

NOTES

OVERHEAD COSTS IN RELATION TO FOREST SIZE

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Overhead costs are real costs and are an important item in any economic calculations. Generally speaking, unit overhead costs tend to decrease with the increase in the size of an organization. The present study was an attempt to see if there are any trends present in our forest costs and to determine the order of differences.

METHOD OF APPROACH

From the annual accounts of all exotic forests (indigenous or partly indigenous forests being excluded) with a planted area in excess of 1,000 acres, the average annual costs for the 3-year period 1962-4 were calculated for categories: Administration general; camps and hostels; fire protection; fire suppression; repair and maintenance — roads and bridges, and buildings.

These total costs were converted to costs per acre by dividing by the total planted area as at the end of 1964.

RESULTS

Complete results are not presented here but they are summarized as follows:

Administration general costs range from 60c to over \$4 per acre per year. Camps and hostel costs also showed wide range — from practically nothing to over \$1.30. When further classified by the type of accommodation provided, a more distinct cost structure was apparent (cost per acre per year):

With no camp facilities — range	0-6c
With baching camp only — range	0-30c
With camp complete with cookhouse	20c-\$1.30

Total administration costs are the combination of these two cost elements.

Fire protection costs ranged from 20c to over \$2.00 per acre per year. Costs of fire suppression were considerably lower, the range being 0-10c with an average of about 2-3c per acre per year.

Repair and maintenance costs were about the same for both categories (*i.e.*, road and bridges, and buildings). The combined costs ranged from about 40c to over \$2.50 per acre per year.

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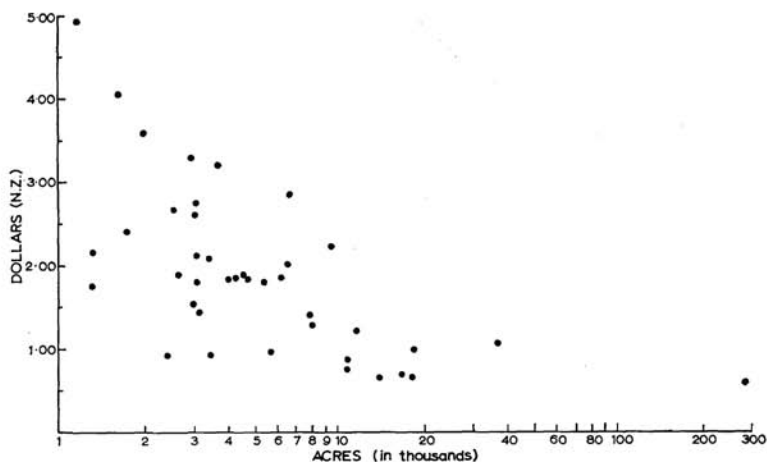


FIG. 1: *Overhead costs and forest size — costs of administration general.*

To determine the effects of forest size on unit costs, unit costs were plotted against forest size. Results for the costs of administration general are given in Fig. 1 (a similar trend is apparent with all other cost categories). In all cost categories there was a distinct trend towards decreasing unit cost with increasing forest size. Some variation was present but this could usually be explained by the activity level of the forest. Older forests not yet in production generally had lower unit costs than recently established similar sized forests with an intensive silvicultural programme.

Nevertheless, a general trend was apparent. If the costs for the largest forest, Kaingaroa (area 289,700 acres), are taken as a base, then, as a general rule, unit costs for forests in the 10-20,000 range are just over double, and those in 1-2,000 acre range quintuple, those for Kaingaroa.

ECONOMIC SIGNIFICANCE OF RESULTS

The average unit costs (in dollars per acre per annum) for Kaingaroa (rounded figures) are:

Administration general	\$0.60
Camps and hostels	0.20
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Total	\$0.80
Fire protection (incl. suppression)	\$0.20
Repair and maintenance	\$0.40
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Grand total	\$1.40

On the 10-20,000 acre forest this is equivalent to a total unit overhead cost of \$3.00 per acre per year and on the 1-2,000 acre forest a total unit overhead cost of \$7.00 per acre per year.

If we consider three forest models in which all direct costs, yields and returns are the same, the only difference being the size of the forest and the corresponding differences in the cost of forest overheads and if the models are:

- A. forest equal in size to Kaingaroa (say, 300,000 acres)
- B. forest of 10-20,000 acres
- C. forest of 1-2,000 acres

then the difference in land expectation value (LEV) for the three models is equivalent to the difference in the capitalized value of the total annual overhead cost. At 5% compound interest the capitalized overhead costs per acre are:

Forest A	....	....	....	....	....	\$28.00
Forest B	....	....	....	....	....	\$60.00
Forest C	....	....	....	....	....	\$140.00

In other words, we could afford to pay, in terms of the saving in overhead costs alone, more than \$30/acre more for land adjacent to Kaingaroa than for similar land adjacent to a 10-20,000 acre forest, or \$110/acre more than for land adjacent to a 1-2,000 acre forest.

The equivalent cost per cubic foot of these administration costs, assuming a yield of 10,000 cu. ft on a 35-year rotation, an interest rate of 5% and all direct costs being the same, would be, per cubic foot:

Forest A	....	....	....	....	....	1.5c
Forest B	....	....	....	....	....	3.3c
Forest C	....	....	....	....	....	9.3c

CONCLUSIONS

These results stress the importance of overhead costs in forest economics and demonstrate that there are significant economies of scale in forest management. The magnitude of these economies is such that it is doubtful if small forests (at least under 10,000 acres) can be economically justified.

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