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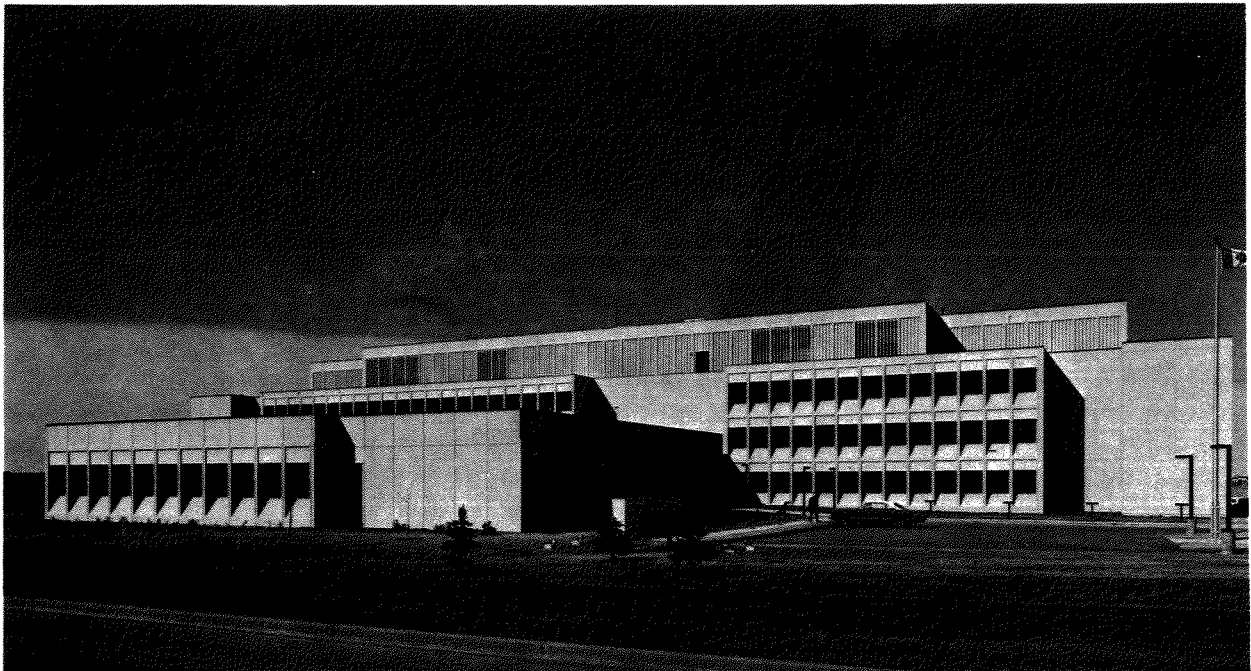
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STUDY STATEMENTS 1982-83

Northern Forest Research Centre

Canadian Forestry Service

Edmonton, Alberta



STUDY STATEMENTS

1982-83

NORTHERN FOREST RESEARCH CENTRE

CANADIAN FORESTRY SERVICE

APRIL 1982

9. Goals for 1981-82: (cont'd)

2. Contribute articles for publication in a Forestry Report as originally proposed for the 1980-81 study year.
 - 1) Evaluation of airtankers and fire retardants on wildfires (Lieskovsky)
 - 2) Retardant effectiveness studied under field conditions. (Newstead)
3. In co-operation with the Alberta Forest Service conduct on-site investigation of airtanker/retardant effectiveness in wildfire control. This goal is dependent upon the provision of suitable transportation to and from fire locations by the AFS during the initial month of the airtanker contract period; and the extent of wildfire occurrence during that period. If successful this goal could be extended to include additional fire seasons in the interest of developing a sound data base for future analysis. (Newstead and Lieskovsky)
4. Continue modification, instrumentation, and calibration of retardant spray apparatus and burning table. Inaugurate a series of lab tests designed to provide a better understanding of the fire suppression, retardancy, and rheological characteristics of present and proposed fire retardant compounds. (Lieskovsky)
5. Provide technical assistance, training, and technology transfer to regional, national, and international fire control agencies and industrial organizations as requested. (Newstead and Lieskovsky)

Goals added:

6. Conduct retardant and water drop trials with the Bell 205A helicopter and belly-mounted tanking system and conventional bucket. In conjunction, determine rotor downwash effects of this helicopter on surface fire behaviour. Assess preliminary modifications to DC-6B tank and gating systems.
7. Attend "Functions of the Middle Manager" course.

10. Accomplishments in 1981-82:

1. Published a Forest Management Note on short-term retardant development and selection guidelines. (see publications)
2. Revised and contributed two articles for proposed Forestry Report:
 - 1) Evaluation of airtankers and fire retardants on wildfires,
 - 2) Retardant effectiveness studied under field conditions.

