HARMONICS

The Engineering Explorations Newsletter

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WHAT IS FORESTRY ENGINEERING?

Canada is a place where people are blessed with many gifts. In the south, particularly the south west and south east, trees flourish in huge swaths of forest. The forest is home to many of the Creator's creatures - birds, deer, bear, elk, rabbit. It is also a source of food, shelter, heat, clothing and medicine. In the time since contact with Europeans, the forests have grown smaller as they have been cleared for housing, roads and commercial purposes. Forests are a part of our legacy on Turtle Island and must be managed carefully; this is something our ancestors understood and something that is a key concern to forestry engineers.

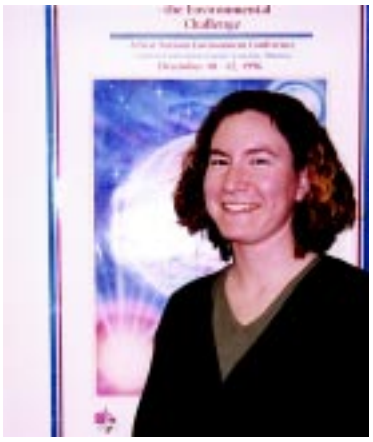
Forests are complex systems. Managing them requires a deep understanding of many different variables. Harvest too many trees and you risk losing the soil which sustains them. You also risk losing all the wildlife which depend on the forest for life. In the Amazon rain forest of Brazil, whole species and ecosystems have disappeared because of irresponsible forest destruction.

So, how can tree harvesting be done so that animal habitats are protected? How do you replant trees to make sure that the forest will continue to survive? Forestry engineers look at these questions (and many more) to develop solutions which will allow for sustainable use of forest resources while protecting the overall habitat and species which live there. Forestry engineers might look at ways to make harvesting machines lighter so that they cause less damage to the soil and forest floor. They might also study how many trees in a particular area need to be left standing in order to provide local animal species with enough food to maintain their population, or enough coverage to protect them from their predators.

Forestry professionals, including forestry engineers will be needed in Aboriginal communities as on going land claims negotiations put the management of many forests in the hands of First Nations. The stewardship of a living breathing ecosystem is a great honour and responsibility. The wisdom of our ancestors will help us to understand the natural rhythms and flows of life in the woods. Combining this traditional wisdom with scientific knowledge will allow us to ensure that the trees and forests will be here to sustain all the peoples of Turtle Island for the next seven generations and beyond.

NATIVE ENGINEERS & SCIENTISTS

A place to meet people from your community.



Name: Rebecca McKay
Nation: Fisher River Cree Nation, Manitoba
Profession: Forester
Degree: B. Sc. Forestry, UBC
Favorite thing about school: "I realized there is always more I do not know… the possibilities are endless."

For Rebecca McKay, learning about forestry meant learning a special way to view trees. "Tree identification becomes second nature. Trees are not just things to analyze, but like people, they are things to understand and respect."

Rebecca's parents taught her to respect nature, and this coupled with her love for the outdoors and in what goes on in forests made her choice simple. "I wanted to work outdoors, and felt at ease in the forest environment."

While still a student, Rebecca landed her first job in forestry. It was there that she saw all the options available to her in the field, so she made a commitment to stay in school. "Once I had my taste of forestry work, and saw the number of options available, I knew I definitely wanted to continue my studies."

She was drawn to the west coast "with its big trees and mountains," and entered the forestry program at the University of British Columbia in Vancouver. She graduated in 1998, something she feels is her greatest accomplishment in life so far. "I see it as a step toward the great things I will do."

After graduation at her job in an Aboriginal company, Rebecca was the only female not doing any clerical work. "I felt a bit intimidated at first, but I was given responsibilities like everyone else. I felt like I should make sure there was no doubt in their minds that a woman was capable of working with the best of them." Having now held many jobs in forestry, Rebecca now works for the National Aboriginal Forestry Association (NAFA) in Ottawa. It is her first office-based job.

Rebecca says that there is a great need Aboriginal forestry professionals "to assist their communities in management. Not to prepare for this responsibility is to lose out on an opportunity for great economic gains. It is important to remember that Native values are vital to the practice of forestry and other sciences… Aboriginal foresters and other professionals … can represent the interests and values of their communities to regain control of land resources."

As for schooling, Rebecca admits it sometimes seems a little insignificant. "It is hard to imagine that a difficult science or math class is going to do anyone any good, least of all, on a bright sunny day. But, it is one of many very important steps, small and large, on the path to making a difference….As insignificant as they may seem, these little days are the only way that the big days will go well. Try putting a roof on a brick house without using any bricks, and you will know what I mean. Enjoy the little accomplishments, because they are no less important and a lot more frequent."

