

Students Work to Revitalize Campus Land

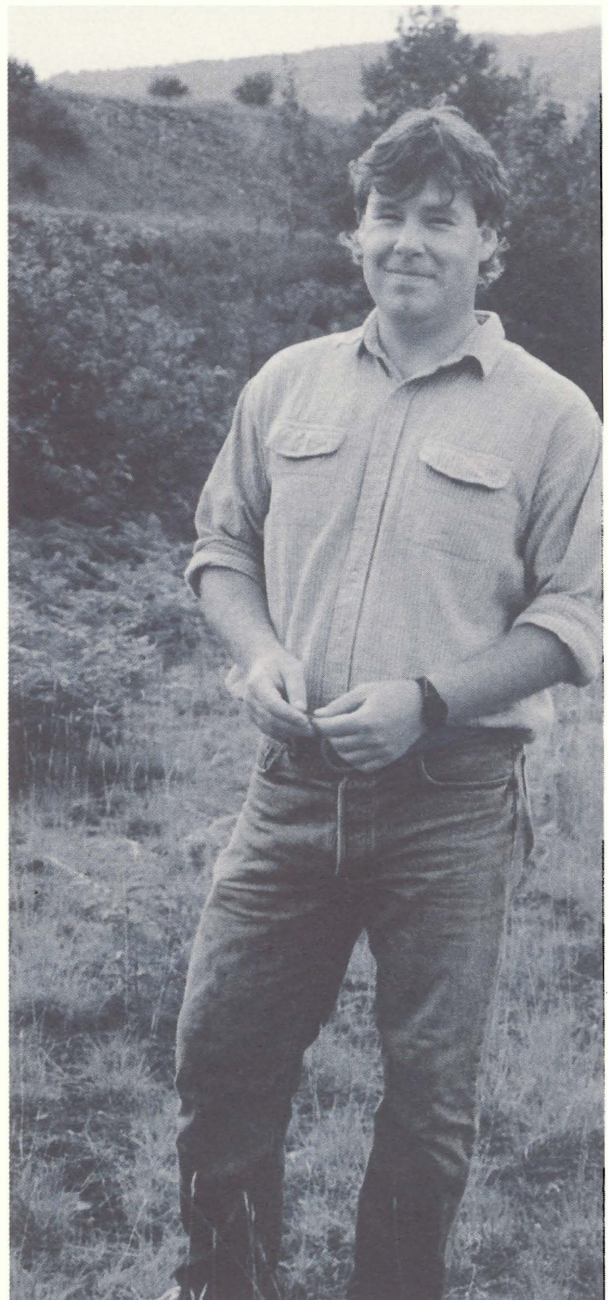
Where the Kootenay River forms an oxbow on the outskirts of Castlegar, the Selkirk College campus stretches. Within the 45-hectare campus grounds can be found a variety of ecosystems — grassland, shrubland, conifer forests and wetlands. The legacy of generations of agricultural activities is evident in the apple trees that grow wild in dense thickets that were once carefully cultivated orchards. The college buildings themselves overlook what was once a farmer's field, now covered with sod-grass. It was in this field where students of the college gathered last spring to plant 8000 seedlings that will transform yesterday's farmland into tomorrow's forest.

Funded through the FRDA II Municipal Woodlands Forestry Program, the planting marks the first phase of the College's long-term goal to develop a demonstration forest that will not only serve as a living laboratory for students of its Renewable Resources Program, but also provide a pleasant refuge for members of the community.

College instructor Rhys Andrews has been involved in the project since its earliest stages when fellow instructor Dak Gilles developed a proposal for funding. "Student involvement in the project was always an important factor," he recalls. "In fact, it was cited as one of the strengths of Dak's proposal."

The students in turn were enthusiastic and extremely committed to the project. Although planting coincided with final exams, 50 students of the Renewable Resources Program sacrificed

Selkirk
College
Instructor
Rhys
Andrews



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FIRDY Hits the Road

FRDA II's faithful mascot FIRDY spent almost six months on the road recently, and his travel budget was next to nothing!

