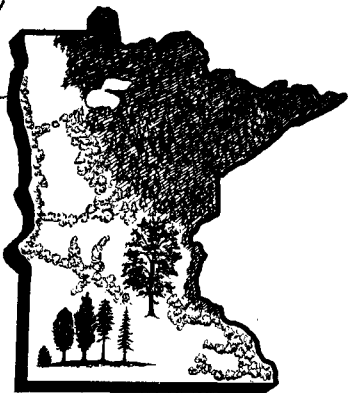
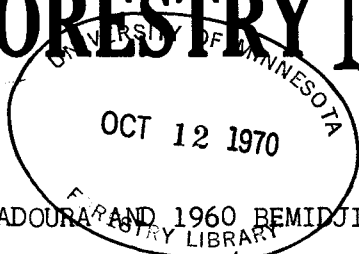


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POST-FIRE REGENERATION STUDY OF THE 1959 BADOURA AND 1960 BEMIDJI FIRES<sup>1/</sup>

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Great interest has been centered on the planned use of fire for various silvicultural objectives. Wild fires in jack pine stands have sometimes encouraged conversion to brush and low value hardwoods and in some cases have stimulated jack pine regeneration. The reasons for this variability in stand response are not entirely known. To determine some of the ecological effects of such fires and their possible implications in the controlled use of fire, a study of the May 1, 1959 Badoura fire and the May 12, 1960 Bemidji fire was undertaken in September, 1960.

On the basis of reconnaissance, fire history, and stocked quadrat data, seven "condition classes" were designated to classify the stands on the basis of characteristics having possible influence on their response to burning. Relevant characteristics include stand composition, crown size, cone abundance, tree size, and burn intensity (see Table I). Only those condition classes represented in both burn areas are included in Table I. Field data were collected from 27 sets of concentric plots (1/1000 acre, 500 sq. ft., and 1/10 acre) which were mechanically located in each of the condition classes. Counts were made of all trees, shrubs, and living or dead reproduction, and d.b.h. of trees was measured. Ferns, herbs, and half-shrubs were rated on the relative per cent of ground cover occupied by each species. Site index data and soil samples were also obtained from each plot. Cone counts and brush data were obtained by mechanically running sample lines in the desired condition classes. Seed distribution data were collected from a series of plots in one locality at Badoura. Weather information was available from Division of Forestry records.

Data taken for the two different fires indicate that regeneration of jack pine was much more successful following the Badoura fire. Condition class 3 stands in Badoura averaged 42,660 seedlings per acre while similar stands at Bemidji had only 1,444. Two major differences, the smaller cone crop on the Bemidji trees and the fortuitous precipitation following the Badoura fire, probably accounted for this difference.

Table II gives post-fire and pre-fire stem counts of several important brush species taken where burning intensity was rated severe. It is obvious that even this severe fire failed to kill the underground roots and rhizomes and actually stimulated an increased number of stems.

Fig. 1 indicates that there was only a very limited effective distribution of seed as judged by seedling establishment into the open field adjacent to the jack pine stand studied.

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Table I. Stand conditions and post-fire data from the 1959 Badoura and the 1960 Bemidji fire areas

| Cond. class | Stand condition         | Ave. no. cones/tree | Location | Reproduction                     |                     | Pre-burn stocking          |       |                                    |       |
|-------------|-------------------------|---------------------|----------|----------------------------------|---------------------|----------------------------|-------|------------------------------------|-------|
|             |                         |                     |          | Jack pine<br>(ave. no. per acre) | Aspen <sup>1/</sup> | Jack pine<br>(ave. d.b.h.) | Aspen | Jack pine<br>(ave. no. trees/acre) | Aspen |
| 3           | jack pine (large crown) | 539                 | Badoura  | 42,666                           | 222                 | 6.2                        | 1.3   | 373                                | 0     |
| 4           | jack pine (small crown) | 17                  | Badoura  | 6,466                            | 0                   | 3.3                        | -     | 1,466                              | 0     |
| 6           | jack pine-aspen         | -                   | Badoura  | 0                                | 33,000              | 4.2                        | 3.4   | 217                                | 380   |
| 3           | jack pine (large crown) | 21                  | Bemidji  | 1,444                            | 1,667               | 5.4                        | -     | 456                                | 43    |
| 4           | jack pine (small crown) | 5                   | Bemidji  | 666                              | 0                   | 2.4                        | -     | 940                                | 0     |
| 6           | jack pine-aspen         | -                   | Bemidji  | 0                                | 36,500              | 5.2                        | 1.9   | 160                                | 735   |

