

TIMBER

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NORTHERN FORESTRY CENTRE

EDMONTON, ALBERTA

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PRINCE ALBERT OFFICE HAS NEW MANAGER

Meet Ray Fautley, the new manager of the Northern Forestry Centre's district office in Prince Albert. This office is the focal point for activities under the Canada-Saskatchewan Forest Resource Development Agreement, and Mr. Fautley brings to the position an excellent working knowledge of such federal-provincial agreements. Before joining CFS this February, he co-managed a subsidiary agreement aimed at boosting land productivity through better water management and drought proofing. Talking with farmers and others directly affected by drought gave him personal insight invaluable in putting together effective programs.

Mr. Fautley says the Saskatchewan forestry agreement has made a marked



Ray Fautley, Manager of Northern Forestry Centre's district office in Prince Albert.

difference in the province's economic development. Sharing technology and information has aided that progress, and Mr. Fautley wants the lines of communication established with companies like Weyerhaeuser and Saskatchewan Forest Products kept open. Now that the Weyerhaeuser pulp mill in Prince Albert is using more aspen, opportunities could open up for private woodlot owners. Mr. Fautley would like to see more assistance made available to these people through the agreement. He also hopes to encourage more native participation in forestry through agreement programs.

We welcome Ray Fautley to the CFS and to Prince Albert.

MOUNTING THE ATTACK ON WILDFIRE

It's an operation of almost military precision.

1. Set up weather station.
2. Mobilize near High Level, Alberta.
3. Place depth of burn pins.
4. Install electronic rate of spread timers.
5. Position ground observers.
6. Establish helicopter positions for video footage.
7. Ignite with flame throwers.
8. Monitor progress of fire front.
9. Perform postburn measurements.
10. Sigh with relief that the weather cooperated.

Experimental fires are almost completely subject to the caprices of the weather. If it's too wet, you can't burn, and if it's too dry there's generally a wildfire problem and any experimental burning can't go ahead then, either. Fire Research Officer Marty Alexander, of the Northern Forestry Centre, is hoping this year's northern Alberta summer will grant at least a week to 10 days of suitable burning weather. It's what he and his co-workers need to complete a series of small scale test fires designed to simulate real wildfires. These would be conducted at Big Fish Lake, within the Footner Lake Forest in the far north-central part of the province. It is an area noted for its remoteness and limited road access.



Setting an experimental fire.

The black spruce forest type at Big Fish Lake represents likely the most explosive fuel complex in Alberta and the Northwest Territories. Three characteristics of the predominant vegetation combine to make it that way. First, the branches of black spruce extend low to the ground, instead of higher up the trunk like pine. Second, a highly flammable shrub known as Labrador tea forms a fairly continuous layer of surface fuel. And third, feather mosses and ground lichens make an excellent "flash" fuel.

Fire managers rely on the Canadian Forest Fire Behavior Prediction (FBP)

Continued on next page

NOTE

The exclusion of certain manufactured products or company names does not necessarily imply disapproval, nor does the mention of other products or company names necessarily imply endorsement by the Canadian Forestry Service.

MOUNTING THE ATTACK continues . . .



Aerial view of experimental burning plots.

System to indicate how fast a fire will spread and how intense it will be. These predictions are based on the best possible information available, but Mr. Alexander says that the existing database for the black spruce fuel type is small because most experimental fires have been concentrated in pine stands and logging debris during the last two decades.

Nine successful experimental fires have been documented to date at Big Fish Lake. Rates of spread have varied from half a metre to 30 metres per minute. "The data gathered so far at Big Fish Lake suggests that the FBP System tends to underpredict how fast a fire will spread at the low end of the scale," notes Mr. Alexander. "There's certainly room for improvement."

The joint Alberta Forest Service/Canadian Forestry Service experimental burning project at Big Fish Lake was initiated in late 1983. The AFS has contributed substantially to the project in providing funding, crews, equipment and air support. Since the 1984 fire season, Mr. Alexander has also been working with staff from the Northern Forestry Centre's Prince Albert office, and with fire researchers from the Pacific and Great Lakes Forestry Centres, and from the Petawawa National Forestry Institute. In 1984, it became apparent such singleness of purpose can be thwarted, when no fires were completed.

1985: A much improved record with six completed. 1986: Known not so affectionately as "Big Fish III: The Monsoon", although three burns were completed despite the above-normal precipitation in July.

