

BIBLIOGRAPHY AND A RÉSUMÉ OF CURRENT
STUDIES ON FIRE HISTORY

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REPORT 0-X-304

CANADIAN FORESTRY SERVICE
DEPARTMENT OF THE ENVIRONMENT

DECEMBER 1979

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ABSTRACT

This report consists of a bibliography containing 307 references dating back to 1900 and a list of 25 current studies on forest and rangeland fire history. A general subject index and an area index are numerically keyed to an alphabetical list of authors. The study title, the principal investigators and their affiliation, the expected completion date of the study and the location of the study areas in which current investigations are being carried out in North America and Fennoscandia are provided.

RÉSUMÉ

Ce rapport consiste en une bibliographie contenant 307 références datant d'aussi loin que l'année 1900 et en une liste de 25 études en cours sur l'historique des incendies de forêts et terres à pâturage. Un index général par sujets et un index des régions sont accordés par numéros à une liste alphabétique des auteurs. Le lecteur trouvera le titre de l'étude, les principaux enquêteurs et leur affiliation, la date prévue pour la complétion de l'étude et le site des régions étudiées dans lesquelles ont lieu actuellement des enquêtes en Amérique du Nord et dans les pays scandinaves y compris la Finlande.

ACKNOWLEDGMENTS

Several colleagues have provided assistance and encouragement during the preparation of this report. I am particularly indebted to Stephen F. Arno, John H. Dieterich, Bruce M. Kilgore, Robert E. Martin, Frederick J. Swanson, and Olle Zackrisson. Sandy B. Burt, Nancy J. Dukes and Patricia J. Smith of the Great Lakes Forest Research Centre library were instrumental in locating and obtaining original references or photocopies in order to ensure citation accuracy. Credit is also due Judith A. Novick for typing various drafts of this report. I greatly appreciate the willingness of the investigators listed in Table 2 to contribute information to the list of current fire history studies.

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Cover photographs (clockwise, starting from the lower lefthand corner):

A portion of the *Stand Origin* map for the Geraldton Site District in north central Ontario (from Lynn and Zoltai 1965¹); increment boring of jack pine (*Pinus banksiana* Lamb.) as part of a current forest fire history study in Pukaskwa National Park, north central Ontario; Map No. 9 in the 1947 Ontario Royal Commission on Forestry report showing all fires greater than 200 ha reported in the province between 1920 and 1946 (from Anon. 1947); a portion of page 7G in W.H.C. Smith's (1892) report on the Hunter Island area in what is now Quetico Provincial Park, northwestern Ontario; cross-section of a triple basal fire-scarred red pine (*Pinus resinosa* Ait.) collected in 1913 from Peterborough County, southern Ontario, noting fires in 1766, 1756, and 1744 (from Howe 1915a¹; also shown in Anon. 1923¹); pollen and charcoal influx diagram from Perch Lake near Chalk River in eastern Ontario (from Terasmae and Weeks 1979¹).

¹Listed in the bibliography.

INTRODUCTION

In a fire ecology research survey (Taylor et al. 1975) of land managers and scientists in western North America, several questions were addressed to fire history. Some of these were:

"To what degree or reliability can fire frequency and intensity be predicted via an in-depth analysis of an area's fire history?"

"Can post-glacial fire history be traced by means of charcoal counts from lake and bog sediments?"

"In south central Washington how frequently should ponderosa pine be subjected to ground fires in order to approximate natural conditions?"

"What is the natural frequency of wildfires as reflected in the distribution of age classes in presettlement forest cover? Can the evidence of climatic variations shown in tree rings (widths of, and specific gravity patterns within, earlywood and latewood) be related to age structure of mature forests to indicate probable past fire disturbance patterns?"

"Did natural fires occurring in the interior ponderosa pine type prior to imposition of fire control happen with any degree of regularity?"

"What is the fire history of our natural forest stands in respect to (a) different environments and (b) different geographic areas? What are the expected frequencies and accompanying intensities of fires in various habitat types?"

"What was the average fire periodicity prior to suppression? What was the nature of fire prior to suppression, e.g., were they low intensity surface fires or high intensity crown fires?"

