

**Forest Renewal BC - Slocan Mixedwood Ecology and Management Chair  
Ecosystem Science and Management Program  
University of Northern British Columbia**

**Strategic Plan 2010-2015  
Revised March 19, 2010**

The role of the FRBC-Slocan Mixedwood Chair is to support the UNBC mission by delivering strategic, technological, and policy solutions to mixedwood issues, and by advocating new directions and opportunities for mixedwood management and research.

The UNBC mission will be supported by i) high standards of undergraduate and graduate teaching, ii) building research partnerships throughout the region, and iii) being responsive to community needs. Technological solutions will be developed for problems which will be identified by our partner (client) group, and which fit within the overall framework of the mixedwood program. By the UNBC Chair playing an advocacy role, an elevated profile will be created for the mixedwood program.

This is a rolling five year strategic plan, i.e. updated annually.

## **1. Background**

As defined in the 1998 proposal submitted to FRBC, the overall goal of the mixedwood ecology and management program is: to improve our understanding of the ecology and diversity of mixedwood ecosystems; and to play a lead role in developing, testing, implementing, and evaluating ecologically appropriate mixedwood regimes for mixedwood forests in northern and central British Columbia.

Achieving this goal will:

- ◆ help sustain a long-term, economically-competitive supply of fiber and timber
- ◆ help sustain the supporting communities
- ◆ foster integrated management of timber and non-timber resources

The specific program objectives listed in the 1998 proposal to FRBC are:

- ◆ increase the ecological understanding of northern broadleaf/conifer mixes, pure broadleaf stands, and mixed conifer stands
- ◆ develop and test a range of integrated management strategies and practices for northern BC's mixedwood ecosystems; the range of strategies and practices will be derived through a comprehensive review of existing mixedwood management practices in BC and elsewhere
- ◆ improve the predictive capability of mixedwood modeling tools by modifying/validating existing models, developing new modeling approaches, and by incorporating a

mechanistic understanding of mixedwood ecosystem processes; these new tools will also have the capability of predicting the dynamics of non-timber resources

- ◆ educate individuals at UNBC to provide regional expertise for mixedwood management in boreal, sub-boreal, interior montane, and north coast forests
- ◆ facilitate co-operation in mixedwood ecology and management education and research among UNBC, the University of Alberta, and the University of British Columbia
- ◆ enhance opportunities for research collaboration and technology transfer between the three universities and with user-groups and stakeholders in central and northern BC, and throughout the rest of the province
- ◆ elevate the profile of mixedwood ecosystems as a vital component of forest management and demonstrate the value in investing in mixedwood ecology and management research and extension
- ◆ enhance community understanding of established harvest levels, timber supply issues, and community-level impacts of rate-of-cut and timber supply fluctuations
- ◆ enhance collaboration between the mixedwood scientists in BC and the researchers in the national and international communities

The primary expected benefits of the program were identified in the 1998 FRBC proposal as:

- ◆ research which will improve our understanding of mixedwood ecosystems, including growth and yield prediction tools for these ecosystems
- ◆ research which will improve our understanding of the management requirements for non-timber resources in mixedwood ecosystems
- ◆ highly trained professional resource managers for the ecosystems of central and northern BC
- ◆ access by the forestry community to continuing education and outreach programs in mixedwood ecology and management

The program goal, objectives, and expected benefits, while extremely ambitious, are still germane to this strategic plan. One of the purposes of this strategic plan is to consolidate the general objectives stated above into specific themes which will guide the annual plans and which will lead to delivery of measurable results.

This strategic plan will, thus, focus on three themes, which are linked, are not mutually exclusive, and relate to the overall mandate of the program: research, extension or outreach and education. The implementation of these themes will facilitate the strategic development of the FRBC-Slocan Mixedwood Ecology and Management Program. The three areas of focus will address ecological, economic, and social issues. The three themes are:

- ◆ provide information and decision-support tools for sustaining a long-term, diverse, and economically-competitive supply of timber (research)
  - ◆ this theme has been further divided into three broad component parts: growth and yield, inventory, and markets
- ◆ continuing education and outreach activities (extension)
- ◆ train professional resource managers (education)

The underlying rationale and specific strategic issues for each theme are outlined in Section 2. The broader strategic issues, desired outcome, and time frame for the themes are presented in table 1.