With the hope that this year will be more favorable, a remote automatic weather station is being installed at the project site in early May. From High Level, about 100 kilometers southwest of the station, weather conditions will be monitored and the long-range outlook (two to five days) supplied by the Alberta Forest Service's weather section will be examined daily. When the conditions

and forecast are deemed "right", the fire researchers will then fly to High Level.

Twenty-one plots were laid out on the north and south sides of Big Fish Lake in 1984. Roughly 50 metres square, each plot is bordered by a ten metre wide fire guard. The plot to be burned on any given day depends on the wind direction; each fire is lit so that it spreads toward the lake. AFS suppression crews then move in to extinguish the fire, and the postburn measurements are made by CFS fire researchers.

Central to almost every fire management decision is the need to accurately predict fire behavior under various burning conditions. How quickly or slowly a fire will advance is a starting point in any assessment for controlling unwanted fires. The fire boss can then start organizing an effective arsenal of suppression crews, water bombers, bulldozers, etc. to combat wildfires. The result: less damage and thousands of dollars saved.

Although the experimental fires are being conducted in Alberta, fire managers in much of northern Canada will benefit from improved fire behavior predictions in the black spruce forest. And more accurate predictions could mean the difference between the turmoil of community evacuation or residents of small northern communities being able to relax.

Now, if only the weather will cooperate ...



On the road again! "Alberta's Managed Forests", a forestry display trailer, will be travelling around northern Alberta from May through September. For information on when the trailer will be in your area, call the Alberta Forest Service at (403) 427-6233.

GIS ... MORE THAN MEETS THE EYE

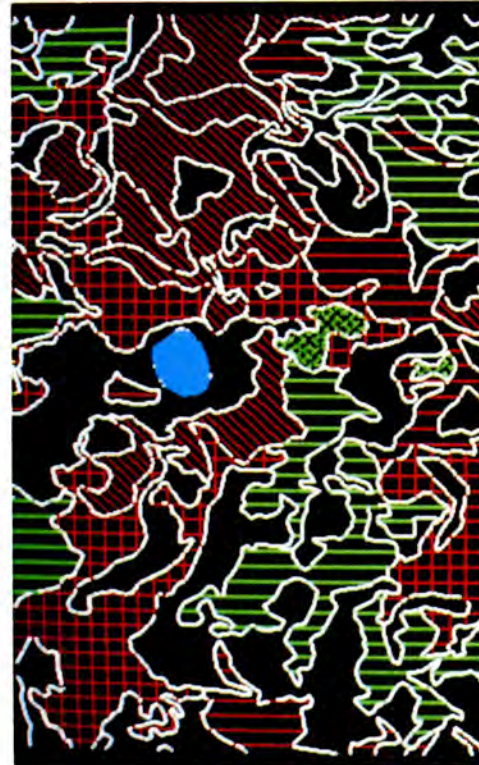
People were literally being turned away at the door. The GIS Workshop this past February in Winnipeg drew about 260 eager participants talking about, showing off and marveling at geographic information systems.

If you're not familiar with a geographic information system, it's a combination of computer hardware and software that turns mapping into an extremely precise decision-making tool. It enables land managers to explore an infinite number of "what if" scenarios. A GIS starts with information that can include, for example, a province's township system or its land registry system. This is entered on the computer first. From this information, base maps are drawn by the computer, or plotted, to depict the surface of the province on a computer screen. Although a two dimensional map is most common, some systems can plot three-dimensional maps.

At this stage, other maps which have been entered on the system can be overlaid on the base map. All maps are entered through a process called digitizing, in which information on conventional maps is converted to a form the computer can use.

These maps may show, for example, lakes and watercourses, or mineral deposits, or forested areas, or topographical features. Combining the latter two maps, for example, on the base map would help a land manager determine exactly where a logging access road should be built. That is just one small sample of a GIS' formidable analytical capabilities. Taking the process one step further, a geographic information system's plotter can then "draw" the newly created map.

The four-day workshop was sponsored by the Northern Forestry Centre with funding assistance from the federal-provincial forestry agreements in Manitoba, Saskatchewan and Alberta. Coordinated by Senior Development Officer Steve Price, it featured top-notch speakers like Les Reed, who is currently a contract advisor to the Department of External Affairs on the softwood issue with the United States. Mr. Reed is also a professor of forest policy at the University of British Columbia. Jack Dangermond was the workshop's other keynote



This personal computer monitor display shows a map created by a GIS designed to help in fighting forest fires in the area.

speaker. Mr. Dangermond is president of ESRI, a California-based firm known internationally for innovation in the application of GIS.

