



Fire Training Videodisc a Winner

An interactive laser disc that gives forestry students hands-on experience in forest fire management has won the first annual Alberta Forestry Innovation Award. This award is sponsored by the Northern Forestry Centre.

This laser disc, known as the Fire Training Simulator, was developed by members of the Forest Fire Management Training Team at the Alberta Forest Technology School in Hinton, Alberta. The disc incorporates video footage and computer graphics to simulate wildfire conditions, and presents students with various options for controlling such "forest fires". At any point students can ask questions and receive user-friendly responses.

The Northern Forestry Centre, together with the Forest Protection Branch of Alberta Forestry, Lands and Wildlife, received an Honourable Mention for development and application of the IFMIS computer program. IFMIS stands for the Intelligent Fire Management Information System. It is an interactive program that marries information about weather, current and predicted fire behaviour, and available fire fighting resources to data bases and sophisticated computer systems and graphics. The result: recommendations for more cost-effective deployment of resources for any given fire. The system is called "intelligent" because it contains an expert systems component that simulates human thought processes.

Two other Honourable Mentions were awarded, one to VisionSmart Inc., an Edmonton firm that has developed a computerized lumber grading system, and the other to Recom Engineering (1987) Ltd., an Edmonton company that has developed an on-line quality control system used in oriented strandboard, waferboard, particle-

board and medium density fibreboard plants.

The Alberta Forestry Innovation Award was established by the Northern Forestry Centre to recognize innovative activities in Alberta's forest sector based on

research products and achievements. Nominees for the Alberta Forestry Innovation Award were judged by members of the Alberta Forest Research Advisory Council, a body comprising government, industry and university agencies active in Alberta's forest sector. ■

Growth & Yield and Beyond

The demographics of lodgepole pine, the major commercial tree species in Alberta's foothills, are changing. While old growth, fire origin stands predominate at present, there is a steady increase in second growth managed stands as the pace of harvesting accelerates. These two types of stands produce different amounts of harvestable wood.

How much usable wood will be produced by each kind of stand? Two computer models developed at the Northern Forestry Centre address that question. One prototype model, under preliminary testing by the Alberta Forest Service, predicts the growth and yield of old growth stands. The second model, nearing completion, makes the same kinds of forecasts for second growth lodgepole pine stands under a range of conditions.

Predicting growth and yield of old growth lodgepole stands is fairly straightforward; for second growth stands it's a different matter. Here, predictions must be more precise to determine the cost-effectiveness of various silvicultural treatments.

Take, for example, the effects of thinning and spacing over time—key considerations when projecting wood yield and profitability at the time of harvest. Dr.

Imre Bella, a research scientist and Chris Cieszewski, a forest mensurationist, have calibrated the managed stand model for lodgepole pine using treatment data from Forestry Canada, Alberta Forest Service and forest industry permanent sample plots dotted throughout Alberta's forests.

An unexpected bonus of the work on the managed stand model has been a breakthrough in formulating one of the model's principal components, a variable height-growth/site index function. Similar functions are used in all growth and yield models to describe the potential productivity of a site in terms of tree height growth. In developing the managed stand model, Mr. Cieszewski streamlined the mathematical equations of the height-growth/site index, making it easier to use and more consistent than earlier such expressions.

Dr. Bella anticipates the managed stand model for lodgepole pine will be available for test runs later this summer. Designed for personal computers and written in FORTRAN, the model is targeted to users at the technical level. "Over time," says Dr. Bella, "we plan to develop a system of second growth yield forecasting models for all the major commercial species across Alberta, Saskatchewan and Manitoba." ■

