



Eco-Link

Linking Social, Economic, and Ecological Issues

Volume 10, Number 3

Canada's Forests

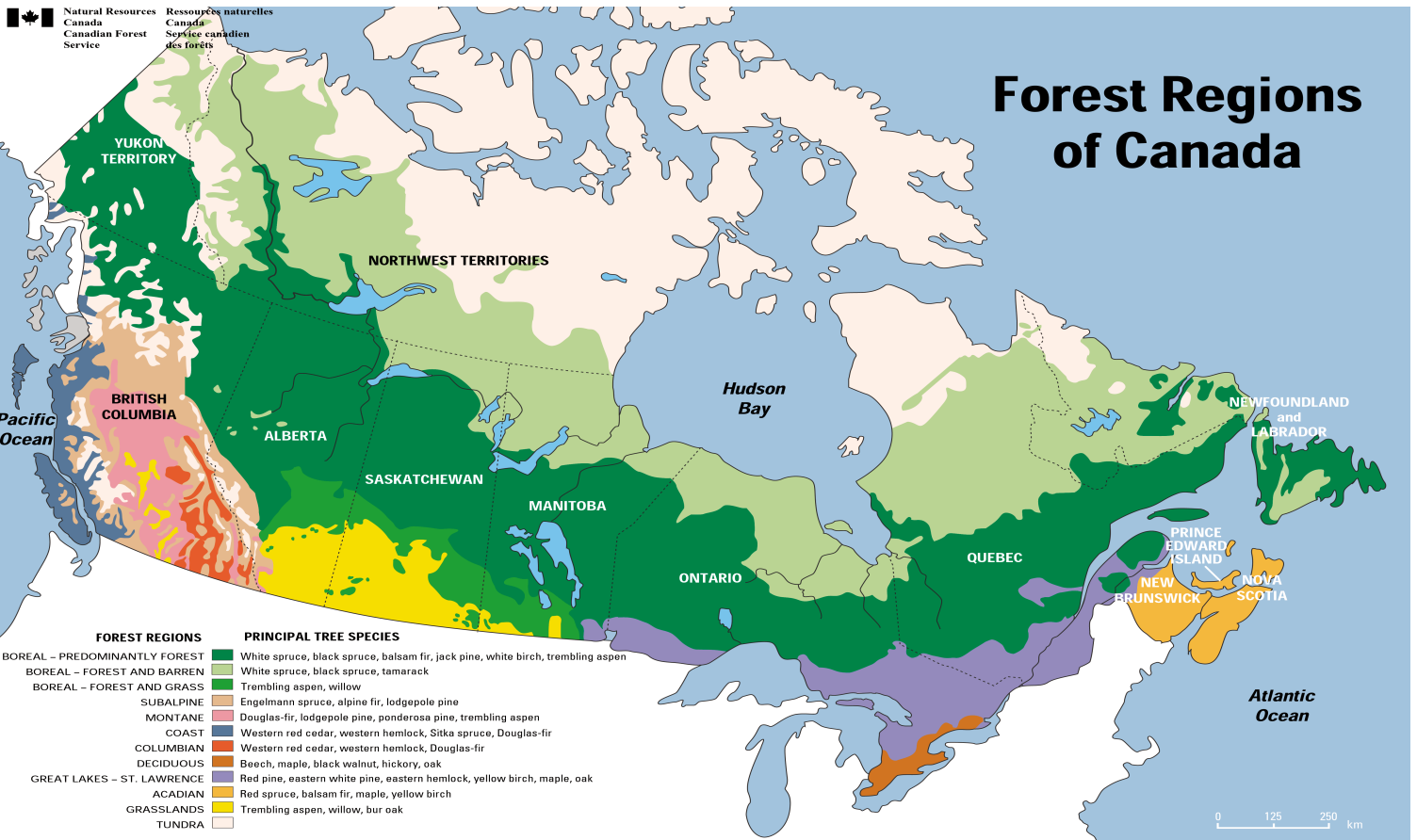
Situated north of the USA, between the Atlantic and Pacific oceans, Canada is the world's second largest country. Forests are a dominant feature of Canada's landscape, covering almost half the country. They are an important part of Canada's character, heritage and economy. They define the country's natural environment by supporting plant and animal life, contributing to the quality of water and soil, and supplying Canadians with recreational, cultural, and aesthetic pleasures.

