



Minnesota Forestry Research Notes

A FIRE CHRONOLOGY FOR ITASCA STATE PARK, MINNESOTA

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National parks, wilderness areas, and some larger state parks have traditionally been administered under policies designed to preserve their "natural," "primeval," or "primitive" qualities. In most cases this has been attempted through programs which emphasize non-interference by man and protecting the vegetation from disturbance by fire, insects, and disease.

In recent years increasing attention has been given to the ecological consequences of such preservation-protection policies. Of particular concern are the consequences of fire protection policies on intolerant sub-climax species such as red pine (Pinus resinosa Ait.)

The relationship between the occurrence of red pine and the incidence of fire has long been recognized. In view of this and of the great importance of this species as an element of the natural beauty of Itasca State Park, (Klukas and Duncan, 1967) the School of Forestry has conducted comprehensive studies of the origin, development, and present condition of the red pine stands in the park. An important phase of this study has been an intensive investigation of the history of fires in the area and their role in the development and maintenance of pre-settlement biotic communities.

Considerable evidence is available which indicates that fire was the most significant influent on the composition and age structure of the pre-settlement forests of the Itasca area. Spurr (1954) published a report on the forests of Itasca in the 19th century as related to fire. The current study has enlarged upon this work considerably in scope and detail. One interesting aspect has been the development of a chronology of fire incidence as presented in Table 1.

The occurrence of 32 fires has been recorded for the period 1650 to 1922. These data were obtained by analysis of basal fire scars on pines, mostly red pine. Because of the scarcity of pines older than 250 years, the data are probably not complete for the period prior to 1700.

An effective fire protection program has essentially eliminated fire as an ecologic factor for at least the last 40 years. No major fires have occurred in the park since 1918. This exclusion of fire can be expected to have considerable influence on the preservation of natural sub-climax communities.

In order to allow for variations in annual weather patterns and their effect on fire incidence, the number of fires recorded by tree scars has been averaged

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for 50 year periods since 1650 (Table 2). Inspection of these intervals in Tables 1 and 2 indicates a considerably greater frequency of fires since the middle of the 19th century and particularly since about 1885. This coincides with the period when land clearing and logging fires were common. Prior to about 1850, the causes of fires would have been limited to lightning, Indians, and possibly occasional white fur traders.

Table 1. Incidence of fires recorded as fire scars in the Itasca State Park area between 1650 and 1922.

<u>Fire Date</u>	<u>Interval</u>	<u>Fire Date</u>	<u>Interval</u>
1922	4	1843	5
1918	5	1838	18
1913	2	1820	9
1911	2	1811	8
1909	2	1803	7
1907	2	1796	9
1905	6	1787	15
1899	4	1772	13
1895	4	1759	17
1891	2	1742	15
1889	2	1727	15
1887	2	1712	10
1885	10	1702	32
1875	4	1670	9
1871	7	1661	11
1864	21	1650	

Table 2. Average time interval between fires in Itasca Park based on fire scar records.

<u>Time Period</u>	<u>Average Interval (Years)</u>
1650-1699	16.7
1700-1749	12.5
1750-1799	12.5
1800-1849	10.0
1850-1899	5.6
1900-1922	3.1

It is recognized, however, that the record of earlier fires may be incomplete because of the fewer older trees, particularly those over 200 years.

The data presented on the fire chronology of Itasca State Park illustrates that fire was of natural and frequent occurrence in the pre-settlement forests of the area. Indeed, it can be demonstrated that these periodic fires created the patchwork pattern of aspen, birch, and pine.

To preserve the natural variety of forest types and to perpetuate red pine, the chief natural attraction in Itasca State Park, it will be necessary to simulate the disturbance of natural fires by prescribed burns or other means.

References

- Klukas, R. W. and D. P. Duncan. 1967. Vegetational preferences among Itasca Park visitors. *Jour. For.* 65:18-21.
- Spurr, S. H. 1954. The forests of Itasca in the nineteenth century as related to fire. *Ecology* 35(1):21-25.