After analyzing their survey responses Taylor and associates (1975) note that "The reader who is familiar with the literature will recognize that answers to some of the questions do not really require more field research because a considerable body of literature already exists. Here we have a poor information diffusion from research to on-the-ground ecosystem managers." The existence of this knowledge gap is not surprising when one considers the fact that the information is not available from a single source but must be obtained from a variety of publication outlets.

The purpose of this bibliography is to attempt to bring under one cover the titles of all the relevant published literature and significant unpublished reports on the many aspects of forest and rangeland fire history. The main emphasis of the bibliography is on North American references, although a selected group of items from other continents has been included. A résumé of current fire history studies known to the author has been included for completeness.

The analysis of stand ages by counting tree rings from increment borings or on stumps, and the dating of basal fire scars or ecological pyrodendrochronology², a branch of dendroecology (Fritts 1971), is but one means of reconstructing fire history. The investigation of fire history may also involve several other disciplines and approaches such as palaeoecology and historical geography. This fact is reflected in the references selected for inclusion in this bibliography.

Inclusion of literature on the pathological aspects of basal fire scars and fire damage (e.g., Meinecke 1916; Munger 1917; Boyce 1920, 1921; Anderson 1934; Garren 1941; Jemison 1944; Wagener 1955, 1961; Loman and Paul 1963) is beyond the scope and direct relevance of the bibliography. Papers describing the dating and mapping of avalanche and glacier paths (e.g., Viereck 1967; Alestalo 1971; Burrows and Burrows 1976) have not been included although the techniques are similar to those used in fire history. The basics of tree-ring analysis or dendrochronology (e.g., Glock 1937; Douglass 1946; Roughton 1962; Stokes and Smiley 1968; Fritts 1976) and associated field aids and tips (e.g., Bauer 1924; Larson 1954; Bauck and Brown 1955; Ghent 1955; Potter 1959; Cole 1977) are available elsewhere. Unless dating methods are utilized, references on charcoal deposits in peat bogs (e.g., Penhallow 1904; Soper 1919; Salisbury and Lane 1940; Godwin and Tansley 1941; Rosendahl 1948; Harris 1958; Noble 1974; Nichols 1975; Fredskild 1978) have been excluded from the bibliography.

Fire history information is required for understanding and managing wildland ecosystems in the presence and absence of fire (Sando 1978). Of the seven problem areas in understanding or describing fire-dependent ecosystems highlighted at the August, 1972 symposium, *The Ecological Role of Fire in Natural Conifer Forests of Western and Northern North America*, three emphasized forest fire

²Dieterich, J.H. 1975. Fire histories in southwestern ponderosa pine. USDA For. Serv., Rocky Mount. For. and Range Exp. Stn., For. Sci. Lab., Tempe, Ariz. Study Plan RM-2107-2. 8 p. + appendices.

history knowledge (Wright and Heinzelman 1973). In the introduction of the only reference book devoted to the subject of fire ecology, *Fire and Ecosystems*, the value of fire history was discounted because "...it does not reveal the biological principles involved" (Ahlgren 1974). Heinzelman (1975) was quick to point out that only through fire history research "...can we evaluate the actual frequency and intensity of fire perturbations in the primeval ecosystems from which evolved the plants and animals our technological society depends on". It is to be hoped that this report will contribute to a better understanding of the historical-ecological role of fire in past, present and future ecosystems.

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This bibliography contains 307 references dating back to 1900. Distribution of the references by 20th century decades on the basis of publication date is noted in Table 1. To ensure that the bibliography is more than a list, a general subject index and an area index keyed to author have been included. A number under the subject or area identifies the article. Articles are listed by author in alphabetical order; those written by the same author are listed in chronological order.

Table 1. Number of references listed in the bibliography by decade on the basis of publication date.