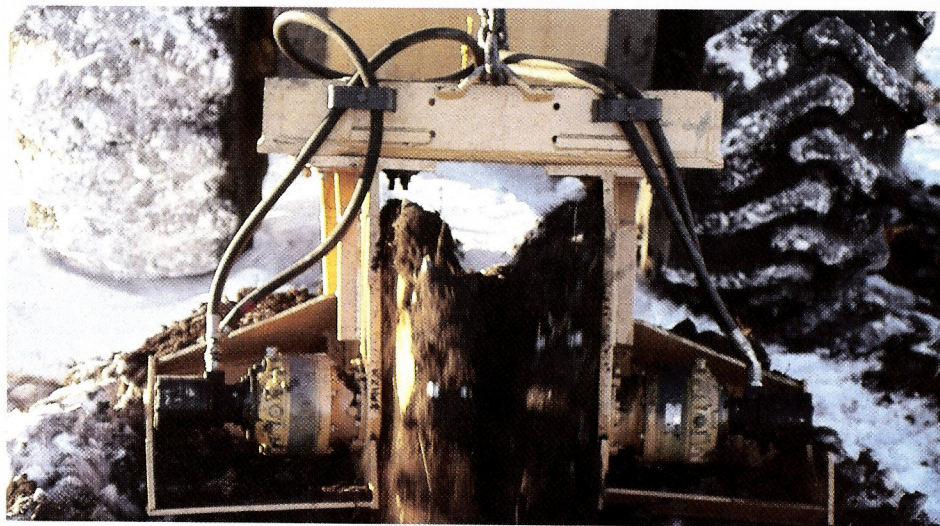
Tackling a Bear of a Job

Derek Sidders is not the type to sit still. Energetic and personable, this Renewal and Intensive Management Specialist with Forestry Canada's Saskatchewan District Office has a personal stake in a vegetation management trial under way in eastern Saskatchewan. This year, the Grizzly is being let loose. The Grizzly is a high-speed site preparation tool developed after Mr. Sidders committed his good ideas to paper and knocked on some doors.

The trial in the Carrot River area is a joint project of Forestry Canada's Saskatchewan District Office and Saskatchewan Parks and Renewable Resources' Forestry Branch. The area is dominated by mixedwood forest, an unruly community of conifers, hardwoods such as aspen and poplar, shrubs and brush that routinely thwarts reforestation efforts. Combinations of mechanical and manual vegetation control methods are being tested to see which works best to prepare a site for planting, and to keep competing vegetation down until conifer seedlings can

hold their own. A small amount of herbicide may also be applied using another of Mr. Sidders' inventions, the ForCan 500 Sprayer.

Saskatchewan. At present the Grizzly is a self-contained prototype, but the next unit, now being developed, will consist of a specialized set of replacement discs that fit



The grizzly at work.

The Grizzly is intended to be compatible with hydraulic disc trenchers such as the TTS Delta widely used in

onto either side of conventional site preparation equipment mainframes. These discs will rotate against the direction of travel, grinding through soil and decomposing litter layers, then mixing and throwing these materials into a continuous "bed" ready for planting seeds or seedlings. "The name 'Grizzly' seemed a natural," says Mr. Sidders. "This is intended to be an aggressive, take-on-anything kind of tool."

The ForCan 500 Sprayer is also designed to be versatile. This tanker can be mounted on a variety of prime movers from all-terrain vehicles to skidders, and can be operated selectively or as a boom broadcast sprayer. The unit consists of a 500-litre cross-linked polyolefin tank mounted on a frame of 2-inch square steel tubing. The hoses and accessories are all shock-tolerant and easily accessible under the tank.

Norsask Forest Products Inc. of Meadow Lake, Saskatchewan has been involved in developing and testing the Grizzly, and prototypes of the Grizzly and ForCan 500 made their debuts at field trials last year. The Grizzly produced a well-aerated, moist, nutrient-packed "bed". These performances were reported in a newsletter published by the Forest Engineering Research Institute of Canada (FERIC), resulting in inquiries from provincial government forest management agencies and forest industries in British Columbia, Alberta and Ontario. Patents are being investigated. ■

Charting Formerly Unknown Waters

A water yield prediction tool developed by Dr. Bob Swanson of the Northern Forestry Centre is now being used by a wide audience including government forest management agencies, forest industries, universities and fisheries biologists across Canada and the western United States.

This tool, called WRNSHYD, is an interactive software program designed for use on an IBM or compatible personal computer. At its most basic level it answers the question "If I clear-cut X hectares, how will that affect water yield from my management area?" However, WRNSHYD has the potential to go well beyond that. It can help forest managers design forest cutting patterns that actually increase water yield from a management area.

The latest version of WRNSHYD incorporates two predictive components. One forecasts water yield for regions where rain is the dominant form of precipitation. The other component does the same for regions where snow is the dominant form, a more complex process due to the influences of wind and partial forest cover on snow movement and loss. Although built

on data from U.S. regions, WRNSHYD travels easily across the border to comparable climatic zones in Canada. To run the program, Canadian users enter data from measurements taken locally.

