SASKATCHEWAN'S FORESTS

Jerry Humeny, Black Box Images Inc.

The trees and forests of Saskatchewan affect everyone. Forests provide wildlife habitat, watershed protection, erosion control, ecosystem stability, recreational opportunities, employment, carbon storage, and aesthetic and spiritual values. Saskatchewan's forests are also a vital part of the province's economy.

The tables and facts presented on the following pages illustrate the most significant characteristics of Saskatchewan's forest sector. Emphasis is on the forest industry and the forest land base from which trees are harvested. Most of the information presented here is based on data collected in 1992 Saskatchewan forest industry surveys. For the purpose of this report, forest industry includes primary and secondary wood-using industries.

"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."

Sustainable Forests: A Canadian Commitment–
National Forest Strategy, 1992.

A Shared Commitment to Sustainable Development

Both the Government of Canada and the province of Saskatchewan have worked together to develop and maintain the forest sector. This cooperation continues today through a 1991 agreement called the Canada-Saskatchewan Partnership Agreement in Forestry. The agreement reflects a commitment, by both governments, to a sustainable development strategy. It places importance on both timber production and other forest resources values, such as water, wilderness, wildlife and recreational development.

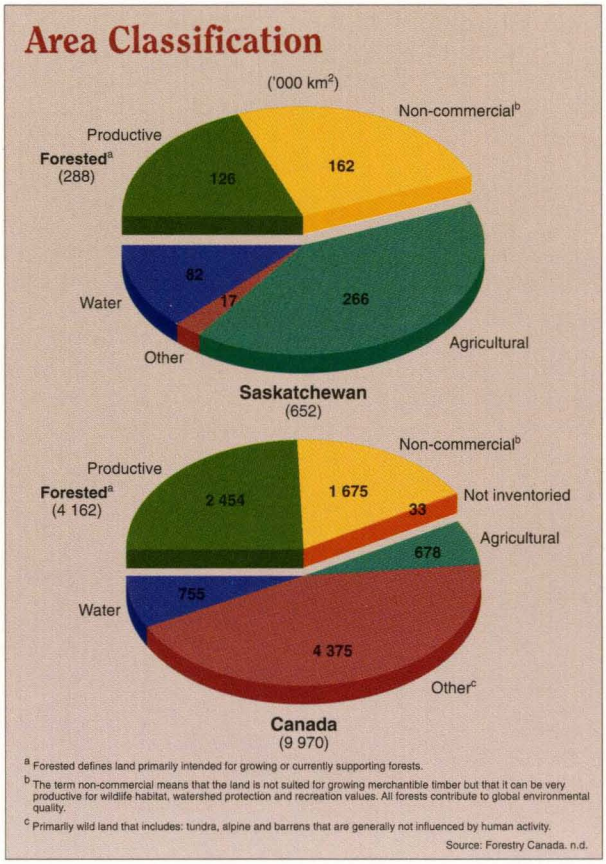
Cette information est également disponible en français.

Forest Lands and Resources

A Province Rich in Forest Resources

Saskatchewan has an abundance of forest resources. Approximately 288 000 km^2 or 44 percent of the province is classified as forested land, of which 42 percent or 120 000 km^2 is considered nonreserved, productive and available for timber management. Canada as a whole has 4 162 000 km^2 of forested land, with about 57 percent considered available for forest production purposes.

Most of Saskatchewan's forests (96 percent) grow on provincial Crown lands, with private land accounting for three percent of forest reserves, and federal Crown land comprising the remaining one percent.



Uses of Saskatchewan's Tree Species

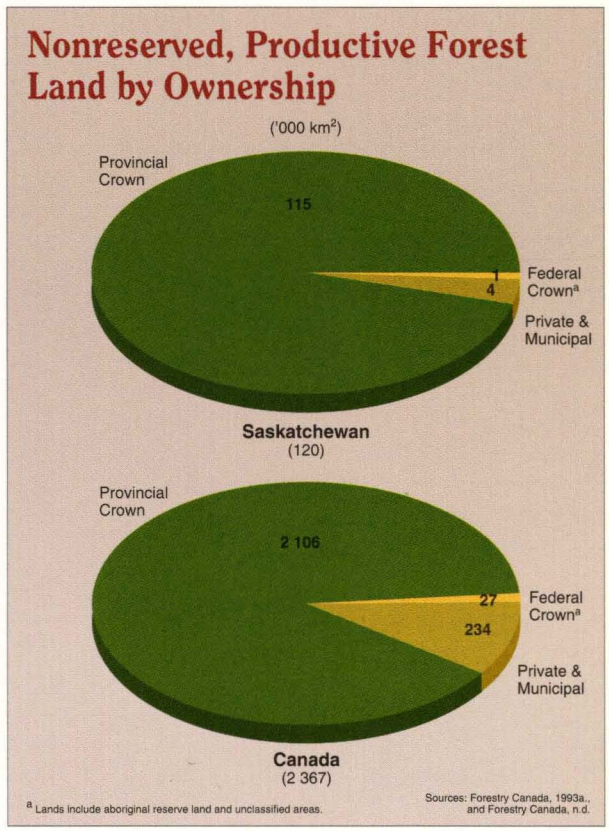
Hardwood Species

White birch *(Betula papyrifera* Marsh.) was selected as Saskatchewan's provincial tree in 1988. It is distributed throughout most of the province, but is found mostly in the northern and central parts. The tree is fast-growing and may reach a height of 21 metres and a diameter of up to 60 centimetres. Appreciated for its stately beauty and easily recognized chalk-white papery bark, white birch is frequently planted as an ornamental tree in gardens and farmyards. The wood is moderately hard, strong and dense. It is creamy white to light brown in colour and straight-grained, with a fine, even texture. When dried properly, birch wood is well suited for furniture, turnery, flooring, veneer, novelties, joinery and firewood. Essential oils may also be extracted.