Canada's Forests are ecosystems of diverse complexes of plants, animals, soil, water and air. With 10% of the world's temperate and boreal forests, Canada is one of the few developed nations still richly endowed with large areas of natural forest. The total area of Canada is 927 million hectares, of which 921.5 million hectares is land. About half of the land mass is covered by forest and of this, approximately 57% is considered commercial forest.

Canada has been divided into fifteen terrestrial eco-zones (based mostly on climate and landform variations). The eco-zones have been broken down into 194 different eco-regions, which in turn have been subdivided into 1,020 eco-districts. Forests are home to roughly two-thirds of the 140,000 species of plants, animals and microorganisms (excluding viruses) estimated to occur in Canada.

There are approximately 180 indigenous tree species in Canada, of which 100 can be found in the Mixedwood Plains eco-zone. The average age of Canada's forests increases from east to west, reflecting differences in disturbance frequencies (fire, insect outbreaks, timber harvesting) and natural variations in species longevity. Tree species living past 160 years are common only in the west and, as a result of natural forest succession, there is a general shift from hardwood to softwood dominance with increasing age of forest stands.

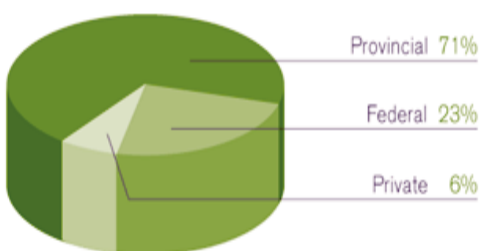
Annually, Canada harvests roughly 0.4% of its productive forest area, an equivalent of approximately 73% of the annual allowable cut, while fire or insect outbreaks affect approximately 0.5% of the forests each year.



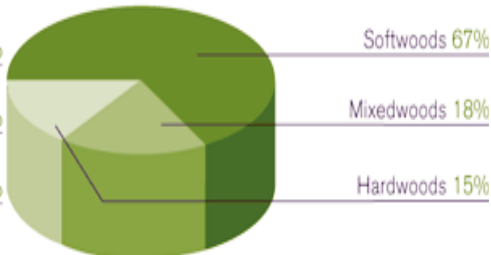
National Profile

	Forest Land	Harvest Volume m ³	Value of exports	Value of shipments	Forest Ownership		
					Provincial	Federal	Private
Newfoundland	22.5 million ha	1.9 million	\$586.4 million	\$710 million	99%		1%
Prince Edward Island	.29 million ha	.5 million	\$22.6 million	\$44 million	7%	1%	92%
Nova Scotia	3.9 million ha	5.8 million	\$595.9 million	\$1.2 billion	28%	3%	69%
New Brunswick	6.1 million ha	11.5 million	\$2.6 billion	\$3.7 billion	48%	1%	51%
Quebec	83.9 million ha	41.4 million	\$11.500 billion	\$18.7 billion	89%		11%
Ontario	58 million ha	23.8 million	\$8.9 billion	\$15.5 billion	88%	1%	11%
Manitoba	26.3 million ha	2.1 million	\$607.4 million	\$918 million	94%	1%	5%
Saskatchewan	28.8 million ha	4.1 million	\$734.1 million	\$947 million	97%	2%	1%
Alberta	38.2 million ha	17 million	\$3 billion	\$4.4 billion	87%	9%	4%
British Columbia	60.6 million ha	76.9 million	\$15.3 billion	23.5 billion	95%	1%	4%
Yukon Territory	27.5 million ha	253,326 million	\$8.4 million			100%	
Northwest Territories	61.4 million ha	182,900 million	\$7.1 million			100%	
Nunavut			\$94,000				

