

# An ecological case against thinning of the karri forest

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## Introduction

Thinning is a silvicultural practice used in plantations and native forests to improve the growth of retained trees. Thinning can be commercial (i.e., logs are removed for sale), or non-commercial (i.e., funding is provided). It is sometimes said to be used to ‘promote forest health and resilience and support biodiversity conservation’, though the ecological rationale for this claim should always be associated with valid and reliable scientific evidence (18). It is inappropriate to use ‘forest health’ as the basis for a claim where social or commercial considerations are the driver.

Because of historical ecological damage of logging in the karri forest (i.e., compaction, spread and intensification of pest flora, fauna and fungal pathogens, industry overreach leading to unsustainable timber production, changes to structure, composition, and function – 5, 15, 22), timber production is scheduled to cease from all native forests, including karri, by 2024. However, the draft proposed Forest Management Plan 2024-2033 proposes commercial thinning, for which the Forest Products Commission (FPC) will provide contract management, planning and operational support. Thus, commercial logging will not have ended in the karri forest and many of the reasons why logging is to cease will remain, such that controversy is likely to continue.

## Ecological considerations

Ten ecological considerations are listed below against which commercial, economic, or social considerations should be weighed.

- 1. Capacity to self-thin** (3,4). Even as eucalypts go, karri is light demanding and is strongly self-thinning. Any small enhancement of growth rates is limited and unnecessary for the persistence and growth of the forest and may be a considerable disadvantage in a warming and drying environment.
- 2. Water yields** (18). Streamflow is not increased by thinning except where it is carried out very intensively and then only for a short time due to rapid regrowth. It is inappropriate to thin karri forest for streamflow benefits, and climate change considerations advise against it.
- 3. Soil degradation** (2, 15). Vehicle traffic causes soil compaction. It increases soil bulk density; decreases porosity and water infiltration; and accelerates erosion in the heavy clay-loam soils of the karri forest, particularly when soils are moist, resulting in persistent negative impacts on tree growth and forest health, which would be exacerbated in warming and drying conditions.
- 4. Disturbance impacts on wildlife** (15, 20, 22). Thinning provides passage for pest fauna such as foxes, and the soil disturbance from access leads to dispersal and establishment sites for weeds already established (e.g., blackberry and several eastern Australian eucalypts). Although both weeds and pests can be managed, they are almost impossible to eradicate, requiring constant costly management.
- 5. Spread and intensification of pathogens** (6,14). Fungal (e.g., *Armillaria*) and other pathogens (e.g., *Phytophthora*) are spread by thinning. Again, neither can readily be eradicated, requiring constant costly management.
- 6. Carbon stocks** (7,8,9). Release of stored carbon occurs with thinning, not only from the trees removed, but also from the drying effects of the disturbance. The carbon in regrowth is stored if it is

not thinned, and the rate of accumulation increases with tree size. The carbon in logging debris is released when the thinned coupe is burned, or products (such as woodchips) used.

7. **Fire considerations** (5, 13, 17). Flammability of the forest is increased by the openings formed by access and tree removal. Higher wind speeds and air temperatures, lower humidity, and lower moisture content in the fuel itself, and fluctuations are all associated with thinning, and all lead to increased fire risk and intensity. 'Fuel load' is also increased by thinning of regrowth by leaving logging debris or dead trees in the forest. Young karri regrowth requires fire exclusion for up to 25 years before it becomes tolerant to fire.
8. **Understorey vegetation characteristics** (17,19,20). These characteristics change following thinning because of changes to the microclimate, specially increased light so that thinning followed by burning results in a dense stand of flammable 'fire weeds', native and introduced, that have a higher flammability than the understorey that has been replaced.
9. **Presence of aggressive woody weeds** (20,21). The establishment and expansion of woody weeds (e.g., eastern Australian eucalypts, *E. muelleriana* and *E. seiberiana*), introduced by the WA Forests Department within regenerating karri clear-fell coupes and abandoned townsites, suggest urgent removal. This is an example of where thinning could be used to 'promote forest health and resilience and support biodiversity conservation'. These two species will be favoured by climate change impacts already occurring in the region (23).
10. **Unsustainability of commercial industrial operations** (5,11). These operations in the karri forest have always been unsustainable (the reason logging has been stopped) and have responded more to market forces rather than to regulation. There is no reason to assume that thinning in the karri forest would be any different, given no change to the regulatory arrangements.

Given that the karri forest has been recognised as worthy of conserving for its ecological values, it is necessary to question why thinning of karri is now considered appropriate from an ecological viewpoint.

## Conclusion

Commercial thinning is a form of logging that does not provide ecological benefits, and no thinning should be practised in native forest (except to remove woody weeds) until scientifically valid and reliable evidence has been provided to the contrary.

The term 'ecological thinning' is inappropriate as the addition of the term 'ecological' does not add any meaning to the term 'thinning' (1). Claims of thinning for forest health need to be substantiated, based on evidence before being generally used. It is more appropriate to use the terms 'commercial' or 'non-commercial' thinning as these terms describe the basis for the operation.

It is appropriate to consider socio-economic benefits (e.g., employment etc.) in management plans, but these need to be stated explicitly and areas likely to be controversial should not be sold as ecological benefits, unless these benefits are clearly demonstrated.

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