Traditional Native Uses

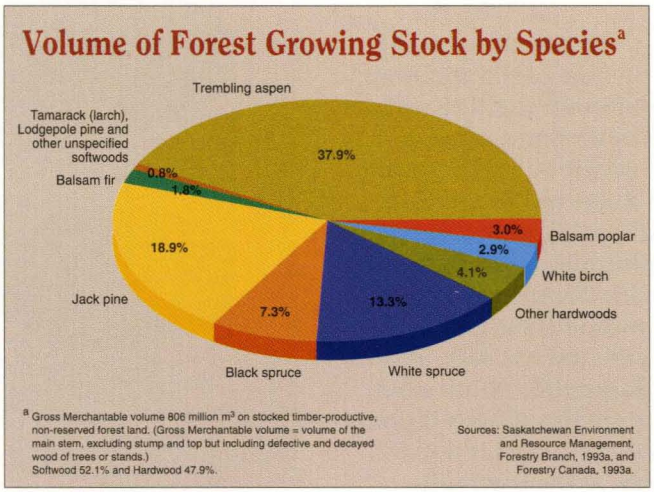
Wood: snowshoe frames, toboggans, canoe paddles, bows and arrows, wood utensils, drums, rattles and wooden nails. Wood fire: tanning, heating and smoking food. Bark: canoes, baskets, boxes, utensils, tipi coverings, dye, torches, moose calls and for decorative patterns. Other uses: nutritious drinks, tea and medicinal purposes. Overall, white birch was most versatile of all the trees.

White elm *(Ulmus americana* L.), **green ash** *(Fraxinus pennsylvanica* Marsh. var. *subintegerrima* (Vahl) Fern.), **plains cottonwood** *(Populus deltoides* var. *occidentalis* Rydb.) and **Manitoba maple** *(Acer negundo* L.) are other hardwood species that have limited commercial use as furniture stock, interior finishing wood, flooring, fuelwood and maple syrup.



Trembling aspen *(Populus tremuloides* Michx.), commonly referred to as poplar, makes up the majority of hardwood volume in Saskatchewan. The wood is white to grayish white, relatively resistant to wear, usually straight-grained, with a fine, even texture and is comparable to spruce in strength. When properly seasoned, it works well, holds nails satisfactorily, and takes a good finish. Due to its availability and increased customer acceptance, aspen use is steadily increasing. It is used for making oriented strandboard, pulp and paper, plywood, lumber, pallets, boxes, furniture stock, flooring, chopsticks, fuelwood and for interior finishes and trim.

Traditional Native Uses
Wood: bowls, snow shovels, and shelter. It was the most preferred wood for fires. Wood fire: heating, smoking fish, meat and hides. Ashes: soap. Bark: medicinal products, horse fodder and when necessary, food during famine.



Balsam poplar *(Populus balsamifera* L.), also known as poplar, is similar to trembling aspen in most wood characteristics. Balsam poplar is grayer, has a coarser texture and a higher incidence of wet pockets in the wood. These drawbacks and the availability of trembling aspen have detracted from increased use of balsam poplar. The wood can be used for most of the same products as trembling aspen; in Saskatchewan, it is used mostly for pulp.

Traditional Native Uses
Bark: buttons and toys. Buds: scented trap lures.

Softwood Species

Jack pine *(Pinus banksiana* Lamb.) wood is light brown in colour, has medium strength and hardness characteristics, and machines and finishes well. Pine is used for pulp and paper, newsprint, lumber and fuelwood, and for treated wood products such as railway ties, posts and poles. Jack pine is the most common conifer found in Saskatchewan.

Traditional Native Uses
Wood: canoe frames, sleds, fishnet floats, and shelters. Pitch: caulking. Cones: tanning agent.

Balsam fir *(Abies balsamea* (L.) Mill.) is similar to spruce in most physical characteristics, although fir is less resilient and has lower strength properties than spruce. Balsam fir is used for many of the same purposes as spruce and is graded and marketed in the species grouping spruce-pine-fir. Balsam fir makes a good Christmas tree.

Traditional Native Uses
Wood: canoe paddles and shelter. Pitch: medicinal uses. Leaves: tea, incense and perfume.

Tamarack or larch *(Larix laricina* (Du Roi) K. Koch) is not in great demand, partly because of its limited availability. The wood is moderately hard and heavy, is somewhat oily, and tends to have a spiral grain that makes it undesirable for most lumber uses. Nevertheless, its strength, durability, and moderate resistance to decay make it well suited to use as floor planking, building skids, pilings, posts and poles.

Traditional Native Uses
Wood: toboggans, canoe paddles and snowshoe frames. Wood fire: tanning and smoking hides, and drying and smoking fish.

Lodgepole pine *(Pinus contorta* Dougl.) wood is almost white and is soft and straight-grained, and exhibits a fine uniform texture. The wood is of medium strength, seasons readily, takes a good finish, and yields a good grade of small, tight-knotted lumber similar to that of jack pine. It is used for pulp and paper, lumber and fuelwood; when treated it is used for railway ties, posts and poles. In Saskatchewan, lodgepole pine is found only in the Cypress Hills area in the southwestern part of the province, which is its most easterly range in Canada.

Traditional Native Uses
Wood: poles for tipi frames and travois poles.

White and black spruce *(Picea glauca* (Moench) Voss and Picea mariana (Mill.) B.S.P.) are nearly indistinguishable in their wood structure. The wood is light coloured, has low weight when dried, is soft, resilient and straight-grained, and has good machining properties. Both species are in great demand for pulp, paper and newsprint manufacturing because of their long fibres and low resin content. The wood is highly valued for plywood and lumber, which is used in all forms of building construction and general millwork. Spruce is both Saskatchewan's and Canada's most important wood species in terms of volume harvested.

Traditional Native Uses
Wood: canoe frames and paddles, arrow shafts, fishnet floats, drying racks, pelt stretchers and tipi frames. Roots: twine and cord. Bark: canoe covering, cooking baskets, and roofing. Pitch: glue, waterproofing and caulking materials and chewing gum. Other uses: shelters, medicines and boughs for bedding and mats.

Harvesting and Use

Sustaining Our Forests

To achieve a sustainable yield or a perpetual supply of timber, foresters calculate a harvest level using an Annual Allowable Cut formula. The calculation is then adjusted to take into account biological risks such as fire and disease and to protect other forest values such as wildlife habitat and recreational development.

Annual Allowable Cut *– the amount of timber that may be harvested annually from a specified area; used to regulate the harvest level to ensure a long-term supply of timber.*

In 1992, the Annual Allowable Cut from provincial Crown lands (productive, nonreserved forest) was 6.65 million cubic metres of net merchantable volume per year; fifty-five percent of this was coniferous and 45 percent deciduous. Trembling aspen makes up 40 percent of the Annual Allowable Cut, followed by jack pine and spruce at approximately 25 percent for each species.