10. Accomplishments in 1981-82: (cont'd)

3. With the full cooperation of the Alberta Forest Service conducted on-site investigation of air tanker/retardant effectiveness on 12 fires. Preliminary observations have been submitted for inclusion in a forthcoming Forestry Report and have been presented to the Alberta Forest Service, Forest Protection Officers and Bird-dog Officers meetings.
4. Modification and instrumentation of the retardant spray apparatus and burning table has been carried out, however calibration and testing of these facilities is pending completion of developmental work delayed owing to other equipment development priorities.
5. Technical assistance, training and technology transfer was provided as follows:
 - a) Assisted A.F.S. personnel in complete evaluation of retardant mixing and storage facilities and retardant quality at all retardant bases in Alberta. Additional technical assistance was provided in regard to the 4 new liquid retardant bases. Reports on findings and recommendations were subsequently submitted to the Alberta Forest Service and Chemonics Industries respectively.
 - b) Provided technical advice to A.F.S. personnel involved in the suppression of the high priority Swan Hills fire DS-3-23-81. A summary report on observations and recommendations was subsequently submitted to the Swan Hills Fire Review Board.
 - c) Participated in two meetings of the CCFFC sub-committee on Forest Fire Research.
 - d) Attended annual meeting of AFS Forest Protection Staff.
 - e) Reviewed three manuscripts, one internal and two external, being prepared for publication.
 - f) Conducted technical presentations at the Forest Technology School pertaining to retardant, preparation and quality control, and air tanker and helitanker operations in forest fire control.
 - g) Provided technical data re: helicopters and buckets for inclusion in A.F.S. aircraft specifications manual, 3rd Edition.

10. Accomplishments in 1981-82: (cont'd)

6. Conducted retardant and water drop trials with the Bell 205 helitanker with both belly-mounted tanking system and conventional bucket in cooperation with the N.W.T. Northern Affairs Program, Chemonics Industries Ltd., Frontier Helicopters and B.C. Forest Service at Kamloops, B.C. Results of these tests are compiled and computer plotting of drop patterns completed. In conjunction with these trials, preliminary assessment of DC-6B tank and gating modifications was conducted at Abbotsford, B.C. A file report has been completed and will be forwarded to cooperating agencies.
7. Attended and completed P.S.C. sponsored course, "Functions of the Middle Manager".

11. Goals for 1982-83:

1. Continue on-site evaluation of retardant/airtanker effectiveness in wildfire control.
2. Investigate and promote modifications of fixed-wing tank and gating systems and helicopter tank and bucket systems. Develop new drop grid system to facilitate testing of new/modified airtanker and helitanker delivery systems.
3. Test and calibrate a prototype retardant application system and combustion table for use under controlled laboratory conditions.
4. Provide technical assistance, training and technology transfer to regional, national and international fire control agencies and industrial organizations as requested.

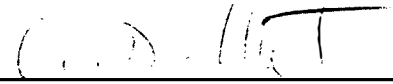
12. Signatures:



 Investigator



 Program Manager



 Director

A.D. Kiil

9. Goals for 1981-82: (cont'd)

3. Continuation of data analysis leading to the determination of basic relationships between fuels, fire behaviour and weather for semimature jack pine stands in central Alberta.
4. Continuation of providing consultative services as required.

Goals Added:

5. Continuation of chemical foliar analyses for major conifers in central Alberta.
6. Submission for publication of a report on rating fire hazard in forest ecosystems of central Saskatchewan.

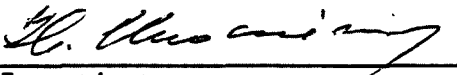
10. Accomplishments in 1981-82:

1. The write-up of three scheduled papers for publication was completed, and the fourth one is now in preparation. The completed papers on "Failures and successes in jack pine regeneration following postcut burning and seeding treatments in southeastern Manitoba" and on "Jack pine and other forest regeneration following postcut burning and seeding treatments in central Saskatchewan" are proposed Information Reports, whereas that on "Foliar moisture variations in jack pine, black spruce, white spruce and balsam fir, central Alberta" is a proposed article for the Can. J. For. Res. The paper on "Foliar calorific variations in jack pine, black spruce, white spruce and balsam fir, central Alberta" is now being prepared for the Can. J. For. Res.
2. A good progress was made in the preparation of text for two chapters in the proposed international monograph on white spruce regeneration. Literature review and one of the chapters are now completed, and work on the remaining chapter is in its final stages.
3. Dimensional categorizations of total forest biomass (trees, shrubs, herbs, grasses, mosses, downed roundwood, surface litter, and raw humus) in semimature jack pine stands of central Alberta were continuing. More than 150 regression equations were solved, and just as many dry-weight tables were computed, so far.
4. Consultative services were provided to several forestry officials and educators from various parts of Canada and from abroad.
5. Nitrogen concentrations were determined in some 480 foliar samples from major conifers in central Alberta.
6. The write-up of the fifth, unscheduled paper for publication was also completed. This one on "Forest ecosystems and fire hazard in central Saskatchewan" is a proposed article for the For. Rep.