<sup>1/</sup> All sucker growth. A few aspen seedlings were found outside the plots.

Fig. 1. Pattern of seedling distribution from the border of a burned jack pine stand

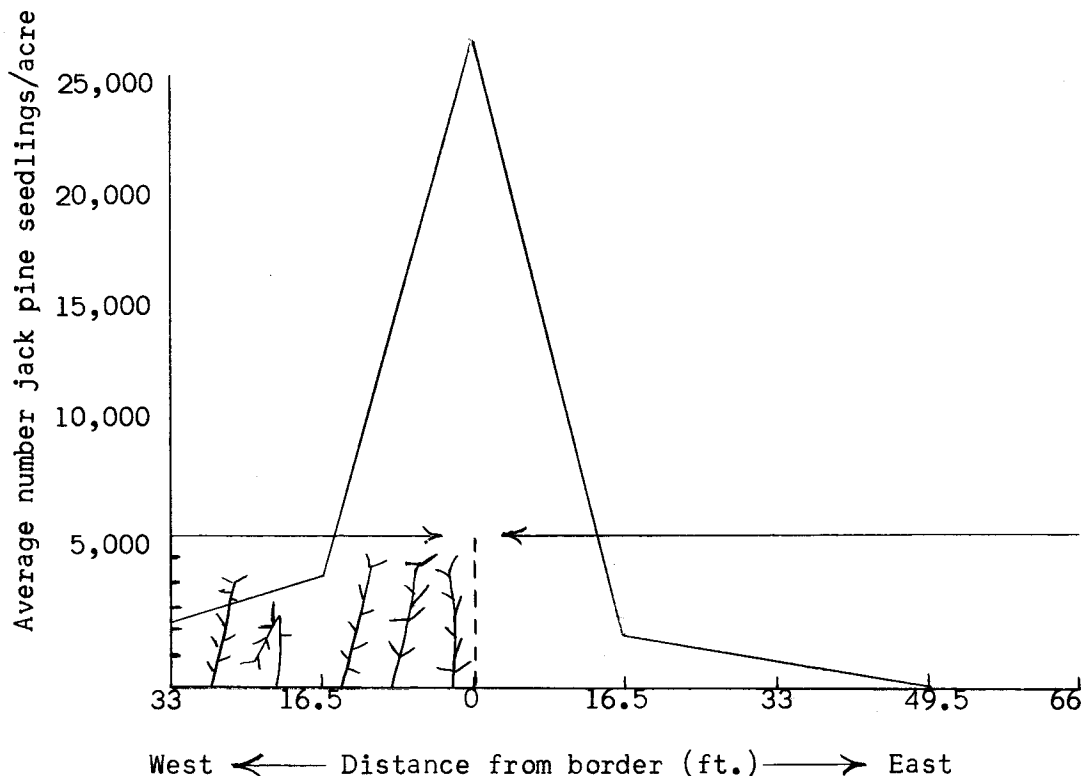


Table II. Brush regrowth following the hottest burn intensities on both fire areas

| Species           | Total stems on all clones examined <sup>1/</sup> |           |
|-------------------|--|-----------|
|                   | pre-burn   | post-burn |
| Corylus americana | 345  | 554       |
| Salix humilis     | 98   | 402       |
| Rosa acicularis   | 75   | 128       |

<sup>1/</sup> Number pre-burn stems obtained by excavating clones and counting burned stem bases.