Getting a GIS to the operational stage involves much more than just buying the hardware and plugging it in. In Alberta's case, work on creating the base maps began in 1981, and that was after necessary preliminary work that started in 1978. Alberta's GIS is situated at the Resource Evaluation and Planning (REAP) branch of Forestry, Lands and Wildlife in Edmonton. It works interactively with information from many natural resource sectors, for a decision in one sector inevitably affects all others.

The Director of REAP, John Harrower, says a pilot project began two years ago to build up the system's capabilities for forest management. This has involved entry of forest-specific information (for example, where commercial stands of lodgepole pine are located). This kind of statistical information is usually not in graphic form, so as it was entered it was converted to a form that the GIS, with its analytical capabilities, could project visually onto the base map. Most of this information is now on the

system, and the prototype forestry GIS is off and running. Where it goes from here, Mr. Harrower says, depends largely on funding.

The provinces of Saskatchewan and Manitoba also have geographic information systems, both purchased by the federal government under the federal-provincial forestry agreements in each province. The Manitoba system is located at the Manitoba Forestry Branch offices in Winnipeg. It is used only for forestry purposes. In Saskatchewan, the main system is located in Prince Albert. Some equipment was also purchased for an office of Saskatchewan Parks and Renewable Resources in Regina. From here, selected fish, wildlife and parks information will be entered onto the database in Prince Albert. However, the primary use of the GIS will be for forestry.

One person who will be using that GIS extensively is Jamie Benson, the head of Timber Management for the province. Mr. Benson says their \$1 million ESRI Arc-Info system will be able to show such things as the geographic distribution of timber supply, or do corridor analyses to find out how much timber is tied up along highways and

GIS ... MORE THAN MEETS THE EYE

streams. The system will also be able to locate old timber, and help design road systems to get in there to pick it up.

Although the price tag of an entire GIS makes it an unlikely purchase for most private industries, there are some "stand alone" mini-systems in a price range suitable for industry. And, there are ways for forest companies to tap into the provincial systems. Jack Spencer, Management Forester for the Weyerhaeuser pulp mill in Prince Albert, says his company has been looking at a micro-system to be based at their office. Mr. Spencer says this system would include a powerful microcomputer, digitizing table and plotter. To begin with, it would use existing forest inventory information to build a database on the company's own mainframe computer. Eventually, it would be hooked into the main database in Prince Albert.

Similarly, the Abitibi-Price newsprint mill in Pine Falls is considering setting up a satellite work station connected to the provincial government GIS in Winnipeg. Dave Chown, Woodlands Manager for the Pine Falls mill, says a local work station would assist the company in all phases of planning, from planting to thinning to harvesting. "We could calculate the annual allowable cut more quickly, for example," he says, "or

get more accurate indications of which silvicultural practices will work best in a certain area to prepare the ground for replanting after harvest."

The province of Manitoba is currently loading forest inventory information onto its GIS, information detailing forest cover types, ownership and zoning of various lands. Bob Lamont is the province's Chief of Forest Management. Right now, his staff is concentrating on loading information for what he calls the "active band" of the province where most of the harvesting and reforestation takes place. Mr. Lamont anticipates the Arc-Info system to be in use operationally for this "active band" in about four years.

A GIS is hi-tech mapping and analytical wizardry, with what seems

limitless potential. Those attending the GIS Workshop were able to sample that incredible diversity, as about six suppliers were on hand to show their wares. And much was learned from the several experts brought in. Dr. Dana Tomlin from Harvard University spoke about the varying sophistication of GIS hardware and software. Dr. Roger Tomlinson, head of a private consulting company, talked about the planning and budgeting involved in acquiring a GIS. The bottom line—what the benefits of purchasing a GIS will be—was explored by Larry Sugarbaker, of the Washington State Department of Natural Resources. Workshop proceedings are expected to be available from the Northern Forestry Centre by early May. In the end, the GIS Workshop at Winnipeg's Delta Hotel was show and tell on a grand, complex and entertaining scale.



Edmonton, August 24-28, 1987

Discussing wetland dynamics, classification and ecology, non-consumptive uses of wetlands and wetland conservation policies and programs.

Contact S. Zoltai (403) 435-7210 for more information.



