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Satellites guide spraying program



Chilliwack forest district Vegetation Management Technician **Ron Gladiuk** discusses aerial spraying with (from left) **Jacob Boateng**, vegetation management specialist; **Colin Ernst**, product representative; and **Mel Scott**, fertilizer and commercial thinning specialist.

The silviculture practices branch is turning to high tech navigation to improve the accuracy and control of aerial spraying. Over the past three months, a team has been testing the effectiveness of GPS (global positioning system) technology to control helicopter spraying of pesticides and fertilizers.

A GPS unit, which can be small enough to fit in a shirt pocket, uses signals received from satellites to calculate its position. Staff at the silviculture practices branch recognized its potential to introduce more accuracy into aerial spraying than had been previously possible.

"In the past, it was difficult to determine how much was being sprayed," said Martin Ross, a GPS advisor with the branch.

"People did it by eyeball or by using microwave guidance systems, and checked the results at periodic spot checks.

Last fall, Ross and Fertilizer and Commercial Thinning Specialist Mel Scott

learned that Frontier Helicopters, an Abbotsford-based company which contracts aerial spraying for the Forest Service, was itself investigating GPS technology.

Developed in Ontario, the Picodas Precision Aerial Navigation System uses differential GPS (which reduces the margin of error of traditional GPS from 100 metres to 2.5 metres) and a computer to track the aircraft's movement. A computer monitor mounted in the cockpit displays a map of the area, and the aircraft's movement over the ground is charted on the map.

By recording the complete flight course, the computer can also plot on the map the area sprayed, and the area left to be done.

Working with the supplier and the helicopter company, the silviculture practices branch conducted a series of trials in the Chilliwack, Duncan and Campbell River forest districts to test ease of operation, reliability and accuracy, and how it worked in different terrains.

Although further tests are planned, the results have the branch hoping to begin

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German business welcomes update on B.C. forestry

German wood products manufacturers welcomed the message brought to them by Forest Service Strategic Planning Specialist **Rudi Mayser** during a recent two-week tour.

Mayser, who works in the Vancouver forest region's Nanaimo office, was dispatched to Germany in late October to update local business people on B.C.'s progress toward sustainable forestry.

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Underwater log salvage planned

Bill Brinnen has a thing about reservoirs. He began work with the Forest Service cruising timber in the area now known as the Williston reservoir in 1962. Today he's managing a project to salvage seven million cubic metres of timber from the Nechako reservoir.

The 400 kilometre-long reservoir was created in 1952 by flooding a chain of existing lakes to provide power for Alcan's aluminum smelter in Kitimat. The body of water, half of which straddles Tweedsmuir Park, occupies 95,000 hectares (365 square miles), much of which was forest.

Brinnen, normally district manager of the Lakes forest district, is managing the salvage project.

"It's a tremendously exciting opportunity to correct something done 40 years ago and gain some economic benefits," he said.

Three 10-year, non-replaceable timber sale licence opportunities in the reservoir, which spans three forest districts and two regions, were announced by Forests Minister Andrew Petter late last year.

Proposals from interested applicants must demonstrate how local employment will be created and how timber will be removed in the most environmentally-sound way.

Improving boating safety on the reservoir is another goal of the program. All timber protruding above 2,765 feet above sea level must be removed and utilized or disposed of.

The closing date is February 1, after which the successful applicants' development plans will be reviewed and made available for public comment.

Brinnen has the task of explaining the project to interested applicants and entrepreneurs and gathering concerns from interested parties. He's taken his maps, overheads and displays to council meetings, chambers of commerce, Rotary club meetings and open houses in Houston, Burns Lake, Grassy Plains, Vanderhoof and Fraser Lake.



Salvage Project Manager Bill Brinnen (l) discusses the salvage operation with a local contractor during an open house in December. (Jeff Elder photo)

He's dealing with seven different First Nations and agencies "he never dreamed of," such as the Canadian Coast Guard.

"Most of the feedback I've received is extremely positive. Most people recognize that this is a one-shot opportunity to get that lake cleaned up," he said.

"Putting the project together and keeping things running smoothly is the biggest challenge," he added. "This project is unique. We're dealing with underwater salvage techniques, sonar imaging, the impact of harvesting on spawning beds — all kinds of things we don't normally deal with."

But Brinnen is still enjoying himself. "Actually, it's a fun project; it's not something you have to defend. Everyone's looking at this in a positive light and they appreciate us getting out and explaining what's going

on and getting their issues and concerns."

The Nechako project marks the first large-scale underwater salvage project in B.C. Watch for further coverage in future issues of the Forest Service newsletter.