WRNSHYD evolved from the WRENSS (Water Resource Evaluation of Non-point Silvicultural Sources) handbook published by the U.S. Forest Service in 1980. Dr. Swanson initially took relevant material from that handbook and gave it new life as a desktop calculator program. Since that time WRNSHYD has been adapted to various computer systems and programs through the programming expertise of Dr. Pierre Bernier (now with Forestry Canada's Laurentian Forestry Centre in Ste. Foy, Quebec) and Kevin Charter, a computer programmer working with Dr. Swanson. The present version is the most comprehensive and user-friendly of those developed. The Alberta Forest Service, British Columbia Forest Service and the U.S. Forest Service in Montana are just three of WRNSHYD's many users. "WRNSHYD takes away the guesswork in predicting water yield," notes Dr. Swanson, "and that is its biggest strength and selling point." ■

Aspen: Adversary or Advantage?

Aspen's meteoric rise on Alberta's forest industry scene has placed a dilemma in the laps of forest managers accustomed to regarding it as an impediment to softwood production. Talk has turned to aspen management—managing for hardwood only, or managing aspen and conifers together for the benefit of both.

For either objective, knowledge of how aspen interacts with other species on a mixedwood site after harvesting is needed to make prudent decisions. Dr. Stan Navratil, a research scientist with the Northern Forestry Centre, has extensively studied these so-called "competition dynamics" on lease lands held by Weldwood of Canada Ltd., Blue Ridge Lumber (1981) Ltd., Procter & Gamble Cellulose Co. Ltd. and Weyerhaeuser Canada Ltd. The Alberta Forest Service has also been a key cooperator.

"First of all," explains Dr. Navratil, "we wanted to find out how much aspen comes back on mixedwood and pine sites through suckering, and how much by seeding in naturally. We've been able to quantify that in each case. Second, we wanted to define what we call the 'competition threshold'. That's the point at which aspen stops acting as a nurse crop to young pine, and starts to hinder its growth. We're close to defining that threshold. In essence, it will be part of a field survey technique to estimate the level of competition requiring silvicultural treatment."

Dr. Navratil expects to complete work on this technique within a year. Although designed to stand alone, it is also intended to form part of a computer program being developed by his research group at the Northern Forestry Centre to model the growth of young mixed stands. "How much pine growth are we losing to aspen

competition? That's the crux of the matter," he notes. "And that's what this model will be designed to tell us."

Modeling will also be used to predict the effects of silvicultural treatments on the growth of young mixed stands over time. Much of this year's field work includes visits to areas where conifer release work has been done, i.e. where pine seedlings have been freed from aspen competition. Measurements taken by Dr. Navratil and Frank Dendwick, a silviculture technician working with him, will be used to develop the predictive capabilities of the model. Once completed, the model is intended to link with long-term growth and yield predictive models being developed by Dr. Imre Bella and Chris Cieszewski of the Northern Forestry Centre (see "Growth & yield and beyond" in this issue of *Timberlines*). Together the models will provide a "cradle to grave" perspective of mixedwood forest growth in this region. ■

Aspen ^{management} FOR THE 21st CENTURY

November 20-21, 1990, Edmonton, Alberta

Aspen management symposium sponsored by the
Poplar Council of Canada, Forestry Canada, and
Alberta Forestry, Lands and Wildlife

Topical sessions to include:

- Aspen management—filling the knowledge gaps
- Aspen harvesting
- Environmental and wildlife implications of aspen management
- Sustainability of the aspen resource

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Minister Visits Edmonton

The federal Minister of Forestry, Frank Oberle, had little spare time when he visited Edmonton in March. Arriving the evening of March 14th, Mr. Oberle gave the keynote address at the Canada-Alberta Forest Resource Development Agreement Awards Night banquet. Various research and development achievements under this cost-shared federal-provincial accord were recognized.

Visits with Northwest Region staff at the Northern Forestry Centre were on the following day's agenda. Mr. Oberle's schedule on the 15th also included a chat with the Editorial Board of the Edmonton Journal, an exchange of views with directors of the Alberta Forest Products Association, and a dinner meeting with executive members of the Alberta Fish and Game Association.

