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The Role of Forest History in the Future Management of Native Forest Reserves

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Introduction

This paper presents a dynamic form of forest history by considering the past, present and options for the future management of an area of native forest now reserved for conservation of biodiversity. The sequence of aerial photographs from 1937 and human history research clearly demonstrate that the area is predominantly regrowth from extensive early clearing. The small diameter of the trees and absence of tree hollows creates a long-term management issue for sustaining biodiversity as Australia has the largest number of faunal species dependent upon tree hollows.

The History

In South Australia the Woods and Forests Department was formed in 1882 in recognition of a long-term need for a sustainable supply of timber for the State, which was founded in 1836. Extensive written reports and photographs are available about the land that was being managed from its long history. Much information is available from the Department's Annual Reports. These are available from the State Library of South Australia.

South Australia's limited native forests were exploited for: railway sleepers, fuel wood, fence posts and rails, building timber, roofing shingles and large poles for wharves and bridges. An increasing scarcity of native timber was ameliorated by the commencement of a plantation forest industry in 1876. From around 1900 the plantations were based primarily on *Pinus radiata*. Extensive areas of native forest were cleared for the establishment of these plantations and numerous other agricultural industries.

From 1969 the Department commenced reserving selected remnants of the original vegetation. Some of these are now considered to be of national significance, such as the most Westerly occurrence of the Snow Gum *Eucalyptus pauciflora* and its isolated populations of the Yellow-bellied glider *Petaurus australis*, which co-occur in the Snow Gum Native Forest Reserve approximately 20 km South-East of Mount Gambier. In the early 1980s such areas became legally protected under the *Forestry Act 1950*. This status is similar to areas reserved under the *National Parks and Wildlife Act 1972*. Detailed Management Plans have been prepared for Native Forest Reserves and are available from ForestrySA's website (www.forestry.sa.gov.au). The preparation of these management plans involved extensive research into the land use history of each area.

The area of focus for this paper is Grundy Lane Native Forest Reserve (288.9 ha), located on Grundy Lane approximately 10km North of Mount Gambier and 2km West of Telford Scrub Conservation Park

on the same road. The locality is known as Wandilo. The following history of this native forest reserve is from Grundy Lane Native Forest Reserve Management Plan (2000).

Section 3.2.2 Timber Production

Original and regrowth native forest was exploited from the time of European settlement to produce a range of timber products. Being relatively close to Mount Gambier, these native forests provided round, split and sawn building timber, strainers, posts, rails, palings and droppers for fencing; firewood for bakers ovens and domestic use; and fuelwood and charcoal for local industries. "On areas other than those felled by the unemployed near Wandilo, extensive cutting in the past for timber including firewood, has resulted in a very mangled appearance to the forest, and it is reasonable to assume that the best sawlog areas have been felled long ago." (N. Hall, Survey of Unplanted Lands 1948). The history of timber cutting in this district differs significantly from all other areas, because apart from part of Section 130 at Grundys Lane NFR, the balance of that Reserve and the existing native forest at Wandilo NFR was cleared in 1933. This clearfelling work was carried out in the Great Depression as part of a make work scheme for unemployed men from Adelaide who were accommodated in tents near the Wandilo railway siding. The intention may have been to plant those cleared areas with pines, that objective was not realised at the time.

At least one hardwood sawmill was known to operate in close proximity to the area now reserved at Wandilo. One of the long-term consequences of cutting down all the trees at Wandilo and Grundys Lane NFRs in 1933 was the elimination of all hollow bearing larger trees, and the impediment to future normal hollow formation, due to the regrowth of a relatively young even-age multi-stemmed tree stand made up of individuals with small diameter stems. Measurements of trees in non-replicated transects in Grundys Lane NFR and in Telford Scrub Conservation Park show that there may be twice as many stems per hectare at Grundys Lane NFR having an average diameter of about half that of the same species at Telford Scrub CP which was not clear cut.

