

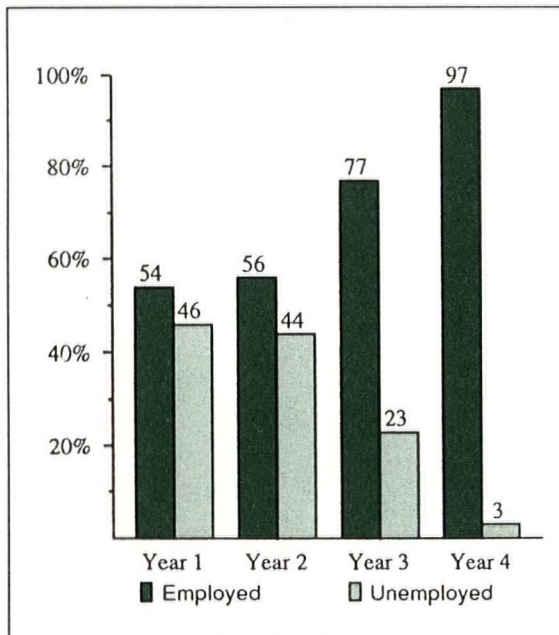
# Branch LINES

Volume 3 No. 2

July 1992

## From the Dean's Desk

**R**ECENT media reports suggest that college and university graduates are having difficulties finding jobs. These reports do not seem to hold true for graduates of the UBC Faculty of Forestry. The bar chart below shows that 97 per cent of this year's graduating class had found employment by Commencement. Roughly half were in permanent positions, and the other half held seasonal or contract positions.



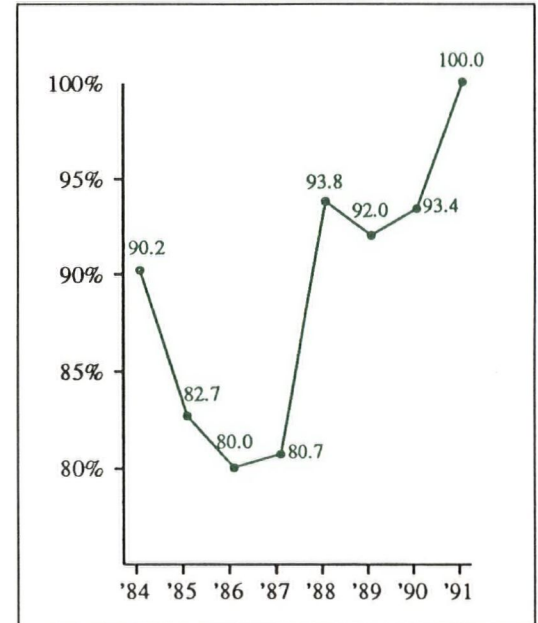
1992 employment status by year (per cent).

By the time of our survey at the end of March, over three quarters of the third year class had secured summer employment, as had slightly more than half of the first and second year classes. These first jobs launch the young forester's careers, and also help pay the next year's school bills.

Each fall we also survey the graduates from the previous spring and winter commencements. Our most recent survey indicates that **all** of the 1991 graduates were either employed or pursuing advanced degrees. Of the total, 91.8 per cent were employed, and the remainder were pursuing advanced degrees. Of those employed, 82.9 per cent held professional forestry positions and another 12.2 per cent held technical positions in forestry.

As indicated on the graph, our surveys show a steady increase in employment for foresters since 1986. Rising from a low of 80.0 per cent in that year, more than 90 per cent of our graduates were employed or studying for advanced degrees in the past four years.

