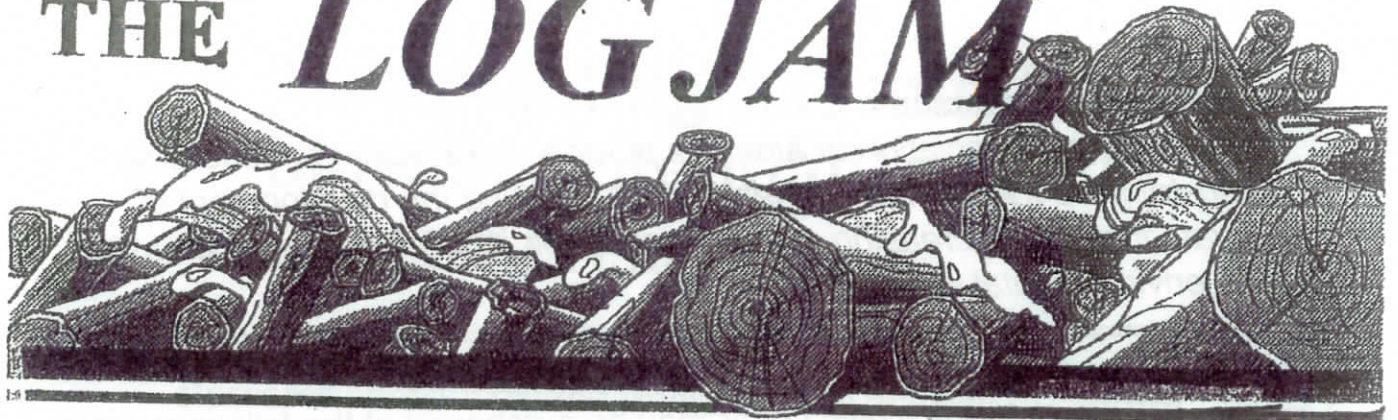
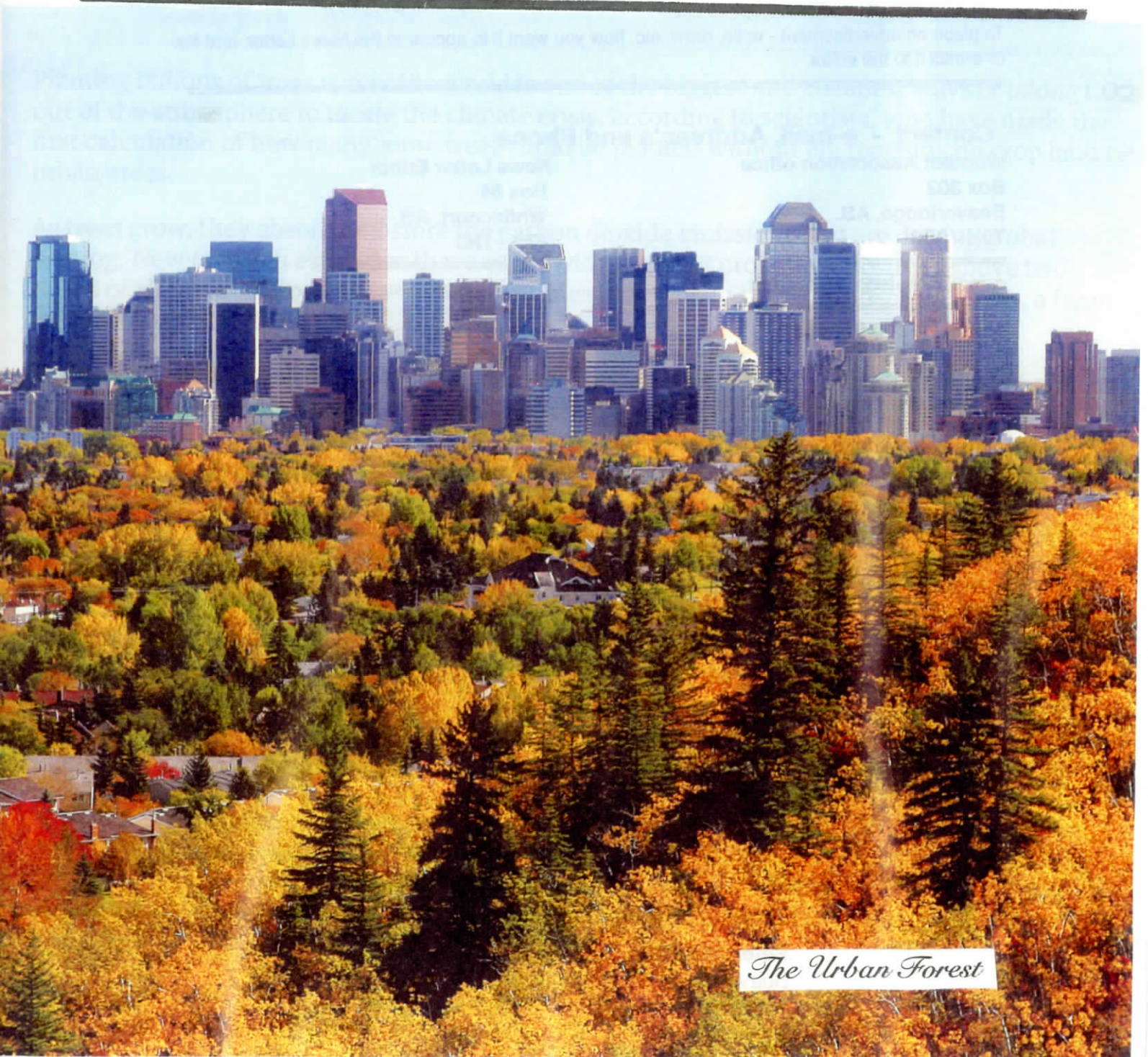


THE LOG JAM



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The Urban Forest

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"The Woodlot Association of Alberta's purpose is to promote leadership in sustainable forest management by encouraging the development of Private forest by increasing awareness of their inherent social, economic and environmental values."

