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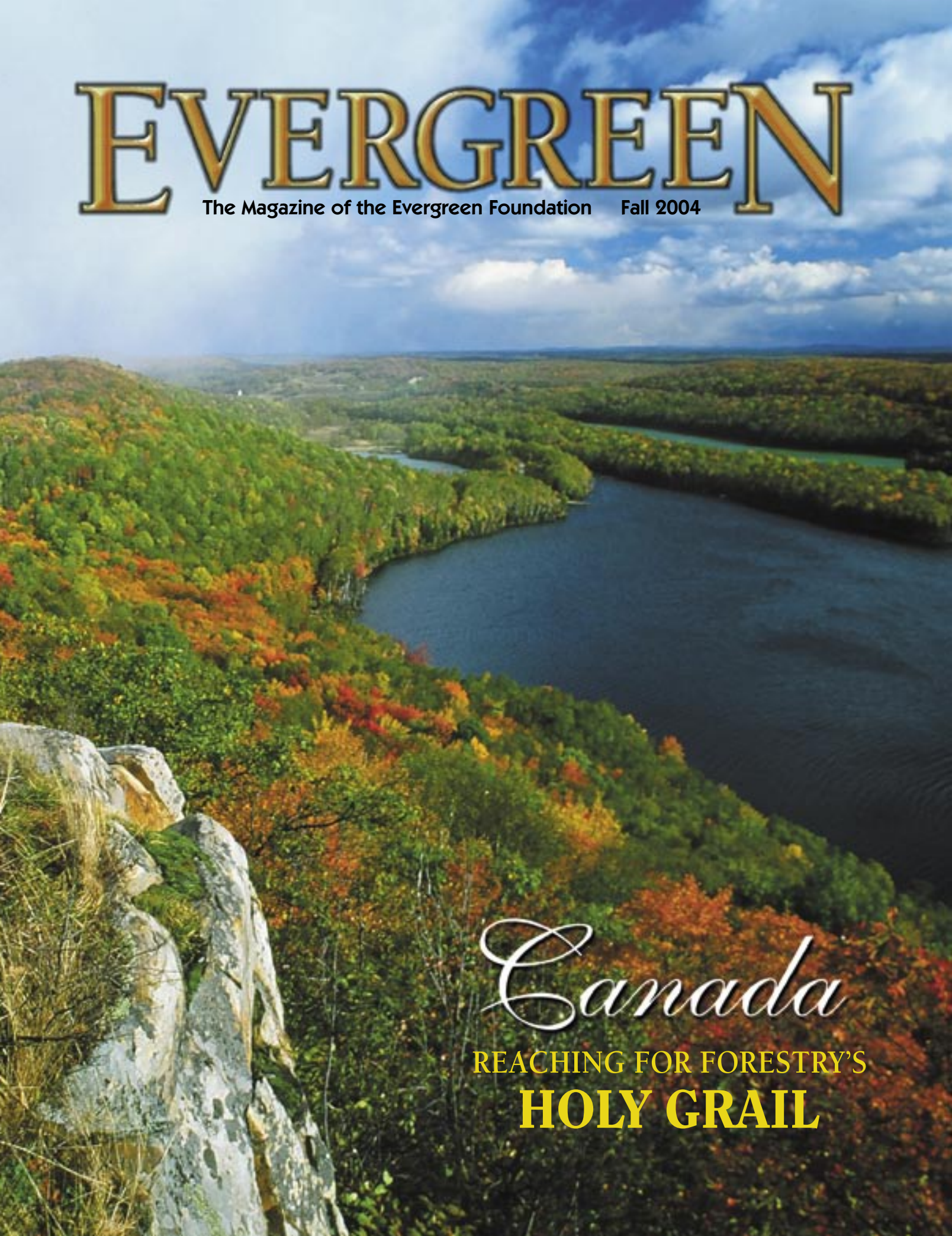

Canada

REACHING FOR FORESTRY'S

HOLY GRAIL

Canada

INDEX

Cover photograph: Elliot Lake, Ontario

Source: *The Forests of Canada* by Ken Farr and J. David Andrews; published by Natural Resources Canada and Fitzhenry and Whitesides Ltd.

In this issue we write about forests and forestry in Canada

Government of Canada

Falls near Blue River, British Columbia

To glimpse the enormity of Canada's forest, and thus the enormity of this task, which has taken almost a year to complete, simply turn to the map on Pages 2 and 3. You are looking at ten percent of the world's forest: 991.7 million acres spanning ten distinct forest types or regions, each defined by wide-ranging geographic, physical and climatic factors. By contrast, the eight forest regions of the United States cover 747 million acres.

Canada's vast forests hold about 198,000 wildlife species, a rarity for one country, even one as large as Canada. Small wonder then that its exceptionally diverse forests have become the subject of increasing scrutiny around the world.

Canada's population—about 31.7 million is less than one-ninth the 281 million counted by our U.S. Census Bureau in 2000. Most of its population is concentrated in urban centers within 100 miles of our shared border. Despite two centuries of growth, the rest of the country remains very remote, so much so that only eight percent of its forestland base has ever been converted to other uses—farms, roads, utility corridors and towns for example—compared to about 29% in the U.S. In fact, Canada's forests are so vast that very little is known about their northernmost reaches, at least in a statistical sense.

The fact that Canada remains very rural makes its economic dependence on natural resource-based industries, particularly timber and energy, far more apparent than rural resource dependence is in the U.S. As a result, social and political support for active development of these resources is much stronger in Canada than it is in the U.S.

Canadians seem to intuitively sense that their future on the global stage is closely tied to further expansion of export markets for their wood products, wheat, cattle, gas and minerals. The country's massive forest products industry already accounts for 50% of global lumber exports, and nearly 60% of newsprint exports, yet another reason why its forests are fast becoming a target of global environmental interests, particularly the boreal forest, which accounts for 76% of Canada's forest land base.

From its northern reaches, along the Canada-Alaska border, the boreal sweeps southeast from the Mackenzie River delta across the Yukon, Alberta, Saskatchewan and Manitoba, touching Lake Superior in Ontario before turning northeast for its journey across Quebec before fading into other more intermingled land forms in Newfoundland and Labrador. Apart from the boreal's enormous timber resource, its countless thousands of lakes, streams and wetlands form one of the world's largest fresh water reservoirs—a fact that was much in evidence when I flew from Ottawa, Canada's capitol city, east to Quebec City, then back west to Montreal, Edmonton and Vancouver in May.

The history of forest development in Canada bears striking similarities to the history of development in the U.S., though the fur trade played a far more prominent role in Canada than it did in the U.S. In fact, fur was Canada's first forest product. It began as an offshoot of Newfoundland's fishing industry in the 1500s.

But apart from the more prominent roles fur trappers and traders played, the history of development of forests in our two countries is virtually the same. The earliest white settlers encountered advanced agrarian Indian cultures, just as they did in Florida, the Carolinas, Virginia, Arizona and New Mexico. But meaningful westward expansion did not begin in Canada until nearly a century after it began in the U.S. Even so, both countries quickly exploited their forests.

Wood heated homes and fired industries, including the railroads, which opened Canada from east to west in the same way they opened the American frontier. Forests were also cleared away, or burned, to make way for crops and livestock grazing, creating a need for countless millions of wooden fence posts and rails. Artists of the day mourned the loss of forests in landscape paintings depicting devastation along the St. Lawrence River, just as they had along New York's Hudson River. And wildfires seemed to claim all that man did not. In 1825, the Miramichi fire destroyed more than a quarter of New Brunswick. More than 200 lost their lives in settlements along the river from which the conflagration took its name.

Canada also had an early day conservation movement, which butted heads with European-trained foresters of the day. But imagine how surprised we were to discover that the earliest foresters to champion forest management in Canada

were disciples of the same man who championed it in the United States: Bernard Fernow, who was the first chief of the Forestry Bureau of the United States, forerunner to the modern-day U.S. Forest Service and widely considered to be the father of forestry in the U.S.

"Forests grow to be used," Fernow declared at Canada's first forest congress in 1906. "Beware of the sentimentalists who would try to make you believe differently." A year later, Fernow, who founded the forestry school at Cornell University, became the first dean of Canada's first forestry school at the University of Toronto.

Canada's Prime Minister, Sir Wilfrid Laurier, hosted the 1906 congress. His government championed Fernow's blend for conservation and science-based forestry, hiring the nation's first cadre of professionally trained foresters. "I desire every man in this audience, as he goes away to his home and his avocation, to become a missionary in the world of forestry," he declared at the closing session.

Gifford Pinchot, the first chief of the U.S. Forest Service, also spoke at the 1906 gathering, echoing both Fernow's warning and Laurier's enthusiasm. "We must put every bit of land to its best use, no matter what that may be—put it to the use that will make it contribute most to the general welfare."

Several of Canada's early day landowners and lumbermen were also Fernow disciples. Among them: Ontario-born H.R. MacMillan, a Yale-trained forester friend of Pinchot, who went on to become British Columbia's first chief forester before building one of Canada's greatest lumber fortunes following World War I. Another was lawyer conservationist Sir Henri-Gustave Joly de Lotbiniere, who embraced European forestry on his family's holdings along the St. Lawrence River and was founding president of the Canadian Forestry Association and a member of both the Quebec Assembly and the Canadian House of Commons.

But here all similarity between the U.S. and Canadian forestry stories ends abruptly. Vastly different dies were cast at the moments of birth for our two countries. Canada's early colonists chose to unite as a federation, conferring significant powers on what would eventually become modern-day provinces. We became a republic of states first, only to gradually transfer significant power to our federal government. The very different balance of powers that ultimately prevailed in our two countries has had a significant impact on forest development in each country, and on the respective government-industry relationships.

Consider these striking comparisons: Virtually all commercial forestland in Canada is owned and managed by the respective provinces. The provinces absorb all management costs and retain all related harvesting revenues. Much of the actual work is done by forest products companies under the terms of multi-year leases that are awarded by the provinces. Imagine how wealthy any of our western states might be if they held the same powers the provinces hold.

Canada's federal government owns little commercial timberland, so little in fact that Natural Resource Canada's Canadian Forest Service [CFS] is principally a research organization. CFS also represents Canadian interests on the international stage where more global environmental issues, like climate change and biological diversity, are discussed and debated.

By contrast, our federal government owns 165 million acres of forestland, 33% of our nation's entire forestland base. Our U.S. Forest Service is responsible for 147 million of these federally owned acres, but layer upon layer of often conflicting and ambiguous environmental law has made science-based management impossible since the northern spotted owl was listed as a threatened species under the federal Endangered Species Act. However well intended, the Act has in recent years done little more than create a rich feeding ground for lawyers and lobbyists.

Canada does not have an Endangered Species Act, but it recently ratified a Species At Risk Act that, unlike the take-no-prisoners mindset embodied in our ESA, seeks to balance economic and environmental considerations in a way that supports active and sustainable forest management. It is emblematic of Canada's willingness to tolerate ambiguity when it benefits the country's common future.

Environmental litigation leading to job loss is unheard of in Canada, not just because the legal framework necessary to promulgate it doesn't exist, but also because most Canadians would take a very dim view of any action that harmed their country's economy or its citizens. No surprise then that the forestry consensus-building process that has failed so miserably in the United

Government of Canada

Skagit Valley Park, Sumullo Grove

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Long Beach, Pacific Rim National Park, British Columbia

States flourishes in Canada. The credibility of the process rests in the fact that consensus cannot be upended by lawyers and judges. With no way to sabotage public will, environmental groups that operate in judicial isolation in our far too litigious society must sit at the same table with everyone else in Canada.

Canada's provincial governments have never viewed their forest products industry as an enemy of the environment, as our own federal government has from time to time. The enormous economic, social and cultural importance of the lumber and paper industries is widely recognized and appreciated at all levels of Canadian government, just as it once was by all agencies of government in our country.

Beyond doubt, the most far-reaching example of the unity between government and industry has been their mutual quest for third party forest certification of provincial forestlands, a process they consider to be essential to their global marketing plans for Canadian lumber and paper. And, indeed, there is increasing reluctance on the part of major consumers and retailers to sell or use forest products that cannot be independently certified as having been made from trees harvested from sustainably managed forests.

More than 143 million acres of Canadian-owned forestland have already been independently certified as being sustainably managed. By contrast, not a single acre of federal forestland in the U.S. has been so certified. And it is unlikely any of our federal forests could meet the stringent sustainability standards imposed by any of the world's top certifiers. Among our many ills: mortality from insects, diseases and wildfires exceeds growth by wide margins in many of our federal forests: a certification no-no.

Many of the same environmental groups that support third party certification of Canada's forests oppose it in our federal forests. They do so because they fear it will lead to renewed emphasis on timber harvesting, which they oppose despite the fact that our current no-management morass is anything but sustainable. And with so much political and legal horsepower behind them, there isn't much the rest of us can do except watch disaster after disaster befall our nation's forest heritage.

In this special report we have purposefully steered clear of the softwood lumber dispute that now has many U.S. and Canadian mills warring with one another. We have done so for two reasons. First, we remain true to our roots in forestry and science. We are not a trade or political journal. Second, we respect the opinions of Evergreen Foundation members and directors on both sides of this dispute. But sad is the fact that the millions of dollars that have been spent on lawyers and lobbyists were not instead invested in forestry education programs, scholarships for students entering in pursuing careers in forestry.

We want to acknowledge our Canadian partners and hosts; especially Andre Rousseau, Interim Director General, Policy, Planning and International Affairs, Natural Resources Canada, and Claude Leger, Senior Forestry Relations Advisor for the Canadian Council of Forest Ministers. The Council helped fund this report through its International Forestry Partnerships Program. And thanks to our fine cadre of Canadian freelance writers. We felt the provincial stories in this issue would be most meaningful for you if they were told through Canadian eyes. They have done a magnificent job.

Onward we go,
Jim Petersen, *Publisher*

Forest Facts About Canada

Total Land Area in Province (Square US Statute Miles)

Provinces and Territories	Land	
	km²	mi²
Newfoundland and Labrador	373 872	144 352
Prince Edward Island	5 660	2 185
Nova Scotia	53 338	20 594
New Brunswick	71 450	27 587
Quebec	1 365 128	527 077
Ontario	917 741	354 340
Manitoba	553 556	213 728
Saskatchewan	591 670	228 444
Alberta	642 317	247 999
British Columbia	925 186	357 215
Yukon Territory	474 391	183 163
Northwest Territories	1 183 085	456 790
Nunavut	1 936 113	747 535
Canada	**9 093 507**	**3 511 010**

Source: Natural Resources Canada. Canada Centre for Remote Sensing. GeoAccess Division. 2001.

Conversion Factor : 1 US Statute Mile = 1 km / 1.609347

Total Forest Industry Employment

Jurisdiction	2003 (No. of Jobs)
Newfoundland and Labrador	3,400
Prince Edward Island	740
Nova Scotia	13,360
New Brunswick	20,400
Quebec	118,300
Ontario	88,100
Manitoba	8,900
Saskatchewan	6,198
Alberta	25,300
British Columbia	91,600
Yukon	N/A
Northwest Territories	N/A
Nunavut	N/A
Canada	**376,300**

Source: The State of Canada's Forests 2003-2004.

Total Forest Land Area per jurisdiction (Square US Statute Miles)

1.1 Area classification by province/territory, 2001 (Square Miles)

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	YT	NT	NU	Canada
Forest	41 430	16 370	1 022	23 518	283 243	207 560	72 096	77 385	107 020	222 399	30 438	109 468	3 146	**1 195 097**
Other wooded land	36 050	413	29	446	43 302	56 124	66 756	16 275	33 474	25 038	57 551	19 281	481	**355 222**
Total	77 480	16 783	1 051	23 964	326 546	263 684	138 853	93 660	140 495	247 438	87 990	128 749	3 627	**1 550 318**

1 hectare (ha) = 10 000 m², 1 km² = 100 ha, 1 ha = 2.470 966 acres, 1 US Statute Mile = 1km / 1.609347

Source: Canada's Forest Inventory 2001.

N.B.of the 1,195,097 square miles of forest land, the Crown owns 92%. The remainder is owned privately by some 425 000 land owners. (Canadian Forest Service)

Total Forest Land Area that is Certified

(Thousands of Square Miles)

Certification is quickly moving forward in Canada: as of June 2004, approximately 223.9 thousand square miles had been certified under one of the three forest-specific certification systems available in Canada (Canadian Standards Association (CSA) 127.0 thousand square miles, Sustainable Forestry Initiative (SFI) 82.6 thousand square miles million ha, and Forest Stewardship Council (FSC) 16.2 thousand square miles). This figure has more than tripled over the last two years.

Jurisdiction	Certified Land Area
	(thous. of sq.miles)
Newfoundland & Labrador	6.9
Nova Scotia	3.9
New Brunswick	15.1
Quebec	17.0
Ontario	45.6
Manitoba	8.1
Saskatchewan	18.9
Alberta	21.2
British Columbia	86.5
Canada	**223.9**

Source: Abusow, Canadian Sustainable Forestry Certification Coalition (www.sfms.com) *Numbers may not add up due to rounding.*

Top Ten Trees In Canada (As defined by total area of natural range)

Scientific name	English name	French name	Area (mi²)	%
Salix bebbiana	Bebb willow	Saule de Bebb	2 310 613	64.9
Picea glauca	White spruce	Épinette blanche	2 258 026	63.5
Betula papyrifera	White birch	Bouleau à papier	2 222 603	62.5
Picea mariana	Black spruce	Épinette noire	2 208 078	62.1
Populus tremuloides	Trembling aspen	Peuplier faux-tremble	1 989 921	55.9
Populus balsamifera	Balsam poplar	Peuplier baumier	1 946 992	54.7
Larix laricina	Tamarack	Mélèze laricin	1 918 585	53.9
Alnus incana ssp. Rugosa	Speckled alder	Aulne rugueux	1 878 540	52.8
Prunus pensylvanica	Pin cherry	Cerisier de Pennsylvanie	1 368 227	38.4
Betula occidentalis	Water birch	Bouleau fontinal	1 350 989	38.0

% column shows percent of total Canadian dry landmass (no lakes) occupied by the species.

Distribution of Arboreal Emblems in Canada

Province / Territory	Arboreal Emblem	Scientific Name	Total Distribution (Canada) mi²
Newfoundland & Labrador	Black spruce	Picea mariana	2 208 078
Prince Edward Island	Red oak	Quercus rubra	149 905
Nova Scotia	Red spruce	Picea rubens	92 405
New Brunswick	Balsam fir	Abies balsamea	1 173 643
Quebec	Yellow birch	Betula alleghaniensis	231 656
Ontario	Eastern white pine	Pinus strobus	319 114
Manitoba	White spruce	Picea glauca	2 258 026
Saskatchewan	White birch	Betula papyrifera	2 222 603
Alberta	Lodgepole pine	Pinus contorta	416 690
British Columbia	Western red cedar	Thuja plicata	140 464
Yukon	Subalpine fir	Abies lasiocarpa	362 815
Northwest Territories	Jack pine	Pinus banksiana	1 187 375

Total Forest Land Area that is Reserved in Protected Areas (Square Miles)

1.1 Area classification by province/territory, 2001

A. forest and other wooded land by status

Reserved

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	YT	NT	NU	Canada[a]
Forest	279	1245	3	123	2675	13680	4981	2497	13295	15315	827	3322	–	**58242**
Other wooded land	132	49	–	4	139	3621	3267	178	1793	3200	–	432	–	**12816**
Total	411	1294	3	127	2814	17301	8248	2675	15087	18515	827	3755	–	**71057**

[a] 1 hectare (ha) = 10 000 m^2, 1 km^2 = 100 ha, 1 ha = 2.470 966 acres, 1 US Statute Mile = 1km / 1.609347

Source: Canada's Forest Inventory 2001.

Type of Forest Industry (lumber, paper, pulp, secondary manufacturing)

Forest Industry - Value of shipments - 1999

Millions of $US

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	YT	NT	NU	Canada
Value of Shipments	x	1254	x	2909	14815	11299	740	647	3332	17814	–	–	–	**53330**
Logging	93	199	5	540	1520	1232	86	130	479	4615	–	–	–	**8899**
Wood Product Manu.	41	316	28	903	5664	3580	365	235	1834	8559	–	–	–	**21525**
Paper Manufacturing	x	739	x	1467	7631	6487	289	282	1019	4640	–	–	–	**22905**

x = data not available 1999 exchange rate: $1 US = $1.48584024 CAN (Source: Bank of Canada)

Source: Statistics Canada

Export in US Dollars and by Volume (tons, board-feet, square feet)

Forest Industry - Value of Exports - 2003

US units

		NL	PE	NS	NB	QC	ON	MB	SK	AB	BC	YT	NT	NU	CAN
Softwood Lumber															
Quantity	Millions board feet	24	34	458	1172	3503	1913	185	268	1695	12292	—	—	—	21545
Value	Millions $US	6	9	116	308	880	410	39	60	414	3781	—	—	—	6024
Newsprint															
Quantity	Thousands Short Tons	894	—	424	417	4087	1899	172	—	198	1045	—	—	—	9137
Value	Millions $US	383	—	168	156	1809	912	101	—	81	417	—	—	—	4027
Wood Pulp															
Quantity	Thousands Short Tons Air Dry	—	—	634	1014	1598	1604	2	484	2164	5196	—	—	—	12695
Quantity	Thous. of Hundredweights Air Dry	—	—	—	12676	20282	31966	32077	44	9678	43276	103924	—	—	—	253902
Value	Millions $US	—	—	—	136	373	648	666	1	203	854	1966	—	—	—	4848
Waferboard															
Quantity	Millions Board Feet	—	—	—	—	125	532	969	191	145	660	737	—	—	—	3359
Value	Millions $US	—	—	—	—	72	300	584	91	83	407	431	—	—	—	1970
Other paper and paperboard															
Quantity	Thousands of Short Tons	7	0	269	720	2752	1886	88	125	20	1340	—	—	—	7207
Quantity	Thous. of Hundredweights	132	0	5379	14396	55048	37720	1764	2491	397	26808	—	—	—	144136
Value	Millions $US	4	0	174	466	1782	1221	57	81	13	868	—	—	—	4665
Converted paper															
Quantity	Cannot be given due to multiple units not being compatible														
Value	Millions $US	—	—	7	23	181	416	21	11	15	11	—	—	—	686
Other Products															
Quantity	Cannot be given due to multiple units not being compatible														
Value	Millions $US	—	1	56	230	2016	1862	148	20	181	1500	1	1	—	6019
Total Exports															
Value	Millions $US	395	9	659	1629	7616	6072	457	459	1967	8973	1	1	—	28372

— amount too small to be expressed or zero 2003. Exchange rate : $1 US =$1.40146175 CAN (Source: Bank of Canada)

Source: Statistics Canada and Canadian Forest Service

Canadians Take Their Stewardship Role Very Seriously

By Tom Douglas

Government of Canada

Boreal Forest Region, Northern Saskatchewan

The word "boreal" is named after Boreas, the Greek god of the north wind, but to Canadians in general it has also come to mean "sacred trust".

Despite rumors to the contrary—spread mainly by certain environmentalists who would seem to want to have that north wind seal off Canada's boreal forest in an icebox of inactivity—the people of Canada are deeply aware of the relative fragility of this wondrous natural resource. Furthermore, they are determined to manage their country's vast stretch of northern forest wisely, operating on the principle of sustainable development for the economic, aesthetic and ecological benefit of present and future generations.

"To set aside an area completely is to recognize your inability to manage it properly," says Richard Côté, Acting Director of the Federal-Provincial Relations Division of the Canadian Forest Service (CFS). "It doesn't necessarily mean you're taking good care of it. Still, a lot of well-intentioned individuals and organizations are clamoring for more conservation of the forest and it's healthy that this should be open for debate."

Mr. Côté adds, however, that when this debate is done through the media, there aren't a lot of nuances—everything comes out either black or white.

"There have been statements made that Canadian forests are 'endangered' forests," he says. "It's a jazzy term, but once people hear the word 'endangered', they take it for granted that nothing is being done to sustainably manage our forests and that just isn't true."

In fact, there are a number of high-profile individuals and organizations from across the forest spectrum who are engaged in numerous activities aimed at the wise use of Canada's forests, of which the boreal constitutes 77% — and 35% of the country's land mass.

In 1992, signatories to the first Canada Forest Accord, representing a cross-section of forest stakeholders from industry, academia, non-governmental organizations, Aboriginal people and other interested parties, indicated their interests and concerns through the following policy statement:

"Our goal is to maintain and enhance the long-term health of our forest ecosystems for the benefit of all living things both nationally and globally, while providing environmental, economic, social and cultural opportunities for the benefit of present and future generations."

In addition, the National Round Table on the Environment and the Economy (NRTEE) was created to play the role of catalyst in identifying, explaining and promoting, in all sectors of Canadian society and in all regions of Canada, principles and practices of sustainable development.

NRTEE is composed of a Chair and up to 24 distinguished Canadians appointed by the Prime Minister as opinion leaders representing a variety of regions and sectors of Canadian society, including business, labor, academia, environmental organizations and First Nations. The members meet as a round table four times a year to review and discuss the ongoing work of the agency, set priorities and initiate new activities.

Another group, the Boreal Research Partnership, is comprised of federal and provincial government representatives as well as members from such agencies as the Canadian Wildlife Service, the Forest Products Association of Canada and Ducks Unlimited. It is working in such areas as inventories of the boreal tree species, wildlife, plants and biodiversity, adaptive management procedures, indicators of sustainability and knowledge and information systems.

And in Québec, a Commission on the Management of Public Forests was formed as an independent body in response to recommendations made by Québec's auditor-general to analyze in depth forest management practices in the province and the evolution of the state of the forests.