During the last five years, the average annual harvest has been about 3.2 million cubic metres. Only 50 percent of the allowable cut has been utilized each year. This means that Saskatchewan has a surplus of available timber. Some of this surplus timber is located in remote areas and its harvest is not, at present, economically feasible. At the same time, some regions of the province are experiencing shortages of harvestable conifers.

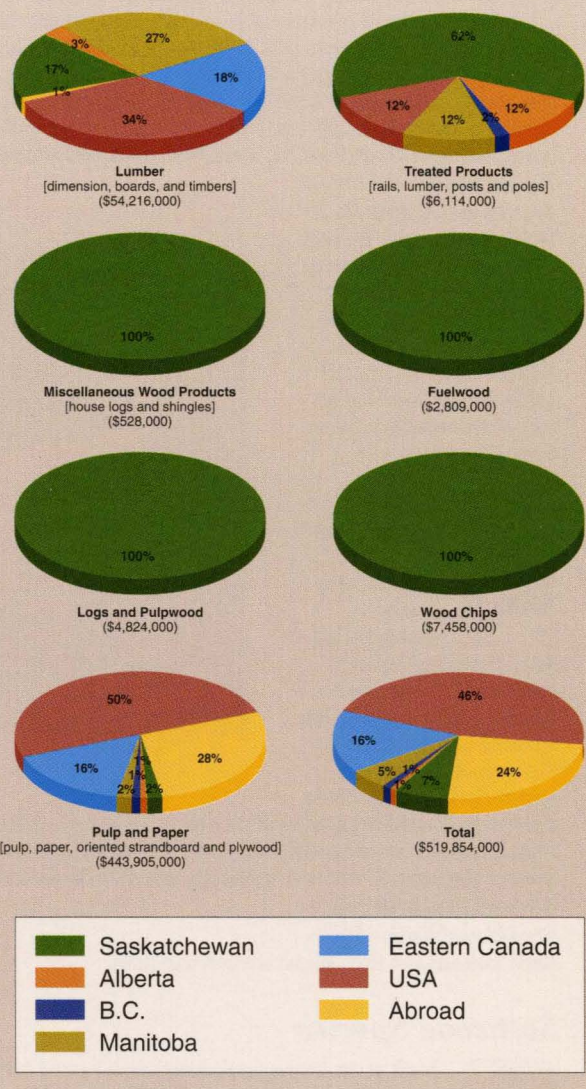
Primary Forest Products in Saskatchewan

Product	1992 Production[a]
Lumber (Dimension, Boards and Timbers)	1 150 500 m^3
Treated Products	
Lumber	4 400 m^3
Posts, Poles and Rails	154 700 m^3
Miscellaneous Wood Products (House Logs and Shingles)	5 000 m^3
Fuelwood	80 300 m^3
Logs and Pulpwood	160 800 m^3
Wood Chips	486 200 m^3
Plywood	75 100 m^3
Oriented Strandboard	140 000 m^3
Pulp	428 500 t
Paper	148 800 t

[a] Total wood harvest in 1991-92 was 2 957 000 m^3.

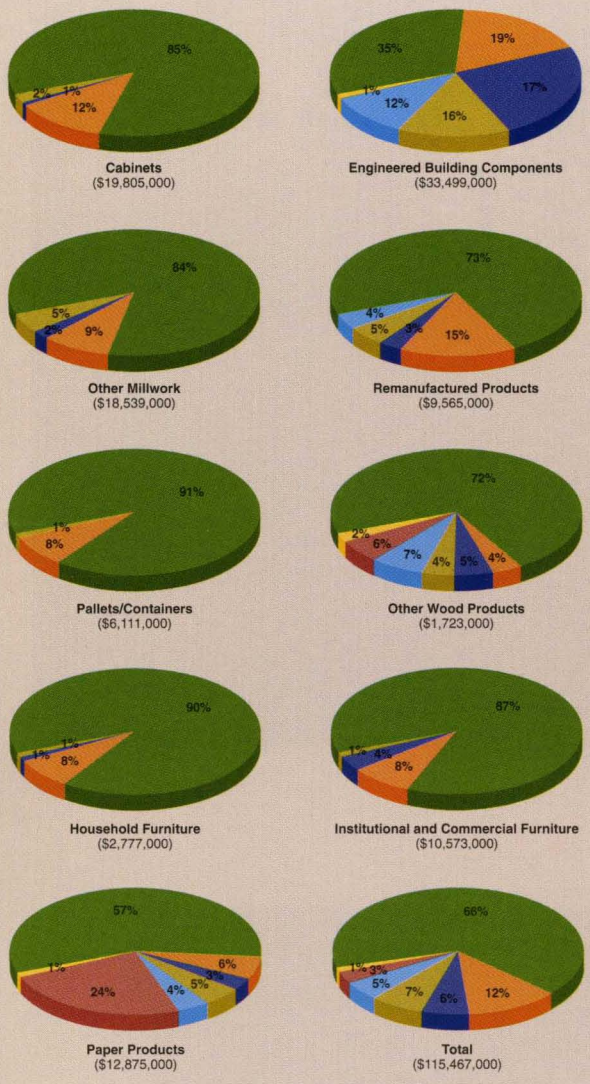
Source: Saskatchewan forest industry surveys, 1992.