During a historical research project conducted by the author in 2012, a sequence of photographs was discovered (Figures 1 and 2), that visually show how the area was "extensively cleared to bare ground" from the obvious open patches and logging tracks showing as white in the previously unknown 1937 black and white photograph. It is also interesting to note that just within the photographs and north of the cadastral boundary being shown, particularly in the extreme north-eastern corner, are some large-diameter remnant trees that are still present today and so have never been cleared. The value of this area and Telford Scrub Conservation Park is that it allows a direct comparison of the size (diameter), presence of hollows, spacing and stocking of these areas with the sites in Grundy Lane Native Forest Reserve that were cleared in 1933 – some 82 years ago. In an unpublished study of *E. obliqua* in the Mount Lofty Ranges, the author found hollows did not occur in trees less than 40cms in diameter and that these were, as would be expected, quite 'small' as the trees had not grown large enough to generate larger branches. From a visual assessment, the diameters of the regenerated trees in Grundy Lane NFR are approximately this size (see Plate 3).

The dominant tree species in the reserve is *E. baxteri* (Brown Stringybark) with *E. viminalis ssp. cygnetensis* and *E. ovata* in the wetter sites, which were probably less accessible to timber cutting as the eastern section of the reserve was left uncleared in 1933.

Discussion

The author is prepared to make the following statement based upon extensive personal experience with a diverse range people who do not possess awareness of the processes of successional age classes:

"People perceive what they see as natural apart from the obvious and sudden impacts from fires and they have a belief that 'left alone nature will do its own thing' with the greatest human involvement being the need to manage invasions of weeds."

In other words, they don't see the trees for the weeds!

Grundy Lane Native Forest Reserve presents a series of interesting and difficult dilemmas for future management:

1. How to convince the broader community that silvicultural thinning is required to increase growth rates of the 1933 regeneration to produce larger diameter trees that will then produce hollows faster than being left to naturally 'gap thin' themselves over extended time;
2. How to garner support and convince the community that this operation is not thinning to create a firewood industry, but rather active intervention for future habitat creation;
3. As extensive cutting of trees requires permissions and approvals under the *Native Vegetation Management Act 1991* an case must be prepared and submitted by the landowner, who may be sensitive to political and public perceptions;
4. What specific treatments to apply in terms of net stocking reduction and creating 'gaps' that will increase branchiness (a precursor to breaking, then rotting and eventually forming hollows);
5. How to answer the query "how long will it take" considering the absence of actual growth-rate data and the timeframes to achieve a result;
6. Then the pragmatic issues: how much will it cost, who will pay, how will it be done, what should be monitored and who will 'own' the project?

The Role of Past and Future Forest History

This historical research has described how the area was manipulated in the past. The aerial photographs (Figures 1 and 2) are compelling evidence the area was largely cleared and, although the species composition is natural, the size of the trees is not.

Recent photographs demonstrate the size class difference (Plate 3), branchiness (Plate 4) and the presence of tree hollows between the cleared and some original remnant trees (Plate 5).

A potential mensuration project could provide additional information. In 1985, the Commonwealth Government initiated a national training programme, which funded the Woods and Forests Department for biological surveys of representative areas of its remnant native forests. One site can be relocated in Grundy Lane NFR, but the individual trees were not marked. Plot based data on dbh, stem numbers per root stock and the presence of tree hollows of different sizes were recorded. This data set has never been analysed, but would enable an interesting quantitative comparison with old trees that have never been cleared, which can be seen on the aerial photographs. Such a comparison could provide the basis for a thinning program to optimise tree diameters and branchiness for future hollow generation.