So just what is this boreal forest that everyone is so concerned about? One writer with a poetic bent described the Canadian portion of it this way: "Draped like a great green scarf across the shoulders of North America, the boreal or northern forest is Canada's largest ecosystem."

It is part of a great northern circumpolar band of mostly coniferous forests extending across the subarctic latitudes of Russia, Scandinavia and North America. Globally, the boreal forest comprises about a quarter of the world's closed-canopy forest and plays a significant role in the earth's environmental balance and life on this planet. Besides being a producer of oxygen, the boreal forest absorbs and stores carbon dioxide, playing a critical role in the ongoing battle against global warming.

It's a dynamic system of shrubs, trees,

herbs, mosses, microorganisms, insects and animals interacting among themselves and with rock, soil, water and air.

In Canada, it forms an arboreal band across the northern portion of the country from Newfoundland to the North West Territories. There are three distinct regions. The lowest, geographically speaking, is the Aspen Parkland Region, a transition zone of mixed grassland and open forest. Next is the Boreal Region, predominantly forested by white and black spruce, tamarack, balsam, fir and jack pine. The upper portion is the Taiga Region, whose forests taper down to barren tundra at its northernmost reaches.

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Boreal Forest Region, Prince Albert National Park, Saskatchewan

The boreal forest is home to countless species of birds as well as such animals as bear, moose and woodland caribou. It also contains some of the most important wetlands in the world.

Formed after the last Ice Age, the boreal forest is disturbance-driven, in that the hardy coniferous species that predominate have learned to cope with — and even thrive on — such natural agents of change as lightning fires, insect infestations and disease. However, a disturbance that has many individuals and organizations more than a little concerned is one that, if left unchecked, could conceivably spell the ruination of this vital ecological resource. That disturbance, of course, is man.

Current management of Canada's boreal forest falls largely to the country's ten provinces, which control 92% of this resource. They allocate harvest rights, monitor harvesting and encourage sound logging and reforestation practices. The federal government, which controls just over 5% of the boreal forest, contributes scientific research, economic development, international trade and relations, and pesticide regulations.

Both levels of government protect significant tracts of forest from logging — in national and provincial parks, wildlife sanctuaries, conservation areas and forest preserves.

Recently, a coalition of environmental groups launched a letter campaign to 500 major corporations in North America urging them to end the use of products sourced from the boreal forest — which they term "endangered" — and to refuse to buy from companies that have not halted logging in the region.

They are concerned with three main issues: certification; protection; and Aboriginal, or Native rights. And, while their concerns are well intentioned, they seem off the mark.

About 143 million acres of forest land in Canada have been independently certified as being sustainably managed in accordance with standards set by North America's three leading certifiers: the Forest Stewardship Council, the Sustainable Forestry Initiative and Canada's National Sustainable Forest Management Standard. In addition, the Forest products Association of Canada — the umbrella association for Canada's largest industrial employer — insists on third party certification as a condition for membership in the association

In terms of protection, Canada has more than 71,000 square miles—about 5,000 square miles larger than the entire state of Washington — of forest and other wooded land reserved, and the door to discuss other worthwhile proposals to reserve land remains open.

As for Aboriginal people, while employment and standard of living remain below national averages, forestry and other natural resources represent a significant part of the livelihood of rural and remote Aboriginal communities. The number of benefit sharing agreements and joint ventures with industry is increasing slowly but steadily. There are federal programs geared to capacity building, such as the First Nations Forestry Program. Aboriginal people are a part of the National Forest Strategy Coalition and one of the eight strategic directions within that five-year national strategy is specifically geared to First Nations peoples and their values. One of Canada's networks of model forests is a First Nations Model Forest and, because of the participatory nature of forest management plans, Aboriginal peoples can and do feed into those planning processes.

There is a strong fear among those who believe in the sustainable development of Canada's forest through their wise use that Canada could be forced, through public pressure, into adopting policies based on arbitrary targets and forest management practices that are not based on science, ecological processes or sound public policy-making.

None of this is to say that concerns about potential harvesting of large tracts of the boreal forest are frivolous or ill conceived. But the challenge is to maintain a healthy balance between the wise use of this resource for the economic and recreational benefit of Canadians and the rapidly-growing global demand for wood products.

The hope is that this country's forest community can get the message out that Canadians from all walks of life are keenly aware of their responsibility as stewards of this priceless natural resource and that responsible action is being taken to sustainably manage the boreal and other forests in Canada.

As André H. Rousseau, Acting Director General of the Policy, Planning and International Affairs Branch of CFS puts it: "The people in the forest industry are no dummies. They read the newspapers. They know that 94% of our forests are publicly owned and that public interest in their welfare is extremely high. They are very strong supporters of a cooperative approach to managing our forests for the benefit of present and future generations."

If, as the scribe once wrote, it's an ill wind that blows nobody any good, perhaps Boreas can be prevailed upon to provide smooth sailing for those entrusted with the all-important task of sustainably managing one of Canada's — and the world's — most precious natural resources.

Compromise Is Key

National Forest Strategy And Canada Forest Accord Turn Potential Enemies Into Across-The-Table Dialoguers

By Tom Douglas

In Canada, the "C" word — compromise — doesn't have the negative connotations it does in other jurisdictions. Canadians, since the country's founding in 1867, have lived in relative harmony as two distinct societies, English and French. The people of Canada have also managed to agree on a perhaps less-than-perfect yet workable national health program and a much-heralded universal pension system. In addition, their recent federal election, where no political party gained a majority, demonstrated that, despite partisan differences, Canadians will make concessions to get the job done.

To the amazement of vested interests in other forested countries, Canadians have also been able to hammer out agreements among the disparate parties setting up their ideological tents under the country's vast canopy of deciduous and coniferous tree species that represent ten percent of the world's forest. Rather than suing each other at the drop of a hardhat, such groups as forest harvesters, environmentalists, academics, Aboriginal peoples, recreational organizations and the public at large have established an ongoing dialogue on forest-related issues. Their mutual aim is the wise use of this invaluable resource for the good of today's population and generations to come.

They know there is much at stake. Canada's forest and other wooded land cover more than 44%, or 401.5 million hectares (991.7 million acres) of the nation's land. The wood and paper products industries are major contributors to Canada's standard of living. They employ over 375,000 Canadians directly and some 700,000 indirectly, with more than 300 Canadian communities dependent on them for their livelihood. Forest

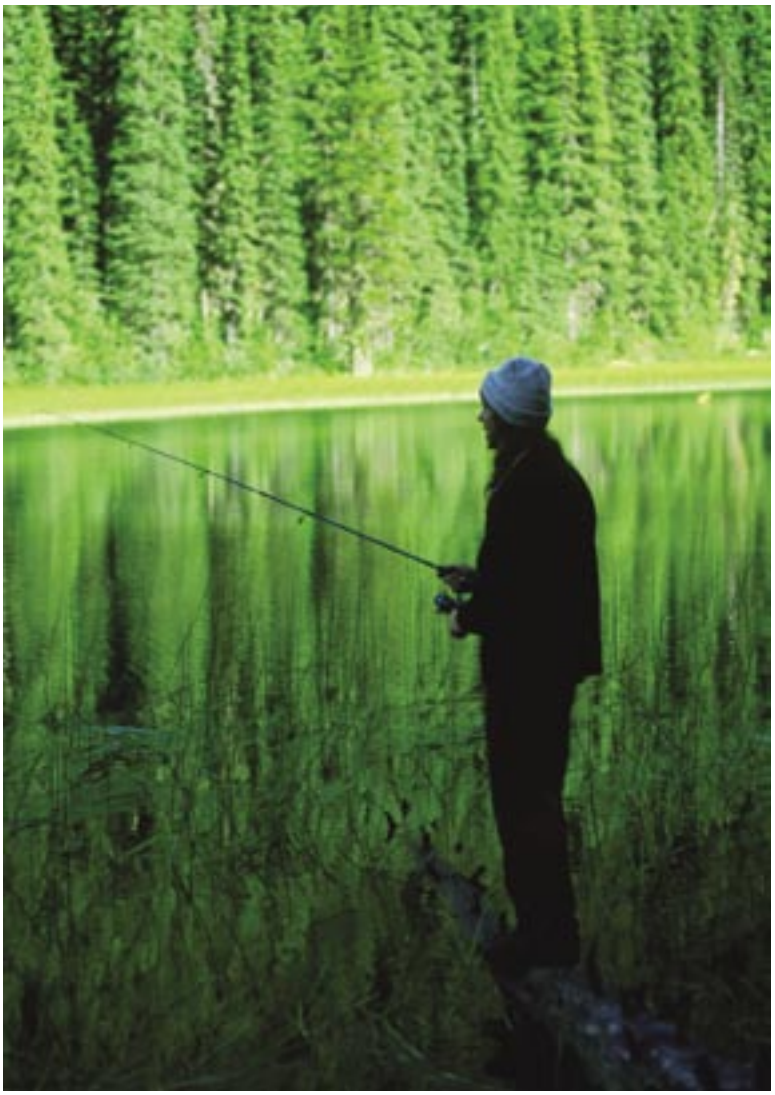
Government of Canada

Elliott Lake, Ontario

products industry exports total close to $30 billion US annually and are one of the major contributors to the country's yearly trade surplus. Despite rising forest exports from other nations, Canada remains the world's largest forest products exporter.

André H. Rousseau, Interim Director General of the Policy, Planning and International Affairs Branch of Natural Resources Canada's Canadian Forest Service, considers forest sector dialogue — manifested in an ever-evolving National Forest Strategy and Canada Forest Accord — a microcosm of the good working relationships between the country's federal and provincial/territorial governments and its diverse non-governmental organizations.

"In Canada, you have several jurisdictions based on the country's constitution with various roles and responsibilities, some of which are shared," says Mr. Rousseau. "For example, the provincial governments have responsibility for all their natural resources concerning legislation, management and, in the case of our forests, harvesting — setting limits on what and how much can be cut, so that the forests remain sustainable."



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Mr. Rousseau explains that when the country's ten provinces were created, one reason they obtained jurisdiction over resources was so that the resultant revenues would help pay for services provided to their constituents.

"The federal government has its own jurisdiction," he continues. "To give just a few examples, you have international trade, national coordination, fiduciary responsibilities for our Aboriginal peoples, and pesticide registration and its use."

Seventy-seven percent of Canada's forest is under provincial jurisdiction, while the federal government is responsible for sixteen percent and the remaining seven percent belongs to private woodlot owners.

Much of the federal land is in the north where the government still retains ownership but has devolved responsibility to the three territories: Yukon, North West Territories and Nunavut.

In terms of the environment, the federal government has trans-boundary responsibilities and laws, such as the new Species At Risk Act (SARA), but traditionally if a provincial law equals or exceeds federal expectations, that's how it's left. Otherwise, the federal government can step in if it sees fit.

"What ties everything together is a National Forest Strategy (NFS) dating from the 1980s," says Mr. Rousseau. "If you follow its history, you can see an evolution in governmental and non-governmental relationships and how the country has adjusted to new environmental, economic and social imperatives. In 1981, the federal government essentially created the first NFS. They consulted the provinces and a few industry and research associations. This was the typical relationship of government and industry — the inner circle." As a result, the first NFS mainly focused on economics and fiber production. A group known as the Canadian Council of Environmental and Resource Ministers oversaw it.

"When that Strategy came out, the next step was the development of a series of Federal/Provincial Resource Development Agreements which tried to address some issues like research, communications and forest management — how to get the fiber supply up," says Mr. Rousseau. "That was sort of the front end of the national forest strategy evolution. But Canada's forest ministers felt not enough attention was being given to forestry, the backbone of this country in terms of our economy, quality of life, social values and such."

To put the proper focus on this natural resource, the Canadian Council of Forest Ministers (CCFM) was created in 1985 to discuss issues of national and international importance, work cooperatively on certain matters and advance the forestry agenda. This was done by working with governmental and non-governmental organizations in a complementary fashion, avoiding duplication, creating synergies, trying to harmonize definitions and approaches, and learning from past experiences.

The second NFS spanned the period from 1987 to 1992, and it was developed through a broader level of consultation. For example, wildlife and other environmental issues were also discussed as part of resource management. The resulting NFS was considered a good step in the evolution toward reflecting the requirements of society.

In 1990, largely in response to the call for sustainable development by the influential Brundtland Report, Canadians embarked on a far more extensive and consultative process.

"The CCFM decided to work towards

a new NFS by reaching out to a wide cross section of the public," says Mr. Rousseau. "They resolved to abandon the 'We' versus 'They' approach and get everyone working together to advance the Canadian agenda while still meeting international responsibilities. The result was facilitated regional workshops featuring people from all walks of forest life. It was inclusive, open, transparent and objective." By design, the process that was used eschewed the traditional scenario of people congregating with their friends in the workshops discussing issues that affected them most.

Government of Canada

Wolf Trail. Gatineau Park, Québec

"We had Aboriginal people sitting with industry reps sitting with woodlot owners sitting with researchers sitting with environmentalists sitting with government officials," says Mr. Rousseau. "I call it strategic social manipulation."

Upon completion of the consultations, a draft report was sent to the participants, both those who attended in person and those who had submitted written proposals.

"We asked them: 'Is this what was said, and is there anything further to add?' Some comments were received but because the process was objective, transparent and inclusive, the document really reflected what people had said."

Next came a draft Strategy presented at a national forum of leaders and opinion-makers from the industrial, academic, environmental and Aboriginal segments of the forest community.

"We assembled some 70 or 80 gurus and put the draft to a test," he says. "We asked them whether it was realistic and doable. With their input, we ended up with a new Strategy in 1992 that contained nine strategic directions and a whole bunch of action items."

Wondering whether the new Strategy truly represented a cross-section of Canadian society, the CCFM ran it by attendees at the National Forest Congress, a function it co-organizes on a regular basis with the Canadian Forestry Association.

"There were some suggested changes, but people primarily agreed with the new Strategy," says Mr. Rousseau. "However, when it came time to sign the document, we found a reluctance to do so, especially by some of the bigger players who feared the legal implications. There was a perception that they would be responsible for everything in the Strategy, whereas it was supposed to be the responsibility of everybody, not one particular group."

What resulted was the drafting of the first Canada Forest Accord, setting out the vision, objectives and values of Canadians for their forests.

As Mr. Rousseau puts it: "The Accord was a way of saying this is what we want to do together. We want to maintain our own rules and responsibilities and capabilities, while working together.'"

A total of 29 major governmental and non-governmental organizations signed that first Accord, along with hundreds of individuals. Yet some suspicion remained about the document's value.

"At the Congress, it was suggested governments would do like they always did — put the document on the shelf and in five years pull it down, check off a few items and boast about the great things they'd done," says Mr. Rousseau. "So I was given a mandate to chair a Task Force of the CCFM, resulting in a recommendation to create the National Forest Strategy Coalition (NSFC) made up of the 29 governmental and non-governmental signatories to the first Canada Forest Accord and anyone else wishing to participate."

The NSFC was mandated with advising the CCFM, promoting the Strategy and participating in its implementation. Another responsibility was reporting regularly on accomplishments and presenting a midterm evaluation with recommended adjustments and overseeing a final, independent third-party evaluation. Since the delivery of the NFS was the responsibility of all Canadians, the NFSC became a network of networks and it provided the tools to promote activities and encourage involvement by all. According to Mr. Rousseau, the NFSC continues to endeavor to make things happen through cooperation—to walk the talk.

Mr. Rousseau doesn't come right out and say so, but he seems to consider the 1992-1997 NFS and the first Canada Forest Accord the apex of forest stakeholder agreements to date, even though the documents were updated in 1998 and streamlined in 2003.

"Some very important initiatives came out of the 1992 NFS and Canada Forest Accord," he says. "Our Model Forest program, which is linked to the International Model Forest Program, provides 11 big outdoor laboratories covering over 19 million hectares (47 million acres), where not only do you test sustainable development and technology transfer and do research, but it's also been a good place for decision-making and public participation. You bring the parties together to look at the landscape, weigh everyone's interests and collectively decide how to move forward as a community on one big area."

Another result was the creation of Criteria and Indicators (C&I) of sustainable forest management. Mr. Rousseau points out: "People were commenting: 'You set out to do these things, now how do you measure whether you did what you said you were going to do?' So the CCFM created a group charged with

coming up with various C&I. They went to scientists and, in the case of national indicators for sustainable development, for instance, they asked how we'd know what it was, how we'd define it and how we'd report on it.

"So the C&I, our Model Forest initiative and our First Nations Forestry Program are all a result of and linked to the 1992 and subsequent strategies. Then we took our Strategy to the Earth Summit in Rio de Janeiro that year and said that as a part of the forest community we wanted to work on sustainable development both within Canada and internationally. We not only have ten percent of the world's forests, we also have 20% of its drinking water and 30% of its boreal forest. Forestry is important to our world trade and to our quality of life, and we take it seriously and responsibly."

When it came time for the 1998 NFS and second Canada Forest Accord, the world was advancing technologically by leaps and bounds, with access to far more data and input through the Internet and e-mail.

"As technology evolved, we evolved with it," says Mr. Rousseau. "Perhaps because people were becoming more aware, there was a perception that the previous Strategy was trying to do too much, trying to satisfy everybody because everybody wanted a piece of the action. We decided to develop a Strategy that was less voluminous and less subjective by really focusing on the priority issues — understanding full well that the other stuff would happen anyway."

Mr. Rousseau says the 1998 NFS was influenced by what he calls "social dynamics" where every interest group lobbied to have its agenda included in the outcome.

"We therefore ended up with an NFS that virtually replicated the previous one," he says. "Instead of fewer strategic directions we retained all of them; instead of fewer action items we ended up with many more. Things hadn't changed much, although we did get 52 governmental and non-governmental signatories to the Accord."

He adds that social dynamics also played a big part in the consultative process leading to the 2003-2008 NFS, with cross representations on each subject that was discussed.

"There would be conference calls that kept us on the phones for seven and eight hours at a stretch. It was a really stimulating and challenging slugfest. We were pushing to have less and people were demanding more. Nevertheless, the resulting NFS is much more streamlined than its predecessors, with a focus on priorities."

Mr. Rousseau is proud that Canadians can reach such significant agreement with only a few minor bumps along the way. "Some people will always be at odds; however, they are all present, willing to dialogue and cooperate and to make their collective vision of sustainable forest management a reality across the country.

"We can't be smug or condescending about it because we have many unique challenges," he says. "However, we're fortunate to live in a big country with vast natural resources and a relatively small yet very diverse population to manage and enjoy them. We work things out and can still do so without taking issues to arbitration or even to court."

He then leans back in his chair and grins: "I suppose to some extent it's a cultural thing. It's the Canadian way, eh?"

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St. William Woods, Ontario

The National Forest Strategy's Themes and Objectives

Ecosystem-based Management: Manage Canada's natural forest using an ecosystem-based approach.

Sustainable Forest Communities: Develop legislation and policies to improve the sustainability of forest-based communities.

Rights and Participation of Aboriginal Peoples: Accommodate Aboriginal and treaty rights in the sustainable use of the forest, recognizing the historical and legal position of Aboriginal peoples and their fundamental connection to ecosystems.

Forest Products Benefits: Stimulate the diversification of markets, forest products and services, and benefits (both timber and non-timber).

Knowledge and Innovation for Competitiveness and Sustainability: Maintain and enhance the skills and knowledge of forest practitioners and mobilize the broader Canadian knowledge community to establish a new forest innovation agenda for Canada.

Urban Forest and Public Engagement in Sustainability: Actively engage Canadians in sustaining the diversity of benefits underlying the importance of Canada's forest, including the urban forest.

Private Woodlots' Contribution to Sustainability: Increase the economic, social and environmental contribution by Canadian woodlot owners to Canadian society through a concerted effort to strengthen policies and services.

Reporting and Accountability: Create a comprehensive national forest reporting system for all valued features of the forest, both urban and rural.

An Interview with R. John Efford

Minister of Natural Resources Canada

Editor's Note

R. John Efford was appointed Canada's Minister of Natural Resources in December 2003. He was also named Minister responsible for Newfoundland and Labrador. He was first elected to the House of Commons as the Member for Bonavista-Trinity-Conception in the May 2002 by-election. He has also served on the standing committees on Canadian Heritage; Fisheries and Oceans; Aboriginal Affairs; Northern Development and Natural Resources; and Human Resources Development and Status of Persons with Disabilities. Mr. Efford entered politics in 1985 as a member of the Newfoundland and Labrador's House of Assembly for the district of Port de Grave. While in Opposition he was a critic for the departments of Consumer Affairs, Public Works, Fisheries, Health and Social Services. After his re-election in the 1989 provincial election, he was appointed Minister of Social Services. Then, in 1993, he was appointed Minister of Works, Services and Transportation and, following his re-election in 1996, Minister of Fisheries and Aquaculture, positions to which he was re-appointed following the 1999 election. Before entering politics, Mr. Efford established and ran several wholesale and retail businesses.

R. John Efford

Mr. Efford, what do Canadians want from their forests?

Canadians want a healthy forest. They also want to live in communities with a healthy environment and a healthy economy. The forest provides economic, environmental and social benefits that are important to Canadians. The role of governments across Canada is to manage the forest, including urban forested areas, so that Canadians can enjoy all these benefits. As a world leader in sustainable forest management, Canada is able to do this and we will continue to refine our understanding and practice of this fundamental principle.

What does the phrase "sustainable forestry" mean to you?

In general terms, sustainable forestry, or sustainable forest management, means maintaining a sustainable level of harvest in forests. More specifically, the Government of Canada, along with the other members of the National Forest Strategy Coalition, refers to sustainable forestry as maintaining and enhancing the long-term health of Canada's forest, for the benefit of all living things, and for the social, cultural, environmental and economic well-being of all Canadians now and in the future.

We can measure sustainable forest management by a set of indicators that define what "sustainable" is from environmental, social and economic perspectives. These definitions have been agreed upon by the Canadian Council of Forest Ministers, which represents the federal, provincial and territorial governments.

Does third-party forest certification have a future in Canada, and are publicly owned forests being certified as being sustainably managed?

First of all, it is important to state that 93% of Canadian forests are publicly owned. Second of all, Canadian forest companies operate in a highly regulated environment that is subject to regular scrutiny and audit. A recent study conducted at Yale University found that Canada's forest regulatory regime compares with the most stringent in the world.

Having said that, many of our companies are embracing certification as a way of verifying their forest management practices, and Canada supports certification as a vehicle for demonstrating sustainable forest management. According to the Canadian Sustainable Forestry Certification Coalition, as of June 2004, approximately 58 million hectares had been certified under one or more of the forest-specific certification systems available in Canada. This figure has more than tripled over the last two years, and the vast majority of this area is public land.

The Forest Products Association of Canada, an industry organization, has made certification of forestry a condition of its membership. This demonstrates broad industry commitment to sustainable forest management and to meeting consumer demand.

What can you tell our readers about Canada's investments in forestry research as well as its investments in wood utilization research?

Canada invests in forestry research to advance our understanding and practice of sustainable forest management, so that our forests will be healthy and will continue to provide economic, environmental and social benefits for future generations of Canadians.

We also believe that research into wood utilization is important to the future of the forest and our economic prosperity. This research creates an environment where new technologies and new processes can be developed, and where the value-added manufacturing sector can grow. This in turn strengthens our economy — particularly in rural and resource-based communities.

Do you believe the majority of Canadians are supportive of timber harvesting in publicly owned forests, and if so, why?

Canadians, particularly in the West, continue to regard the natural resources sector overall (37%) as the number one contributor to the Canadian economy, over the manufacturing and service sectors (each seen by 28% of Canadians as number one).

Canadians appear to be more concerned with the way forests are *managed* than how they are *used*. According to surveys conducted in Alberta in 1999 and in Ontario in 2002,

respondents were not opposed to using forests in different ways to add to the quality of human life. As already mentioned, 93% of our forestlands are public property, and a fair percentage of these are set aside for conservation purposes.

One sign of public support is the large number of organizations of all types that formed a coalition to develop and implement Canada's National Forest Strategy. This coalition represents all levels of government, as well as forest industries, environmental groups, labour, Aboriginal peoples, research institutions, universities, practitioners and private woodlot owners. This strategy is meant to be implemented both in privately and publicly owned forests.

Needless to say, Canadians depend upon the range of economic benefits that our forests provide. The forest sector accounted for more than 11% of total Canadian exports last year. The forest and related economic activity are also part of our heritage, and continue to be the lifeblood of many communities across our country.

What do you perceive to be the most contentious forest-related environmental issues?

While there are a number of contentious and challenging forest-related environmental issues, arguably the most challenging is climate change. We do not know exactly how this will affect forest health, although we do expect to see an increase in the rate and scope of disturbances such as fire and insect outbreaks. As forests shift and adjust to new climatic conditions, these disturbances may increase or happen in different forms. Adapting to climate change is a challenge that Canadians are coming to accept, and it is one that the entire world must accept.

Is there an overarching forest policy in Canada — one in which all of your forested provinces are heavily invested?

Canada was the first country in the world to develop a comprehensive, inclusive national forest strategy. Our current strategy, which will guide us through 2008, was developed through Canada-wide consultations by the National Forest Strategy Coalition.

A Sustainable Forest: The Canadian Commitment will ensure that our forest is managed sustainably and for multiple benefits by committing Canada's broad forest community to some 47 specific priority actions. This is the fifth National Forest Strategy, and other nations and jurisdictions are now applying this model.

Are U.S. environmental groups exerting too much influence over forest policies in Canada?

Environmental groups from around the world are now liaising and partnering with each other, thus extending their reach over the whole planet, including Canada and the United States. These groups play an important role in policy development on an international scale. They remind us that forest ecosystems affect all nations and that we need to apply a more holistic approach to managing them. Canada's National Forest Strategy reflects this approach.