*— By Jeff Elder, communications officer,
Prince George forest region*

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phasing in the system as a requirement in all aerial spraying contracts starting next fall.

Over the long term, the system will not only greatly improve the accuracy of spraying programs, it will also save field staff time by eliminating the need for spot checks and improving reporting of the areas sprayed.

Further improvements to the system are already being examined. While differential GPS provides the necessary accuracy, it also requires that the air-borne GPS communicate with a ground-based GPS station.

However, a system of fixed GPS receivers is being developed in B.C. by the provincial government, in cooperation with other governments and industry. Once operational, these receivers can communicate via satellite with mobile GPS receivers, eliminating the need for ground-based GPS stations.

A second option under review is using the Forest Service's network of repeater stations.

Branch staff are also looking into technology that would transmit data from the aircraft directly to the appropriate district office or to headquarters.

Forestry division puts planning strategy to work

A new strategic planning process adopted by the forestry division has gained support throughout the Forest Service as a valuable tool to promote cohesion and cooperation among all divisions and branches.

Under the direction of Chief Forester Larry Pedersen and the forestry division management team, the division invited representatives of all Forest Service divisions to two workshops held in Victoria in October and December.

Beginning with the dominant issues and priorities facing the Forest Service, participants developed a series of goals and outputs in support of one or more of the overriding issues. With each step in the planning process, the supporting activities became increasingly detailed, shifting from broad-based strategic concerns to specific requirements. (See *Forestry Division Strategic Directions 1996/97*.)

"The workshops began with the division's and the ministry's main concerns, identified how the forestry division fits in, and then developed a plan to fill that role," said Deputy Chief Forester Bronwen Beedle.

The process, she said, provided two key benefits to the Forest Service as a whole.

"First, it incorporates the Forest Service's main strategic issues into a series of manageable activities in a way that clearly demonstrates each activity's strategic importance," she explained.

The second is the opportunity it provided for Forest Service clients to include their concerns and requirements within the forestry division's strategic plan.

"The workshops were as much focused on client needs — particularly the operations

division — as on the forestry division's work," Beedle said.

Representatives from other divisions who attended the workshops agreed the process promotes their individual interests and those of the ministry as a whole.

We were very pleased to see the convergence — we had come to the same conclusions independently.

— Ray Schultz

"I was impressed at how focused forestry division was on providing service to operations division," said Williams Lake forest district Manager Brian McNaughton, who represented the regions in the workshops. "The key strategies are going to serve the needs of operations division."

Ray Schultz, acting regional manager of Prince George forest region, said forestry division's planning process revealed that better communication within the ministry is beginning to pay dividends.

"Brian McNaughton and I got together before the workshops to list what we thought forestry division could do to sup-

port operations division. At the workshops, we were very pleased to see the convergence — we had come to the same conclusions independently," said Schultz, who represented district offices in the planning process.

Schultz attributed the common ground to earlier senior managers meetings and to better communications from ministry executive.

"The challenge now is to ensure that activities described in the forestry division strategic plan are incorporated in branch business plans and managed for success," said Anthony Britneff, strategic planning specialist with forestry division services branch.

Schultz and McNaughton agreed their participation in forestry division's planning puts the onus on operations division to reciprocate.

"They're providing direction on how operations division can work with forestry division to help address the Forest Service's priorities," said McNaughton. "These are two divisions but we've got to work together to achieve these goals."

"The framework is there for that to happen. Now we've got to make it work."

Forestry Division Strategic Directions 1996/97

Although still in draft form, the forestry division's annual strategic plan provides a roadmap to guide the "on-the-ground" activities that ultimately contribute to the success of the Forest Service.

In preparing the plan, its authors

reviewed four sets of criteria which served as guidelines:

- the legislation affecting forestry division and current business plans;

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Resource tenures director retires

After 35-and-a-half years, Bob Harding decided it was time for a fresh set of legs to take over the resource tenures and engineering branch.

"I decided that was long enough to be regimented," he said a few days after his December retirement. "The work has always been rewarding but in the past eight or so years in particular it has been quite demanding."

The only employer Harding ever had was the Forest Service. He signed up with inventory in Victoria right after graduation from Washington State University in 1960. For the next 15 years, he worked at several positions, including zone forester in Kamloops and Prince George regions.

In 1975 he joined the planning branch (now the resource planning branch) in Victoria and began a career at headquarters that led him to the director's position in the timber harvesting branch (the predecessor of the resource tenures and engineering branch) in 1991.



Bob Harding: Time for fresh legs.