With the snow barely off the ground in some parts of the province, FIRDY left the warm climes of Victoria for Kamloops in March to participate in the celebration of the transfer of the B.C. Forestry Capital honours from Quesnel to Kamloops. In May, he was back in Kamloops to help mark National Forestry Week, and in June supervised the planting of B.C.'s 3 billionth tree.

From there he hit the road north to Chetwynd for a local community picnic and the Fort St. John Rodeo Parade in July, then south down the highway to nearby Taylor to try his "hand" at gold panning later in the month.

Finally, he helped celebrate Science and Technology Week by meeting and greeting the people at Prince George's Pine Centre Mall.

FIRDY spent most of his time billeted by Trudy Goold of the B.C. Ministry of Forests in Kamloops, the District of Chetwynd, and Shelbi December of Canfor in Fort St. John. It was only recently that he was encouraged to catch the nearest Loomis truck to return to Victoria to await his next assignment.



FIRDY at the Forestry Capital Transfer Ceremony, March 1993, in Kamloops B.C.

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their weekend to plant trees. Pacific Rim exchange students also cheerfully volunteered their time.

One of the project's biggest challenges was to overcome the pervasive sod-grass. In preparation for planting, the field was rototilled to expose the softer earth beneath the sod. Brush blankets were installed around most of the seedlings to discourage the returning grass from smothering the young trees. The black plastic-like biodegradable blankets not only deter weeds but also retain the heat and water needed for healthy growth. To further ensure survival, each seedling was planted with a teabag-like envelope of fertilizer containing vital nutrients and an ingredient that attracts water to the roots of the seedlings.

Walking through the field months after the planting, Rhys is pleased to see that the seedlings are indeed thriving despite the inevitable return of the sod-grass. "None of this would have been possible without the FRDA funding," he says. "It's given us the kick start we needed to get the project off the ground."

In recognition of the project's value, the college board recently honored Dak Gilles with a certificate of appreciation for his work in spearheading the project. But the real rewards are less easily measured. Those less tangible rewards are surely felt by everyone involved, including Rhys Andrews who looks at the field and proudly says, "A hundred years from now, this will be a forest, and I'll have had a part in making it happen."

SEIDAM Project Gathers Attention as Well as Data



Dr. David Goodenough of the Canadian Forest Service, Principal Investigator for the SEIDAM Project

The SEIDAM project (System of Experts for Intelligent Data Management) was the focus of considerable media attention during the summer, as many flights to gather forest data took place over three test sites — the Victoria watershed, Parson B.C., and Tofino Creek.

The project, designed to develop a system that will integrate remote sensing data with geographic information systems and effectively manage the massive amount of data, has an international list of partners. It is one of 22 projects approved in 1991 by NASA's Applied Information Systems Research Program, and the only Canadian one at that. By better managing the enormous supply of forest data, it is hoped the system will assist decision makers with more complete information on which to base their forestry decisions.

FRDA II funding has been contributed to the project. As well, Natural Resources Canada (formerly Forestry Canada) and the B.C. Ministry of Forests are also providing a variety of Geographic Information Systems and field data, as is the B.C. Ministry of Environment Lands and Parks, which is also a local member of the team of investigators.

SEIDAM has three sites but it was the inclusion of the Tofino Creek area of Clayoquot Sound which drew the media's attention. News coverage included the arrival in Victoria and the flight of the Convair 580 from the Canada Centre for Remote Sensing, the flights of an Oregon State University light research aircraft in the Tofino Creek area, and helicopter flights in the Victoria Watershed to collect tree samples for laboratory analysis.

Data from the flights will be analyzed over the next few months before being added to the expert system. The project is scheduled for completion by March 1995.

Marmots Make the Move to Man-made Habitat—but should they?

Provincial wildlife biologists are trying to figure out if man-made clearcuts are a blessing or a curse for the Vancouver Island marmot, a member of the squirrel family indigenous to B.C., and now on the North American list of endangered species.