11. Goals for 1982-83:

1. Publish "Forest ecosystems and fire hazard in central Saskatchewan" (Forestry Report). [See Study NOR-5-174, Goal]
2. Publish "Failures and successes in jack pine regeneration following postcut burning and seeding treatments in southeastern Manitoba" (Information Report)
3. Publish "Jack pine and other forest regeneration following postcut burning and seeding treatments in central Saskatchewan" (Information Report)
4. Publish "Foliar moisture variations in jack pine, black spruce, white spruce, and balsam fir, central Alberta" (Canadian Journal of Forest Research).
5. Publish "Foliar calorific variations in jack pine, black spruce, white spruce, and balsam fir, central Alberta" (Canadian Journal of Forest Research)
6. Complete preparation of text for the second chapter in the proposed international monograph on white spruce regeneration. Submit both chapters for publication.
7. Continue data analysis on dimensionally categorized biomass of six major understorey shrub species in central Alberta.
8. Continue data analysis on relationships between fuels, fire behaviour and weather for semimature jack pine stands in central Alberta.
9. Analyse data on relationships between standard moisture codes (CFWI-System) and sampled moisture contents of dimensionally categorized aerial and ground fuels on jack pine clear-cuts in central Saskatchewan.
10. Continue with technology transfer as required.

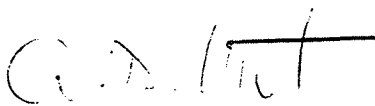
12. Signatures:



 Investigator



 Program Manager



 Director

A.D. Kill

CANADIAN FORESTRY SERVICE

STUDY STATEMENT

1982 - 83

Responsibility Centre: NORTHERN FOREST RESEARCH CENTRE

Date: January 12, 1982 .

1. Project: Fire management systems and guidelines
2. Title: Evaluation and planning of fire detection, surveillance and communications systems and methods.
3. New: Cont.: X 4. No.: NOR-5-131
5. Study Leader: C.J. Ogilvie
6. Key Words: Aerial patrols, lookouts, forestry communications, weather data collection, storm tracking, wildfire smoke emission, wildfire mapping, remote sensing.
7. Location of work: Alberta, National Parks, and Northwest Territories, Saskatchewan, Manitoba
8. Study Objectives:
 1. Develop plans for wildfire surveillance and communications systems for the Northwest Territories, and other clients, on request.
 2. Identify the most advantageous detection medium (alternative) for given conditions.
 3. Define and identify factors influencing the design of wildfire detection and communication systems.
 4. Develop effective wildfire mapping and surveillance techniques.
9. Goals for 1981-82:
 1. Provide an article for the Forestry Report on the use of the scan-extender on large fires.
 2. Write a Management Note on the scan-extender detailing its construction and uses.

9. Goals for 1981-82: (cont'd)

3. Enter a co-operative study with the AFS to establish the capabilities of the Thermovision Scan-extender combination for various flying heights, target sizes and target composition.
4. Provide Forestry Report article on 3 years of detection effort in Saskatchewan.
5. Continue a co-operative study with the Department of Northern Saskatchewan to develop improved methods of detecting incipient lightning fires under different fuel and fire weather conditions.
6. Provide liaison, technical services and training to client agencies as the need arises.
7. Terminate study and move 1981-82 Goal 5 to Study 174.

10. Accomplishments in 1981-82:

1. Provided first draft of article for the Forestry Report on the use of the scan-extender on large fires.
2. Prepared first draft of Forest Management Note on the scan-extender.
3. Conducted a test in conjunction with the Saskatchewan Department of Tourism and Renewable Resources (DTRR) to establish the capability of the thermovision-scan extender at several heights above ground for different target sizes. The system can reliably locate hotspots, equivalent to eight charcoal briquets from 4000 ft. (1219 m)
4. Provided first draft of article for the forestry report on three years of detection effort in Saskatchewan.
5. Continued the cooperative study with DTRR (Saskatchewan) to develop improved methods of detecting lightning fires using the scan-extender, the LLP system and the fire weather codes and indices.

Saskatchewan lightning and lightning fire data suggests that most lightning fires in 1980 and 1981 started when the FFMC was 80 or greater. In 1981, some lightning fires were visually detected before the area was thermally scanned. All of these fires, except one, were smoking heavily, presenting some control difficulties. This resulted in a decision to conduct a combined thermal and visual search as soon as possible after a lightning storm rather than wait for 24 hours before thermally searching a storm path for "holdover" fires.

10. Accomplishments in 1981-82: (cont'd)

In 1982, a 7° lens will be tested on the thermovision (rather than the standard 20° lens) from a fixed-wing aircraft flying fast (290 km/h:180mph) at high altitudes (2500-3000 m: 8-10,000 ft.) This will increase the rate of scanned area (approx. 3X) without increasing costs, compared to a Bell 206 helicopter. The LLP direction finder in Prince Albert was relocated to improve the accuracy of the system.

