

A METHOD OF ESTIMATING SALVAGE VOLUME AFTER
AN INTENSE FIRE IN THE JARRAH FOREST

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Introduction

The inherent fire resistance of jarrah creates problems when estimating the timber volume requiring salvage, after damage has occurred from an intense wildfire. The species has a higher than average resistance to these fires, and there are difficulties in deciding which trees will recover and which will die or remain badly damaged.

The damage assessment in the Dwellingup fire area could be a useful guide for estimating salvage volume in jarrah forest burnt at a comparable intensity. This assumes that recovery will be similar, and would apply in particular to northern jarrah forest carrying about 23 loads over 36" GBHOB, of which 20 per cent is useless for milling. Volume correlations will be improved if the fire occurred in late summer, after the period of leaf replacement.

The Dwellingup fire assessment has covered two crown damage categories, defoliated and fully browned. The assessment was based on one acre randomly located plots, at an intensity which gave a standard error of 15 per cent of the mean volume per acre. Trees within plots were divided into two size classes, then into crown recovery and merchantability categories.

The merchantable volume of trees over 36" GBHOB which were fire killed, or had bole epicormics only, is the criterion of the amount of volume requiring salvage.

Results

Results of the assessment are given as the percentage of total volume per acre over 36" GBHOB, in three crown damage categories. This percentage volume is divided into merchantable and useless for milling.

The percentage volumes in the fire killed and bole epicormics only merchantable class are used later for predicting salvage volume. The fire killed useless volume could be used in a similar manner for estimating future available firewood.

Distribution of Recovery by Percentage of Total Volume per Acre
(23 loads over 36" GBHOB)

<u>Crown Recovery Class</u>	<u>Defoliated</u>	<u>Fully Browned</u>
(1). Crowns Replaced		
Merchantable	56%	70%
Useless	6%	12%
(2). Bole Epicormics Only		
Merchantable	18%	7%
Useless	8%	4%

(3). Fire Killed		
Merchantable	6%	2%
Useless	6%	5%

The volumes per acre requiring salvage are as follows.

Defoliated.

Bole epicormics only, merch., 18% of 23 lds. = 206 cub.ft.
 Fire killed, merch., 6% of 23 lds. = 69 cub.ft.

Browned.

Bole epicormics only, merch., 7% of 23 lds. = 80 cub.ft.
 Fire killed, merch., 2% of 23 lds. = 23 cub.ft.

Estimation of Salvage Volume

An example has been used to estimate the salvage volume for a fire area.

Example

A fire in the jarrah forest defoliates 2,000 acres and fully browns a further 3,000 acres. This forest has an average stocking of 23 loads per acre over 36" GBHOB, of which 20 per cent was useless for milling before the fire.

Total Volume for Salvage

Defoliated Area.

Volume per acre of bole epic. only merch. and fire killed
 merch. = 275 cub.ft.

Total Volume = 275 x 2,000 acres = 550,000 cub.ft.
 = 11,000 loads.

Browned Area.

Volume per acre of bole epic. only merch. and fire killed
 merch. = 103 cub.ft.

Total volume = 103 x 3,000 acres = 309,000 cub.ft.
 = 6,180 loads.

Volume requiring salvage = 11,000 + 6,180 loads
 = 17,180 loads.

Range of Salvage Volume

If the range of volume about the mean is required, the limits could be established at two standard errors.

In the defoliated area the standard error is 15 per cent of 275 cub.ft. acre, which equals 41 cub.ft. The range per acre is therefore the mean \pm 82 cub.ft., or 193 to 357 cub.ft. The range in total volume 7,720 to 14,280 loads.

In the browned area the standard error is 15 per cent of 103 cub.ft./acre, which equals 15.5 cub.ft. The range per acre is therefore the mean \pm 31

cub.ft., or 72 to 134 cub.ft. The range in total volume is 4,320 to 8,040 loads.

Combining the defoliated and browned area the range in salvage volume is 12,040 to 22,320 loads.

Discussion

The results given here are based on a stocking of 23 loads per acre over 36" GBHOB. The recovery percentages would probably apply to a greater or less stocking, providing the proportion of vigorous trees remains comparable. If the volume of cull trees contributes about 20 per cent to the total volume over 36" GBHOB, then the distribution of recovery should be similar.

There is a query whether recovery from fire damage will follow a consistent enough pattern for prediction methods to be employed. On the other hand there seems little reason why treatment by fire should be any less reliable in this regard than treatment by fertilizer or thinning.