Destination of Primary Forest Products by Estimated Value



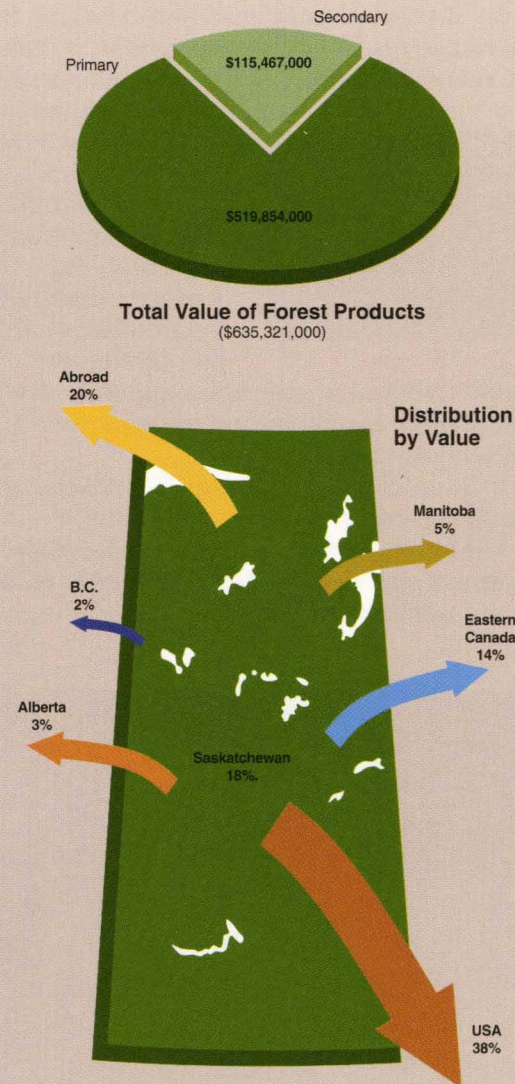
Forest harvesting guidelines in Saskatchewan vary according to the management prescription for each forest stand and the topography of the area to be cut. Forest companies must comply with these guidelines. In softwood forests, cut blocks are generally 40 hectares or less. In hardwood forests cut blocks can be as large as 120 hectares, but the average size is closer to 70 hectares.

Destination of Secondary Forest Products by Estimated Value



Source: Saskatchewan forest industry surveys, 1992.

Market Destination of Saskatchewan's Forest Products



Source: Saskatchewan forest industry surveys, 1992.

R.A. Bohning

Marketing Lumber

Employment Benefits

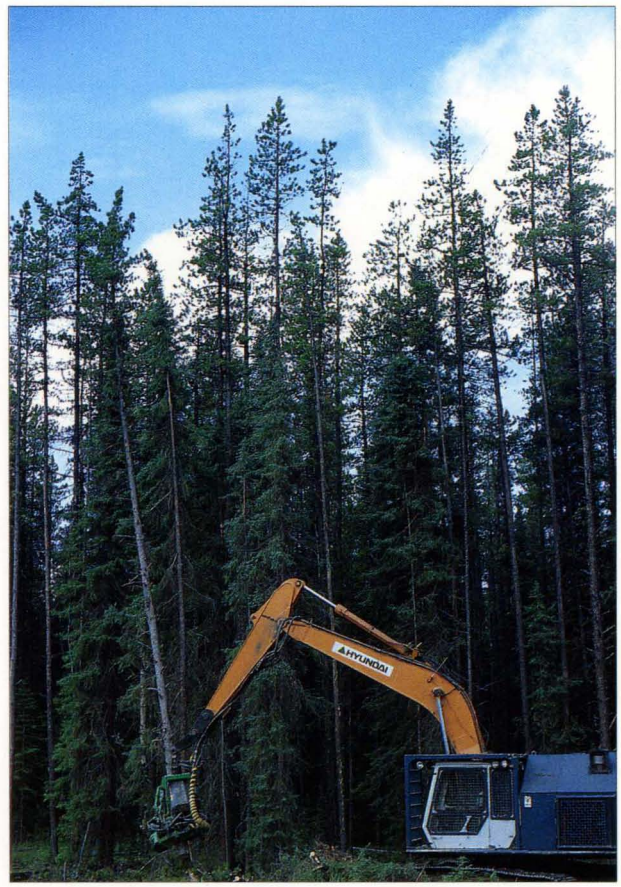
The Forest Industry in Saskatchewan Provides One Job in 35

In the forest industry, direct employment includes all people directly employed in logging and processing plants for both primary and secondary forest industries. Indirect employment includes all people employed as a result of forest industry activity, such as sales personnel in local retail outlets, people who supply the forestry complex with intermediate goods, and government employees required to maintain community services. Export-oriented manufacturing activities result in indirect employment.

Employment Multiplier– *A value that, when multiplied by the direct employment of a given industry, indicates the total direct and indirect employment generated by that industry.*

In Saskatchewan, one job in 35 is directly or indirectly dependent on the forest industry.

The forest environment also provides other employment opportunities through tourism, recreation and related activities.



R.A. Bohning

Harvesting timber

R.A. Bohning

Sorting lumber for quality

R.A. Bohning

Building homes

R.J. Marles

Traditional use

Employment in the Saskatchewan Forest Industry

	No. of Firms	Direct Employment (Person-Years)	Indirect Employment (Person-Years)	Total Employment (Person-Years)	Employment Multiplier[a]
PRIMARY INDUSTRY					
Sawmills					
Production:[b]					
>5 MM fbm	4	692	1 248	1 940	2.803
1 MM fbm - 5 MM fbm	5	90	162	252	2.803
100 M fbm - 1 MM fbm	38	129	233	362	2.803
<100 M fbm	84	25	45	70	2.803
Independent Planing Mills	1	2	4	6	2.803
Wood Treating Plants	6	159	145	304	1.912
Pulp, Paper, and Panelboard Mills	4	2 075	4 758	6 833	3.293
Commercial Fuelwood Producers	85	48	20	68	1.424
Miscellaneous Wood-Using Industries	3	4	4	8	1.912
Independent Log Producers	n/a	92	39	131	1.424
TOTAL	**230**	**3 316**	**6 658**	**9 974**	**3.008[c]**
SECONDARY INDUSTRY					
Sash, Door and Other Millwork Industries (SIC 254)[d]	67	809	449	1 258	1.555
Wooden Box and Pallet Industries (SIC 246)	11	294	156	450	1.530
Coffin and Casket Industry (SIC 258)	1	7	3	10	1.467
Other Wood Industries (SIC 259)	14	157	143	300	1.912
Household Furniture Industries (SIC 261)	12	75	39	114	1.521
Office Furniture Industries (SIC 264)	5	27	14	41	1.521
Other Furniture and Fixture Industries (SIC 269)	16	151	79	230	1.521
Paper Box and Bag Industries (SIC 273)	2	60	44	104	1.734
Miscellaneous Paper Converting Industries (SIC 279)	3	114	81	195	1.713
TOTAL	**131**	**1 694**	**1 008**	**2 702**	**1.595[c]**
PRIMARY AND SECONDARY FOREST INDUSTRY TOTALS	**361**	**5 010**	**7 666**	**12 676**	**2.530[c]**

[a] The multipliers used in this table are derived from the Manitoba Bureau of Statistics and are presented as weighted averages to reflect the forest industry classification system used in this report.