6. Provided liaison and technical services to client agencies as follows:
 - a) Developed an inexpensive portable fire finder for use in Saskatchewan fire towers.
 - b) Trained an employee of DTRR (Saskatchewan) on the use of the scan extender.
 - c) Developed a mount to attach the scan extender to a Bell 206A helicopter.
 - d) Provided an evaluation of the AGA superviewer to DTRR (Saskatchewan) personnel.
 - e) Provided an evaluation of the intertech infrared scanning system to DTRR personnel based on an operational exercise.
 - f) Attended LLP Workshop (Tucson) and gave a brief presentation on the lightning fire detection program in Saskatchewan.
 - g) Examined the LLP system at Slave Lake, Alberta at the request of that forest's fire control officer.
 - h) Presented a slide lecture on NoFRC detection activities to students at the Hinton Forest Technology School.
 - i) Provided information on the operation of the scan extender (including video tapes and polaroid pictures) to the B.C. Forest Service (R. Townsend) and the Ontario Ministry of Natural Resources (J.F. Goodman)
 - j) Assisted in the relocation of two look-out towers in Saskatchewan based on seen-area maps.
 - k) Arranged a demonstration of the English Electric Valve Company's pyroelectric videocon tube for members of the C.F.S. A.F.S.
7. Reactivate and continue study.

11. Goals for 1982-83:

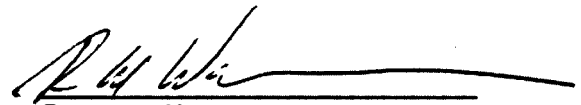
1. Develop lightning fire detection method using AGA thermovision/scan extender from high-flying twin-engine aircraft.
2. Assess currently available infrared systems, including operational procedures, availability, sensitivity, accuracy and costs.

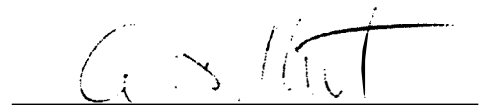
11. Goals for 1982-83: (cont'd)

3. Compile and analyze LLP system data and fire occurrence data using NoFRC computer and data base management systems to develop an effective method for lightning fire prediction.
4. Publish FMN report on "Construction and use of portable fire finder".
5. Provide liaison, technical services and training to client agencies.

12. Signatures:


Investigator


Program Manager


Director

A.D. Kil

CANADIAN FORESTRY SERVICE

STUDY STATEMENT

1982 - 83

Responsibility Centre: NORTHERN FOREST RESEARCH CENTRE

Date: January 12, 1982

1. Project: Fire management systems and guidelines
2. Title: Evaluation of the role of fire in forest and intermingled vegetation in the Prairie Provinces, Rocky Mountains and far north.
3. New: Cont.: X 4. No.: NOR-5-168
5. Study Leader: D.E. Dubé
6. Key Words: Fire ecology, fire history, fire cycle, fire type, fire climax, fire scar rating
7. Location of Work: Region Wide
8. Study Objectives:
 1. To develop and implement fire management programs in designated National Parks.
 2. To define the needs and priorities of client agencies in the area of fire impact assessments.
9. Goals for 1981-82:
 1. Publish as Information Report "Early plant succession following wildfire, Kootenay National Park".
 2. Publish in Forestry Report "Prescribed burning in Elk Island National Park".
 3. Complete and submit fire management study for Nahanni National Park.
 4. Complete and submit fire management study for Wood Buffalo National Park.
 5. Assist in prescribed burning programs in Elk Island National Park, Banff and Prince Albert National Park.

9. Goals for 1981-82: (cont'd)

6. Assess status of current study; make recommendations giving consideration to proposed CFS/National Parks agreement and modify or terminate study as appropriate.
7. Provide advice and consultation and participate in training sessions of client agencies and meetings relevant to study content.

10. Accomplishments in 1981-82:

1. No progress was made in the study year. The report has been through the initial review process and is currently with the author awaiting revision.
2. Report on prescribed burning in Elk Island National Park is complete. A condensed version is required for the forestry report. All other contributing articles have been submitted for review to the Technical Information section.
3. No progress was made in the study year. Though considered a high priority, day-to-day commitments precluded work on this goal.
4. No progress was made in the study year for the reason indicated in three, above.
5. Attended several meetings (see "1981 activities") with Elk Island National Park personnel to discuss a long-term prescribed burning plan. Some preburn vegetation sampling was conducted by NoFRC but 1981 spring burning did not take place due to rapid green-up and other pending commitments by park personnel. Banff Park did not receive administrative approval for burning in the fall of 1981. However, a very fruitful meeting took place with superintendents and chief wardens of Banff, Jasper, Kootenay and Yoho Parks where a firm and unanimous commitment was made to pursue fire management activities, including prescribed burning in the 4 contiguous mountain parks.
Bruce Wilson, Superintendent, Prince Albert National Park, met with CFS/CWS personnel to reaffirm prescribed burning operations/research within the park.
6. Study should continue until current goals are completed. The CFS/Parks Canada memorandum of understanding is now in place (Sept. 4, 1981) and essentially preserves the basic concepts of CFS/Parks Canada cooperation that have evolved through years of informal cooperation.
7. See attached "1981 activities"