1987 ANNUAL MEETING

Canadian Institute of Forestry

1987 CONGRÈS ANNUEL

Institut Forestier du Canada



**AUGUST
2-6, 1987**

**DU 2 au 6
AOÛT 1987**

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Thème : Les communications un lien essentiel en foresterie

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NFC BLOODHOUNDS PURSUE UNUSUAL QUARRY



There are bloodhounds on the loose in the Slave Lake Forest. These highly trained beasts are sniffing out the traces of small aluminum tags, each with a number on it. In 1951-52, these tags were attached to spruce trees in stands within an 18-kilometer radius of Smith, Alberta (about 200 kilometers north of Edmonton). The trees were marked after competing aspen had been cleared out using hand tools and chemicals. Each marked tree also had a red ring painted around the trunk. What researchers Jack Quaitte, George Ontkean, and Dr. Jock Lees wanted to find out was how the spruce responded to this release after five and again after ten years.

The last measurement was made in 1961, a report published and the project terminated. But interest in the project

did not end there, and research scientist Dr. Richard Yang of the Northern Forestry Centre decided in the fall of 1985 to resurrect it. The 1961 report had shown that release resulted in a great increase in the spruce's height and diameter. How much change would there be 25 years later?

Last June Ross Waldron, the Northern Forestry Centre's Director of Forest Resources Research, together with Dr. Yang and technician Stan Lux, returned to the area. Their first visit was just to survey the stands. Some of the paint rings were still visible, others not. Some trees still had tags attached, some tags were on the ground nearby, others were missing. Some trees without any identification were suspected to be originals because aspen stumps still surrounded them.

It was time for the bloodhound. "Bloodhound" is actually the trade name for a series of metal detectors manufactured by Garrett Metal Detectors in the U.S. These detectors are generally used in crime and security investigations to locate metal objects ranging from bullets to boats. Each one has a ground adjuster on it to tune out mineralized soil. With the researchers the second time was Jack Wright. Mr. Wright is now retiring as Chief Forester with Champion Forest Products in Hinton, but 35 years ago he was a student, part of the crew that set up the study.

The bloodhound, four lean pounds of sensing superiority, found about 150 tagged trees. The trail is fresh now, and about six people with three detectors are again in pursuit of their quarry. Mr. Lux says in some areas the spruce's response to thinning after 35 years has been very impressive. We wish our crew good luck in their hunt.



WHAT'S WRONG WITH MY TREE is the title of one of 28 useful brochures available from the Northern Forestry Centre. They detail symptoms and treatments of many insect and disease problems. Write to us at the address shown on the back page of TIMBERLINES.

TRAPPING SMALL BUT IMPORTANT PREY

Looking now at the 1987 forecast:

Forest tent caterpillar activity will be up slightly, but spruce budworm and jack pine budworm numbers overall will be down. Not much trouble expected from the mountain pine beetle, although the foothills area in Alberta will be watched closely. Generally speaking, insect damage is not expected to be serious for most forests across Alberta, Saskatchewan, Manitoba and the Northwest Territories.

Each year, the Forest Insect and Disease Survey (FIDS) unit makes general predictions as to the degree of insect damage expected in the region's forests that year. These predictions are based on the extent and severity of the previous year's damage, which has been determined by aerial surveys together with monitoring of the egg, larval, and adult insect stages. For some important insect species the adult stage may be monitored with pheromone-baited traps. Pheromones are chemical attractants that serve as bait to trap the specific species. They have proven to be an effective tool to help predict potential outbreaks or population declines.

This year, the FIDS field staff, known as bug rangers, will be setting out spruce budworm pheromone traps across Alberta, Saskatchewan and Manitoba. Traps will be placed at 35 to 40 sampling sites. This work is part of a national monitoring program that is now in its fifth year.

Although spruce budworm numbers have been declining, a few stubborn pockets remain in south-central Alberta, eastern Saskatchewan and southeastern Manitoba. Dr. Herb Cerezke, head of the FIDS unit at the Northern Forestry Centre, says two areas to watch this year are in the Northwest Territories along the Liard and Slave Rivers, where budworm populations have been expanding.

Pheromone traps to monitor jack pine budworm populations across the three prairie provinces may also be set out this year, to help field test a new bait now under development. Although numbers of these insects have been dropping, particularly in Manitoba, there is still concern in central Saskatchewan where the forest is heavily used by

industry. The prairie provinces are expected to suffer moderate-to-severe defoliation at several locations.

Pheromone baits are also used in the detection and control of mountain pine beetles by attracting them to "bait-trees" which can then be cut down and burned once infested. When the beetles attack trees and burrow into the bark they bring with them fungi that play a major role in killing the trees. The crowns of infested trees turn reddish brown when they die, within several months of the initial attack. By then they are easily spotted for follow-up sanitation treatment (cutting and burning) or salvaging. The numbers of infested trees in Kootenay National Park went up last year, so neighboring areas will be watched closely this year for any sign of eastward spread.