Decade of Publication	Number of Publications	Percent of Total
1980 -	23	7
1970 - 1979	174	57
1960 - 1969	39	13
1950 - 1959	23	7
1940 - 1949	4	1
1930 - 1939	18	6
1920 - 1929	15	5
1910 - 1919	6	2
1900 - 1909	5	2

Citation form and abbreviations are according to current editions of the Council of Biology Editors Style Manual and the American Standard for Periodical Title Abbreviations. Every effort has been made to ensure that the citations are correct. It is hoped that the report will be a useful source of reference for locating and ordering items through interlibrary loan.

The final selection of literature included in the bibliography remains a personal judgment on the part of the author. In certain instances, items were selected because they were representative, comprehensive or unique.

*Subject Index*Charcoal Analysis (lake sediments and peat bogs)

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RÉSUMÉ OF CURRENT STUDIES

Current fire history studies in North America and Fennoscandia that are either in progress or nearly completed are summarized in Table 2, and the study areas are noted in Figure 1. An attempt has been made to include all known studies through personal contacts and by sending review draft copies of this report to approximately 30 colleagues in different geographical regions. Invariably some studies have been missed and I apologize for their omission. The listing of current studies should ensure that the bibliography is reasonably comprehensive for 2-3 years, for at least major works.

Table 2. Summary of pertinent information on current fire history studies in North America and Fennoscandia listed chronologically by expected completion date.

Map ²	Study Title	Principal Investigator(s)	Affiliation	Expected Completion Date
1	Fire History and Management in Nahanni National Park, N.W.T.	Dennis E. Dubé	Canadian Forestry Service, Northern Forest Research Centre, Edmonton, Alberta T6H 3S5, Canada.	Dec. 1980
2	Fire History and Ecology of Lava Beds National Monument, California	Arlen H. Johnson	Faculty of Forestry, University of British Columbia, Vancouver, B.C. V6T 1W5, Canada	June 1980
3	Fire History on the Horse Pasture Plateau in Zion National Park, Utah	Neil E. West and Michael H. Madany	Department of Range Science, Utah State University, Logan, Utah 84322, U.S.A.	Sept. 1980
4	Fire Cycles in the Interior of Alaska	John A. Yarie	Forest Soils Laboratory, University of Alaska, Fairbanks, Alaska 99701, U.S.A.	June 1980
5	Fire and Logging History of Voyageurs National Park, Minnesota	Michael S. Coffman ¹ and Lawrence Rakestraw ²	¹ Department of Forestry and ² Department of Social Science, Michigan Technological University, Houghton, Mich. 49931, U.S.A.	July 1980
6	Vegetation and Fire History at Voyageurs National Park: study of pollen and charcoal	Albert M. Swain and Walstrand A.R. Brinkman	Center for Climatic Research, University of Wisconsin, Madison, Wisc. 53706, U.S.A.	Aug. 1980
7	The Ecology of Fire in the Guadalupe Mountains and Adjacent Chihuahuan Desert, Texas	Gary H. Ahlstrand	USDI National Park Service, Cooperative Park Studies Unit, Texas Tech University, Lubbock, Texas 79409, U.S.A.	Sept. 1980
8	Forest Fire History of Pukaskwa National Park, Ontario	Martin E. Alexander	Canadian Forestry Service, Great Lakes Forest Research Centre, Sault Ste. Marie, Ontario P6A 5M7, Canada.	Sept. 1980
9	Postglacial Record of Fire and Vegetation in Baxter State Park, Maine	R. Scott Anderson and Ronald B. Davis	Department of Botany and Plant Pathology, University of Maine, Orono, Me. 04469, U.S.A.	Sept. 1980
10	Forest Fire History of Finnish Nature Reserves	Antti Haapanen	Ministry of Agriculture and Forestry, Bureau of Natural Resources, Hallituskatu 3A, 00170 Helsinki 17, Finland.	Dec. 1980

(continued)

Table 2. Summary of pertinent information on current fire history studies in North America and Fennoscandia listed chronologically by expected completion date. (concluded)

