Forest Fire Protection and Management in Nova Scotia: Reflecting on the Past, the Present, and the Future

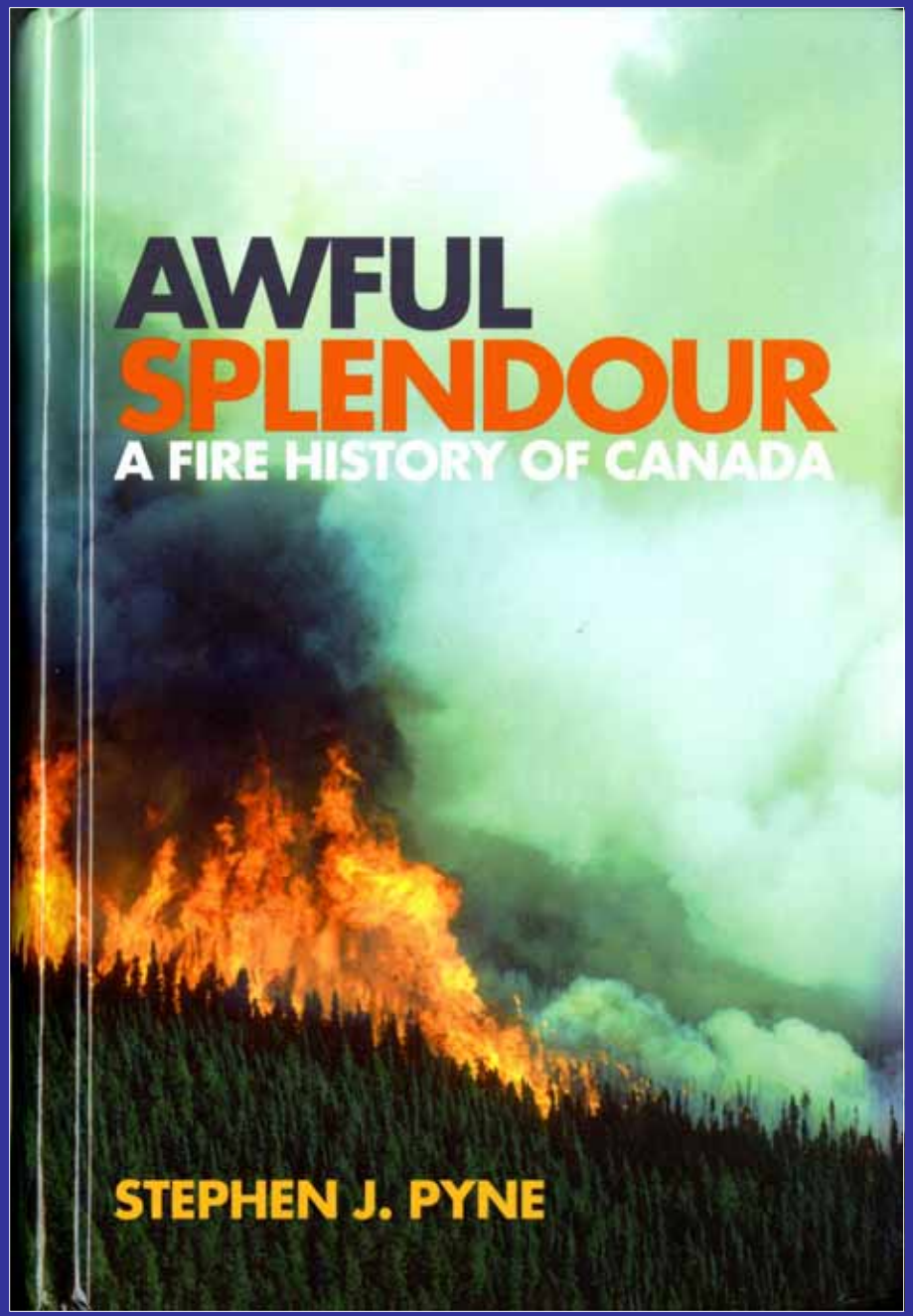
Marty Alexander, PhD, RPF

Honorary Research Associate
Faculty of Forestry & Environmental Management
University of New Brunswick

On the occasion of the
60th Anniversary of the Shubenacadie Fire Control Centre
The Citadel Inn, Halifax, NS
November 5, 2008

Previous Visits to Atlantic Canada, including Nova Scotia

- **Apr. 1987** – CFS information sessions on the Canadian Forest Fire Danger Rating System (Fredericton, Shubenacadie, Charlottetown, Gander)
- **Nov. 1996** – CIFFC Advanced Wildland Fire Behavior Course (Fredericton)
- **Sep. 1998** – Atlantic Forest Fire Management Coordinating Committee Wildfire Behavior Documentation Session (Charlottetown)
- **Sep. 2000** - Forest Fire Science and Management Forum (Halifax)
- **Apr. 2002** – Canadian Forest Fire Behavior Prediction (FBP) System Fuel Typing Meeting with Atlantic Canada Fire/Forest Managers (Amherst)
- **Apr. 2002** – Northeastern Forest Fire Protection Commission Spring Fire Academy (Amherst)
- **Sep. 2003** - Canadian Forest Fire Behavior Prediction (FBP) System Fuel Typing Working Meeting (Shubenacadie)



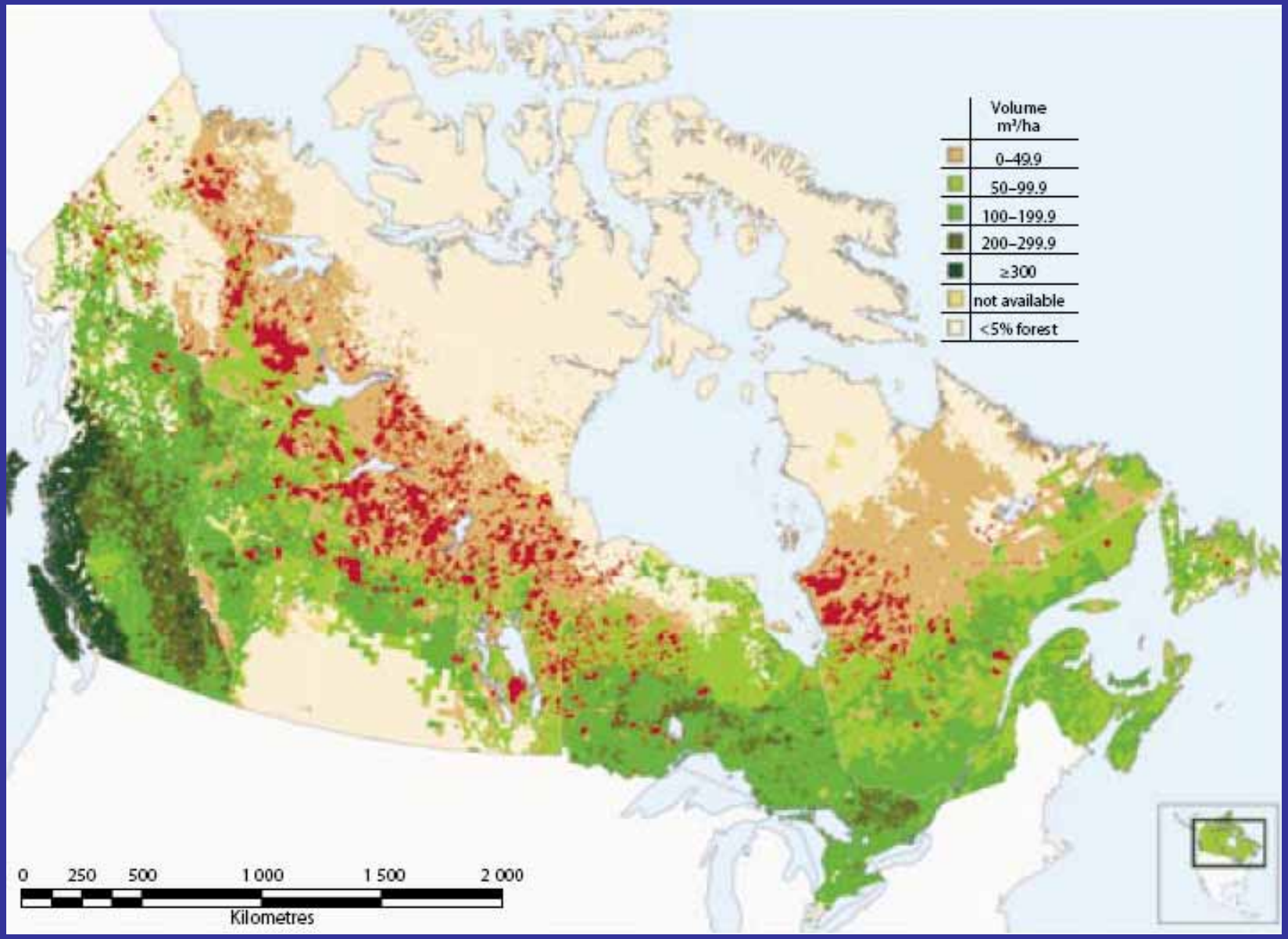
Published in spring of 2007

"Fire is a defining element in Canadian land and life.

With few exceptions, Canada's forests and prairies have evolved with fire.

Its peoples have exploited fire and sought to protect themselves from its excesses, and since Confederation, the country has devised various institutions to connect fire and society."

Area Burned by Wildfires Greater Than 200 Hectares in Size, 1980-2001 (in red) in Relation to Timber Volume



Basic National Fire Statistics

- 8600 fires have burned about 2.5 million hectares annually since 1980

- Lightning responsible for ~ 50% of the fires but about ~ 85% of the area burned (mainly June-July)

- Fire management expenditures have reached $500-600 million annually and are growing

Multiple Roles of Fire as an Ecological Process:

- Fire influences the physical-chemical environment
- Fire controls plant species and communities
- Fire regulates dry-matter production and accumulation
- Fire determines wildlife habitat patterns and populations
- Fire influences insects, parasites, fungi, etc.
- Fire controls major ecosystem processes and characteristics

Wildfire is a Threat to Human Safety and other Values-at-Risk

1916 – Matheson Fire - NE Ontario

~ 300 fatalities

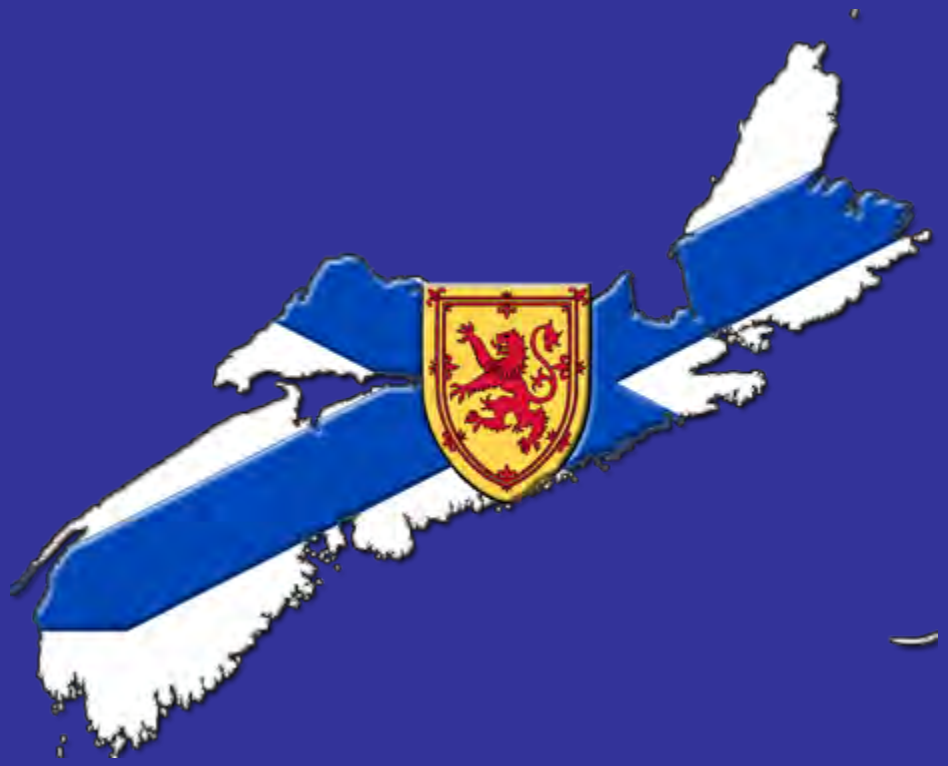
Portable fire pumps at the Shubenacadie Depot.

From 1954 Annual Report of Lands and Forests Department

Nova Scotia's Fire History

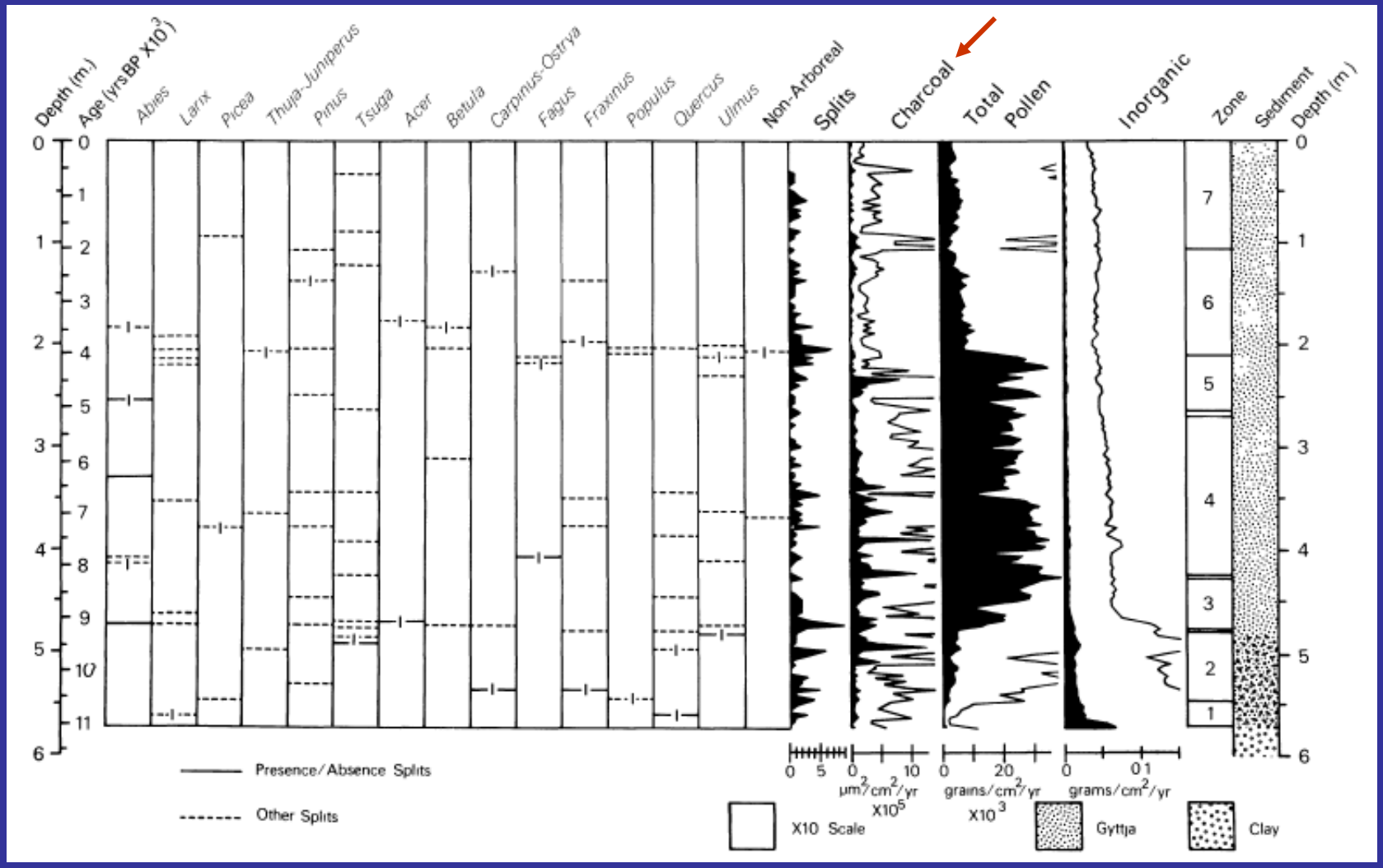
Most Recent 10-yr Averages

Number of Fires – 323.5
Area Burned (ha) – 779.9
Average Size (ha) – 2.4



Charcoal deposits in lake sediments date back 10,000 years

Everitt Lake, southwest NS – Green (1982)



Green, D.G. 1982. Fire and stability in the postglacial forests of southwest Nova Scotia. *Journal of Biogeography* 9: 29-40.

Feature

Fires sweep across the Mid-Cretaceous landscape of Nova Scotia

by Andrew C. Scott[1] and Ralph Stea[2]

Fire may be an important element in many Post-Devonian terrestrial environments. Data has come predominantly from fossil charcoal (fusain) which may be preserved in numerous depositional environments. Fire is known to be an important element in several Cretaceous ecosystems, such as in the Wealden of the Isle of Wight, but interpretations concerning the frequency and extent of fire systems have proved difficult. In only a very few cases in the Carboniferous have charcoal horizons been traced laterally and often this is only at one stratigraphic level. New data from the Cretaceous of Nova Scotia, Canada, offers the possibility of unravelling some of these Cretaceous fire systems for the first time.

Winners of the
T B Tyrell Research Fund 1999

Cretaceous deposits of Nova Scotia

In central Nova Scotia in the Shubenacadie and Musquodoboit Basins, drilling beneath Quaternary cover has shown the presence of Early Cretaceous non-marine sediments filling palaeovalleys. These sediments up to 130m thick (in basins up to 5 x 15km) include coarse unconsolidated silica sands, kaolin clays and 'lignites'. The kaolin clays occur in commercial quantities and exploitation of the deposit is planned. As part of the investigation more than 200 cored boreholes have been sunk by the Nova Scotia Department of Natural Resources and by Kaoclays Inc. Palynological dating has indicated that the deposits range in age from Aptian to Albian but may include younger sediments). In each of the basins several correlatable 'lignite' horizons were identified. Initial sample analysis from an outcrop in the Shaw Pit in the Shubenacadie Basin and from four boreholes in the Musquobodoit Basin indicated that these layers are probably organic-rich sediments rather than true *in situ* peats. Charcoal occurs in many closely spaced layers. New sampling of an outlying deposit at Indian Road, together with further sampling from five boreholes has confirmed that all the deposits formerly termed lignites are in fact medium to dark clays and silts with abundant charcoal. Studies of the charcoal horizons not only offers the chance to reconstruct the vegetation and fire ecology but also may help in interpretation of the relationship of fire and sedimentation and climate change.

Lithostratigraphy

These Cretaceous sediments are included in the Chaswood Formation which has been divided into three members: Lower, Middle and Upper.

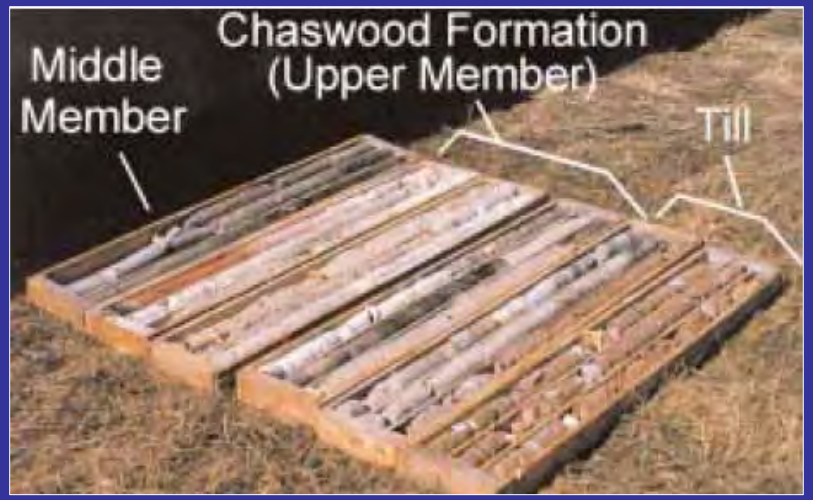
The Lower Member comprises predominantly 5-10m packages which alternate with 8-20m units of sandy sediments (Stea *et al. ibid.*). Within the unit there are occasional horizons of charcoal-rich fine-grained sediments. These are particularly well seen in boreholes MUCS 95-5,96-5 and 96-4. These charcoal rich beds are overlain by mottled red, yellow and purple silty clay, which may be paleosols.

The Middle Member contains many units of light to dark grey clays with scattered to abundant charcoal as well as some uncharred plant fragments. These plant-rich beds generally cap fining-upward cycles of white silica sand overlain by light grey kaolinitic sediments. Good sequences are encountered in MUCS 95-1,95-2 and 95-3.

The Upper Member reaches a maximum thickness of 35m and comprises 0.5-10m cycles of white to light grey silty clay. There is rarely grey clay with charcoal. Red, yellow and purple mottling of the clays are rare. Light grey kaolin is present within the sand units. These deposits are best seen in MUSC 95-2 and 96-5.

[1]Geology Department, Royal Holloway, University of London
[2]Nova Scotia Department of Natural Resources

Fossilized charcoal deposits found in borehole cores taken in central Nova Scotia date back ~100 million years ago

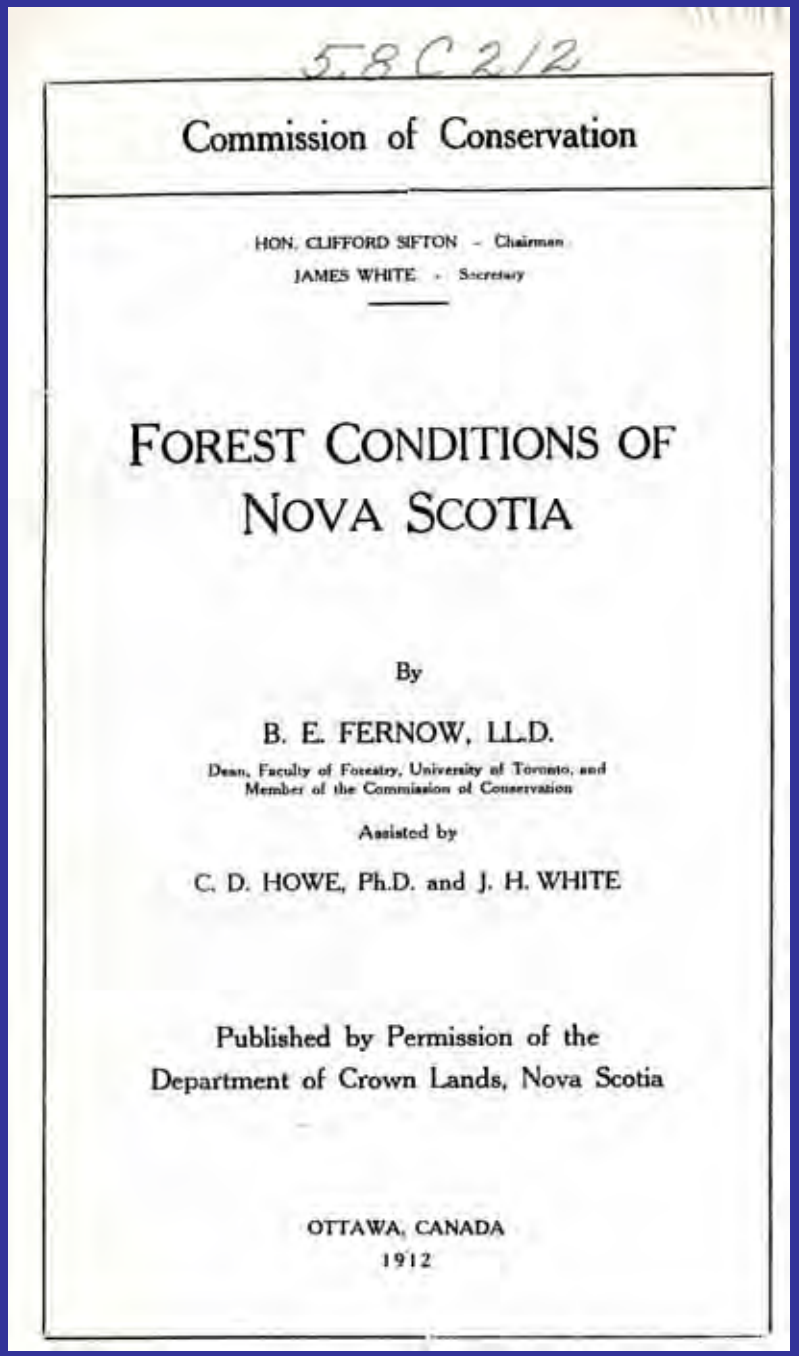


Scott, A.C.; Stea, R. (2002) Fires sweep across the Mid-Cretaceous landscape of Nova Scotia. *Geoscientist* 12: 4-6.