Mr. Oberle met the next day with Alberta's Minister of Forestry, Lands and Wildlife, LeRoy Fjordbotten. Following that discussion, the Minister shared a coffee break with some fourth-year forestry students at the University of Alberta.

Mr. Oberle's Edmonton visit was one stop in a nationwide tour intended to inform a wide variety of organizations of Forestry Canada's mandate and policies. ■



Poplar Council
of Canada



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Canada



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and Wildlife

The Northern Forestry Centre

... As Others See Us

Human nature being what it is, most of us are curious to know what others think of us. So, naturally the final report of an external communication study done for the Northern Forestry Centre has made for some absorbing reading for our managers.

Representatives of key client and

target audiences across our region were interviewed over the phone this past January by staff of an Edmonton communications firm, The Alexander Consulting Group. These representatives were, for the most part, senior decision-makers within their organizations. They

were asked to describe the role of the Northern Forestry Centre; whether they view their relationship with us as positive, neutral or negative; to outline how they currently receive information, and to indicate how we can improve our communication with them.

Verbatim comments contained in the report are generally frank and constructive. Most respondents view their relationship with us favourably, and it appears they have a good understanding of the Northern Forestry Centre's role within Forestry Canada. Newsletters are the highest-ranked source of information, followed closely by personal visits. Scientific publications, technical publications and workshops are also seen as valuable conduits of information. Fifteen percent of our respondents would appreciate receiving information from us in native languages. Three-quarters require information in English, and about 10% mention French as their primary language requirement.

The external communications study is serving as a building block for our communications initiatives through 1990-91. Staff and financial resources permitting, we intend to respond to concerns raised in the study. ●

New Project Leader Appointed

Dr. Doug Maynard now heads the Northern Forestry Centre's research studies into the environmental impact of chemical substances and vegetation management on forest ecosystems. Dr. Maynard replaces Dr. Surin Sidhu in this post, as Dr. Sidhu is returning to full-time research at the Northern Forestry Centre.

Dr. Maynard earned his B.Sc. in Agriculture and M.Sc. in Soil Science at the University of British Columbia, and his Ph.D. in Soil Science at the University of Saskatchewan. He has been with the Northern Forestry Centre since 1981.

Dr. Maynard and his Northern Forestry Centre colleagues will continue to examine the effects of airborne pollutants



and chemical substances on forest ecosystems. Dr. Maynard also expects the impacts of various forest management practices on the forest environment to be increasingly addressed. ●

The NORTHERN FORESTRY CENTRE, located in Edmonton, Alberta is the Northwest regional establishment of Forestry Canada. The Northern Forestry Centre coordinates all federal forestry research and development activities throughout Alberta, Saskatchewan, Manitoba and the Northwest Territories.

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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 Forestry Canada.

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New Publications

Boughton, B.J.; Samoil, J.K., editors.
1990. Forest Modeling Symposium. Proceedings of a symposium held March 13-15, 1989, in Saskatoon, Saskatchewan. For. Can., Northwest Reg., North. For. Cent., Edmonton, Alberta. Inf. Rep. NOR-X-308.

De Franceschi, J.P.; Bell, F.W. 1990. Labor productivity and costs of motor-manual release of spruce from hardwoods in Manitoba. For. Can., Northwest Reg., North. For. Cent., Edmonton, Alberta. Inf. Rep. NOR-X-312.

Emond, F.J.; Cerezke, H.F. 1990. Forest insect and disease conditions in Alberta, Saskatchewan, Manitoba,

and the Northwest Territories in 1989 and predictions for 1990. For. Can., Northwest Reg., North. For. Cent., Edmonton, Alberta. Inf. Rep. NOR-X-313.

Hiratsuka, Y.; Gibbard, D.A.; Bakowsky, O.; Maier, G.B. 1990. Classification and measurement of aspen decay and stain in Alberta. For. Can., Northwest Reg., North. For. Cent., Edmonton, Alberta. Inf. Rep. NOR-X-314.

Maynard, D.G. 1990. Biomonitoring forests near two sour gas processing plants. For. Can., Northwest Reg., North. For. Cent., Edmonton, Alberta. Inf. Rep. NOR-X-311.



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