

# Branch LINES

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## From the Dean's Desk

In policy and management debates about forests, scientific information always is consequential but rarely is determinate. At its best, science can predict how specific management alternatives produce specific future ecosystem conditions (and can possibly help to identify new alternatives that might be useful to managers). The choice among these alternative futures rests on human values and on one's view of the place of humans in the biota. The last issue of **Branch Lines** expanded on these themes with the idea that understanding the limits of science in resource policy is the basis both for good policy and for good science. But understanding these limits leaves a great deal unsaid about how scientific research and science-based education should proceed in the contentious setting of contemporary forest management.

In a recent paper<sup>1</sup> Prof. Gene Namkoong, Head of our Department of Forest Sciences, explained the problem:

*Managers are now expected to deliver plans and policies with virtually no transition time between a theory and its practical application. They are asked to develop policies and procedures based on little data and debatable theory, with neither the time nor the funds for technology transfer between separate management and research bodies. Forest management and forest science have been forced into a shotgun wedding: the quality of management is now directly related to the state of scientific development. (p. 24)*

As a result of our comparatively modest expenditures on forest-sector R&D,<sup>2</sup> forestry in British Columbia hosts many examples of the premature nuptials described by Namkoong. Current concerns about the connectivity of reserves and "forest environmental networks" in British Columbia's working forest provide particularly pointed instances of this situation.

The authoritative journal *Science* recently commented on the value of corridors in protecting biological diversity:<sup>3</sup>

*All of this depends, of course, on whether animals in nature will use [emphasis in original] corridors. And this is where even supporters of the concept admit there is a paucity of evidence. At a recent conference devoted to corridors, only five of 36 papers presented empirical data on their use, three of which showed that animals rarely traverse them. (p. 1870)*

Although some theoretical models of population genetics and dispersion suggest corridors may be a useful strategy for protecting biological diversity, the empirical evidence apparently falsifies at least some parts of these theories. Yet managers must choose a spatial pattern of cutblocks knowing that corridors *may* prove to be useful in some circumstances, but that every hectare left in a corridor has a cost. The cost may be paid in reduced harvest levels and lower economic activity. If the total area in preserves is fixed by governmental policy (such as the B.C. Protected Area Strategy target of 12%), the cost of corridor reserves may be paid in ecological currency: fewer opportunities to establish large reserve areas, a larger area of ecotone, and less forest-interior habitat.

The shrinking time between scientific hypothesis and management action demands new ways of thinking about science and education for science-based professions such as forestry. Practicing foresters must begin their careers with a deep appreciation of the scientific process, and must keep current with emerging scientific ideas. If not, professional foresters will become marginal to forest management. Conversely, scientists must come to see management actions as opportunities for critical experimental work.

The forced marriage between science and management can be fruitfully consummated by careful monitoring of ecological changes in individual watersheds as logging and other management activities proceed. This process usefully

begins by establishing baseline conditions against which the changes can be assessed. Places such as Clayoquot Sound offer ideal opportunities for such adaptive management approaches because the preserved watersheds may be used as scientific controls for comparisons with those watersheds which are logged.

For foresters, the old distinction between management questions and scientific questions no longer exists. Dysfunctional ideas of technology transfer need to be discarded, and applications must be bolted into the R&D process itself. Only through this fundamental integration of management and science will forestry succeed either on the ground or in the universities.

Clark S. Binkley

<sup>1</sup> Namkoong, G. 1993. Integrating science and management at the University of British Columbia. *J. Forestry* 91(10):24-27.

<sup>2</sup> Binkley, C.S. and S.B. Watts. 1993. The status of forestry research in British Columbia. *For. Chron.* 68: 730-735.

<sup>3</sup> Mann, C.C. and M.L. Plummer. 1993. The high cost of biodiversity. *Science* 260:1868-1871.

## Namkoong Wins Award

Dr. Gene Namkoong, Head of the Forest Sciences Department at UBC, has been awarded the prestigious Marcus Wallenberg Prize for outstanding contributions in forestry research. Dr. Namkoong was cited for groundbreaking work in the areas of quantitative genetics, population genetics, and tree breeding and for the contributions these developments bring to the management of forest resources and the maintenance of biological diversity in forests. Gene will receive his Prize in Stockholm from the King of Sweden next September.