FOREST LAND OWNERSHIP

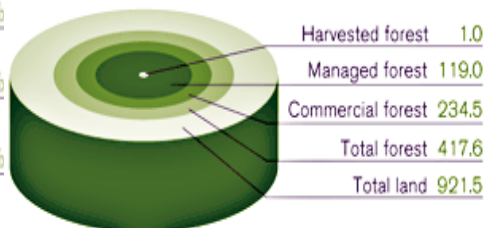


CANADA'S FOREST TYPES



CANADA'S FORESTS

million hectares



Management

Forest Management involves regenerating forest areas that have been harvested or damaged by fire or insects. The approach to forest management in Canada has evolved in response to unique conditions, to growth in knowledge and to changes in public values. Today, Canada serves as a model for the practical application of sustainable forest management. Provincial governments play a particularly important role in implementing Canada's commitments regarding sustainable forest management. **Under the**

“Sustainable Development: development that meets the needs of the present without compromising the ability of future generations to meet their own needs.”

World Commission on Environment and Development, 1987

Canadian Constitution, the provinces have responsibility for forest management. Each province has its own legislation, regulations, standards, and programs through which it allocates forest harvesting rights and management responsibilities. In recognition of the broad spectrum of forest users, provincial government agencies seek public views and work closely with forest industries, Aboriginal groups and environmental organizations to incorporate recreational, social, wildlife and economic values into forest management planning and decision-making.

Most of Canada's forests (94%) are publicly owned; provincial governments are responsible for managing 71% and the federal and territorial governments manage 23%. The remaining 6% are the private property of more than 425,000 landowners, including individuals, families, corporations and communities. Each province has its own legislation, regulations, standards and programs through which it allocates public forest harvesting rights and corresponding manage-

ment responsibilities. In the Northwest Territories and Nunavut (the newest territory, which came into being on April 1, 1999), the responsibility for resource management, including that of forests, has been transferred from the federal government to the territorial governments. Some of Canada's forests are protected from harvesting by legislation and policies, i.e. forests located on sensitive sites, such as those close to streams or on steep slopes. Some other forests are protected by legislation as part of Canada's commitment to preserve a network of areas that are representative of its land and fresh water.

“Our working forest is shrinking in Canada. This means we need to do a better job with what we have, managing it more intensively to maximize yield.”
Jack Munro, Former Chair, Forest Alliance of British Columbia

Management Cost

In recent years, the provinces have shifted responsibility for forest management costs to industry. Between 1988 and 1997, industry expenditures nearly tripled, while provincial and federal expenditures dropped by two-thirds. Last ten years' cumulative spending on forest management totaled \$24.3 billion, a 16% raise over a 10-year period.

Capital expenditures are divided into two major categories: fixed capital expenditures and repair expenditures. Fixed capital expenditures

are new investments that increase existing production capacity, whereas repairs maintain the existing industrial facilities in operation.

Today's resource manager has to make sure every action is Biologically Possible, Economically Feasible, Culturally Acceptable, Politically Practical and Legally Defensible.

Dr. Hamish Kimmins, a forest ecology professor at the University of British Columbia, does an excellent job of expanding on this theme in his book titled “Balancing Act”.



Ontario



Quebec



Nova Scotia



New Brunswick



Manitoba



British Columbia



Prince Edward Island



Saskatchewan



Alberta



Newfoundland



Land Tenure - Ontario as an example

Tenure systems are different in every province. On Crown land, tenure (private license to operate and manage) is a vital part of any forest management system. It is authorized by the CFSA (Crown Forest Sustainability Act). CFSA is very broad in scope. The specifics of what needs to be planned for, and when, are managed through regulations.

In Ontario, forest industry companies gain access to timber supplies through FRLs (Forest Resource Licenses). FRLs confer certain rights relative to species and volumes on defined areas, but don't carry with them any direct stewardship responsibility. The larger FRLs are referred to as SFLs (Sustainable Forest Licenses). These licenses are issued for 20 years, renewable every five years if performance standards are met, as determined by an independent audit. The SFL is the primary vehicle for delivery of forest management plans, which govern all forest activities on Crown land, and the SFL holder has the responsibility to deliver the legal obligations contained in the SFL. SFLs require forest products companies to protect the environment and pay the full cost of reforestation on the lands they harvest. The third tenure is Minister's directive, in which the SFL holder is obliged to make certain volumes of wood available to a designated party.



