number of unopened banksia cones) of two dominant banksia species (*Banksia attenuata* and *B. menziesii*) in 39 sites with varying fire ages.

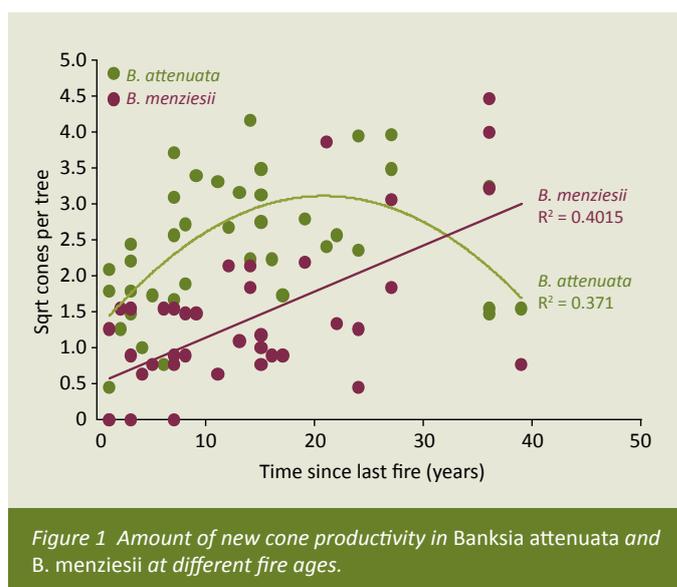


Figure 1 Amount of new cone productivity in *Banksia attenuata* and *B. menziesii* at different fire ages.

Time since fire strongly influenced the fruit productivity of both banksia species (Figure 1). Maximum cone productivity for *B. attenuata* was observed in sites approximately 20 years since last fire. In contrast, maximum cone productivity in *B. menziesii* was observed in sites approximately 36 years since last fire.

Using existing information on the calorific content of banksia seeds and the field metabolic rate of Carnaby's black cockatoo (Cooper *et al.* 2002), combined with our tree density and cone productivity data, we estimated the number of birds that could be supported per 100 hectare of banksia woodlands of different fire ages. Recently-burnt habitat (<6 years since last fire) could support the least number of birds (Figure 2). The greatest number of birds could be supported in sites aged between 20–29 years since last fire (Figure 2).



Carnaby's black cockatoo (*Calyptorhynchus latirostris*) pair feeding on *Banksia attenuata*. Male is on the left (with red eye-ring and dark bill) and female is on the right (with white cheek patch and pale bill).

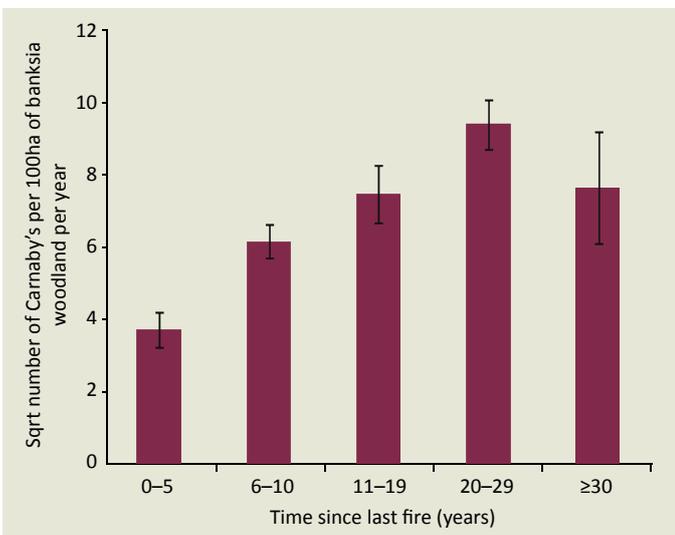
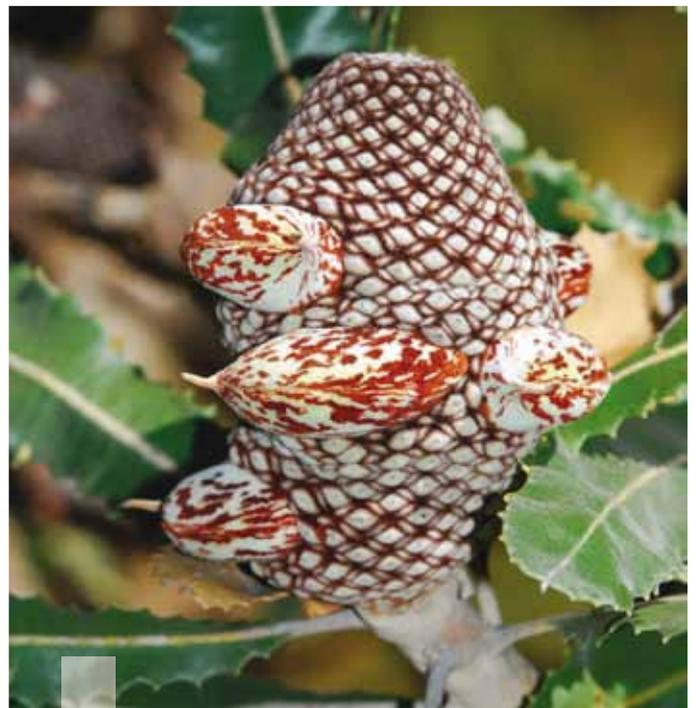


Figure 2 The predicted number of Carnaby's black cockatoos that could be supported in different fire-aged banksia woodland.



Banksia menziesii fruit.

Conclusions & Recommendations

Fire is often used in conservation reserves as a management tool to reduce fuel loads and reduce the risk of extensive wildfire and ensuring safety of human lives and infrastructure. However for plants that take a long time to mature and fruit (such as *Banksia* spp.), fire interval also has significant impact on fruiting resources.

Time since last fire influences fruit productivity in *B. attenuata* and *B. menziesii*, two dominant species of banksia woodlands on the Swan Coastal Plain. Fire management of banksia woodlands will therefore be an important component for ensuring adequate food resources for animals that depend on these fruiting resources, such as the endangered Carnaby's black cockatoo. Prescribed burning regimes aimed at reducing wildfire risk will also need to protect some areas of long-unburnt vegetation to protect biodiversity values of these woodlands.

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References

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- Cooper, C.E., Withers, P.C., Mawson, P.R., Bradshaw, S.D., Prince, J. and Robertson, H. (2002) Metabolic ecology of cockatoos in the south-west of Western Australia. *Australian Journal of Zoology*, 50, 67-76.



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