A careful settler would surround the slashings with a firebreak, or call neighbours to help with the burning, or trust to his knowledge of the season to keep the fire within bounds. But the work was tedious, colleagues scant, and experience hard won, so it happened that wildfires could enter the drying slash and ... fires burst out.

In 1865 ... Log-driver Daniel Moody set a smudge fire along the banks of the Mersey River. He succeeded in driving off the black flies, along with scorching 20,000 acres.

... loggers birthed a vicious fire cycle in which they found themselves in competition with fire to see who could harvest the standing timber first. The more loggers cut, the more their locomotives puffed through the cutover, the more fires broke out, which then rushed into the uncut woods.



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Commission of Conservation

HON. CLIFFORD SIFTON - Chairman
JAMES WHITE - Secretary

FOREST CONDITIONS OF NOVA SCOTIA

By

B. E. FERNOW, LL.D.

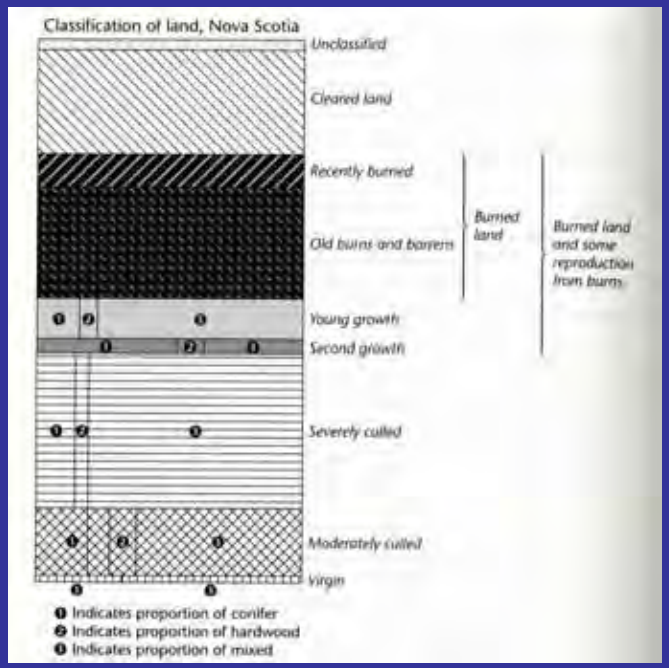
Dean, Faculty of Forestry, University of Toronto, and Member of the Commission of Conservation

Assisted by

C. D. HOWE, Ph.D. and J. H. WHITE

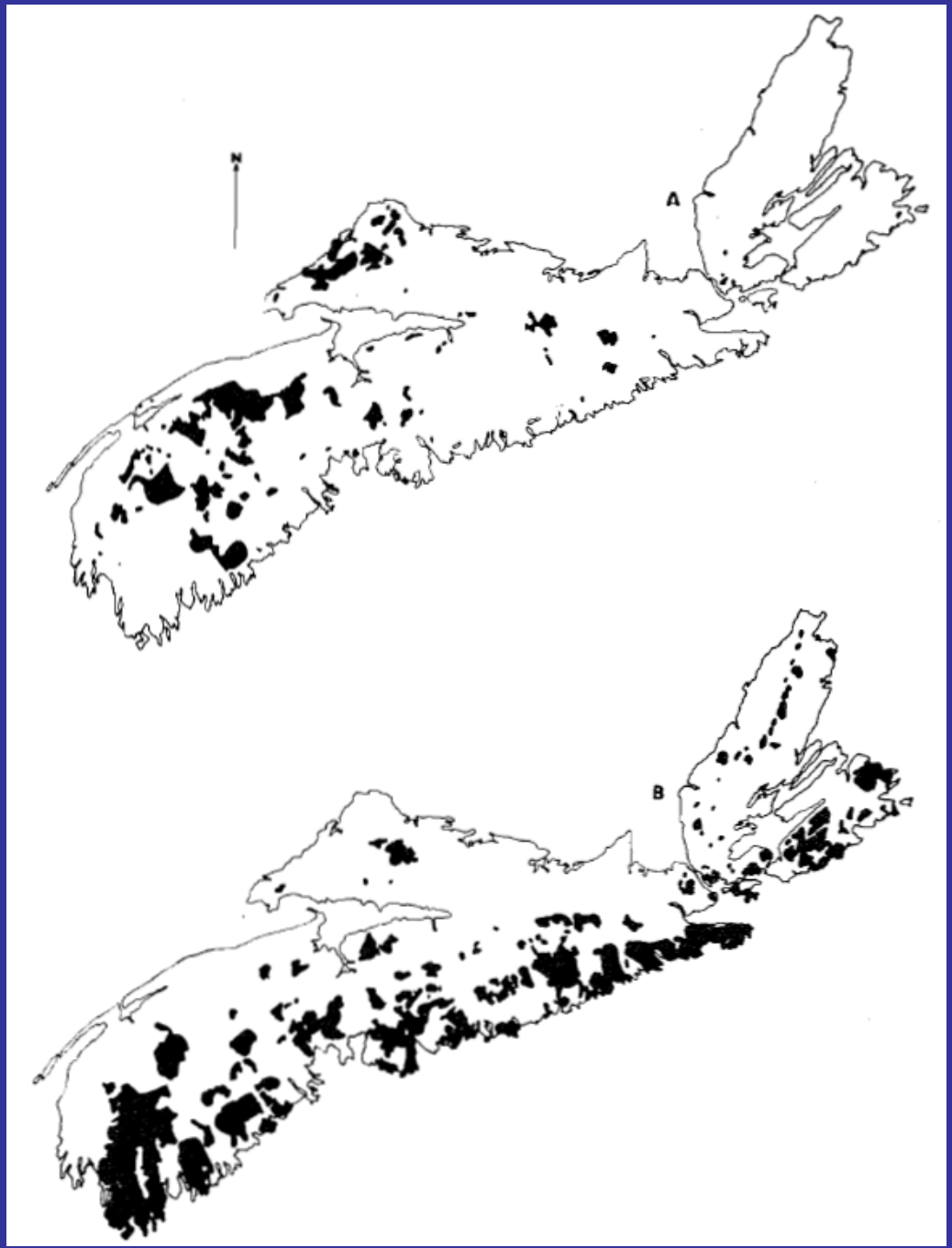
Published by Permission of the Department of Crown Lands, Nova Scotia

OTTAWA, CANADA
1912



B.E. Fernow

- Fernow's study highlighted the fact that more than 25% of the province had been ravaged by fire in recent times and the existence and effects of repeated burning
- He recommended the erection of fire towers, a permit system, controlled burning of brush, a proper firefighting organization, and that railways take responsibility for the fires they start



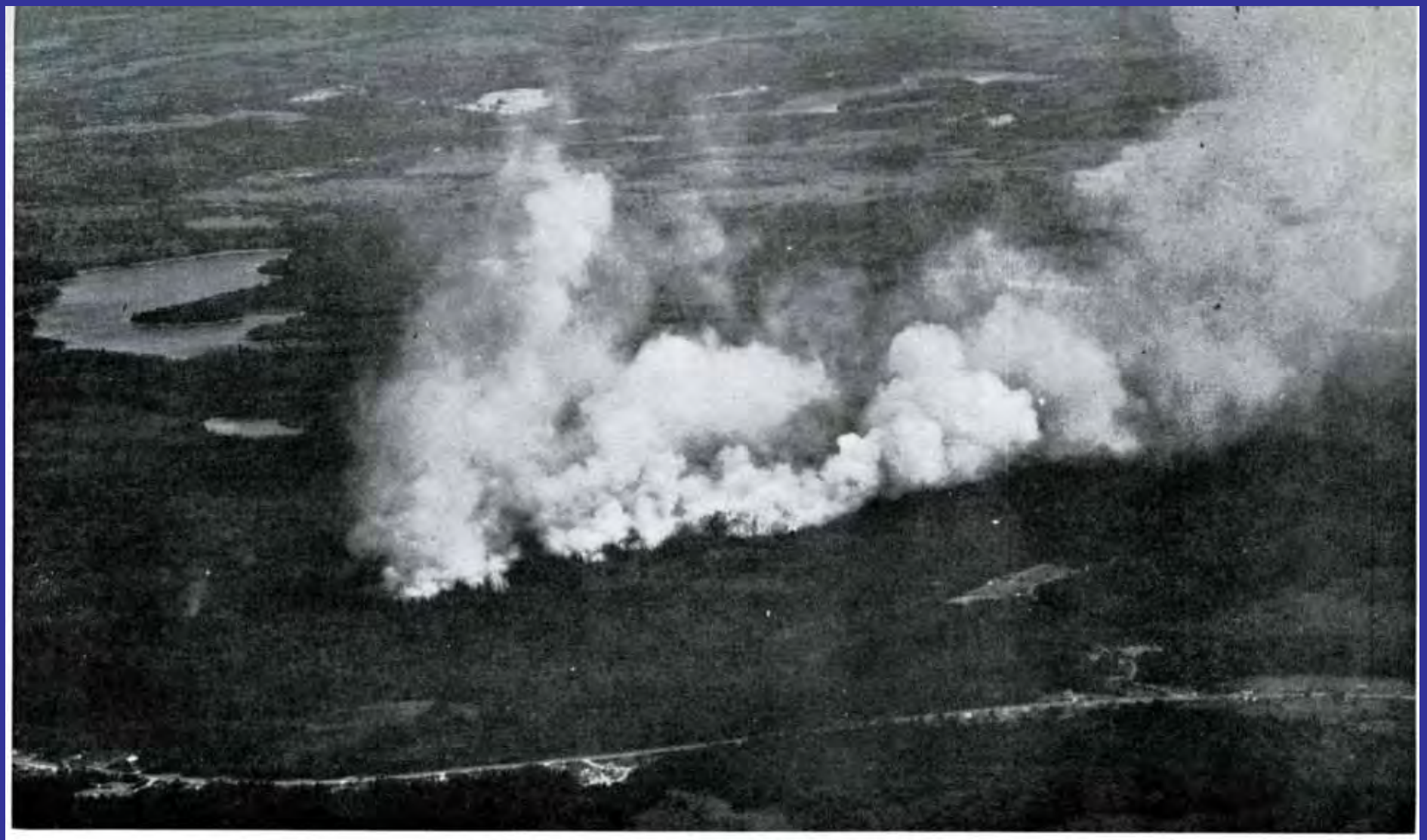
Areas burned in 10-yr period prior to 1909-1910

Areas burned before 1900 and not regenerating to trees, plus barrens as mapped in the years 1909-1910.

Adapted from Fernow (1912) by Wein and Moore (1979)

Middleton Fire — 1949.

Nova Scotia seems to have “bad fire days” rather than “bad fire years” – Provincial Forester, 1955



Forest Fire—Goodwood, Halifax County 1952.

Looking up MacKenzie Brook, near Pleasant Bay, Cape Breton Island, where the Fire of 1947 started. This picture was taken in 1948.

This picture of the same area was taken in 1952, showing new growth starting.

Fire history and recent fire rotation periods in the Nova Scotia Acadian Forest

ROSS W. WEIN AND JANICE M. MOORE
Fire Science Centre and Department of Biology, University of New Brunswick, P.O. Box 4400, Fredericton, N.B., Canada E3B 5A3

Received May 5, 1977[1]
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WEIN, R. W., and J. M. MOORE. 1979. Fire history and recent fire rotation periods in the Nova Scotia Acadian Forest. Can. J. For. Res. 9: 166–178.

Descriptive records of wildfires since the earliest writings and quantitative provincial fire records since 1915 have been used to produce a synthesis of fire history for the Province of Nova Scotia, Canada. Large annual burns were common up to the mid-1930's. Annual burns totalling over 15 000 ha occurred in each of the years 1918, 1920, 1921, 1930, 1934, 1944, and 1947, and annual burns totalling over 30 000 ha occurred in each of the years 1920 and 1921. Lightning has accounted for 1% of the number of fires (three per year). Thirty percent of the fires have occurred in the month of May; however, fires have been recorded for all months. Fire rotation periods for the province as a whole were 1000 or 2500 years, using the mean annual burn or median annual burn, respectively, for all burns in the years 1915 to 1975. In contrast, calculations of burned areas on maps produced at the turn of the century gave pre-suppression fire rotation periods of just over 200 years. Vegetation types have had widely varying fire rotation periods. The vegetation of Cape Breton Island has been subjected to almost no fires over 20 ha, whereas the vegetation type with the shortest fire rotation period (in the interior of western Nova Scotia) has been subjected to fire rotation periods as low as 65 years at the turn of the century, to about 2000 years for the years 1958 to 1975. A summary of fire rotation periods for the Boreal, Great Lakes – St. Lawrence, and Acadian Forest Regions found in the literature is presented for comparison with the Nova Scotia data, and more detailed comparisons are made between the fire rotation periods of the similar vegetation types in New Brunswick and Nova Scotia.

WEIN, R. W., et J. M. MOORE. 1979. Fire history and recent fire rotation periods in the Nova Scotia Acadian Forest. Can. J. For. Res. 9: 166–178.

Les descriptions de feux de forêt, retrouvées dans les écrits anciens et les régistres provinciaux depuis 1915, ont servi à préparer une synthèse de l'histoire des incendies forestiers en Nouvelle-Ecosse, Canada. Les incendies annuels de grande étendue étaient courants jusqu'en 1930. Des incendies couvrant plus de 15 000 ha se sont produits en 1918, 1920, 1921, 1930, 1944 et 1947; ils avaient même plus de 30 000 ha en 1920 et 1921. La foudre cause 1% du nombre des incendies enregistrés (trois par an). Trente pour cent des incendies se sont produits en mai, bien que des feux aient été enregistrés tous les mois. La périodicité d'incendie à l'échelle de la Province entière est estimée à 1000 ans ou à 2500 ans en se servant respectivement de la moyenne ou de la médiane des surfaces incendiées annuellement, compte tenu de tous les incendies qui se sont produits entre 1915 et 1975. Par contre, en se référant aux aires incendiées obtenues à partir des cartes dressées au début du siècle, avant la mise en place de la lutte organisée, on obtient une périodicité d'à peine plus de 200 ans. La périodicité constatée varie fortement selon les types de végétation. La végétation de l'île du Cap-Breton n'a presque pas subi d'incendies supérieurs à 20 ha alors que le type de végétation ayant la plus courte périodicité d'incendie a été rencontrée à l'intérieur de la partie ouest de la Nouvelle-Ecosse: de 65 ans au tournant du siècle elle est toutefois passée à environ 2000 ans pour la période de 1958 à 1975. Un résumé des périodicités d'incendie pour les Régions Forestières Boréale, des Grands Lacs et du Saint-Laurent, et Acadienne, estimées à partir de documents, est présenté à titre de comparaison avec les données de la Nouvelle-Ecosse; des comparaisons plus élaborées de la périodicité des incendies sont aussi faites pour des types de végétation semblables au Nouveau-Brunswick et en Nouvelle-Ecosse.

[Traduit par le journal]

Introduction

There is no doubt that a detailed understanding of wildfire (hereafter referred to as fire) history is necessary for the management of National Parks, Ecological Reserves, and similar areas if these areas are to be maintained in a 'natural state.' Fire may be essential to maintain species diversity or habitat mosaics or to evaluate the use of fire for several

[1]Revised manuscript received December 15, 1978.

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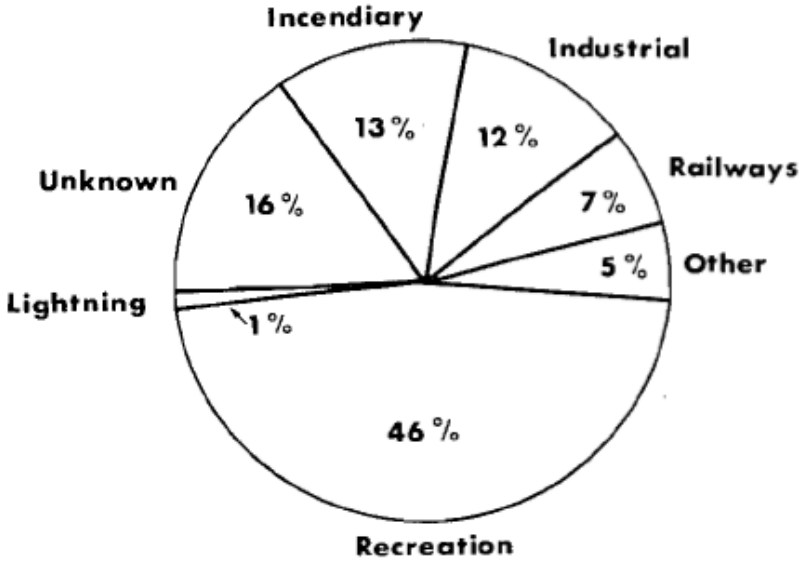


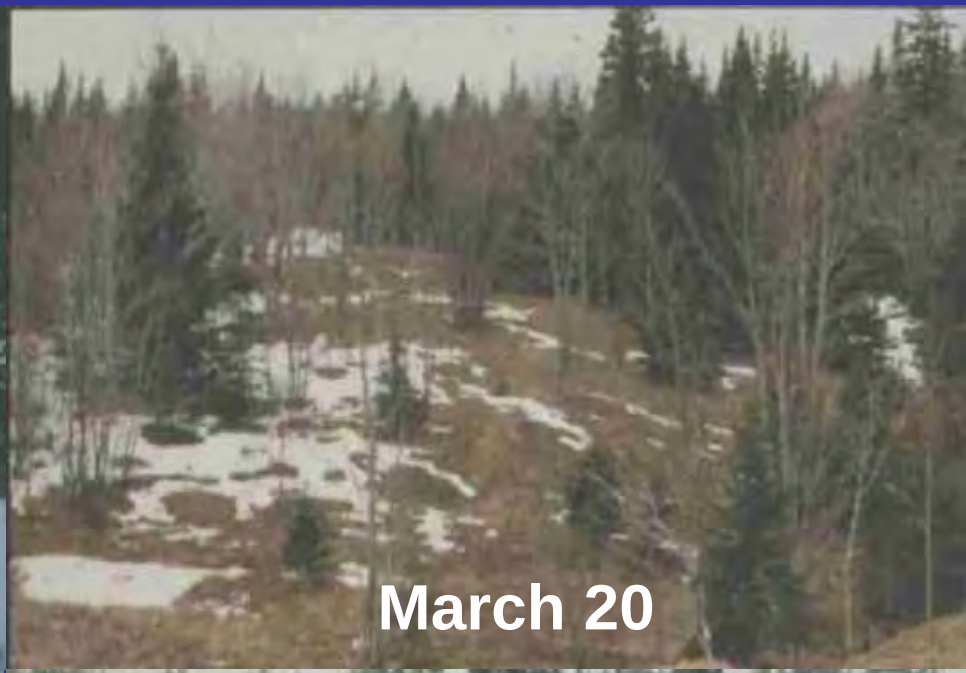
FIG. 2. Causes of all recorded fires (percent of total) for the period 1926–1975.

TABLE 1. Mean (± SD) and medians of number of fires, area burned, and size of fires, by month, for the years 1926–1975*

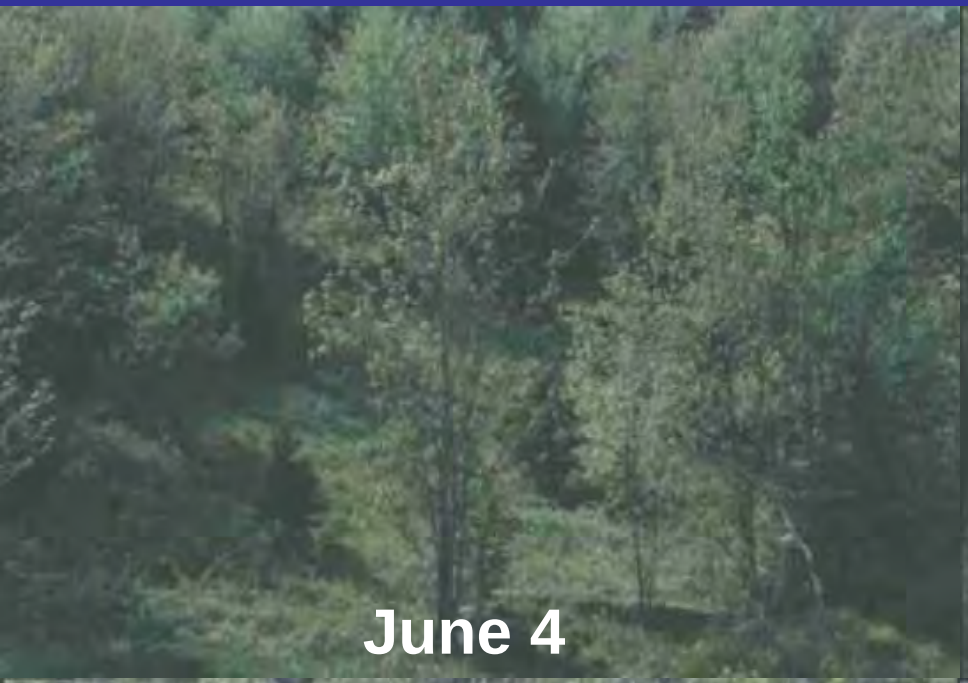
Month	No. of fires		Area burned, ha		Size of fire, ha	
	Mean	Median	Mean	Median	Mean	Median
January	*T*	0	*T*	0	*T*	0
February	*T*	0	*T*	0	*T*	0
March	2 ± 7	0	26 ± 131	0	4 ± 13	0
April	62 ± 72	39	351 ± 492	264	20 ± 36	9
May	118 ± 86	92	2014 ± 2986	699	38 ± 50	19
June	50 ± 34	47	427 ± 746	93	17 ± 31	8
July	48 ± 36	38	628 ± 1738	107	25 ± 74	7
August	56 ± 50	35	983 ± 2144	66	23 ± 36	5
September	24 ± 25	16	137 ± 284	15	9 ± 15	2
October	10 ± 15	5	177 ± 725	12	12 ± 38	2
November	3 ± 7	0	7 ± 16	0	1 ± 3	0
December	*T*	0	*T*	0	*T*	0

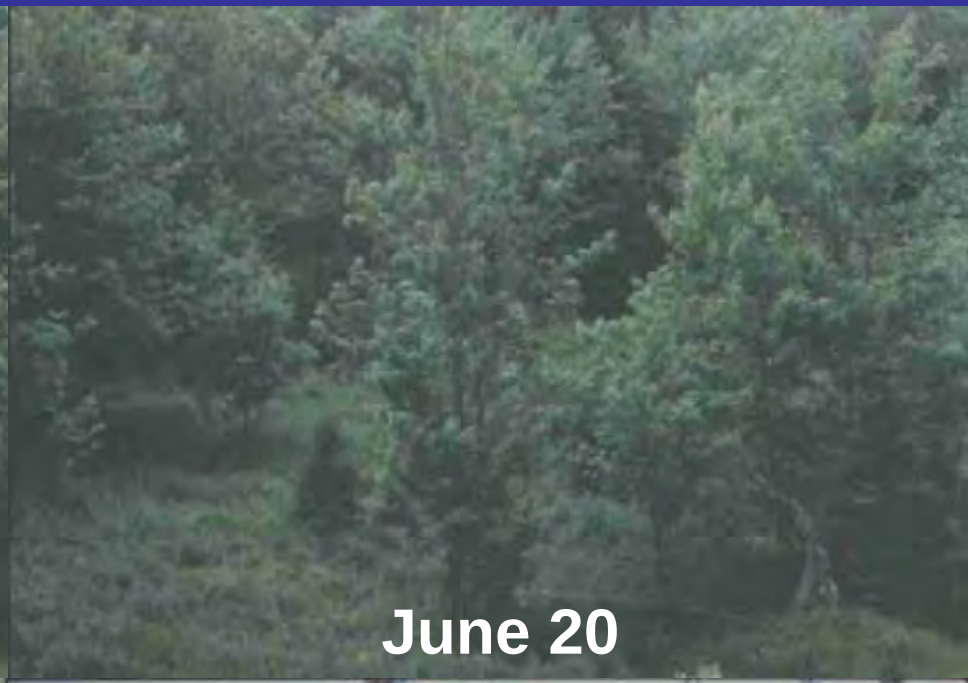
Wein, R.W.; Moore, J.M. 1979. Fire history and recent fire rotation periods in the Nova Scotia Acadian Forest. *Canadian Journal of Forest Research* 9: 166-178.