What is Canada's role on the global forestry and wood processing stages?

Canada is a major player in meeting the world's demand for wood fibre. We supply the international market with wood of the highest quality, produced in a sustainable manner. Having said that, we would like to see more secondary, value-added manufacturing of finished products take place in Canada. It would strengthen our economy, particularly in rural and forest-dependent communities.

How would you say Canada's relationship with its forest products industry differs from the U.S. government relationship with its forest products industry?

It would not be appropriate to comment on the relationship between the U.S. government and its forest industry. However, the Government of Canada enjoys a healthy relationship with Canada's forest industry.

The Government of Canada works in partnership with the forest industry to ensure that the industry remains competitive while at the same time respecting the principles of sustainable development. For example, we collaborate with the industry in areas such as pre-competitive research and development, sector innovation, market access and development, and skill development.

Another example is the creation of the Canadian Forest Innovation Council (CFIC), which was supported by the Canadian Council of Forest Ministers, an organization that includes the federal, provincial and territorial ministers of forestry. The CFIC comprises forest research organizations from industry, government and universities across the country. Its mandate is to maximize the innovative capacity of the Canadian forest sector to promote industry profitability, environmental quality and community stability.

What is your vision of the future of forests and forestry in Canada?

The vision of the Government of Canada is of a healthy forest and a strong forest economy. To this end, we will continue to invest in research and development so that we can provide forest managers with the tools necessary to support these objectives. We also want to provide Canadians with as much information as we can so that together we can make wise choices for our future.

Canada's collective vision of the future of forests can be found in the National Forest Strategy. It is an action plan that is based on consensus, and advances the principles of sustainable forest management so that our forests continue to provide social, environmental and economic benefits for future generations of Canadians. [See Canada's National Forest Strategy at http://nfsc.forest.ca/strategies/strategy5.html]

An Interview with Brian Emmett

Assistant Deputy Minister, Canadian Forest Service, Natural Resources Canada

Editor's note:

Brian Emmett is Assistant Deputy Minister of the Canadian Forest Service, Natural Resources Canada—a position that casts him in a role similar to that of Dale Bosworth, Chief of the U.S. Forest Service. But unlike our U.S. Forest Service, the Canadian Forest Service is mainly a forestry research organization. It has no direct involvement in managing public forestlands. Mr. Emmett directs the research. He is also responsible for strengthening national consensus as it relates to Canadian forest policies and practices, and he represents his country in international forestry forums that focus on global environmental issues including sustainable forestry, biological diversity and CO_2 emissions. In 1996, he was appointed Canada's first Commissioner of the Environment and Sustainable Development. He began his career in public service with Environment Canada in 1973; then worked for ten years in the Department of Energy, Mines and Resources, now Natural Resources Canada. He holds a master's degree in economics from the University of Essex in England. In his youth he worked in his father's lumberyard at Sarnia, Ontario, just across the border from Port Huron, Michigan.

Brian Emmett

Mr. Emmett, what role does the Canadian Forest Service play in caring for Canada's forests?

Our basic job is science and technology development in forestry, upstream from the forest products industry. Our present research priorities are on developing management strategies for reducing the risk of catastrophic wildfires as well as insect and disease infestations that undermine forest productivity. We're also heavily involved in the design of harvesting methods that more closely resemble natural disturbance patterns. As you know this is seen as a cornerstone in the implementation of sustainable forestry practices.

How does your role differ from that of provincial foresters and their staffs?

The provinces own most of Canada's forests and are directly engaged in forest management, including harvest-licensing agreements. The federal government owns about 63 million hectares or 16% of the 400 million or so hectares of forests in Canada. However, most of this area is in the territories, where the management of forests has been devolved to the three territorial governments. The federal government itself, through the Department of National Defence and Parks Canada, for instance, manages around 7.6 million hectares of forests.

Does the Canadian federal government have any control over the management of provincial forestlands?

While the Canadian federal government has very little to say directly about how the provinces manage their forests, there are a number of federal laws and international obligations that do influence provincial policies and practices—the *Species at Risk Act* and the Biodiversity Convention, just to name two.

Do you have federal laws—an endangered species act for example—that allow you to control harvest levels, or whether harvesting can even occur, on provincial or private forestlands in Canada?

We do have a federal *Species at Risk Act*, but we don't lock up land and throw away the key, if that's your question. But our law does require development of a management plan that satisfies Environment Canada, which is a federal agency. The forest management plans go through a public consultation phase, so that in the end, we have a balanced management plan that groups with disparate interests can live with. Once the plan is developed, it is implemented, usually with little or no controversy.

CFS is Canada's foremost forestry research organization. What are the focal points of your research program and what is your annual budget?

Our total annual budget is about $161 million. Of this approximately $100 million is allocated to research and development. We do laboratory as well as field work. Much of the long-term focus is on improving forest productivity through the design of protection as well as harvesting systems that more closely approximate natural processes. We also do a good deal of lab work at the genetic level, particularly with insects and diseases. We're also searching for new biological agents that can replace pesticides that are environmentally harmful. Invasive species like the gypsy moth and the emerald ash borer are a major focus for us.

We also do a lot of seedling research mainly in cloning to produce better quality, disease-resistant trees. And we're doing some major work in the wildfire arena, trying to come up with better tools for predicting when and where big fires will occur. I'm an economist by training, so a good deal of this is way over my head. But as a layman I can assure that our work is elegant and very convincing.

How do you interface with other forestry research organizations in the world?

Most of our international work is through global organizations including the United Nations. We work to keep the playing field level. We also assist other developing nations that are struggling to get their economic legs under them. We believe a strong economy is the first step toward improving environmental quality. Here in Canada we also participate in joint research programs with our forestry universities and several institutes funded through partnerships (government and industry) including the Forest Engineering Research Institute of Canada and Forintek Canada Corp., separate organizations respectively engaged in forest operations research and improved wood utilization.

CFS also provides leadership to Canadian stakeholders for whom sustainable forestry is both an issue and a worry. How do you define sustainable forestry and can you enumerate the specific concerns stakeholders express?

I know this will sound trite, but for Canadians sustainable forestry is a journey, not a destination. We believe the working definition must include both scientific and social elements. We start from a belief that healthy economies and environments go hand in hand. As the world's leading lumber, pulp and paper exporter we also recognize that we must factually demonstrate to our customers that our forests are being sustainably managed. Otherwise, they will not want to buy our products. Our industry understands this, which is why there is such strong support for independent, third party forest certification.

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Spillmacheen River, Golden, British Columbia

What conflicts, if any, do you perceive between your sustainable forestry program and the parallel need to maintain harvests at levels sufficient to support Canada's forest products industry?

So long as we get the science right, balance the interests of those who use the forest and pay attention to the public's concerns, as well as those of our customers, we do not see any conflicts between sustainable forestry and the need to continue providing our forest industries with adequate supplies of harvestable timber. This isn't to say there won't be changes in harvesting levels from time to time, brought on by refinements in science or public policy or by losses due to fire and insect infestations. It's to say that we believe our forests and our industry can both be sustained in the long term.

Has third-party forest certification altered the way in which commercial timberlands are managed in Canada and, if so, how?

Yes, third-party certification is altering the way forestlands are being managed. Variable retention harvesting is replacing more simplified clearcuts, and there is, on the part of companies and on-the-ground foresters, an effort to inject real creativity into harvesting practices. As well, companies find that forest certification schemes bring greater consistency across jurisdictions in many areas. People share best practices. Certification has also changed the way companies build and maintain relationships with local people and environmental groups, through a better understanding of common interests.

Various interest groups are calling for preserving large portions of Canada's boreal forest. Some say current forest practices are destroying the boreal forest ecosystem. What is your response to this challenge?

We work for the taxpayers of Canada. My expectation is that we will settle this matter amiably using the same consensus-building techniques we've used so successfully in the past. It is my personal view that the ecological integrity of the boreal forest is not being threatened, but I recognize we need to prove this point with solid science.

Frankly, I think we are on the same page with most environmentalists. We recognize that we share a responsibility to protect the ecological integrity of boreal forests, as well as of other forests, while also protecting the economies of rural communities that depend on the forests.

Those who are concerned about the boreal must remember that its forests belong primarily to the provinces, not the Canadian federal government. I can't imagine that the provinces will want to get bogged down in boycotts or other actions that threaten their industries' relationships with their big box customers, such as Home Depot or Lowes.

What would you say are the most striking differences between Canada and the United States?

Oh my, I'm not sure I can answer your question. Your country is so much larger in population, and you are so much richer than we are. But I suppose if I had to contrast our two countries I would say that our national psyches are different. Yours is a far more individualistic society. We are more willing to tolerate ambiguity. Peace, order and good government are our watchwords. You chose life, liberty and the pursuit of happiness.

Reaching For Forestry's

"Sustainable forestry, including social forestry, must be founded on respect for nature as it is, not as we might want it to be. This requires that we separate what we perceive to be beautiful from forest practices that do, in fact, sustain the diversity of values we wish to leave as our legacy."

Hammish Kimmins, Ph.D., Canada Research Chair in Forest Ecosystem Modeling, Department of Forest Sciences, University of British Columbia

"We share the same broad goals. Our society is less adversarial and less litigious than yours. There is more respect, even when we strongly disagree with one another. Our solutions aren't always perfect, but we find ways to get along. I think it is cultural."

Avrim Lazar, President, Forest Products Association of Canada

An Essay By Jim Petersen, Publisher, *Evergreen* Magazine

Our Canadian neighbors are standing at a crossroads in the midst of an immense forest. Behind them lies a forest history rich in human and natural events. Just ahead lies forestry's Holy Grail: a sustainable future shared by those who love forests for what they are and those who love them for what they produce.

Once upon a time in America, forestry's greatest prize was within our grasp too, but then we took a wrong turn and spent the next 40 years lost in a regulatory wilderness, trying to figure out how to get nature to give us the forests we wanted with no effort on our part. Only recently have we rediscovered that nature—and especially wildfire—is indifferent to human need.

Meanwhile, our Canadian neighbors were busy building a forestry empire that is today the envy of the world. The question is, "Will they reach the Holy Grail, or will they get lost in the same wilderness that claimed us?" This is their story, told through the eyes of nine who have dared to reach.

Most Americans know Canada best for its beautiful parks. Few know that our neighbors to the north also own and manage some of the most diverse, most productive forests on earth. And they are

Near Revelstoke Lake, British Columbia

very good foresters. Credit well focused management plans controlled completely by provincial governments. Canada's federal government has no authority over provincial forest management decisions.

Canada is so large and so remote that 92% of its original forest land area is still forested. Small wonder then that Canadians have been thrust on to a world stage as no nation ever has.

"Ten percent of all the world's forests grows in Canadian soil," observes Hammish Kimmins, Canada Research Chair in Forest Ecosystem Modeling in the Department of Forest Sciences at the University of British Columbia. "We should not be surprised that we have become the subject of so much worldwide attention."

What is surprising is how well Canada is handling its newfound prominence. Indeed, the entire country —or at least those who are interested in forests—seems to have risen to the occasion in one way or another, and there is a unity of purpose that is hard to miss. It is as though a long awaited national conversation has begun.

How to protect Canada's rich biological heritage, how to convincingly demonstrate to the world that its provincial forests are being sustainably managed, and how to make sure the country's 1,200 timber communities and 100-some manufacturers also get to share in forestry's greatest prize, and are not swept away by globetrotting preservationists for whom Canada's great forests are a Holy Grail of another kind.

Few have been keener observers of Canada's quest to transform itself from a country with a reputation for heavy-handed treatment of forests into a world-class forest practitioner and conservationist than Dr. Kimmins, a scientist who many consider one of the finest forest ecologists in the world. We met in his cramped office on the University of British Columbia in early May, surrounded by books, papers and mementos of his devotion to forests and his students.

"We have moved on again," he says of his country's journey beyond early day exploitation of forests that once seemed so vast they would go on forever. "We moved first from exploitation to administrative forestry, which produced lots of timber but didn't do a very good job of accounting for variability in nature, to ecosystem-based forestry, which does a good job of accounting for diversity but still has a heavy emphasis on timber, only to recently conclude that while ecosystem-based forestry is ecologically sustainable, it still does not satisfy our more aesthetic, intrinsic needs."

You won't find it discussed in colorful brochures yet, but what Canadians, their federal and provincial governments and their scientific institutions are now flirting with is a blend of two disciplines that could not, of themselves, be more distant from one another: social science and forest ecology.

"I call it social forestry," Dr. Kimmins explains. "It is ecologically based, but it sustains values ranging from employment to spiritual. We're not there yet, and won't be for some time, but now there is a recognition that ecosystem-based forestry cannot meet all of our society's forest needs. And so we have come face to face with the reality that forestry isn't about ecology or biological diversity at all. It is about people, about the art, practice, science and business of managing forest stands and forest landscapes to sustain an ecologically possible and socially desirable balance of values."

It is clear from his many writings that Dr. Kimmins is comfortable with social forestry's evolution, just as he is with all of forestry's blossoming paradigms: ecosystem management, adaptive management, zoning, variable retention forestry and management regimes that emulate the natural range of variability in forests. But he says that many who are pushing social forestry lack a basic understanding of ecosystem function, and are thus poorly equipped to implement forest policies and management practices that can deliver on social forestry's promise of a brighter future for all. And he worries that advocates are not honoring nature's ambiguities—the fact that what is beautiful is not always sustainable and what is sustainable is not necessarily beautiful.

"We humans are an emotional species," Dr. Kimmins observes. "Our eyes and our hearts tell us what we value, what we think is beautiful and good. You would think that our heads could then tell us how to sustain what we value, but we often reject the head part, especially in forests. We reject clearcutting because it is momentarily ugly, and we embrace light-touch logging because there is little visual change. But nature doesn't work this way. Appropriately used, clearcutting is quite sustainable, and inappropriately used, light-touch logging is not the least bit sustainable. Sustainable forestry, including social forestry, must be founded on respect for nature as it is, not as we might want it to be. This requires that we separate what we perceive to be beautiful from forest practices that do in fact sustain the diversity of values we wish to leave as our legacy."

The fact that social forestry—still very much a work in progress—has burst on to the public stage in Canada attests to the two great differences between forest policy formation and subsequent regulation in Canada and the United States.

First, because Canada's forests are owned by the provinces, and the federal government has no hand in their management, people living in, say, Alberta or Quebec have absolute control over how forests in their provinces are managed. But in the United States, where most public forestland is federally owned, people living in, say, Montana, Idaho, or Oregon have no voice in the management of forests that often comprise 30 to 40% of their entire land base.

Worse, there are no credible mechanisms for building public consensus, or for reconciling conflicts between timber-dependent communities and the federal government, or communities and often-distant environmental groups. If a Florida environmental group disagrees with a man-

agement decision that favors a logging community in Montana they can hire a lawyer who can upend the decision in court. All that's needed is a modest understanding of conflicting U.S. federal environmental laws and regulations.

Second, Canadians hold their environmental groups accountable for their actions, just as they hold Canada's forest products industry responsible for its actions. In fact, the leader of Canada's largest forest industry association believes the two disparate groups share the same social license.

"We certainly do share the same social license," says Avrim Lazar, President of the Ottawa-based Forest Products Association of Canada. "The fact that most forestland in Canada is owned by the provinces creates a very different starting point in all of our discussions. We no longer fight with environmentalists. We engage them. We share responsibility for the health and sustainability of our publicly-owned forests and the communities that depend on them."

The forest products industry is Canada's largest industrial employer. Direct employment is over 375,000. Add in indirect employment and nearly one million workers—one in 30 Canadians—are dependent on the industry. After tax earnings have been chaotic in recent years, just as they have been in the U.S: $1.9 billion [Canadian dollars] in 2001 compared to $5 billion in 2000. Chalk it up to fierce global competition and, until this past year, the complete absence of pricing power. But as bad as 2001 was, exports of lumber, panel products, paper and pulp still generated $34.2 billion dollars.

Canadian wood and paper producers are well aware of their place on the global stage—a place they occupy not just because theirs is such a large industry, but more so because the forests they harvest from comprise 10%-plus of all the world's forest and, equally, because Canada still has 92% of its original forest land base, a preservationists dream come true.

"Our visibility—and the fact that we are the world's leading lumber and paper exporter—makes us a target in environmentally sensitive markets," Mr. Lazar says. "We have a special responsibility to assure companies that market or use our products that our forests are being sustainably managed. This is why third party certification is a condition for membership in our association. We want our customers to know that we are good forest stewards and that we intend to honor our global environmental commitment."

Almost 20% of all commercially managed forestland in Canada—143 of 724.7 million acres—has been certified as being sustainably managed in accordance with standards set by North America's three leading independent certifiers: the Canadian Standards Association, the Forest Stewardship Council and the Sustainable Forestry Initiative. Although their standards differ significantly most of North America's leading retailers and consumers, including Home Depot, Lowes, Staples, Centex Homes, Hallmark Cards and Time Warner Inc., accept all three as verifiable, third party evidence of sustainable forest practices.

Black bear and cub
Northwest Territories Resources, Wildlife and Economic Development

Mr. Lazar sees increasing interest in social forestry as yet another opportunity for his members to demonstrate their commitments to sustainable forestry.

"The licenses our members operate under are granted by communities, by the provinces," he explained. "People care about wild things and wild places, just as they care about jobs and recreation. We have to honor these values, be they social, economic, cultural or environmental, so whether you call it ecosystem management, social forestry or sustainable forestry really doesn't matter. The fact is we are engaged, we are involved, we embrace these values because if we don't we lose our license to work in the public's forests. Our member companies are required by law to seek citizen input before they submit their management plans to the provinces for approval."

Although Canada—and especially British Columbia—has witnessed some of the same eco-terrorism now common in the U.S., including protests carefully choreographed for television news crews, a recent industry-funded survey reveals six in ten Canadians has a favorable impression of the industry, compared to just 47% for corporations in general. Not surprisingly, the industry's favorable rating has improved steadily since it launched a major public relations offensive a few years ago.

But equally clear is the fact that there is an un-quantifiable closeness between the industry and the country as a whole.

"We share the same broad goals," Mr. Lazar observes. "Our society is less adversarial and less litigious than yours. There is more respect, even when we strongly disagree with one another. Our solutions aren't always perfect, but we find ways to get along. I think it is cultural."

It must be. How else does one explain the fact that Canada's largest forest industry association was able to work side by side with Canadian environmentalists, crafting language for the Canada's Species At Risk Act, that country's more proactive version of our federal take-no-prisoners Endangered Species Act?

"None of the participating groups wanted an act that trampled one side or made one side feel more righteous than the other," Mr. Lazar explained. "So we worked out a compromise we collectively believed would help wildlife."

Now Mr. Lazar and his members face

a new challenge: a global push by conservationists to create a system of forest and wetland reserves in the 752.9 million acre boreal forest, a Canada-wide region spanning 76% of the country's entire forestland base. Protests and boycott threats grabbed the early headlines, but in January the Forest Products Association of Canada, the World Wildlife Fund and Ducks Unlimited of Canada unveiled a bold strategy—the Canadian Boreal Forest Initiative—defining their mutual hopes for creating a land template that will include research areas, interconnected parks and commercial forestlands. The shared objective is to advance a series of scientific initiatives that promote sustainable forestry and habitat conservation while also providing jobs for the estimated four million people who earn their living in one manner or another inside the vast region.

As a show of solidarity Mr. Lazar's group is contributing $200,000 to World Wildlife Fund boreal research and another $100,000 to Ducks Unlimited research. Meanwhile, San Francisco-based Forest Ethics is again rattling its boycott sword. The new targets: catalogues produced by Lands' End, LL Bean, Williams-Sonoma, Pottery Barn, Victoria's Secret, J Crew and JC Penny. Forest Ethics says these catalogues are made from paper harvested from the boreal region, a practice it calls "despicable."

"I expect we will have our squabbles as this project moves along," says Mr. Lazar. "But we are pragmatists. Experience tells us we will arrive at mutually acceptable terms for conserving and developing the boreal forest." Assuming Canada's ability to calm nervous U.S. catalogue publishers he is probably right.

Few Canadians have a better grasp on Canada's often-ambiguous public discourse than Tom Beckley, an American-born Ph.D. sociologist who teaches at the University of New Brunswick. Dr. Beckley has been studying public processes and values for years. He recently co-authored a book, "Two Paths Toward Sustainable Forests," which compares forest policy formation processes in the U.S. and Canada.

"Although our early forest histories are similar, some big differences developed through time," he said in a May telephone interview. "Because 94% of Canada's forests are provincially owned people feel closer to the decision makers, feel that their concerns are heard and respected. Our politics are less contentious than yours, and ours is a less litigious society. We are more inclined to trust each other, to find ways to work out our differences. For these reasons I think most Canadians are more comfortable with a close government-industry relationship than people are in the U.S., though I sense this may be changing. But because so much of our forest is still undeveloped we have a window of opportunity, assuming our willingness to learn from the mistakes of others."

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Columbia Forest Region

Like many others I interviewed, Dr. Beckley validates the existence of a shared social license to harvest timber from provincial forests.

"Oh absolutely," he declared. 'We all feel it, not just for all that it means environmentally, but also because so much of our economy is directly dependent on international markets. Third-party forest certification manifests itself in our awareness of the need to demonstrate not only that our forests are being sustainably managed, but also that there is significant public buy-in. It's true that the provinces own most of the land and have most of the power, but they do not operate in isolation. Ours is a very transparent society. Scrutiny is constant."

And amid constant scrutiny, Canada's forest products industry is changing in a way that Dr. Beckley thinks may eventually pose problems for it.

"For years even our largest forest products companies were locally owned," he recalls. "Now as a result of mergers, consolidations and shutdowns we are seeing more foreign ownership. It remains to be seen whether Canadians will be as comfortable or as trusting as they were when their neighbors were running things."

For now though, the relationship between Canadians and their forest products industry seems solid. No less a conservation force than Jean Cinq-Mars gives the industry high marks for their efforts to reach out to all Canadians.

"For a long time the industry was perceived to be confrontational and insensitive to the public's more intrinsic forest values," he observed. "But they're doing better now. I suspect the possible loss of European markets had a lot to do with it, as did the increasing number of ecologically aware pension and investment funds. The media played a role too by focusing the public's attention on perceived environmental wrong-doing."

Mr. Cinq-Mars is president of Wildlife Habitat Canada, a non-profit foundation created by Canada's federal government in partnership with several conservation groups. It is funded by revenues from the sale of migratory bird hunting stamps, much like Ducks Unlimited is in the U.S. The organization promotes stewardship and applied science in resource management and is engaged in numerous habitat conservation projects across Canada.

"It is easier here than it is in your country," Mr. Cinq-Mars concedes. "Our population is small compared to yours, and we are more like a family. Also, we have more land to work with. Our relationships are much less adversarial; there is more of a feeling that we share the same responsibilities. We are more comfortable working with companies, and, of course, the provinces own most of our forestland. They have no choice

Balancing values - Communities throughout British Columbia rely on forestry for their economic stability, yet less than one third of one percent of the province's forestland is logged each year. More than half of British Columbia's forestland, a total of 86 million acres, will likely never be logged for environmental or economic reasons.

British Columbia Ministry of Foprestry

Commercial and sport fishing boats moored at Prince Rupert: British Columbia's managed forests support 15% of the province's economy while also providing a magnificent backdrop of fisheries, wildlife and recreation.

but to accept responsibility, make the rules, collect the royalties and fund economic and environmental programs."

Mr. Cinq-Mars organization does not lobby or litigate, as do virtually all conservation groups in the United States. "We get money from the federal government, so it would not be acceptable for us to lobby. And litigation designed to stop activity or lock up land is unknown in Canada. Mainly, we try to raise awareness of problems and propose structural and lasting solutions."

Among the problems: wildlife habitat fragmentation, especially in southern Ontario and Quebec where forestry, agriculture and urban sprawl collide; loss of old growth forests, insect and disease infestations and larger, more frequent wildfires; loss of ecological characteristics associated with wild forests, including large downed woody debris; multiple canopies and large trees; and the industry's push into timber-rich northern Canada.

Among Habitat Canada's recommended solutions: an expansion of regionally limited habitat conservation plans, linking Canada's sustainable forestry initiatives with science-based habitat inventory and monitoring programs, better identification of habitat action items, especially in boreal forests and development of a communications program to keep Canadians and Canada's global wood product customer base abreast of progress in habitat conservation.

"It all comes down to mutual trust and respect," Mr. Cinq-Mars observes.

Like Dr. Kimmins, Mr. Cinq-Mars has watched forestry in Canada move from one paradigm to the next: exploitation first, then administrative forestry and ecosystem management, and now social forestry.

"Canadian forests have long been used for privately produced products: timber, pulp, paper," Mr. Cinq-Mars says. "These are all good, but now the public in starting to recognize non-timber values: fishing, hunting and camping for example. And elsewhere in our society there is a recognition that forests also provide ecological services we all need: carbon sequestration, climate control, flood and erosion control and improved air and water quality. Our challenge is to accommodate all of our needs and wants without forcing any part of our society to bear more than their share of the burden."

Mr. Cinq-Mars also serves as president of the National Forest Strategy Coalition, a 55-member public-private partnership whose mission is implementation of Canada's National Forest Strategy, a sweeping plan that calls for simultaneous and sustainable, ecosystem-based development of Canada's forests and its forest products sector.

"It is a bit of a miracle," he says of the coalition's remarkably diverse membership. "We have coalition partners who until now have rarely seen eye to eye, including the Sierra Club and our forest products industry. This could not have happened were it not for the fact that all of our members feel the Forest Strategy is well balanced and evenhanded. There is something in it for everyone."