But seeing one is a little difficult. The species has never been abundant, and some established colonies have apparently disappeared, leaving only about 3–500 members of the species on Vancouver Island. But inventories of the animal, its historical sites, and other suitable habitats are lacking, and therefore a high priority of the research efforts.

Their scarcity may be due in part to man-made clearcuts. Fresh clearcuts contain herbaceous plants particularly pleasing to the marmot, a confirmed vegetarian who also considers tree stumps in clearcuts particularly good look-out and resting platforms. The base of stumps also provide suitable soil conditions for burrows, as do roadside cast materials. Normally found in sub-alpine terrain 800 metres or more above sea level, increasing numbers of marmots are making the move to lower level clearcuts — signalling a shift in habitat that may have just as many disadvantages as benefits.

That shift is one of the reasons B.C. Ministry of Environment, Lands and Parks Regional Wildlife Biologist Doug Janz was called upon to study the Vancouver Island marmot. As part of the Sustainable Forest Development Program under the joint Canada/B.C. Forest Resource Development Agreement (FRDA II), and the Habitat Conservation Fund, Janz chairs the Vancouver Island Marmot Recovery Team, overseeing recovery efforts. Team member Andrew Bryant has the task of tracking the movements of the Vancouver Island marmot in the Nanaimo area to see how many are making the switch to clearcut habitats, and how many are abandoning clearcuts and returning to their traditional neighbourhoods.

“We’re comparing their survival in the more natural sub-alpine habitats to those in the man-made clearcut habitats. The clearcut habitats are generally at a lower elevation than the natural colonies. So they usually receive less snowfall.”

For a creature that hibernates eight months of the year before poking its head out of its den to procreate and eat, less snowfall generally means less insulation and warmth. Less warmth may mean higher death rates in the marmot population.

The relatively short period of time the Vancouver Island marmot actually spends above ground gives researchers relatively little time to study its behaviour. Janz’s team relies on tiny radio transmitters inserted during minor surgery into the bellies of captured marmots to closely monitor their movements. In this way they hope to determine the rate at which marmots are moving into or abandoning clearcuts.

“These man-made or artificial habitats may be drawing these animals off the natural habitats,

The Vancouver Island marmot, like this one being held by Doug Janz, is characterized by its chocolate-coloured coat and the startling white patches punctuating its nose, chest or forehead.



disrupting their natural dispersal pattern. On the other hand it could be a stepping stone type of approach where they’re becoming established as a colony. That’s what we’re trying to find out.”

So far, the information indicates that successful colonization of clearcuts is offset by lower numbers of marmots from one season to the next — the result either of higher mortality rates under conditions less suitable than sub-alpine environments or of simple dispersal by the animal to other areas.

Push-over Logging the Key to Battling Armillaria Root Disease Says Scientist

Last year U.S. newspapers declared in bold headlines that a giant organism — the largest organism known to man — had been discovered beneath the ground in a Michigan forest. Residents there breathed a little easier only after being reassured that despite its size — covering 15 hectares — the creature posed no risk to human beings. The organism, a fungus called *Armillaria*, is however a serious threat to forests, and the size record

Removing the stump from the ground once a tree has been cut reduces the chance of *Armillaria* infecting the stand.

has since been claimed by Washington State where another species of *Armillaria* was found to occupy several hundred hectares.

Species of the *Armillaria* fungus cause root disease of many trees and shrubs worldwide. Close to home, it poses a very real threat, especially to coniferous trees growing in the southern third of British Columbia. The natural equilibrium between trees and fungus that exists in undisturbed forests has been upset by forestry practices, such as selective logging. As part of the Sustainable Forest Development Program under the joint Canada/B.C. Forest Resource Development Agreement (FRDA II), Dr. Duncan Morrison, a forest pathologist with the Canadian Forest Service, and a specialist in *Armillaria* root disease, is determining the effect of selective log-

ging on levels of *Armillaria* root disease.

In a dry, Douglas-fir ecosystem, about one in every 10 trees was found to be infected with *Armillaria* root disease prior to selective logging. After logging nearly half were infected.