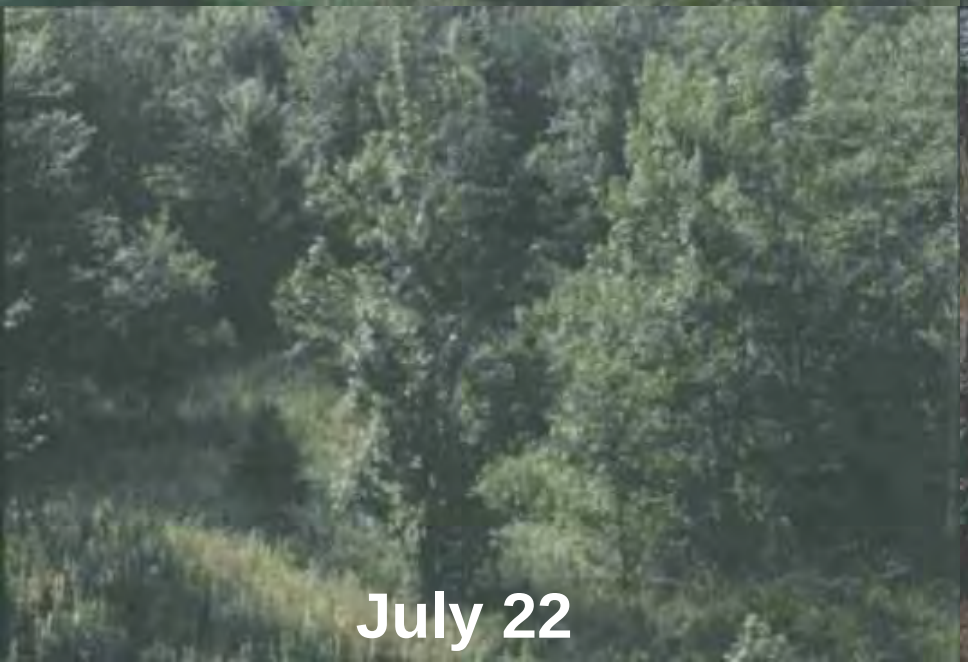
Seasonal Changes in NS Fuels (D. Graham photos)

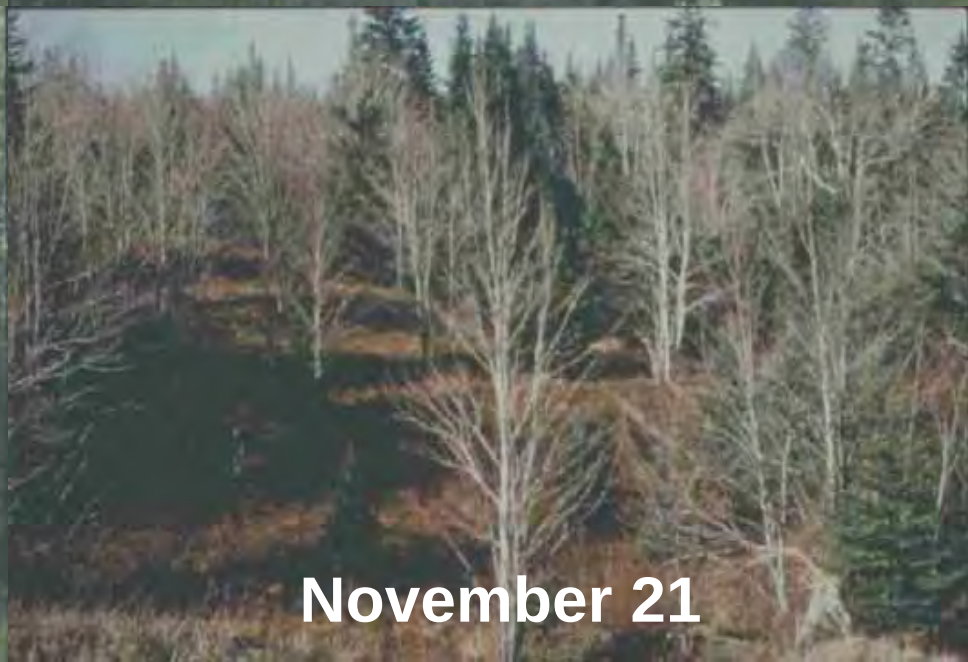


Seasonal Changes in NS Fuels (D. Graham photos









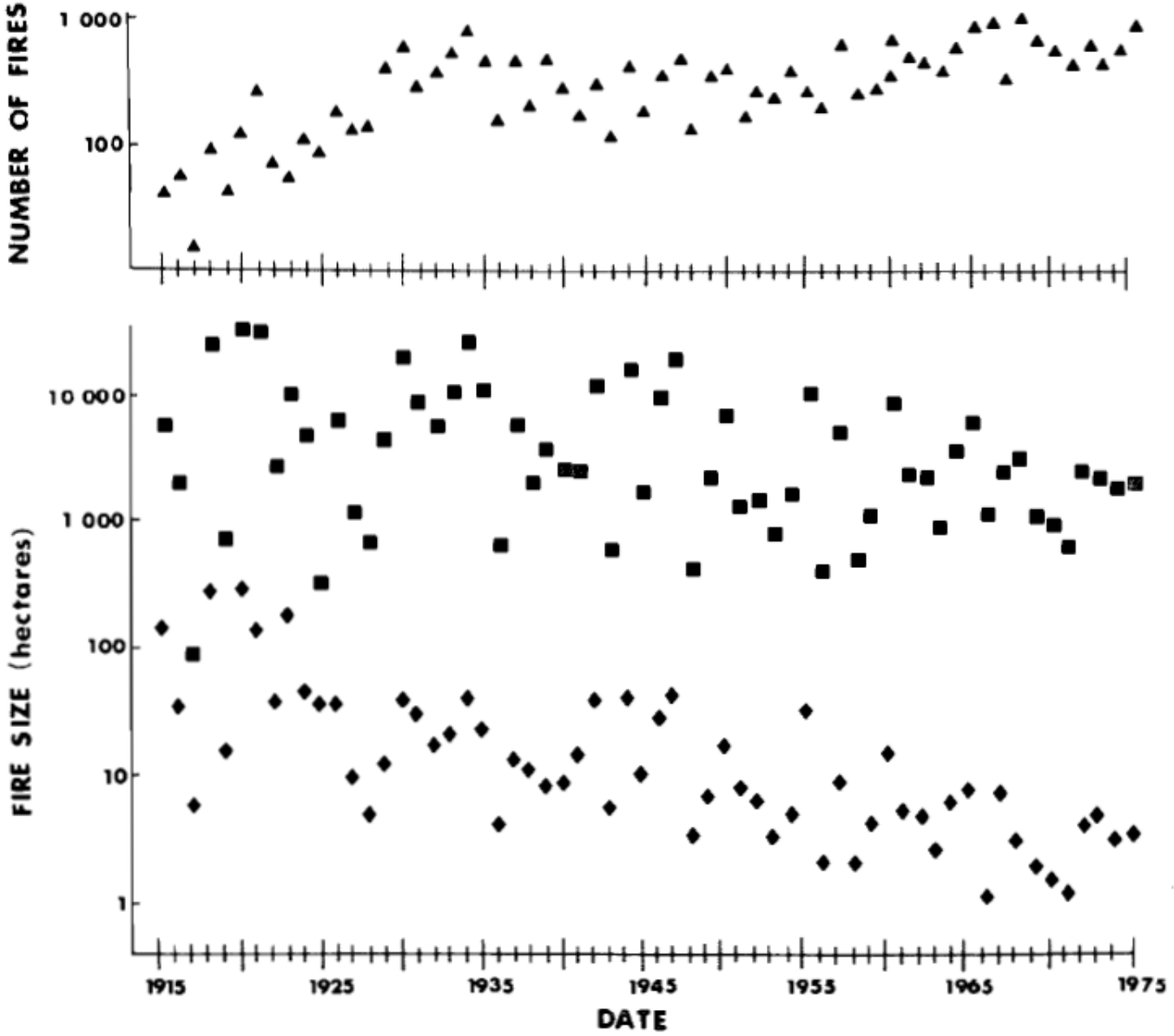


FIG. 1. Number of fires (triangle), total area burned (square), and mean fire size (diamond), per year, for the period 1915 to 1975.

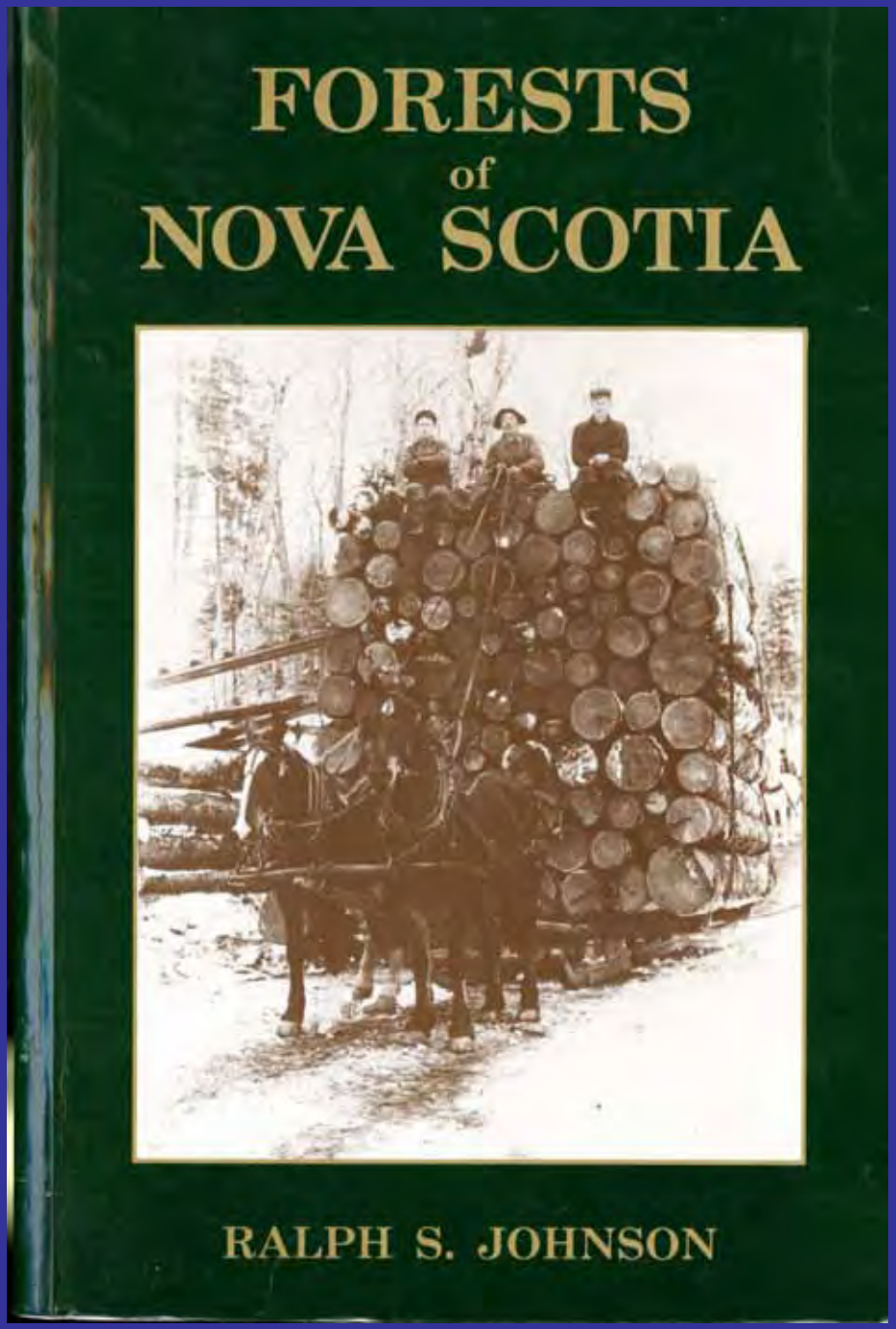
Wein and Moore (1979)

History of Forest Fire Protection in Nova Scotia

A Ranger's "Kit" of Fire Fighting Equipment

Suppression Crew on Fire Line

Field Kitchen at Forest Fire



FIRE IN THE WOODLANDS OF NOVA SCOTIA

by

David Bernard Bradshaw
B.Sc.F., U.N.B., 1954

A REPORT SUBMITTED IN PARTIAL FULFILMENT OF THE
REQUIREMENTS FOR THE DEGREE OF
Master of Forestry
in the Department
of
Forest Management,
Faculty of Forestry

This report is accepted.

Desmond Fry
.....
Dean of Graduate Studies

THE UNIVERSITY OF NEW BRUNSWICK

April, 1969

Bradshaw, D.B. 1969. Fire in the woodlands of Nova Scotia. MFor Report, University of New Brunswick, Fredericton. 108 p.

FIRE PREVENTION IN NOVA SCOTIA[1]

BY G. W. I. CREIGHTON

Deputy Minister, Department of Lands and Forests, Nova Scotia

THE Province of Nova Scotia with a forest area of about ten million acres rankes fifth among the provinces of Canada as a producer of forest wealth and fourth as a producer of sawn lumber. Its forests supply the raw material for one paper mill, three pulp mills and over seven hundred sawmills and woodworking plants, and in 1947 the value of all forest products was estimated to be in excess of forty-three million dollars.

The problem of preventing fires in the forest is apparently as old as the province itself, and some areas had been burned before permanent settlements were establishd.

In 1761, just twelve years after the founding of Halifax, the Provincial Legislature passed an Act "To prevent damages by unseasonable burning or firing of the woods". The preamble to this Act describes how settlers' fires set in dry periods had caused serious damage in the new settlements and the Grand Jury was empowered to set up regulations for burning and to impose fines for infractions of the regulations.

From that time on additional legislation has been passed from year to year with the object of eliminating fire losses, but no direct action was taken until 1904, in which year Chief Rangers were appointed for each municipality in the province.

The rangers received their appointment from the Provincial Government, but all costs were paid by the municipalities. Each ranger was required to make an annual report to the Commissioner of Crown Lands setting forth work carried out during the year, area burned, estimated damage and fire fighting costs.

These figures were first compiled and published in 1915, in which year thirty-nine fires burned an area of thirteen thousand three hundred and thirteen acres.

Fire protection in Nova Scotia remained the responsibility of the municipalities until 1927, when full responsibility for protecting all woodlands in the province was assumed by the Department of Lands and Forests, which had been organized in 1926 by merging the Department of Crown Lands with the Department of Forests and Game.

In the period from 1927 to 1948 very considerable progress has been made and the Department of Lands and Forests now owns two hundred and forty-one motor pumps, more than six hundred thousand feet of motor hose, over four thousand hand pumps and six bulldozers, together with a fleet of trucks, jeeps and a large supply of other miscellaneous equipment.

The Department also maintains thirteen fire towers, and operates an aerial patrol which in 1947 flew in excess of thirteen hundred hours.

During the past summer a new repair shop and storage depot was completed to service fire fighting equipment, and in 1949 a much better repair service than ever before will be provided.

1. Paper presented at the fortieth annual meeting of the Canadian Society of Forest Engineers, Fredericton, N.B., October 4 to 7, 1948.

PROGRESS IN FOREST FIRE PREVENTION [1]

By G. W. I. CREIGHTON [2]

G. W. I. Creighton is a native Nova Scotian. He studied forestry at the University of New Brunswick and was employed for a short time by the International Paper Company, the Federal Forest Service, and for two years by the Laurentide Division, Canadian Power and Paper Company, which is now the Consolidated Paper Company. He spent nearly three years in Europe studying European forestry methods and has been with the Nova Scotia Government since 1934.

Canada is a big country with such a variety of conditions that it would be a difficult task to cover the subject, "Progress in Forest Fire Prevention", in one short paper, even if one had the knowledge necessary to make the attempt.

Since we have at this meeting many persons well qualified to speak on the subject, I will confine my remarks to my own Province.

In Nova Scotia, serious losses from forest fires have been recorded over a long period, and apparently the first attempt to prevent losses from forest fires was made in 1761. In that year, the Government at Halifax passed legislation entitled, "An Act for Preventing Damages by Unseasonable Burning or Firing of the Woods".

This Act provided that the Grand Jury at the March Sessions should make regulations with the approbation of the Justices for the Province. Regulations were to remain in effect for 12 months and were to be renewed annually.

Penalties imposed on persons who neglected or refused to obey the regulations were to be set by the Magistrates but were not to exceed £5, and any prosecution for an offence against the Act had to be commenced and prosecuted within the space of three months after the offence was committed.

In 1864 a Section appears in the Act: "If any person convicted under this Chapter shall not pay the penalty and costs, and shall have no goods whereon a levy can be made, he may be imprisoned for a term not exceeding one day for every dollar of the amount of the judgment unless the same shall be sooner paid".

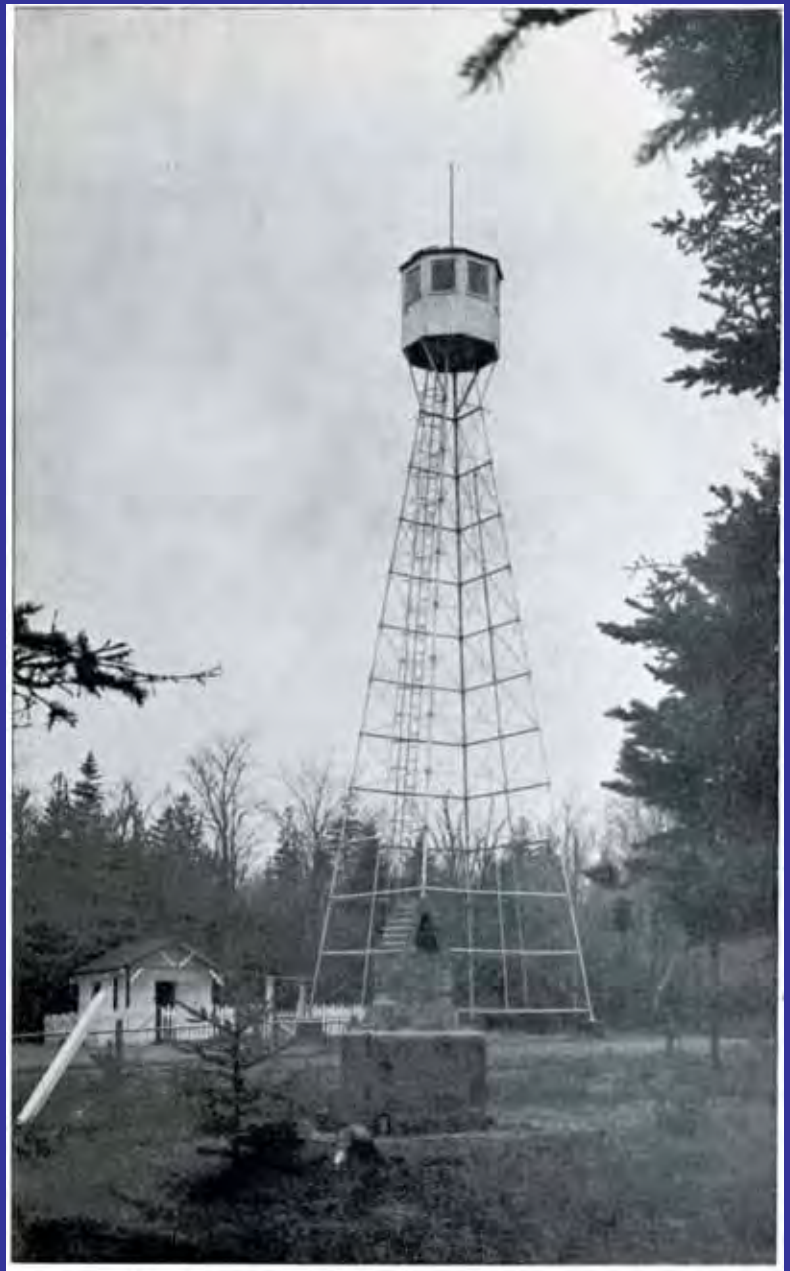
By 1873, the penalty was increased to $80.00 and the following Section added: "Any person violating the provisions of this Chapter shall be liable to the person injured for all damage resulting from such violation".

In the Revised Statutes of 1884, Chapter 65, "Protection of Woods Against Fire", the provisions of the Act are set out in twenty-three Sections. Here for the first time restrictions are imposed on railway locomotives, and the duty of engine drivers is defined.

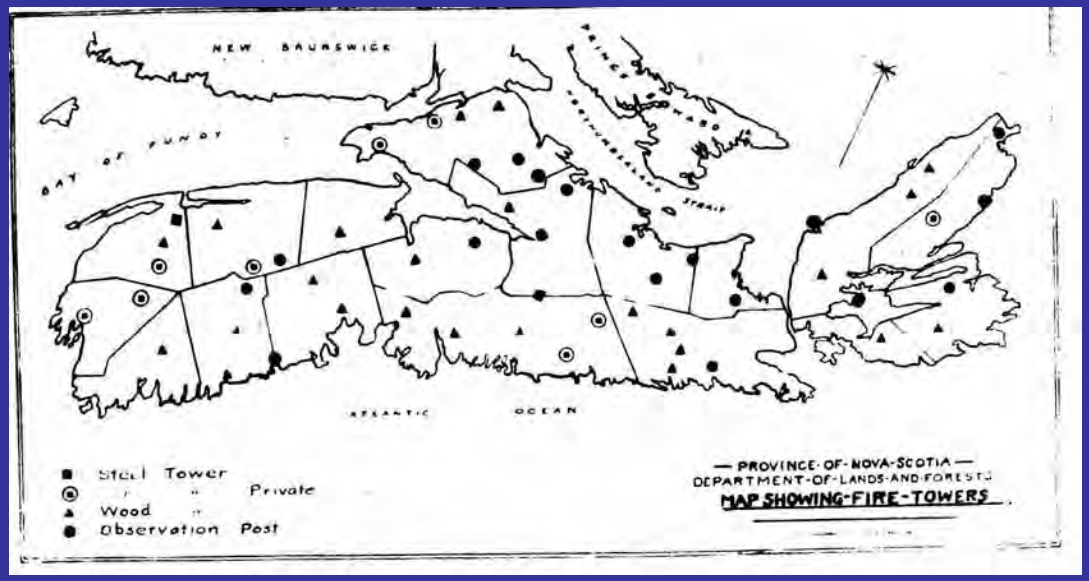
The Municipal Councils are given authority to put in force fire regulations and the Act states: "It shall be the duty of all County Councillors, Stipendiary Magistrates, Justices of the Peace and other County Officers, and the special duty of all Deputy Surveyors and other officers of the Department of Crown Lands, and Chief and other Game Commissioners, and of all Game Wardens to enforce the provisions and requirements of the Chapter."