1981 ACTIVITIES - D. DUBE

- January 9: Attended meeting of library committee.
- 12-15: Wood Buffalo National Park - board of review.
- 20: Met with R. Fytche, AFS to discuss fire loss statistics.
- 26: Program review.
- 30: Provided slides and data for AFS personnel participating in fire management course, Marana, Arizona.
- February 2: Met with AFS to discuss on-site retardant effectiveness program.
- 9: Fire section meeting.
- 11: Meeting with Elk Island National Park regarding proposed fire management plan.
- 13: Environment Council of Alberta meeting - review of fire research activities in National Parks.
- 17: Attended program review of Technical information project.
- 18: Presented seminar to Canadian Society of Environmental Biologists.
- 19: Presented four hour review of NoFRC fire research program to forest tech students at Hinton, Alberta.
- 20: Met with personnel from Elk Island National Park to discuss their fire management document.
- 25: Met and provided information to private consultant, (R. Hudson) Manecon Limited, on contract to the Dene Nation, NWT.
- 27: Met with H. Abbott, Elk Island National Park to review fire management document.
- March 9: Computer Applications Committee.
- 10-11: Traveled to Prince George to review BCFS/PFRC fire ecology project in northern B.C.

- March 16: Meeting regarding use of new telephone system.
- 17-18: Hinton meeting of AFS forest protection officers.
- 24: Met with Elk Island National Park personnel re: prescribed burning plan.
- 24: Met with Parks Canada-Prairie Region (D. MacMillan) to discuss fire workshop in Riding Mountain National Park.
- 25: Attended seminar at U of A presented by P. Stickney, USFS on fire effects.
- 26: Attended meeting on Nat. For. Res. Data program presented by T. Honer.
- 26: Met with student interested in pursuing forestry career.
- 27: P. Stickney, USFS visited NoFRC and presented an informal seminar on fire effects research.
- 31: Attended seminar at U of A by J. Bentz on fire history in Ram Mountain area.
- April 6: Board interview for vacant fire technician position.
- 7: Demonstration of remote weather station at AFS depot.
- 7: Met with D. Kiil re: fire program.
- 8: Attended meeting on biomass info in NWT hosted by C. Kirby.
- 9: Seminar at U of A presented by M. Johnson on prescribed burning thesis.
- 10: Met with EINP personnel and U of A to discuss burning project.
- 22-23: Attended PSC sponsored "Management of Time" course.
- 27-30: Traveled to Montreal for National Fire Danger Rating meeting.
- May 4: Met with Personnel (Kolstad) re: PAS review process.
- 7: Meeting in board room to provide study overview.
- 12-13: NWT fire management program committee meeting in Yellowknife, NWT (1st).

- May 20: LMCC meeting.
- 21: NWT fire management program committee meeting in Yellowknife, NWT (2nd).
- 22: Environment Council of Alberta meeting, Edmonton.
- 26: Met with Alberta provincial parks to discuss danger rating approaches.
- June 1: NWT fire management program committee meeting (3rd) in Yellowknife, NWT.
- 3-5: Attended "Classification Evaluation Course" in Jasper National Park.
- 16: NWT fire management program committee meeting (4th) in Ft. Simpson, NWT.
- 26: Met with Parks Canada, Hdqt's. (N. Loupchene) in Edmonton, to discuss fire research activities in national parks.
- July 6: Met with Yukon Forest Service (Morgan) to discuss fuel sampling procedures.
- 6: Met with AFS to review data base for fire atlas.
- 8: NWT fire management program committee meeting (5th) in Yellowknife, NWT.
- 6-10: Alberta Ecosystem Consultants visited NoFRC to finalize two reports.
- 23: Met with U of Toronto professor (P. Aird) to discuss fire program.
- 29: Met with EINP to discuss prescribed burning program.
- August 10: Met with NFI (W. Clark - Petawawa) to discuss damage appraisal research.
- 11: NWT fire management program committee meeting (7th) in Ft. MacPherson, NWT.
- 18: Dene Nation representatives (Lockhart and Burke) visited NoFRC to discuss fire management activities in NWT.