“Any tenure system requires by its nature that the government constrain its power to make land use designations on Crown Land. This causes predictable pressures from interest groups to strengthen or weaken the tenure mechanisms.”

George Bruenner, Tembec

Forest renewal in Ontario is financed by payments into a Renewal Trust Fund, based on a per m3 charge for wood harvested. The Trust Fund is dedicated solely to the management unit from which the wood was cut, and can't be accessed by government.



Certification

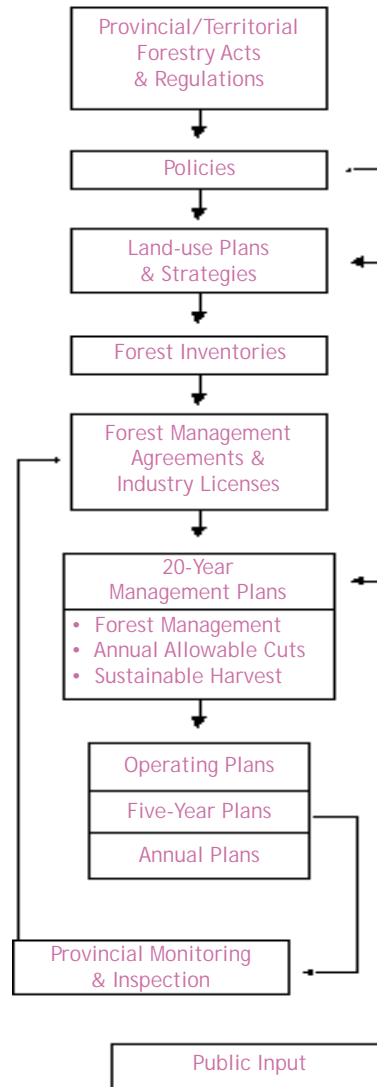
As of May 31, 2000, there were more than 16 million hectares of Canadian forest land certified under one of the three systems used in Canada: CSA, ISO or FSC. Each of these systems uses third-party audits to verify compliance with its standard.



The Criteria and Indicators Framework

Over the years, governments across Canada have been rethinking their forest policies to better reflect the principles of sustainable management. The CCFM (Canadian Council of Forest Ministers) was established in 1985 to allow the 14 federal, provincial and territorial ministers with responsibility for forests to cooperate closely in national and international matters.

Forest Management Planning Framework in Canada



The CCFM C&I (Criteria & Indicators) framework is composed of criteria that define a set of values to enhance and sustain, while the indicators identify scientific factors to assess the state of the forests and measure progress over time.

The C&I are intended to provide a common understanding and scientific definition of sustainable forest management. The information and data is used to shape forest management policies and to focus research on areas where it is needed to improve the technology and knowledge. The six sustainable forest management criteria that have been identified include traditional concepts, such as timber values, but go beyond economics to encompass among others, environmental, social and Aboriginal values. Each criteria is subdivided into

elements, and from those elements, 83 indicators have been established to help track the nation's progress in achieving sustainable development and balancing.

Several provinces have adopted provincial sets of C&I, and many are preparing to incorporate C&I into their forest management planning. In addition, some provinces have taken steps to integrate C&I into their forest legislation.

Public Interest

In recent years, Canada's forests have been attracting increased public attention and concern. In 1998, Canadians renewed their commitment to sustainable forests nationwide by adopting a new five-year strategy aimed at bringing together the ecological, economic, social, and cultural aspects of forest conservation and use. They changed how their forests are managed and how they are harvested. They lobbied for and got more species protection and more land base protection. They influenced forest appearance and forest use. They asserted that Canada's forests are worth more than the timber they contain, and pressed for recognition of forests' non-commercial values.



