FACULTY OF FORESTRY • **NEWSLETTER** • THE UNIVERSITY OF BRITISH COLUMBIA

Branch LINES

Volume 7 No. 3 December, 1996

From the Dean's Desk

Forestry in a Post-Modern World, Part II

Societal values relevant to forest management have changed, or so it has become conventional to assert. Following this hypothesis, forestry conflicts can be resolved if foresters shift the output mix towards the nontimber aspects of forestry — wildlife, water flows, biodiversity... Successive moves from "integrated resource management" to approaches carrying such new-age names as "ecosystem management" or "new forestry" have strengthened this new emphasis. In B.C., the end point of this succession is our Protected Areas Strategy which proscribes human intervention for material consumption on a land base larger than many European countries. Yet the conflicts persist. Hypothesis falsified, we should re-examine it.

Post-modern analysis, common in the humanities, provides an alternative view. According to this view, there is no objective reality, only "social constructions" contingent on our culture, society and power circumstances. Hayles[1] outlines one of the less virulent forms of this line of thinking. She argues that physical laws place some constraints on social constructions of nature, but the bounds are not so tight as to imply a single, objectively knowable perspective.

Take, for example, the difference between the notion of a *tree* and that of an *ecosystem*. A tree is more or less delimited by its trunk, roots and crown but no similarly stark boundaries exist for an ecosystem. The eminent zoologist, Richard S. Miller frequently complained about the ecosystem diagrams drawn by the equally eminent ecosystem ecologist F.H. Bormann: they included no animals. Some scientists might defend his omission on the grounds of narrowing the problem to pay special attention to some particular element of interest. Such an argument merely confirms that, at an operational level, an ecosystem is not a self-defining unit of analysis (such as a cell or a tree), but instead is a model of human construction.

Careful analysis of our language indicates just how strongly cultural factors condition our realities. For example, the term "landscape" implies that humans are *not* part of nature — Webster's definition is "a stretch of inland natural scenery *as seen from* a single point" [my emphasis]. So, the seemingly value-neutral term "landscape ecology" already takes a position on the appropriate role of humans in nature. With this kind of cultural context so deeply intertwined with what we claim to be science, it is not surprising that scientific prescriptions for forest management are so controversial.

Most people define "natural" as the circumstances occurring in the absence of human influence. Environmental history reveals the stark limitations of this apparently objective definition:

- In the Blue Mountains of Oregon, European settlers found a paradise of open ponderosa pine woodlands. Plenty of room for grazing sheep and cattle, wonderful wood for construction purposes, fettered only by "savages" who burned the woods each year.[2] Decades after the fires were excluded and the native people extirpated, the forests reverted to Douglas-fir/grand fir thickets. Only then did the descendants of those settlers come to understand that the native people and their regular fires *created* the "discovered" paradise.
- Ancient indigenous cultures established rainforest orchards in Central and South America, either by planting trees that bore fruit, or by selectively thinning out those that did not.[3] Just as a grouse hunter might find a fall bonanza in the abandoned orchards of a New England woodlot, botanists have "discovered" that the fruit growing in "natural" rainforests of the tropics may be worth far more than the timber which could be produced from the same area.[4]

Photographs would seem to be an utterly objective record, but social constructions infect even this perspective on nature. Critiquing photographs of the North American West at the dawn of European occupation, Goldberg concluded that simply the choice of scene inscribes on the film the photographer's expectations for the land.[5] In her words "We remain hopelessly nostalgic for a lost Eden that never fully existed outside our imaginations."

Without the bright beacon of science, forest management wanders in a fog of social constructions. The Hayles-constraints on the constructions of "ecosystem" are so loose that many alternative management plans are consistent with the available scientific evidence. Even the boundary of what comprises an ecosystem in a particular circumstance is subject to social and cultural interpretation. Managing a forest or park requires much more specificity than science alone can unambiguously provide. As a consequence, managers and policy makers must necessarily choose one social construction of nature in preference to another. Enforcing such a choice is inconsistent with the liberal notions underlying western democracies. This, I think is a central conundrum of contemporary resource management.

You can reach me by letter, fax (604) 822–8645 or by e-mail binkley@unixg.ubc.ca.

Clark S. Binkley

[1] N.K. Hayles. 1995. Searching for common ground. Ch. 4 in M. Soulé and G. Lease, eds. **Reinventing Nature.** (Island Press: Washington, DC). I thank Jim Pojar for bringing this book to my attention.