*Congratulations Gene!*

# Protection of Water Flows for National Parks and Nature Reserves

**C**ONFLICTS between water use and protected area management are increasing worldwide. Through funding from the Canadian Universities Consortium – Asian Institute of Technology Partnership Project, ongoing research will assess the nature and extent of protection of water flows to and within protected areas of Thailand. The research focuses on Doi Inthanon and Khao Sam Roi Yot National Parks as case studies. The first overview phase of this project attempts to define the broader issues facing water-flow protection to Thailand's protected areas. Topics include:

- current national policy on water for environmental management,
- water demands for nature conservation areas, and
- case-studies identification of land uses and land-use practices affecting the quantity and quality of water flow to protected areas in Thailand's mountain and coastal tropical environments.

For comparative purposes a similar study of protected areas will be conducted in British Columbia.

Water-resource management involves conservation, regulation, and allocation decisions with the three types of decisions varying in their propensity to generate conflict. Water allocated to the sector designated "nature conservation" has only recently been recognized as a competing interest for domestic and industrial uses. Allocation decisions concerned with dividing a limited in-stream flow between competing interests or user groups are inherently conflict-laden.

Designation as a protected area should include the protection of the water resource to and within the protected area. Yet, in both the popular and scholarly literature on national parks and equivalent protected areas, protection of the quantity and quality of water flow is given comparatively little attention compared, for example, with displacement of resident peoples, land claims, land acquisition, exotic species, human-wildlife conflicts and visitor management. This is paradoxical because water flows are near the heart of protected areas and

remain central to their effective stewardship.

*For further information, please contact Dr. Peter J. Dooling at (604) 822-3540 or Randy Spyksma at (604) 822-5092. □*

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"Adapting to Global Supply Constraints: Timber Scarcity and Six Reasons Why It Won't Occur" at the November Forest Products Society meeting in Portland, Oregon.

In October, Drs. David Haley and Peter Marshall participated in a training course in the Peoples Republic of China. The course, which focused on establishment and management of high yield forest plantations, was sponsored by the Asian Development Bank and executed by the Faculty of Forestry in cooperation with Sandwell Inc.

Also in October, Dr. Peter Pearse toured China with support from the B.C. Scholars to China grant. Dr. Pearse spent a week at China's Northeast Forestry University as a visiting lecturer, toured forests and forest operations in the northeast region and developed joint research activities in Beijing and Hangzhou.

Drs. Fannin, Howard, Nelson and Professor Young of the Forest Operations Group are assessing implications of the proposed British Columbia Forest Practices Code for the Forest Resources Management and Forest Operations Program curricula at UBC. Recommendations for undergraduate, graduate and continuing education on forest roads are being developed relative to road planning, design, construction, maintenance, monitoring and deconstruction. The position paper and curriculum plan being produced will be a positive response to public and professional concern about forest road practices in B.C. □

## DEPARTMENT NEWS

**T**he Department is currently searching for two faculty members, one in collaboration with the Landscape Architecture program, and the other in collaboration with the Department of Anthropology and Sociology. We plan to have both individuals in place by 1 July 1994, so they can contribute to our undergraduate programs in forestry and in Natural Resource Conservation, and in graduate instruction.

Dr. Gordon Baskerville has been contracted by the Provincial Government to act as a Listener, on behalf of the government, at a series of public open houses

concerning the new Forest Practices Code. Dr. Baskerville will also chair several sector workshops designed to receive comment on the new Code.