Forests provide 877,000 direct and indirect jobs to Canadians, generating more than \$11 billion in wages. Canadian forests count some 425,000 woodlot owners. About 337 communities across Canada are forestry dependent. Individuals, families, communities, and forest companies own 6 % of Canada's total forestland and provide 19 % of Canada's industrial roundwood production. As a result, the sector has seen dramatic changes that have reshaped forest values and forest management and practices. More than anything, these changes have underlined the need for balance in the forest; the balance between commercial and non-commercial uses, between wood supply and wood demand, and between the values of the present and the requirements of the future. In 1999, forest products contributed \$35.4 billion to Canada's balance of trade. For the eighth time in the past decade, Canada's balance of trade would have been in a deficit position were it not for the contribution of forest products exports.

"In societal terms, the forests will change in that there will be even more sharing of the various forest resources and more collaborative decision-making about how the forests will be used."

Roxanne Comeau, Executive Director, Canadian Institute of Forestry

Growing environmental concern over the years has also prompted environmental groups to launch campaigns to exclude certain forest products from the marketplace. Extensive lobbying by these groups has persuaded some customers not to buy wood from natural, old growth, and ecologically sensitive forests. Green consumer groups

have also influenced decisions to protect certain old growth and natural forests from logging and other activities. Government agencies across Canada have, without exception, adopted a consultative approach to developing forest policy, and routinely seek public views. A number of provinces have announced incentives to encourage the sustainability of private woodlots through tax rebates and financing for silvicultural activities and education.

The First Nation Forestry Program (FNFP), a partnership program between First Nations (Aboriginal Peoples) and the federal government, was introduced in April 1996. The five-year program is aimed at improving the economic conditions in status First Nation communities by promoting increased First Nation involvement in the forest sector. Canada's forests have played a key role in meeting the cultural, spiritual and material needs of Aboriginal people. Canada recognizes that, through their enduring relationship with the land, Aboriginal people have gained an intimate knowledge of forests and can bring a special perspective to sustainable forest management in Canada.

"Major issues for the future are the resolution of land claims and the institutionalization of Aboriginal and treaty rights in forest policy, so that Aboriginal people can have an equitable share of Canada's resources, enabling them to participate equally in industry and to use land according to their traditions."

Harry Bombay, Executive Director, National Aboriginal Forestry Association

Approximately 80 % of Aboriginal communities are located within the forest regions of Canada. A number of Aboriginal land claims are working their way through the Canadian judicial system of which some have been settled and others are nearing settlement. If eventual decisions award Aboriginal claimants title to disputed land, they will likely be granted exclusive use of that land (with certain limitations). In theory, such decisions could change the use of the affected forests, including removing them from the commercial inventory. However, for the time being, the outcome of many Aboriginal land claims is unknown. Consequently, these claims are adding an element of uncertainty to forest planning, since it is unclear how they will alter forest use, tenure agreements, and the commercial wood inventory. Adapting to public needs and concerns while supplying the growing worldwide demand for wood has become a complex balancing act.



Technology

Instituting change to achieve sustainable forest management is a long term endeavour. Ecosystems are dynamic, and long periods of monitoring are needed to measure their response to changes



in human activities and natural phenomena. Canada's three national forestry research institutes are: Forintek, FERIC (Forest Engineering Research Institute of Canada) and Paprican (Pulp and Paper Research Institute of Canada). These institutes are considered to be a vital part of Canada's research and development infrastructure. Their research is aimed at helping Canada's forest industry improve productivity and innovation, and providing technological solutions that are considered crucial to an ecologically sustainable and economically viable forest industry.

"The focus on technology will mean we need different knowledge and skill levels in forestry personnel. In Canada, we have always trained our foresters as generalists, but we will increasingly need specialists who have the knowledge to take us forward technologically."

Ken Higginbotham, Vice-President of Forestry and Environment, Canfor Corporation

Approximately one million hectares of forest are harvested in Canada annually. Although many of these harvested areas regenerate naturally, on average approximately 470,000 hectares of forest are replanted or seeded in Canada each year. Planted and seeded forests require significant, long-term labor and monetary investments. To protect these investments and to ensure rapid and successful establishment, vigorous and pest-tolerant tree species have to be used. Further, once the new tree stands are established they must be protected against the ravage of diseases and insect pests, as well as fire. Canada has made great strides in its research and development efforts to increase

the vigor and growth rate of harvestable trees, to improve their wood quality and to protect them from diseases and insects through the use of means more environmentally-acceptable than synthetic chemical controls.