The numbers are even more startling for a moist, mixed conifer ecosystem where the infection

pioneered the use of pushover harvesting to remove diseased stumps from the ground. Once on the surface, says Dr. Morrison, the diseased stump and root system pose no danger to surrounding forest.

The task now is to convince forest companies to remove the stumps of trees as well as their stems during harvesting.



rate before cutting was 80% and nearly 100% after selective logging.

Following selective logging, *Armillaria* quickly occupies the stump and roots of cut trees, and in time, spreads to surrounding healthy trees, killing them or reducing their growth. Large diameter stump roots are the long-term source of the fungus. Once these are out of the ground, a minor problem may develop but it will not develop into a major problem as the stand gets older.

Don Norris, pathologist for the Nelson Forest Region, has

Pushover logging means additional costs, something foresters — even those impressed by Dr. Morrison's findings — are not keen on absorbing.

But Norris has shown that by practicing pushover logging, companies get 15-20% more volume off the same piece of ground than by conventional logging methods. The stumps can be cut one to two feet lower when they are out of the ground, and there is better utilization of small-diameter trees. The additional volume, Norris says, would more than offset the cost of stump upheaval.

New Vegetation Inventory Design Being Pilot Tested

An enthusiastic group of foresters, research scientists and contractors are testing an entirely revamped forest vegetation inventory design this summer near Jordan River on Vancouver Island and near Williams Lake.

The trials are being conducted by the Vegetation Working Group

funding is being provided through FRDA II, Program 1.5.

"We've been testing field classification and field sampling components of the new inventory," explained Imre Spandli, Forest Resource Inventory Manager at the B.C. Ministry of Forests. "This was a shakedown of both operational efficiency and technical requirements."

Field work is being coordinated by Verne Sundstrom from the Inventory Branch. Six two-person field crews hired from private contractors are supplementing ministry crews gathering data at each test site.

"We purposely chose some crews with less experience

Bob Maxwell illustrates the details of the soil examination phase of the field work.

than others," noted Imre, "to assist us in developing training plans."

Kim Iles, consultant to the Working Group, referring to the diverse personnel, said "it helps to have cross-fertilization of ideas. Some of the least experienced people were important because they questioned even our basic premises and concepts."

How does the new inventory differ from previous designs?

"It will coordinate with standards for other resources values besides timber," explained Imre, "And it will be more reliable and detailed."

"For example, before we'd only known there were so many hectares of rangeland. Now we shall have more and better information about the types of vegetation and be able to make wildlife habitat and ecological interpretations."

Don Munro noted that the new inventory will be flexible to the needs of a range of users, consistent with biogeoclimatic classification, GIS-based (using TRIM), and compatible with other resource inventories. It will incorporate data on elements large enough to be visible on an aerial photo with smaller vegetation being accounted for in other resource inventories.

How does this compare to the Swedish, US, Finnish and Albertan inventories examined by the working group? After integrating this new design with other revised resource inventories, British Columbia will be the "world leader in inventory design and operation," said Munro.

A description of the new standards is contained in "Report of the Vegetation Inventory Working Group on the Proposed Vegetation Inventory", which is available through the RIC Secretariat.

A report on this summer's pilot testing will be available in March 1994.

Next summer will see a full-scale operational trial of the design. This more complex project will also test compatibility and coordination with inventories on a range of other resource values.



(chaired by Dr. Don Munro of UBC) of the Terrestrial Ecosystems Task Force, which is one component of the Resources Inventory Committee's overall reworking of provincial resources inventory standards and methodologies. [See article on next page for an overview on RIC.] Major

Over a Hundred Specialists Re-designing Resources Inventory Standards

Over a hundred specialists have been toiling since 1991 on a little-known project which will affect every forester — and most other resource specialists in the province.

The Resources Inventory Committee (RIC) is funded by FRDA II under program 1.5. Co-chairs are Dave Gilbert, director of B.C. Ministry of Forests' Inventory Branch, and Dr. Mike Bonnor, research scientist at the Canadian Forest Service's Pacific Forestry Centre.

