LEFROY BROOK REGROWTH PLOTS

by

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The karri forest is an impressive sight and the Lefroy Brook karri 100 year old regrowth stand is a showpiece within that forest.

This stand is still a piece of forest which a forester can proudly present as a good example of karri forest management.

But is it? On investigation it was clearly seen that the stand is obviously well overstocked, even the thinned plot. Deaths of some trees within the thinned plot and obvious suppression of other stems make it clear that the stand is due for another thinning, and a rather heavy one at that.

History reveals that in the early 1860's, Mr. G. Decourcey Lefroy cleared an area of 23 acres, and in 1865 cultivated and grew a crop of wheat, leaving it abandoned in 1867.

Lane-Poole estimated the date of establishment of karri as 1875 by counting the annualar rings (41) in 1916.

An unthinned and a thinned plot have been subsequently established within the stand.

Plot No. 7A unthinned, was established in 1917 and remeasured in 1927.

An area was thinned in 1928 by A.C. Harris and plot 7B (1 acre) was established within it in 1949.

Both plots were measured in 1954, 1960, 1965, 1967, and now in 1971.

The process of natural suppression and dominance of stems is illustrated by the number of stems remaining alive at each measurement.

Year of Measurement	Plot 7A Unthinned	Plot 7B Thinned
1949	102	48
1960	78	44
1967	71	44
1971	64	40

The loss of trees since 1967 in plot 7B thinned were due to suppression leading to death of the stems. This fact alone gives an indication of an overstocking.

Basal Area figures provide further proof of this -

Year	(Sq. Ft.)	7A Unthinned	7B Thinned
1960		218	178
1967		223	174
1971		208	174

These results illustrate the climaxing of growth within the thinned stand, a stage where the previous thinning no longer shows an effect.

Both plots are now at the stage where the total basal area varies only slightly, balanced by the loss of trees through suppression and subsequent deaths, and actual increment to the remaining stems.

To gain a more realistic comparison of the two plots and the effect of the thinning in plot 7B, the largest stems in each plot were used to calculate c.a.i. and m.a.i. figures for g.b.h.o.b. and b.a.o.b.

10 Largest Stems

	B.A.O.B.			
	1960	1971	c.a.i.	m.a.i.
7A Unthinned	63.44	71.074	0.6442	0.7404
7B Thinned	69.338	79.359	0.8457	0.8267
	G.B.H.O.B.			
	1960	1971	c.a.i.	m.a.i.
7A Unthinned	107.2	113.5	0.5316	1.1823
7B Thinned	112.0	119.75	0.6540	1.2474

20 Largest Stems

B.A.O.B.

	1960	1971	c.a.i.	m.a.i.
7A Unthinned	105.556	116.83	0.9514	1.2170
7B Thinned	111.741	126.813	1.2719	1.3210

G.B.H.O.B.

	1960	1971	c.a.i.	m.a.i.
7A Unthinned	97.75	102.8	0.4262	1.0708
7B Thinned	100.5	107.1	0.5570	1.1156

30 Largest Stems

B.A.O.B.

	1960	1971	c.a.i.	m.a.i.
7A Unthinned	140.356	155.415	1.2708	1.6189
7B Thinned	139.711	157.424	1.4948	1.6398

G.B.H.O.B.

	1960	1971	c.a.i.	m.a.i.
7A Unthinned	92.00	96.25	0.3586	1.0026
7B Thinned	91.75	97.4	0.4786	1.0146

These results express the effect of thinning in plot 7B 53 years ago.

The effect is greatest in the 10 largest stems, but even here it is only small.

It is only in the 10 largest stems that the c.a.i. is higher than the m.a.i. (0.8457 sq. ft. per annum c.a.i. compared with 0.8267 sq. ft. per annum m.a.i.), but for the largest 20 and also 30 trees the m.a.i. is greater than the c.a.i. In all girth figures the m.a.i. is greater than the c.a.i.

Has the thinning in plot 7B resulted in larger girths?

It can be seen that the difference in girth in 1960 and 1971 for the largest stems is not great and that the overall effect is only small.

Difference in G.B.H.O.B. -	1960	1971
10 largest stems	4.8 "	6.25"
20 largest stems	2.75"	4.3 "
30 largest stems	-0.25"	1.15"

Thus it can be deduced that the thinning has had little effect and that thinning at age 50 seems worthless.

It appears that both stands, unthinned and thinned, have reached a situation where some stems are adding volume, some are being suppressed with small increments and some are being phased out due to suppression leading to deaths.

Both b.a.o.b. increments are slightly negative (unthinned = -0.8439, thinned -0.3375 sq. ft. per annum) as a result of the expression of dominance and the subsequent loss through deaths.

The thinned stand appears well overstocked in its present stage and a thinning appears necessary.

Several methods of deciding upon a suitable thinning regime in plot 7B have been investigated and each results in a reduction to 20 stems per acre.

Using a crown/diameter ratio, a suitable spacing of about 45 to 50 feet between stems points to approximately 20 stems per acre. The K/D ratio for 100 year old forest is between 18 and 20.

An occular appraisal revealed that the stand had sorted itself well into approximately 20 dominants and vigorous codominants, and 24 suppressed, worthless or dead stems.

Comparison of c.a.i. and m.a.i. figures for both g.b.h.o.b. and b.a.o.b. further supported the appraisal by eye.

The Lefroy Brook area is a good stand and a showpiece of our karri forest, but its appearance is marred at present by this overstocking.

The thinned plot 7B will be marked for thinning to a proposed 20 stems per acre, and the thinning probably carried out early in 1972.