[2] N. Langston, N. 1995. **Forest dreams, forest nightmares.** (U. Washington Press: Seattle, WA).

[3] A. Gomez-Pampa and A. Kaus. 1992. Taming the wilderness myth. **BioScience** 42:271-279.

[4] C.M. Peters, A.H. Gentry and R.O. Mendlesohn. 1989. Valuation of an Amazonian rainforests. **Nature** 339:655-656.

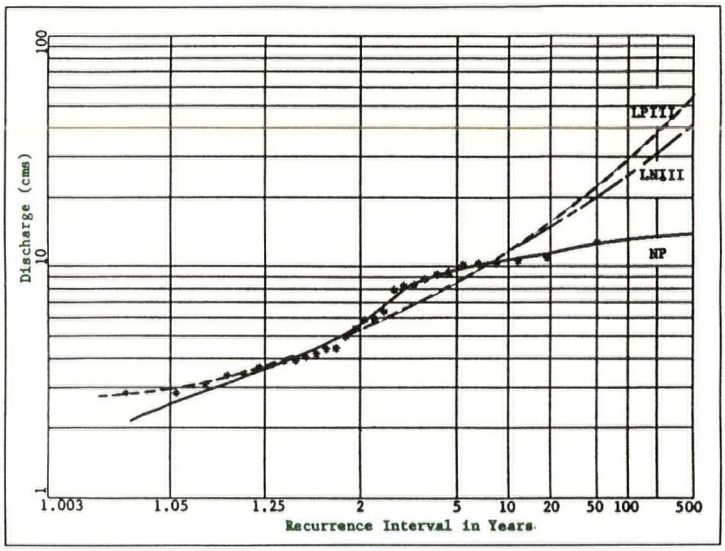
[5] V. Goldberg. 1995. Photographs in history's shifting gaze. **NY Times,** 10 Nov., Section 2, pp. 1,3.

RESEARCH HIGHLIGHT

Hydrologic Engineering of Stream Crossings

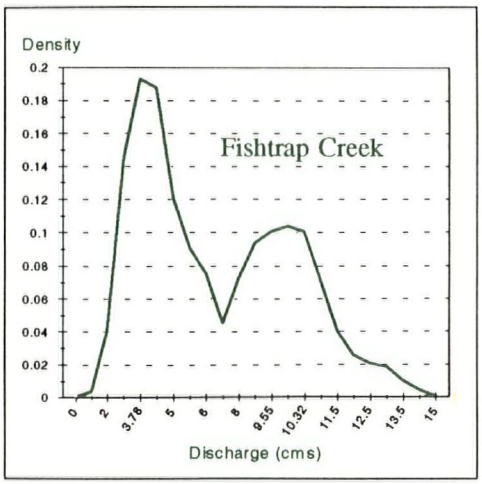
THE knowledge of design floods is of fundamental importance in forest engineering hydrology. Specification of the design flood is required by the Forest Practices Code of British Columbia for the sizing of waterway opening of bridges and culverts. At gauged streams design floods are often computed based on single-site parametric frequency analysis of annual flood series. Flood series are commonly assumed to have been drawn from a probability distribution and its parameters are estimated by the method of moments or maximum likelihood.

Parametric flood frequency analysis is based on the assumption that the annual flood series is a random sample from a single population. In B.C., this assumption may not always be valid as floods may be either rainfall-induced in the fall and winter or snow-melt-induced in spring and summer. When such distinct streamflow regimes are identifiable in a basin the parametric frequency analysis, based on statistical unimodal distributions, may have serious adverse ramifications on the reliability of design flood estimates.



Flood frequency curves at Fishtrap Creek

In this project we are assessing the extent of mixed distributions in flood data and their impact on the reliability of parametric flood frequency analysis. We are also investigating other alternative approaches such as the nonparametric frequency analysis which explicitly recognizes the characteristics of probability distributions of floods generated by more than one hydrologic process.



Nonparametric probability density function

Preliminary analysis of flow records from streams across B.C. indicated that when floods are generated by two or more distinct hydrologic processes the resulting flood distributions are multimodal and may not be represented by the parametric unimodal distributions. The figure opposite displays a typical multimodal density function of the annual flood series of Fishtrap Creek estimated by the nonparametric method. The figure above shows for the same creek how the nonparametric distribution can give a more satisfactory fit to the observed flood data than unimodal parametric distributions. The 100-year design flood estimate by the nonparametric (NP) approach is two times smaller than those estimated by the parametric analysis using the three parameter log-normal (LN III) and log-Pearson type III (LP III) distributions.