Map ^a	Study Title	Principal Investigator(s)	Affiliation	Expected Completion Date
11	Fire History and Management in Wood Buffalo National Park, Alberta/N.W.T.	Dennis E. Dubé	Canadian Forestry Service, Northern Forest Research Centre, Edmonton, Alberta T6H 3S5, Canada	Dec. 1980
12	Forest Fire History in Red Pine Stands of Newfoundland	Bruce A. Roberts	Canadian Forestry Service, Newfoundland Forest Research Centre, St. John's, Nfld. A1C 5X8, Canada.	Dec. 1980
13	Forest and Disturbance History of the Apostle Islands National Lakeshore	Albert M. Swain and Walstrand A.R. Brinkman	Center for Climatic Research, University of Wisconsin, Madison, Wisc. 53706, U.S.A.	Dec. 1980
14	The Role of Fire in Parke Township, Sault Ste. Marie, Ontario	Steven W.J. Cominsky ¹ , Martin E. Alexander ² , and Robert J. Day ¹	¹ School of Forestry, Lakehead University, Thunder Bay, Ontario P7B 5E1; ² Canadian Forestry Service, Great Lakes Forest Research Centre, Sault Ste. Marie, Ontario P6A 5M7, Canada.	May 1981
15	Relationship of Indian-Caused Fires to the Ecology of Western Montana Forests	Stephen W. Barrett	School of Forestry, University of Montana, Missoula, Mont. 59806, U.S.A.	June 1981
16	Fire History of Forests in the Priest Lake Area, Northern Idaho	Larry A. White ¹ , Dan H. Davis ¹ , and Stephen F. Arno ²	USDA Forest Service, ¹ Idaho Panhandle National Forests, Priest Lake Ranger District, Priest Lake Idaho 83856 and ² Northern Forest Fire Laboratory, Missoula, Montana 59806, U.S.A.	June 1981
17	A Paleo-ecological Study of the Spruce Budworm-Wildfire Hypothesis	Ross W. Wein ¹ and B.A. Sreenivasa ²	¹ Fire Science Centre and ² Department of Biology, University of New Brunswick, Fredericton, N.B. E3B 5A3, Canada.	Sept. 1981
18	Forest Fire History of Muddus National Park, Sweden	Olle Zackrisson	Faculty of Forestry, Swedish University of Agriculture Sciences, S-901 83 Umeå Sweden.	Nov. 1981
19	The History of Wildfire in Douglas-fir Forests of the Central Western Cascades of Oregon	Frederick J. Swanson	USDA Forest Service, Pac. Northwest Forest and Range Exp. Stn., Forestry Sciences Laboratory, Corvallis, Oregon 97331, U.S.A.	Dec. 1981
20	Fire Frequency in the Presettlement Forests of Northern Wisconsin	Craig G. Lorimer and William R. Gough	Department of Forestry, University of Wisconsin, Madison, Wisc. 53706, U.S.A.	June 1982
21	The Effects of Fire on the Presettlement Forests of Massachusetts as Determined by Pollen and Charcoal Analysis	William A. Patterson III	Department of Forestry and Wildlife Management, University of Massachusetts, Amherst, Mass. 01003, U.S.A.	June 1982
22	Fire History of Central Oregon	Robert E. Martin	USDA Forest Service, Pac. Northwest Forest and Range Exp. Stn., Silviculture Laboratory, Bend, Oregon 97701, U.S.A.	Dec. 1983
23	Fire History of a Mixed-Conifer Forest, Thomas Creek Area, Arizona	John H. Dieterich	USDA Forest Service, Rocky Mt. Forest Range Exp. Stn., Forestry Sciences Laboratory, Tempe, Arizona 85281, U.S.A.	-- ^b
24	Fire Histories in Southwestern Ponderosa Pine	John H. Dieterich ¹ and Marvin A. Stokes ²	¹ USDA Forest Service, Rocky Mt. Forest and Range Exp. Stn., Forestry Sciences Laboratory, Tempe, Arizona 85281; ² University of Arizona, Laboratory of Tree-Ring Research, Tucson, Ariz. 85721, U.S.A.	-- ^b
25	Forest Fire History in Eastern Finland Studied by Palaeo-ecological Methods.	Pertti Huttunen	Karelian Institute-Section of Ecology, University of Joensuu, P.O. Box 111, 80101 Joensuu 10, Finland.	-- ^b

^aRefers to study area location in Figure 1.