Although job prospects for foresters have brightened, we see some significant challenges ahead. Three stand out. First, we need to insure that this year's good performance in job placement continues next year. Second, we need to diversify the employment base for UBC forestry graduates. Most currently work for the forest products industry or the provincial government. While these employers provide fine careers, our graduating class is vulnerable to economic downturns and policy changes. Third, we need to place more first and second year students in meaningful, forestry-related summer jobs. Varied on-the-job field experience has become almost mandatory for finding a high-quality



UBC forestry graduates employed or in graduate studies 1984-91 (per cent of previous year's graduates, surveyed in the subsequent fall).

position after graduation, so we need to increase the number of summer positions available to students. To accomplish these objectives, Ms. Donna Goss, our Coordinator of Student Services, is organizing a Career Fair for this fall. If any of you would like to assist in the project — as potential employers, as concerned alumni, or simply as someone with a good idea — please do not hesitate to contact Donna at (604) 822-3547, or me at (604) 822-2467. □

Clark S. Binkley



## RESEARCH HIGHLIGHT

### Radio Frequency/vacuum Drying of B.C. Softwoods

**T**HE two major lumber drying methods used today in B.C. are conventional kiln drying, and dehumidification. These methods involve heated dry air that is circulated between lumber rows to provide the required energy for water evaporation. Properties of the air that is absorbing the moisture can seriously affect drying times and lumber quality. Radio frequency/vacuum drying (RF/V) is a new lumber drying method which takes advantage of the strong dielectric properties of water and its selective heating in hygroscopic material such as thick, high quality timbers.

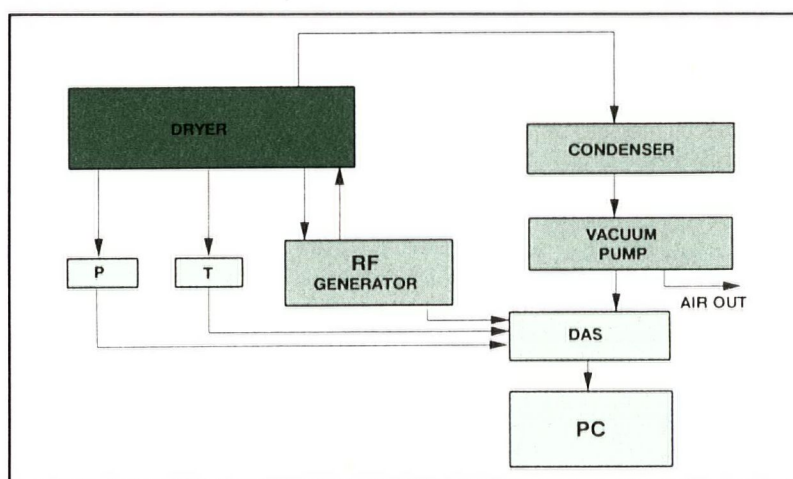
Dielectric materials (such as wood) are good electrical insulators. When such materials are placed in an alternating electric field, internal charge displacements attempt to follow the changes in field direction. Energy absorbed in carrying out these displacements is dissipated as heat. Since the average dielectric constant for water is about twenty times greater than that for dry cell walls, water will heat at a much more rapid rate than wood. Therefore the water in the wood is heated internally and the slow heat conduction present in conventional kiln drying is eliminated.

Preliminary studies in a 9,500 mbf commercial RF/V kiln have shown that western hemlock, Douglas-fir, and western

red cedar timbers from 4 inches in thickness, can be dried economically and degrade free in less than 30 hours (at 80°F and 28 inches of vacuum).

We have currently launched a major study to evaluate the physical processes taking

A RF generator will provide 10 kW of electro-magnetic energy at 13.56 MHz frequency. A vacuum pump and a water condenser will maintain the appropriate conditions. Load cells, fibre optic thermometers and pressure transducers will be connected to a PC through a data acquisition system (DAS) that will monitor water loss rates, and temperature and pressure profiles in the wood. This information will be used in schedule development, process modelling and optimization.



*Schematic of RF/V kiln in Wood Products Laboratory.*

place during RF/V drying. The study will also develop drying schedules for different local species, model the drying process and investigate the pinewood nematode pasteurization of wood in a RF field.

A laboratory size kiln is under construction at our campus Wood Products Laboratory.