Although it is too early to draw firm conclusions, these differences may have a significant impact on the environmental and economical outcome of the design of stream crossings in B.C. Our plans are to assess the viability of the nonparametric frequency approach as an alternative to a traditional parametric method that may not recognize the unique features of streamflow characteristics in B.C.

This study is funded by a grant from FRBC. For further information, please contact Dr. Younes Alila, P. Eng., at (604) 822–6058 or e-mail alila@unixg.ubc.ca.❑

DEPARTMENT NEWS

We have active searches for two Chairs in Hydrology, to be joint with the Department of Geography, a Chair for Forest Management and a joint position with Landscape Architecture, specializing in GIS applications.

The Canadian Space Agency will be redirecting the view of the RADARSAT satellite December 4 to northern Vancouver Island (Port Hardy, Port McNeill, Port Alice) to take images for Dr. Peter Murtha's RAINS project. Images will be acquired every 24 days for the next 6 months and as soon as data are received here interested people may view the data in the remote sensing/GIS lab.

Dr. Peter Pearse participated in a meeting of experts in Brussels to help design a legally binding international treaty on forest conservation.

The Task Force for the BSF Curriculum will be presenting program recommendations to the Faculty shortly.❑

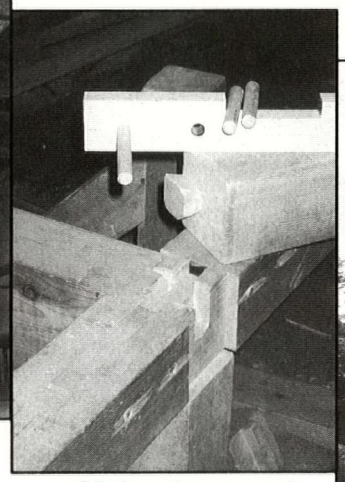
RESEARCH HIGHLIGHT

Wood Construction in Japan: Past and Present

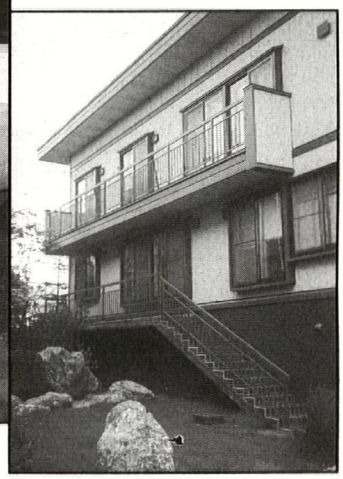
A RECENT trip to Japan took six UBC researchers to the roots of timber construction, exemplifying how the tradition and skill of carpentry has evolved through the centuries to find its rightful place in modern society. Visits to temple structures in the ancient cities of Kyoto and Nara, some of which more than 1200 years old and made from untreated wood, provided proof of the master carpenter's belief that wood, when used appropriately, is a durable material that will outlast even stone and iron. Visits with two master temple carpenters provided the philosophical background to a journey into the marvels and traditions of ancient beliefs and crafts. Most striking is the master's reverence and admiration of wood as a gift of nature that demands to be respected as such when used in a building that will provide shelter to humans or a space for worship and meditation. In the fast-paced consumer oriented society of today, however, this reverence for wood as a natural and durable building material has largely been lost.

Ancient temple in Nara

As part of this project on "housing for northern climates" (see article on page 5) the team visited the Hokkaido-based housing company KST which has its roots in the traditional building practices of master carpentry while embracing modern fabrication methods that provide a link to the construction industry of the future. Owned and lead by a man devoted to environmentally sound business practices and a strong belief in bioregionalism, the company has soared to become the biggest home builder on the island of Hokkaido, producing more than 700 houses per year. The main features of these prefabricated homes are the high quality of materials and construction, while durability is assured with a projected lifetime of more than 100 years. High levels of insulation with quintuple window panes, an inverted roof that captures the snow for added insulation and a very efficient heating system provide a comfortable living space for a harsh winter climate. KST houses are much larger than the average Japanese house and are meant to accommodate several generations of a family, thus making it more affordable while fostering the social benefits of an extended family structure.