^bUnknown according to investigator(s).

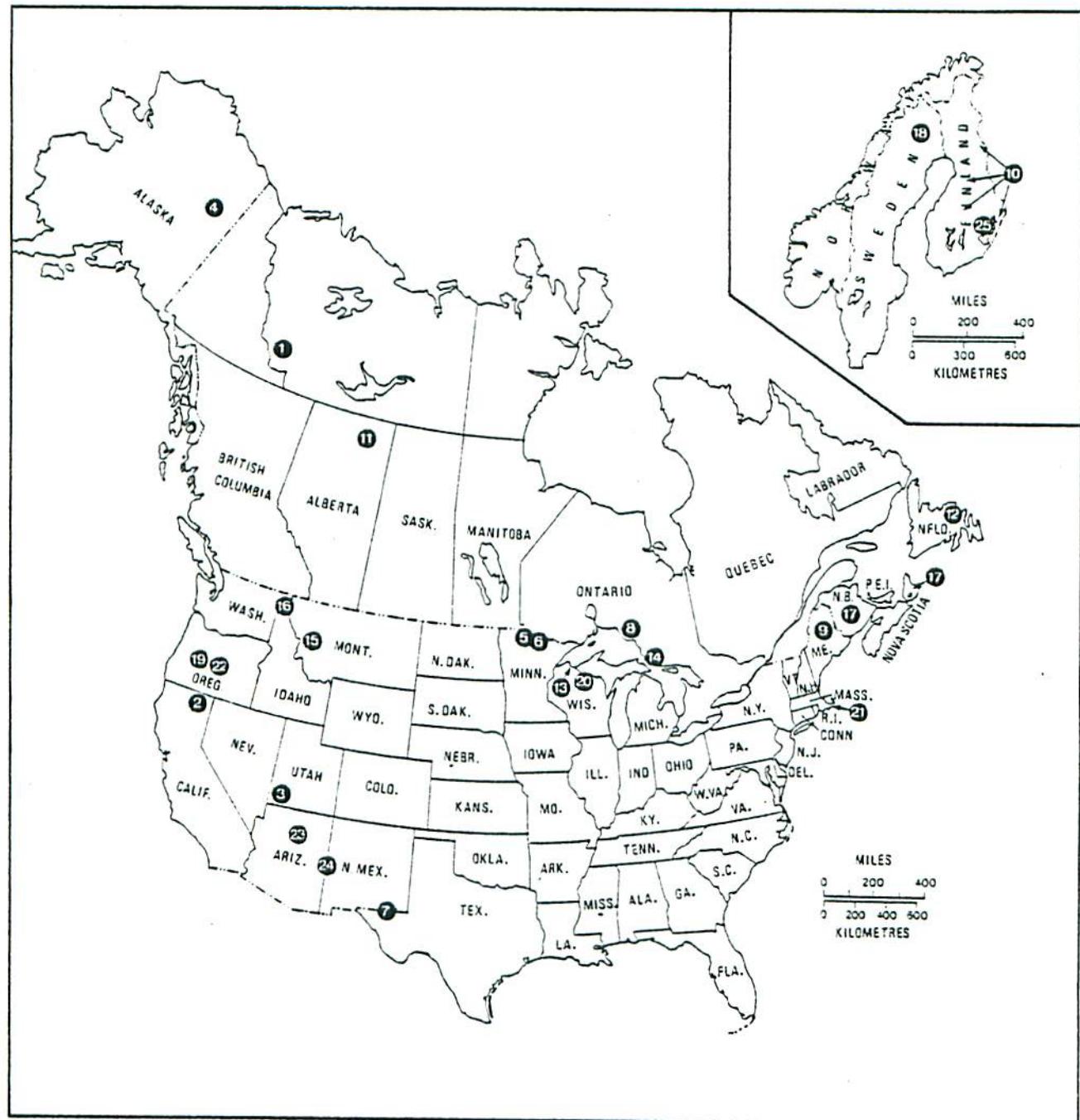


Figure 1. Location of study areas for current fire history studies in North America and Fennoscandia as noted in Table 2.