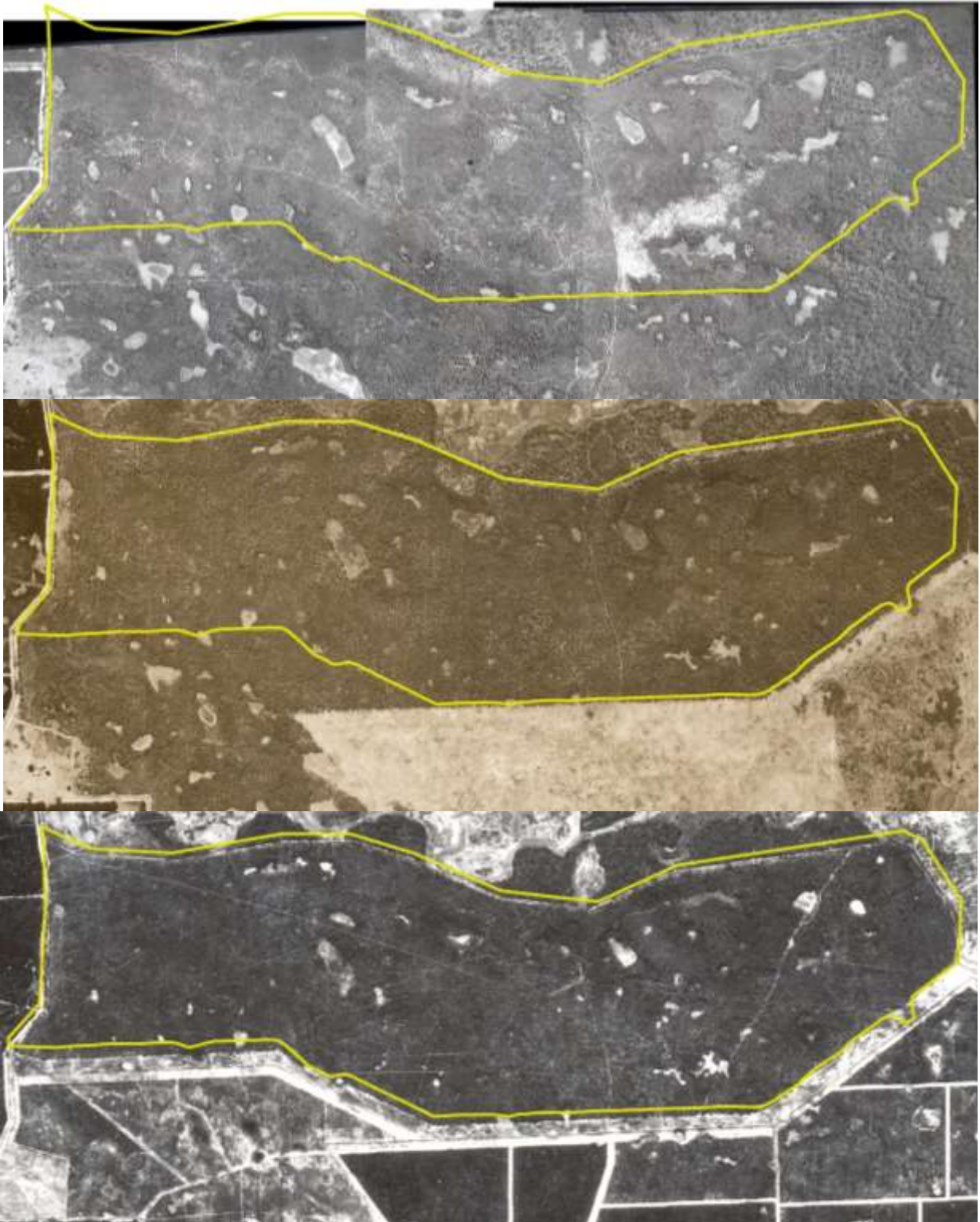


Figure 1: Aerial photograph sequence 1937 (top), 1956 (middle), 1965 (bottom) showing the progressive increase in density of regeneration