Modern factory made connection detail



Standard KST house

Lessons learned from the Japanese experience will be adapted to Canadian circumstances to broaden the understanding of many interrelated issues that form the basis of a successful wood building industry.

For more information, please contact Dr. Helmut Prion at (604) 822–3864, e-mail prion@civil.ubc.ca or Dr. David Cohen at (604) 822–6716, e-mail dcohen@unixg.ubc.ca. ❑

DEPARTMENT NEWS

The Centre for Advanced Wood Processing held the first annual North American-European Wood Construction Forum in Vancouver on September 19-20. The forum was a joint effort of the CAWP and the Swiss School of Engineering for the Timber Industry from Biel, Switzerland. Over 100 people attended the event.

Proceedings are now available from the Wood Building Design and Construction Conference and Tour, held at UBC, June 27-28.

Dr. David Cohen presented a paper entitled *Opportunities in Japan for OSB* at the 4th Annual Panel and Engineered Wood Technology Conference and Exposition in Atlanta, Georgia, November 14.

A new version of the CSA Wood Preservation Standard was approved for early 1997. Research conducted by Dr. John Ruddick on the influence of preservative penetration on protection against decay in lodgepole pine and hem-fir was instrumental in the development of a new standard for decking with a reduced (5 mm) penetration.

On October 28-31, Dr. Helmut Prion and students presented five papers at the International Wood Engineering Conference in New Orleans.

Dr. Jack Saddler has been awarded a "Going Global" project to enhance collaboration between Germany and Canada.❑

RESEARCH HIGHLIGHT

FORCEE-ing the HORIZON

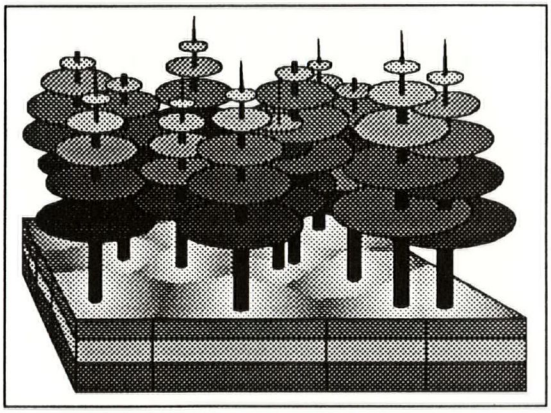
Computer-based decision support tools for forestry

ACCURATE prediction about the consequences, for a wide variety of values, of alternative ways of managing forests is the foundation of sustainable forest management. The long-time scale of forestry, the complexity of forest ecosystems and the relatively short history of forest management in British Columbia collectively prevent us from relying solely on the traditional basis for prediction in forestry: experience. As a result, we use knowledge-based decision support tools as a complement to our slowly accumulating body of experience. These tools will become indispensable as a part of the certification of the sustainability of forest management.

We have been developing computer-based management simulation models as decision support tools since 1978. For ten years, we developed the *FORCYTE* series of models to assess the sustainability of intensively-managed, even-age forest stands. We then developed a more advanced version of this hybrid simulation modelling approach: *FORECAST*. This led to the production of a user-friendly graphical analysis package and an educational applications package (*FORTOON*), including a forest management game that examines value trade-offs in managing an area of forest, a library of information classrooms on forestry, ecology and wildlife, and a university-level management-gaming package.

Our present work is focused on producing two new products:

1. A spatially explicit, individual-tree, stand-level ecosystem management simulator, *FORCEE* for a wide variety of values including sustainability, site productivity, soil fertility, wildlife habitat, timber production, stand-level economics, carbon storage, and employment. The model will be able to simulate all major types of natural disturbance events and stand-level forest management practices, with real-time, user-controlled management interactions.



Screen representation of the tree component of FORCEE

2. A landscape-level forest management analysis tool called HORIZON which will analyze issues of habitat supply and fragmentation, landscape patterns, natural disturbance regimes, carbon storage, and the more conventional values of timber supply and employment. This GIS-based decision support tool will link the landscape-analysis power of modern GIS approaches with the detailed stand-level ecosystem management simulators we have developed. For fast-action gaming applications, HORIZON will link with *FORECAST*. For more detailed evaluations and research it will link with *FORCEE*.