Forest tent caterpillars favor the aspen parkland in the prairie provinces, feeding on aspen, green ash and other ornamental deciduous trees. Dr. Cerezke is expecting some expansion of the caterpillar in central Alberta, extending mainly southwest and northward from Edmonton, and eastward through aspen parkland to North Battleford, Saskatchewan. Defoliation hasn't extended greatly into the forested areas, and control continues to be handled mainly by individual land or property owners and by the provinces in high-use recreational areas. But aspen is becoming more important commercially, and control of the caterpillar in forested areas may be given a higher priority by the provinces in the future.

As far as diseases are concerned, the FIDS unit helps to keep tabs on the most prevalent ones, such as Dutch elm disease, fire blight, silver leaf, and various stem canker diseases in urban and farm shelterbelt areas. Dwarf mistletoe, several conifer rust diseases and Armillaria root rot are actively monitored in forested areas across the prairie provinces and Northwest Territories. Disease outbreak predictions on a yearly basis are not usually necessary because their presence and degree of severity often doesn't change much from year to year. Also, conditions which may favor their spread are often strongly weather related and so may be more unpredictable. Disease monitoring overall requires



Pheromone trap helps to predict potential insect outbreaks.

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The bug rangers are out in the field starting in early May. It's a huge territory for five people to cover, but by July aerial surveys will be in progress to supplement their ground observations and collections. By then it should be clear if what was predicted is actually occurring, and whether controls put in place have been effective.

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PEOPLE



CONGRATULATIONS to MURRAY MAFFEY and RICK HURDLE on their promotions. Both are now at the EG ESS 06 level.



WELCOME to ART SHORTREID who has joined the Prince Albert office as a Forestry Officer.



GOODBYE to JIM FARRELL, KAY CONATY and TOM WALSH. JIM is now Chief Implementation Officer for the Canada-Ontario Forest Resource Development Agreement at the Great Lakes Forestry Centre. KAY has retired after 15 years at Northern. And TOM is now in Dartmouth, Nova Scotia.



PINK BOOTIES to MIKE and ANNETTE GRANDMAISON, parents of VANESSA AERIEL NICOLE born January 11, 1987. And a blue pair for MARTY and HEATHER ALEXANDER. NEAL RUSSELL was born January 30th, 1987.



And CONGRATULATIONS to DR. TEJA SINGH. TEJA, executive vice-president of the Edmonton Multicultural Society, has received a cultural doctorate in Intercultural Relations from the World University Round Table.

NEW PUBLICATIONS



Below is a list of reports published under the Canada-Alberta Forest Resource Development Agreement. Because our numbers of copies are limited, we ask that you please request one copy only of any particular report. Notice of reports under the Canada-Saskatchewan and Canada-Manitoba agreements will be given once they are available.

Value Added Opportunities for Alberta Lodgepole Pine

Evaluation of Kiln Drying Characteristics of Aspen Lumber

World Market Pulp Demand (Eucalyptus)

Review of Chemical Products (Tigney)

Bonding Wood Composites with Isocyanates

Improving Fibre Utilization in the Aspen Structural Panel

Study of Chemithermomechanical Pulp

The Continuing Challenge: Competition and New Products

Outlook for the Treated Lumber Market

Directory of Wood-using Industries in Alberta 1986

Testing of Alberta Spruce and Pine Laminated Beams

Listed below are other recent publications of the Northern Forestry Centre. Copies may be obtained by writing or telephoning the centre.

Addison, P.A.; L'Hirondelle, S.J.; Maynard, D.G.; Malhotra, S.S.; Khan, A.A. 1986. Effects of oil sands processing emissions on the boreal forest. Inf. Rep. NOR-X-284.

Ball, W.J.; Kolabinski, V.S. 1986. Performance of container and bare-root stock on prescribed burns in Saskatchewan. Inf. Rep. NOR-X-283.

Hiratsuka, Y. 1987. Forest tree diseases of the prairie provinces. Inf. Rep. NOR-X-286. (Limited distribution)

Malik, N.; Vanden Born, W.H. 1986. Use of herbicides in forest management. Inf. Rep. NOR-X-282.

Moore, W.C.; Chow, W. 1987. A Mapping and Analysis of Resources System application. Inf. Rep. NOR-X-285.

Samoil, J.K., editor. 1987. Manitoba's forests. For. Rep. 32.

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