"I really enjoyed it," he said, singling out the people he worked with as one of the outstanding rewards. "For some reason, we get really good people."

But Harding also noted that the job has changed from the time he joined the organization.

"In the old days, our approach to forest management was relatively straight forward. Now the issues are greater in number, often more complex, and resolving them can be extremely difficult."

Although he predicts a few challenging years ahead for the Forest Service, Harding said current initiatives such as land-use planning and the Forest Practices Code will over time reduce the complexity of, and make it easier to resolve, many issues.

When asked what he will miss the most about the Forest Service, Harding replied: "The people. But I won't miss the computer. Instead of surfing the net I'll be netting fish in the surf."

He also plans to do some consulting, but not so much that it interferes with golf, hunting and fishing, and getting reaccustomed to home life.

"The wife's not quite sure about my being underfoot all the time, but as long as I stay out of the way of her bridge games, it will be all right."

Strategic Directions — Continued from page 3

- the Forest Service's overall corporate priorities identified by executive last fall;
- issues affecting the division, as identified by branch staff; and
- the division's Forest Service client needs, conveyed by representatives of other divisions.

Based on these criteria, participants then developed five key strategic issues for the division:

- maintenance and enhancement of timber, forage and recreation supplies
- timber supply analysis
- the Forest Practices Code
- land-use planning
- the Forest Renewal Plan.

Several goals were then adopted to support each key strategic issue. The plan was further refined by developing "outputs" in support of each goal. A priority was assigned to each output, and the branch(es) responsible were identified.

The result, titled *Forestry Division Strategic Directions 1996/97*, is 34 pages of prioritized operational and policy-oriented activities. Although it represents a milestone, the plan is only the beginning of the process that will eventually detail the operational activities of forestry division staff.

Anthony Britneff, strategic planning specialist with forestry division services branch, emphasized it does not identify all activities to be undertaken by division staff.

"Strategic Directions 1996/97 doesn't

encompass all the work division staff will do," he said. "Rather, it will guide individual branches in the development of detailed branch business plans."

Dale Leitch, manager of corporate planning and development, is one of the chief architects of the Forest Service's business planning function. He sees the forestry division's planning process as an example of how the ministry's broad strategic concerns filter through to the branch and district business plans which guide day-to-day activities.

"This process links the Forest Service priorities with those of the forestry division, and identifies how the Forest Service priorities influence the division's work," he said.

Seedling quality tests take "quantum leak" forward

Research branch scientists have developed two new procedures to test the quality of seedlings produced at B.C. nurseries.

Developed by research branch scientists Wolfgang Binder, Sylvia L'Hirondelle, David Simpson and Chris Hawkins, the new tests give faster, more precise results. This would give nursery managers more flexibility in scheduling stock testing, lifting the seedlings from nursery beds, and shipping. It would also increase the quality of the crop.

Testing is necessary before seedlings are planted in the field to ensure good survival rates and early growth. Two tests now used by nurseries were developed by the branch a decade ago.

The first determines storability. In the fall, seedling samples are frozen to -18 degrees C for one hour, then thawed. After a week, they are checked for visible damage. If needle damage is less than 25 per cent, the seedlings are ready to be lifted and placed in over-winter cold storage.

The second test estimates seedling vigor after cold storage. Samples of seedlings are placed in warm, lighted growth chambers. After a week, root growth is recorded. If seedlings have at least three new roots longer than one centimetre, they are considered suitable for planting.

Research branch staff demonstrated two



Research Technician Helga Mehl measures quantum yield to determine a seedling's probability of surviving.

new tests this spring. The tests were done on conifer seedlings, which were first stressed by freezing or heating them to various temperatures to produce a range of seedling qualities.

For the first test, the seedlings were measured with a fluorometer, an instrument that determines the quantum yield. Quantum yield shows how well the foliage uses light for photosynthesis, an indication of the plants' probability of surviving and field performance.

For the second test, needles were removed from the seedlings and placed in water. The amount of electrolytes leaking from the needles was measured with a conductivity meter. High readings indicate cell membranes are damaged.

The test results showed that shoot damage could be detected with both quantum yield and electrolyte leakage one or two days after the stress was applied. The amount of dam-

age increased with the level of stress applied, and was strongly related to the development of visible injury. Quantum yield values were also useful in predicting how much new growth would be produced eight weeks after stress treatments.

In addition to giving faster results, the new tests provide other advantages. Quantum yield tests do not require expensive growth chambers and a standard procedure can be used. The electrolyte leakage procedure can be used with deciduous trees as

well as conifers.

The instruments are portable and easy to use, the tests do not damage the seedlings, and data entry can be automated. Responses to stresses other than heat and cold can also be detected.