## **2. Program Initiatives 2010 - 2015**

### **2.1 Long-term, diverse, and economically competitive timber supply - research**

#### **2.1.1 Rationale**

Greater assurance of long-term supplies of timber will provide stability to forest-resource-based communities and the forest industry in central and northern BC. This is particularly important given the impact of the mountain pine beetle epidemic on timber supply. The mixedwood program will:

- ◆ improve our understanding of the structural and functional ecological relationships in mixedwoods<sup>1</sup>, at both the landscape and stand levels
- ◆ design, implement, and analyze research and operational measurements characterizing mixedwood growth and dynamics, the effects of forest management practices on mixedwood growth and dynamics, and the quantity and quality of products which can be expected from mixedwoods at harvest

Better estimates of renewal rates and yields of raw materials, given the impact of the mountain pine beetle epidemic, can promote activities which:

- ◆ encourage sustainable forest management
- ◆ assist forest industry diversification
- ◆ maintain existing jobs in the harvesting and traditional processing sectors of the industry
- ◆ foster further processing and increased manufacturing of the wood supply
- ◆ minimize boom – bust cycle for silviculture workers
- ◆ encourage forest-employment opportunities, job training, and worker adjustment
- ◆ provide skills training in new forestry techniques, intensive forest renewal, and environmental clean-up.

The mixedwood program will provide timely and realistic estimates of mixedwood timber supply trends so that resource managers can implement decisions which foster sustainable forest resource supplies and so communities can sustain their existing economic base, or can take the necessary actions in anticipation of future changes in timber supply.

Work toward assurances of a long-term, diverse, and economically-competitive timber supply must be undertaken in the context of maintenance of ecological integrity of mixedwood systems, the range of other forest resources and possible products, and the conservation of biodiversity while assessing the impact of climate change on the preceding factors.

---

<sup>1</sup> Mixedwoods refer to complex stands – even aged species mixtures (e.g. birch and spruce) ; uneven aged stratified stands (e.g. conifer leading stands post beetle attack)

### 2.1.2 Strategic Issues

Providing information and decision-support tools for sustaining a long-term, diverse, and economically-competitive supply of timber from mixedwood ecosystems and landscapes in central and northern BC does have some strategic hurdles to overcome. The Mixedwood Program cannot address all of the issues. The strategic topics that we are addressing are indicated below. For most of the topics, there is insufficient knowledge rather than an absence of knowledge. Topics include:

- ◆ basic ecological knowledge of mixedwood systems and landscapes: ecosystem structure, function, and dynamics; ecosystem processes, such as natural disturbance, succession, productivity, and intra- and inter-specific competition; landscape structure, pattern and dynamics; landscape processes, such as material transfer, natural disturbance, habitat, fragmentation, corridors and connectivity. The northern stands project is providing new information on intra- and inter-specific competition and succession in mixedwood systems
- ◆ understanding the ecology of forest health/renewal agents in mixedwood ecosystems; key processes of forest renewal. MPB stand dynamics projects are giving indications of early complex stand dynamics and the release of secondary stand structure
- ◆ knowledge/expertise concerning the most cost-effective management regimes (e.g. is brushing of competing tree species a good investment). Northern stands and sub-boreal projects indicates brushing of mixed conifer – broadleaf stands is not cost effective in many situations, in fact deleterious competition threshold levels are higher than previously thought
- ◆ growth and yield data and validated models for mixed species stands. Boreal and sub-boreal projects are building a catalogue, albeit of relatively short duration, of complex stand growth and yield data
- ◆ biodiversity information for complex stands, and management requirements for conservation of biodiversity in these stands. Sub-boreal project suggests that complex stands enhance floristic biodiversity and structural diversity
- ◆ knowledge/expertise concerning the necessary policies and practices for sustainable management of mixedwood systems. Northern stands, sub-boreal and MPB projects are contributing to knowledge on future forest condition and the practices and policies needed to attain them
- ◆ recognition and utilization of traditional ecological knowledge. Preliminary work is being conducted by a UNBC colleague (J. Young)
- ◆ mixedwood market identification and pertinent issues surrounding markets. This is not being addressed by our program but will be on the FP Innovations agenda
- ◆ certification criteria and local level indicators for sustainable forest management. Our program is not working on this topic