[b] MM fbm= million foot board measure; M fbm= thousand foot board measure.

[c] Implied multiplier.

[d] Standard Industrial Classification (SIC) system.

Sources: Saskatchewan forestry industry surveys, 1992, and Manitoba Bureau of Statistics, 1985.

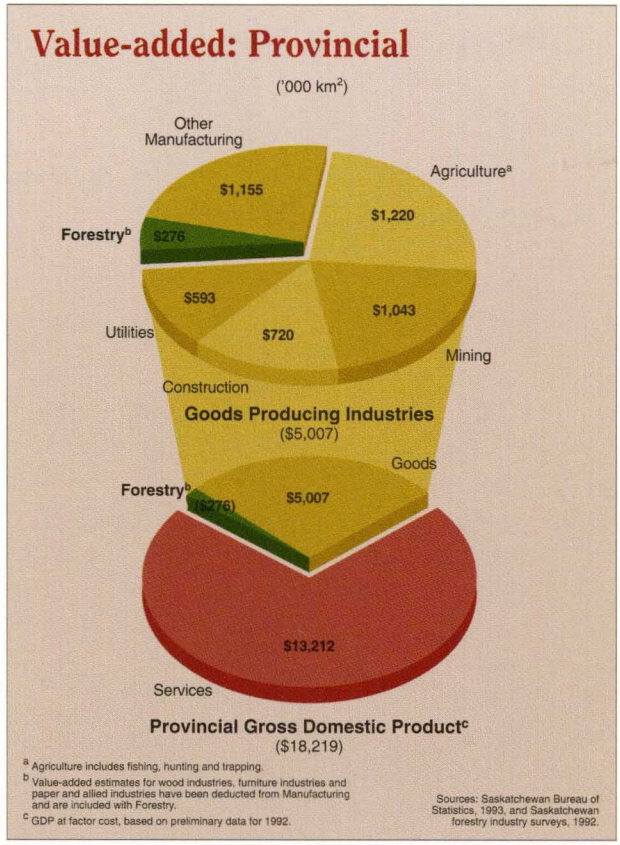
VALUE ADDED

Adding Value Generates Income

The manufacturing process uses intermediate goods and services to transform raw materials into finished goods and to add value to final products. Examples of such goods and services in the forest industry include fuel and electricity, wood-preserving chemicals, contracting fees and legal and accounting fees. Without the use of these goods and services, forest product firms could not produce the end products demanded by consumers. Forest product firms include both primary and secondary wood-using firms.

***Value-added** – The difference between total revenue and the cost of all purchased materials, supplies and services. It includes payments to labour, depreciation, profits and taxes.*

The value-added generated by an industry is a measure of that industry's contribution to a total regional, provincial and national income. The value-added for Canada as a whole is described as its gross domestic product.



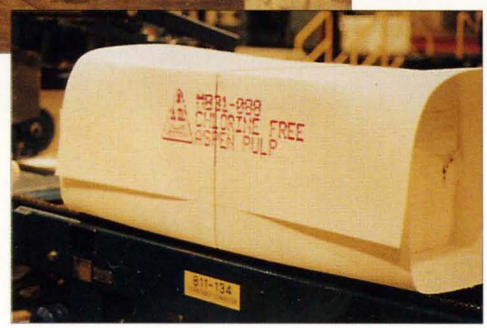
R.J. Marles

Traditional Carving

R.A. Bohning

R.A. Bohning

Plywood for export



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Chlorine-free aspen pulp

Other Forest Uses

Tourism is the world's fastest growing industry, and is therefore of major importance to Saskatchewan. In fact, an estimated $650 million of Saskatchewan's Gross Domestic Product (GDP) is derived from tourism.

Recreational activities consist of consumptive and non-consumptive uses of resources in the forest environment, consumptive uses include hunting, fishing and trapping. Non-consumptive forest activities are numerous and include hiking, skiing, camping, boating, photography, bird watching and general wildlife viewing. In 1991, for example, wildlife-related activities, including fishing, involved 91 percent of Saskatchewan's population in some form of activity.

The overall contribution of recreational activities to the provincial economy was $325 million, with a considerable portion of this money coming from activities taking place in the forest environment.

G.E. McEwen

H. Hesseln

A Multiple Use Resource

	1992
FISH	
Angling Licenses ('000)	176
Fisheries Revenue ('000)	$2,682
Estimated Recreation Days ('000)	2 300
Number of Fish Stocked ('000)	34 000
Commercial Fish Production ('000 kg)	3 415
Commercial Fish Market Value ('000)	$3,078
GAME	
Hunting Licenses ('000)	214
Hunting License Revenue ('000)	$4,674
Estimated Recreation Days ('000)	467
TRAPPING	
Trapper Licenses ('000)	3
Trapper License Revenue ('000)	$53
Estimated Value of Harvest ('000)	$952
OUTDOOR RECREATION[a]	
Visitors ('000)	2 802
Campers in Parks ('000)	786
Estimated Park Permit Revenue ('000)	$3,752
WATERSHED BENEFITS[b]	
Net Mean Annual Yield in River Discharges ('000 000 m^3)	42 589

[a] Combined provincial and federal figures for daily park visitors.

[b] Difference between outflow and inflow river discharges, with majority of water being produced in a forested area.

Sources: Saskatchewan Environment and Resource Management, 1993b, and Environment Canada, 1993.