Dean Clark Binkley was recently appointed a member of the provincial Forest Sector Strategy Committee. This committee — tasked to develop an industrial strategy for the Province's forest sector — was organized by the Minister of Forests and includes the government's key deputy ministers, the deputy premier, and broad representation from the forest sector. Dean Binkley also presented a keynote paper

## Earthquake Resistance of Timber Structures

**T**HE probability of a major earthquake off the British Columbian coast has evoked much discussion about safety of existing and new buildings. Compared with other materials, timber structures have performed very well in past earthquakes because of conservative traditional design practices. With increased use of engineered timber products, however, new construction practices are often applied which may not have the same reliability, especially under extreme conditions. Some reasons are:

1. The permissible height of timber construction has been raised from three to four storeys.
2. Soundproofing of timber floors by using concrete topping adds significant weight to structures.
3. Large display window spaces required for modern construction leave entire walls without racking resistance.
4. Open floor plans often do not allow for timber shear walls.

These and many other factors may increase chances of severe damage or collapse in a major earthquake and need to be investigated.

The essence of earthquake resistant construction is not only to provide strength, but also ductility (or energy absorption and damping). Wood can be quite ductile when used correctly (e.g., if loads are in compression perpendicular to grain) or rather brittle,

leading to catastrophic failures (e.g. when tension is applied perpendicular to grain).

Nailed panel walls are a proven means of providing racking resistance and ductility in buildings. Where walls are not permitted, however, post and beam frame construction may be a practical solution. In this case, lateral resistance is often provided by moment connections between columns and beams. Current design standards provide only minimal

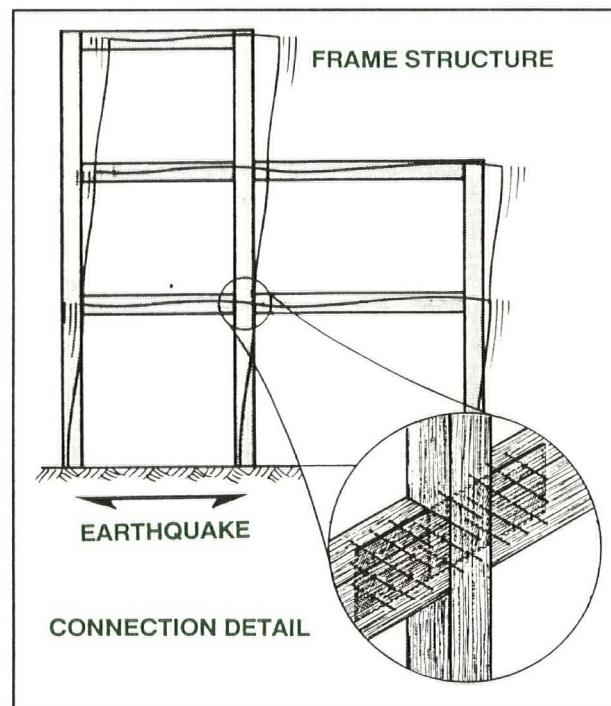
guidance for the design of heavy timber frames with non-traditional connection methods. A current research project investigates strength and ductility of different connection types, such as mortise and tenon, and drift pin connections. Both are aesthetically pleasing with hidden steel hardware, which also enhances fire resistance by protecting steel components from excessive heat and subsequent softening.

Connection subassemblies tested in the laboratory provide comparative data for verification of computer models which simulate stress distributions and cyclic load behaviour. Scaled down frames are subjected to simulated earthquakes on the shake

table to study dynamic behaviour. Results are then compared with analytical dynamic predictions.

The aim of this project is to generate design guidelines which will provide engineers with knowledge and confidence to design timber structures in high risk earthquake zones. Importantly, it will also open markets to Canadian wood products by providing the necessary know-how, especially in the Pacific Rim region.

For more information contact Dr. Helmut Prion at (604)822-3864 or fax (604) 822-6901. □



*Moment resisting connection in heavy timber frame.*

### DEPARTMENT NEWS

Dr. David Cohen co-organized and co-chaired a conference on "The Globalization of Wood: Supply, Processes, Products, and Markets" held in Portland, Oregon in early November. The conference attracted 200 people from over 12 countries.

In October, the Chair of Forest Products Biotechnology held its annual Review

and produced a 12-page newsletter describing the projects and personnel within the group.

In September, Dr. John N.R. Ruddick served as vice-chair of the CSA 080 Wood Preservation Committee Meeting in Montreal.