"In Finland and Sweden, there is far more proactive use of technology on the production side than we have in Canada, and it's not because the technology isn't known to us or available to us; it's just that for many reasons we have been slow to adopt it."

Joseph Wright, President and CEO, Pulp and Paper Research Institute of Canada

Planting and seeding programs are implemented at sites that have failed to regenerate several years after natural disturbances or harvesting.

Genetically modified trees are not being used for reforestation purposes in Canada.

State of Canada's Forests, 1999-2000 report

Site preparation and stand tending refers to all silvicultural operations that improve the growth and quality of young trees from thinning, fertilizing and pruning in recently planted forests, to commercial thinning in more mature forests.



Model Forest Program

The Model Forest Program was established by Canada in 1992 to accelerate the implementation of new approaches to forest management through shared decision making. Each of Canada's 11 model forests is based on a partnership of groups and individuals possessing a broad range of forest values who collaborate in working toward their shared objective of sustainable forest management within the unique social, economic, and ecological conditions in their forest area. Together, the model forests cover more than six million hectares and represent the diverse ecologies of the major forest regions of Canada. As such, they serve as excellent field laboratories.

- *About 76% of Canadian forests are coniferous (softwood) trees*
- *About half of Canada's forestland is classified as "multiple use" (tourism, research, hunting, fishing, forest products)*
- *Only one quarter of 1% of Canada's forests is harvested for wood each year*
- *Every hectare harvested must be regenerated within a specific time frame as stipulated by rigorous legislation within each province*
- *In all provinces, it is required that the company which harvests the trees be legally responsible to regenerate the area after harvesting*
- *Natural regeneration is abundant in many forest types, and harvesting methods have changed to protect this regeneration*
- *Canadian forest companies plant more than 650 million seedlings annually*
- *Every year, Canada loses more wood to fire, insects and disease than is harvested*
- *Of the 800,000 to one million hectares of forest harvested annually in Canada, 53% will regenerate naturally; 43% is replanted with seedlings; 4% directly seeded*

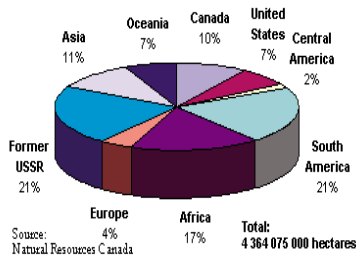




Canada's Forests on the Globe

Canada is recognized as a world leader in forest management and in developing innovative and practical approaches to issues the forest sector faces. It is playing a leadership role in international efforts to measure forest sustainability. Of particular importance is the Montreal C&I Process, so named because the first meeting sponsored by the Conference on Security and Cooperation in Europe took place in Montreal in 1993. This initiative involves 12 countries that together represent 90% of the world's boreal and temperate forests. Globally, there are at least 140 countries participating in C&I initiatives at various levels and in various ecosystems.

World Forest Resources - Forest Areas



Canada, along with an increasing number of nations, recognizes that progress towards sustainable forest management worldwide requires a common agenda. The approach must be flexible and balanced; integrating the economic, social, cultural and environmental values of forests. Canada believes an international forest convention would complement existing forest-related instruments like the conventions on Biological Diversity, Climate Change and Desertification.

Forest issues know few boundaries. In today's world, the activities and decisions of one nation are generally influenced by, and have an impact on, others around the globe.

At the core of Canada's support for a convention is the recognition that the world's future is dependent on the world's forests and that sustainable forest management is fundamental to achieving global sustainable development. Among those who have been consulted on a range of forest issues, including Canada's position on a convention, are environmental groups, labor, Aborigines, academics, and industry.