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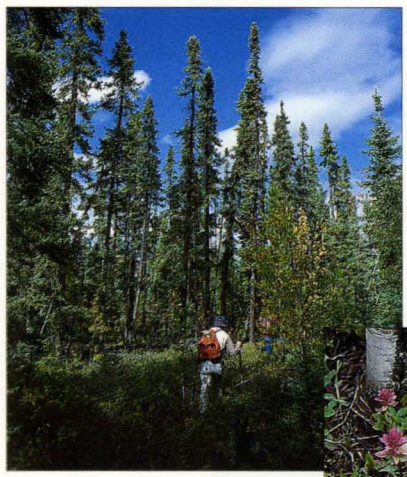


R.A. Bohning

R.A. Bohning

G.E. McEwen

The Federal Role: Research and Development

The federal government plays an important part in the development of Canada's forests. Through work with the provincial government, Aboriginals, private woodlot owners and the general public, the Canadian Forest Service has been able to promote forest science, integrated resource management, environmental quality, forest sector development and international trade. In this way, it follows its mission, which states:

> *"To promote the sustainable development and competitiveness of Canada's forest sector for the well-being of present and future generations of Canadians."*

As users put increasing pressure on Canada's forests, resource managers need to be flexible when planning for the future of our forests. Not only is a sustainable supply of timber important, but the sustainable development of other forest resources is also a concern. Resources such as wildlife, watersheds, recreation and fisheries complete the forest ecosystem and work together as an ecological entity within our forests.

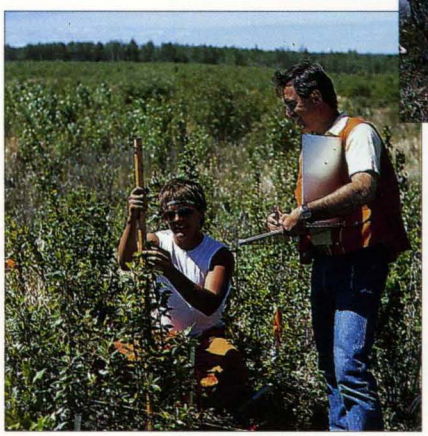
In Saskatchewan, research is being conducted in many fields of forestry. Industry surveys by the Canadian Forest Service identify products and markets, show "who's who" in the industry, characterize the forest sector in terms of the number of firms and workers and generate public awareness of Saskatchewan's forest industry. Other federal research areas focus on the development of new silvicultural techniques and equipment, integrated resource management programs, and environmental impacts of forestry practices, as well as wildlife concerns, watershed values, climate change studies, and other non-timber values.

R.A. Bohning

Checking for regeneration after fire

R.A. Bohning

Determining tree age



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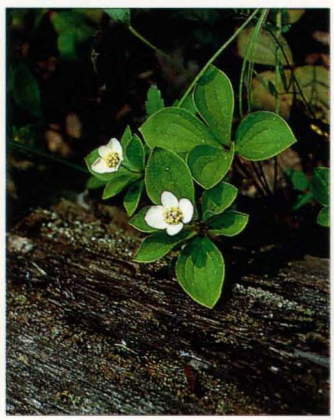
Measuring vegetation response after silvicultural treatment



R.A. Bohning

Maintaining the ecosystem

The **Saskatchewan Forest Habitat Project** is a good example of how to manage the forest as an integrated resource, instead of simply as a sustainable source of timber. The aim of the project is to manage the timber resource and, at the same time, create and improve wildlife habitat. By considering the needs of wildlife, forest managers can carry out forestry activities and harvest the timber they require, while preserving and sustaining wildlife habitat.

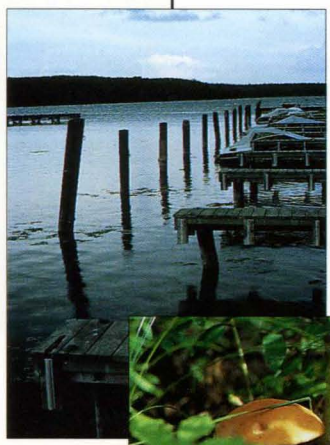
S. Lux

Model Forests – Ensuring Environmental, Social and Economic Interests

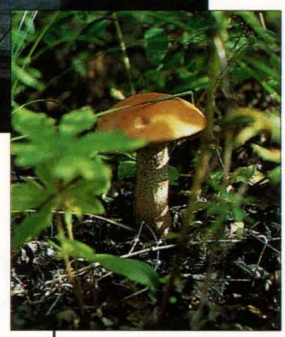
The Prince Albert Model Forest, located one half-hour drive north of Prince Albert, Saskatchewan, is one of ten areas chosen from across Canada to promote innovative forest management. The diverse and thriving forest community of 367 000 hectares is managed by a partnership committed to sustainable development. The partnership is drawn from industry, government resource management agencies and the First Nations.

The model forest provides habitat for numerous birds, mammals and fish, as well as fungi and microbes. It also supplies a working laboratory in which research is conducted, tested, and implemented. Emphasis is now on integrating forestry practices with non-consumptive forest uses such as recreation, watershed protection and enhanced wilderness values.

The model forest program is funded by the Canadian Forest Service under Canada's Green Plan.



H. Hesseln



R.A. Bohning

Aboriginal Lands

Saskatchewan has 152 Aboriginal reserves, which cover over 133 000 km² hectares of timber-productive nonreserved forest lands. These forest lands provide Native groups with traditional hunting, trapping and recreational opportunities, as well as wood for firewood and shelter purposes. Forest lands also provide a timber source for the forest sector, which supports employment and stability in Aboriginal communities and therefore should be managed efficiently. The Canadian Forest Service and the Native groups are completing integrated resource management plans, using new inventory technology. Inventory data is collected and entered into a geographic information system that analyzes data and helps implement the management plan. The plans call for modern technology and silvicultural techniques. The Native groups are also working on other forest management techniques, such as site preparation, reforestation projects and releasing operations.

M. Newman

Reforestation

R.J. Marles

Birchbark basket

Woodlot Owners

Private land accounts for about 400 000 hectares of the province's forested area and is located primarily at the agricultural fringe. This land is productive in the traditional sense because it provides a timber source; however, it also provides non-timber forest products such as Christmas trees, maple syrup and mushrooms.

The Farm Woodlot Association of Saskatchewan, in conjunction with the Canadian Forest Service is providing technical knowledge and incentives to help landowners who are interested in managing the forest on their land. A federal government-sponsored agroforestry extension specialist assists in preparing and implementing management plans and providing services for woodlot owners.