Standards and methodologies are being developed for a more detailed and more accu-

rate forest inventory in the province. Data from this inventory will be compatible with information gathered on a range of resource values — from tourism, recreation and cultural heritage, to fish, wildlife, land use, geology, climate and more.

Based on Forest Resources Commission's recommendations

In 1991, the Forest Resources Commission deplored the state of B.C.'s resource inventories and called for "a commitment to complete inventories for all renewable forest resource values using standardized com-

Members of the Vegetation Working Group of RIC's Terrestrial Ecosystems Task Force, left to right: Dave Campbell, Bob Maxwell, Barbara von Sacken, Ted Lea, John Johnson, Joe Nemuth, Verne Sundstrom, and Kim Iles.



patible systems." The Resources Inventory Committee [RIC] was then established to review all current inventories, identify vital information needs and to develop common procedures and standards. Standardization will allow data exchange between inventories — making collection more cost-effective and analysis more responsive to user needs.

Inventory specialists were recruited from provincial and federal agencies, companies, academia and other resource interests. To coordinate aboriginal input and encourage adoption of the standards, a

rate forest inventory in the province. Data from this inventory will be compatible with information gathered on a range of resource values — from tourism, recreation and cultural heritage, to fish, wildlife, land use, geology, climate and more.

Foresters and other professionals dedicated to integrated resource management, long hampered by a lack of usable data on all resource values, will be greatly encouraged by RIC's progress. Wide adoption of RIC standards will also minimize land-use allocation 'data-battles', in which each side parades

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First Nations Inventory Committee has been established. RIC members represent a full range of resource disciplines — marine biologists, foresters, geologists, climatologists, archaeologists, agronomists, tourism planners, soils scientists, to name a few.

Some standards being pilot tested

Task forces are presently working under these themes: aquatic ecosystems, atmosphere, coastal areas, culture/tourism/recreation, land use, earth sciences and terrestrial ecosystems. Analyses of existing inventories and information needs have been produced for each theme. Working groups are now developing standards and methodologies for sampling, collecting, storing and interpreting data.

The new vegetation (timber) inventory design is being pilot tested this year near Jordan River and Williams Lake [see previous article]. Additional testing next year will further integrate with the other new inventory designs. The RIC-approved standards are scheduled to be implemented province-wide during 1995-96. Training and extension programs are being planned to facilitate wide-spread adoption.

This autumn, to confirm direction and prioritize development work, an integrated data model of all provincial resources inventory information will be reviewed by both strategic clients (such as Commission on Resources and Environment, Protected Areas Strategy and other land-use allocation processes) and operational users (resource ministries and industry). Dates and locations will be announced soon.

Multi-ministry provincial program will implement RIC standards

A parallel provincially-funded program, called Corporate Resources Inventory Initiative (CRII), is improving and integrating resources inventories within the provincial government. As RIC standards are confirmed, they will be implemented throughout government.

Provincial data collection efforts are being stepped up and directed toward meeting the information needs of the Commission on Resources and Environment and other land use allocation processes. Over \$9 million was spent last year and this year \$6.3 million in funding has been committed.

Twenty branches in seven ministries are now involved in projects, which range from bio-physical mapping of proposed protected areas to modelling socio-economic impacts. Other CRII funding has allowed chronically underfunded branches of the government to build an infrastruc-

ture of GIS equipment and trained staff.

Ministries participating in CRII are: Aboriginal Affairs; Agriculture, Fisheries & Food; Economic Development, Small Business & Trade; Energy, Mines & Petroleum Resources; Environment, Lands & Parks; Forests; and Tourism & Ministry Responsible for Culture.

How to become part of RIC

How can you participate in RIC's work? Inventory specialists can call RIC task force chairs to investigate volunteering on a standards development working group. As well, you may wish to independently review draft standards and methodologies.

For more detail on the Resources Inventory Committee's work, or the name of a task force chairperson, please write or fax: RIC Executive Secretariat, 840 Cormorant Street Victoria, B.C. V8W 1R1, Fax 604-384-1841, Phone 604-381-5661.

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