This work is a co-operative effort between the Forest Ecosystem Management Simulation Group, UBC and Life Science Programming Ltd. led by Kim Scoullar, supported by Rod Thauberger, Bill Waldie and Laurie Kremsater. The UBC team includes Research Associate Dr. Cindy Prescott, Laboratory Manager Min Tsze, Post-doctoral Fellows Brad Seely, Robert Bradley, Morris Sun and Daniel Mailly, and a team of ten graduate students. Cooperative projects are being developed in Spain, Switzerland, Germany, China and Australia. The University of Saskatchewan (Dr. Ken Van Rees, Soil Science) and UNB (Dr. Paul Arp, Forest Hydrology), are also involved. The work is funded by NSERC, SCBC, BCMoF, FRBC and the forest industry.

For further details, please contact the project leader, Dr. Hamish Kimmins, at (604) 822–3549, fax (604) 822–5744 or e-mail kimmins@unixg.ubc.ca. ❑

DEPARTMENT NEWS

Dr. John Richardson reports the start of two new studies of hydroriparian ecosystems in B.C.: A study of the effectiveness of a series of riparian reserve widths and a whole watershed ecosystem study, including 11 lakes. Richardson is developing a web site for information and discussion of riparian ecosystems in B.C. and would welcome input at http://www.interchg.ubc.ca/cacb/riparian.

Dr. Kathy Martin was a joint recipient of the 1996 Wildlife Publications Award from the Wildlife Society for a publication in Science 269:1112-1115. She has been appointed as the Canadian representative to IUCN/ICBP Specialist Group for Galliformes committee that will be involved in preparing species survival plans.

The search to fill the FRBC Chair in Silviculture is now underway. Contact Dr. Bart van der Kamp at (604) 822–2728 for further information. Closing date: January 15, 1997.

Dr. Gene Namkoong has been appointed to the Board of Trustees of the International Plant Genetic Resources Institute (IPGRI). As one of the International Research Centres, its program is devoted to the global conservation and use of genetic resources for international development. ❑

Japan-Canada Cooperative Housing System Research

The six member delegation from UBC along with their partners from International Environmental Institute and KST, Hokkaido, a unique home builder in northern Japan.

The UBC Department of Wood Science in the Faculty of Forestry and the School of Architecture have recently signed a multi-year, multi-million dollar agreement with International Environmental Institute of Hokkaido, Japan. The goal of this project is to complete joint, interdisciplinary research into the full utilization of wood in housing systems. The trip to Japan reported on in the Department of Wood Science research highlight (page 3), initiated this interdisciplinary project to study the philosophical, ethical, environmental and technological implications of wood housing design for specific regions in both Japan and Canada. Much of the research will focus on the theoretical underpinnings of the KST-Hokkaido Natural Housing system. Once this complex mix of social, ethical and technological foundations is better understood, it will be adapted and applied to Canadian circumstances.

This project is based on a recognition that a key component of sustainable forestry is to use the wood resource for its "best" purpose. To meet this obligation requires a unique mix of ancient wisdom and modern technology, a synthesis of opposites, which requires the knowledge of modern day scholars in both the social and natural sciences as well as the artistic and design community. These modern academic disciplines will mix with traditional Japanese philosophies and beliefs and be applied to wood housing systems to understand their impact on current and future generations. The intent is to form a strong relationship between Canadian and Japanese researchers and builders to learn from each other to benefit both societies in the future.

For more information on this project, please contact Dr. David Cohen at (604) 822–6716, fax (604) 822–9104 or e-mail dcohen@unixg.ubc.ca.❑

International Student Exchanges

The Forestry Faculty's International Programs Office is receiving increasing interest from forestry students wishing to participate in an international exchange as part of their undergraduate or graduate studies.

The university-wide Education Abroad Program allows students in their third year of undergraduate study or second year of graduate study to participate in one of 70 UBC endorsed exchange agreements. These agreements allow a student to study and receive transfer credit for courses completed at a partner university, while paying regular tuition fees to UBC. There are currently 279 students from UBC away this academic year and 265 students visiting from other partner institutions.

Forestry selected 12 students to represent the Faculty abroad and in return accepted 10 visiting international exchange students. Some of the leading universities in forestry are among our exchange partners. Students can select from programs in Sweden, Finland, United Kingdom, Germany, Austria, Malaysia, Philippines, New Zealand, Australia, Costa Rica and the United States.