*For further information on this research project contact Dr. Stavros Avramidis at (604) 822-6153 or E-Mail [stavros\\_avramidis@mts.ubc.ca](mailto:stavros_avramidis@mts.ubc.ca).*

## DEPARTMENT NEWS

**Dr. John Nelson** has recently received industrial and Green Plan funding to investigate the impacts of harvesting guidelines on road network development, delivered wood costs and sustainable harvest levels. Several study sites, ranging from the Tsitika watershed on Vancouver Island to the Revelstoke Timber Supply Area are being analyzed with tactical forest planning models developed by the UBC Forest Operations Research Group.

During May, Dr. David Barrett travelled to Taiwan as a member of the Sino-Canada Workshop on Forest Technology Cooperation. Included in this group were Canadian federal, provincial, private sector and university representatives. The purpose of the mission was to discuss opportunities for expanded markets for Canadian wood products and the sharing of technology and information in forest related areas.

Dr. John Ruddick's international contributions to the wood preservation area have

recently been recognized by his election as Vice-President of the International Research Group on Wood Preservation and his appointment as Senior Editor of the *Material and Organism Journal*.

One of the Department's Adjunct Professors, Dr. Suezone Chow, Research Director of Canfor, has been awarded the Order of British Columbia in recognition of his contributions to the forest industry in this province.



## RESEARCH HIGHLIGHT

### Development of a Dynamic Taper Model

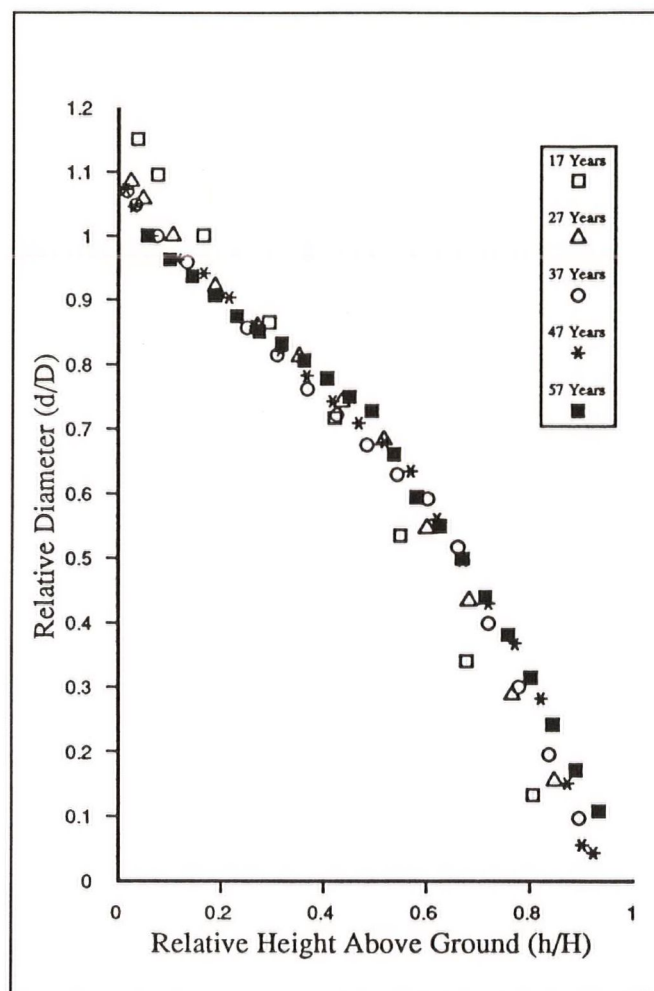
THE ability to predict changes in forests over time is necessary for sound forest management. Currently, growth of the main stem of a tree is estimated by modelling the growth of tree diameter and tree height separately. Tree volume growth is then obtained indirectly from diameter and height growth. Alternatively, if the shape of the main stem of the tree could be modelled over time (called a dynamic taper model), diameter, height, and volume growth could be obtained simultaneously. This insures compatibility among the height, diameter, and volume growth estimates.