Canada is the world's largest exporter of forest products, valued at \$39.7 billion in 1998. The country has a trade surplus of \$31.7 billion, which adds to the Canadian economy and contributes \$18.2 billion to the gross domestic product (GDP). In 1999, Canadian exports of forest products went mainly to the United States (\$35 billion), Japan (\$3.1 billion) and the European Union (\$3 billion).

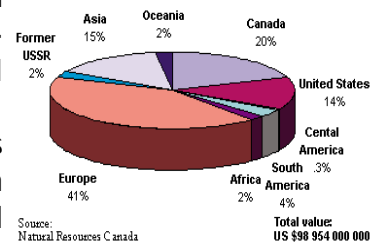
The five year Canada-United States Softwood Lumber-Agreement will expire on March 31, 2001. Under the terms of the agreement, each year, 14.7 billion board feet of softwood lumber from the four main producing provinces of, British Columbia, Alberta, Ontario and Quebec, are allowed into the United States fee free. Quantities over this limit are subject to export fees. Consultations with industry, the provinces and other stakeholders are underway to determine what course of action Canada should take when the agreement expires. This is a key issue for lumber exporters, as 88% of Canada's softwood lumber exports go to the United States.

Future

Forests are crucial to future generations of Canadians for the environmental, social, and economic values they represent. The sustainability of the forests will be the key to Canada's future success; meeting its environmental goals and ensuring the stability of communities that are economically reliant on forests.

Canada's recognition of the multiple values of forests has raised a number of challenges and has ushered in a new era of forest management, in which the knowledge of forest ecosystems is shared and consensus building is seen as the basis for decision making. Forests will continue to have an invaluable role to play in Canada's economic, social and environmental well being in the 21st century. For many, the onset of the new millennium seems a natural time to reflect on the past and project into the future.

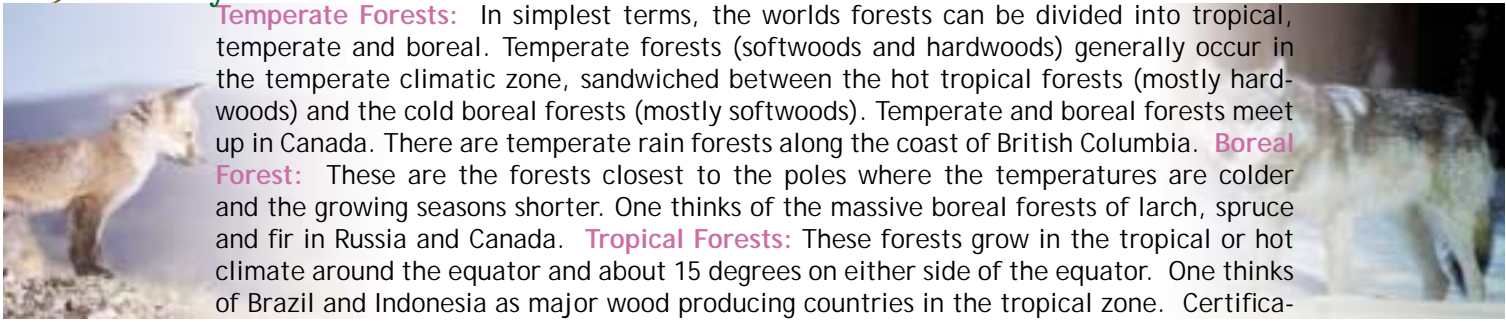
World Export of Forest Products



Future

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Temperate Forests: In simplest terms, the world's forests can be divided into tropical, temperate and boreal. Temperate forests (softwoods and hardwoods) generally occur in the temperate climatic zone, sandwiched between the hot tropical forests (mostly hardwoods) and the cold boreal forests (mostly softwoods). Temperate and boreal forests meet up in Canada. There are temperate rain forests along the coast of British Columbia. **Boreal Forest:** These are the forests closest to the poles where the temperatures are colder and the growing seasons shorter. One thinks of the massive boreal forests of larch, spruce and fir in Russia and Canada. **Tropical Forests:** These forests grow in the tropical or hot climate around the equator and about 15 degrees on either side of the equator. One thinks of Brazil and Indonesia as major wood producing countries in the tropical zone. Certifica-