[1] Paper presented at the 1955 Annual Meeting of the C.I.F. held at Saskatoon, Sask.
[2] Deputy Minister of Lands & Forests, Nova Scotia.

Creighton, G.W.I. 1949. Fire prevention in Nova Scotia. Forestry Chronicle 25: 43-46.
Creighton, G.W.I. 1956. Progress in forest fire prevention. Forestry Chronicle 32: 179-182.



Sixty foot fire tower at Blue Mountain, Pictou County, with adjoining grounds cleared for picnic area. Fire place avoids danger of picnic fires.



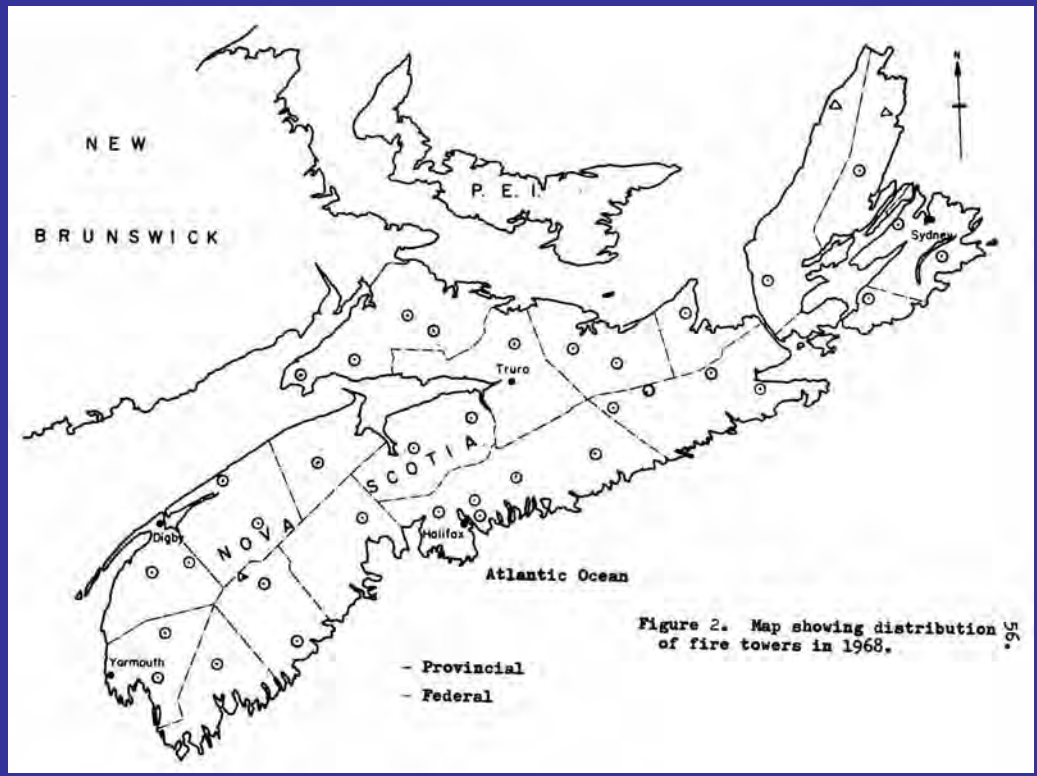
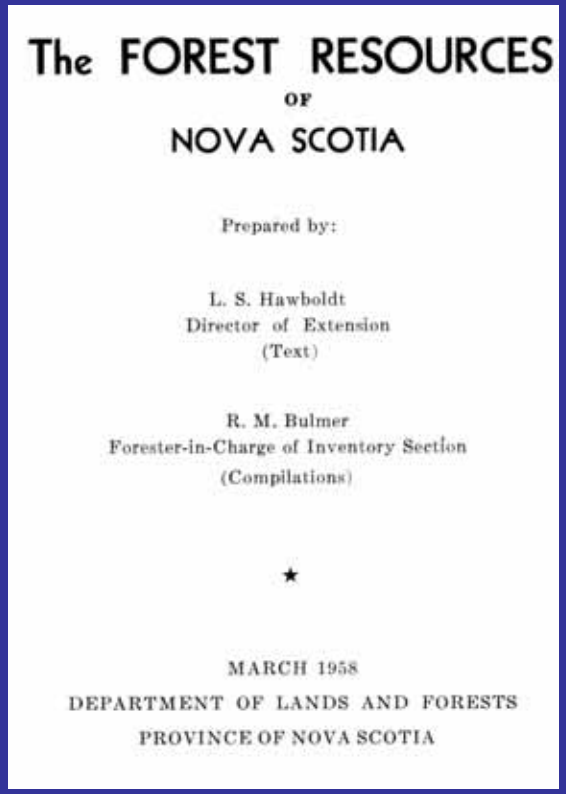


Figure 2. Map showing distribution of fire towers in 1968.


The FOREST RESOURCES
OF
NOVA SCOTIA

Prepared by:

L. S. Hawboldt
Director of Extension
(Text)

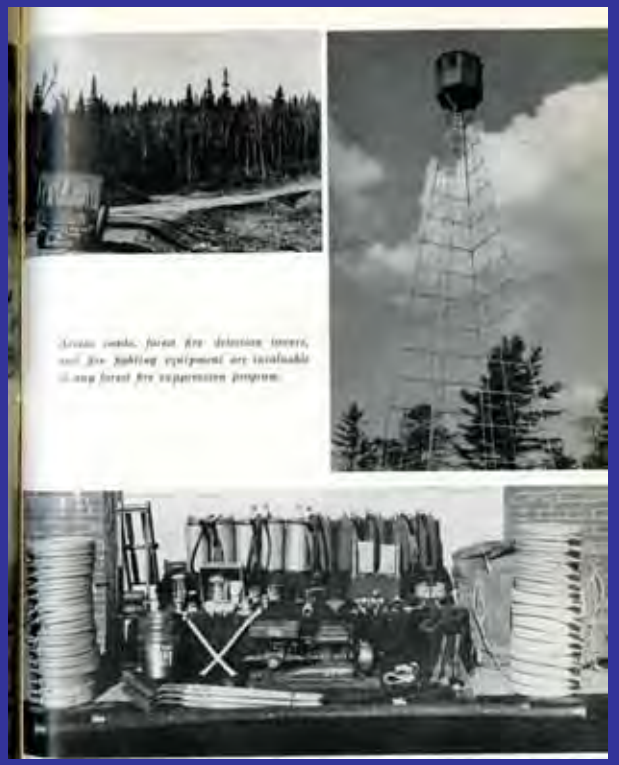
R. M. Bulmer
Forester-in-Charge of Inventory Section
(Compilations)

★

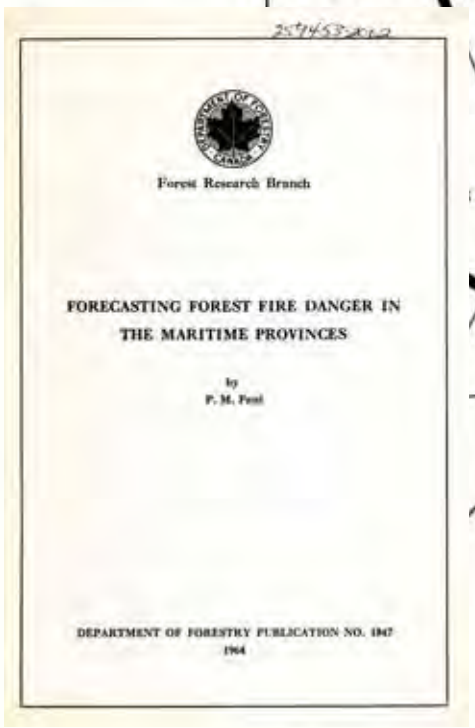
MARCH 1958
DEPARTMENT OF LANDS AND FORESTS
PROVINCE OF NOVA SCOTIA

Recommendation 2:

Fire prevention and suppression programs must be continued and expanded.



The proportion of burned land in Nova Scotia has been reduced greatly since 1910. The success in decreasing the number of acres burned per fire in recent years is attributed to the efficiency of fire fighting personnel and the development of equipment resources. All such efforts are minimized by a weak fire prevention program.



Forest Research Branch

FORECASTING FOREST FIRE DANGER IN THE MARITIME PROVINCES

by
P. M. Feni

DEPARTMENT OF FORESTRY PUBLICATION NO. 1047
1964

FOREST FIRE DANGER FORECAST
AUGUST 11, 196

RESTIGOUCHE E
MADAWASKA
VICTORIA
NORTHUMBERLAND
GLOUCESTER H
N' LAND
E
KENT
PRINCE
H
QUEENS
KINGS
INVERNESS
VICTORIA
M
L
CAPE BRETON
RICHMOND
WESTMORLAND
SUNBURY
QUEEN'S
ALBERT
CUMBERLAND
ANTIGONISH
H
KING'S
E
COLCHESTER
PICTOU
ST. JOHN
GUYSBOROUGH
HANTS
H
KINGS
HALIFAX
H
ANNAPOLIS
LUNENBURG
DIGBY
QUEEN'S
M
YARMOUTH
SHELBURNE

L — LOW
M — MODERATE
H — HIGH
E — EXTREME

The Silent Tracker

D. B. BRADSHAW[1]

A trained dog has proven valuable for fire investigation work in Nova Scotia. The dog is also an effective deterrent to incendiaries, who fear they may be tracked down even after they leave the fire area.

For the fourth consecutive season in Nova Scotia, a German Shepherd dog, Major, trained for tracking persons has been used to help curb forest fires started by incendiaries. Such fires have plagued fire control personnel throughout the Province's 40-year comprehensive fire prevention program.

Aircraft Partially Successful

During the 20-year period following World War II, the use of aircraft, both fixed wing and helicopter, proved partially successful as a preventive measure. However, in some counties of the province, the determined incendiary continued to have his way, perhaps more wary, but still undaunted. Clearly, a more impressive method of linking him with his handiwork was required.

The successful experience of the Royal Canadian Mounted Police in using a tracking dog to apprehend criminals, to locate lost hunters, children, and so on, was noted by provincial fire control personnel. The use of such a dog to deter the incendiary seemed reasonable.

Choosing a Dog

In early January of 1966, a Western Canadian firm, specializing in raising and training dogs for activities associated with police and security types of work, was contacted. The firm was asked by the Supervisor of Forest Protection to express its views on the feasibility of using a dog to track a "fire-bug" in a woodland area. The company considered this to be feasible, and suggested the German Shepherd and Doberman Pinscher as good breeds for the purpose. They offered to train a dog owned by the Department of Lands and Forests or to sell the Department a suitably trained dog.

Further correspondence established the particulars needed to train a dog to track in wooded areas under possibly smoky conditions. This included the preferable sex and age of the animal to be trained and a mutually acceptable leasing fee for a 2 or 3 month trial period.

In mid-April of 1966, the company was requested to ship a trained male German Shepherd to Halifax under lease for an initial period, with the possibility of purchase later on. On May 2nd, "Rommel" arrived at the Halifax International Airport.

Rommel

Within 2 weeks of his arrival in the province, Rommel was put to work in Halifax County. During the previous two months some 50 fires had occurred near a community in this county. When the dog arrived, two fires were in progress. Suppression action had started on one.

The dog was taken to the second fire where his initial attempt at tracking was unsuccessful due to confusion over an animal track. However, on being taken back to the fire, he followed a scent to a house in which a

See TRACKER, p. 15

Figure 1.—Commanded to "sit", Major awaits instruction from dogmaster. The four-year-old German Shepherd is used in forest protection and game law enforcement work in Nova Scotia. (N.S. Dept. of Lands & Forests)

[1] Forester i/c, Forest Protection, Nova Scotia Dept. of Lands and Forests.

The Three "Es" of Fire Prevention:

- Education
- Enforcement
- Engineering

Bradshaw, D.B. 1970. The silent tracker. Fire Control Notes 31(2): 15-16.

“Water bombs” stored at a site near the Department of Lands and Forests Lake William Air Base (circa mid 60s)

From: Bradshaw, D.B. 1969. Fire in the woodlands of Nova Scotia. MFor Report, University of New Brunswick, Fredericton. 108 p.

Modern Era Fire Protection Today

Incident Command System

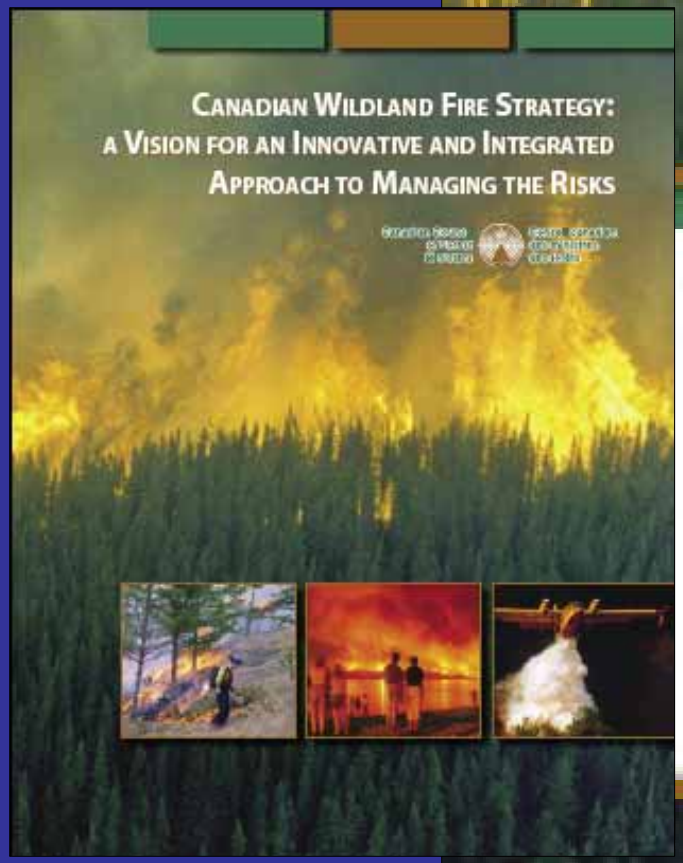
- Agency Executive or EOC (if Activated)
  - **Incident Commander IC**
    - Wildfire Information Officer
    - Safety Officer
    - Liaison Officer
    - **Operations Section Chief OSC**
      - Staging Area Manager STAM
      - Operations Branch Director OPBD
        - Division Supervisor DIVS
          - Sector Leader SCLD
            - Strike Team Leader STLD
              - Crew Leader
      - Air Ops Branch Director AOBD
        - Air Tactical Group Supervisor ATGS
        - Air Support Group Supervisor ASGS
    - **Planning Section Chief PSC**
      - Resources Unit Leader RESL
      - Situation Unit Leader SITL
      - Documentation Unit Leader DOCL
      - Demobilization Unit Leader DMOB
    - **Logistics Section LSC**
      - Service Branch Director SVBD
        - Communication Unit Leader COML
        - Medical Unit
        - Food Unit
      - Support Branch Director SUBD
        - Supply Unit Leader SUPL
        - Facilities Unit Leader FACL
        - Ground Support Unit Leader GSUL
    - **Finance Section Chief FSC**
      - Time Unit Leader TIME

Partnerships and Cooperation

CIFFC
Canadian Interagency Forest Fire Centre

NFFPC
NORTHEASTERN
FOREST FIRE PROTECTION
COMMISSION

Atlantic Canada Forest Fire Management Coordinating Committee

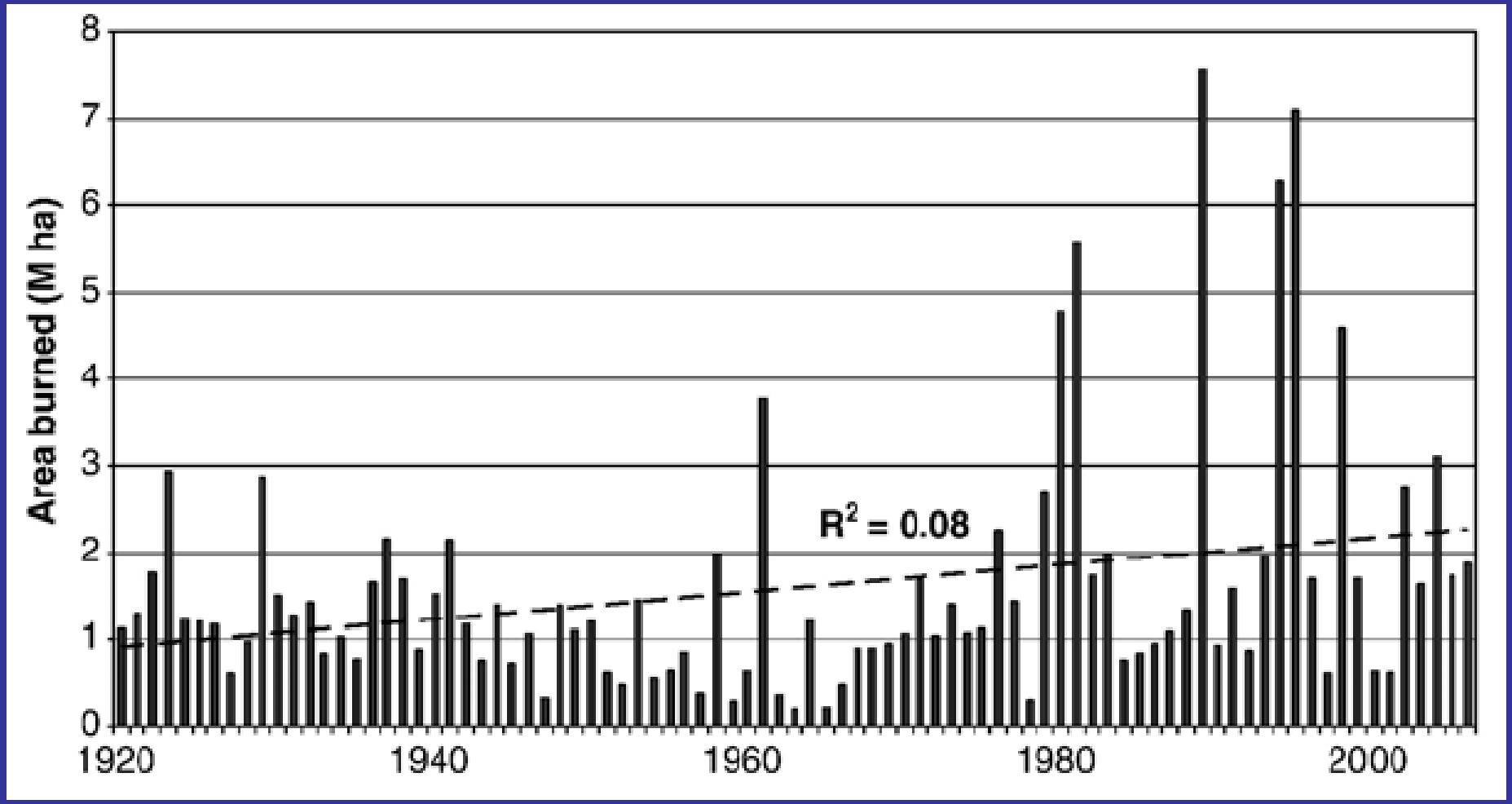


http://www.ccfm.org/

Canadian Wildland Fire Strategy

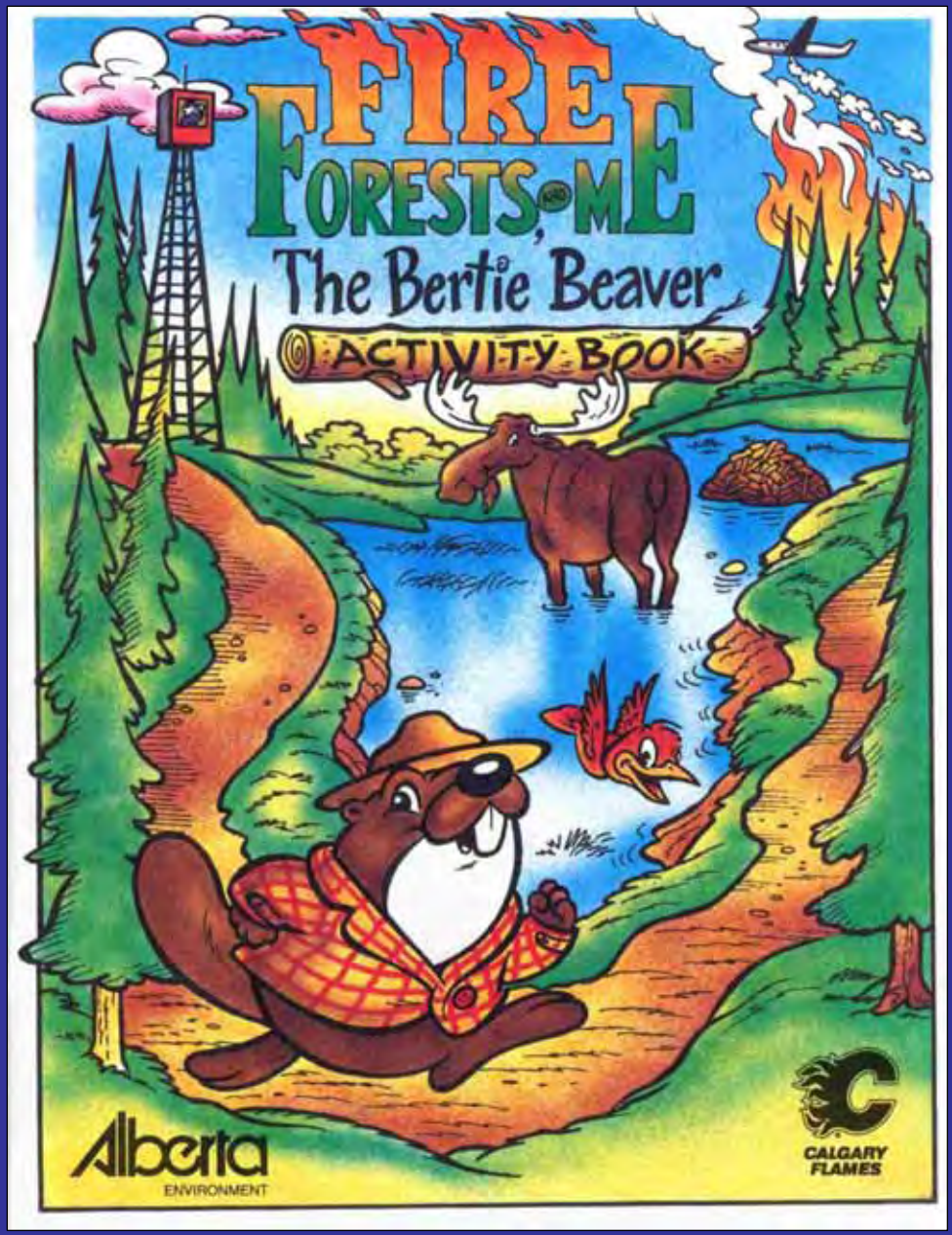
- Canadian FireSmart Initiative
- Improved Preparedness and Response Capability
- Public awareness campaign
- Innovation through S&T

Is Wildfire Activity Increasing in Canada?



Is it not possible to simply eliminate the wildfire problem?