Research into how tree shape changes over time is being conducted at UBC under the direction of Drs. LeMay, Kozak, and Marshall. This research will lead to the development of a dynamic taper model. The project began in 1989, and is currently funded by the Science Council of B.C.

Initially, detailed growth data for lodgepole pine (*Pinus contorta* var. *latifolia* Engelm.) from the Interior of B.C. were collected. In 1990 and 1991, Mr. Charles Muhairwe, a Ph.D. student, used these data to examine the relationship of tree shape over time (see figure opposite;  $d$  is the diameter at point  $h$  above ground;  $H$  is the total tree height;  $D$  is the diameter at 1.3 metres above ground) and how this shape varies with changes in several tree and stand measures. Also, he developed a preliminary dynamic taper model, using

Dr. Kozak's variable-taper exponent function as a basis. This year, Mr. Muhairwe is revising the preliminary dynamic taper model for lodgepole pine, and we are collecting detailed tree growth information for coastal Douglas-fir *Pseudotsuga menziesii* var. *menziesii* (Mirb.) Franco from the Malcolm Knapp Research Forest near Maple Ridge, B.C. These new data will be used to develop a dynamic taper model for Douglas-fir similar to that developed for lodgepole pine.

This research will help manage trees for specific products. For example, trees to be used for telephone poles must be tall and straight with little taper, in that there are very gradual reductions in the diameter over the height of the telephone pole. The dynamic taper model will help to identify management properties that will result in the appropriate taper for the product. Also,



The relationship of tree shape over time.

the dynamic taper model will be incorporated into a simplified tree growth model to demonstrate the use of this type of model for growth prediction.

Further information about this research project can be obtained from Dr. Val LeMay at (604) 822-4770. □

## DEPARTMENT NEWS

Dean Binkley and Dr. Susan Watts recently completed a report entitled "The Status of Forestry Research in British Columbia" for the Ministry of Forests. Dean Binkley has addressed a number of groups over the past few months, including the B.C. Environmental Prosecutors Society, B.C. Nature Federation, and the Washington State Society of American Foresters.

Professor Les Reed travelled to Scotland in June where he attended meetings with the U.K. Forestry Commission and the Governing Council of the Commonwealth Forestry Association.

Dr. Peter Dooling has been appointed as a visiting faculty member in the Interdisciplinary Natural Resources Development and Management Program, Asian Institute of Technology, Bangkok, Thailand, from September through December.

Dr. David Haley has been elected to serve on the Council of the Association of B.C. Professional Foresters. He will serve a two-year term on Council as Director of the Discipline and Ethics portfolio.

In June, Dr. Val LeMay attended a meeting of the Canadian Forest Inventory Committee in Hinton, Alberta where she made a presentation on inventory updates. □



## RESEARCH HIGHLIGHT

### Seedling Stress Resistance and Cold Hardiness

**B**EFORE conifer seedlings can be placed into cold storage it is essential that they develop adequate cold hardiness and a high level of general stress resistance. Drs. Lavender and Silim have recently demonstrated that patterns of cold hardiness development and resistance to physical stress are not fully coincident.

After one season's growth, dormant seedlings of white spruce and lodgepole pine were maintained until spring either outside under natural conditions, or in a controlled environment chamber at 5°C and 8 hour day length. Seedlings were lifted at regular intervals to assess cold hardiness and degree of resistance to a standardized crushing stress applied to either roots or shoots. Stressed seedlings were placed in a growth chamber (15/10°C day/night temperature, 12 hour day length) for five weeks to determine effects on growth responses, particularly root growth. Changes in cold hardiness after lifting were also determined. Trials with the spruce seedlings were conducted from October 1990 to April 1991, and from September 1991 to May 1992, and for the latter period only for lodgepole pine.

Data from these experiments support the following conclusions.