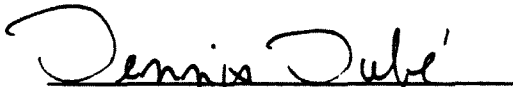
- August 25: Member of Classification committee that met to review 3 PAS's.
- September 1: Met with Director of PILP (P. Fogerty) to discuss opportunities for commercial production of items developed by NoFRC.
- 2: Meeting with Alberta Dept. of Energy and Natural Resources to discuss options to produce maps for fire atlas projects.
- 14: Met with the research subcommittee of the CCFFC to discuss fire research strategies.
- October 1: Provided high school student with information for a science presentation.
- 1: Reviewed on an informal, internal basis two PAS's that had been prepared for submission.
- 9: Discussed "What our Forests Mean to Us" on Capital Cable T.V. as a CFS contribution to Environment Week.
- 19-23: Attended Intermountain Fire Council workshop in Salt Lake City, Utah.
- November 2-5: Attended "Damage appraisal workshop" in Ottawa.
- 6: LMCC meeting.
- 9: Met with the superintendent, Prince Albert National Park (B. Wilson) to discuss prescribed burning program.
- 13: Brief presentation at "West Central Provinces Forest Economist" meeting.
- 18-19: Attended Forest Protection Officers (AFS) meeting in Hinton, Alberta.
- 20: Attended seminar on "Influence of Forest Fires on the Swedish Boreal Forest" by Dr. O. Zackrisson.
- 25: Met with the research subcommittee of the CCFFC.
- 30: Traveled to Banff at the request of Parks Canada to discuss fire management planning in the 4 contiguous mountain parks, with superintendents and chief wardens.

- December 3: Lectured at U of A to fourth year agriculture students on fire management planning in national parks.
- 7-11: Attended fire research program review of NFI in Petawawa, Ontario.

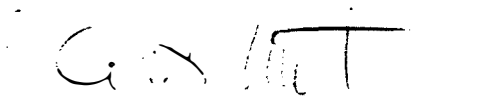
11. Goals for 1982-83:

1. Publish information report "Early plant succession following wild-fire, Kootenay National Park".
2. Complete and submit fire management studies for Nahanni and Wood Buffalo National Parks.
3. Assess status of "Role of fire in forest and intermingled vegetation in the Prairie Provinces Rocky Mountains and Far North"; make recommendations giving consideration to CFS/Parks Canada agreement and modify or terminate study as appropriate.

12. Signatures:


Investigator


Program Manager


Director A.K. Kill

9. Goals for 1981-82: (cont'd)

4. Initiate a cooperative program with the AFS to develop priority zoning guidelines aimed at providing more cost/effective fire management planning. (Alexander, Dubé)
5. Refine and calibrate the performance of a resource location-allocation model based on Masters thesis and apply same to updated fire occurrence data in co-operation with the Alberta Forest Service. (Newstead)
6. Publish an information report on the status of all airtanker/retardant drop patterns compiled and analyzed to date. (Newstead)
7. Complete preliminary analysis of AFS aerial observer report summaries (1976-80) compiled to date. The need for subsequent data collection and/or publication requirements will be determined during the 1981-82 study year. (Newstead)
8. Establish procedures and provide client agencies with the over-winter adjustment to the drought code for 1981 and on a regular, annual basis in subsequent years. (Dubé)
9. Publish information report on spring burns in a 50 year old aspen stand. (Dubé)
10. Publish Forest Management Note on forest fire containment model. (Newstead)

Goals added:

11. Co-author manuscript revisions for submission as a journal article to Canadian Geographer. (Newstead)
12. Prepare and present a paper on the NoFRC initial attack planning model at the annual meeting of the Intermountain Fire Council in Salt Lake City, Utah. (Newstead)
13. Provide technical assistance, training, and technology transfer to user groups interested in application of the NoFRC initial attack planning model. (Newstead)
14. Participate in Parks Canada-Prairie Region fire management workshop at Riding Mtn. National Park. (Alexander)
15. Participate in C.F.S. National Fire Danger Rating Group meetings. (Alexander)
16. Develop fire-oriented programs for the Texas Instrument Model 59 hand-held calculator. (Alexander)

Goals added: (cont'd)

17. Provide technical advice and services on the CFFDRS, including assist Alberta Provincial Parks in development of fire danger rating procedures. (Alexander)
18. Participate in Central and reactivated Western Region Fire Weather Committees. (Alexander)
19. Act as external reviewer for unsolicited fire research manuscripts. (Alexander)
20. Determine fire research needs and priorities in the N.W.T. (Alexander)
21. Provide technical advice on the Swan Hills fire, (DS3-23) to the Alberta Forest Service. (Alexander)
22. Continue analysis and writing commitments resulting from lateral transfer from Great Lakes Forest Research Centre. (Alexander)

10. Accomplishments in 1981-82:

1. A contract has been let and fulfilled and a draft report is nearing completion. This information report will incorporate contract and in-house results. (Newstead)
2. Historical fire weather record forms obtained from PNFI (see CFS Misc. Rep. FF-Y-1) for five central and western national parks covering the period 1940-1969; metric conversion and transcribing for keypunching initiated. Four computer programs associated with the Canadian Forest Fire Danger Rating System placed on NoFRC's PDP 11 and file report drafted. (Alexander)
3. Regional fire statistics have been compiled, verified and entered on the PDP-11. A fire atlas for Alberta and selected national parks is nearing completion. Publishing costs are high and will determine to some extent, the timing of publication. (Delisle)
4. Several meetings and discussions have taken place including a national damage appraisal workshop (Ottawa), internal NoFRC discussions between fire research and economics research and discussions between NoFRC (Fire Research) and the A.F.S. (Protection Headquarters and Footner Lake forest). Interest remains high and reasonable progress is expected in 1982-83. (Dubé)
5. In lieu of revising a resource location-allocation model based on Masters thesis, a contract has been let to develop a similar model compatible with the TI-59 hand-held calculator for localized application rather than for use with centralized computing facilities. (Newstead)