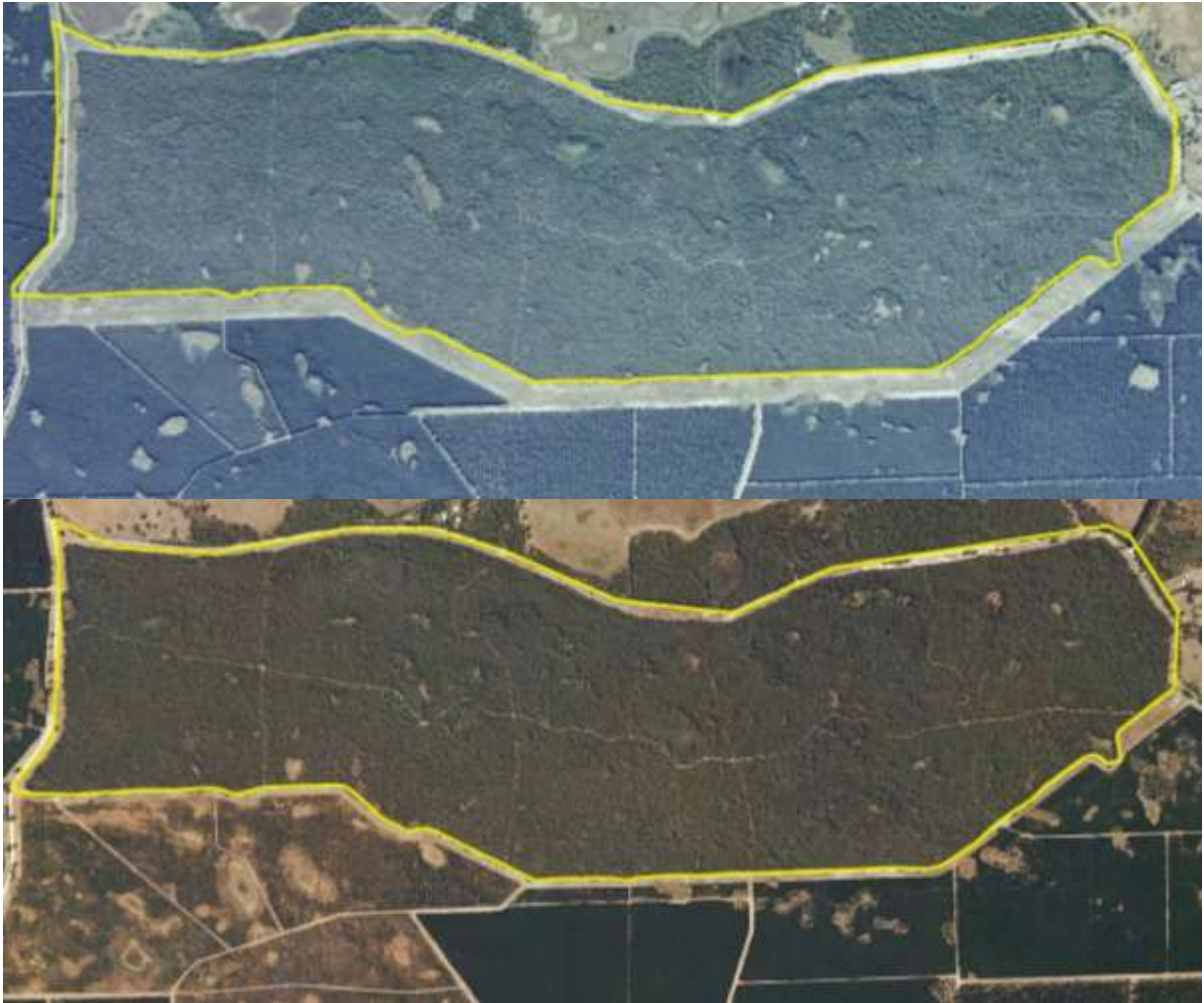


Figure 2: Continued sequence (from Figure 1) 1982 (top), 2008 (bottom).



Figure 3: Small diameter regrowth in the 1937 cleared sites (photo 2012).



Figure 4: Large diameter remnant tree on firebreak on Grundy Lane, North of reserve (photo 2015).



Figure 5: Broken branch tree hollows on tree from Plate 4 (photo 2015).