Over 60 Forestry students attended a recent information meeting on the student exchange program and we anticipate that 20 students will go on exchange next year. Students are enthusiastic about broadening their educational experience with an international exchange, and this university-wide program provides them with an opportunity to do so. In fact, a scholarship fund is in place for students selected for the program. Students with a 75% average or better are automatically eligible for scholarships which average around $1500. **The deadline for applications for the next academic year is January 27, 1997.**

If anyone would like more information, please contact Sandra Schinnerl at (604) 822–9627, fax (604) 822–9102 or e-mail sandra@unixg.ubc.ca.

Tenure and Management

An insert in a recent edition of **Branch Lines** provided a brief overview of the UBC Research Forests and their staff. Although administratively in one department within the Faculty of Forestry at UBC, the Research Forests comprise three discreet forest management units: the Malcolm Knapp Research Forest, the Alex Fraser Research Forest, and Woodlot License #037. Each has its own tenure, its own character, and unique use patterns.

The Malcolm Knapp Research Forest:

- Located 50 kilometers east of Vancouver.
- Entirely private, fee simple land, wholly owned by the University of British Columbia.
- Much of the area is subject to a Restrictive Covenant.

The Alex Fraser Research Forest:

- Situated in the interior, close to Williams Lake.
- Special Use Permit, entirely Crown land.

Woodlot License #037:

- Lies immediately to the west of the Malcolm Knapp Forest.
- Crown land, subject to all the conditions of a Woodlot License.

The most obvious difference between the Forests is their legal status. Management of Crown Land under tenure requires conformance with the Forest Practices Code; private land is not subject to the provisions of the Code. As any licensee in B.C. can attest, the planning, review and approval requirements are very time consuming, restrictive, and expensive.

The flexibility enjoyed in private land management has direct benefits in terms of responding to forest health issues, timber market fluctuations, and educational and research needs. Certainly the reduced administration in planning improves the financial performance on private land.

Crown land management entails much more "multiple use" of the forest than private land. The Malcolm Knapp Forest has restricted access, and no hunting or fishing is allowed. The Alex Fraser Forest, on the other hand, accommodates unrestricted access, hunting, fishing, and motorized recreation. In addition, other permitted users have rights to the same piece of Crown land for grazing, trapping, guide-outfitting, and mineral development.

Another significant difference between private and Crown land is with respect to First Nations issues and the treaty making process.

Tenure is not the only difference between the Research Forests. The Malcolm Knapp Forest is on steep ground, close to an urban population, so public perceptions of management play a greater role. The Alex Fraser Forest is less productive forest land, and has more significant forest health challenges (bark beetles and root diseases) which tend to drive the harvesting program.

Another issue not related to tenure is the history of each Forest. The Malcolm Knapp Forest has fifty years of operations, data, and experience to draw upon. The Alex Fraser Forest has only been operating for ten years, and therefore has less developed but rapidly expanding research and education programs.

Managing the Research Forests is a challenge requiring a unique mix of research, education, social and operational considerations. In future articles in **Branch Lines** we will address some issues of urban/forest interfaces, similarities between UBC's and other research forests and the challenges of managing long-term research projects.

For further information please contact Peter Sanders, Research Forests Director at (604) 463–8148, fax (604) 463–2712 or e-mail sanders@unixg.ubc.ca.❑

ALUMNI Fund Raising Appeal *Huge Success*

This year to date (November 1, 1996) Forestry Alumni have given a total of $34,740 to the Faculty of Forestry, representing gifts from 505 individuals and an increase in giving of 22% over last year's level. The majority of this giving has been the direct result of activities of the Alumni Campaign Committee, led by Vice-Chair Gerry Burch ('48). Forestry Telepledge evenings were held across the province in mid October and teams of volunteers made contact with alumni to solicit their support. Special thanks are due to each and every donor and the many volunteers, especially Vidar Nordin ('46), Jack Toovey ('60), Reid Carter ('79), Bruce Devitt ('57), Charles Johnson ('58), Bob Beard ('65), Bill Dumont ('71) and Peter Affleck ('75), who coordinated these telephone evenings.

We would also like to express our thanks to John Pennant for a job well done. John has been our Development Officer since 1994, and left UBC in October to take up a new position at the University of York in England. We wish John the best of luck in his new position.

NEWSLETTER PRODUCTION

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

http://www.forestry.ubc.ca/

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In-house typesetting and layout: Patsy Quay and Susan B. Watts.

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