That such a diverse group could discuss two seemingly conflicting objec-

tives—a robust forest industry economy and an equally robust forest conservation strategy—in the same conversation attests to Mr. Cinq-Mars considerable diplomatic skill and, further, to the fact that Canadians know how to have a respectful dialogue with one another.

"We have our disagreements from time to time," he says, "but Canadians prefer not to waste time, money or energy fighting about problems that are common to all of us. We like the round table—the partnership approach. It is an underpinning in our society, not just where the environment is concerned, but with health care, social programs, all aspects of Canadian life.

Even so, American-style radical environmentalism is creeping into Canada's forest dialogue, especially in British Columbia, a fact that Mr. Cinq-Mars laments.

"There have been some protests, including tree sittings. A few have chained themselves to logging equipment, the same things you see in your country, including exaggeration and sensationalism to gain attention and money. But they can't stop the world here like they can in the U.S., so I expect that so long as we can keep our national dialogue going, hold confrontation to a minimum and avoid costly litigation, public support for our evolving Forest Strategy will continue to grow."

Unlike Canada, there is no national dialogue—or strategy—for managing and conserving forests in the United States. And in the current litigation-driven environment, it is unlikely one could be developed.

But Canada and the United States are alike in one respect: the federal governments in both countries fund impressive forestry research programs. But there is [again] one major difference. In Canada, most federal research dollars flow into active management programs maintained by provincial scientists and foresters who work in concert with leaseholder forest products companies that do the harvesting, replanting and habitat conservation work to standards set by the provinces. But in the U.S. most [but not all] federally funded forestry research is more theoretical, meaning it cannot be quickly or cheaply transferred to the ground. And because the U.S. government no longer manages federal forests for timber production, private, state and tribal forest landowners are the primary end users of taxpayer-funded research that can be easily adapted for daily use: growth simulation models, fire models, soil-hydrology maps, habitat and site classification systems and forest inventory data.

"A theme in Canada today is identifying management regimes that resemble or approximate natural processes, just like in the United States in the late 1980s and early 1990s explains Jim Fyles, a Ph.D. forest ecologist at McGill University in Montreal. Dr. Fyles was recently selected to head the Sustainable Forest Management Network, a federally funded program that funds university-level research in much the same way that the National Science Foundation does in the U.S.

Government of Canada

Goldstream Park, Victoria, British Columbia

"The original idea was to simply devise management regimes that would emulate natural disturbance patterns, like wildfire, insect and disease infestations or storms," he recalls. "But we have evolved from that rather unsophisticated view to a recognition of the very complexity of the question. The larger issue is that humans are here, and have needs that rarely match natural processes."

As the new program leader for the research network, Dr. Fyles first challenge is to foster a research culture amongst stakeholders who are under no obligation to follow his recommendations, much less implement the network's findings, whatever they may be.

"All of us who are engaged in research have to be careful not to stop on sensitive provincial toes," he explains. "Most of Canada's forests belong to them, not to the federal government or private industry. But in a broad sense we are helped in our work by the fact that our forests are so vast and our population is so small compared to yours."

Beyond doubt the biggest challenge facing Dr. Fyles involves bridging vastly different stakeholder cultures: the timber industry, communities, Indian tribes [known as First Nations in Canada] and environmentalists.

"Fostering an early comfort level is key," he says. "Scientists often lead cloistered lives, unaware of the rough and tumble national discourse that goes on around them. We have to change this by encouraging greater interaction between them and the stakeholders we serve. Otherwise, a great deal of very useful research will never be applied."

But science does not deal in absolutes—and there are few forest scientists willing to respond to public worries with simple "Yes" or "No" answers. There is always a caveat; a fact that Dr. Fyles concedes will frustrate the network's outreach.

"We scientists are very uncomfortable with absolutes," he explains. "But if your question is, 'Do we know enough to be managing our forests on such a large scale?' the answer is 'Yes,' with the caveat that we will never know all that there is to know about the forests we depend on for so much, which is why we have a social responsibility to proceed, and a scientific responsibility to keep looking for answers to questions we cannot answer today."

Of all the questions that are being asked by stakeholders—and consumers of Canada's vast forest bounty—none is asked more often than this: Are Canada's forests being sustainably managed? It is *the question* that has driven provinces, the Canadian federal government and Canada's export-dependent forest

products industry to embrace third party forest certification—seen by environmentally conscious consumers, among them Home Depot and Lowes, as the only true verification that Canada's forests are, in fact, being managed sustainably.

"It is such a value-driven question," Dr. Fyles observes. "As much as anything I think the answer lies in our commitment to keep asking questions and keep adapting our management practices as we learn more about forest productivity, habitat conservation and biological diversity. But clearly some of our past management practices were not sustainable, and clearly harvest levels will have to be reduced in some areas, if for no other reason than to accommodate an expanding forest reserve system."

Dr. Fyles' many insights are reaffirmed by Dr. David MacLean, a forest ecologist and Dean of the Faculty of Forestry and Environmental Management at the University of New Brunswick.

"Monitoring of multiple species is the key," he says of Canada's efforts to demonstrate to the world that its forests are being sustainably managed. "But, yes, we possess sufficient knowledge about our forests to proceed on large scales, and that is what we are doing. The main adjustment has been in the transition to harvesting regimes that more closely approximate natural disturbance patterns, not just wildfires but the often more subtle impacts of insects and diseases."

The theme is not new. In fact, most private forestland owners in the United States embraced it a decade ago, leaving more dead snags and green trees on harvest sites for cavity nesting birds, leaving more large woody debris on the ground to help replenish soil nutrients and provide habitat for small mammals, insects, reptiles and amphibians.

"The old 'cut it flat, burn it black and plant it back' mindset has given way to a large scale effort to conserve biological legacies," Dr. MacLean observes. "For example, how to design a harvest that approximates the natural aftermath of a spruce budworm outbreak or a wildfire that burns at varying intensities as it moves through a forest. We still have some distance to go in terms of striking a better balance between ecological function and timber production, but what we are now doing is certainly sustainable."

Few scientists in Canada have devoted more time or study to replicating natural processes in managed forests than Dr. Stan Boutin, a wildlife biologist attached to the Department of Biological Sciences at the University of Alberta in Edmonton.

"We are painting on a fresh canvas," he says of adaptive forest management in Alberta. "Our objective is to maintain system variability by reconciling forest practices with disturbance patterns that drive natural succession. It is the opposite of classic German forestry, which sought to control growth through even-age management."

Dr. Boutin joined the UA faculty in 1986, but he later left the university for three years to work for Alberta Pacific,

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British Columbia takes special care to maintain the diversity of its old-growth forests. Along the Pacific Coast, they are defined as being more than 250 years old, but inland, where trees don't live as long and wildfires are more frequent, 120–140 years old

one of the province's most admired lumber companies. As a result of this experience he views the industry through different eyes than do many of his research colleagues.

"I give the industry high marks for its willingness to accept change, to embrace our research on the ground," he says. "We are asking them to leave five to 15% more trees behind in their cut blocks to create the structural components of future biological diversity; and they are doing it willingly. In fact, the creativity that we see in the cabs of our mechanical harvesting machines is stunning. Loggers are very keen observers of nature. Once we teach them how to think like a wildfire they do amazing work."

Variable retention harvesting is the name given to the shift away from clearcuts that once covered thousands of acres in western Canada's remote forests. By varying the size and shape of harvest units—and leaving large groups of residual trees in patches of varying sizes and shapes inside each unit—Dr. Boutin and his colleagues are approximating structural and biological diversity created by wildfires as well as insect and disease infestation.

"The patches of trees that are left behind are left for good," he explains. "We won't be going back after them in subsequent years. They form the biological legacies we want to pass on to the next forest."

Dr. Boutin believes forests should be managed on a grand scale—millions of acres at a time if at all possible. How else, he says, can you effectively account for the risk that ecological legacies will be lost to natural disaster or human error?

"Many people believe forestry is simply a matter of managing tree growth and reproduction," he begins. "This isn't true. Forestry is about managing large landscapes for long periods of time. You need a land base large enough to hold all of the pieces you are trying to conserve, which means you need a land base large enough to allow you to distribute the impacts of human development. There is no other way in which to account for inevitable ecological losses caused by natural disaster or human error; no other way to avoid the steady increase in human activity that results when activity is confined to smaller and smaller spaces."

In Alberta—and across most of Canada—grand scale forest management is still possible in a way that it is no longer possible in most industrialized nations; first because much of Canada's vast forestland base is still virgin, second because the wildfire regimes that have dominated the country's boreal forests for thousands of years are relatively easy to approximate, and third because the provinces own Canada's forests and can manage them in any way they see fit. Unlike our U.S. Forest Service, provincial forestry organizations answer only to their provincial constituents, not the entire country.

"It makes a big difference in what we are able to do," Dr. Boutin concedes.

Two time zones east of Edmonton, amid Quebec's spectacular mixed conifer and hardwood forests Dr. Sylvie Gauthier, a fire ecologist with Natural Resource Canada's Canadian Forest Service, is studying long-term wildfire cycles in the province's commercial forests. Her objective mirrors that of forest scien-

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Beach on the west side of Point Pelée, Point Pelée National Park, Ontario

tists working in every Canadian province: identify management strategies that more closely resemble observable natural disturbance patterns.

"Our goal is to develop forest practices that promote the natural evolution of forests as well as the natural diversity of habitats," she explains. "We have assumed that we could simply replace the large openings that wildfires create with harvesting regimes that produce similar sized openings, but we're learning that it isn't that easy.

We have created regions with a large amount of young forest. Now we need to develop harvesting systems that maintain the mix of species and the variety of structure observed under natural conditions. Variable retention harvesting systems do account for species and structural diversity, but we still need a spatial component—openings of varying sizes featuring [for example] mixes of randomly spaced small and large trees in stands, and a mixture of young, mature and old-growth forest in the landscape."

For a time it was assumed that such intended randomness might result in more costly harvesting, and it is true that it costs are higher than they are for simple clearcuts, but according to Dr. Gauthier, the newer approaches she and her colleagues are testing may in fact yield more timber, with the added benefit that harvest sites might be ready for harvesting sooner than they might be if they were clearcut.

"As with all forest-related decisions, there are trade-offs," she says. "Some factors, like increasing timber volumes, are easy to measure, and others, like changing habitat or maintaining biological diversity, are more difficult to measure. But we are making steady progress. What is most important is that the results of our research be applied on the ground as quickly as possible."

Dr. Gauthier gives Canada's provincial lumber and paper producers good marks for their willingness to put Canadian Forest Service research to the test, particularly in a time when many wonder aloud about whether the pace of harvesting needed to sustain the industry can continue with so much public attention focused on forest sustainability and biological diversity.

"We are clearly at a crossroads in Canada," Dr. Gauthier concedes. "We have a vast forest that has never been harvested. Some people want it to stay that way, but I'm certain that it is possible to manage some of these forests in a sustainable way, while conserving biological diversity and producing wood and other economic benefits for northern communities. For scientists and society as well the key lies in learning how to minimize the ecological risks associated with harvesting. With knowledge and experience we can turn the unknown into the possible."

Of all the forestry research projects underway in Canada few, if any, rivals EMEND, an acronym for Ecosystem Management Emulating Natural Disturbance. It spans an astonishing 125 square miles and involves partners from academia and industry. Collaborative research on this scale has never been undertaken on public forestland in the United States, not that it isn't needed.

"They have turned us loose to find some answers," says Dr. Jan Volney, one of two EMEND project leaders and Senior Research Scientist in Forest Insect Ecology with the Canadian Forest Service. "We are defining a new research paradigm for forestry, at least in Canada. Extensive collaboration, no turf battles and very few institutional barriers, just way I like it."

It is clear that Jan Volney loves knowledge the same way Hammish Kimmons loves it. Books, scientific journals and reports are stacked high on every flat surface in their too-small offices, including chairs normally reserved for guests. Both men have also been in the forestry research game for a long time, 35 years in Dr. Volney's case: long enough to be willing *and able* to challenge conventional wisdom.

"Canadians are sensitive to global issues, like carbon sequestration, forest certification and biological diversity, because they have become market factors for assessing forest management sustainability," Dr Volney observes. "But the scientific underpinnings for many of the assumptions and conclusions that are being discussed aren't fully developed yet. EMEND aims to find some quantifiable, measurable standards that can be used to answer ecological questions."

The range of research projects underway in conifer, deciduous and conifer-deciduous forests 50 miles northwest of Peace River is indeed impressive: everything from 100% forest retention to zero retention, from prescribed fire to harvest only regimes, plus some related experiments in regeneration, soil nutrient dynamics, habitat diversity for birds and invertebrate species, hydrology, forest health, biomass productivity and factors that

influence changes in microclimates.

"You could say we are trying to figure out what makes these forests tick," Dr. Volney says. "We hope to determine which combinations of harvesting and regeneration techniques best maintain biological communities, spatial patterns in forest structure and ecosystem functions that have been influenced by wildfire for a very long time."

Like all of the forestry research the Canadian Forest Service is conducting, EMEND has its own political sensitivities, beginning with the fact that the forests in which the work is being conducted belong to the citizens of Alberta, not the Canadian federal government. Moreover, these are economically vital commercial forests, not designated research areas in which harvesting would normally not occur.

"Everything is negotiated—and very political," Dr. Volney says. "Our provinces are like your states, but they have as much autonomy as countries. It would be impossible for our federal government to impose a collective will. Of course, it would be possible for a large Canadian city—say Edmonton in the case of Alberta—to impose its will in a way that hurt rural, timber-dependent communities. But they haven't yet, probably because the wealth our timber and gas industries generate is plainly evident in Edmonton."

Does the sheer magnitude of Canada's harvesting program worry Dr. Volney?

"Not at all," he says. "I see systems recovering and I see lots of natural reproduction following harvest. But we need to constantly rebalance our harvesting equation so that we account for increasing forest productivity as well as natural losses caused by wildfire, insects and diseases. And we need to be sure we are managing our forests on the right geographic scale. Is it part of a province, an ecological region, all of Canada or perhaps North America in total? No one knows, but our two countries need to do some big picture thinking together. Otherwise, we are headed for biological problems somewhere down the road."

Americans living in the rural U.S. West can be forgiven for having difficulty comprehending the enormous scale on which forestry occurs in Canada, much less Jan Volney's vision, which he likens to the Marshall Plan, the U.S. led effort to rebuild war torn Europe after the Second World War. After nearly a century of prosperity, the West's timber economy vanished in less than a decade following the litigation driven collapse of the federal timber sale program. Chalk it up to profoundly different balances of political power and very different social and cultural agendas in our two countries.

In Canada the provinces own the forests, make all the management decisions, collect the rent and pay the bills. Good paying jobs in logging and milling remain the economic lifeblood in hundreds of rural communities that still hold real political power. It is no wonder the provinces annually invest hundreds of millions of dollars in forestry research programs, or that they—and the Canadian federal government—have gone to such great lengths to demonstrate to environmentally anxious global markets that Canada's forests are being sustainably managed.

So our story ends where it began: with a question. Will Canada claim forestry's Holy Grail? Will Canadians embrace what Hammish Kimmins calls "social forestry" or will they get lost in the same wilderness that claimed us for 40 years. Will social forestry deliver on its promise to find a way in which those who love forests for what they are can share them with those who love them for what they produce? Or will Canadians finally descend into the same legal and political morass that killed much of our forest products industry and pushed America's federal forests to the brink of ecological collapse. Lastly, will Canadians as a people continue to honor those who get their hands dirty every day, feeding, clothing and sheltering their nation, or will class warfare shred their society as it has ours?

Don't bet on it.

Government of Canada

Kicking Horse Mountain, British Columbia

Prince Edward Island

Population: **139,913**
Total Area: **0.57 million ha**
Land Area: **0.57 million ha**
Forest Land: **0.29 million ha**
Provincial Parks: **1,500 ha**

Tony Morrison's Lifetime Devotion To Island Forests

By Shiela Christie

Prince Edward Island's landscape is world famous for its blend of red farm fields, green forests, blue rivers and bays, and gently rolling hills. While agriculture, tourism and several fisheries are mainstays of the local economy, forests do play an important part in the economy environment and way of life in Canada's small province.

In terms of Canadian forests, Prince Edward Island is unique because some 16,000 small woodlot owners—rather than the provincial government or large industry—own 90% of the Island's 630,000-acre forest. Woodlots average about 50 acres, yet each one has its own unique history of human influences.

The results of several centuries of poor land use practices are still very evident in Island woodlots today. By the end of the nineteenth century, only 30% of the Island's was still under forest cover; the remainder had been cleared agriculture. The remaining un-cleared forest also faced huge pressures for building materials, fuel wood and other forest products. Subsequent generations left the land for opportunities in other places and over the next century, the forest reclaimed many abandoned old fields. By 1990, forests once again covered nearly 50% of the Island but this "new" forest was very different from the one encountered by the first European settlers. Therefore, it is safe to say that decisions made by people 50, 100 or even 200 years ago still influence today's forest management and harvest decisions.

While most of the forest is privately owned, most landowners do not carry out their own harvest or silviculture work. Instead, they rely on small contractors to thin overcrowded stands, plant trees on cut-overs or abandoned agriculture lands, or harvest and sell traditional forest products. Many of these contracting businesses are small, family-owned and operated ventures such as the one run by Tony Morrison of Gairloch, Prince Edward Island

In the spring of 1981, Mr. Morrison started planting trees on private and public forestlands in eastern P.E.I. In the early 1980s, many Islanders were just beginning to explore the potential of their woodlands. Planting trees and thinning overcrowded natural stands was something new and exciting to most people, and over the years, more and more Islanders began to get involved in forest management programs. Since that time many things have changed in the Island's forest sector, but one thing has remained constant over the years—Mr. Morrison is still planting trees and helping landowners to manage their forests.

By himself, Mr. Morrison has planted more than one million trees—a truly remarkable feat. These days he is also the man behind Renewable Energy Systems Inc., a company dedicated to silviculture and stewardship. For him and his crew, this involves planting seedlings and maintaining young stands by removing competition and giving the trees room to grow. The company also works in natural forests thinning overcrowded stands, doing selective harvests and improving the stem quality of slightly older trees by pruning their side branches. Much of this work is cost-shared between government, industry, and landowners who want to manage their forests for a wide range of reasons.

So what does Mr. Morrison see as the major changes over the past twenty years? "Since the early days, the number of trees being planted annually has increased substantially," he noted. "For instance in 1981 we planted approximately 470,000 trees in eastern PEI but now this figure is usually closer to a million trees per

year. This represents a major investment by hundreds of land owners in the future of the Island's forest sector."

The increase in tree numbers has resulted in a longer planting season. In the 80s, Mr. Morrison's planting season only lasted four to six weeks, but today it lasts ten weeks in the spring and another three to six weeks in late summer. His planting crew is a combination of seasoned veterans with years of experience and students who earn their college tuition over the planting season. When planting season ends, the students go back to school and the smaller crew moves into maintenance, pruning and thinning. He noted that, depending on the weather, maintenance, thinning and pruning work can now last well into late fall providing more employment for the people in his community.

Besides the increase in tree numbers and the length of the work season, Mr. Morrison felt that the other big change was the average size of today's planting sites. When he began, many sites were only four or five acres in size but today, 20–30 acre sites are not uncommon. This increase in harvest size was brought about by world demand for softwood timber and mechanization of the harvest industry in the 1990s.

For Mr. Morrison, the last twenty years have seen a lot of very early mornings on planting sites from one end of the region to the other. It has meant dealing with blackflies and mosquitoes, all kinds of weather, rough terrain, and hundreds of landowners.

But it has also meant getting to where he is now—an independent employer who enjoys what he does—working outside and sometimes thinning and pruning the same trees he planted more than twenty years ago. It has also given him the satisfaction of knowing his work has helped hundreds of Island woodlot owners become better stewards of the land.

Today his daughters often work beside him planting and tending trees for a new generation of Islanders. Mr. Morrison's one million trees are a feat by themselves, and when combined with the silviculture work that he and his crew have done and his personal commitment to forest stewardship, Tony Morrison is truly someone who has helped to keep Prince Edward Island's forests green.

Government of Prince Edward Island

Government of Prince Edward Island

Tony Morrison [top] figures that over the last 20 years he's planted nearly one million seedlings on private lands across eastern Prince Edward Island. [Below] His daughter, Sunny Patch, is joining him in the family business

Nova Scotia

Population: **944,765**
Total Area: **5.6 million ha**
Land Area: **5.3 million ha**
Forest Land: **3.9 million ha**
Provincial Parks: **30,507 ha**

After 400 years, forestry still drives the province's economy

By Susan Mader Zinck

George Chisholm has been working and managing his 200-hectares of woodland in western Nova Scotia for over 20 years. Home for George is Bear River, Digby County where he has lived all of his life and where forestry has historically played a significant role in the life of his community.

Mr. Chisholm describes himself as a conservationist and is committed to leaving 10% of his land in a natural state. His long-term goal is to see most of his property, which is largely abandoned farmland, restored to the Acadian forest type with long-lived species like red spruce, hemlock, white pine and oak returning to inhabit the land. He is also committed to managing his land as a productive forest through the use of different silviculture treatments such as shelterwood harvesting, commercial and pre-commercial thinnings, planting and weeding. As a result of the forest management practices on his wooded property, Mr. Chisholm was awarded Nova Scotia's Woodlot Owner of the Year award in 1998.

"During the last six years I've continued to carry out different treatments on my woodlots, most recently a pre-commercial thinning in a young stand to encourage the growth of red spruce." says Mr. Chisholm. "I've also increased the amount of work I do for others in my community who have similar goals for managing their forested properties."

Nova Scotia is located within the Acadian Forest Region, which includes Prince Edward Island and much of New Brunswick in Canada and Maine in the United States. The Acadian Forest is unique because of the variety of softwood and hardwood species that can be found throughout the region. They include red, white and black spruce; balsam fir (resulting in Nova Scotia's successful Christmas tree exporting industry); eastern white and red pine; eastern hemlock; red and sugar maple; white and yellow birch; trembling and large tooth aspen; and beech. In comparison, the Boreal Forest, located just below the treeless tundra in the northern areas of Canada, is dominated

Shirley Robb

An older clearcut flush with natural regeneration

Michael Creagen

Sorting lumber in a Nova Scotia mill

more by softwoods with fewer varieties of tree species.

Nova Scotia's total land area spans 5.3 million hectares, of which 4.25 million hectares are forested. The province's forests are made up of 52% softwood, 12% hardwood, 24% mixed wood and 12% land that is regrowing.

Mr. Chisholm's family-owned operation isn't unique in this province. Much of Nova Scotia's forested lands are privately owned—almost 70%—and have been passed down from generation to generation.

Although small in size by area, Nova Scotia has been actively logged since the early 1600s when Europeans first arrived on our shores and settled communities. Today, forestry is still a key economic driver, particularly in rural communities where many of the sawmills and family-owned woodlots are located. Nearly three quarters of the province's primary forest workers live in these rural areas.

Mr. Chisholm can attest to that as a fourth generation landowner himself who is committed to taking into account the natural environment around him by leaving wildlife corridors, cavity trees, snags and riparian zones along streams on his properties. His woodlots are also used for recreational activities, such as hiking and cross-country skiing.

Nova Scotia forests are essential to our way of life, providing opportunities for tourism, recreation, and clean air and water. Over 30,000 individual woodlot owners account for almost half of the productive forestland in the province. Woodlot and industrial lands together supply 90% of the annual provincial harvest, which totaled 6.1 million cubic meters in 2003.

In 1997, the Nova Scotia government introduced a forest strategy to ensure that the province's forests are sustainable into the future. Nancy McInnis Leek is the Director of Forestry for the Nova Scotia Department of Natural Resources and has been leading implementation of the strategy.

"A need for change in forest management was identified back in the early to mid-1990s to ensure that forest practices in the province were sustainable," says Ms. McInnis Leek. "The strategy underscores the province's commitment to biodiversity, ecosystem management and a strong, healthy forest sector."

There are a number of tools in place to support the forest strategy. Through new regulations the government is able to collect information on our forests, set requirements for silviculture work, and protect wildlife habitat to ensure that the forests and the environment they support are sustainable.

Staff uses a variety of education and information tools to assist the public in understanding the forest environment and forest use and to help landowners manage their forestland effectively.

The principles of the strategy are based on science, including ecological land classification and forest ecosystem classification systems. The Department of Natural Resources continuously

takes inventory of Nova Scotia forests, identifying changes that occur. This information is used to forecast the long-term wood supply, which can then be used to evaluate any changes that may be needed in government policy or within the forest sector.

Cooperation among government, the forest sector and other stakeholders will ensure that Nova Scotia achieves a varied and productive forest. Silviculture is key to ensuring the province's forests are sustainable, says Ms. McInnis Leek. Since 2000, the forest industry has carried out around $52 million worth of silviculture on more than 116,000 hectares of land.

"The amount of silviculture is tied directly to the level of harvest on private lands," she says. "And these figures illustrate that industry and private landowners are generally supportive of the strategy and its initiatives by their compliance with regulations and legislation."

The Department of Natural Resources will be developing a strategy to look at the next steps for Nova Scotia's forests and their use. Once finalized, implementation of the strategy will take place over a five-year period. Ms. McInnis Leek says it will be broader in scope, but also take into account any changes in the forest sector that need to be addressed.

"This strategy will look at any aspects or gaps that were not included in our first forest strategy, such as the interaction between forest management and watersheds,' says McInnis Leek. 'We will also look further at biodiversity objectives and some aesthetic and recreational values."