J. Johnston

Christmas tree plantation

R.A. Bohning

Log landing

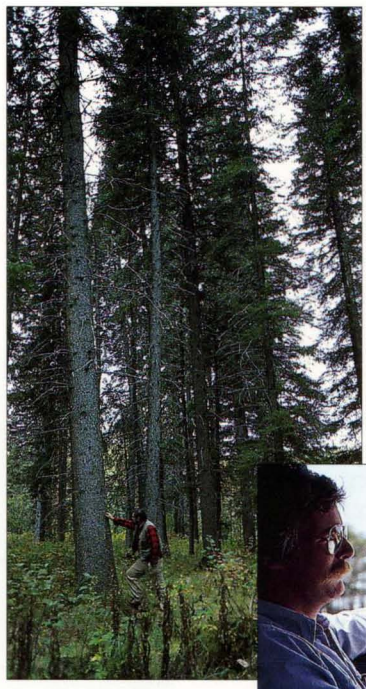
THE PROVINCIAL ROLE: FOREST MANAGEMENT

Forest Policy Objectives

Saskatchewan's forest policies are being rewritten through the development of an Integrated Forest Resource Management Plan. The province, with the help of the Canadian Forest Service, has established a new plan, using a process of public consultation. As a result, a renewed vision of Saskatchewan's forests has evolved:

> *"This province's forests will be maintained in a healthy, natural state, and forest management will recognize both the capacity and the limitations of the land to support and renew its timber and non-timber resources. Sustainable use of these resources will contribute to the prosperity of Saskatchewan residents, now and in the future. An informed public will take an active role in long-term planning for the use of all forest resources. A spirit of co-operation will prevail, as we seek to find solutions to our common problems."*

Forest management principles that are based on the National Forest Strategy and the wishes of the people of Saskatchewan, are the basis of the new forest policy for the province.



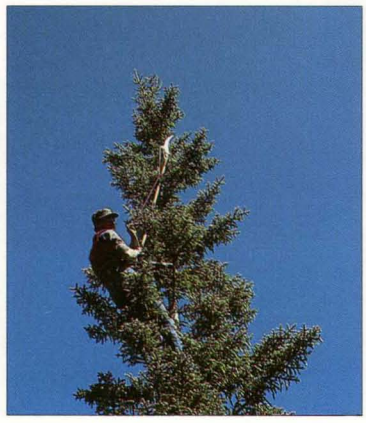
R.A. Bohning

Forest managers

G.E. McEwen

J.R. Gorman

Hardwoods with spruce understory



C. Rentz

Collecting superior seed sources

Forest Management Ensures Productive Forests

In Saskatchewan, forest management is largely the responsibility of the forest companies and the provincial government. Provincial forest management activities are carried out by the silviculture unit of Saskatchewan Environment and Resource Management. These management activities include regeneration surveys, site preparation, tree planting and plantation assessment. The province is also involved in a variety of intensive silvicultural activities, including stand tending. This work involves weeding, cleaning, releasing and spacing of young stands. Treatments are designed to improve the productivity of the forest stand as well as to enhance the viability of other forest resources such as wildlife habitat. Foresters visit the stand several times during a forest rotation to achieve the desired results.

> ***Silviculture–*** *The theory and practice of controlling the establishment, composition, growth, and quality of forest stands to achieve the biological and economic objectives of forest management.*

Forest Renewal

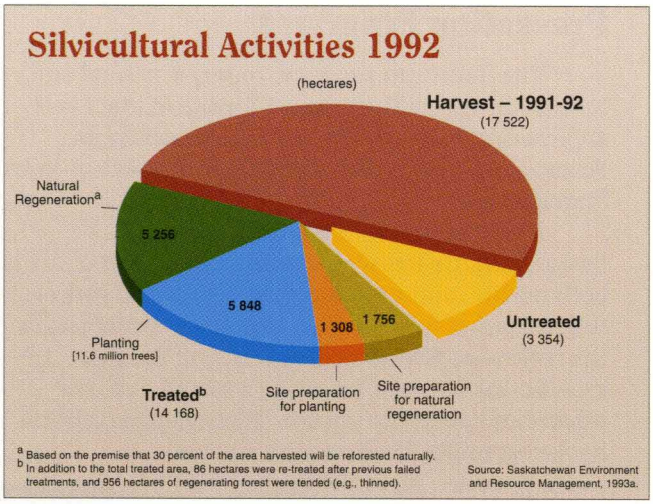
When left to nature, a mature forest gradually declines until a natural disaster such as insect infestation, disease, windstorm or fire ushers in a period of renewal. This natural forest regeneration is usually irregular. After natural disasters, the pockets of old trees that remain must die out before the forest canopy opens and sunlight reaches the ground to support new growth.

Resource managers try to recreate the lifecycle of the forest. To maximize economic returns, timber harvesting takes place when the forest is in its prime, before decline begins. Risk of loss, from fire, insect and disease, is therefore minimized.

Forest renewal is a priority of the provincial government and the Forest Management License Agreements holders. The province's primary goal is to restore current harvested areas to productive forest growth. Naturally occurring monocultures, particularly jack pine, trembling aspen and black spruce, will often fully regenerate on their own. Site preparation treatments, however, will also greatly enhance the survival rate of these seedlings, as well as seedlings that are planted in understocked areas previously identified by forest managers.

Site Preparation– *Disturbance of an area's topsoil and ground vegetation to provide favourable conditions for natural or artificial regeneration.*

After planting, foresters monitor the new stands to determine stocking, vigor, and growth rates. Overall survival rates for plantations in Saskatchewan have improved from an average of approximately 70 percent throughout the 1970s, to over 85 percent today. In 1987, the provincial government established a planting target of 50 million trees in five years. By working together, the province and industry exceeded this target by 3 million seedlings.




R.A. Bohning

Forest nursery stock


R.A. Bohning

Blueberries after fire

Site preparation for planting


R.A. Bohning


S. Lux

Vigorous aspen stand

Western red lily, Saskatchewan's provincial flower


G.E. McEwen

Forest Protection

Prevention Programs

The forest can succumb to many natural and human disasters. The greatest threats to any forest are insect infestation, disease and, especially, fire. Forest protection is, therefore, a key element of forest management.