The goal of fire prevention is to reduce fire occurrence



Winter Brush Burning

The following steps will help you prepare to burn brush more safely. Winter Burning may take place from November 1 - March 1. Please check with your local Fire Department before burning; some municipalities require a burning permit year round.

1

Gather and pile brush in an open area away from over-hanging branches.

2

In the fall, cover the brush pile with a tarp. Keep the pile covered for at least two months before you burn.

3

When you are ready to burn, choose a calm day (wind 10 km/h and below) with snow on the ground. Remove the tarp.

4

Place crumpled pieces of newspaper into the brush around the base of the pile.

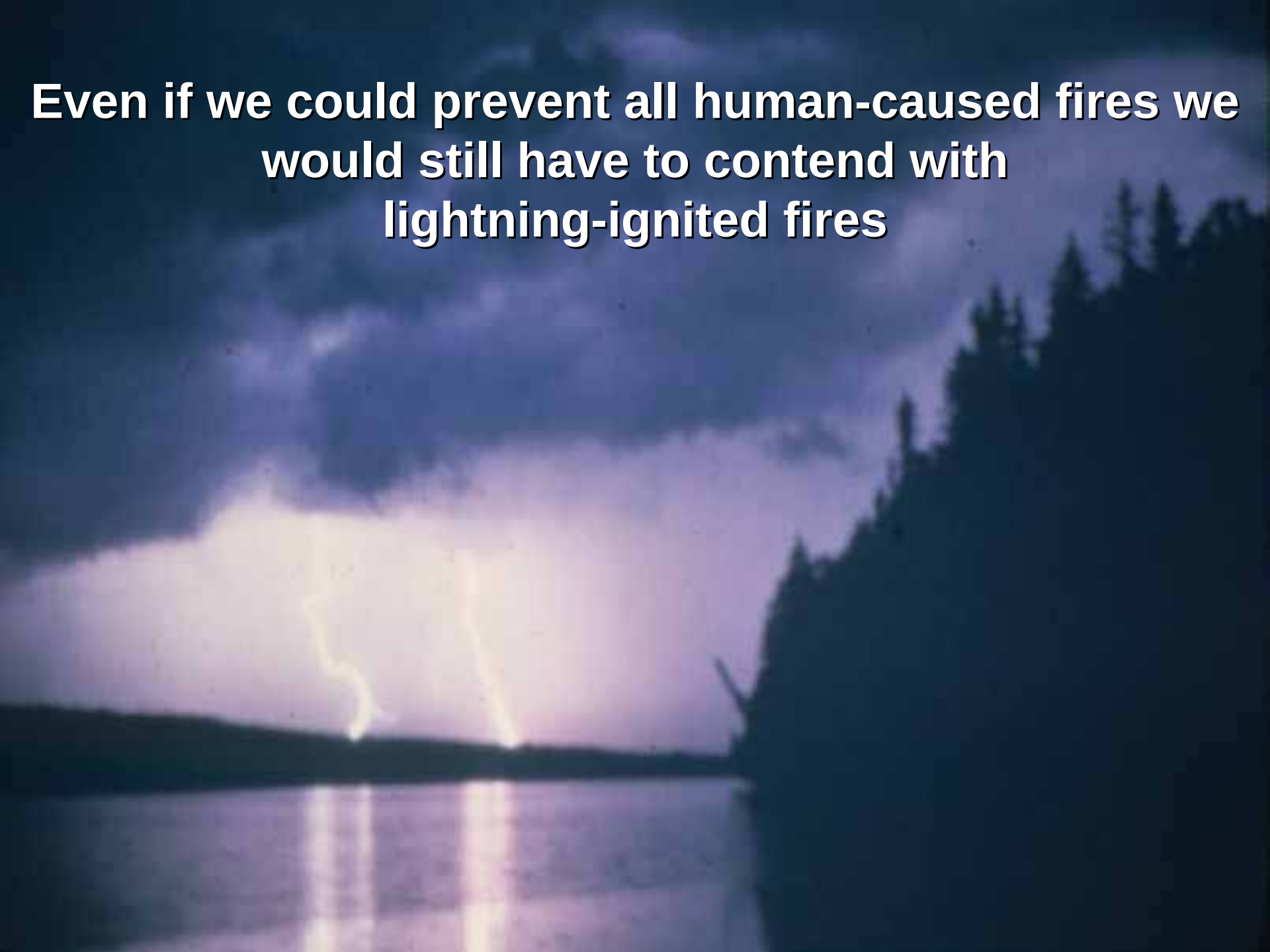
5

Light the paper all around the base of the pile. Do not use the fire to dispose of household garbage, or use old tires, oil or other accelerants.

6

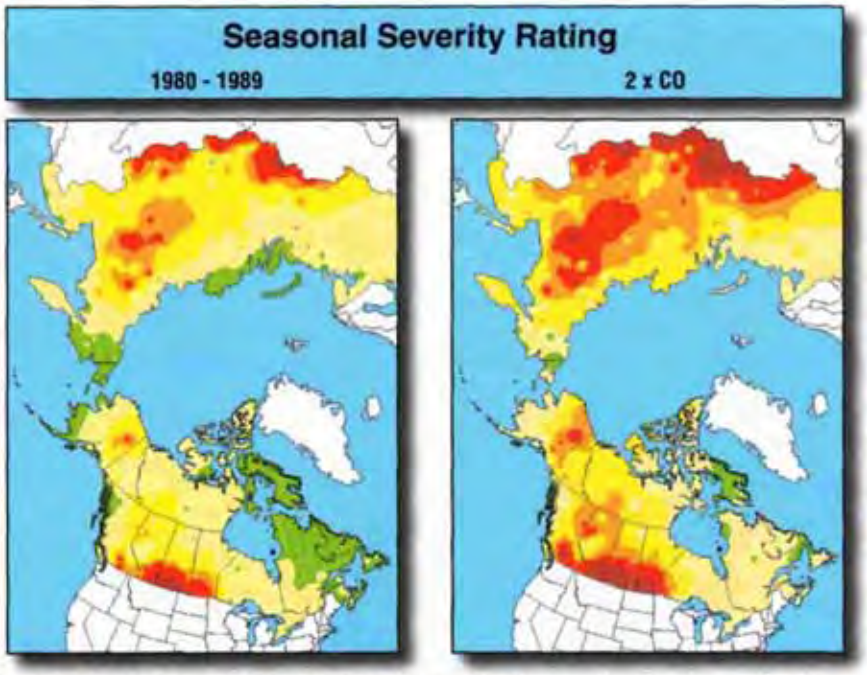
Enjoy a safer, cleaner burn with very little smoke.

Every human-caused fire is a fire prevention failure!


Even if we could prevent all human-caused fires we would still have to contend with lightning-ignited fires

Is it realistic to expect we can control all fires before they reach conflagration levels?

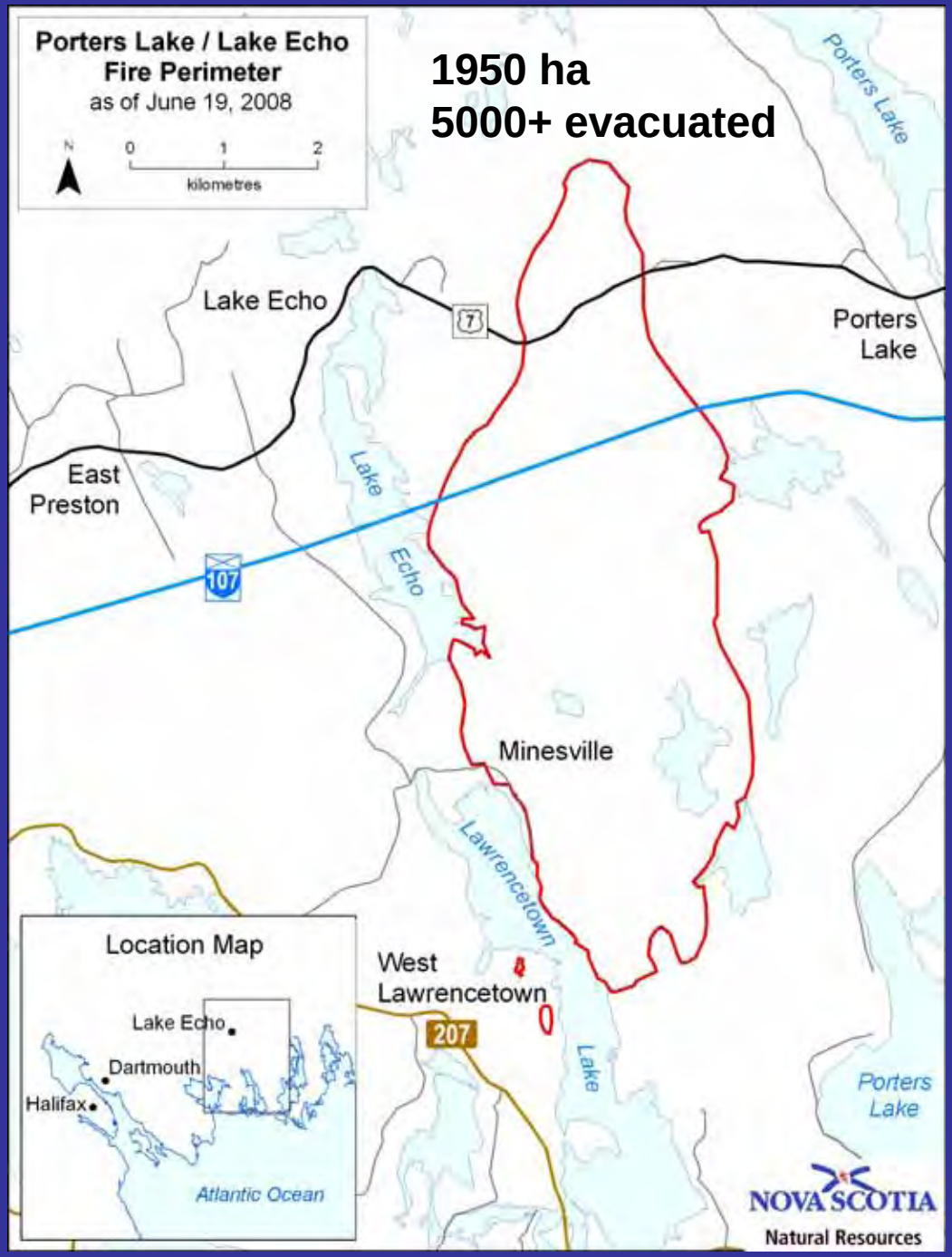
… especially in light of increasing frequency of severe fire weather and forest health issues



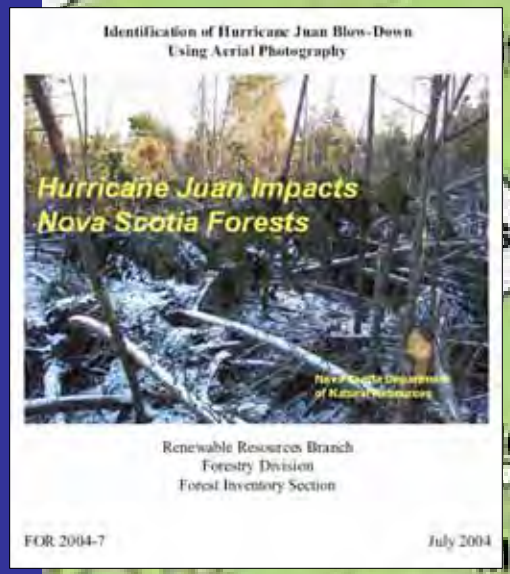
General circulation model-projected changes in circumpolar fire danger levels with a doubling of atmospheric carbon dioxide.

Crown fire in mountain pine beetle infested forest

The growing number of wildland-urban interface fires is compounding the problem



A Wakeup Call ?



Little River

Tatamagouche Park

Waterside

Green Hill

Beaver Mtn

North River

Sheepherders

Riversdale

Truro

Liscomb

Shubenacadie

Antrim

Old Annapolis Trail

Soldier Lake

SPRUCE BEETLE SURVEY
ESTABLISHED PLOTS
18, June 2004

- Red Spruce
- White Spruce
- Light Hurricane Damage
- Heavy Hurricane Damage

10 0 10 20 Kilometers

Damage by Hurricane Edna 1954

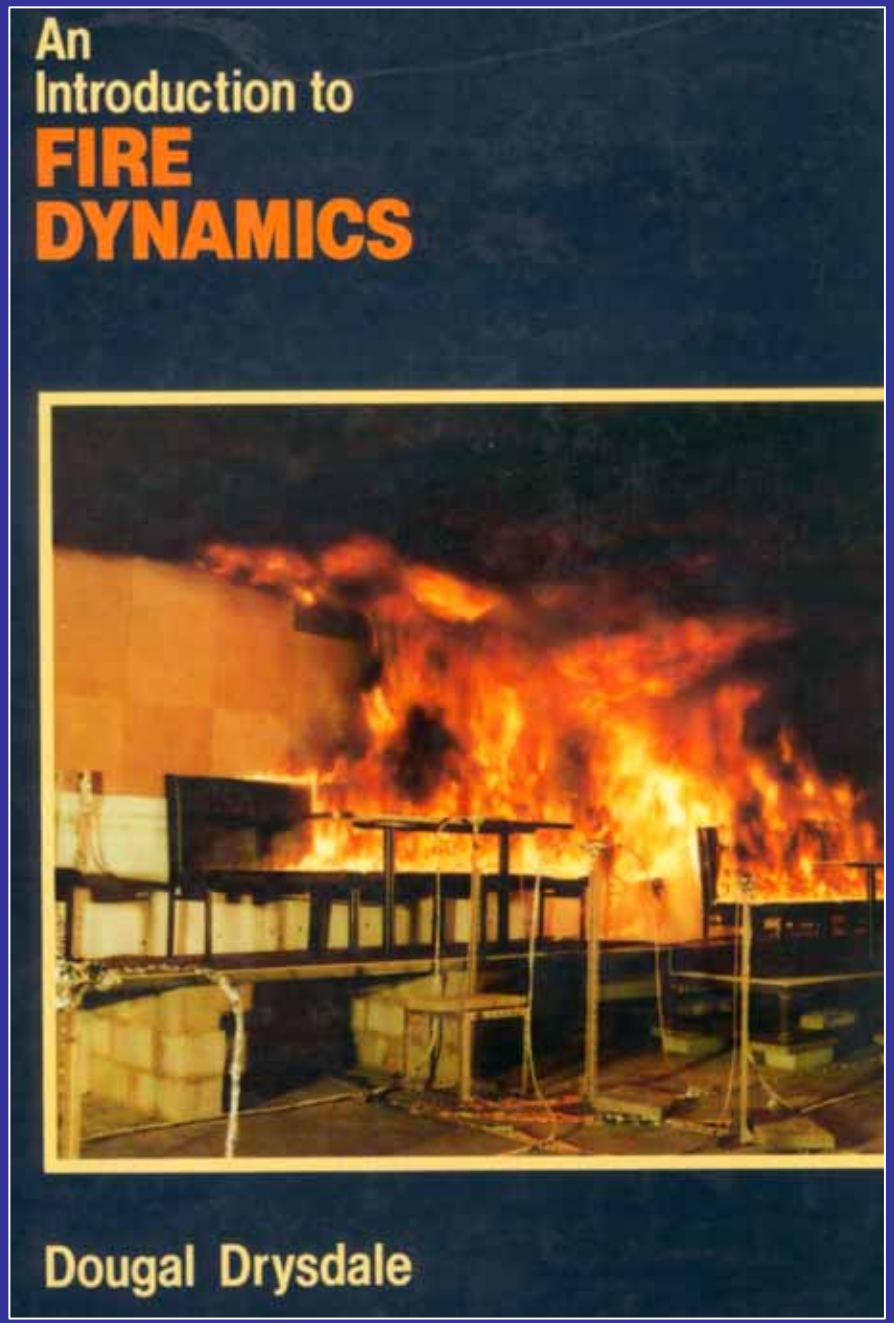

INTERFACE FIRES 2000
HALIFAX CANADA
Conference Info
Registration
Agenda
Sponsors
What's New
Links
Contact Us
NOVA SCOTIA
Labour
Office of the Fire Marshall
NOVA SCOTIA
Natural Resources
CIFFC

Socially irresponsible to jeopardize the safety of firefighters in the wildland/urban interface because of homeowner expectations regarding fire protection

No radically new concept in fire suppression can be anticipated.

Would more airtankers eliminate the wildfire problem?

Are these realistic solutions to the wildfire problem?



"... further major advances in combating wildfire are unlikely to be achieved simply by continued application of the traditional methods. What is required is a more fundamental approach which can be applied at the design stage …

Such an approach requires a detailed understanding of fire behaviour ..."

Drysdale (1985)

Fire Behavior !

What is it?

Fire behavior is defined as the manner in which fuel ignites, flame develops, fire spreads and exhibits other related phenomena as determined by the the fire environment.

The Fire Environment Defined

The surrounding conditions, influences and modifying forces of topography, fuel and fire weather that determine fire behavior.

Fire Environment Factors

Fuel Characteristics:

- Quantity
- Moisture
- Size & Shape
- Depth/Height
- Arrangement

Weather Characteristics:

- Wind Speed & Direction
- Relative Humidity
- Air Temperature
- Rainfall Amounts & Duration
- Cloud Clover
- Atmospheric Instability

Topographic Characteristics:

- Slope Steepness & Aspect
- Elevation
- Configuration
- Barriers to Fire Spread

The more important fire behavior characteristics from the practical standpoint of fire suppression are:

- Forward Rate of Spread
- Fire Intensity
- Flame Front Dimensions

- Spotting Pattern (densities & distances)
- Fire Size and Shape
- Rate of Perimeter Increase
- Burn-out Time

Extreme fire behavior represents a level of fire activity that often precludes any fire suppression action. It usually involves one or more of the following:

- High Rate of Spread & Intensity

- Crowning

- Prolific Spotting
- Large Fire Whirls

- Well-developed Convection Column

Basic Features of a Wildland Fire:

It spreads …

it consumes or "eats" fuel and …

it produces heat energy and light in …

… a visible flaming combustion reaction.

Fire Intensity

$$I = H \times W \times R$$

I	H	W	R
Fire Intensity (kW/m)	Heat of Combustion (18 000 kJ/kg)	Fuel Consumed (kg/m^2)	Rate of Fire Spread (m/sec)

Fire Intensity Spectrum

10 kW/m – Lower limit of surface fire spread

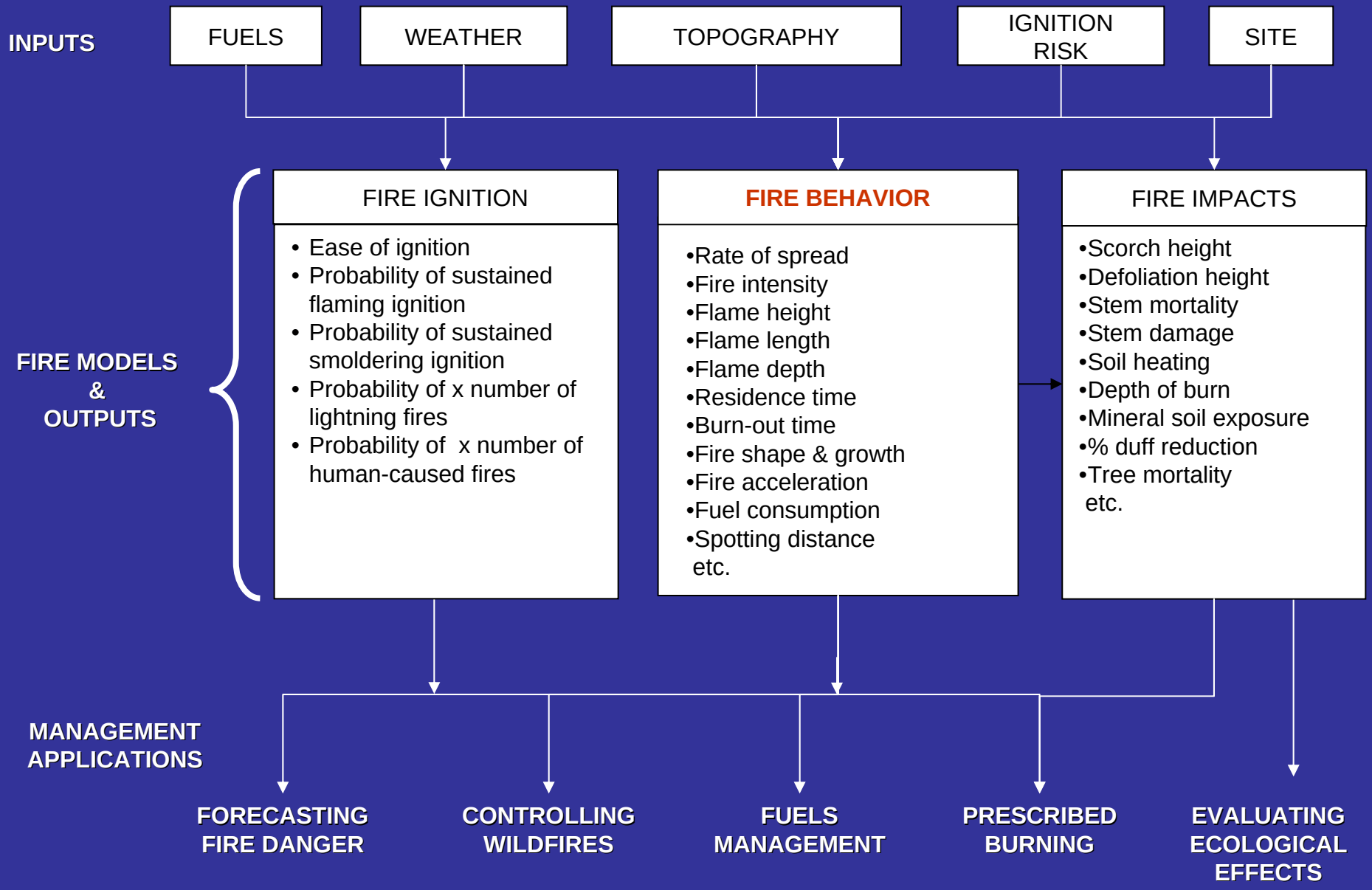
100 kW/m – Ideal for prescribed under-burning