FOREST FIRES

In Canada, every summer, approximately 9000 fires flare up. They consume about 3 million hectares of trees and vegetation. Because many First Nations communities are in or near forested areas, fires and their control directly impact many Aboriginal people each year.

Wildfires are a part of the Earth's natural process of renewal. They help to recycle dead plant material into the soil; certain plants, especially fir trees, have seeds which are only easily released by the heat of fire. Natural wildfires are usually caused by lightning. In areas where there is large build of dead vegetation, small contained fires are sometimes deliberately set to prevent larger more destructive fires. Unfortunately, many fires are also caused by human carelessness: campfires left unattended or cigarette butts flicked into the bush can easily and quickly ignite dried vegetation and even tree roots. It is these accidental fires which often cause the most damage.

By themselves wildfires do little damage and burn out quickly. In fact, only 200-300 fires each year will consume more than 200 hectares of forest and wildland. Unfortunately, this 2-3% of fires account for almost 97% of the annual area burned. These fires generally occur in places where a huge amount of dead plant material has built up over a long period of time and provides fuel for an out-of-control inferno.

When forest fire season starts, hundreds of trained volunteers and professional fire fighters battle the blazes in order to protect natural resources, towns, people and wildlife. On the ground, they haul heavy pumps and hoses. Using axes, chainsaws and other hand tools they create firebreaks to slow or stop the spread of flames. In the air, helicopters and airplanes dump water and chemicals on the fires to stop their spread. Forestry engineers work with these people and advise on forest fire management, prevention and control.

Some of the information used for this article was found at www.fnc.ca/nafa/nafa.html and nrcan.gc.ca/cfs/cfs_e.html.

PUZZLES & GAMES

What Comes From Trees?

More than 5,000 things are made from trees : houses, furniture, baseball bats, crutches, fences, garden mulch, books, newspapers, movie tickets, and so much more! What items listed below come from trees?

rubber gloves
pecans
paint
shampoo
charcoal
cork
crayons
chewing gum
Kleenex
grocery bags
apples
chewing gum
waxes
furniture

Ans: all of the above come from trees

Tree Rings

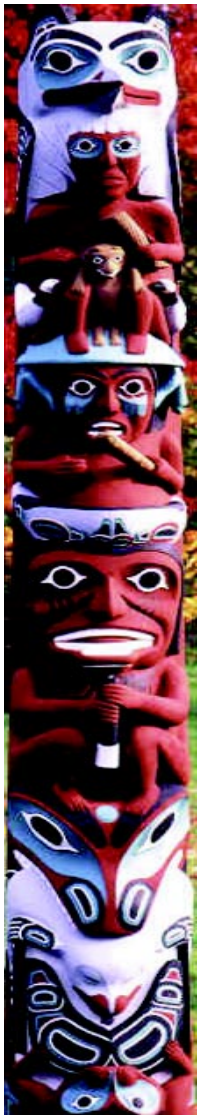
One of the most commonly known facts about trees is that if you cut them in half horizontally, the rings that you see inside tell the age of the tree. Every line represents another year of growth. If this tree was cut down in 1999, in what year was it planted?

Source: www.domtar.com/arbre/english/ann5.htm

Ans.: 1986

TOTEM POLES

If you're ever lucky enough to visit the west coast you'll notice three things, mountains, water and forests. The Pacific northwest is blessed with lush, old growth forests which contain massive trees, including red and yellow cedars. These cedars can grow up to 75 m (250 feet) tall and 5.5 m (18 feet) in diameter. They have been known to live up to 1,500 years. These trees hold a great significance for the peoples who have traditionally lived in the forests near the ocean.

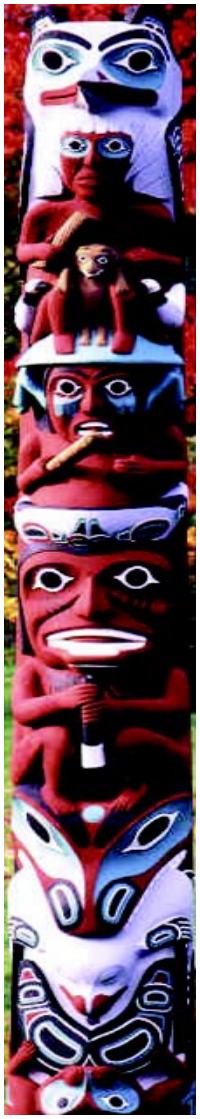


Source: Totem poles
www.evergreen-washelli.com/test/qa73153147.htm

Cedar cells contain high concentrations of tannins, aromatic oils and resins that inhibit the growth of wood-decomposing fungi and bacteria. This rot-resistance along with straight grain, light weight and thin fibrous bark have made the cedar a very useful tree to the Aboriginal peoples of British Columbia. Because they are also relatively straight softwoods which are easily carved, one of the traditional uses for the cedars was totem poles.