Nova Scotia's forest sector is an important part of the provincial economy, employing thousands of people directly and indirectly. It remains the backbone of the province's rural economy, much as it was back in the 1600s when communities were first settled in the new world.

The strength of our forests originates with our people, is founded upon sustainability and flourishes as a result of diversity. George Chisholm demonstrates management practices that underscore these tenets as he continues to manage his own and other woodlots in his in western Nova Scotia community.

Shirley Robb

Small logs await pickup on a Nova Scotia logging road

Nova Scotia Department of Natural Resources

A heavily timbered buffer zone separates a protected riparian area from a harvest site

New Brunswick

Population: **756,652**
Total Area: **7.3 million ha**
Land Area: **7.2 million ha**
Forest Land: **6.1 million ha**
Provincial Parks: **23,451 ha**

A Rich Forestry History and a Powerful Vision of the Future

By Gwen Martin

New Brunswick measures roughly the size of South Carolina and would slide handily into a corner of most Canadian jurisdictions. Even so, you can see forests from every highway in the province, often reaching unbroken to the horizon. Trees cover 85% of the landscape—a greater proportion of forested terrain than any other province in the country. What's more, the New Brunswick government has one of the most sophisticated forest management programs in North America. Reasons for this are twofold.

First, New Brunswick's social and cultural traditions are intertwined with forestry. It has buttressed the provincial economy since Thomas Jefferson was a babe in arms, and today more than 18,000 New Brunswickers work directly or indirectly in the industry. Visit any local museum, and you'll find walls hung with rusty bucksaws and peavey handles alongside faded photographs of men driving logs downstream. This sense of history encourages constant adaptation, helping New Brunswick forestry folk to incorporate lessons from the past with a powerful vision of the future.

Second, more than half of New Brunswick's forests grow on Crown land, which the province owns. Government thus can administer Crown woodlands to suit all aspects of its forest management program. Put simply, the program aims to integrate values such as water quality, biodiversity and wildlife habitat, the so-called non-timber values, with industry's need for sustainable volumes of timber. Bob Dick is manager of Forest Management Planning with the provincial Department of Natural Resources, and explains: "Our ultimate goal is to balance all forestry objectives, economic, social and environmental, while making sure the Crown forests are sustainably managed for the long term."

Which brings us to the keystone of Crown forest management in New Brunswick: the Crown Lands and Forests Act.

Ole Larsen photo courtesy PANB

Breaking a logjam in an eastern Canada river in 1897.

The Crown Lands and Forests Act was proclaimed in 1982 after years of preparation and consultation. It divides New Brunswick Crown land into ten timber licenses ranging in size from 277 to 2,641 square miles. Each license is leased through a 25-year forest management agreement to a large forest-based company: the licensee. Licensees manage their Crown forest licenses under the administration of Department of Natural Resources personnel.

The act gives the licensees access to timber on Crown land in exchange for meeting specific 'objectives and standards' set by government (more about those in a moment). Binding contracts called Forest Management Agreements define the responsibilities of each party.

Among other responsibilities, the provincial government is to:

- Establish forest management objectives reflecting current society values and new scientific data.
- Define standards that licensees must follow while carrying out those objectives on Crown land.

- Monitor all activities of forest companies operating on Crown land.

Each licensee must:

- Develop a forest management strategy incorporating all objectives set by government.
- Produce a forest management plan describing how it will meet those objectives. Management plans cover a 25-year period, are updated every five years and must be sustainable over an eighty-year planning horizon.
- Produce an annual operating plan. These highly detailed reports show how the company will carry out the strategies, how it will conduct harvesting and silviculture activities with appropriate attention to biodiversity and other environmental concerns.

The Department of Natural Resources regularly monitors forestry operations on Crown land across the province. Staff members assess criteria ranging from silviculture activities, road construction and harvesting methods to wildlife habitat and water quality. Billie Lewis is the department's Monitoring Coordinator and spends at least three months a year in the field with his inspectors. "Our job," says Mr. Lewis, "is to visit the harvest and silviculture operations, making sure people follow the government's requirements and the licensee's own management plans.

We monitor how they construct watercourse crossings, whether they're leaving proper buffer strips beside streams, the size of their deer wintering yards, that sort of thing." Inspectors also check that forestry companies meet specific operating standards while working on Crown licenses. The standards are designed to make the most sustainable use of Crown timber, while at the same time limiting environmental disturbance.

Every five years, the department formally assesses each licensee's management performance over the past five years. If satisfactory, if the company has honoured its management objectives, the department extends the 25-year forest management agreement for another five years. If unsatisfactory, the agreement is not extended, and the department requires the licensee to take corrective action.

And now for a closer look at New Brunswick's forest management goals to see how they play out on the ground.

The Department of Natural Resources defines two categories of forest management goals or 'objectives': timber and non-timber. The timber goal is to harvest the maximum sustainable volume of wood from each Crown license

New Brunswick Department of Natural Resources

Selecting spruce cones at Kingsclear Provincial Nursery. The nursery produces 20-25 million seedlings annually for New Brunswick Crown forests

while accommodating non-timber objectives. Non-timber objectives concern the social and environmental aspects of forest management—values such as biodiversity, wildlife habitat, water quality and protected natural areas.

The *timber objective* of Crown forest management appears straightforward; yet achieving that objective is anything but simple. Government must consider two vital issues: How much timber can be removed? And how and where can timber be harvested?

Each forest management agreement addresses the question of 'how much' by specifying the volume of timber that licensees can remove from their licenses. The so-called annual allowable harvest, the sustainable harvest level, represents the volume that can be harvested from a Crown license year after year without depleting the resource.

Scientists calculate the sustainable harvest levels through a detailed wood supply analysis that incorporates timber and non-timber objectives. The total wood volume harvested by all Crown licensees in New Brunswick cannot exceed the province's annual allowable harvest. Government and licensee personnel track the actual harvest from each license.

The 'how and where' of timber harvesting is even more complex, sometimes involving an acre-by-acre scrutiny of each operating plan. In brief, the government encourages licensees to tailor their harvest methods to suit different types of forest stands. Clear-cutting is appropriate for some stand conditions, and alternative harvest methods are preferable for others. About 30% of Crown forest stands are now selectively cut, part of a provincial trend towards using non-clear-cut methods.

New Brunswick's forest management philosophy emphasizes the importance of accommodating *non-timber goals* while meeting timber objectives. Close to a third of provincial Crown land is managed for the protection of biodiversity, wildlife habitat, watercourses and recreational or protected natural areas. The most striking aspect of these non-timber goals is their degree of refinement. Rather than vague statements such as "licensees must preserve old forest habitat," government spells out the types of tree community, the percentage to be maintained, the trunk size of mature trees... even the decayed quality of their branches.

Here is one example. Tree communities are fundamental to forest biodiversity. Their complex ecological systems support a characteristic assemblage of wildlife, insects and other organisms. Crown forests in New Brunswick support nine types of naturally occurring tree communities named for the species dominating upper levels of the forest stand, e.g. Balsam Fir. Companies first must identify where each type of tree community grows on the license and report that data in their management plans. Next, their harvest schedules must ensure that 12% of the total

area for each type remains in a mature stage, 'mature' meaning trees at least 18 inches in diameter and/or with deteriorating uppermost branches.

Forest habitat objectives are similarly refined. Scientists working on Crown land in New Brunswick have identified six types of old forest habitat needed for wildlife survival. Government requires licensees to track the total area of each habitat type on their license and monitor its continued presence. Further, they must maintain individual 'patches' on the ground, sized according to the habitat type. Old Spruce-Fir Habitat, for instance, is preserved in patches measuring at least 927 acres.

New Brunswick winters are not aggressive by Alaskan or even Michigan standards, but local white-tailed deer need protective habitat to survive the low temperatures and deep snow. Licensees maintain a specified area of land on each license as deer habitat. Deer wintering areas on Crown land presently total 680,000 acres. Another area under special management is watercourse buffer zones, vegetated strips of land immediately adjacent to banks of lakes, rivers and streams. Buffer zones protect watercourses from effects of erosion, soil compaction and siltation caused by tree harvesting. Timber removal is permitted in buffer strips, as long as their protective function is maintained. Licensees also must leave an aesthetic buffer zone 98 feet wide beside all numbered highways in the province.

New Brunswick recognizes the intrinsic worth of sites with exceptional aesthetic, cultural or ecological value. Protection of such sites is yet another forest management goal, one that mirrors evolving society values within and beyond the province. Government recently has established ten Protected Natural Areas across New Brunswick. They total approximately 383,240 acres and occur mainly on Crown land. Forest management activities in these areas are disallowed or highly restricted.

New Brunswick's forest management program goes far beyond establishing and monitoring timber and non-timber objectives. Silviculture, firefighting, insect and disease control, and forest inventory work also play critical roles in the overall strategy. "You can plan all the harvesting strategies and habitat protection you want," says Tom Spinney, Director of the Forest Management Branch with the Department of Natural Resources, "but they have to be supported by a strong emphasis on forest renewal through tree planting and other silviculture activities. We need to control fires and insect infestations. It's also crucial to have an accurate, up-to-date forest inventory so we know where we stand from year to year."

J.D. Irving Limited

An overhead crane transfers a roll of paper to a winder at J.D. Irving tissue mill at Saint John, New Brunswick

Silviculture work such as tree planting and pre-commercial thinning can boost the rate of natural forest renewal. Properly tended tree stands, ones that are cleaned and thinned on schedule, grow more quickly and produce more timber in less time than do untended forests. The end result: larger volumes of sustainable timber over the long term. Government requires Crown licensees to plant trees and conduct thinning on specified areas of their licenses. Since the 1970s, silviculture workers have planted 583 million trees and treated 716,590 acres of forest stands on Crown land.

Mike McDonald coordinates the provincial forest inventory, which, according to him, is "the best forest inventory in Canada. We use it daily in forest management decision-making ... to analyze timber supply, determine sustainable harvest levels, forecast biodiversity requirements, you name it." The most recent inventory began in 1993 and is updated, 10% of the province annually, on a continuous ten-year cycle.

New Brunswick's forest management program may be sophisticated, but it still is evolving. Government adjusts its strategies every five years to reflect new inventory data, recent scientific advances and changing society values. New Brunswick's commitment to aboriginal harvesting rights and forest certification are two cases in point.

The province recently signed five-year harvesting agreements with each of New Brunswick's fifteen First Nations. They receive 5% of the annual allowable harvest from Crown forests, all royalties generated by the aboriginal timber harvest, and proceeds from the sale of that timber. In 2002 New Brunswick also became the world's first jurisdiction to require forest certification of all licensees operating on Crown land. Licensees must be certified under the ISO14001 Environmental Management System. As well they must be certified and routinely audited under an independent Sustainable Forest Management System, either CSA, the Canadian certification standard, the Forest Stewardship Council [FSC] or the Sustainable Forestry Initiative [SFI].

New Brunswick's willingness to constantly adapt its forest management strategies is "perhaps our greatest strength," says Bob Dick. "We've been at this a long time. Whenever we add new objectives, improve the inventory, and so on, we're in a better position to find common ground between the various users of our Crown forests."

Which, it seems, is the end game of wise forest management.

Québec

Population: **7.5 million**
Total Area: **154.1 million ha**
Land Area: **135.7 million ha**
Forest Land: **83.9 million ha**
Provincial Parks: **7.2 million ha**

Stakeholders and citizens are getting more and more involved

By Rémy Charest

Forests take up an important place in Québec, in more than one way. First, because woodland covers nearly half of Canada's largest province —290,000 square miles, an area larger than the state of Texas and almost twice the size of Montana. Tree-covered expanses are a constant, visible presence in most Québeckers' lives and, since 89% of them are under public ownership, an important concern for everyone.

Interest in the state and future of Québec's forests is also driven by their economic importance. Wood processing represents the main manufacturing activity in nearly 250 municipalities, and accounts for 13% of all manufacturing sector jobs in Québec. In 2002, shipments reported by the forest products industry totaled nearly 15 billion US dollars, two-thirds of which went for export.

Even the large urban centers have a stake in the forestry sector. Québec City, the capital of Québec, is host to several forestry research centers, including Forintek, a world leader in the development of cutting edge engineered wood products and lumber manufacturing processes. Montreal, Québec's largest city, is host to international associations like the Pulp and Paper Products Council, and to the corporate headquarters of eight pulp and paper companies that have a combined annual production capacity of some 20 million tons.

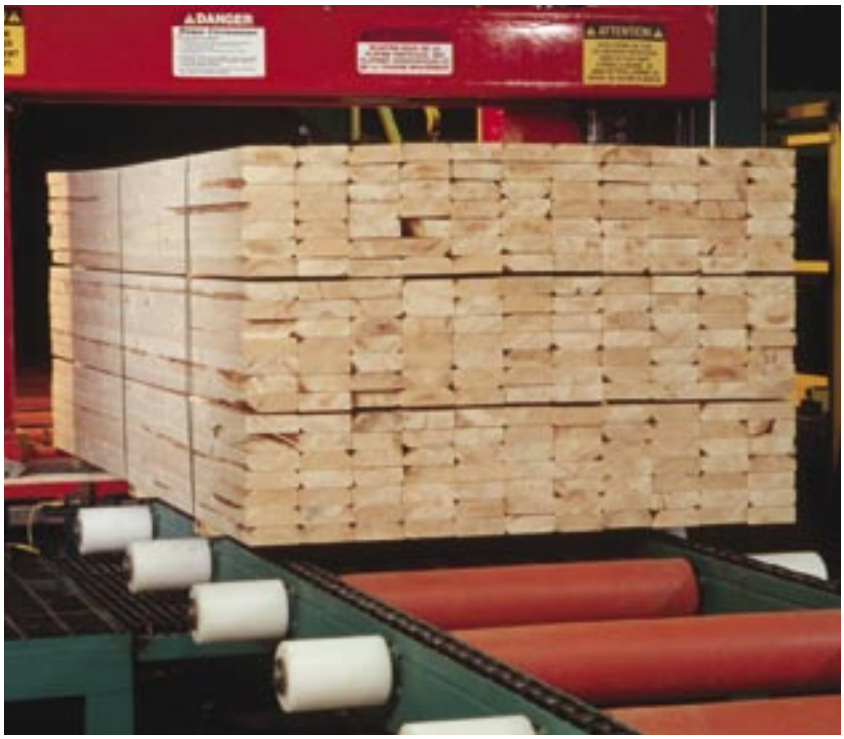
Quebec Ministry of Forestry

Regular testing of growth rates in publicly owned forests is an essential part of Québec's sustainable forest management program

Beyond forestry, millions of people also use the forests for hunting, fishing, hiking and other outdoor activities, a sector that represents over three billion dollars in yearly spending in Québec. Thousands of jobs are also linked to Québec's famous maple syrup industry, which represents over 90% of Canada's production, while activities like the harvesting, in forested areas, of other plants like blueberries or the Canada yew, highly sought-after for its pharmaceutical properties, are growing in importance. Meanwhile, Québec's network of protected areas has grown from 2.9% of Québec's territory in the late 1990s to over 5.5% today, as the province works to protect at least 8% of its territory by the end of 2005.

Participating in forest management

Ensuring that these various uses of Québec's forests can cohabitate as harmoniously as possible is, of course, a complex task. "Making sure that all users are treated with consideration, and conciliating the presence of many users on the same territories is one of the most important challenges facing Québec's forestry management system," says Marc Ledoux, the associate deputy minister for Forests at the Ministry of Natural Resources, Wildlife and Parks.



Quebec Ministry of Forestry

Lumber enroute to final packaging at a Québec sawmill. Lumber and paper manufacturing are essential to the economic vitality of hundreds of rural communities scattered across the province

Québec's forestry management system has evolved considerably in order to help this multi-usage conciliation process. In the late 1990s, an in-depth public review of the system led to the drafting of a number of new legislative measures, which were adopted by Québec's National Assembly in May 2001 and have gradually come into effect since then.

A fair number of these recent measures look to increase the involvement of stakeholders in the planning of forestry operations, a movement that has accelerated considerably in recent years. "Over the course of the last two decades, we've gone from providing information to consultation to participation", sums up Mr. Ledoux. " The process began at an administrative level in the 1990s, and was made into a formal part of the system, at the legislative level, in 2001."

Increasing public involvement is seen as a way to improve the acceptability of forest management methods and forcing all stakeholders to interact and take each other's perspectives into consideration. Jacques Gauvin, the director general of the Québec Forest Industry Council, the sector's main association in the province, points out that the consultation policy "is a concerted effort to make the process more transparent" and thus a good way to reinforce the industry's credibility.

Now, public consultations are required for a wide-range of subjects, including: general policies and programs concerning the management of both public and private forests; public land use plans; the indicators used to evaluate the performance of logging rights holders; the protection of exceptional forest ecosystems; the determination of forest protection and development objectives (soil and water protection, ancient forest preservation, etc.) within each forest management unit, as well as any significant amendment to the *Forest Act*. The re-drawing of the management units that compose public forests and the definition of a northern boundary to commercial management, following the 2001 review of the *Forest Act*, was the first major step in this process—along with a public consultation on the public consultations policy itself.

Although they are called by the minister of Natural Resources, Wildlife and Parks, the consultations are primarily managed by regional authorities. The goal is to allow stronger participation at the regional level, and to make sure that policies can be adjusted to the specific requirements of each region. In the same spirit, the *Forest Act* also states that consultations involving Aboriginal communities must be adapted to better take into account their traditional activities and values.

In the years leading to the 2001 legislative amendments, many had called for such a process to be included in the public forest management system. Still, the introduction of a systematic consultation process was met with a certain dose of skepticism "For many people, the first reaction is to say that consultations aren't any use, that they won't change anything. I can tell you that certainly isn't the case," says Richard Savard, the person in charge of forestry issues at the Conference regionale des élus du Bas-Saint-Laurent, a forum of elected representatives from this region of Eastern Québec. Indeed, a recent survey of consultation participants by the ministry of Natural Resources, Wildlife and Parks showed that about 70% of participants felt their opinions were taken into account as policies were developed.

"There have been two major consultations since the 2001 legislative reform," Mr. Savard explains. "The first one was about the reorganization of the territorial units for forestry management. People actively took part in that one, there was plenty of time to prepare, and the government listened. The result was really wonderful. The second one, in the fall of 2003, was concerned with the introduction, in the five-year management plans used by logging right holders, of the new forest protection and development objectives. That one was not quite as successful: with the many complex subjects involved, people were less able to intervene in a fully knowledgeable manner. Still, the process is a clear improvement over the past."

Gilles Lavoie and Anne Stein, two of the people responsible for organizing the public consultation processes within the ministry of Natural Resources, Wildlife and Parks, point out that the system is still quite young, and that adjustments will be introduced, over time. "We need to change perceptions and ways of thinking, to reduce the level of mutual apprehension, and that takes years to accomplish", points out Lavoie.

"Consulting is a way to help make the best possible decisions," says Anne

Stein. "We hope that it will allow the ones to be more understanding of the others, and that public consultations will increasingly become a forum for dialogue."

Improving Dialogue

One area given special consideration, in this context, is the participation of Québec's 11 Aboriginal Nations in the management and development of Québec's forests. Today, partnerships are beginning to emerge where tensions and loudly expressed discontent—if not pure and simple mutual ignorance—were more often on the agenda.

"Fifteen years ago, the people involved on either side hardly knew the names of the people across the table," sums up Jean-François Gravel, director of Aboriginal Relations at the Ministry of National Resources. "Now, people are talking, and often on a regular basis."

The best example of the considerable change in the nature of the relationship between First Nations and the government of Québec is the signing of a new and innovative agreement between Québec and the Cree people living in the greater James Bay area, in the northern part of the province. Signed in February 2002, this "Peace among Braves", as Cree Grand Chief Ted Moses named it, put an end to two decades of legal battles and often tense relations between the Cree and the Québec government. It is a wide-ranging, fifty-year deal involving hydroelectric development, mining, forestry, wildlife and community development. The signing of this "nation to nation" agreement was a watershed moment that has highlighted a change in the tone and substance of relations between Aboriginal peoples and the government of Québec. Within a few months, a similar, twenty-five year agreement had been signed with the Inuit people, the Cree's northern neighbors.

Quebec Ministry of Forestry

Because Québec's provincial forest management strategy relies largely on natural regeneration a good deal of attention is devoted to protecting sprouting seedlings and their vitality as well as soil stability and nutrient production.

In the 1980s and 1990s, Cree representatives had actively campaigned on the international scene to make their disagreements with the Québec government known. Today, they are regularly appearing in international forums, including various United Nations organizations, to present the 2002 agreement as an example for governments all over Canada and all over the World.

At the forestry level, a Cree-Québec forestry board, along with joint working groups in each Cree community, started working in 2003, in order to put in place an adapted management system taking into account traditional Cree activities, the location of trap lines used by Cree fur trappers and of culturally significant sites, as well as wildlife management considerations.

An article in the winter 2004 issue of *Eeyou Eenu Nation*, the Grand Cree Council's magazine, pointed out that recent months have been "exceptionally productive", as the Cree-Québec joint working groups completed important work like the complete mapping of trap lines, and the establishment of protected areas and wildlife interest areas within the territory covered by the 2002 agreement.

Québec Forest Industry Council's Jacques Gauvin describes the discussions between forestry companies present in the area and the Cree authorities as "cordial" and wide-ranging: "proposals by both sides have covered issues such as job training, management overview, and the way the new rules may affect supplies and employment levels for Cree and non-Cree workers."

The agreements signed in Northern Québec are by no means the only examples of this change in outlook. For instance, the modernization of Bowater's sawmill in the town of Maniwaki, in western Québec, took place in large part thanks to a five-year partnership signed between the company and the Algonquin first nation of Kitigan Zibi, an immediate neighbor to Maniwaki itself. The community has signed a five-year agreement to deliver its wood allocations in Québec public forests to the Maniwaki plant, thereby contributing over a quarter of the supply that the plant needs for its annual production of 135 million bfm.

In north central Québec, an agreement between the ministry, forest companies active in the region and the Manawan Atikamekw community have defined community involvement

in the forestry management decision-making process and allowed a growing number of young Atikamekw to be employed in local forests. At a time when the forestry industry is increasingly concerned about renewing an ageing workforce, nearly 100 young aboriginal workers will be doing sylviculture work this year, up from 67 in 2003.

Other agreements of varying scope have been signed or are being negotiated with several other Aboriginal communities all over Québec. Although outstanding issues remain in some regions—tensions with the Long Point Algonquin First Nation, in Northwestern Québec, delayed the beginning of the harvesting season in the area's public forests, this spring—the climate has changed considerably over the last few years. "There is a much better mutual understanding of everyone's point of view," says Jean-François Gravel. "It's no longer a question of one side wondering what the other wants to take away from them."

Quebec Ministry of Forestry

Forintek is the only research center in eastern Canada that is entirely dedicated to wood product development. It's headquarters in Québec's capital, Québec City, showcases the structural and creative possibilities for engineered wood products.

Facing the future

Indeed, conciliatory attitudes will be needed across the board, as Québec's forest sector sees more change on the horizon. For instance, limits in the expansion of available supply and changes in the context of international trade are pushing companies to increase secondary and tertiary processing. Québec is aiming to ensure that such changes still allow the industry to remain present all over the province, in order to sustain regional economic development.

Also, an independent commission on the management of Québec's public forests was called late last year to ascertain whether the system is fully meeting its objectives. Numerous regional and national associations, forest companies, wildlife managers and environmental groups have made representations in this new round of consultations on Québec forestry. The commission's report is expected by the end of 2004, and will likely include recommendations reinforcing integrated forest management in Québec's public forests, in order to further improve the balance between social, economic and environmental factors.

Enacting such changes would certainly be a new test of Québec's capacity to generate constructive dialogue between forest sector stakeholders.

Managing Québec's Public Forests

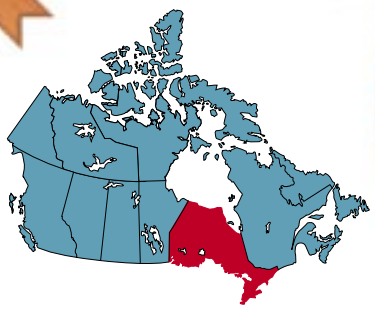
Public forest management in Québec is governed mainly by the *Forest Act* and its regulations. Its stated objectives are sustainable development, accountability and public participation in the decision-making process. It promotes management methods that favor natural regeneration of Québec's forests, in order to preserve the characteristics of each ecosystem.

A central aspect of the Act is the Timber Supply and Forest Management Agreement (TSFMA), a twenty-five year contract offering long-term supplies to the forest companies, in exchange for managing the forests in a manner that will maintain or improve productivity and, through a series of protection and development objectives, preserve its biodiversity. Several agreement holders can cohabitate on a single territorial unit; they then become collectively accountable for the management activities and their results on the whole territory.

By law, such agreements are reviewed every five years, and extended for a further five-year period, insofar as the holder has fulfilled its obligations. Harvesting is allowed within the limits of a determined allowable annual cut meant to ensure stable supply levels, and companies pay the Québec government stumpage fees calculated in direct relation to the price of standing wood on the marketplace.

As part of their obligations, TSFMA holders must draw up five-year General Forest Management Plans that describe the management strategies and activities and the silviculture work that is to take place over that period of time. Under the provi-sions of the *Forest Act* enacted since 2001, Agreement holders are now obligated to include municipal authorities, Aboriginal communities, wildlife area managers and other stakeholders in the preparation of these plans.

Ontario



Population: **12.1 million**
Total Area: **106.9 million ha**
Land Area: **89.1 million ha**
Forest Land: **58 million ha**
Provincial Parks: **7.2 million ha**

A World Leader in Sustainable Forest Management

By Kenneth A. Armson[1] R.P.F.