## 2.2 Continuing education and outreach - extension

### 2.2.1 Rationale

The forest sector in BC is facing challenges. In addition to economic challenges, the AAC for the central BC interior will probably be significantly reduced because of the MPB. For instance, it is obvious that the sector must realize greater value out of our timber resource, we must diversify our suite of forest products all while managing the forest in a sustainable fashion. Also, the forest industry appears to need greater flexibility and a faster response-time in dealing with forest health issues, market changes, currency swings, and customer demands. What appears to be emerging is a knowledge-based, value-centered, innovation-driven forest sector which is integrated in its philosophy and practice from the forest to the mills, from the mills to the market, and from the market back to the forest. Nowhere is this more evident than in the mixedwood and broadleaf management operations in the northeast corner of BC.

A knowledge-based forestry sector requires:

- ◆ current, relevant and usable information which is accessible in a ‘user-friendly’ format
- ◆ new and innovative approaches to operational and policy issues
- ◆ an accessible educational infrastructure dedicated to the principles of quality life-long learning, and to the sector’s specific information needs in order for the sector to be able to change and thrive
- ◆ access to most efficient and effective decision-support tools available
- ◆ partnerships in learning and testing new information, practices, regulations, and guidelines

### **2.2.2 Strategic Issues**

It is essential that those forest practitioners already in the workforce have the necessary knowledge and skills to keep up with the increasingly complex responsibilities of mixedwood management. Most practitioners have insufficient information about complex stand management rather than a lack of such information. Some of the obstacles to overcome in achieving this objective are:

- ◆ awareness of existing information. Most practitioners did not have complex stand management as part of their formal training
- ◆ opportunities for accessing and understanding available information. Given the current downturn, most practitioners are unable to attend regional meetings so an effort needs to be made for local meetings (field days)
- ◆ basic ecological and management knowledge of mixedwood systems and landscapes. Same obstacle as awareness
- ◆ knowledge/expertise as to the most cost-effective management regimes. Some recommendations are/will be posted on our website
- ◆ knowledge/expertise for the development of appropriate policies and practices for sustainable management of mixedwood systems. Field tours will assist with dissemination of ideas
- ◆ awareness of the UNBC mixedwood program. Field days, workshops and meetings are being promoted more widely

### **2.3 Professional resource managers - education**

### **2.3.1 Rationale**

Training of new professional resource managers in central and northern BC will provide a local and regional pool of mixedwood management expertise that is currently unavailable. There has been little educational expertise available in the north to provide the training. The UNBC mixedwood program will be able to bring 'real world' problems and issues associated with mixedwood management into the classroom, and will be able to take advantage of the extensive network of research and demonstration sites established by the program and its partners.

### 2.3.2 Strategic Issues

There is a lack of professionals and technicians with an adequate knowledge of mixedwood ecology and management. It is important that students who enter the workforce have the necessary knowledge and skills to be able to step into the responsibilities of the modern forest management professional. Students face some barriers, similar to those noted above in Section 2.2.2, in achieving this objective. The solutions are similar to section 2.2.2. Obstacles include:

- ◆ relevant basic ecological and management knowledge of mixedwood systems and landscapes. Presented in NRES 732 (Forest Systems and Management)
- ◆ awareness of existing information on mixedwood ecosystems and landscapes. Presented in NRES 732 (Forest Systems and Management)
- ◆ opportunities for accessing and understanding available information. Presentations at NSC start to address this obstacle
- ◆ knowledge/expertise as to the most cost-effective management regimes. We are developing economic decision based matrices for some management activities
- ◆ knowledge/expertise for the development of appropriate policies and practices for sustainable management of mixedwood systems. Establishing trials that directly address policy issues

These barriers are being addressed in the first two themes, particularly the first theme dealing primarily with research. Other barriers precluding the increased employment of properly-trained graduates in mixedwood management in northern BC might include:

- ◆ difficulties in attracting and keeping undergraduate students in the forestry stream.
- ◆ shortage of adequately educated graduates in mixedwood management.
- ◆ difficulties in retaining program graduates in the north.
- ◆ difficulties in recruitment and funding of graduate students.

### 3. Conclusions

Through strategic planning and effective delivery of the annual plan, the Forest Renewal BC-Slocan Mixedwood Ecology and Management Chair will provide leadership and direction in

- ◆ enhancing our understanding of mixedwood ecosystems and landscapes
- ◆ improving our mixedwood management policies and practices.

The expected strategic outcomes have been defined in terms of meeting the needs of field practitioners as well as company and agency managers.

The mixedwood program is but one of several players in mixedwood research and management in northern and central BC. It is imperative, thus, that the UNBC mixedwood program be aware of all players, ensure that all the players are aware of the UNBC program, and form partnerships with appropriate players. The Mixedwood Chair will, therefore, play a major role in co-ordinating the research, extension, and demonstration activities initiated.

The strategic plan and the annual plan will be prepared under the aegis and approval of the Mixedwood Program Advisory Group. The partner needs and information gaps in mixedwood

ecology and management will be addressed primarily through graduate student, research associate, and post-doctoral fellow research. The Chair's prime responsibilities will include research planning and supervision, some research, and ensuring that the research results are extended to the partners. Due to the departure of the Forestry Extension Officer and unlikely replacement in the short-term, the main responsibilities of liaison with industry, assessing client extension needs, initiating and delivering extension events will be done by the Chair. Also, where and when appropriate, various partnerships will be formed to facilitate the delivery of the strategic outcomes and the annual objectives. The partnerships will include companies, stewardship agencies, educational and research institutions, extension organizations, community groups, and funding agencies.

Table 1. Mixedwood themes, issues, and responses (strategic or tactical). The current level of activity and priority for each issue is identified. Activities: O, an ongoing Chair activity; +, delivered by partnerships; ++, high priority, partner to deliver; and +++, high priority, Chair and graduate students to deliver.