Operational tests of quantum yield and electrolyte leakage will conclude next spring. Results will be compared with standard procedures for storability and root growth potential, and seedlings will be planted so that field performance can be followed.

In the future, quantum yield and electrolyte leakage tests may be used to supplement or replace current stock quality tests. Eventually Binder says an automated assembly line approach could be applied to seedling testing.

— Submitted by Wolfgang Binder, Sylvia L'Hirondelle, David Simpson and Chris Hawkins, research branch

B.C. planner receives positive reviews in Germany

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Organized by the Canadian consulate in Hamburg, the tour was designed to give German importers of B.C. wood products the information they need to respond to environmentalists' accusations and threats of boycotts.

"They wanted to hear about the progress that B.C. and Canada are making toward sustainable forestry so they can use that information in talking to their own clients," said Mayser, an expatriate German who has lived in Canada since 1990.

Mayser's presentations focused on the Forest Practices Code, land-use planning process, Protected Areas Strategy, and developments in Clayoquot Sound. One of the greatest obstacles to portraying an accurate picture of B.C. forestry was trying to instill an appreciation for the magnitude of B.C. wilderness and the historical context.

For the most part, Mayser found his audiences well informed and receptive to his message. But there were exceptions. One individual asked when the province would quit "shifting cultivation" or "slash and burn" forestry. That practice, used in some South American countries, entails burning patches of forest, using the land for agriculture until the soil is exhausted, then moving on to a fresh patch of forest.

The technique is not used anywhere in Canada, but Mayser said the question reveals the effectiveness of Greenpeace's campaign to portray B.C. as "Brazil of the North."

The trip left Mayser convinced that the Forest Service alone should undertake more public relations activities in Europe.

"When you're travelling with industry repre-

sentatives, you are no longer perceived as objective," he said. "I think we could make better inroads with environmental groups if we do our own PR independent of the B.C. forest industry."

Mayser was also struck by the irony of his mission:

"There is so little natural landscape left in a country that is so critical of others' resource management."

As well, Mayser believes B.C. should adopt, and promote, the use of a new term to

define what has traditionally been called clearcutting. The term, he said, evokes a picture of completely denuded landscapes. "With the advent of the biodiversity guidelines under the code, clearcutting in the conventional sense is a thing of the past in B.C.," he explained, suggesting "patch retention would be more appropriate."

Mayser was also struck by the irony of his mission. "We were flying over a landscape of autobahns and nuclear power plants, and there was no forest land — just settlement after settlement," he recalled. "There is so little natural landscape left in a country that is so critical of others' resource management."



Senior Mapping Technician Rick Wells was the surprise guest of honor at an October baby shower hosted by the Resource tenures and engineering branch. Mother Trish Gray, a human resource assistant with human resources branch, helped get Wells out of the office for coffee while staff took care of the decorating.

The couple, whose son was born on October 29, met during National Forest Week last year while hunting for slugs as part of a school field trip. Their shared interest in old Ford cars led to a motorcycle ride, which led to . . . just what our mothers said it would.

Congratulations to the new parents.

Silviculture practices branch raises \$1,200 for sick children

Two chronically ill children are a little better off now, thanks to a contribution from the silviculture practices branch.

Branch staff turned their Christmas dinner into an auction to raise money for children treated at the Queen Alexandra Hospital for Children in Victoria. With 64

people in attendance — and a range of great items donated by staff — the event raised over \$1,200.

The money purchased a special key board for a four-year-old boy suffering from spastic cerebral palsy and upgraded his computer. Money also went toward leg braces for an eight-year-old boy.

Finance and Administration Manager Fred



Miller said the idea to raise money for sick children originated with the branch's coffee service, an independent supplier who donates 10 per cent of his revenues to Queen Alexandra.

"He was the link to finding the children who needed us," Miller said.

Staff donated numerous items and services, including a weekend at Director Henry

Jack Smith receives a cheque from Silviculture practices branch Director Henry Benskin.

Benskin's waterfront cabin on Saltspring Island, a day fishing with Chief Forester Larry Pedersen (no fish guaranteed), and a 33-kilogram slate sculpture of an Asian rhinoceros donated by a local artist.

Other individuals donated everything from home-made wine to cookies. Even merchants nearby the branch offices, who overheard staff discussing the event during coffee breaks, contributed merchandise.

The event was organized by Secretary Eva Roberts and quickly gathered momentum.

"Our goal was \$600 for the keyboard, and I never dreamt it would exceed that amount. But the total also covered a computer upgrade," she said.