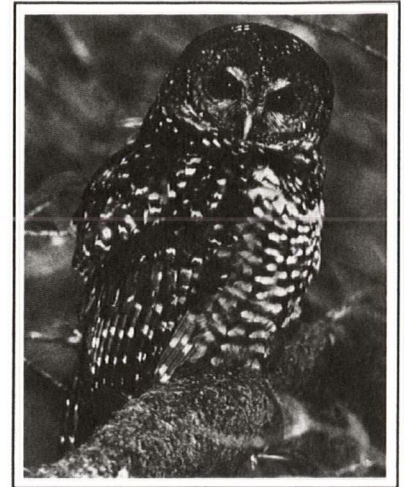
1. When white spruce has been stimulated to develop cold hardiness, it will continue to harden without regard to its environment until it is cold hardy below -60°C.
2. Resistance to crushing stress in both species is relatively low in September-October, reaches a maximum in December-January, and then declines during February-April. This stress resistance is independent of cold hardiness and, therefore, cannot be predicted by measurements of cold resistance.
3. Stress to the seedling shoots was much more destructive than stress applied to the root systems.
4. Dehardening potential, but not absolute cold hardiness, and loss of bud dormancy were strongly correlated in both species and appear to be related to the number of hours of exposure to 5°C temperatures.
5. Root growth of the control white spruce seedlings was constant during the period of the trials for both years.

Results of outplantings of seedlings of these species demonstrated that seedlings lifted and placed in cold storage in early December had significantly greater biomass, based on survival and growth measurements, after two growing seasons than did similar plants lifted and stored in late October.

The foregoing research strongly suggests that plantations of white spruce and lodgepole pine will have greater vigour if cold storage prior to outplanting is delayed at least until late November.

For further information on this research project contact Dr. Rob Guy at (604) 822-6023. □

### Spotted Owl Sighting



In May, Dr. Fred Bunnell led a small group of biologists on a field trip to the Capilano watershed in North Vancouver. The main purpose of the trip was to provide Claire Fortier, Senior Programs Officer for the Donner Canadian Foundation, with a first-hand look at biological diversity in old-growth and second-growth forests.

A pair of spotted owls was first observed in the watershed in 1985 and just recently it was confirmed that the pair is actively breeding in an old-growth site. With the help of Ian Blackburn from the Ministry of Environment and his expert owl calling abilities, the group was treated to a rare up-close sighting of an adult spotted owl.

Ministry of Environment biologists estimate that there are between thirty and fifty pairs of spotted owls in B.C. The inaccessible nature of many owl habitats, and the difficult inventory techniques necessary for the birds make it very difficult to census the total owl population.

Since the field trip in May, researchers revisiting the Capilano watershed have observed young birds at the nesting site, making this only the fourth recording of an active breeding site in B.C.

Old growth is the key to maintaining populations of spotted owls and every attempt is made to preserve areas believed to be nesting sites for the birds. The Capilano watershed nesting site, which is protected from logging, is being carefully monitored by researchers attempting to better understand biology of the owls. □

## DEPARTMENT NEWS

Dr. Denis Lavender retired as Department Head on May 31, 1992. He has returned to Corvallis, Oregon, where he will continue some work with the College of Forestry at Oregon State University, and occasionally visit B.C. His successor will be Dr. Gene Namkoong, a mathematical geneticist, currently at North Carolina State University.

Dr. Namkoong will commence his term later this year. In the interim Dr. Michael Feller is Acting Department Head until Dr. Namkoong's arrival later this year.

During May, Dr. John McLean was the Forest Pest Management Entomology consultant to a CIDA funded integrated forest management project in north-eastern China. □



### Silviculture Institute of British Columbia

**T**HE Silviculture Institute of British Columbia (SIBC) was established in 1985. Since then, it has developed and refined a 10-week post-graduate level program for Registered Professional Foresters (RPFs) specializing in silvicultural practice. This Professional Module Program was modelled after that of the Washington/Oregon Silviculture Institute. The program has focused on refining the RPF's capabilities to make sound silviculture prescriptions.