10. Accomplishments in 1981-82: (cont'd)
 6. Analysis and tabulation of all drop test patterns has been completed. (Newstead)
 7. Preliminary statistical analysis of A.F.S. Aerial Observer Report Summaries is underway. Owing to the nature and quality of information being collected, it is not likely that this goal will be continued beyond the 1982-83 study year. Departure of NoFRC resident systems analyst delayed efforts in 1981-82. (Newstead)
 8. Provided user agencies with spring Drought Code starting value look-up tables for 1981 fire season and prepared both a Forest Management Note and a brief Forestry Report article summarizing work and background information. A proposal for determining spring DC starting values in the prairie provinces and far north on a yearly basis was prepared for discussion and formal agreement at the January 1982 Central and Western Region Fire Weather Committee meetings. (Alexander)
 9. Additional analysis and writing was completed on the information report entitled "Spring fires in a semi-mature trembling aspen stand, Alberta". Final draft will be submitted to editor by Feb/Mar. 82. (Alexander)
 10. A Forest Management Note on the NoFRC fire containment model as an initial attack planning tool has been published. (Newstead)
 11. Co-authored revised manuscript on wildfire and airtanker locations for resubmission to Canadian Geographer. (Newstead) (Accepted for publication)
 12. Co-authored and co-presented a research paper on an initial attack planning model at the annual meeting of the Intermountain Fire Council at Salt Lake City, Utah. (Newstead) (In press). Council also attended by D. Dubé, M. E. Alexander and R. Lieskovsky.
 13. Provided technical assistance and instruction on the performance and application of the NoFRC initial-attack planning model. Sessions included the Canadian Committee on Forest Fire Control, N.W.T. Northern Affairs Program and Alberta Forest Service Division level training course. (Newstead)
 14. Attended Parks Canada-Prairie Region fire management workshop (May 20-24) at Riding Mtn. National Park and made a presentation entitled; "Is there a place for prescribed burning in Canada's National Parks?". (Alexander)
 15. Attended CFS National Fire Danger Rating Group meetings in Montreal (Apr. 27-30) and Victoria (Dec. 14-18) as NoFRC representative regarding quantification of the CFFDRS. (Alexander)

10. Accomplishments in 1981-82: (cont'd)
15. a) Completed reanalysis of all experimental fire behaviour data on file at NoFRC and analysis of applicable data from U.S. as input into quantification of the CFFDRS and
b) Completed fuel and weather analysis relative to rate of spread of several wildfires and prepared a file report and summary Forestry Report article on Fire Weather Index analysis of the 1968 Lesser Slave Lake fire. Results to be used in quantification of the CFFDRS.
 16. Prepared two fire oriented programs for the Texas Instruments model 59 hand-held calculator (spring DC starting values and hourly calculation of the Fire Weather Index) and distributed informally to user agencies and CFS fire researchers. (Alexander)
 17. a) Initial work completed on adapting the Canadian Forest Fire Danger Rating System to the Provincial Parks in the prairie region of Alberta; b) Distributed introductory document on the new SFFMC to agencies; c) Assisted AFS Weather Section Staff with Fire Weather Index Severity Rating analyses of the 1980 and 1981 fire seasons. (Alexander)
 18. Attend Central (Jan. 14, Winnipeg) and Western (Jan. 21, Edmonton) Region Fire Weather Committee meetings as NoFRC representative. Organized, hosted, chaired and produced minutes of WRFWC meeting.
 19. Reviewed the following manuscripts (Alexander):
 - a) Wildland Fires: Hazards and survival (chapter for book on management of wilderness and environmental emergencies) by K.M. Davis and R.W. Mutch.
 - b) Nondirectional sampling of wildland fire spread (Fire Technology article) by A.J. Simard and K.B. Adams.
 - c) Wilderness fire management planning guide (USDA Forest Service General Technical Report) by W.C. Fischer.
 - d) Fire history in southwestern mixed conifer: A case study (Forest Science article) by J.H. Dieterich.
 - e) Synoptic weather change and fire behavior in Alberta, 1981 (Alta. For. Serv. Tech. Rep.) by N. Nimchuk.
 - f) Pyrodendrochronology of a ponderosa pine cross section (scientific journal article) by J.H. Dieterich and T. Swetman.
 - g) Fuel succession in northwestern Montana (Environmental Management article) by C.D. Armour and L.F. Neuenschwander.
 - h) Automated daily fire danger forecasting (AES Technical Memorandum) by R.L. Raddatz and G.B. Atkinson.
 - i) Fire frequency distribution and its role in succession (PNW-Forest succession workshop proceeding) by R.E. Martin.
 20. Initial field reconnaissance (2 weeks in July) regarding fire danger and fire behaviour research needs in the N.W.T. completed. (Alexander)

10. Accomplishments in 1981-82: (cont'd)

21. Spent ten days on the Swan Hills fire (DS3-23) in the plans section of the overhead team as fire behaviour officer. (Alexander)
22. Completed rewrite of journal manuscript on Byram's fire intensity concept.