Native plants help restore salmon stream

The forest biology section of the Forest Service research branch has joined forces with the federal department of fisheries and oceans (DFO) to begin revegetation of agriculturally abused portions of the lower Salmon River.

Tens of thousands of Pacific salmon once spawned in the lower 30 kilometres of the Salmon River, above its entrance to Shuswap Lake. But 40 years of land clearing and over grazing, combined with over allocation of irrigation rights, have all but destroyed this spawning ground.

Today, only a few hundred fish struggle to

reproduce each year in the warm, shallow river.

Since 1993 DFO biologists Mel Sheng and Michael Crow have built several kilometres of fence on both banks to keep cattle out. And Forest Service staff from the Kalamalka Research Station in Vernon have started the revegetation process.

With the help of a local contractor and various school and volunteer groups, over 5,000 rooted plants — including red osier dogwood, saskatoon, paper birch and prickly rose — have been produced and

planted during each of the last three years. Unrooted whips of Pacific, sandbar and coyote willows have also been planted.

Revegetation of the shoreline will help stabilize eroding banks, provide shade and cover for salmon fry, and increase the number of insects for young fish.

Along with other bank stabilizing techniques and voluntary reduction in water withdrawal by farmers, these efforts will help restore the Salmon for the salmon.

— Submitted by Michael Carlson, research scientist,
Kalamalka Research Station

Former Rapattack crew member hero in high seas rescue

A former Forest Service Rapattack crew member was behind the controls of a Canadian Armed Forces Sea King helicopter in early December when the chopper and its five crew members made a daring rescue in the heaving Atlantic Ocean.

Capt. Dan Burden, a Rapattack crew member in the late '70s and early 1980s, was instrumental in the rescue of 30 crew members from a Greek-owned freighter which became disabled and began taking on water 1,900 kilometres southeast of Halifax.

Burden steadied and maneuvered the Sea King in complete blackness during an intense Atlantic storm as a member of his flight crew was lowered to the deck of the freighter to retrieve the stranded mariners.

News reports say that Cpl. Rob Fisher made 30 trips through the stinging sea spray to the deck of the rolling and listing ship to attach himself, one by one, to each of the passengers and then guide them 15 metres up to the helicopter, which Burden was trying to steady in turbulent conditions.

Fisher told reporters following the rescue that conditions were very difficult and he nearly smashed against the freighter's hull as he dangled close to the pitching freighter.

Once groups of passengers were safely on board the Sea King, Burden ferried them to a nearby merchant ship.

Burden and his flight crew were on the HMCS Calgary which was returning from United Nations duty in the Persian Gulf and off Bosnia when it received the call for assistance. The Calgary managed to race 900 kilometres in less than 18 hours to aid the stricken freighter.

With the vessel increasingly close to sinking, the Sea King launched from 80 kilometres to make a dash for the stranded passengers.

During the rescue mission, Burden remained focused on the efforts despite a dwindling and perilously low fuel supply. The Sea King aviators are members of the 443 Squadron based at Patricia Bay, north of Victoria.

Burden's wife Catherine said she didn't sleep a wink after she learned her husband was enroute to a dangerous rescue. Thinking of ice, howling winds and raging seas, Catherine said it was a very difficult time.

"Dan loves to fly but it is especially challenging work when you are trying to land a helicopter on the deck of a heaving ship at night," she said.

As for the Atlantic incident, Catherine said the enormity of the rescue didn't really hit her until it was over and the media began to cover the story.

"There were satellite hook-ups and everyone wanted to interview him."

Catherine managed to chat with her husband when his ship was in Puerto Vallarta, Mexico not long after the incident. It was at that point in the journey home that the Sea King from the Calgary made the news again, only this time because of its own mechanical difficulties.

While flying off Mexico, the chopper returned to the ship due to engine difficulties. It was not clear whether Burden was on the aircraft at the time.

Burden was involved with the Rapattack Program to fund his schooling, Catherine explained. Following two years in B.C.,

Burden and Ray Ault, another former protection program staff member, went to Alberta to assist in development of that province's rappel program.

Burden also attended Mount Royal College in Calgary in pursuit of his commercial pilot's licence, having already obtained a private licence at age 10.

But his timing was off. When he graduated from college, the airline industry was suffering and companies were laying off pilots. He joined the military, and, according to Catherine, topped his class in helicopter training and was given his choice of aircraft. Knowing a Sea King assignment would take him to either coast, Burden chose the chopper with the hope of returning to his native B.C. — and as luck had it, he got his wish.

— Submitted by Wendy Stewart,
communications manager, protection branch

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