tion started as a way to recognize and reward companies that manage tropical forest sustainably. **Hardwoods:** Whether a wood is soft or hard depends on the specific gravity of the wood. However, the words "hardwood" and "deciduous" are usually used synonymously. Deciduous trees lose their leaves annually. **Softwoods:** Like hardwoods the true test of a tree's softness or hardness is specific gravity. However "softwood" is generally used synonymously with "evergreen" and "coniferous". Coniferous trees are cone-bearing trees that generally have needle-like leaves. Most are evergreen, but larch (tamarack) loses all of its leaves/needles annually. **Roundwood:** This refers to trees which have had the tops and limbs removed and have been processed into tree length or log length. The wood, however, is still round. Mills are generally fed with roundwood which is processed into lumber, veneers for plywood, engineered-wood, or is chipped to make pulp. **Aboriginal:** In Canada, native or Aboriginal peoples are referred to as First Nations. In the United States, aboriginals are referred to as Native Americans. Aboriginal land claims are an extremely large issue in Canada. **"Sustainable":** The world sustainable refers to a practice which is ecologically sound, economically feasible, legally defensible and politically practical. However "sustainable" is a word like "service" or "quality" that means little until some standards and benchmarks are applied. Sustainable development refers to economic development which is environmentally and socially sustainable. Sustainable forestry is a subset of sustainable development. **Forestry:** The art, science and practice of managing forest landscapes to provide a sustained production of a variety of goods and services for society. **Silviculture:** The arts and science of managing stands of trees to achieve desired outcomes relative to species composition and stand structure. **Ecosystem:** A natural system which functions as a unit. It can be anything from a rotting log to the entire planet. It is an assemblage of living organisms together with their non-living environment in a particular area. **Adaptive Management:** Driving forest management with scientific research. This requires excellent monitoring and feedback loops to quickly put new knowledge into practice on the ground. Canada's model forests are an example of learning from adaptive management. **Ecology:** The study of ecosystems. As a science, ecology makes no value judgments.

All figures are in Canadian dollars. The exchange rate between Canadian and American dollars varies.

Canada Forestry Links & Resources

Government of Canada: www.gc.ca; Alberta: www.gov.ab.ca; British Columbia: www.gov.bc.ca; Manitoba: www.gov.mb.ca; New Brunswick: www.gov.nb.ca; Newfoundland and Labrador: www.gov.nf.ca; Northwest Territories: www.gov.nt.ca; Nova Scotia: www.gov.ns.ca; Nunavut: www.gov.nu.ca; Ontario: www.gov.on.ca; Prince Edward Island: www.gov.pe.ca; Quebec: www.gouv.qc.ca; Saskatchewan: www.gov.sk.ca; Yukon: www.gov.yk.ca

Environment Canada: www.ec.gc.ca

The Montréal Process: www.mpci.org

Forest and Forestry: www.silvafor.org

Canada's Forest Network: www.forest.ca

First Nation Forestry Program: www.fnfp.gc.ca

Forintek Canada Corporation: www.forintek.ca

Canadian Institute of Forestry: www.cif-ifc.org

Natural Resources Canada: www.nrcan.gc.ca/cfs

Canada's Model Forest Program: mf.ncr.forestry.ca

Canadian Ecology Center: www.canadianecology.ca

Canadian Council of Forest Ministers: www.ccfm.org

Canadian Model Forest Network: www.modelforest.net

Sustainable Forest Management Standard: www.sfms.com

Forest Engineering Research Institute of Canada: www.feric.ca

Pulp and Paper Research Institute of Canada: www.paprican.ca

The Canadian Forestry Association: www.canadianforestry.com

Department of Foreign Affairs and International Trade: www.dfait-maeci.gc.ca

1 Hectare (ha)	= 2.47 Acres
1 Cubic Meter (M ³)	= 1.3 Cubic Yards
1 Kilometer	= .62 Miles

1 Acre	= .405 Hectares
1 Cubic Yard	= .76 Cubic Meters
1 Mile	= 1.61 Kilometers



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