A glance at any map showing the natural features of Ontario reveals a vast swath of forest that covers two-thirds of the province. While 174 million acres of land is forested, it hasn't always been that way. Ontario's forests are relative newcomers, sitting on lands that were shaped by continental glaciers, water and wind just 15,000 years ago. The trees became established on what was then a barren landscape as the ice retreated and waters receded south. Human settlement also happened in waves: first the Aboriginals, then Europeans and more re-cently people from all over the world.

Humans have had a significant effect on the forests, leading to increasing concern in the past century. However, the nature of the forest and the trees it contains is largely determined by overriding climatic conditions. For example, the boreal forest in northern Ontario still has remnants of eastern white and red pines, species characteristic of the Great Lakes–St. Lawrence forests to the south. Their presence reflects a period some three to four thousand years ago when a major warming of the climate allowed such species to move north.

Ontario Ministry of Natural Resources

Crystal Creek, near Sault Ste. Marie, Ontario is managed as a ski area, with periodic tree removal, but the boreal forest in the province's northwest quarter is more intensive managed as these block cuts indicate.

There are four main kinds of forests in Ontario. The most northerly part of the province, the Hudson Bay Lowlands, is an area of subarctic barrens with black and white spruce and willow trees. Below this is the Boreal forest, the largest forest region in Ontario and Canada. Here the main conifer species are black and white spruce, jack pine, balsam fir, tamarack and eastern white cedar; the predominant deciduous species are poplars and white birch.

These forests are very similar to those in northern Minnesota and parts of upper Michigan. Next is the Great Lakes–St. Lawrence region, the second largest in Ontario, which contains a wide range of tree and

shrub species. These range from eastern white pine, hemlock and white cedar, red pine and balsam fir to sugar maple, white and yellow birches, red oak and basswood. The deciduous forest region is the most southerly and is situated north of Lake Erie. While it has most of the tree and shrub species found in the Great Lakes—St. Lawrence forest, it also contains black walnut, butternut, tulip, magnolia, black gum, many types of oaks, hickories, sassafras and red bud—species commonly found in Ohio, Pennsylvania and the Carolinas.

For millennia, Ontario's forests have been shaped by major disturbances such as forest fires and fierce winds. As a result, there are large areas with one or more species that are adapted to regenerate after such catastrophic events. In the boreal forest, these include black spruce, jack pine and poplars, while the Great Lakes–St. Lawrence region has eastern white pine and red pine. In these forests, indigenous pests like the spruce budworm and forest tent caterpillars have also affected the nature of forest development. While the size, location and extent of infestation have varied, these pests have affected a wide range of forested landscapes. Of course, forests have also continued to change due to human activities. In the deciduous forest region and southern portions of the Great Lakes–St. Lawrence region, use of fire by Aboriginal peoples and cultivation of crops, such as corn, beans, squash and tobacco, was a major factor in determining the nature of the forests in the thousand or so years before European settlement.

The lumber industry in Ontario first developed in response to Great Britain's need for timber during the Napoleonic Wars and to an ever-expanding market in the United States since the mid-1800s. During this same period, much of southern Ontario's forest was cleared for agriculture, which also led to serious erosion by wind and water on areas of sandy soils. When over-harvested pine forests that had been burned by settlers' fires or wildfire failed to regrow, it raised serious concerns. As a result, a conservation movement that started in the 1880s gathered strength and resulted in the establishment of Algonquin Park in 1893. Set aside as a *"public park and forest reservation, fish and game preserve, health resort and pleasure ground for the benefit, advantage and enjoyment of the people of the Province",* Algonquin Park was then a major source of timber. Forest harvesting has continued in the park since 1975 under the careful management of the Algonquin Forestry Authority. Increased interest in conservation also led to the establishment of a provincial forest fire protection service. In southern agricultural areas, the reforestation of eroded and marginal farm lands was accomplished through municipal forests—some of the first in Canada. Significantly, the movement also resulted in the establishment of Canada's first faculty of forestry in 1907 at the University of Toronto. Fifty years later, the Ontario Professional Foresters Association was formed to "…promote and increase the knowledge, skill and proficiency of its members…" In 2000, the association became a licensing body with authority and responsibility for the regulation of the practice of professional forestry by its members.

The tremendous growth of the United States economy in the first quarter of the 20th century provided both markets and incentives for investment in Ontario's forests, particularly by the pulp and paper industry. This was the beginning of the initial exploitation of the Boreal forest, and led to the earliest attempts to manage the forests on a sustainable basis for timber.

With that outline of Ontario's forests and some of the factors that have affected them as background, the purpose of this article is to look at what Ontario has done in recent years to promote sustainability. The fact that Ontario's forests reach back some 15,000 years doesn't necessarily mean they will be there for another 15,000 years. Unless they are managed sustainably, they could cease to be a vital part of the province's landscape and of people's experience of Ontario. As noted above, a conservation movement helped remake public attitudes to the forest, and recent years have seen Ontario shift its forest policy to a more balanced ecological approach. During the past two decades, the province has worked hard to become a world leader in sustainable forest management

It is important to note that a full 88% of forested lands in Ontario are provincially owned and known as Crown lands. All forest policies and management practices on these lands must conform to the Policy Framework for Sustainable Forestry, which covers such matters as harvesting and regeneration, the management of old-growth forests and the protection and conservation of non-timber values.

The goal of forest sustainability is entrenched in *The Crown Forest Sustainability Act* (1994) and entails providing for the sustainability of Crown forests while managing them to meet social, economic and environmental needs of present and future generations. This legislation covers all aspects of forest management, including planning, operations and silviculture, timber measurement and forest information systems.

Ontario Ministry of Natural Resources

Hooker Lake, near Sioux Lookout, is reserved from harvesting because it lies within Ontario's expanded park system. Excellent walleye fishing attracts many anglers from the United States.

In 1988, the management of timber on Crown forests was the subject of a thorough and in-depth environmental assessment, the first such comprehensive assessment of a province's management of public forests in Canada. The Decision of the Board in 1994 approved the "undertaking" but placed a number of terms and conditions with timelines for implementation. Board hearings covered concerns raised by Aboriginal peoples, forest interest groups and the public. Issues such as clearcutting, the use of pesticides, and managing for water, wildlife, aesthetic and cultural values were addressed in the board's decision. While initially focused on timber and long-term supply, many of the assessment's terms and conditions dealt with how forest management affected other non-timber resources and values, biological diversity and the environment. The environmental approval of 1994 was extended and amended in 2003.

Ontario Ministry of Natural Resources

Ontario's official tree, the eastern white pine, is making a comeback, thanks to a special provincial reforestation program. First harvested in the Ottawa Valley in the 1600s, it was a staple of the shipbuilding industry for many years.

Most of Ontario's Crown forests are divided into forest management units. Before any forestry activities can take place, a forest management plan must be prepared. The plan is developed by a Registered Professional Forester with help from a multidisciplinary team and input from a Local Citizens Committee, and must follow the requirements of a government manual. This includes determining the available harvest areas and assessing criteria and indicators of sustainability that meet Canadian and international systems (the Montreal Process).

Forest companies manage Crown forests under Sustainable Forest Licences. These cover a period of twenty years and are subject to renewal every five years following a satisfactory report, made public, by an independent third party audit. Companies are responsible for forest management on their licence area and pay the province for the right to harvest timber. Known as a stumpage charge, the fee consists of a base charge, a forest renewal charge and a residual value. The forest renewal charge is held in a trust fund to be used for forest regeneration on the licence area. Residual value is the percentage difference between the selling price of the forest product and the cost of manufacturing.

Ontario's balanced ecological approach to the forest has been reflected in a major focus on setting aside significant areas of productive forest land as parks and protected areas. In these areas, logging, mining and hydro-electric development are for the most part excluded. In some cases, proposed areas for protection were within existing areas licensed to forest companies. Since their removal would affect timber supply, representatives of the forest industry, the environmental community (Partnership for Public Lands) and the government met in 1999 to try to resolve this issue. The result was *the Ontario Forest Accord,* a ground-breaking agreement that created a process for setting aside more parks and protected areas in the future and that promoted studies on ways to increase forest productivity. Since 1999, about 9,375 square miles have been added to Ontario's system of parks and protected areas. The system now protects 35,500 square miles, and forests make up 23,500 square miles of that total.

Ontario's stringent legislative and policy framework to safeguard forest sustainability means that forest companies operating in the province are well-placed to meet the standards set by any third party forest certification system. In fact, the province is moving to require that all Sustainable Forest Licence holders be certified to an accepted performance standard by the end of 2007. This is complemented by similar requirements from the Forest Products Association of Canada that its members meet the standards of sustainable forest management of the Canadian Standards Association (CSA-SFM), the Forest Stewardship Council (FSC) or the Sustainable Forest Initiative (SFI) by the same date. Currently 31,250 square miles are already certified to one of these standards.

The province's commitment to sustainable forest management is also strongly supported by forestry science and innovation. MNR scientists work closely with the Canadian Forest Service, universities, forest industry and other organizations, to help forest managers take a lead role in developing new approaches and practices in their forests. New technologies are used to gain better information about both timber and non-timber values and to adapt practices to conserve those values at both forest and landscape levels. Such innovation is a priority and research is focused primarily on two large forest pilot studies. As well, two forests—one in the boreal forest and the other in southeastern Ontario—are members of the Canadian Model Forest Program. With one located on Crown forests and the other in an area made up primarily of private lands, the model forests been the source of many cooperative studies and technology transfer in the past two decades.

In ensuring sustainable forest management, it is ultimately silvicultural practices that determine what evolves after harvest. These practices involve different methods of harvesting and regeneration, as well as the tending and protection of the forest. The clearcutting system is used mainly in the Boreal forest and is designed to mimic many of the effects that would occur from natural fire. Under the Natural Disturbance Pattern Emulation Guide, harvested areas must vary in shape and size, and trees are left behind to ensure successful and healthy regeneration. Regrowth may also be promoted by seeding or

planting. In such cases, mechanical site preparation may be used and some form of tending applied during the early development of the young stands of trees. The shelterwood system is used mainly in the Great Lakes-St. Lawrence region with eastern white pine and sometimes hardwoods such as yellow birch. The selection system is also used here and in the deciduous region in hardwood forests. With both the shelterwood and selection systems, the main focus is on natural regeneration. Ontario also has several detailed guides for the management of fish and wildlife and other non-timber values which provide forest managers with direction in the design of silvicultural practices

While the vast majority of Ontario's forests are Crown forests, private forests do make up about 11% of Ontario's forested lands. They contribute a substantial proportion of Ontario's timber harvest and also provide other products such as maple syrup. Private landowners are supported by the Ontario Stewardship Program, funded by the government, which provides help in finding information and expertise to better manage their forests. The program is delivered through a network of 40 Stewardship Councils comprising volunteer groups of landowners working with Ministry of Natural Resources staff.

Human efforts to maintain healthy and sustainable forests must also address fire, insects and disease—all natural components of forest ecosystems. This often means intervention to protect young forests or those with significant values. To help detect and suppress forest fires, a provincial air service was set up in 1924—the longest flying non-military government air service in the world. Over time, the Aviation and Forest Fire Management program has evolved and now takes a broader approach in providing not only protection for the health, safety and property of people living in and near forests but in allowing forest fire to fulfill its ecological role in certain forests. Ontario's fire management program has been innovative in adapting new technology in detection and suppression and in working with federal and other provincial forest fire agencies through the Canadian Interagency Forest Fire Centre.

Ontario Ministry of Natural Resources

Ontario's vast Algonquin Park is very popular with canoers and campers from both the U.S. and Canada. The area features a well-balanced mix of reserved areas and areas where harvesting is permitted.

Forest insects and diseases can readily change forest conditions, often over large areas. A number of the major pests, such as the spruce budworm, tend to be cyclical. During a period of 13 years (1967-1980) this pest, which actually prefers balsam fir, defoliated over 72,656 square miles of mostly balsam fir and white spruce. Trees killed by insects are a ready source of fuel for a forest fire, so areas of such outbreaks are of special concern. The Ministry of Natural Resources works in partnership with the Canadian Forest Service to monitor forest health, particularly with regard to insects and disease.

In Ontario's far north, forest fires and insect depredations have been the major factors of disturbance. Human interference with the northern Boreal forest has been minimal, and no commercial logging has been allowed. Other activities, such as fly-in tourism, have been limited. This forest is home to a number of First Nations communities who, for generations, have depended on the forest for their existence. Recognizing the ecological importance of this large forest and its indigenous peoples, the Ontario Ministry of Natural Resources has established the *Northern Boreal Initiative*. The goal of the initiative is to work towards having Aboriginal people assume responsibility for the management of the forest lands on a community-by-community basis.

By way of conclusion, Ontario's forests continue to be shaped and altered by human and natural forces. The early exploitation of pine forests provided the province with direct revenues—as much as 35% of the total—that were used for such infrastructure as roads and schools primarily in southern Ontario. Today, those direct revenues make up less than a quarter of one percent. However, the forest industry continues to be a key economic support of many northern communities. During the past few decades, the forest has also gone from being a source of a few renewable resources, such as timber, furs and game, to being treasured for a host of values and resources of importance to a largely urban population and seasonal recreational users. Too often, the conflicts that have arisen over forestry have resulted from a lack of understanding of the dynamic nature of forests and the timeframes over which they develop. This ongoing challenge must be met in many ways.

One way that Ontario has addressed it is to ensure public involvement in forest management planning and to make the primary goal in every plan the achievement of a healthy sustainable forest ecosystem. Ontario is committed to being a world leader in sustainable forest management because it recognizes that a sustainable forest is vital to both forest-based and urban communities.

By balancing the social, economic and environmental benefits derived from its forests, the province ensures that its forest resources continue to provide people with jobs and a healthy living environment now and in the future.

(Footnote)

[1] Kenneth Armson is the former Provincial Forester for Ontario (1986-1989) and the author of "Ontario Forests: a historical perspective" 2001, 233 p., Fitzhenry & Whiteside and the Ontario Forestry Association, Toronto.

Manitoba

Population: **1.2 million**
Total Area: **65 million ha**
Land Area: **54.8 million ha**
Forest Land: **26.3 million ha**
Provincial Parks: **3.4 million ha**

Sustainability Sets the Pace In Provincial Forests

By Avery Ascher

Start in Winnipeg, capital of the province of Manitoba and the geographic centre of North America. Situated at the confluence of the Assiniboine and Red rivers (the latter once nicknamed the 'Mississippi of the North'), Winnipeg is the perfect place to open up the map and chart your course northward. For it's in the north that huge, untapped reserves of trembling aspen and balsam poplar lie—the new gold of Manitoba's forest industry, some would say.

Highway 6 northwest out of Winnipeg takes you up to Grand Rapids, where a hydroelectric dam jumpstarts 480 megawatts of power flowing south, on through Ponton then northeast onto Highway 39 to Thompson, Manitoba's most northerly city built on nickel. By now you've been driving steady for 7 1/2 hours, much of that through mixed wood forest of white spruce, black spruce, jack pine, birch, tamarack (also known as larch), balsam fir, aspen and poplar, a formidable presence that shows no sign of ending at Thompson's INCO smelter.

It just keeps on going, past 56° North, 57°, and into 58° until halted by the taiga reaching down from Nunavut, Canada's newest territory.

Fully 40% of Manitoba's 247,000 square miles is forested. Mind you, just 60% of that forested land base is productive, in the sense of being able to support some kind of forest industry. Northern Manitoba's forests are fretted with wetlands configured variously as bogs, fens, marshes or muskeg—and what isn't wet on the unproductive portion is subject to frequent forest fires. The province's stands are largely fire-origin, fire being both life—destroying and life—giving here.

Government of Manitoba

Portable sawmills like this one operate all across Manitoba

Still, the annual allowable harvest for all species in 2001 was 3,760,000 cords of wood, more than enough for the three big companies together with smaller private operations and timber quota holders that presently harvest on provincially-owned land, known as Crown land.

Tolko Industries Ltd. (lumber and kraft paper), Tembec Manitoba Inc. (newsprint) and Louisiana-Pacific Canada Ltd. (oriented strand board) dominate

the primary sector, each operating under a Forest Management License agreement with the Province of Manitoba. The province grants these companies operating tenure, the right to operate on a specified land base known as its Forest Management License Area (FMLA). These agreements are granted for a period of not more than 20 years.

Each company is required to prepare a long-term Forest Management Plan for the land included in its FMLA that incorporates strategic and operational considerations, as well as an annual operating plan outlining harvesting and renewal plans for each upcoming year. These plans are submitted to the provincial government for review and approval. Each company is also responsible for all the work and costs in reforesting areas it harvests, and in constructing and maintaining roads on its FMLA.

Including their predecessor companies, Tolko at The Pas and Tembec at Pine Falls are the veterans of Manitoba's forest sector. Their primary feedstock: softwoods such as jack pine, and white and black spruce, renowned for their resilience and straight grain.

Newer on the scene is Louisiana-Pacific (L-P), which received a Forest Management License in 1994 for its aspen and poplar-based operation in Swan River. L-P's arrival paralleled the exploding market demand worldwide for composite wood products, as well as the provincial government's desire to diversify Manitoba's forest industry. The mill currently produces about 440 million square feet of oriented strand board per year.

While there is more softwood than hardwood on the land base (a 60/40 split, respectively), most of the province's softwood resources are presently allocated to forest companies under their FMLAs, or are inaccessible. Softwood's longstanding pride of place can be traced to the premium the first Europeans in Manitoba set on softwood timbers for constructing boats, forts and the other machinery of exploration and trade.

Government of Manitoba

Trembling aspen [top] is Manitoba's most common hardwood tree species. [Bottom] Protecting unique landscapes, like Bell Steep, is a critical component in Manitoba's sustainable forest management program.

Manitoba's softwood resource is no less important to the province's well being today. The province shipped about $69.5 million [Canadian] dollars' worth of lumber, primarily softwood, to the United States in 2001. Pulp and paper exports (also primarily softwood-derived) to the U.S. that year topped $191 million.

So, softwoods continue to hold their own. But what's this? Manitoba also shipped close to $101 million dollars' worth of composite board products to the U.S. in 2001. Aspen and poplar, the so-called "Cinderella" trees once regarded largely as impediments to harvesting the prized softwoods, have secured more than a glass-slipper toehold in the province's forest industry. In fact, the Manitoba government believes the hardwood resource can sustain two additional mills of L-P's size.

Such a projection is the result of thorough analysis taking in a host of issues including wood fiber quality, wood supply, forestland tenure and creation of jobs. And it's against the broader framework of sustainable development policies set out by the Manitoba government that any decisions on forest sector development are made.

It's the job of the province's Sustainable Forestry Unit (SFU) to dovetail economics, environment and social development as they relate to the forest sector. By working across all government departments, the SFU facilitates the broadest and most current information flow possible into any forest development decision-making.

Created in 2003, the SFU has been charged to increase value-added processing in the forest sector (both timber and non-timber), encourage aboriginal forestry developments, and to foster interaction between primary and secondary industry.

The Forintek Canada Corp. office now open in Winnipeg shows that the SFU has been quick off the mark in addressing the value-added issue. A second office is due to open in The Pas (375 miles northwest of Winnipeg) this year. Forintek's forte is helping companies devise solutions to problems relating to lumber manufacturing, composite wood products, value-added wood products manufacturing, market intelligence and resource assessment.

On the non-timber side, the SFU administers a provincial grant to the Northern Forest Diversification Centre (NFDC) in The Pas. The non-profit NFDC works with people in the region to sustainably harvest, process and market a wide range of forest products such as edible mushrooms, plants with medicinal properties, and twigs and other materials widely used in the floral industry.

The SFU is also helping the NFDC develop a long-term operational strategy. Given that many of the NFDC's clients are First Nations or Métis, supporting the NFDC also answers part of the SFU's second goal, to work with aboriginal communities.

Further to this, and reflective of overall government policy, another SFU priority is to link any new hardwood mills to economic development in aboriginal communities.

The Manitoba government is currently funding a study into the feasibility of expanding the hardwood industry; part of this will zero in on aboriginal involvement from square one.

Ultimately, any such projects will likely partner aboriginal interests with conventional forest industry players, formally setting out levels of equity participation, resource management and co-stewardship for both parties.

Government of Manitoba

Sort yards like this one are used to separate softwood logs used in the manufacture of newsprint, kraft paper and lumber.

The SFU's third key task, that of strengthening the links between primary and secondary sectors, is designed to address a current—and significant—disconnect in the overall industry.

Manitoba has a robust secondary forest sector, with companies making a wide range of products from boxes and pallets to cabinets to high-end upholstered furniture. The value of secondary products in 2001 exceeded $1.6 billion.

Yet much of the wood used in their manufacture is presently imported. The reason: historical and consumer preferences. The door and window industry, for example, has long used Douglas fir, a species not found in Manitoba. The SFU is working to foster greater buy-in to native woods among the province's value-adding secondary industry.

Given all this momentum aimed at growing Manitoba's forest industry, it's fair to ask about checks and balances. Or, more precisely: Where does the "sustainable" part of Sustainable Forestry Unit come in?

As mentioned previously, the SFU draws on the brainpower of many disciplines, and one of its key colleagues is the provincial forestry branch's inventory and resource analysis division.

It's this group that determines exactly what forest resources are out there on the land base, where they are, how much there is of each, the relative state of maturity of each, and myriad other nitty-gritty details used to calculate how much wood forest companies can harvest without depleting the resource, an amount known as the annual allowable cut (AAC). The information collected is also invaluable to many other users of the forested land base.

Such information is only as valuable as it is current. And these days, "current" means not only tallying the trees, but also including data relating to landforms, soils, water bodies and other key elements comprising the whole forest mosaic. Such a trend reflects the move in Canada's larger forest community toward what is known as ecosystem-based management, managing the forest not only for timber but also a range of other values.

Furthermore, such an inventory should be a "living" body of information, not a static snapshot in time.

With these objectives in mind, the inventory and resource analysis division has embarked on updating the provincial forest inventory, so that users of the information such as the SFU can make the most informed decisions possible.

However, employing the latest techno-wizardry capable of capturing the breadth and depth of information desired over the entire forested land base is an exceedingly pricey proposition. Recognizing that such a project must be undertaken in manageable chunks, as well as for getting the best bang for the buck, the provincial government is looking to partner wherever possible to get the job done.

A successful pilot project completed in 2003 with Louisiana-Pacific yielded a wealth of inventory data from the Duck Mountains and Porcupine Mountain, critical wood supply areas for L-P. The $2.2 million cost was cost-shared equally between the province and the company.

The province is now distilling the essential and most cost-effective elements of this project into an approach it can successively roll out across the rest of the forested land base.

As noted, the SFU relies on numbers provided by the inventory division to accurately inform its planning. The inventory and resource analysis people, in turn, work closely with staff with the province's Protected Areas Initiative (PAI), because any forestland taken out of production must be factored out of the inventory. Manitoba established its PAI in 1990 in response to the Endangered Spaces Campaign launched by the World Wildlife Fund. This campaign challenged provinces and territories to conserve Canada's biological diversity by protecting a representative sample of each of the country's terrestrial and marine natural regions by the year 2000.

Manitoba was the first jurisdiction in Canada to answer the challenge, and today 8.4% of Manitoba's lands have protected status, meaning they are off-limits to logging, mining, hydroelectric, oil and gas development and other activities that could significantly and adversely affect natural habitat.

One of the most recent, the Bell and Steeprock Canyons Protected Area in the Porcupine Mountain, was designated in May 2004. The forestry and mining sectors, First Nations and non-governmental organizations were all consulted to finalize the boundaries of this area covering over 27,900 acres.

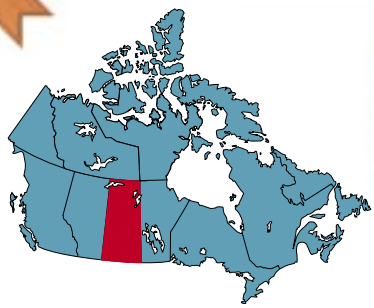
Formally protecting unique areas within the province removes uncertainties respecting development. With the picture clearly defined, wood supply analysis can move forward.

And moving wood supply analysis forward ultimately contributes toward sustainability of the forest industry. With the lines plainly drawn, forest companies can make strategic decisions regarding contracting, infrastructure, expansion or upgrading and other business considerations for the longer term.

You may choose, upon leaving Manitoba's northern forests, to leave your rental car in Thompson and fly back to Winnipeg. Perhaps you'll see a line of rail cars loaded with dimensional lumber or newsprint. Or maybe you'll spot some caribou on the move.

Manitoba's forests are open for business—and for the infinitely larger business we call life.

Saskatchewan



Population: **1 million**
Total Area: **65.2 million ha**
Land Area: **57.1 million ha**
Forest Land: **28.8 million ha**
Provincial Parks: **1.2 million ha**

Province takes a serious look at forest sustainability

By Moira Farr

Golden wheat fields, flat open roads and endless horizon lines are what mostly come to mind when picturing the prairie province of Saskatchewan. Outsiders and even many, who live there, are usually surprised to learn that in reality, the province is more than half covered in trees. "The boreal forest of northern Saskatchewan is the best-kept secret in the country," says Rod Thompson, a manager with Saskatchewan Environment Forest Service who helped craft recent legislation aimed at sustaining that forest. More than a dozen hardwood and softwood species grow on the province's millions of hectares of forested Crown and private land.

M. McLaughlan

Scott Lake Rapids—an impressive riparian ecosystem composed of black spruce and white birch—flows out of Scott Lake in northern Saskatchewan.

