

## Attachment 7

### An ecological case against thinning of the jarrah 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 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 (22,23). It is disingenuous 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 jarrah 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 – 4), timber production is scheduled to cease from all native forests, including jarrah, 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 jarrah forest, and many of the reasons why logging is to cease will remain so 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** (15, 16). Thinning takes place naturally in jarrah although it takes a long time (100 years or more). This is a relatively short period in the life of a jarrah tree. 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 (see below).
- 2. Water yields** (11). Despite attempts to demonstrate impacts of thinning on water yields (the Wungong Trial), no evidence has yet been provided to show that thinning for the purpose of improving streamflow for ecosystem health has been successful (13). Streamflow is not increased by thinning in jarrah forest except where it is carried out so intensively as to be ecologically devastating and then only for a short time due to rapid regrowth. It is inappropriate to thin jarrah forest for streamflow benefits, and climate change considerations advise against it (see below).
- 3. Water table considerations** (11, 12, 14, 17, 26). It is very highly likely that water tables in several areas of the jarrah forest of the Yilgarn Craton (but not the Blackwood Plateau) will reach bedrock during the present decade, and soon thereafter elsewhere. No amount of thinning will prevent this. Further, trees will die as a result, whether thinning is carried out or not. It is therefore appropriate to retain cover to minimise the drying and desiccating impacts of this climate change effect for as long as possible. In the medium to longer term, the jarrah forest will more closely resemble an open woodland or mallee environment, regardless of thinning. However, not thinning will ensure that it retains biodiversity levels longer than it would by thinning (which will speed and exacerbate inevitable change).

4. **Soil degradation** (3, 10, 12, 19). Vehicle traffic causes soil compaction. It increases soil bulk density; decreases porosity and water infiltration and is damaging to the microbiota in old landscapes such as the substrate of the jarrah forest. This results in persistent negative impacts on tree growth and forest health, which would be exacerbated in warming and drying conditions.
5. **Disturbance impacts on wildlife** (12, 18). Thinning provides passage for pest fauna such as foxes and cats, and the soil disturbance from access leads to dispersal and establishment sites for weeds. Although both weeds and pests can be managed, they are almost impossible to eradicate, requiring constant costly management.
6. **Spread and intensification of pathogens** (20, 24). Pathogens such as canker and various species of *Phytophthora* are widespread in the jarrah forest. Though jarrah is not highly susceptible to *Phytophthora* dieback, many species of the jarrah forest are highly susceptible. Further, *Phytophthora* slows growth rates in less susceptible species. Vehicle movement spreads and intensifies *Phytophthora*, and no amount of 'quarantine' or 'disease management actions' can prevent it. Thinning tends to be extensive, providing maximum opportunity to spread the pathogen. Pathogens such as *Phytophthora* cannot be eradicated, requiring constant costly management. While drying will potentially limit impacts of *Phytophthora*, expected seasonality changes in rainfall (i.e., more in summer) may well exacerbate it.
7. **Carbon stocks** (5, 6, 7, 25). 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 firewood) used. While standing dead trees have negative visual amenity, there is a need to change public perception of standing dead trees (and the general vision of a tidy forest being most desirable). Improved visual amenity is given as a co-benefit of ecological thinning.
8. **Fire considerations** (9, 21, 25). 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 on the forest floor. It is far better to retain dead trees standing from a fuel load perspective than leaving them on the forest floor (and better from a carbon stock viewpoint to retain them on site than removing them).
9. **Presence of introduced woody weeds** (14). The establishment of woody weeds (e.g., pines and several eastern Australian eucalypts) in rehabilitated bauxite pits scattered throughout the northern jarrah forest requires increased attention to be paid in these transformed ecosystems. Recognising the transformed nature of these pits urges management that will provide most benefit or cause least damage to the surrounding jarrah forest (i.e., by removing them). Further, the presence of these introduced woody weeds in jarrah forest surrounding these pits, associated with the Forest Improvement and Rehabilitation Scheme (FIRS) of the 1980s-1990s, necessitates removal. In this case, removal (i.e., thinning) would provide a tangible benefit to the forest, and could be used to 'promote forest health and resilience and support biodiversity conservation'.
10. **Unsustainability of commercial industrial operations** (4.8). Logging operations in the jarrah forest have always been unsustainable (the reason logging has been stopped) and have always responded more to market forces than to regulation. There is no reason to assume that thinning in the jarrah forest would be any different, given no change to the regulatory arrangements. Thus, the long-term trend of running down the timber resource to smaller size classes and lower biomass will be exacerbated by continuing to remove forest resources from site.

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

## Conclusion

According to a report prepared for the draft FMP (2), the benefits of ecological thinning include reduced moisture stress in forest stands; increased soil moisture; increased resilience to drought, heatwave events and bushfire; faster growth of remaining trees to maturity, reducing the time required to develop suitable habitat such as hollows for fauna; and long-term carbon storage. These alleged benefits are not demonstrable, and reviews (e.g., 18) have shown the contrary, particularly under drying and warming climatic conditions. In both the report and the draft proposed FMP, the word 'may' occurs over a hundred times. This indicates that the authors do not know whether the alleged benefits will be achieved and are just hoping that they will.

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 applied. 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 operations likely to be controversial should not be sold as ecological benefits unless these benefits are clearly demonstrated.

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