11. Goals for 1982-83:

1. Publish information report on the development and application of the initial-attack planning model, incorporating fire-line productivity, rate-of-spread, fuels and other related information. (Newstead)
2. Publish information report on the status of all airtanker/retardant drop pattern data compiled and analyzed to date. (Newstead)
3. Develop a prototype resource allocation model for use in initial attack planning at the field level. (Newstead)
4. Continue compilation and analysis of AFS aerial attack observer data to determine future data requirements and level of reporting. (Newstead)
5. Prepare file report on NoFRC data on hand towards developing a regional fire data library. (Alexander & Dubé)
6. Complete analysis and reports on a) Pukaskwa National Park fire history and ecology, b) on experimental fires and wildfires associated with GLFRC studies. (Alexander)
7. Initiate study to assess economic impact of fire in relation to fire management objectives and priority-zone considerations. (Dubé)
8. Continue to provide technology transfer, participation on committees, task forces and review boards aimed at improving the protection and use of Canada's forests through efficient fire management. (All)
9. Publish Fire History Atlas for Alberta. (Delisle)
10. Publish Forestry Report. (Dubé)
11. Publish Information Report on spring burns in a 50 year old aspen stand. (Alexander)

12. Signatures:

Dennis Dube
Investigator

[Signature]
Program Manager

[Signature]
Investigator

[Signature]
Director A.D. Kill

^{For}
J. Chocrewig [Dube]
Investigator

Martin E. Alexander
Investigator

CANADIAN FORESTRY SERVICE

STUDY STATEMENT

1982 - 83

Responsibility Centre: NORTHERN FOREST RESEARCH CENTRE

Date: January 12, 1982

1. Project: Fire management systems and guidelines
2. Title: Fire danger and behavior rating in forest and rangeland environments
3. New: X Cont.:
4. No.: NOR-5-191
5. Study Leader: M.E. Alexander
6. Key Words: Canadian Forest Fire Danger Rating System, wildfire case histories, fire behavior estimation, fire environment.
7. Location of Work: Regional
8. Problem:

This study formalizes the need for continued development, evaluation, interpretation, and application of the Canadian Forest Fire Danger Rating System in the region serviced by the Northern Forest Research Centre in order to extend its usefulness. Secondly, it recognizes the opportunity to formulate improved methods of anticipating and estimating the behavior of wildfires by regional adaptation of existing knowledge and techniques. This study is designed to compliment rather than duplicate the research efforts covered by NOR-5-086.

9. Study Objectives:
 1. To develop, evaluate, interpret and apply the Canadian Forest Fire Danger Rating System.
 2. To improve the assessment and prediction of wildfire behavior in terms and by methods which are useful to fire management agencies.
10. Resources:
 - a. Starting date: 1982
 - b. Estimated year of completion: Indefinite
 - c. Estimated total prof. man-years required: 10
 - d. Essential new major equipment items for 1982-83 with costs: Nil
 - e. Essential new major equipment items beyond 1983 with costs: Nil
 - f. 1981-82 man-years:

Prof.	0.5	(M.E. Alexander)
Supp.	0.2	(M.E. Maffey)
Casual	-	
Total	0.7	

11. Progress to Date:
N/A - new study
12. Goals for 1981-82:
N/A - new study
13. Accomplishments for 1981-82:
Some related goals were completed under NOR-5-174.
14. Goals for 1982-83:
1. Prepare FMN on descriptive danger index classes associated with the new Sun-exposed Fine Fuel Moisture Code (SFFMC) and Fast-Drying Spread Index.
 2. Prepare FMN on relationship between SFFMC and Cladonia Fire Hazard Index.
 3. Participate in cooperative projects on CFS National Fire Danger Working Group, including continued development of the Fire Behavior Index subsystem.
 4. Initiate field reconnaissance and prepare study plan on adaptation of CFFDRS to the distinctive weather and fuel conditions in the NWT.
 5. Provide advice and services as required, including serving on Central and Western Regional Fire Weather Committees.
 6. Compile and analyze data for selected past wildfires.
 7. Monitor and document on-site fire behavior of selected fires.
 8. Prepare FMN on use of hand-held wind gauges on forest and rangeland fires.
 9. Review unpublished experimental fire behavior data on file at NoFRC and summarize.
15. Publications:
N/A - new study
16. Signatures:

Martin E. Alexander
Investigator

[Signature]
Program Manager

[Signature]
Director

A.D. Kiil