Managing the forest has its particular challenges. Back in the 1990s the provincial government decided it was time to take a serious look at sustainability and modernize its approach, from a strictly timber-resource focus to a more integrated one that factors in the impact of all human activity, from logging to manufacturing to recreational development, on the entire complex ecosystem and the people who use it. That includes one of the largest Aboriginal populations in North America—in northern Saskatchewan, as high as 80%, many directly involved and with a significant stake in the forest industry.

In other parts of the province, farmers who once viewed stands of aspen and poplar as worthless weeds are returning their fields to fast growing bush and yielding profits as members of a burgeoning agro-forestry industry.

Homegrown is the word: hooking up their timber harvest with local sawmills, these small-woodlot managers see their timber turned into pre-fab housing packages and shipped to the U.S.—minus the controversial softwood lumber duty that raw 2x4s would require.

Saskatchewan, it seems, is serving notice that when it comes to forest management, it will find unique and innovative ways to look after its own. After years of strategic planning and consultation with the public, forest industry scientific experts and Aboriginal representatives, the provincial government proclaimed The Forest Resources Management Act in 1999. It sets out a legal frame work for development:

eco-system-based management principles, standards and guidelines that ensure a high degree of policy input and accountability for all forest stakeholders; strict monitoring of forestry practices to measure their impact on soil and water quality and wildlife; various regional land-use plans. Consistent with these initiatives is the recent establishment of the Saskatchewan Forest Center, to manage technology-transfer to commercial companies and farmers involved in the province's forest industry, and the Forest Development Fund, directing research dollars toward finding techniques and approaches tailored specifically to increasing Saskatchewan's forest sustainability, an area of study lacking in the past.

M. McLaughlan

A loaded logging truck rolls along Highway 106 in northern Saskatchewan

The Province's forestry program has the distinction of being the first province-wide government program in Canada to receive ISO 14001 certification from the Geneva-based International Standards Organization (ISO). "We have an accountability framework that's second to none," says forester Al Willcocks, Executive Director of the Saskatchewan Environment Forest Service. That means lots of consultation at both local and provincial levels and Willcocks admits that forestry companies are often resistant to regulation and any policies that might eat into their bottom line. But, he argues, while the Act's objectives are ambitious and the degree of transparency high, they are broad enough to allow for a wide range of forest management approaches. "We're not prescriptive, but we are saying to companies that our evaluations will be based on what you said you were going to do— after seven to ten years, this is what we want the forest to look like." It's all in keeping with the goals set out in the Saskatchewan Forest Management Policy Framework, a kind of Provincial Accord with aims similar to the Canada Forest Accord. The new Act requires Saskatchewan to develop a Provincial Accord every ten years. In 2009, the provincial government will take a broad-level look at what has been accomplished and consult the public again on what they want at that time for their forests' future.

In the meantime, the advisory approach very much involves both the public and the forest industry, working together in consultation with the provincial minister on all policy matters. Land-use planning advisory committee members develop guidelines meant to be revisited every five years and that deal with a variety of issues relevant to the land area in question: Are the forests being renewed sufficiently? Are wildlife and fish habitats being maintained? Are there opportunities for recreational use? Are traditional land uses (such as trapping) protected? Are jobs being generated, through manufacturing of wood products, or ecotourism? Most time is spent figuring out viable ways for all the various interests to be accommodated—and it isn't always easy to reach consensus. "In the beginning, the public often doesn't want the forest industry involved, because they are afraid they'll sway things," says Andrea Atkinson, who helped design the area-based resource land management program. But she says, "It's a learning curve. First there is a degree of skepticism, but when people work on committees like this they have to listen to each other. We try to argue that there is are inherently good or bad land uses and not to make value judgments. The guy who makes a living cutting down trees may actually be quite supportive in developing a plan for a healthy ecosystem."

The legislation calls for separate committees to oversee almost a dozen different land areas throughout the province, ranging from 50,000 hectares to over a million.

Management approaches may vary significantly depending, for instance, on how close to water, or cities and towns, the forest in question is located. That's where local planning committees, appointed by the forest companies themselves, come into the picture. It's a mandatory part of the whole scheme and, says Rod Thompson. It means " (quotations here) the government leads the way, but we leave local people to devise the processes that work best for them" (quotations here). It also means that forest companies must report on how they have accomplished what they originally proposed to do, and that local people they have appointed themselves, can track how companies have responded to concerns.

How close to cut to riparian areas—lakes and rivers—was a big concern to the public, for instance. Forest companies and the province "(quotations here) worked hard on agreeing what they'll measure (insect populations, water quality) as indicators of health." It means strict rules for harvesting in these areas, but rules that can be changed down the road if we have learned from experience. "I think everyone understands we're all in this together," says Thompson. "We heard loud and clear that the public wants their government to consider all the values of the forest," says Thompson.

Saskatchewan's overall forest strategy is built upon ecosystem-based management. This approach is based on

learning from the results of our forest management activities. With respect to this, the Forest Health Monitoring Program was developed. The program uses a variety of modeling techniques to track the impact of forestry practices on a number of scientifically determined factors. The agreed goal is to ensure that forested areas affected by harvesting mimic as much as possible the conditions of natural cycles, the most notably being fire.

M. McLaughlan

A mature white spruce forest in Greenwater Provincial Park

It's a little too early for definitive results, but data is being collected on a variety of indicators. Changes in songbird populations, for instance, are being monitored in harvested and burned areas using locally invented super-sensitive omni-directional microphones to record songs during the calling season which are later interpreted by experienced birders. "(no quotation here) Vegetation and other organisms in streams, such as macro-invertebrates like aquatic insects, are also being monitored to indicate forest health and sustainability "(quotation here) after impact," says Dwayne Dye, who manages the monitoring program. "We're still uncertain about some things," he adds, (no quotation here) "but eventually the data will be used to determine how closely actual forest impacts are following scientific projections, and to make any necessary changes to keep the forest as healthy as possible. (no quotation here)"Soil experts are also on the job.

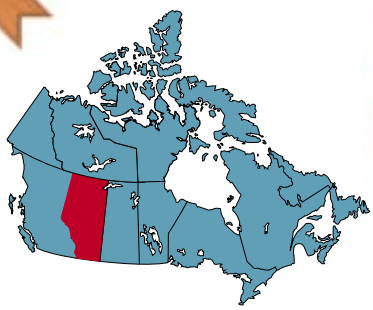
Specialist Dr. Ken Van Rees, a soil scientist based at the University of Saskatchewan in Saskatoon, sits on the province's scientific advisory committee for monitoring forest impacts. Dr. Van Rees has done field research on the impact of forestry on soils for the Canadian Forestry Service and such companies as Weyerhaeuser (though he points out that research dollars have dried up since the softwood lumber dispute flared up between the two countries). His research has indicated, however, that replanted trees grow better on sites prepared to reduce soil compaction and repair roadways and landings beside roads. Though his own specialty is soils, he says the best thing about Saskatchewan's "one-of-a-kind" approach is that it focuses not just on individual impact indicators but also on a complete framework. Smart forest monitoring with computer models is the next phase, he says.

It's the kind of technological research and development that the Saskatchewan Forest Center was set up to encourage and fund, says director Robin Woodward. The Center finances a dozen research projects per year, based at mostly western Canadian universities, all of it aimed at providing solutions uniquely suited to Saskatchewan and its forestry management goals. "We have a fire-dominated ecosystem," says Woodward. "We want our forest harvests to follow the same pattern as in nature, to leave behind the same footprint." (quotations here) Research may determine that means leaving a large, irregular border, or whole patches of trees left in the fire zone. "(quotations here) Whatever most closely follows nature," says Woodward. Another Forest Center goal is to stimulate local value-added product markets, such as cabinet materials, flooring and pulp and paper strandboard. "It comes down to making the best use of the wood we have."

In other words: maximum benefit for the people of Saskatchewan, with opportunities to expand into U.S. or even Japanese markets. Al Willcocks is certainly right to call Saskatchewan's overall forestry goals "ambitious." He's proud of what has already been accomplished and points out some of his province's unique strengths. Only eight or nine million of the 36 million hectares of Saskatchewan forest are used for commercial or recreational purposes. "North of the Churchill River, we let the fire rock and roll," he says. "We have a great opportunity to learn how the natural fire cycle works."

He says he's sometimes frustrated by a forest industry that can be resistant to change and on the other hand, environmentalists and a general public that don't fully understand how forests work. "People love old forests and I agree that one the west coast or the tropical rain forest that's the way to go, but the boreal forest is different. You need disturbance and renewal. A young forest is where birds nest." Fostering a greater appreciation of the true ecology of forests may be difficult, but Willcocks believes that is ultimately the most crucial task facing forest managers today. Above and beyond the specific benefits he'd like to see for the province of Saskatchewan through its forest management plan, he views the challenge of facing down global warming as the biggest of all. "In Saskatchewan alone, our forests produce enough oxygen for 250 million people on the planet." The province is the only one in Canada so far to cash in $6 million in carbon credits (one dollar per tonne) based on scientifically reviewed agreement with the provincial electrical utility, SaskPower. The funds help plant new forests and conserve existing ones. More than anything, says Willcocks, "We have to see the forest as a big lung

Alberta



Population: **3.1 million**
Total Area: **66.1 million ha**
Land Area: **64.4 million ha**
Forest Land: **38.2 million ha**
Provincial Parks: **1.9 million ha**

Diverse land–use demands and landscapes influence Alberta's management approaches

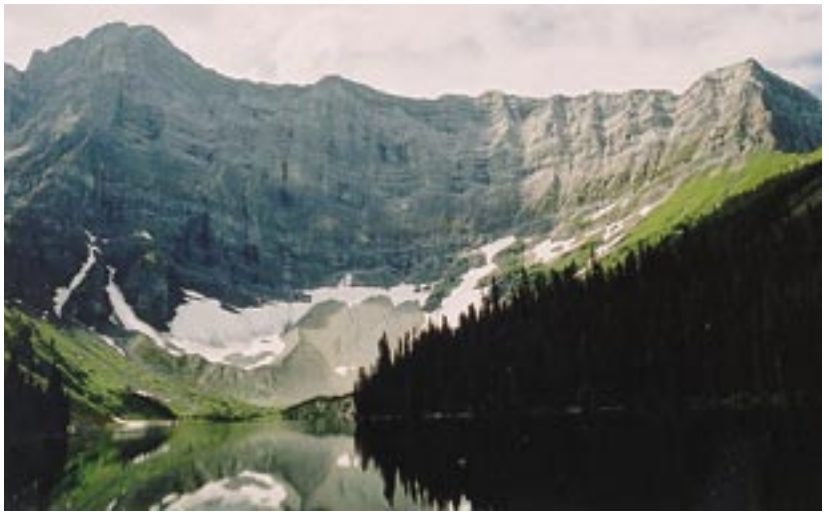
By David Holehouse

Alberta's forests feature a breadth of landscapes and land-use considerations that pose unusual and dramatic challenges to managing the province's forests for the long-term benefit of all Albertans.

"One important aspect of forests in Alberta and most of North America is that they must support a diversity of interests and demands," says Howard Gray, Assistant Deputy Minister, Strategic Forestry Initiatives division of Alberta Sustainable Resource Development (SRD). "We have to manage the forest for the benefit of all, not just one industry or group of individuals. The result is a real layering of activity on the landscape, and a whole group of challenges around how we integrate those activities to meet everyone's expectations."

A few examples: an oil and gas sector that over the last five years has averaged 15,000 wellsites a year; a forest sector employing more than 54,000 people; numerous communities that depend on the stability of natural resource economies; hundreds of thousands of residents near the Rocky Mountains east slopes who want access to forests and wilderness for recreation of all types; and a keystone agriculture sector that requires leases for grazing.

"The unique challenges faced by Alberta have encouraged government and industry to be innovative in virtually all areas of forest management, from developing new seismic techniques and practices to working on integrating land management through advanced computer models," Mr. Gray says.



Duncan MacDonnell

Spectacular trademark setting in Alberta's Canadian Rockies

Sustainability

Alberta faces the challenge armed with a commitment to national and international standards of sustainable forest management and to the perpetual flow of all the forest's products, services and amenities, from clean water to

wildlife habitat to ATV trails. It's an approach that increasingly drives the push to landscape-level, integrated man-agement—and one that seeks to minimize humanity's footprint and maximize the ecosystem's ability to continue its historical patterns of renewal and change.

The legislation, regulations and policies underpinning this management approach allow for input from the public and other stakeholders—as in the case of the *Alberta Forest Legacy*, a policy document that outlines broad management and conservation directions for Alberta's forests. The province fosters a regulatory environment conducive to the quality of life that comes from business and economic development.

Mr. Gray says this means the government tells forest users what results or outcomes are required, and lets them decide how to meet those objectives. Failure to produce is caught by audits and check-offs, and results in penalties.

"Our regulations aren't prescriptive," Mr. Gray explains. "For instance, government doesn't tell forest companies exactly how to regenerate the forest after harvest. We tell them regeneration has to happen within a certain time and trees have to be a certain size within a specified period of time—the onus is on industry to figure out how to achieve the result.

"We're telling them what the public owners of the forest demand in terms of economic, environmental and social sustainability, and they have to deliver the results. We provide direction in a way that allows companies and other users room for flexibility and innovation in how our objectives are met."

Access to timber

Forest companies harvest almost one-fifth of one per cent of Alberta's public forest each year—about 65,300 hectares (161,363 acres) in 2000. They are granted access to timber through 20-year area-based Forest Management Agreements and 20-year volume-based Quotas, and one- to five-year timber permits for local and small commercial operators.

In exchange for rights to harvest, companies provide two benefits to Albertans: one is cash, based on the value of timber harvested; the other—equally important—is in the form of services that reduce the management burden on taxpayers and the government. These services include forest management planning, detailed public consultation, prompt reforestation, road construction and maintenance, habitat management, water and soil management and more. It's a cost of doing business that can add $2 or $3 to the company's price on every cubic meter (1.3 cubic yards) of timber harvested. And again, all of these activities are conducted in accordance with forest management results and outcomes specified by the Government of Alberta.

Duncan MacDonnell

Solitary moose near Jasper, Alberta

Doug Sklar, Executive Director of the Forest Management Branch, says the province's new draft Forest Management Planning standard is structured to encourage the adoption of evolving sustainable management practices. Alberta has adopted the Canadian Standards Association (CSA) Sustainable Forest Management standard as a minimum; it sets out goals for harvest planning, public involvement, dispute resolution, timber supply analysis, reforestation, wildfire minimization, forest biodiversity and more.

The CSA standard is uniquely built on a national set of criteria and indicators of sustainability, and is one of the few in the world not developed or sponsored by an industry association or special interest group. It parallels or exceeds Sustainable Forestry Institute (SFI) demands and is being considered for equivalency with the Pan-European Forest Certification body.

"We are stewards of a public resource, and forest practice must be guided by society's needs and by innovation in research and technology," Mr. Sklar says. "Alberta has made a commitment to sustainable forest management practices. Our management principles are based on internationally-accepted standards and criteria of sustainability, and we will expect forest management plans to develop objectives, targets and indicators to meet these expectations."

The government's role is to conduct inspections and take enforcement actions that ensure operating standards and expectations are being met. It also encourages clear and credible scientific research into how best to ensure sustainability of Alberta's forests.

Mr. Sklar says research over the past decade has advanced understanding of how forests evolved to their present state, and how human activity can be managed to enable forest ecosystems to function effectively. For instance, repeated patterns of wildfire and pest infestations mean few forest stands in Alberta are older than 200 years; many forest areas burned on a 60–70 year cycle before modern fire suppression practices were introduced.

Current thinking is that emulating natural patterns in harvesting and forest practices will maintain forest ecosystems. This approach has resulted in forest management practices that vary the size and shape of harvested blocks, and leave structure on harvested sites, to emulate the effects of fire. "If you visit a harvested area where some structure was retained during harvesting 20 or 30 years ago, it's just full of wildlife," Mr. Sklar observes. "I'm convinced our direction is one that will provide a very efficient way of maintaining biodiversity across the landscape."

Economic development

The economic value derived from Alberta's forest products sector is growing. Estimated at CDN $3.693 billion in 2003, those numbers continue to climb. According to Alberta Economic Development's report, *Alberta's International Merchandise Exports: January-December 2003*, the export value of all forest products types was CDN $2.3 billion, making the forest industry the province's second largest exporter of

manufactured goods.

The Alberta economy also boasts a vibrant secondary wood products manufacturing sector. "The secondary or value-added forest products sector is an important component of the industry, and it holds significant potential for reducing the forest sector's reliance on the fluctuating prices of commodity markets," says Dan Wilkinson, Executive Director of SRD's Strategic Forestry Initiatives division. "We want to build on our strengths by diversifying into new products and markets to get more value per cubic meter of wood harvested."

Government of Alberta

Camping amid the splendor of Alberta's Canadian Rockies

Research

Alberta contributes significant dollars to forest research and development each year. One of the key challenges is ensuring that research results influence operational practices that improve management of renewable resources, says Dr. Keith McClain, Director, Science Policy and Strategy with SRD.

Dr. McClain works closely with government, industry and research agencies to identify Alberta's science and technology needs related to land and resource management strategies. Putting knowledge to work in a practical fashion is the only way to translate the investment in new knowledge into the long-term sustainability of the resource, he says. Research and development is making significant changes in areas such as watershed management, ecosystem-based forest management and sustainable habitat for grizzly bears and woodland caribou.

The Alberta government is a primary partner in the Foothills Model Forest (FMF), a research area covering about 2.75 million hectares (6.8 million acres) and a component of the Canadian Model Forest Network.

The model forest is a living laboratory for conducting research in a range of areas from grizzly bear habitat needs to natural disturbance to socio-economics. "The model forest brings together nearly 100 partners to tackle hard management questions through sound science," says communications program leader Lisa Jones. "The result is that some of the most innovative land and resource management ideas and tools are being used to guide forest management in Alberta."

The Government of Alberta also contributes $1 million a year to the Sustainable Forest Management Network (SFMN), a national research organization and Centre of Excellence based at the University of Alberta. SFMN is recognized internationally for its outstanding peer-reviewed research programs, and for developing new solutions to forest sustainability challenges.

Industrial footprint reductions

Alberta is investigating the development of an access management program to work closely with existing industry initiatives and other government agencies to reduce the industrial footprint on the province's forests. Examples of actions include energy and forest industries collaborating to plan activities, and to build and using the same road networks.

Alberta leads the way in reducing forest disturbance caused by the cutting of seismic lines for the booming oil and gas sector. Some 75% of new seismic lines approved each year on public and private lands are low impact. New approaches include the use of portable Geographic Positioning System units and continuous, meandering lines that accommodate natural features and values rather than impose the traditional straight line through the forest.

Today's seismic lines average 3.5 meters (11.5') wide, with some as narrow as 1.5 meters — a far cry from the standard eight-meter (26') swath cut ten years ago. Dave Bartesko of SRD's Public Lands and Forests division believes that in five years the average will be down to 2.5 meters (8.25') or less.

The Alberta government enforces even stricter rules in highly sensitive areas. There, lines are zero-width, allowing for no cutting or equipment. Crews walk in and seismic units are lowered by helicopter through the forest canopy.

Regeneration and reforestation

Prompt reforestation is a crucial aspect of sustainability. Alberta enforces reforestation standards that maintain the natural mix of species that were present prior to harvesting, explains Scott Milligan of the Harvesting and Renewal section of SRD's Forest Management Branch.

Reforestation standards specify requirements for tree height, vigor of regener-ation, stocking and freedom from competing vegetation. Reforestation treatment must occur within two years of harvest. A regeneration survey is conducted from three to eight years after harvest to determine whether a stand is reforested to standard.

Site preparation (mostly mechanical scarification) and tree planting are the most common reforestation treatments in coniferous and mixed-wood forest types, which are planted to a density of 1,500-1,800 trees per hectare (600-720 per acre). Some pine sites are left for natural regeneration if sufficient cones exist on site. Most deciduous sites are left to regenerate naturally due to aspen and balsam poplar's characteristic of prolific 'suckering' after timber harvest.

Larger companies carry out regeneration planning and operations at their own expense. Smaller operators pay a levy to the Forest Resource Improvement Association of Alberta, which has authority delegated from the government to conduct reforestation work on their behalf.

Each year, forest companies in Alberta invest CDN $140-150 million for reforestation activities and plant approximately 75 million seedlings.

Forest certification

Forest certification applies to forest products companies. The Government of Alberta supports the concept of third-party certification and has adopted the CSA's Sustainable Forest Management standard as a minimum requirement in its new draft *Forest Management Planning* standard.

Northern lights silhouette Alberta forest

Government of Alberta

Alberta companies are responding to evolving marketplace demands for certified forests and products. More than 20 million hectares (49.5 million acres) of public forestland are certified, much of it under ForestCARE, a stewardship and audit program created by the Alberta Forest Products Association. Other certification programs used in Alberta include the CSA's Z809 standard (5,230,000 hectares, or 12.9 million acres) and SFI (270,000 hectares, or 667,000 acres). Alberta-Pacific Forest Industry's pulp operation north of Edmonton has recently been a key player in helping to develop a new boreal certification process for the Forest Stewardship Council (FSC).

Wildfires

In 2003, Alberta spent approximately $216 million battling more than 1,100 wildfires that burnt close to 78,900 hectares (195,900 acres). Over the last decade, an average of more than 1,000 wildfires have started in Alberta each year, affecting more than 196,000 hectares (484,000 acres) of forest annually.

The government strives to initiate wildfire suppression action before a fire exceeds two hectares in size, and to contain all wildfires at four hectares or less.

Alberta boasts the largest air tanker fleet in Canada as well as the country's largest fixed detection system, featuring 131 lookout towers. Agreements with neighboring provinces and U.S. states allow Alberta to import and export resources as required.

Alberta continues to work with municipalities, industry and homeowners to protect their communities from the threat of wildfire. Successful programs such as FireSmart protect Albertans and their homes by promoting activities that include fuel removal, vegetation management and public education.

Forest health

Efforts to limit incursions of the mountain pine beetle, a naturally occurring forest pest that has wreaked tremendous damage in British Columbia to the west, are paying off for Alberta.

Across Alberta's eastern slopes (4.6 million hectares or almost 11.4 million acres) about 2.25 million hectares (slightly more than 5.5 million acres) of mature and over-mature pine trees are susceptible to the beetle. Aggressive monitoring and management strategies include pheromone baits and aerial surveys followed by systematic tree-by-tree ground surveys, says Sunil Ranasinghe, a forest entomologist with the Alberta government. Affected trees are cut and burned before beetle emergence each year.

"Ground surveys are costly and detailed, but are the only effective ways to detect infested trees before the beetles emerge and attack new trees," said Mr. Ranasinghe, noting that ground surveys helped Alberta achieve a 70% reduction in the number of trees infected in 2003-04, compared to the totals of a year earlier.

Conclusion

Alberta's experience with a multiplicity of land use demands, challenges and users has helped the province effectively manage its forests. Respecting the need to balance a wide range of economic, social and environmental values across a broad and varied landscape, the joint stewards of the resource have embraced sustainable forest management principles to ensure the long-term health of the province's forests.

Forest management continues to evolve in Alberta as new knowledge and innovative techniques are applied to the province's forests. Users of the land are succeeding in minimizing their impact on a single shared landscape. Alberta remains committed to the long-term health of the resource, and to ensuring that all Albertans share in the value and benefits provided by the province's forests.

British Columbia

Population: **4.1 million**
Total Area: **94.8 million ha**
Land Area: **93 million ha**
Forest Land: **60.6 million ha**
Provincial Parks: **11.3 million ha**

The Standoff Ends: Industry, First Nations and Environmentalists Make Peace. B.C. Embraces Innovative Results-based Forestry Program

By Marj Welch

In June 2004, a gathering at the First Nations community of New Vancouver on British Columbia's central Pacific Coast marked a key step along the path toward resolving what could have become one of the province's toughest resource management issues.

Three years earlier, forest industry and environmental organizations had ended a standoff over 12 million acres of temperate rainforests and important watersheds along the Pacific Coast in a region containing part of what some call the Great Bear Rainforest. Industry agreed not to log in the areas of greatest concern and environmental groups agreed to end specific market campaigns. They formed an alliance and began to work with First Nations and other interests to develop an ecosystem-based model for conservation and management of the coastal forests as part of the provincial govern-ment's regional land and resource management planning process.

In December 2003, the disparate Coast land and resource management planning completion table reached a consensus agreement, with recommendations consistent with the guiding principles of ecosystem-based management—an adaptive approach to managing human activities that ensures coexistence of healthy, fully functioning ecosystems and human communities.

British Columbia Ministry of Forestry

A loaded log truck: symbolic of the fact that communities throughout British Columbia rely on forestry for their economic vitality. Yet less than one-third of one percent of the province's forestland is logged annually, and for economic or environmental reasons, more than half of the province's 86 million acre forestland base will probably never be logged.

The recommendations are part of the discussions between the B.C. government and area First Nations that will help lead to decisions on the legal designation of the lands and an approved land use plan.

"I think this marks a real milestone that the table members and their caucuses were able to reach a significant agreement," process chair Jim Lornie said shortly after the agreement had been reached. "There were some tense moments—but every participant at the table should be proud of the recommendations we are turning over to government."

The Central Coast planning process reflects the kinds of challenges that are so common in British Columbia, where the largely publicly owned forests support an amazing array of natural values, and anchor the province's economy. They help paint the magnificent vistas that attract millions of tourists every year to the province, which is gearing up to host the Winter Olympic and Paralympic Games in 2010.

The Central Coast also demonstrates the value of comprehensive government-led land use planning. By the end of 2004, government will have completed land use plans

for more than 80% of British Columbia. While the process is consistent across the province, each plan is unique to reflect the vast differences among British Columbia's regions.