1000 kW/m – Limit of suppression capability by hand crews

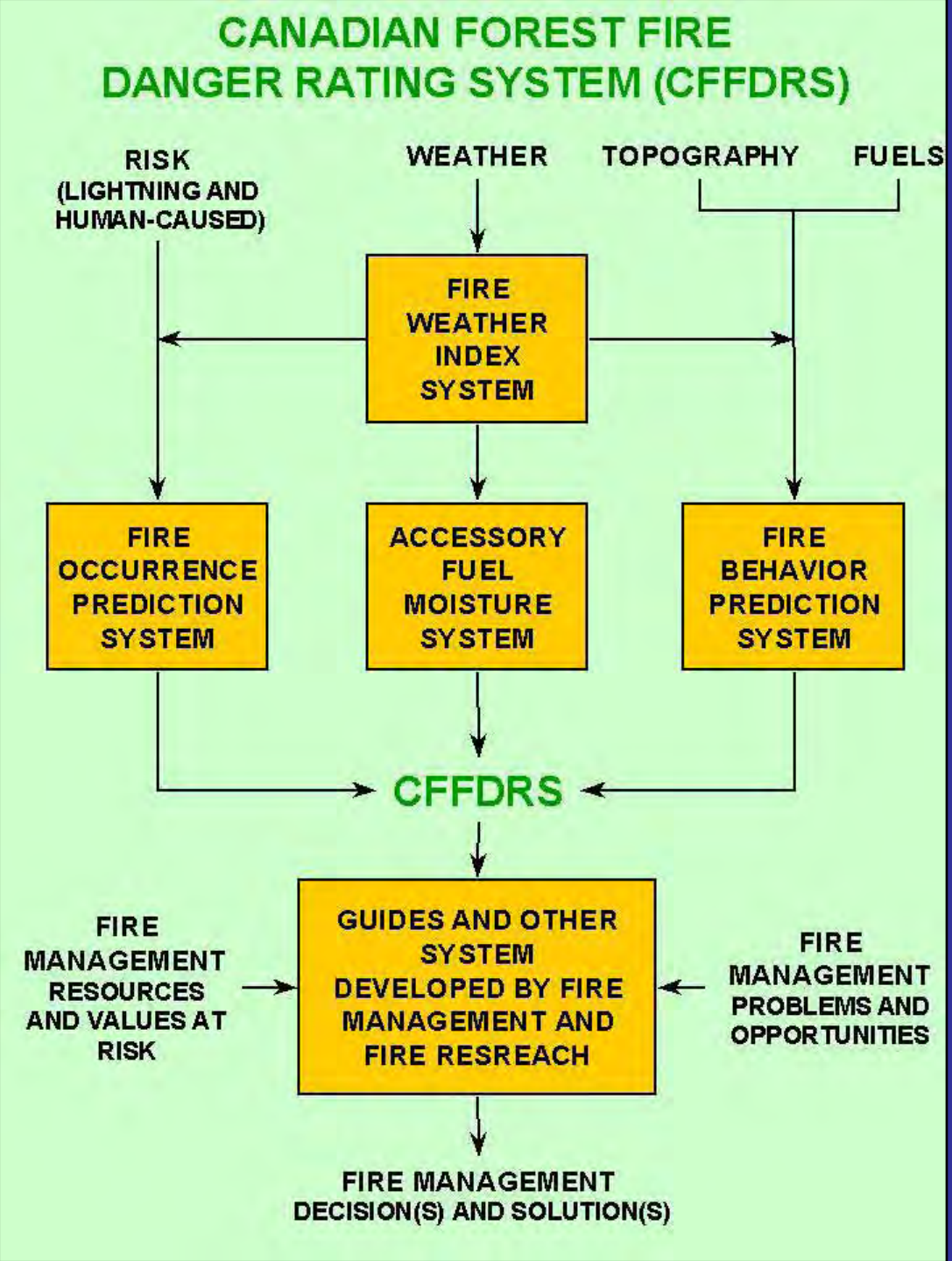
10 000 kW/m – Active crown fires have developed

100 000 kW/m – Major conflagrations

Conceptual Model of Scientifically-based Forest Fire Management

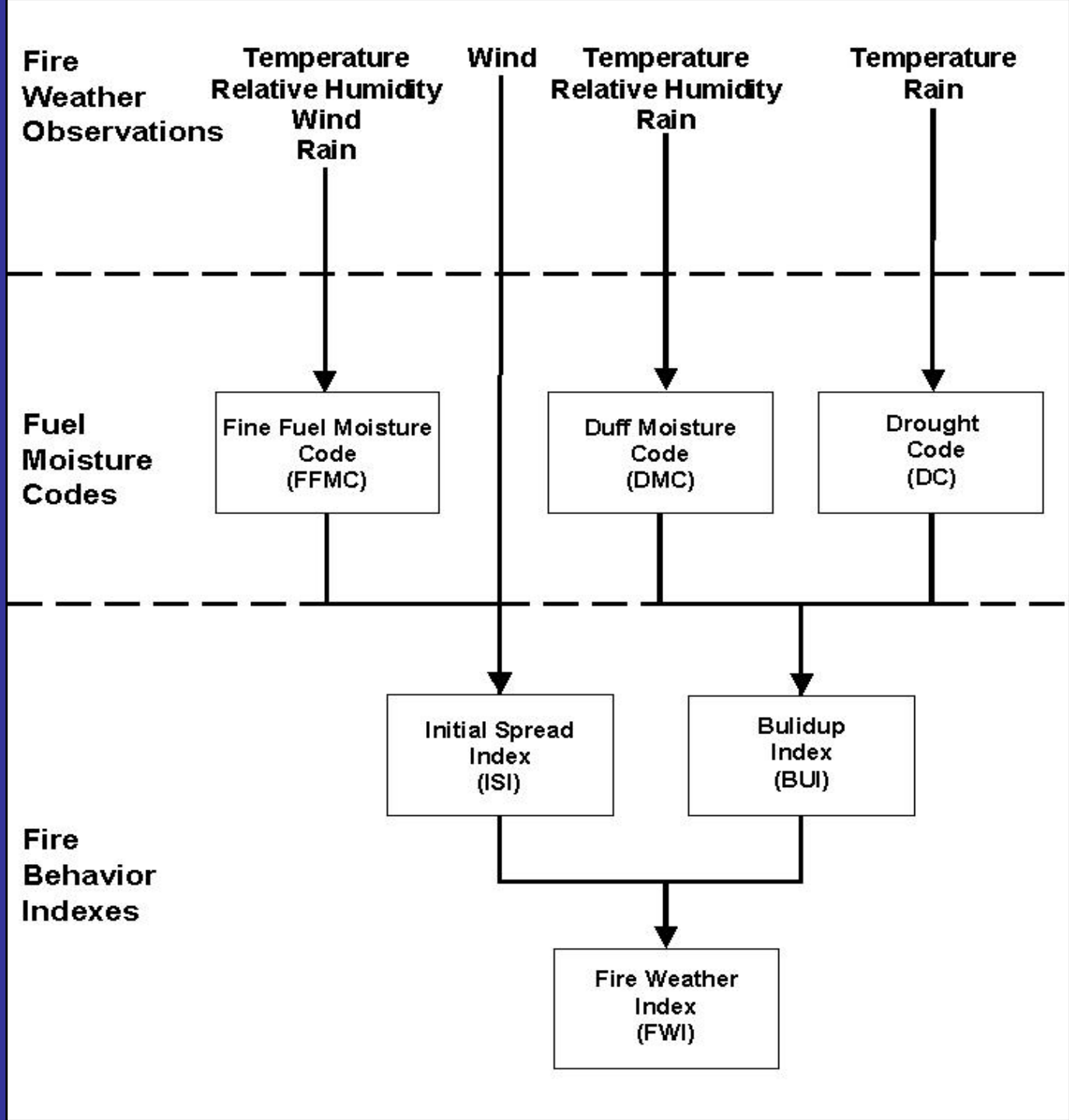


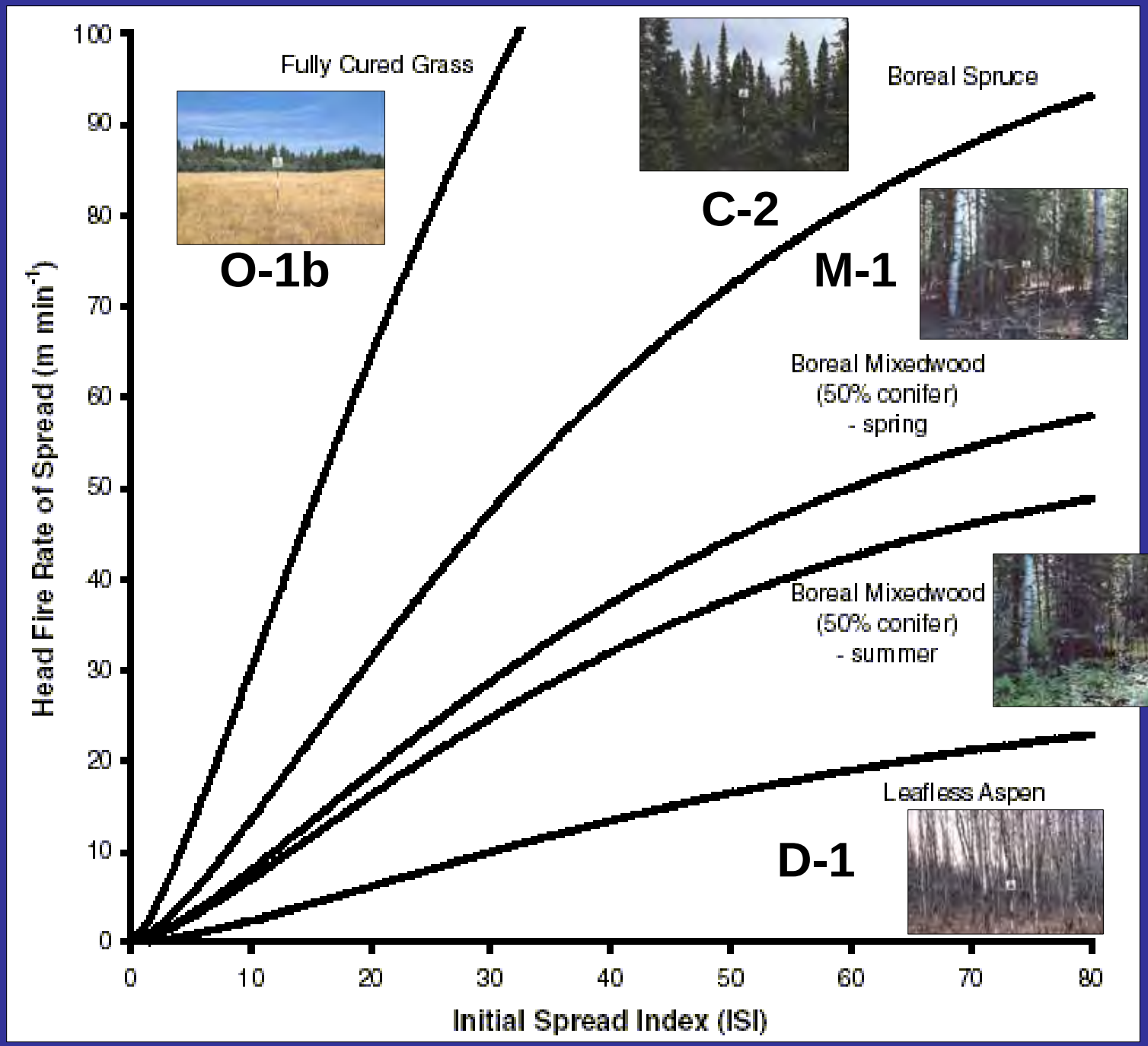
Canada has traditionally taken an empirical approach to developing fire behavior models based on conducting outdoor experimental fires



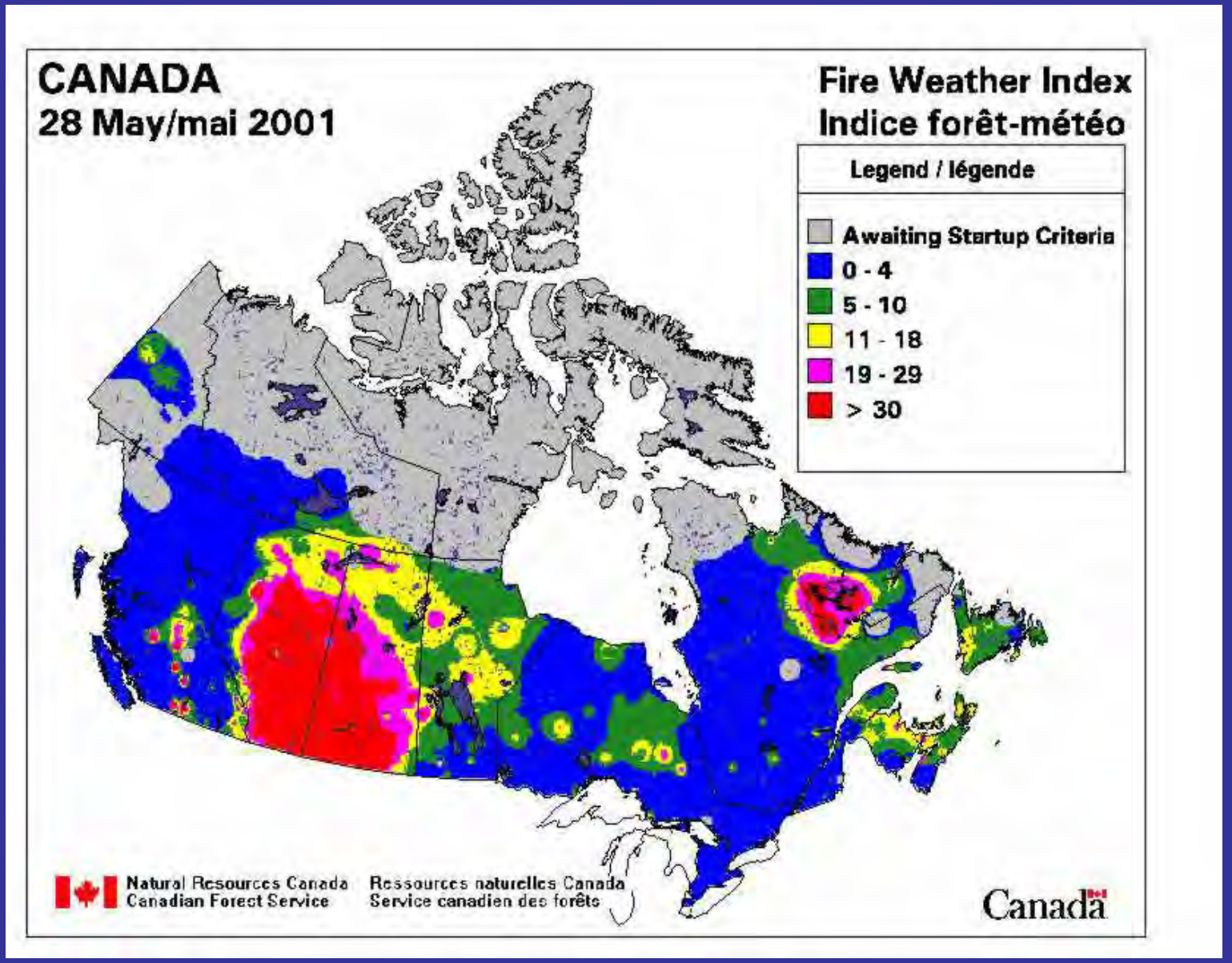
Simplified CFFDRS structure diagram illustrating the linkage to fire management actions

Structure of the Canadian Forest Fire Weather Index (FWI) System




Fully Cured Grass
O-1b
Boreal Spruce
C-2
M-1
Boreal Mixedwood
(50% conifer)
- spring
Boreal Mixedwood
(50% conifer)
- summer
M-2
Leafless Aspen
D-1
Head Fire Rate of Spread (m min-1)
Initial Spread Index (ISI)
0
10
20
30
40
50
60
70
80
90
100

Canadian Wildland Fire Information System



http://fms.nofc.cfs.nrcan.gc.ca/cwfis/

Nova Scotia Wildfire Fire Management

File Edit View Favorites Tools Help

Back Search Favorites

Address http://www.gov.ns.ca/natr/protection/wildfire/fwi/default.htm

Go

NEW Burning Restrictions / Advisories / Closures
Fire Management Group
8 Hour Fire Weather Forecast Map
8 Hour Fire Weather Forecast Indices
Today's Fire Weather Map
Today's Fire Weather Indices
24 Hour Fire Weather Forecast Map
24 Hour Fire Weather Forecast Indices

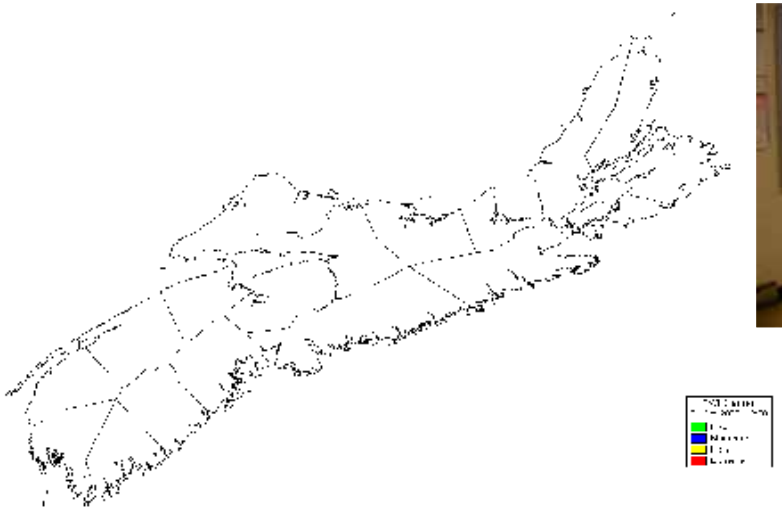
The Department of Natural Resources Forest Protection, Wildfire Management Group is comprised of seven programs: Provincial Fire

Fire Weather Index Map

The Fire Weather Index (FWI) map below depicts a prediction of potential fire conditions for the afternoon of the date shown. This map does not indicate a level of wildfire threat, but shows the potential level of wildfire intensity should one break out.

The Fire Weather Maps and Indices will resume on April 2009

This map is updated daily between 1:30 PM and 2:00 PM during fire season.
Please Note: Blank areas denote non-reporting district office stations.



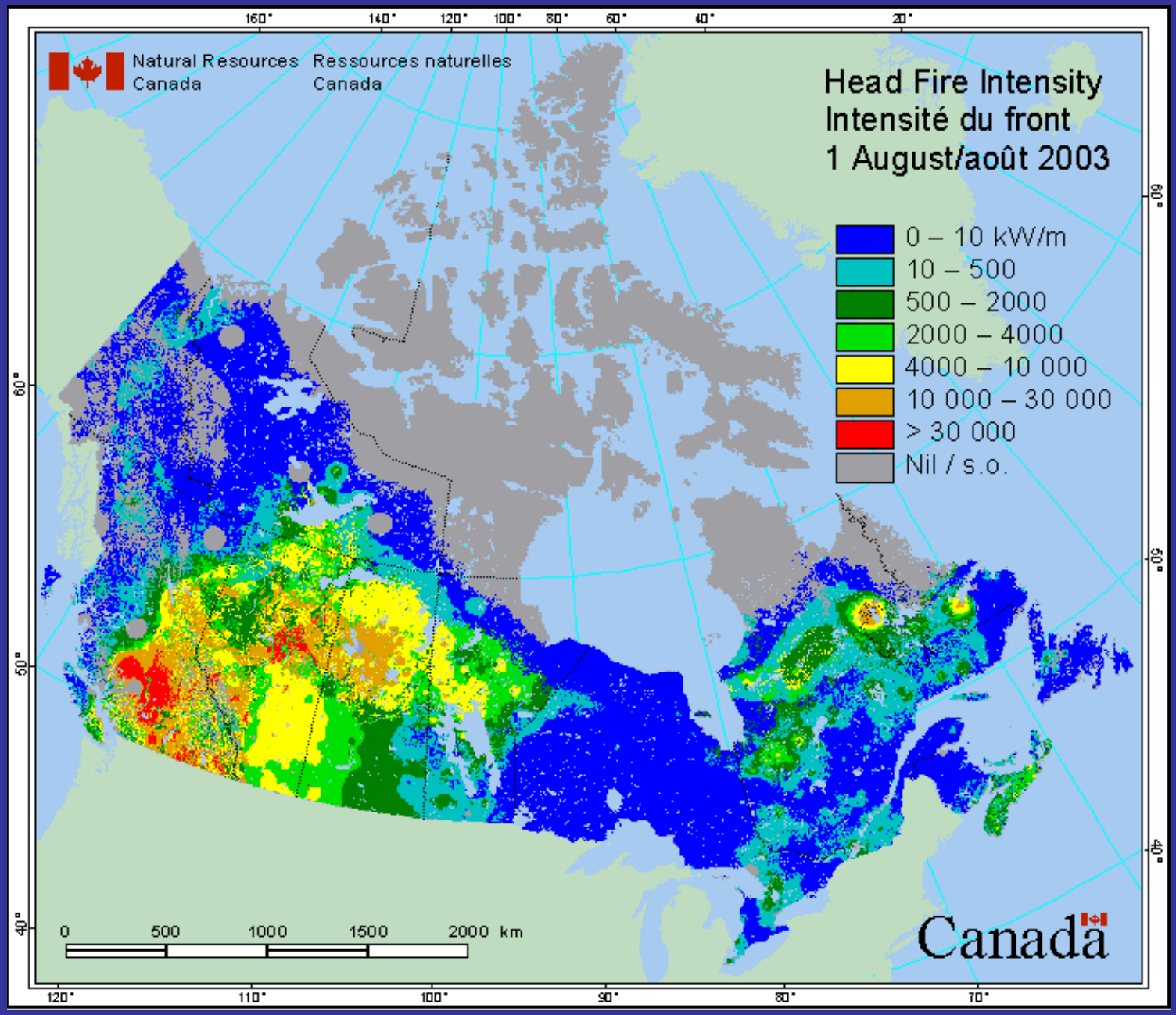
LOW MODERATE HIGH EXTREME

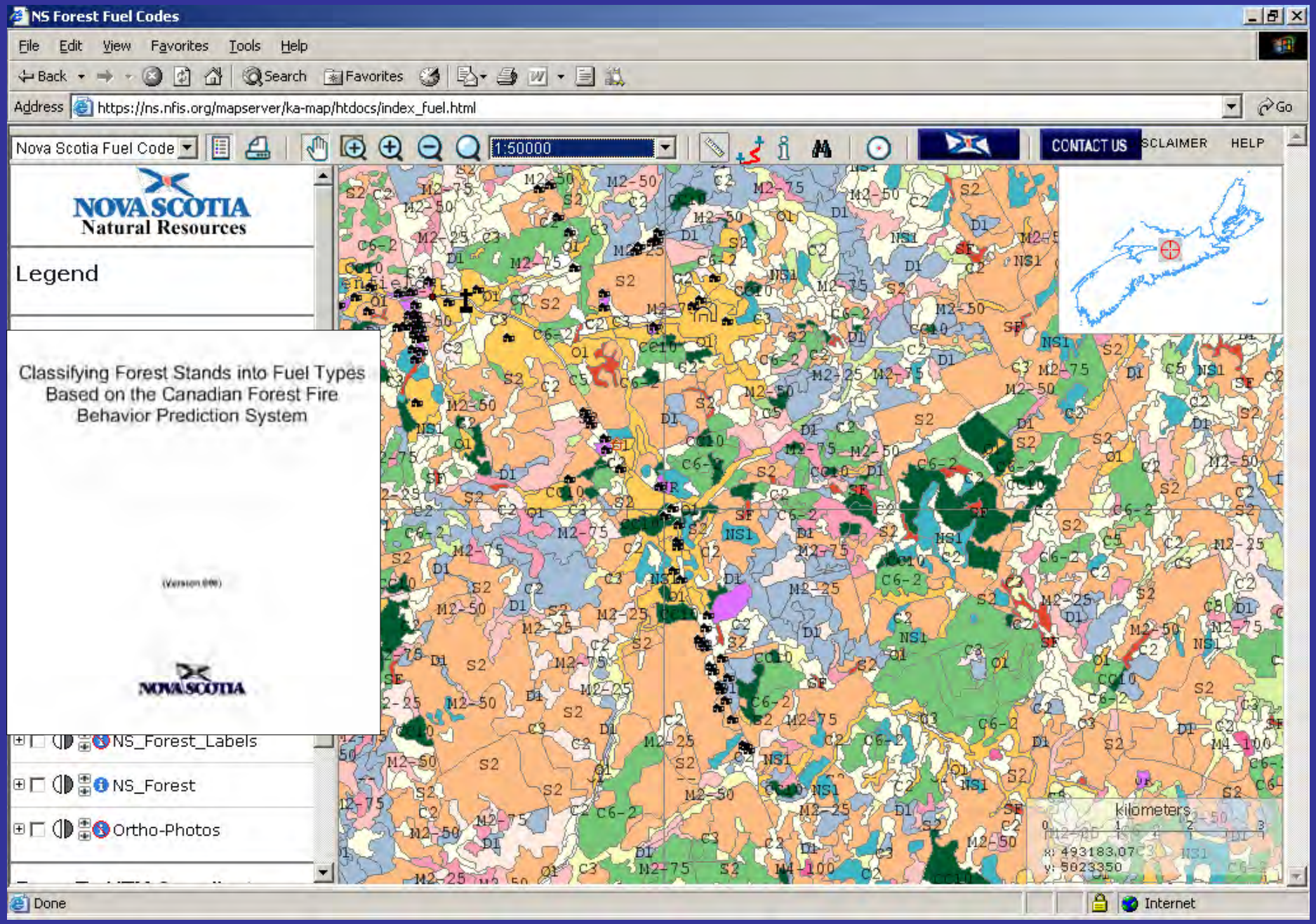
(Click on the map to view a full size version.)

