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GREAT LAKES FOREST RESEARCH CENTRE
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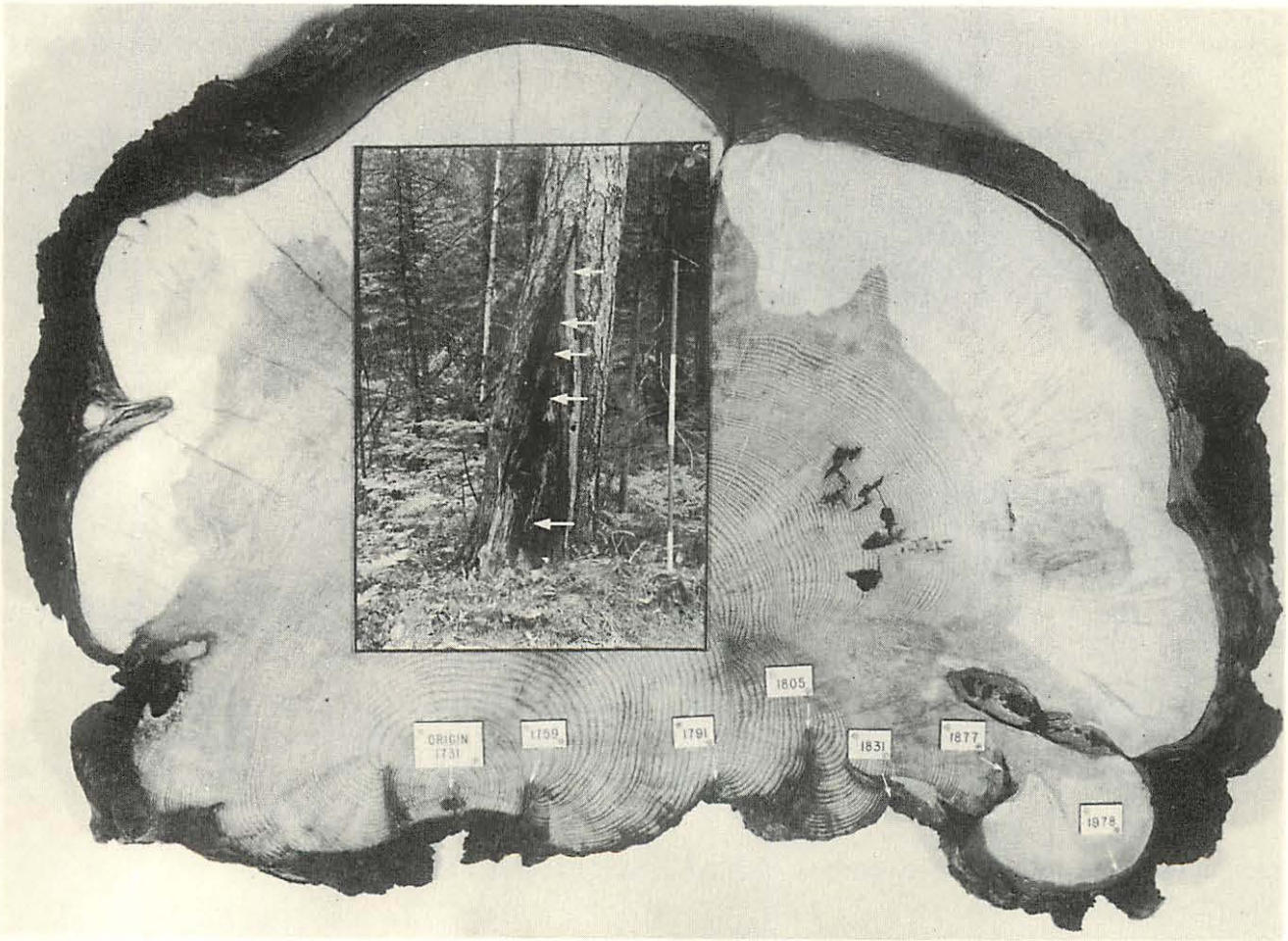
TWO AND A HALF CENTURIES OF RECORDED FOREST FIRE HISTORY

Illustrated in the photograph below is a ground line cross-section from a basal fire-scarred red pine (*Pinus resinosa* Ait.) collected in July, 1978 near Pointe aux Pins in Parke Township, 15 km west of Sault Ste. Marie, Ontario. The *catface* (an open scar resulting from one or more fires) on the main tree bole, noted in the insert, shows the various scar folds associated with each fire date. This tree dates from about 1731. The year 1727 is known to have been a major fire year in the Great Lakes region and is probably responsible for the tree's origin. Five successive fires occurred in 1759, 1791, 1805, 1831, and 1877. This represents a recorded fire frequency or average interval between fires of 29 years with a range of 14 to 46 years for the period 1727 to 1877. No known fire has swept the immediate area in over a hundred years, although in 1936 suppression efforts just prevented a recurrence.



Basal fire scar cross-section from red pine showing five successive fires. Maximum width of the section is 75 cm. Note compact, thick corky bark and the charcoal on the catface edge. The rod that appears in the insert is marked off in half-metre intervals. Arrows in photo insert denote individual scar folds.

Fire scars result when a tree is exposed to sufficient heat long enough to kill a portion of the living cambium layer. The tree attempts to heal itself by growing new wood over the dead area from the edges of the wound, forming a band of callus tissue. When the healing process is interrupted by another fire or when the tree is unable to cover the exposed area, the catface develops. Fire years are dated by counting the number of tree rings from the cambium layer back to the scar tissue and subtracting for the current calendar year.

In addition to its renowned longevity, red pine has developed a number of attributes through evolution that enable it to withstand periodic fire and consequently preserve a record of fire history. Its characteristically thick bark provides insulation against intense surface fires which could lead to death. Red pine has a high resin content, and the sealing action of this resin inhibits the entrance of wood-destroying fungi.

There is substantial evidence that a natural "fire regime", i.e., recurring fires of a specific intensity, frequency and depth of burn, has been responsible for the maintenance and perpetuation of red pine. Red pine does poorly under a full canopy. It prefers a near mineral soil seedbed and little or no competition from shrubs and shade-tolerant trees. Thus, fire serves to reduce the forest floor mantle, inhibit understory vegetation, and create open stand conditions. Prescribed fires can be used as a land management tool to duplicate optimum regeneration conditions achieved by low-intensity surface fires in the past.

The cross-section and catface portion of the tree bole are currently on display for public viewing in the foyer of the Great Lakes Forest Research Centre. An investigation is under way to elucidate the specific historical and ecological role of fire, and the consequences of fire exclusion for all of Parke Township. The investigation includes the construction of a master fire chronology, determination of the areal extent of past fires, and assessment of the influence of the presence or absence of fire on the forest vegetation.

FOR FURTHER READING

Burgess, D.M. and Methven, I.R. 1977. The historical interaction of fire, logging and pine: a case study at Chalk River, Ontario. Can. For. Serv., Chalk River, Ont. Inf. Rep. PS-X-66. 18 p.

Van Wagner, C.E. 1971. Fire and red pine. Proc. Tall Timbers Fire Ecol. Conf. (Aug. 20-21, 1970, Fredericton, N.B.) 10:211-219.

Van Wagner, C.E. and Methven, I.R. 1978. Prescribed fire for site preparation in white and red pine. p. 95-101 *in* White and Red Pine Symposium (Sept. 20-22, 1977, Chalk River, Ont.). Can. For. Serv., Sault Ste. Marie, Ont. Symp. Proc. O-P-6.

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Copies of this leaflet can be obtained from the Centre's Information Office.

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