British Columbia's north-south mountain topography and a climate that includes a small desert and North America's wettest weather station make it the most biologically and ecologically diverse province in all of Canada. It has grasslands, oak parklands, desert-like steppes, dry pine forests, boreal black spruce muskegs, tundra and alpine meadows. It is home to 1,138 known species of vertebrates including 488 species of birds, 468 species of fish and 142 species of mammals.

Two-thirds of the province's 235 million acres is forest land, representing seven of Canada's 12 forest regions and covering an area twice as big as all of the New England states and New York state combined. Temperate rainforests stretch along the Pacific Coast from Washington state north to Alaska; there's a slice of boreal forest in the northeast and vast pine forests across the Interior. On the slopes of the Columbia and Rocky Mountains in the southeast, moist, wet conditions have even created an interior rainforest, with more tree species than any other ecological zone in the province.

British Columbia's 62 million acres of old-growth forest include ten million acres that are fully protected and another 30 million acres that will likely never be harvested due to conservation, inaccessibility or other operational restrictions. British Columbia's economy is forest-based, one in every five jobs in the province depends on forestry and it is the world's largest exporter of forest products, yet less than one-third of one percent of its forests is harvested each year. And less than two percent of the forest land has been converted to other uses over time—most of this in the highly populated areas around Vancouver and Victoria or in farmlands of the Peace River Valley near the Alberta border in the northeast.

In a comprehensive survey of Canada's wild forests last year, Global Forest Watch reported that more than one-third of British Columbia forests, or close to 50 million acres, is within a large intact forest landscape. The report credited the province for adopting policies to maintain large intact forest landscapes.

British Columbia has doubled the amount of fully protected areas from 6% in 1992 to 12.5% today—and half of this, or 14 million acres, is forested. It has the largest provincial parks system in Canada, and its protected areas include Tatshenshini-Alsek wilderness park in the remote northwest which joins with parks in Alaska and Canada's Yukon to form the largest international protected area in the world—at 20.7 million aces, it is almost as big as Minnesota.

Another 14% of British Columbia's land base is designated for special management, which means other values such as wildlife habitat take precedence over resource use. In north central British Columbia, the almost 15 million acres in the Muskwa-Kechika special management and protected areas represent one of North America's last true wilderness areas south of the 60th parallel.

British Columbia's natural diversity presents a challenge to resource managers who want their actions to be compatible with the needs of each unique ecosystem. One solution is the Biogeo-

British Columbia Ministry of Forestry

Overlooking Jervis Inlet on the Pacific Coast north of Vancouver: British Columbia's new results-based regulatory climate protects riparian areas, scenic vistas and fish and wildlife habitat. Great care is taken to insure that areas like Jervis, which is very popular with tourists, are not visually compromised.

climatic Ecosystem Classification System, also known as BEC, which provides a common reference point for forests and other natural resource professionals, including naturalists, ecologists, soil scientists and biologists.

BEC got its start with the work of ecologist Vladimir Krajina and his botany students at the University of British Columbia from 1950 to 1975. They found that naturally occurring plant species varied according to soil, climate and land form combinations, and they proposed ecological zones throughout British Columbia based on these biogeoclimatic characteristics—bio for plant, geo for landform and climatic for climate. No other jurisdiction in the world works with such a detailed accounting of diverse ecosystems covering such a large land base.

British Columbia Ministry of Forestry

Although wildfires are a natural part of most forest ecosystems, record drought, unseasonably high temperatures and winds made for a dreadful fire season in Interior British Columbia in 2003. Here the 64,000-acres McLure Fire near Kamloops.

BEC uses a wide variety of ecological information about plants, animals, soils, landforms and climates to describe, name and classify the full range of ecosystems found in the province. Since the 1970s, resource professionals with the provincial Ministry of Forests have collected data from 30,000 ecosystem field plots and mapped out 14 broad zones and many finer sub-zones across the province with similar climates and distinct patterns of soil and vegetation, usually characterized by the general tree species that eventually dominate the site.

This kind of detailed information is invaluable for forest companies licensed to harvest public land in British Columbia because they are expected to create new forests that mirror the ecological and biological diversity of the natural forest. BEC is also one of the many reasons why British Columbia is well positioned to become one of the few jurisdictions in the world to move to a results-based approach to forest practices legislation.

British Columbia has other advantages that make it an ideal candidate for a results-based system, including its comprehensive land use planning system, a forest industry that has high compliance with forest laws, skilled resource professionals, and experience gained through a number of pilot projects. The province also has a high rate of sustainable forest management certification—more than 55 million acres is certified under third-party certification.

In 1995, British Columbia consolidated and strengthened its forest legislation in the Forest Practices Code, creating some of the toughest and most comprehensive forestry legislation on earth. The code increased environmental protection and provided a consistent set of rules for forest licensees.

Early in 2004, British Columbia began its transition to the new results-based Forest and Range Practices Act, which emphasizes on-the-ground results rather than process. The new act aims to maintain British Columbia's high level of environmental protection, while encouraging more innovation and reducing costs. The transition will be complete by the end of 2005.

Under the act, companies licensed to operate on public land must develop a forest stewardship plan that sets out how they can best achieve government objectives for soils, timber, wildlife, water, fish, biodiversity and cultural heritage resources. While they can choose the best way to meet the objectives, they are accountable for the results.

Government may also require results or strategies for special management of areas of local concern, such as recreation trails, wildlife habitat areas, winter range for animals such as deer and mountain goats, lakeshore management zones, community watersheds, fisheries-sensitive watersheds and scenic vistas. All activities must be consistent with approved land use plans.

The new forest regulatory regime also specifies requirements to conserve soils, support sustainable forest management, and protect riparian areas, fish and wildlife habitat, watersheds, bio-diversity and wildlife. And it specifies the requirements for building, maintaining and deactivating forest roads.

The Forest and Range Practices Act allows resource managers the flexibility they need to deal with British Columbia's diverse forest resource, and it is backed by both a comprehensive compliance and enforcement regime and tough accountability rules for trained resource professionals such as foresters, agrologists, engineers, geoscientists and biologists.

The safety net also includes the independent Forest Practices Board, which functions as auditor-general and ombudsman for the forestry sector and holds both government and industry publicly accountable for forestry practices. Since its creation in 1995, the board has made more than 270 recommendations in 120 public reports on ground-level examinations of forest practices. Government and industry have implemented the majority of the board's recommendations.

Dr. Bruce Fraser, a forest ecologist who studied at the University of British Columbia under Vladimir Krajina, was appointed board chair in November 2003. With 17 years of experience as a consultant in the areas of community economic development, public participation in resource management and resource conflict resolution, he is well positioned to lead the board into what he sees as interesting times ahead.

"We will have a key role in providing scrutiny over whether results are being achieved, and whether those expected results represent good forestry practices," Dr. Fraser says. "We have already begun changing our approach to auditing and monitoring forestry operations to reflect emerging trends, including

results-based regulation and third-party certification. We need to be sure we can measure the effectiveness of forest practices on the ground."

Larry Pedersen is not surprised that British Columbia keeps finding innovative approaches to forest management, like result-based regulations and ecosystem-based management. Pedersen is British Columbia's chief forester, and he has been involved with forest management in the province for more than a quarter of a century. He's seen a lot of changes in that time, some in response to new science, some in response to social pressures.

British Columbia Ministry of Forestry

Snowcapped peaks rise from British Columbia's coast range. Aside from their immense beauty, these peaks have a major influence on both climate and vegetation patterns across the province. Much of the province's non-forest area lies in these harsh alpine regions.

He was one of the authors of a report in the early 1990s that led to the introduction of British Columbia's comprehensive timber supply review system. It requires that the chief forester determine how much wood can be harvested from each of the province's forest management units at least once every five years. The decision is based on the latest policies, detailed technical, scientific and economic information and, like everything else related to forest management in the province, consultation with the public and with First Nations.

"There was a time when allowable annual cut determinations were not being done fast enough to keep pace with changing management objectives and practices, and all forest values were not being given full consideration," Mr. Pedersen says. "Today, allowable annual cut determinations are outcomes based on the best available information about the forest, its current use and management. They are independent, professional judgments that respect the objectives of local land use plans and the views of British Columbians."

The chief forester can postpone a review for up to five additional years if an annual allowable cut is not expected to change significantly, or set a new harvest level earlier to deal with urgent situations where new information is available. Recently, Pedersen set early determinations in several Interior management units in response to wildfires and a catastrophic mountain pine beetle infestation.

In 2003, record drought, high temperatures and wind results in wildfires that burned 640,000 acres across the province, compared to 75,000 acres in an average year. And most of this was in the Interior, which was already in the midst of the most extensive mountain pine beetle infestation in British Columbia's recorded history, thanks to a very abundant source of mature pine trees, hot summers and mild winters.

"Beetles are natural occurrences in British Columbia's Interior but we have never seen anything like the recent situation," Mr. Pedersen says. "Government and industry have been working hard to slow the beetle infestation but we have not been getting the frigid winters we need so it keeps expanding exponentially. We can't harvest all the beetle-killed trees before the wood deteriorates, but we can harvest more and still protect all forest values. This will also allow us to speed up reforestation."

British Columbia is also committed to ensuring that First Nations, which have traditionally and culturally depended on forests for economic, environmental and spiritual values, participate more in the province's forest economy. The British Columbia government has invited a number of First Nations to apply for forest licences, including several that involve harvesting timber damaged by fires and beetles. At the same time, modern-day treaties and interim measures agreements are being negotiated to address outstanding aboriginal rights and title issues, and to provide a stable environment for resource development.

Back at the big house of the Da'naxda'xw First Nation in New Vancouver, Dallas Smith, representing area First Nations leaders, and George Abbott, British Columbia's Minister of Sustainable Resource Management, formally accepted the recommendations of the Central Coast land and resource management planning table from chair Jim Lornie.

"It's historic—the work that you have done," Mr. Smith told the process participants. "You have built a foundation that is necessary for First Nations and the provincial government to agree on land and resource management in a pre-treaty environment."

Kerry McGourlick, chief forester with Western Forest Products, one of four major forest companies that played a role in the process, also welcomed the certainty that comes with the recommendations. "It will allow us to go forward and balance the needs of the environment with the needs of the communities and our businesses needs."

After honouring the participants for their work, the Government of British Columbia and the First Nations moved into discussions informed by the recommendations, decisions that ultimately will protect the environment, maintain spiritual and cultural values, foster community stability and allow ecosystem-based resource management based on sound science.

While the decisions will focus on the Central Coast region, the benefits will resonate across the province and beyond its borders, showing the world how British Columbians are achieving the necessary balance in managing and conserving their natural resources.

Yukon Territory

Population: **41,403**

Total Area: **342.6 million ha**

Land Area: **329.3 million ha**

Forest Land: **61.4 million ha**

Building Forestry Partnerships For Prosperity

By Elaine Schiman

It's a Friday night in June, and Yukon sawmill owner Bill Bowie is strolling through the trees he has planted around his Dawson City home… oak, maple, apple and cherry trees that he is growing "just for fun." None of these species is native to the territory, and Bowie is proud they've survived the long cold Yukon winter.

Survival is something Mr. Bowie knows a lot about. Arctic Inland Resources, his small logging, sawmill and building supply business, has been around for nearly 30 years. This is a rare accomplishment in what is still an emerging forest industry in the Yukon, a territory tucked into the far northwest corner of Canada just beside Alaska.

The Yukon's boreal forest covers more than 106,000 square miles, but just 15% of it is considered commercially viable. Nevertheless, Mr. Bowie's company has made a go of it. Primarily logging white spruce, the company carved out a niche for itself by selling dimensional lumber as well as products not as easily found on the commodities market—rough lumber, timbers, heavy planking, building logs and firewood. Mr. Bowie sells to the local Yukon market, as well as into Alaska, the Northwest Territories, British Columbia and Alberta. Logging takes place in the winter months, when the frozen ground and water make for easier access.

Now in his sixties, Mr. Bowie could be thinking about a well-earned retirement. But instead, he is hard at work on a new dream, to turn his sawmill into a stand-alone business with increased production, an expanded product line and four times as many full-time staff.

"My business has lasted this long because of the help I've gotten from other people," Mr. Bowie observes. "I want to give something back to the community by providing more full-time jobs and quality products."

Government of the Yukon

Logs for home construction are a product of some Yukon forests

Mr. Bowie is hopeful he can make his plan work. His optimism is at least partially due to a shift in the responsibility for forest resources in the Yukon. On April 1, 2003, management of Yukon forests devolved from the federal government of Canada to the Yukon government's Energy, Mines and Resources (EMR) department.

"This is an exciting time for us," says Gary Miltenberger, EMR's Forest Management Branch Director. "When we assumed our responsibilities, the Yukon forest industry had not been very active for several years. Our biggest hope is to be part of building a small-scale sustainable Yukon forest industry that matches the profile of the timber and the land's ability to produce the timber on an ongoing basis. Based on extensive public consultations, most Yukoners want to see that type of sustainable economic activity. But our forests are also important to Yukoners for other reasons—their significant cultural, ecological, traditional, subsistence and recreational uses."

The branch has taken a number of steps to encourage a balanced re-

newal of the Yukon forest industry, many of them accomplished by forming some unique partnerships.

"We are working together with community and First Nation representatives from across the territory to carry out extensive community-based planning," says Mr. Miltenberger. "Currently, we're assisting with the development of forest management plans for five separate areas of the Yukon."

These arrangements flow from the recognition that the Yukon has a unique governance structure. Responsibilities and jurisdiction are shared between the territorial government and fourteen self-governing First Nations who have either completed land claim agreements or are close to doing so. Under the agreements, each First Nation receives settlement lands to administer as a government and landowner.

"We have been managing our forest resources for just over a year and I am proud of the progress we have made for the sustainable management of our forests," said Archie Lang, Minister of Energy, Mines and Resources. "This would not have been possible without the commitment of our First Nations partners and reflects well on the economic partnerships we have established."

In two cases, the Champagne and Aishihik First Nation and the Kaska Nation, the Yukon government has signed formal agreements with the First Nations to work together on forestry planning.

The Champagne and Aishihik Draft Strategic Forest Management Plan, which covers about five million acres of forest in the southwest Yukon, is the closest to completion.

The draft plan is the product of work by community, First Nation and Yukon government representatives, with plenty of opportunities along the way for public participation. Planners faced a number of key challenges and opportunities.

"The forests in our settlement area are subject to a significant spruce beetle infestation," says Lawrence Joe, the Champagne and Aishihik First Nations' Director of Heritage, Lands and Resources. "One of our key interests is in economic opportunities that may result from the beetle-kill. Also paramount is the reduction of forest fire risk around homes and communities. And, we want to ensure we have a healthy forest in years to come. We are looking very much to the future."

The Champagne and Aishihik draft plan may well prove to be a model for other First Nations in the territory. "We want to build on our partnerships and manage forests around what the community needs are," says Joe. "We think it's important that more people have the opportunity to in-fluence what is happening in their back yards."

Government of the Yukon

Bill Bowie's logging, sawmilling and building supply business has been operating out of Dawson City, Yukon for 30 years

Myles Thorp is the Manager of Planning and Development for the government's Forest Management Branch. He works closely with the Alsek Renewable Resources Council, the group of community and First Nation representatives, which helped produce the Champagne and Aishihik draft plan. Such Councils are formed under each First Nation's land claim agreement.

"The Council was pivotal to our success in producing a draft plan of this quality," says Mr. Thorp. "Once the plan is approved, it will set the direction for forestry in the southwest Yukon. And as other Yukon communities become ready to carry out forest management planning, we'll be working closely with the Renewable Resources Councils in their areas as well."

Another unique partnership has been formed between the Yukon government and the Kaska Nation, whose traditional lands in southeast Yukon encompass the best wood reserve in the territory.

"About 80% of the Yukon's best merchantable timber is located on Kaska lands," says Ed van Randen, Policy and Legislative Advisor for EMR. "The southeast Yukon is the place where it's most feasible to build a forest industry."

That said—aspirations are still relatively humble. "We'd be looking at an annual cut that would be just a tiny fraction of what is cut in an area with a more developed forest industry, like British Columbia," says Van Randen. "All we really want is to provide the opportunity for Yukoners to be self-determining and to have the ability to make a living off the land."

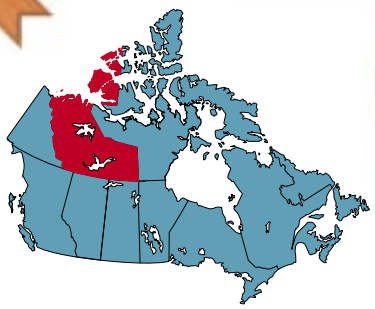
Jayne Sun-Comeau has been negotiating forestry issues for the Kaska Nation for the past four years. "The most important thing for us is that this is our traditional territory. We live here. So we want to see development, but not at all costs. We want to ensure our values are incorporated into the planning process. The forest is important to us and other Yukoners not just because of the economic opportunities, but also because of other uses—hunting, fishing, trapping, camping, and tourism. We also want to protect areas that are culturally significant or sacred to us."

The partnership with the Kaska Nation has so far produced an interim management committee and an interim release of wood. By 2005, it's hoped that a regional forestry management plan will be in place, along with a new forest authority.

The Yukon government also hopes to complete its first ever-territorial forestry legislation by 2005, making the next year a crucial one for all those involved in forestry in the territory.

"The Yukon is charting a course forward by working together with First Nations and other Yukoners," concludes Van Randen. "Other parts of Canada may want to keep a close eye on how things evolve. We could become an example for others to follow."

NW Territories



Population: **29,924**

Total Area: **48.3 million ha**

Land Area: **47.9 million ha**

Forest Land: **27.5 million ha**

Traditional Uses Of Forest Products Drive Management Philosophy

By Annelies Pool

The boreal forest is the cradle of life for many of the people in Canada's Northwest Territories [NWT]. Forest-based activities such as hunting, trapping, camping, firewood harvesting, forest fire fighting and plant harvesting are daily parts of life that contribute to the northern economy and culture. The forest links the northern First Nations people to the traditions of their ancestors and is considered part of their identity as Aboriginal people. These values, rather than purely economic considerations, are the driving force behind forest management in the NWT.

The NWT is the middle of Canada's three northern territories, and includes areas of sub-arctic boreal forest as well as arctic tundra. The territory extends north from the 60th parallel to the islands of the Arctic Archipelago in the Arctic Ocean. It has a sparse population of about 42,000 spread over a landmass of 458,000 square miles. About half of the population lives in the capital city of Yellowknife while the remainder resides in 32 small communities, ranging in size from a few hundred to several thousand inhabitants. The boreal forest covers about 28% (130,000 square miles) of the territory, and surrounds 29 communities, including Yellowknife. This forest is dominated by black spruce, white spruce and aspen but also includes birch, alder, pine and tamarack and is home to many species of animals such as black and grizzly bears, moose, bison and caribou.

NW Territories Resources, Wildlife and Economic Development

[Top] A Dene [First Nations] woman cuts fish for drying. [Bottom] Wildfires are common across the vast reaches of Northwest Territories

With the small population, a resource that is of marginal value (small wood that takes longer to grow) and far from exports markets, there has not been sustained pressure to develop a large-scale timber industry. Much of the NWT forest remains pristine. Commercial wood harvesting that has taken place has been restricted to small-scale operations. White spruce and trembling aspen have been harvested for timber in the southern portion of the territory since the 1940's. This industry peaked in 1996-97 when the annual volume harvested was about 5.8 million cubic feet in 2003. Fuel-wood production has remained stable at about one million cubic feet of roundwood annually.

Much of this decline in saw-log harvesting can be attributed to specific economic pressures in British Columbia in the 1990's, a struggling Canadian lumber industry, recent community development focus on oil and gas exploration and negotiations by First Nations on

land claim issues. Commercial timber harvesting is expected to increase slowly and steadily but remain below the 1996 volume for the foreseeable future.

The boreal forest has other values to the people of the Northwest Territories. Dene (First Nations) and Metis people have traditionally relied on the forest to provide them with food, clothing and shelter. Most Aboriginal peoples now live in communities and take part in the modern wage economy but continue to rely on the forest for economic, cultural and spiritual reasons. "There is a spiritual understanding of land. I've heard it defined as having respect for the land, however we use it," explains Extension Forester, Beatrice Lepine. "Being out on the land is healing. I know so many people who say they feel their best and think most clearly when they're out in the bush."

These values are reflected in the forest management policies of the Government of the Northwest Territories. "We've been slowly shifting to dealing with forest management in a much more holistic way, rather than a southern approach that focuses only on commercial timber development," explains Susan Corey, Director of Forest Management. "We look at how the people in the communities see the forest being used, what they need for economic stability within the community and how they want to preserve the cultural values of the forest."

This means people living in forest communities are kept in the loop when making decisions about forest use. For example, when a business applies for approval to harvest timber, the application is referred to representatives of First Nations and community governments. If the community wants to preserve the forest for a traditional use, it might result in a lower level or permitted harvest under the principles of sustainability that focus more on commercial forestry. "We have models that will develop a sustainability limit that can take into consideration wildlife habitat, bio-diversity, cultural and traditional uses of the forest," says Ms Corey. "The numbers on what's sustainable might be lower, but that's just from a commercial point of view. There are other values, both cultural and economic, that are equally or more important."

The Dene and Metis have relied on the forest to provide fuel for warmth and cooking for hundreds of years. Today, 19% of the homes in the territory use wood-heat, 25% of which have wood as their primary source of heat. The importance of wood-heat is recognized by legislation, which allows each NWT homeowner a free annual harvest of 20 cords (1,865 cubic feet) a year. "That's unique in Canada," points out Manager of Forest Resources Tom Lakusta. "We give you a permit to harvest fuel-wood and a renewable resource officer will help guide to you a harvest area."

Trapping, hunting and plant harvesting are other traditional uses of the forest. Trapping of fur-bearing animals such as marten, wolverine, fox and lynx adds about $1 million to the northern economy. Many people also supplement their food supply by hunting animals such as moose, caribou and bison. In 2002, about 40% of NWT residents spent some time on the land in 2002 hunting or fishing and about 75% of households ate locally harvested meat or fish. People also harvest birch syrup, berries and medicinal plants. Materials such as animal skins, fur, birch-bark, moose-hair and porcupine quills are used to create traditional clothing and arts and crafts for personal use and sale.

The holistic approach to forest management in the NWT is also reflected in forest fire management policy, which recognizes fire as a natural phenomenon that helps regenerate the forest. "The NWT has a very rich fire history that goes back thousands of years," explains Manager of Fire Operations Frank Lepine. "If you dig in the ground, you'll find charcoal. It's estimated that the forest burns itself over entirely every 100 to 300 years." People who harvest and live on the land in the NWT still live with fire and expect it to occur, and know what kind of animals they can expect to find in a burn areas," says Mr. Lepine.

Fires in the NWT are fought only if they threaten certain stated values of which human life and property are the most important. An average of 1.5 million acres of the NWT forest burns every year, and about 65% of the fires are fought. While people accept fire as a natural occurrence, at the same time forest fire fighting has been incorporated into traditional culture, providing seasonal work to people through the generations. Many First Nations companies are under contract to provide fire-fighting crews, providing employment for about 200 people on a seasonal basis. In addition, up to 200 emergency workers are hired by government to fight fires each year, making firefighting an important seasonal economic activity in this sparsely populated territory.

Because of their traditional ties to the forest, Aboriginal people have a natural interest in forest management. For the past several decades, the First Nations have been negotiating land claim and self-government agreements that will, in time, give them stewardship over much of the NWT's forest. To prepare for this transfer of responsibility, the Forest Management Program is collecting forest and vegetation inventories that will be tools for future (as well as present) managers. This scientifically-gathered information, combined with the traditional knowledge First Nations have built up through centuries of living close to the land, will help ensure the forest will continue to provide economic, cultural and spiritual nurturance to future generations.

NW Territories Resources, Wildlife and Economic Development

Wood bison grazes near Fort Providence in the Northwest Territories. Many First Nations families supplement their diets and their incomes with bison, caribou and moose.

The Evergreen Foundation: Exploring the art and science of forestry

The Evergreen Foundation is a non-profit forestry research and educational organization dedicated to the advancement of science-based forestry and forest policy. To this end, we publish *Evergreen*, a periodic journal designed to keep Foundation members and others abreast of issues and events impacting forestry, forest communities and the forest products industry.

In our research, writing and publishing activities, we work closely with forest ecologists, silviculturists, soil scientists, geneticists, botanists, hydrologists, fish and wildlife biologists, historians, economists, engineers, chemists, private landowners and state and federal agencies responsible for managing and protecting the nation's publicly owned forest resources.

All statistical information appearing in *Evergreen* is taken from publicly supported federal and state forest databases in place since the 1950s. Industry information is also used, but only when it can be independently verified.

All *Evergreen* manuscripts are reviewed before publication to ensure their accuracy and completeness. Reviewers include those interviewed as well as scientists, economists and others who are familiar with the subject matter. While not a peer review, this rigorous process makes for strong, fact-based presentations on which the Evergreen Foundation stakes its reputation.

Evergreen was founded in 1986. Initial funding came from a small group of Southern Oregon lumber companies interested in promoting wider citizen involvement in the federal government's congressionally mandated forest planning process. In the years since its' founding, *Evergreen* has assumed a much wider role, providing public forums for scientists, policymakers, landowners, federal and state resource managers and community leaders across the nation.

Support for our educational mission comes from Foundation members and other public and private sector organizations that share our commitment to science-based forestry. We also generate revenue from reprint sales–and from "Our Daily Wood," a hand-finished four-pound wood block that is the volumetric equivalent of the amount of wood fiber consumed ever 24 hours by every person on the Earth.

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