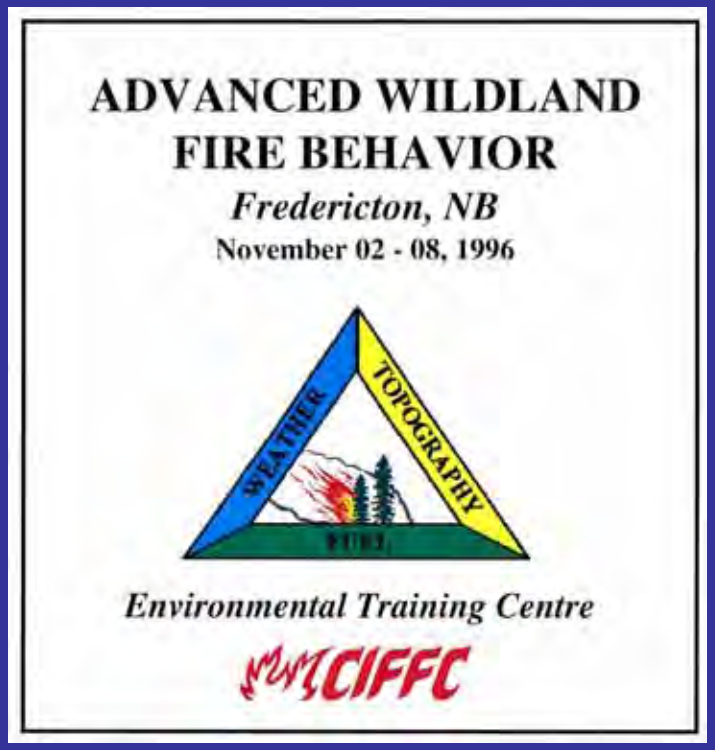
Disclaimer

Weather conditions are constantly changing. This information has been prepared for

Internet


Natural Resources Canada
Ressources naturelles Canada
Head Fire Intensity
Intensité du front
1 August/août 2003
0 – 10 kW/m
10 – 500
500 – 2000
2000 – 4000
4000 – 10 000
10 000 – 30 000
> 30 000
Nil / s.o.
0 500 1000 1500 2000 km
Canada


NS Forest Fuel Codes
File Edit View Favorites Tools Help
Back Search Favorites
Address https://ns.nfis.org/mapserver/ka-map/htdocs/index_fuel.html
Nova Scotia Fuel Code
1:50000
CONTACT US
SCLAIMER
HELP
NOVA SCOTIA
Natural Resources
Legend
Classifying Forest Stands into Fuel Types Based on the Canadian Forest Fire Behavior Prediction System
NOVA SCOTIA
NS_Forest_Labels
NS_Forest
Ortho-Photos
kilometers
x: 493183.07
y: 5023350
Done
Internet



Wildland Fire Behavior Specialist Course

Fire Behavior and the Connection to Fire Suppression

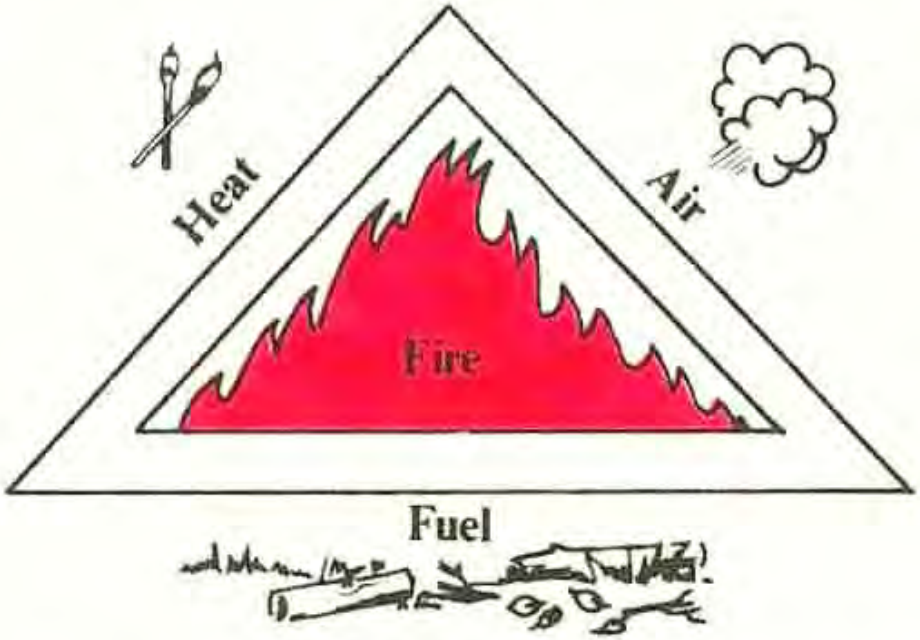
Fire behaviour as a factor in forest and rural fire suppression

Martin E. Alexander

Forest Research Bulletin No. 197
Forest and Rural Fire Scientific and Technical Series
Report No. 5

FOR A FIRE TO BURN, YOU MUST HAVE...

HEAT **AIR** **FUEL**



TO STOP A FIRE FROM BURNING, YOU MUST REMOVE EITHER...

HEAT **AIR** **FUEL**

To stop a fire one can:

(1) Remove the fuels ahead of the spreading combustion zone

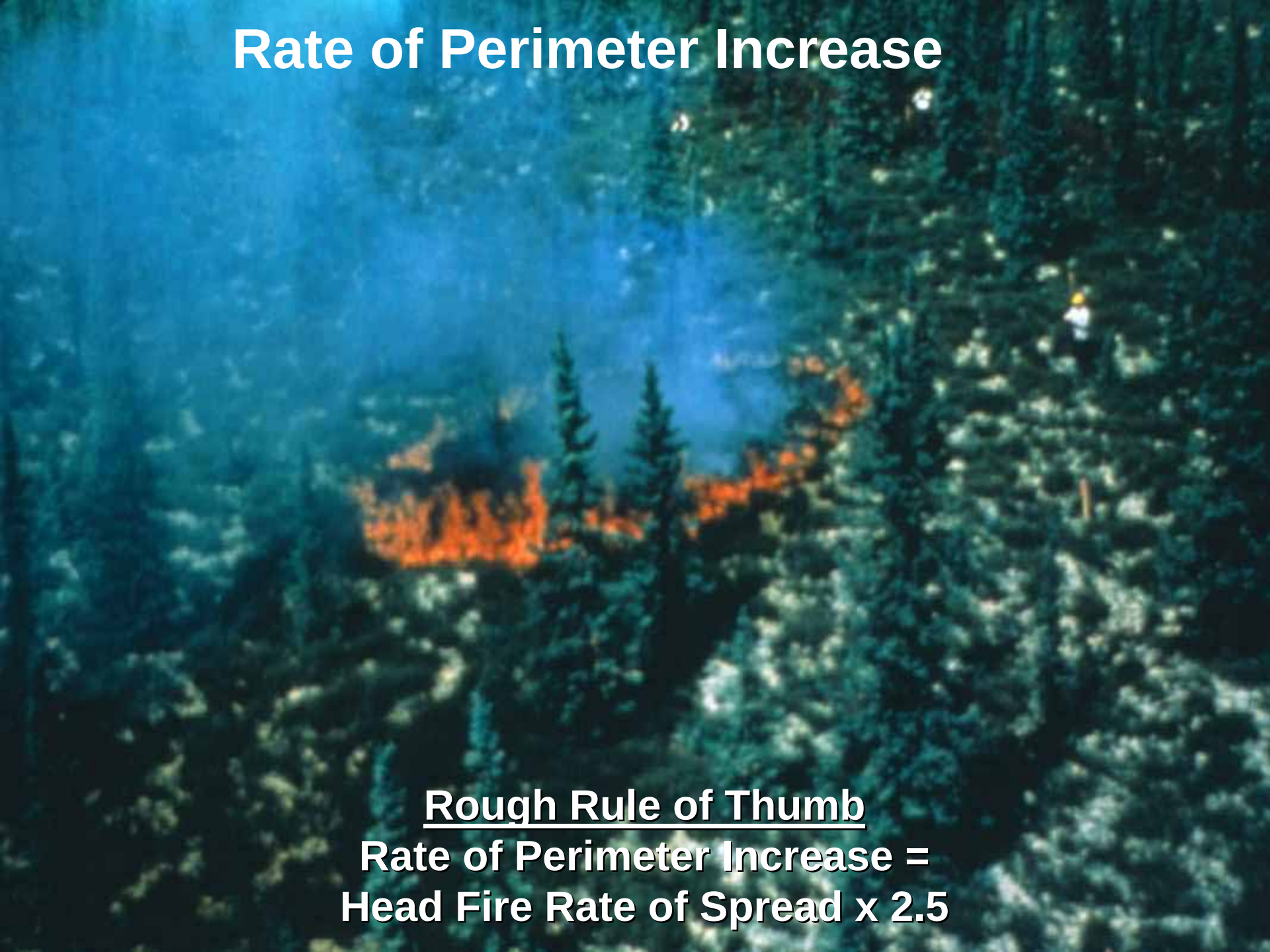
To stop a fire one can: (2) Reduce the temperature of the burning fuels

To stop a fire one can:

(3) Exclude oxygen from reaching the combustion zone

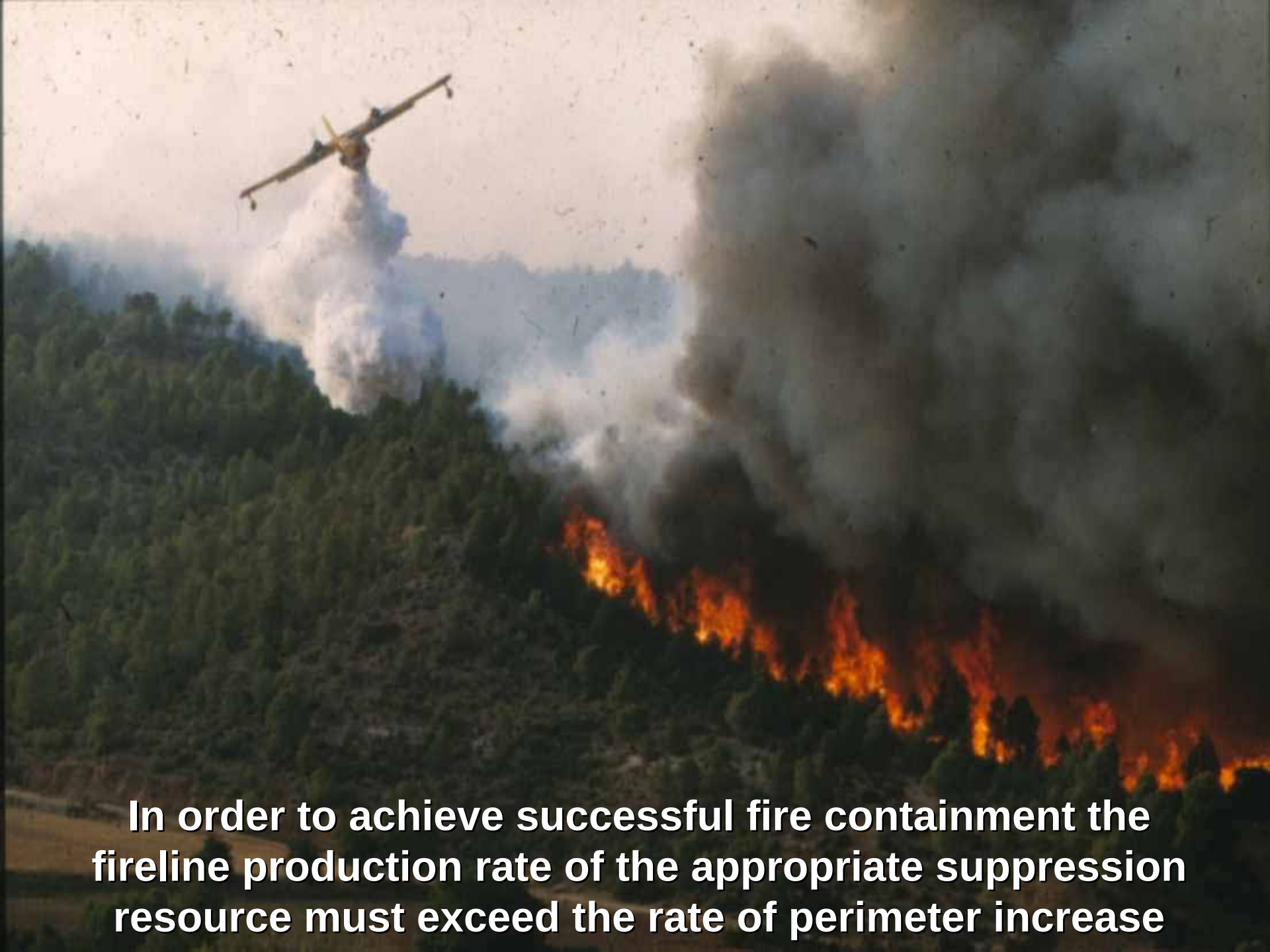
Fire Intensity	Minimum Control Requirements
< 500 kW/m	hand tools
500-2000 kW/m	water under pressure and/or heavy machinery
2000-4000 kW/m	helitankers & airtankers using chemical retardants
4000+ kW/m	very difficult to control

Rate of Perimeter Increase



Rough Rule of Thumb

Rate of Perimeter Increase =
Head Fire Rate of Spread x 2.5


In order to achieve successful fire containment the fireline production rate of the appropriate suppression resource must exceed the rate of perimeter increase


EXTREME
FIRE HAZARD
DON'T EVEN FART
IN THE FOREST

On some days adverse fuel, weather and topographic conditions coupled with an ignition source lead to instances of extreme fire behavior which are impossible to contain until burning conditions ameliorate.

Tattrie (1978):
First Wildfire Case Study for Nova Scotia

Abstract

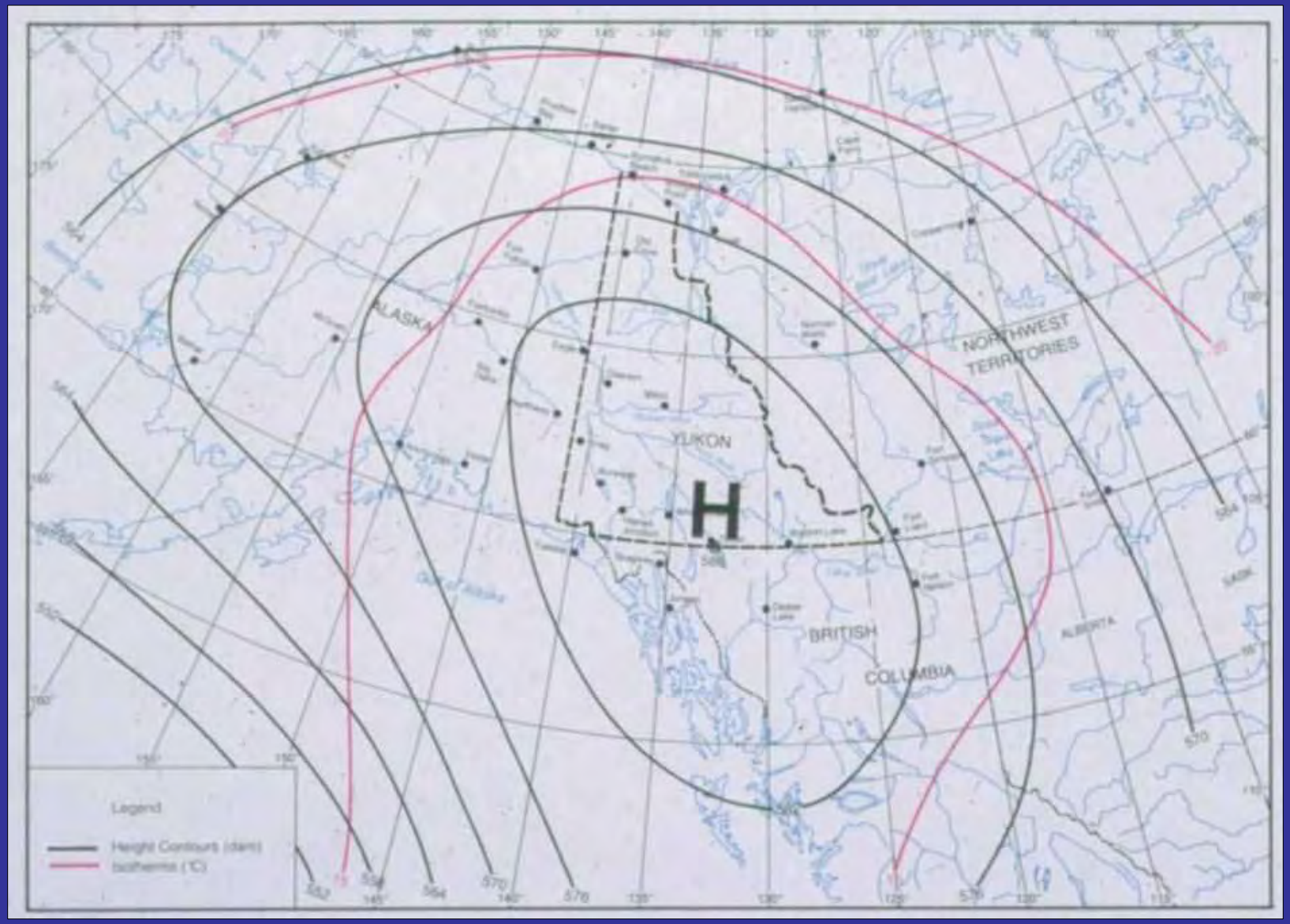
Nova Scotia's largest recorded wildfire (13,258 ha.) broke out on June 4, 1976 in Pictou County, north of Porcupine Lake. This study describes the various factors such as high wind velocity, extensive areas of softwood slash and a long period of high temperatures and low relative humidities which contributed to the outbreak of the fire and describes fire control, damage and present and future silviculture plans for the area.

Tatrrie, R.S. 1978. The Porcupine Lake Fire: a case study. BScF Thesis, University of New Brunswick, Fredericton. 58 p.

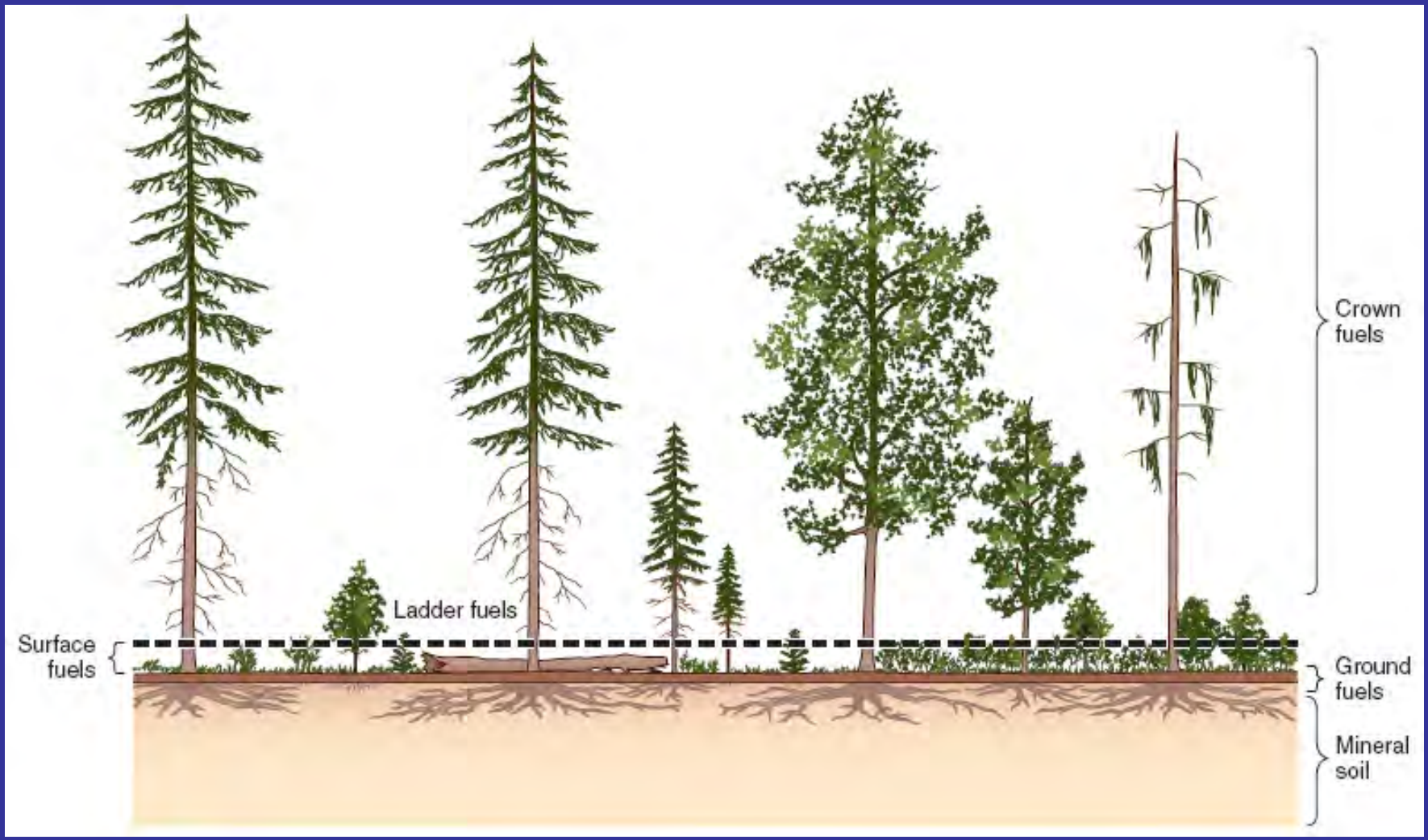
So just how can we hope to accomplish this?

We cannot readily modify the topographic component of the fire environment

Nor can we readily modify the air mass or weather component of the fire environment



How about the fuel component of the fire environment?
Is it possible to manage the fuels (i.e., Fuels Management)?



What is the Basic Premise Behind Fuels Management?

We cannot really do much to control the weather or reshape the topography but we can and of influence the quantity and character of wildland fuels.

What is Fuels Management?

Fuels management is the planned manipulation and/or reduction of living or dead forest fuels for forest management and other land use objectives (e.g., hazard reduction, silvicultural purposes, wildlife habitat improvement).

This is accomplished by:

- **prescribed fire**
- **mechanical means**
- **chemical means**
- **biological means**
- **changing stand structure and species composition**

What is the Purpose of Fuels Management?

The goal is to proactively lessen the potential fire behavior and thereby increase the probability of successful containment and minimize adverse impacts.

More specifically, it's to decrease the rate of fire spread and in turn fire size and intensity as well as crowning and spotting potential.