Dr. David Barrett presented invited lectures to the Institute of Wood Science and the Institute of Engineers in Australia. He also served as technical

advisor to the Canadian industry in the tri-lateral (Japan-USA-Canada) Building Experts and Japan building materials standards meetings held in Tokyo in October.

The Natural Sciences and Engineering Research Council of Canada has announced the award of the seventh of ten instalments to the Faculty for the Industrial Research Chair in Wood Preservation. □

## RESEARCH HIGHLIGHT

# Monitoring Bird Populations in North America

**T**HERE is mounting evidence that populations of North American birds, especially those that migrate to the tropics, are in decline. In eastern North America, three-quarters of the neo-tropical migrant species censused by the Breeding Bird Survey have declined over the past 10 years. Migration monitoring stations from throughout the continent have reported declines, and independent radar evidence from the Gulf of Mexico confirms that the number of migrant

flocks has halved between the 1960s and 1980s. If corroborated, these trends represent a conservation problem of international importance.

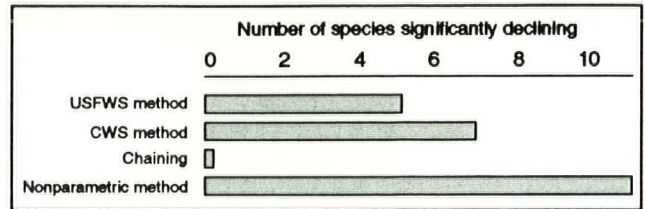
Almost all of our information about bird trends comes from long term continent-wide census schemes, such as the Breeding Bird Survey, Christmas Bird Count and Nest Record Scheme, which together attract over 45,000 volunteer participants each year. Each of these programs contain many biases, such as concentration of sampling around centres of population and variation in observer ability. The biases make extrapolation from individual counts to continental patterns of population trends an enormous analytical challenge, but one which is essential if we are to pinpoint the species and habitats that are in danger.

The key role of data analysis is demonstrated in the figure above, which shows that between 0 and 11 species are declining in B.C., depending on which analysis method is applied to Breeding Bird Survey data. We are now using simulation modeling to

determine which of these methods is the best at detecting known declines. We are also using statistical power analysis to determine the optimal sampling design for a number of new survey programs designed to monitor



*Breeding Bird Survey census points.*



*Conflicting results from 4 analyses of British Columbia Breeding Bird Survey data.*

birds in areas not currently surveyed. Lastly, we hope to use Bayesian estimation techniques to integrate the results of the various programs.

Our goal is to incorporate the information which is currently collected into an integrated monitoring framework that identifies species in decline before they reach critical levels. This can then be used by managers, scientists and policy makers to focus research and conservation efforts towards vulnerable or threatened species and their habitats. It is easier to change land management activities at an early stage than to embark upon intensive and very expensive restoration programs to bring species back from the brink of extinction.

*For more information, please contact Mr. L. Thomas or Dr. K. Martin at the Centre for Applied Conservation Biology, (604) 822-5724. □*

## DEPARTMENT NEWS

**Dr. Gene Namkoong** has recently received an NSERC Strategic Grant of \$70,000/year for 3 years for his work on managing forest tree genetic variance for climate change.

**Dr. Fred Bunnell** has been appointed by the Government of British Columbia as Independent Chair of the newly created Clayoquot Scientific Panel.

**Dr. Bunnell** will be reviewing forest harvesting standards in the Clayoquot area.

**Drs. Robert Guy and Karel Klinka** are the first recipients of research awards from the Imajo Cedar Management Fund. The fund was set up by Mr. Yoshihisa Imajo of the Sanki Corporation in Japan to support and

demonstrate suitable management practices for western red cedar. **Dr. Guy** will be looking at mechanisms of shade tolerance/acclimation in western red cedar and **Dr. Klinka** will be studying relationships between red cedar site index and measures of ecological site quality. □

### BC Forestry Continuing Studies Network

Cindy Pearce has returned to her consulting career after a highly productive two-and-a-half year term as the founding director of the BC Forestry Continuing Studies Network. Cindy pioneered the establishment of the Network as a co-ordinating body for the delivery of forestry continuing education in the province. She successfully established the Network's Provincial Office at UBC and delivery centres at Malaspina College, University College of the Cariboo, Selkirk College, University of Northern B.C. and Northwest Community College. Cindy's determination and commitment resulted in a highly successful and rapidly expanding program of forestry continuing studies for British Columbia.