THEME		STRATEGIC OUTCOME									
	STRATEGIC ISSUE	10	11	12	13	14					
<b>Timber supply:</b> <i>Growth and yield</i>	Understanding of treatment effects on ecology, forest health, and growth and yield in mixedwood stands.	ID and evaluation of knowledge gaps; action plan for gaps	O	O	O	O	O				
		Description of early mixedwood stand development	O	O	O	O	O				
		Impact of MPB on growth and yield and stand dynamics	O	++	++	++	++				
		Research and operational partnerships in BWBS & SBS	+++	+++	+++	+++	+++				
		Development and refinement of mixedwood G&Y models	++	++	++	++	++				
		Linkage of stand treatments and stand dynamics to wood quality	++	++	++	++	++				
		Economic analyses of mixedwood management	O	O	O	O	O				
		Relationships between stand treatments and future forest conditions	++	++	++	++	++				
		Relationships between stand treatments and forest health	++	++	++	++	++				
		Facilitate certification efforts	++	++	++	++	++				
<i>Inventory</i>	Knowledge/expertise – practices and policies	Determination of utility of various mixedwood G&Y models	O	O	O	O	O				
		Sub-Boreal (PG TSA) mixedwood AAC determinations	++	++	++	++	++				
		Definition of free growing stands (mixedwood and coniferous)	O	++	+	+	+				
		Definition of range use by seral stage distribution	+	+	+	+	+				
		Relationship between site quality (SIBEC) and SI <sub>50</sub>	O	+	+	+	+				
		Description of early mixedwood stand development	O	O	O	O	O				
		Effect on MPB on stand dynamics and mid-term timber supply	O	+++	++	++	++				
		Differences in stand dynamics between managed and natural stands	++	++	++	++	++				
		Estimate amount and quality of mixedwoods on the landscape	++	++	++	++	++				
		Relationship between stand productivity and forest health	++	++	++	++	++				
<i>Markets</i>	Understanding of structure and functional relationships among seral stages from stand to landscape levels	Describe natural disturbance patterns	++	++	++	++	++				
		Impact of management activities on natural stand dynamics	++	++	++	++	++				
		Describe range of natural variation (RNV) by seral stage	++	++	++	++	++				
		Management success of RNV will be defined	+	+	+	+	+				
		Description of wood quality attributes	++	++	++	++	++				
		Location, amount, and quality of fiber available (fiber supply detail)	++	++	++	++	++				
		Definition of best product use	++	++	++	++	++				
		Publish reviews of mixedwood management practices and policies,	O	O/+	O/+	O/+	O/+				
		Update Mixedwood Web page	O	O	O	O	O				
		Networking with academia, and government agencies	O	O	O	O	O				
<b>Continuing education and outreach: extension</b>	A awareness of existing information	Initiation of partner-approved extension projects	O/+	O/+	O/+	O/+	O/+				
		Establish the necessary partnerships for an extension plan	O/+	O/+	O/+	O/+	O/+				
		Publish reviews of cost – benefits of mixedwood management	O	+++	+++	+++	+++				

		STRATEGIC OUTCOME						
THEME	STRATEGIC ISSUE	10	11	12	13	14		
	Relevant ecological and management knowledge	++	++	++	++	++	++	
	Knowledge/expertise re: cost-effective management and SFM policies and practices	++	++	++	++	++	++	
	Awareness of UNBC Mixedwood program	O/+	O/+	O/+	O/+	O/+	O/+	
	Ensure graduates have best and current mixedwood management knowledge and skills	O/+	O/+	O/+	O/+	O/+	O/+	
<b>Education of professional resource managers</b>	Graduates skilled in mixedwood management	O/+	O/+	O/+	O/+	O/+	O/+	
	Actively recruit students at the undergraduate and graduate level	O/+	O/+	O/+	O/+	O/+	O/+	
	Definition and utilization of all available funding sources	O/+	O/+	O/+	O/+	O/+	O/+	
	Facilitate industrial sponsorship of graduate students	+++	+++	+++	+++	+++	+++	
	Develop UG/Grad course in mixedwood management offered every 2-3 years	+++	+++	0	0	0	0	
	Prepare and submit research proposal on behalf of graduate students	0	0	0	0	0	0	
	Institute studentships and internships with industrial partners	O/+	O/+	O/+	O/+	O/+	O/+	
	Involve partners in delivering operational perspectives to students	O/+	O/+	O/+	O/+	O/+	O/+	
		List of extension needs and detailed annual action plan	++	++	++	++	++	++
		Field demonstrations of 'best practices'	++	++	++	++	++	++
	Incorporate results of research and operational trials into extension program	O/+	O/+	O/+	O/+	O/+	O/+	
	Coordinate local-regional discussion-action on policy needs	O/+	O/+	O/+	O/+	O/+	O/+	
	Field demonstrations of 'best practices'	++	++	++	++	++	++	
	Technical presentations at local, national and international meetings	0	0	0	0	0	0	
	Regional information seminars-workshops	+++	+++	+++	+++	+++	+++	
	Regular updates UNBC mixedwood curricula	0	0	0	0	0	0	
	Engage undergraduate students in Mixedwood research program	0	0	0	0	0	0	
	Resource professionals participate in delivery of UNBC Mixedwood program	O/+	O/+	O/+	O/+	O/+	O/+	