The Institute has one staff member, Candace E. Laird, R.P.F., and is guided by a Board of Directors representing the B.C. Ministry of Forests (MoF), Forestry Canada (ForCan), the University of British Columbia (UBC), the forest industry, and the Association of B.C. Professional Foresters.

SIBC is located in Room 72 of the MacMillan Building on the UBC campus, sharing an office with the BC Forestry Continuing Studies Network ("the Network"). Although not officially connected to the university, the Institute is linked in many ways to the Faculty of Forestry. Many Forestry professors are involved in the program as volunteer instructors, members of the Curriculum Committees, and as members of the Board of Directors. Operation of this program would not be possible without the volunteer support of these individuals.

In addition to Faculty members, the Professional Module Program is supported by many other members of the forestry community—government, industrial, and consulting foresters as well as other professionals from related disciplines. Financial support is provided by the MoF and ForCan (through FRDA I and II).

Since its inception in 1985, a total of 95 foresters have completed and graduated from the program. There are currently over 100 students enrolled in the program.

The Institute's programs are presently being expanded:

- The Professional Module Program will continue in the same format, and a refresher course for past graduates will be developed.

- A Technical Module Program will be developed and implemented, commencing in early 1993. It will be offered via three, one-week course modules to government, industrial and consulting technical forestry staff. Development of this program will be a collaborative effort with MoF, the Network, regional colleges, the Applied Science Technologists and Technicians of B.C. and other interested groups and individuals.
- Two professional-level correspondence courses in basic silviculture will be upgraded, delivered, and administered by SIBC.
- Short courses and workshops are also planned and will be developed from existing course curriculae.

A contractor/consultant will be hired to assist with development and delivery of the SIBC Technical Module Program.

*Interested parties should submit a resume or company profile, outlining relevant qualifications, to the SIBC office.*

*For further information on SIBC programs, please contact:*

Candace E. Laird, R.P.F.  
Executive Director  
Silviculture Institute of British Columbia  
Room 270 - 2357 Main Mall  
Vancouver, B.C.  
V6T 1Z4

**Phone:** (604) 224-7800  
**Fax:** (604) 822-3106

### An Update on ...

#### The B.C. Forestry Continuing Studies Network

The past few months have been hectic and exciting for the FCS Network. We have established new Delivery Centres and organized several new activities.

Our Delivery Centre at the University College of the Cariboo in Kamloops has been established with the hiring of Tom Rankin as Coordinator. Tom is a professional forester with several years experience with the Forest Service, and as a consultant. Tom will be responsible for the 'Central Interior' area which includes the Cariboo and Kamloops Forest Regions. He can be reached at (604) 371-5540.

April Anderson continues to provide services for the 'Southern Interior' area from Selkirk College in Castlegar. April can be reached at (604) 365-7292.

The FCS Network Coastal Advisory Board has selected Malaspina College as the location for the Coastal Delivery Centre.

We encourage you to contact your local Delivery Centre or the Provincial Office for more information on the FCS Network and its activities.

*Cindy Pearce  
Director*

The position of Provincial Coordinator in the Provincial Office at the UBC Faculty of Forestry is now vacant.

This position is primarily responsible for organizing provincial level activities and maintaining the calendar and other supporting databases.

*Interested individuals should contact Cindy Pearce, FCS Network Director at (604) 822-9278 before July 31, 1992.*



# FOREST NEWS

## from the Malcolm Knapp Research Forest

### A new bridge over the North Alouette

**T**HE bridge on Road A, that passes over the canyon not far from the Administration Office, is to be replaced at last. Over the past 20 years, it has been propped up, "restringered," upgraded, deplanked, replanked, restricted and finally condemned. The bridge has great strategic importance. It provides access to a series of active research projects, many of a long term nature and to the southern part of the "Abernethy and Loughheed" lands. These are the areas of the Research Forest that were harvested in the 1920's, burned over in 1931, and now are the site of considerable areas of thrifty 60-year-old stands and a major proportion of our short term, future harvesting program.