The Faculty of Forestry is pleased to welcome Dr. Patricia Plackett as the Network's new director. Patricia joins us after 15 years of involvement with forestry in the public and private sectors in Canada and New Zealand. She brings to the Network her experience in education and training as well as in planning, marketing and communication.

Our sincere thanks to Cindy and a warm welcome to Patricia.

\* \* \*

The Network has achieved a substantial track record in the past two years. In the period April '92 to March '93, staff members organized 213 sessions of 42 training activities for 6288 participants, ranging from hands-on field training for small groups to conferences for 200-300 delegates.

Recently the Network has been asked by the Ministry of Forests to develop a strategy for delivering standardized and cost-effective training to forest workers in forest management and harvesting operations. Network staff have had some involvement with training initiatives for B.C.'s 38,000 forest workers prior to this project. One example of the way in which the Network has contributed is its participation in the meetings of the committee of the

Coastal Fisheries/Forestry Guidelines and the subsequent development of training related to these guidelines. This multi-disciplinary training was provided to several hundreds of forest workers last May and June in Network sessions and to over 3000 through industry in-house training.

Another example of the Network's involvement with the forest worker audience is the coordination of workshops on road construction for operators to link Ministry of Forests' specification guidelines for road construction with field practice. About 700 forest workers participated in these sessions on the Coast and there have been requests for a version of this training to address Interior conditions.

*For further information on the BC Forestry Continuing Studies Network, please contact Dr. Patricia Plackett at (604) 822-9278. □*

### Silviculture Institute of British Columbia

The Silviculture Institute of British Columbia continues to offer its popular "Professional Module Program" in both Vancouver and Prince George locations. The next Module I session will be held January 24-February 4, 1994 at the Green Timbers Forestry Centre in Surrey.

We are currently involved in negotiations with the UBC Faculty of Forestry to convert the Professional Module Program to a UBC Diploma Program. The Faculty of Forestry Curriculum Committee approved the academic content as being suitable for a diploma program, and Faculty members approved the concept, in principle, with the financial and administrative details still to be worked out. Both SIBC and the Faculty look forward to this new arrangement.

### Upcoming Clayoquot Forum

In October, the UBC Faculty of Law and Continuing Studies co-sponsored a public forum "Conflict in the Clayoquot: The Decision and the Response." As a follow up to this very popular event, the Faculties of Forestry and Law, in cooperation with UBC Continuing Studies, are presenting a day-long forum "Conflict in the Clayoquot: A Comprehensive Analysis" to explore many aspects of the controversy over logging. Academic speakers will address biophysical, legal and economic implications as well as the concerns of First Nations peoples and public policy issues. Questions from the audience will be entertained after each session. The day will conclude with a panel discussion. This free public forum will be held on Saturday, January 29, 1994, from 8:30 - 4:30, Room 100, UBC Scarfe Bldg.