Totem poles tell a story related to the person, family or clan it represents. Each pole shows one or more images of animals or spirits, each of which has a special meaning within the greater story. A wolf, for example, represents a powerful healer. The stories told may honor a deceased elder, represent the names one had acquired over a lifetime, or record an encounter with a spiritual being. Totem poles tell stories and remind us that we are linked to a spiritual world.

While we are most familiar with the tall, multi-faced poles seen in movies, museums and parks, totem poles are made for a number of purposes. They commemorate great events like marriages or births. They can be used as structural supports in a home. The may also be used for death rites. The poles shown are mortuary poles in the abandoned Haida village of Ninstints. Each is designed to hold the body of a high-ranking person behind a carved and painted plaque in a cavity at the top.



This article was written with information from:
users.imag.net/~sry.jkramer/nativetotems/default.html and
rbcm1.rbcm.gov.bc.ca/notes/cedar.html

FUN FACTS AND THINGS TO THINK ABOUT

The greatest oak was once a little nut who held its ground.
- unknown

Forests are oxygen factories!
To grow a kilogram of wood, a tree consumes 1.47 kilograms of carbon dioxide and gives off 1.07 kilograms of oxygen.

Source: www.afandpa.org/kids_educators/forestfacts.cfn

Did you know...
every day products such as paper grocery bags, and corrugated boxes are really made out of recycled sawdust and wood shavings, that were left over from manufacturing wood products like tables and chairs?

Source:www.afandpa.org/kids_educators/forestfacts.cfn

The Canadian Forest Service has a most wanted list. It's a list of foreign insects that have either arrived in Canada accidently by airplane or cargo ship or on purpose through importation. Because these bugs are not native to North America, they have few or no natural predators and can cause huge amounts of damage to forests crops and grasslands.

Most-wanted insects include:
• the Asian Long-horned Beetle which kills hardwoods, especially sugar maples;
• the European Gypsy Moth which kills oaks and other broad-leaf trees;

The best way to avoid trouble is to make sure the insects never have a chance to establish significant populations. When they do, the populations must be contained quickly in order to avoid their spread. In the summer of 2000, the city of Halifax considered cutting down 10,000 trees in city parks to halt an infestation of the Brown Spruce Longhorn Beetle.

WANTED!

Asian Long-horned Beetle

European Gypsy Moth

Source: Canadain Forest Services
http://www.nrcan.gc.ca/cfs-scf/index_e.html

COMMUNITY PROFILE

Temagami:Deep Water by the Shore

Temagami is a region in Northeastern Ontario, north of Sudbury and North Bay, which covers 680,000 hectares of forest, lakes and rivers. It is named for the Teme-Augama Anishnabai (the Deep Water People) who have lived in the area for many generations. Their population numbers around 1700.

The Temagami First Nation (TFN) and the Teme-Augama Anishnabai (TAA) are currently in negotiations with the Government of Ontario, to extend their claim to lands beyond their current holdings on Bear Island in Lake Temagami. Their land claim goes back to 1877 when Chief Tonene protested to the federal government that lumber companies were felling trees in n'Daki Menan, his people's traditional homeland. The protest was based on the fact that the Teme-Augama Anishnabai had been excluded from the 1850 Robinson-Huron Treaty, and had not given up title or rights to their traditional lands. Chief Tonene asked the government to create a reserve which would protect his people and their land from the lumber companies. More than 100 years later, the situation is still not resolved.

Lumber companies have been interested in the Temagami region for so long because it is home to the densest area of old growth Red and White Pine forest in the world. These trees are quite large, and because of their size can be used for many products, like furniture and giant plywood sheets.

The trees also hold a spiritual significance for First Nations peoples of the region. The forest stands have been in place for over 7,000 years. Some of the trees are over 350 years old. Old growth forests are living entities: because of their age, they house highly developed, stable and self-sustained ecosystems. Within these systems are complex and delicate food webs which are sensitive to changes in the local environment, and very sensitive to the effects of forest harvesting. A good proportion of the old growth forest is now protected from logging in order to protect the ecosystems they contain.

Some of the information in this article was found at nativenet.uthscsa.edu/archive/nl/9306/0090.html, www.ancientforest.org/explore.html

All about us

Native Access provides culturally relevant learning opportunities in science, math, engineering and technology to Aboriginal students and their teachers across Canada.

Established in 1993, the projectÕs ultimate goal was to increase the representation ofAboriginal peoples among the the ranks of practicing engineers and scientists in Canada.

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