We looked at a number of different locations for a new bridge, but in spite of the somewhat higher costs of building on the old location, this was considered the most appropriate place.

The capital expenditures involved in a high level, permanent road bridge are considerable. Raising such capital provided quite a challenge, and we elected to mortgage the endeavour over a five year period, offsetting the annual fees by means of a small charge per cubic meter of timber that will pass over the structure. The site survey and much of the design was carried out by the engineering branch of the B.C. Ministry of Forests. Such assistance is very much appreciated, and helps bring the overall expenditures within our reach.

Sometime later this summer, the old bridge will be taken out, and the new structure erected. If you are visiting the Research Forest, and are planning to travel to the southeastern corner of the Forest, call ahead to ensure that there is road access. □

### Fire plans at the forest

**T**HE UBC Research Forests, like most other managed forest areas in the province, have fire plans in place in the event of an uncontrolled wild fire.

The Malcolm Knapp Research Forest in Maple Ridge is located on the fringe of a large, rapidly expanding population centre and local community concerns over uncontrolled wildfire are increasing annually.

Every year, generally in April or May, the Fire Pre-organization Plan is updated and circulated for review and comment. Rick St. Jean, the Senior Technician, tests the pumps and grades out the older hose, which although not usable for uncontrolled fires, can be used for sprinkler systems in controlled burns, or in practice sessions.

As the use of the Forest increases, so does the chance that a researcher or visitor will become involved in reporting a fire or having to fight one. In fact, anyone using the forest could be in the front line of a fire. So, as part of the preparations for the 1992 fire season, a joint fire and safety workshop was held for Research Forest staff and visitors who are frequently on the forest. The workshop, attended by a broad representation of the many individuals using the Forest, provided extremely useful safety and emergency response information. □

#### Centre for Applied Conservation Biology

Applications are invited for an Associate Director to assist in the development of the new Centre for Applied Conservation Biology's research and education programs. A Ph.D. and 1 to 3 years experience are required.

*Please send your letters of interest and curriculum vitae to Dr. Fred Bunnell, Dept. of Forest Sciences, Faculty of Forestry, UBC, 270-2357 Main Mall, Vancouver, B.C. V6T 1Z4.*

### New Annual Report

**T**HIS ISSUE of Branch Lines is being mailed out as a "combined mailing" with the Alumni newsletter and with our first Faculty of Forestry Annual Report.

In future, we will be publishing quarterly — Branch Lines three times a year and the Annual Report once a year. Summer issues of Branch Lines will include the Forestry Alumni newsletter as an insert.

If you are on our regular mailing list for Branch Lines you will now receive the Annual Report every spring. Please let us know of any address changes, or if you would like to have your name added to, or removed from, the mailing list.

We encourage your comments on Branch Lines (now two years old) and on the Annual Report — *our first*.

*Susan Watts  
Editor, Newsletter and Annual Report*

#### NEWSLETTER PRODUCTION

**Branch Lines** is published by the Faculty of Forestry at the University of British Columbia three times each year. ISSN 1181-9936.

*Editor:* Susan B. Watts, Ph.D., R.P.F.  
*Typesetting and layout:* Patsy Quay and Susan B. Watts.

This newsletter is typeset in-house on an IBM PC AT compatible computer using Microsoft Word version 5.0 and Aldus PageMaker. A final camera-ready impression is produced using a QMS PS 815 printer.

Questions concerning the newsletter or requests for mailing list updates, deletions or additions should be directed to Dr. Susan Watts, Newsletter Editor at:

Faculty of Forestry  
University of British Columbia  
270-2357 Main Mall  
Vancouver, B.C. V6T 1Z4  
☎ (604) 822-6316  
Fax: (604) 822-8645  
E-mail: Sue\_Watts@mtsg.ubc.ca