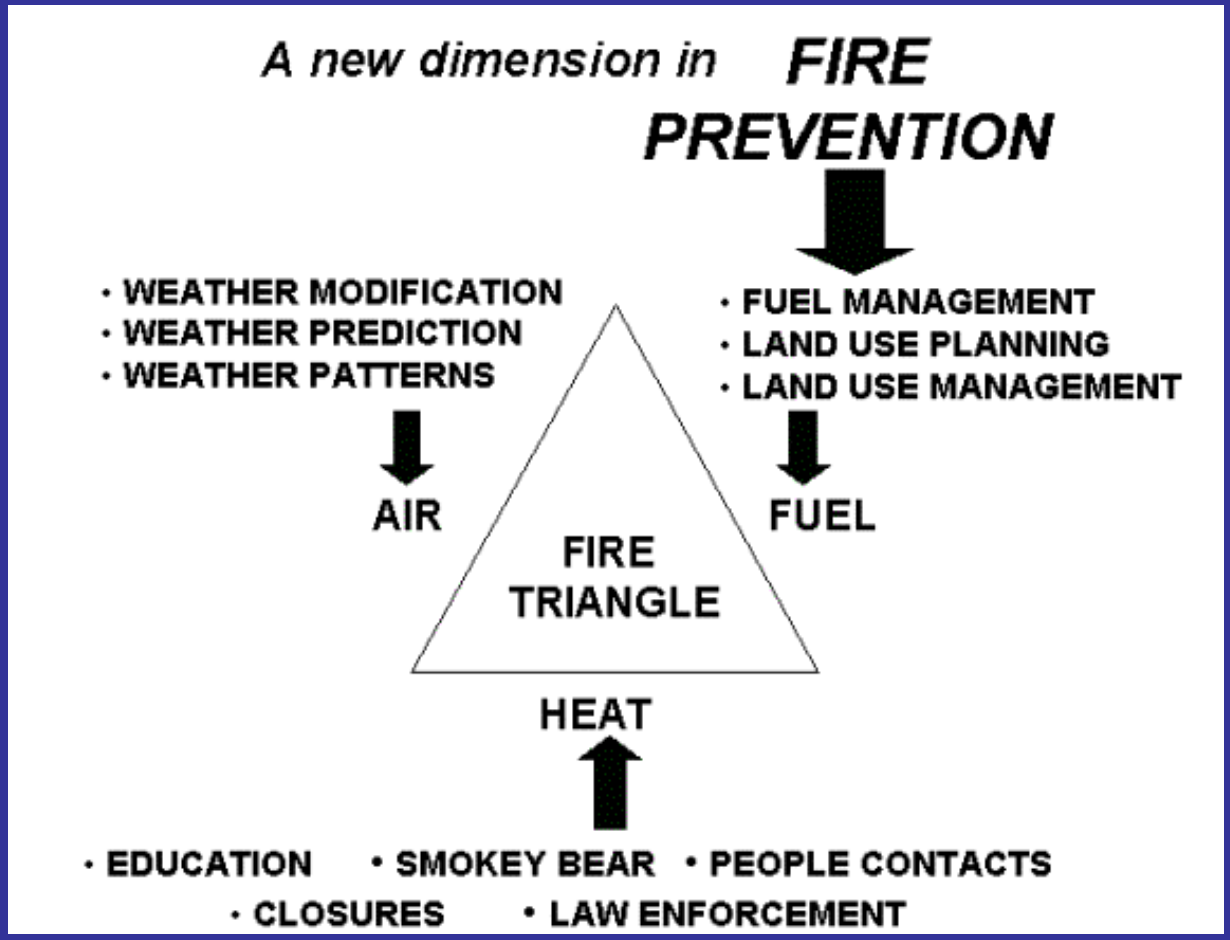
Fuels management can be accomplished by three principal means:

- Reduction & Manipulation

- Conversion

- Isolation

Preventing the Occurrence of “Large” Fires Through Fuels Management



“Nova Scotia Solutions for Nova Scotia Problems”?

"In the final analysis it would seem that the greatest possibility of preventing fires lies in better management which will lessen the danger from fire, for no matter how efficient our fire fighting system may be or how fire conscious the general public may be ... every so often we will be faced with a set of conditions favourable for the rapid spread of fire, and severe losses will be suffered."

Dr. Wilfred Creighton (1949)
Deputy Minister
Department of Lands and Forests
Nova Scotia

On the Job that Lies Ahead

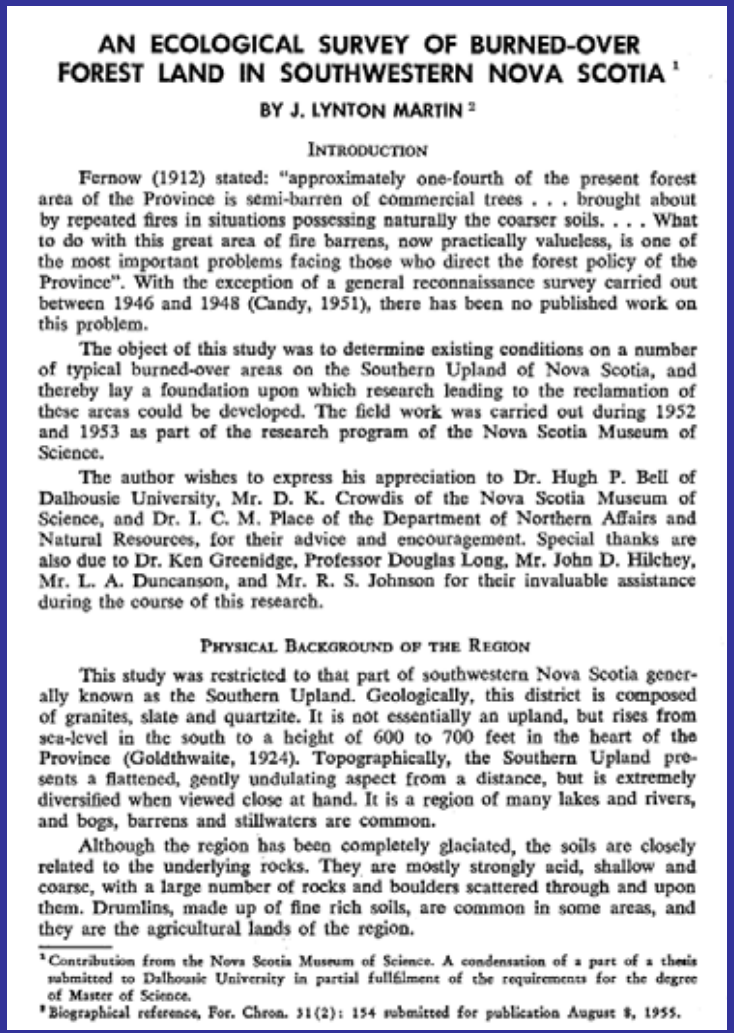
"Although considerable progress has been made in decreasing the average loss caused by fire, much remains to be done. When one considers the large number of fires still occurring annually; when one considers that the Province [of Nova Scotia] is still without an effective method of preventing the rapid spread of fire during a "fire blow-up" weather condition; when one considers that such a weather condition is not an infrequent visitor to the Province; and finally, when one considers the extent to which the value of the forest resource has increased in recent years, then a very great deal indeed remains to be done."

Dave Bradshaw (1969)
Fire in the Woodlands of Nova Scotia
UNB Master of Forestry Report

Leadership and Fire Management: Challenges for the Future

- Always strive for vigilance -- resist complacency or “resting on your laurels” – don’t hesitate or fail to fear the worst
- People have short memories so establish and maintain an institutional memory regarding fire
- Appreciate the importance of succession planning and mentorship in your organization
- Try to avoid having disasters take place in order for change to occur

More Localized Fire Research is Needed!



AN ECOLOGICAL SURVEY OF BURNED-OVER FOREST LAND IN SOUTHWESTERN NOVA SCOTIA [1]

BY J. LYNTON MARTIN [2]

INTRODUCTION

Fernow (1912) stated: "approximately one-fourth of the present forest area of the Province is semi-barren of commercial trees . . . brought about by repeated fires in situations possessing naturally the coarser soils. . . . What to do with this great area of fire barrens, now practically valueless, is one of the most important problems facing those who direct the forest policy of the Province". With the exception of a general reconnaissance survey carried out between 1946 and 1948 (Candy, 1951), there has been no published work on this problem.

The object of this study was to determine existing conditions on a number of typical burned-over areas on the Southern Upland of Nova Scotia, and thereby lay a foundation upon which research leading to the reclamation of these areas could be developed. The field work was carried out during 1952 and 1953 as part of the research program of the Nova Scotia Museum of Science.

The author wishes to express his appreciation to Dr. Hugh P. Bell of Dalhousie University, Mr. D. K. Crowdis of the Nova Scotia Museum of Science, and Dr. I. C. M. Place of the Department of Northern Affairs and Natural Resources, for their advice and encouragement. Special thanks are also due to Dr. Ken Greenidge, Professor Douglas Long, Mr. John D. Hilchey, Mr. L. A. Duncanson, and Mr. R. S. Johnson for their invaluable assistance during the course of this research.

PHYSICAL BACKGROUND OF THE REGION

This study was restricted to that part of southwestern Nova Scotia generally known as the Southern Upland. Geologically, this district is composed of granites, slate and quartzite. It is not essentially an upland, but rises from sea-level in the south to a height of 600 to 700 feet in the heart of the Province (Goldthwaite, 1924). Topographically, the Southern Upland presents a flattened, gently undulating aspect from a distance, but is extremely diversified when viewed close at hand. It is a region of many lakes and rivers, and bogs, barrens and stillwaters are common.

Although the region has been completely glaciated, the soils are closely related to the underlying rocks. They are mostly strongly acid, shallow and coarse, with a large number of rocks and boulders scattered through and upon them. Drumlins, made up of fine rich soils, are common in some areas, and they are the agricultural lands of the region.

[1] Contribution from the Nova Scotia Museum of Science. A condensation of a part of a thesis submitted to Dalhousie University in partial fulfilment of the requirements for the degree of Master of Science.

[2] Biographical reference, For. Chron. 31(2): 154 submitted for publication August 8, 1955.

Martin, J.L. 1956. An ecological survey of burned-over forest land in southwestern Nova Scotia. *Forestry Chronicle* 32: 313-336.

Fire hazard in budworm-killed balsam fir stands on Cape Breton Highlands

by Gyula Péch

The forests subject to budworm attack in eastern Canada vary considerably in tree species composition, and the severity of fire weather in those regions also varies. It is likely, therefore, that fire hazard or fire potential in budworm-damaged forest has complex causes. A forest of mixed conifers near the Aubinadong River in central Ontario represents probably one extreme situation, that of an abundance of combustible surface and aerial fuels coupled with high fire weather severity. This has resulted in many fires that are difficult to control. Then there are the pure and mature balsam fir stands of the Cape Breton Highlands in Nova Scotia, which have no apparent fire history and represent the other extreme: no accumulation of combustible surface fuels and low fire weather severity. A systematic study was undertaken between 1979 and 1988 in the Highlands, following a major budworm epidemic in the 1970's, to measure fire hazard quantitatively by monitoring changes in fuel distribution, and to evaluate fire weather severity and its seasonality. The results indicate that the cool and moist climate of the Highlands decomposed dead fuels rapidly, and there was little accumulation of surface combustibles. Furthermore, fire weather severity is low, and even when an unexpected drought occurs, direct attack and attainment of control of wildfire in these stands can be achieved with existing resources.

Les forêts pouvant être la cible d'épidémie de tordeuses de bourgeons dans l'Est du Canada varient considérablement en terme de composition d'espèces d'arbres, et la gravité des saisons de feux pour ces régions diffère également. Vraisemblablement, en conséquence, le risque ou le potentiel de feu dans les forêts attaquées par la tordeuse des bourgeons découle de causes complexes. Une forêt de différentes espèces de conifères située près de la rivière Aubinadong dans le centre de l'Ontario représente probablement une situation extrême d'abondance de combustible en surface et au dessus du sol en plus d'une saison de feu au niveau le plus élevé. Il en est résulté plusieurs feux difficiles à contrôler. Par la suite, on retrouve les peuplements purs et à maturité de sapin baumier des Hautes Terres du Cap Breton en Nouvelle-Ecosse, qui n'ont pas d'historique de feu apparent et qui représentent l'autre extrême: pas d'accumulation de combustible en surface et une gravité des saisons de faible niveau. Une étude systématique a été entreprise entre 1979 et 1988 dans les Hautes Terres, suite à l'importante épidémie de tordeuses des années '70 afin de mesurer quantitativement le risque de feu par l'évaluation des changements dans la distribution des combustibles et pour évaluer la gravité de la saison de feu ainsi que sa périodé. Les résultats démontrent que le climat frais et humide des Hautes Terres décompose rapidement les combustibles morts, et qu'il y a peu d'accumulation de combustible de surface. De plus, la gravité de la saison de feu demeure faible, et même en l'occurrence d'une sécheresse inattendue, l'attaque directe et la réalisation du contrôle des feux ravageant ces peuplements peuvent être effectuées par les ressources existantes.

Introduction

The outbreak of a spruce budworm (*Choristoneura fumiferana* [Clem.]) epidemic in eastern Canada during the 1960s and 1970s resulted in widespread mortality of balsam fir (*Abies balsamea* [L.] Mill.) and, to some extent, white spruce (*Picea glauca* [Moench] Voss). The infestation spread to Cape Breton Island in the early 1970's (Kettela and Moran 1975) and, in subsequent years, most balsam fir stands there went through repeated partial-to-total defoliation by the insect. What made the Highlands especially vulnerable was that most of its softwood stands were 50- to 80-year-old pure balsam fir. This species made up 90 per cent of the total gross merchantable volume of softwood stands (Anon. 1977) and occupied 50 per cent of the Highlands. The remaining area was covered by mixedwood (30 per cent) and hardwood (20 per cent) cover types. By 1977, about 10 per cent of the area had been harvested and was regenerating balsam fir satisfactorily.

It was estimated in 1977 that about 16 per cent of the mature balsam fir was already dead (Sterner *et al.* 1977), a figure that was increased following the 1978 survey to over 25 per cent for the Central Highlands. In some of the stands, mortality was as high as 36 per cent of the total basal area (MacLean 1979). Judging by the cyclical patterns of previous outbreaks of budworm in eastern Canada (Morris 1963, Miller and Varty 1975) mortality estimates were expected to jump substantially by 1981, the eighth year of the epidemic on the Highlands.

The principal user of the softwood stands, Nova Scotia Forest Industries Ltd., started to accelerate a salvage cutting program in 1977, and the anticipated rise in fire hazard and risk of fire prompted the Nova Scotia Lands and Forests Protection Branch to increase its level of preparedness on the Highlands. A possibility of the existence of large tracts of dead standing timber by the early 1980's, devoid of foliage and bearing a considerable amount of dry aerial fine fuels, gave concern to the protection agencies. It appeared that potentially catastrophic conditions were developing in the wake of the budworm epidemic. A study, commissioned by the Cape Breton Highlands National Park in early 1978 to assess the effectiveness of the Park's fire control plans, especially with respect to the budworm infestation on the Cape Breton Plateau, concluded (Kayll 1978) that (a) fire hazard was higher in budworm defoliated stands than in those where budworm was not active, (b) the hazard was going to get worse with increased tree mortality, (c) wildfire in the dead and drying balsam fir stands would be so intense that direct attack and control would be impossible.

The present report arose out of a request by the Nova Scotia Department of Lands and Forests in 1978 to the Forest Fire Research Institute of the Canadian Forestry Service (now Forestry Canada), to investigate the possible increase in fire hazard on the Highlands owing to budworm damage to balsam fir stands. There was already an active study of this kind in

[1] Forestry Officer, Forestry Canada, Petawawa National Forestry Institute, Chalk River, Ontario, Canada K0J 1J0.

Pech, G. 1993. Fire hazard in budworm-killed balsam fir stands on Cape Breton Highlands. *Forestry Chronicle* 69: 178- 186.

Wildland Fire, the General Public (and the Media)* ... the human or people side of the business

*Recognize they can be your best friend or your worst nightmare.

IF A WILDFIRE OCCURS

1. Call 911.
2. Close windows and doors, including those inside the house.
3. Take down light drapes and close curtains.
4. Turn off gas at the meter or propane tank.
5. Prepare to evacuate family and pets upon notification from fire authorities or police.
6. If police and fire authorities permit, an able-bodied member of the household may remain to protect the house.

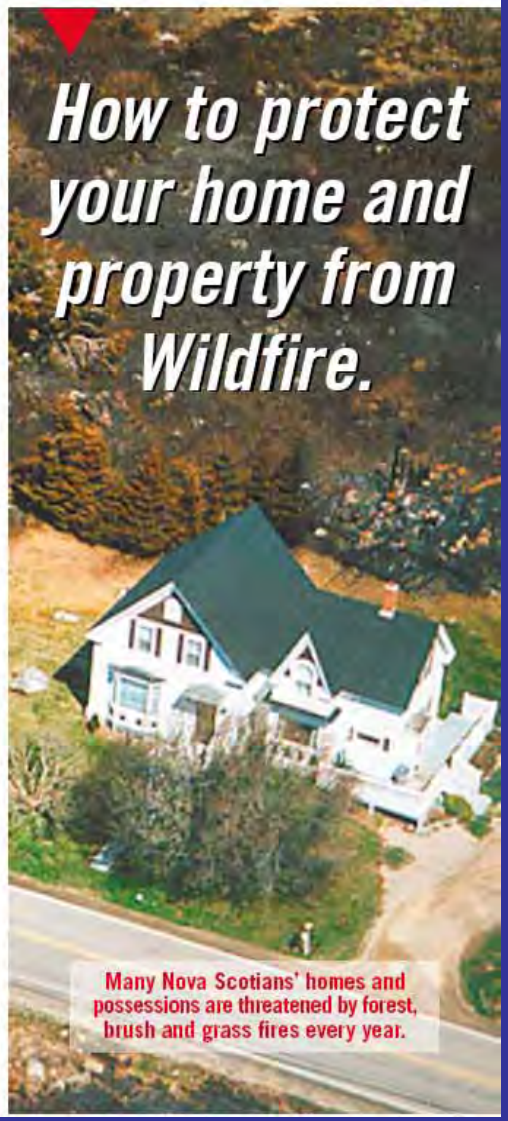
Please remember:
Taking the steps recommended in this brochure will help protect your home or cottage but does not guarantee your structure won't sustain damage in the event of a wildfire. It is always advisable to carry adequate homeowners insurance to protect your investment in the event of a tragedy.

For more information contact:
Department of Natural Resources
Forest Protection
Fire Management Group
P.O. Box 130
Shubenacadie, NS
B0N 2H0
Phone: (902) 758-2232
Fax: (902) 758-3210

DNR publication:
Information Circular FOR - 3
March 2004

NOVA SCOTIA
Department of Natural Resources

How to protect your home and property from Wildfire.

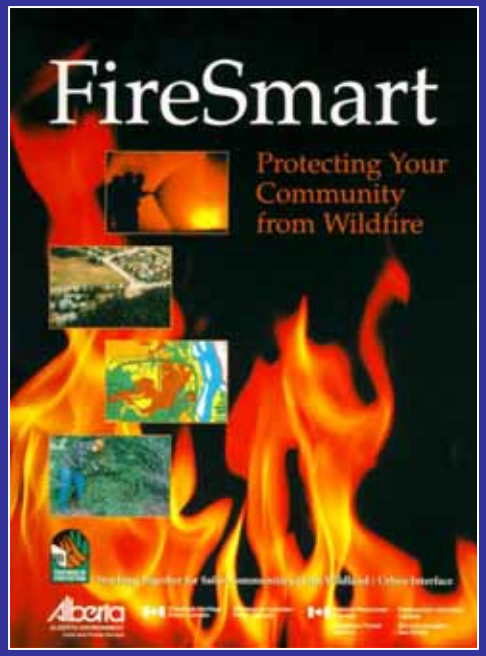


MEDIA GUIDE TO FOREST FIRES

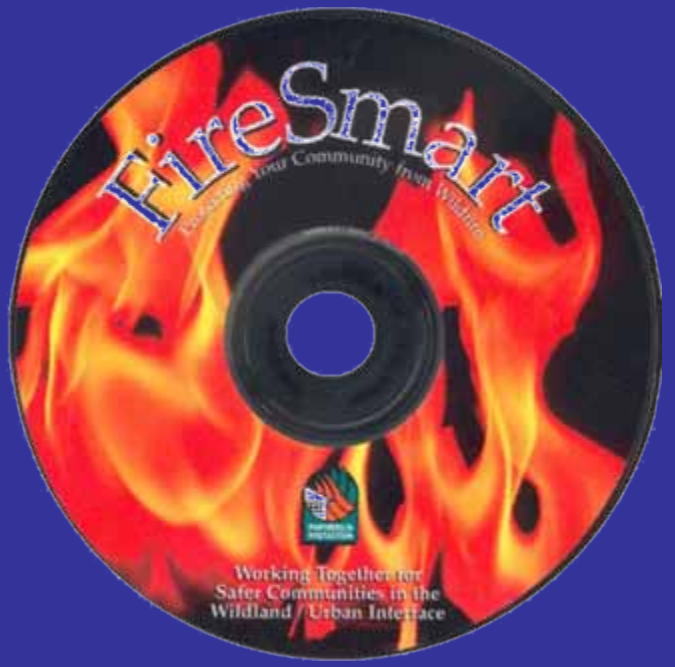
A Media Guide to Forest Fires
Prepared by the
Department of Natural Resources
Forest Protection Division
Wildfire Management Group
Updated May 2007

Partners in Protection

PIP has produced a comprehensive manual, available in both book and CD-ROM form, which deals with nearly every facet of the wildland/urban interface fire problem

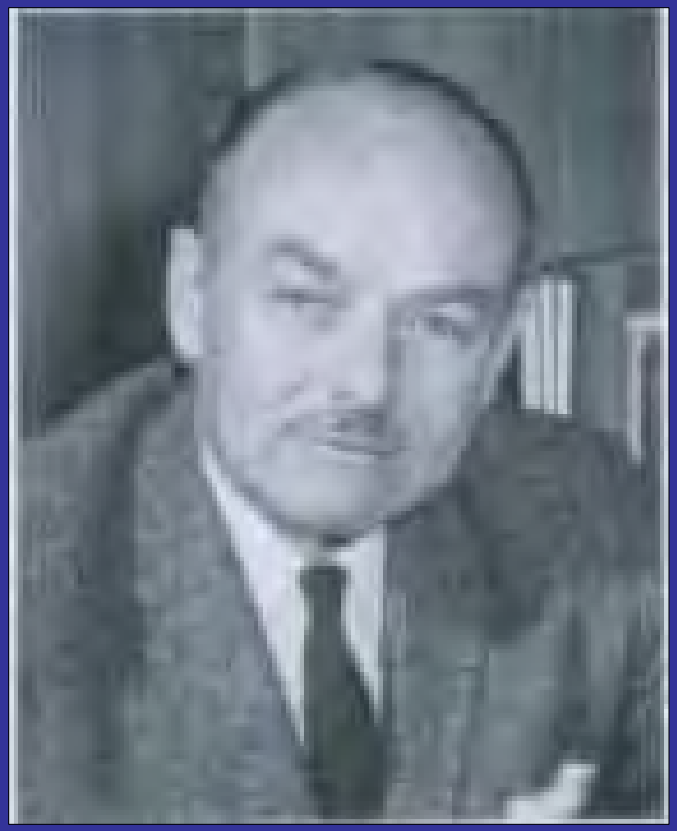


PARTNERS IN PROTECTION



http://www.partnersinprotection.ab.ca/

"Working together for a safer communities in the wildland/urban interface"



…there is one overriding challenge to fire management: that of maintaining full respect for the power of fire and the effects of this power on both wildland environments and the people who live and work in these environments.

Jack S. Barrows (1974)

Four Basic Options for Surviving a Wildland Fire Entrapment or Burn-over (in no particular order)

- **Retreat from the Fire and Reach a Safe Haven**

- **Burn Out a Safety Area**

- **Hunker in Place**

- **Pass Through the Fire Edge into the Burned-out Area**


Houses protect people and
people protect houses
“Stay and Defend or Go Early”

THANK YOU FOR YOUR ATTENTION