*For further information, please call UBC Continuing Studies at (604) 222-5203.*

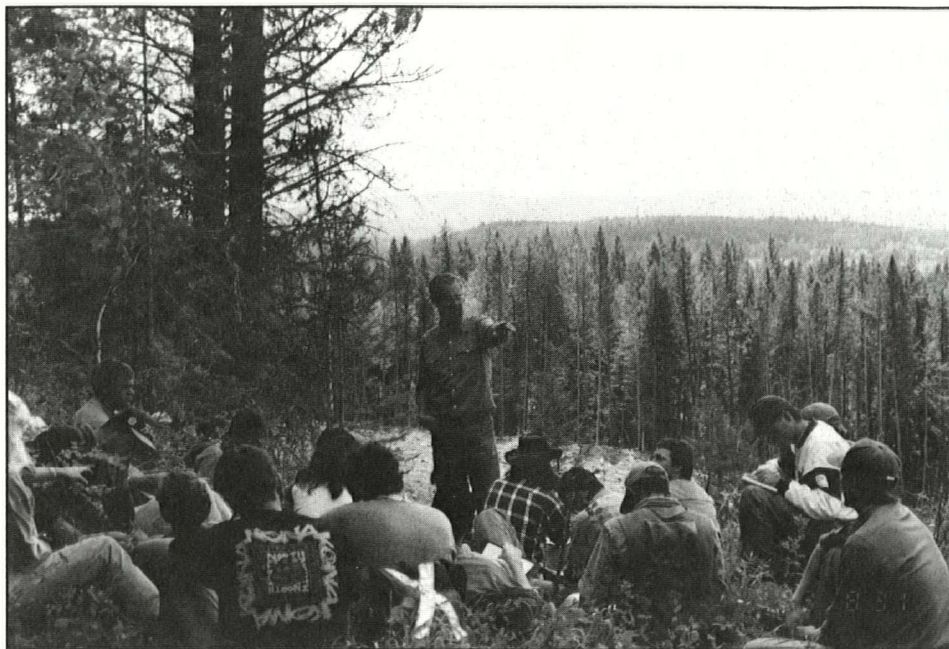
Our new "Technical Module Program" was launched in Prince George in November. This program, created for forestry technicians and technologists, includes six, one-week modules taken over a three year period. The program complements the Professional Program and is consistent with our goal of improving the level of silvicultural practices in British Columbia.

Other activities include the ongoing offering of Silviculture 1 and 2 Correspondence Courses (similar to FRST 305 and 306 at UBC) as well as organizing short courses/workshops on a contract basis.

*For further information on SIBC programs, please contact Candace Laird, Executive Director, at (604) 224-7800. □*

# FOREST NEWS

from the Alex Fraser Research Forest



*Students in an "Outdoor Laboratory" at the 1993 Fall Field School in the Alex Fraser Research Forest.*

The UBC/Alex Fraser Research Forest (AFRF), located near Williams Lake, has now been operating for seven years. The Forest is 9,000 hectares of Crown land dedicated to education, research and demonstration of integrated resource management in the B.C. interior. The Forest employs three full-time people, one summer student, and two part-time technicians. The annual allowable cut (under a Special Use Permit and a Licence to Cut) is 5,400 m<sup>3</sup>, of which 30% has been pine and fir beetle salvage logging over the past five years.

The AFRF provides a training ground and outdoor laboratory for students in resource management programs. A 7-day field school is held on the forest each year for UBC third year forestry students. The forest provides demonstration of classical, current and innovative methods of forest management and research results — many of the research projects are initiated by UBC graduate students. Two new

interpretive trails, demonstrating soils and mule-deer winter ranges, were completed this year. These trails include information stops for self-guided use by the general public.

Silvicultural operations this past year have included site preparing 10 hectares, planting 115 thousand seedlings on 10 units and juvenile spacing 31 hectares. Six research projects were established in newly planted units and two in juvenile spaced areas. The research program is growing rapidly and includes 65 established projects to date. One of the larger projects, being carried out co-operatively between the AFRF and Forestry Canada (FRDA II), is looking at alternative silvicultural strategies to lower the incidence of the spruce terminal weevil attack on interior spruce plantations.

*For further information on the UBC Alex Fraser Research Forest, call (604) 392-2207. □*

## Attention...

### UBC Forestry Graduates

We are compiling information on employment of graduates from programs offered at the University of British Columbia's Faculty of Forestry. We would also like to hear from graduates who have started their own forestry-related businesses.

If you are a UBC Forestry graduate you should find a questionnaire included with this newsletter. Additional copies of the questionnaire can be obtained from Donna Goss, Co-ordinator of Student Services, at (604) 822-3547, or by writing to Dr. Susan Watts, Newsletter Editor, at the address below.

Thank you for taking the time to complete this short questionnaire. Our results will be published in **Branch Lines** at a later date.

#### NEWSLETTER PRODUCTION

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