Fire has an enormous impact on Saskatchewan's forest resources. The impact of fire is both positive and negative. Fire is a natural part of the renewal of forest ecosystems and is beneficial to the control of disease and insects, and the new growth that emerges following a fire also creates important habitat for wildlife. When commercial timber is lost to fire, however, the loss puts added pressure on remaining timber resources. Forest fires are currently the greatest cause of depletion, both in area and volume. In 1989, a particularly bad fire season, there were 1 020 fires that consumed over 470 000 hectares of forest. These fires caused the provincial government to pay over $42 million in control costs alone. An average of 940 fires annually consume approximately 215 000 hectares of forest, of which 35 percent is productive timber land. Fires burn, on average, more than 3.8 times the area of productive forest harvested each year.

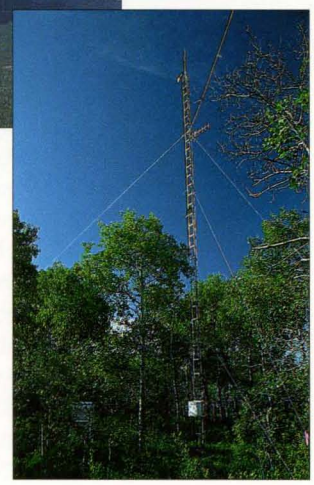
Wildfire management includes prevention programs. A toll-free number (1-800-667-9660) is available to the public for reporting fires, and an early-detection program uses aircraft patrols, lightning locator sites, and lookout towers to identify wildfires before they become uncontrollable.

Fire prevention includes pre-suppression as well as fire suppression activities. Pre-suppression activities use the Intelligent Fire Management Information System (IFMIS), which was developed by the Canadian Forest Service and implemented by the province of Saskatchewan. IFMIS combines a computer inventory of forest fuel types, actual and forecasted weather conditions, and predictions about fire behaviour. The system helps forest fire managers choose the best way of using fire suppression resources, by using the latest techniques, tools, and the most cost-effective aircraft support.

Minimizing the destructive impact of **insects and diseases** on the forest is an important aspect of forest management. A pest management program was created to monitor and respond to insect and disease outbreaks. If an infestation occurs, it is surveyed and treated appropriately. In 1992, for example, there was a fivefold increase in damage caused by the spruce budworm, which affected 87 000 hectares of forest. To respond to this threat, forest managers have combined sanitation harvesting with the use of a biological pesticide. In 1992, an 8 000 hectare area of the infestation was sprayed with the biological insecticide, *Bacillus thuringiensis* var. kurstaki (*Bt*), with encouraging results; the spruce budworm population in the sprayed area was reduced. Other insect damage common to Saskatchewan's forests is caused by the forest tent caterpillar, northern pitch twig moth, jack pine budworm and terminal weevils.

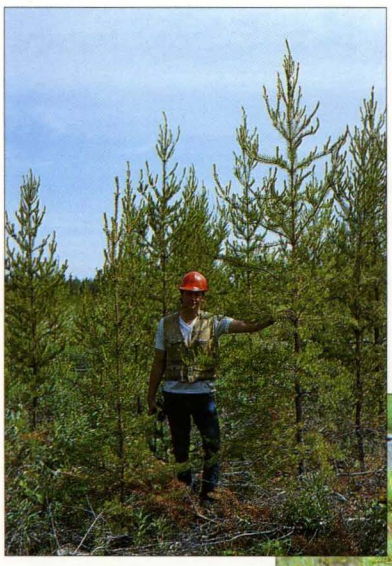
C. Ogilvie

Wildfire



T. Hogg

Communications



R.A. Bohning

Thinning to improve tree growth

R.A. Bohning

Forest pests on young spruce

Diseases most common to the province include Armillaria root rot, Atropellis canker, western gall rust and dwarf mistletoe. As well, Dutch elm disease has recently been found. Treatments for these and other diseases range from salvage logging to sanitation thinning or pruning. The use of improved silvicultural management techniques plays a key role in the prevention of forest tree diseases.

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Conversion Factors

METRIC		IMPERIAL
1 hectare (ha)	=	2.471 acres
1 square kilometre (km^2)	=	0.386 square miles (mi^2)
1 tonne (t)	=	1.102 tons (T)
Wood Chips		
1 oven dried tonne (ODT)	=	0.918 bone dry units (BDU)
1 cubic metre	=	0.341 BDU
Sheet material (particle/insulation board)		
1 cubic metre (m^3)	=	1 131 square feet (ft^2) (3/8" basis)
	=	565.0 square feet (ft^2) (3/4" basis)

METRIC		IMPERIAL
Roundwood (sawlogs, pulpwood & fuelwood)		
1 cubic metre (m^3)	=	0.415 cords
Posts and Poles		
1 cubic metre (m^3)	=	35.315 cubic feet (ft^3)
Lumber		
1 cubic metre (m^3)	=	207.7 foot board measure (fbm)
Solid Wood Conversion		
1 cubic metre of solid wood (m^3) (processed lumber)	=	616 foot board measure (fbm) (processed lumber)
M= 1 000		**MM= 1 000 000**

R.A. Bohning

Sustaining Global Health

Forests play an important role in global health. Through photosynthesis, trees absorb carbon dioxide (CO_2), a greenhouse gas, and convert it to carbohydrates, of which carbon is an essential ingredient. Trees store much of the carbon they absorb, but decomposition and forest fires both release carbon back into the atmosphere. As forest products, harvested trees continue to retain carbon. As a result, forest management practices may help alleviate the greenhouse effect by increasing net amounts of stored carbon.

With over 10 percent of the world's forests, Canada's trees are important in sustaining a healthy global atmosphere. Canadian forests absorb 135 million tonnes of carbon per year, while 58 million tonnes of carbon return to the atmosphere through fire, decomposition and other processes. That translates to a net gain of 77 million tonnes of carbon stored in our forests. Saskatchewan's forests alone store 4.5 million tonnes[a] of this carbon sink.

[a] Based on Saskatchewan comprising 30 percent of Canada's Boreal West and 3 percent of Canada's Subarctic Ecoclimatic zones.

Credits

The Canadian Forest Service of Natural Resources Canada and the Forestry Branch of Saskatchewan Environment and Resource Management gratefully acknowledge the cooperation of the forest industry in Saskatchewan and its participation in the survey that provided information reported here. Detailed results of the forest industry survey are available in the Directory of Primary Wood-Using Industries in Saskatchewan–1992 and the Directory of Secondary Wood-Using Industries in Saskatchewan–1992, published under the Canada–Saskatchewan Partnership Agreement in Forestry.

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