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Tree planting 'has mind-blowing potential' to tackle climate crisis

Research shows a trillion trees could be planted to capture huge amount of carbon dioxide

Planting billions of trees across the world is one of the biggest and cheapest ways of taking CO₂ out of the atmosphere to tackle the climate crisis, according to scientists, who have made the first calculation of how many more trees could be planted without encroaching on crop land or urban areas.

As trees grow, they absorb and store the carbon dioxide emissions that are driving global heating. New research estimates that a worldwide planting programme could remove two-thirds of all the emissions from human activities that remain in the atmosphere today, a figure the scientists describe as “mind-blowing”.

The analysis found there are 1.7bn hectares of treeless land on which 1.2tn native tree saplings would naturally grow. That area is about 11% of all land and equivalent to the size of the US and China combined. Tropical areas could have 100% tree cover, while others would be more sparsely covered, meaning that on average about half the area would be under tree canopy.

The scientists specifically excluded all fields used to grow crops and urban areas from their analysis. But they did include grazing land, on which the researchers say a few trees can also benefit sheep and cattle.

“This new quantitative evaluation shows [forest] restoration isn’t just one of our climate change solutions, it is overwhelmingly the top one,” said Prof Tom Crowther at the Swiss university ETH Zürich, who led the research. “What blows my mind is the scale. I thought restoration would be in the top 10, but it is overwhelmingly more powerful than all of the other climate change solutions proposed.”

Crowther emphasised that it remains vital to reverse the current trends of rising greenhouse gas emissions from fossil fuel burning and forest destruction, and bring them down to zero. He said this is needed to stop the climate crisis becoming even worse and because the forest restoration envisaged would take 50-100 years to have its full effect of removing 200bn tonnes of carbon.

But tree planting is “a climate change solution that doesn’t require President Trump to immediately start believing in climate change, or scientists to come up with technological solutions to draw carbon dioxide out of the atmosphere”, Crowther said. “It is available now, it is the cheapest one possible and every one of us can get involved.” Individuals could make a tangible impact by growing trees themselves, donating to forest restoration organisations and avoiding irresponsible companies, he added.

Other scientists agree that carbon will need to be removed from the atmosphere to avoid catastrophic climate impacts and have warned that technological solutions will not work on the vast scale needed.

Jean-François Bastin, also at ETH Zürich, said action was urgently required: “Governments must now factor [tree restoration] into their national strategies.”

Christiana Figueres, former UN climate chief and founder of the Global Optimism group, said: “Finally we have an authoritative assessment of how much land we can and should cover with trees without impinging on food production or living areas. This is hugely important blueprint for governments and private sector.”

René Castro, assistant-director general at the UN Food and Agriculture Organisation, said: “We now have definitive evidence of the potential land area for re-growing forests, where they could exist and how much carbon they could store.”

The study, published in the journal *Science*, determines the potential for tree planting but does not address how a global tree planting programme would be paid for and delivered.

Crowther said: “The most effective projects are doing restoration for 30 US cents a tree. That means we could restore the 1tn trees for \$300bn [£240bn], though obviously that means immense efficiency and effectiveness. But it is by far the cheapest solution that has ever been proposed.” He said financial incentives to land owners for tree planting are the only way he sees it happening, but he thinks \$300bn would be within reach of a coalition of billionaire philanthropists and the public.

Effective tree-planting could take place across the world, Crowther said: “The potential is literally everywhere - the entire globe. In terms of carbon capture, you get by far your biggest bang for your buck in the tropics [where canopy cover is 100%] but every one of us can get involved.” The world’s six biggest nations, Russia, Canada, China, the US, Brazil and Australia, contain half the potential restoration sites.

Tree planting initiatives already exist, including the Bonn Challenge, backed by 48 nations, aimed at restoring 350m hectares of forest by 2030. But the study shows that many of these countries have committed to restore less than half the area that could support new forests. “This is a new opportunity for those countries to get it right,” said Crowther. “Personally, Brazil would be my dream hotspot to get it right - that would be spectacular.”

The research is based on the measurement of the tree cover by hundreds of people in 80,000 high-resolution satellite images from Google Earth. Artificial intelligence computing then combined this data with 10 key soil, topography and climate factors to create a global map of where trees could grow.

This showed that about two-thirds of all land - 8.7bn ha - could support forest, and that 5.5bn ha already has trees. Of the 3.2bn ha of treeless land, 1.5bn ha is used for growing food, leaving 1.7bn of potential forest land in areas that were previously degraded or sparsely vegetated.

"This research is excellent," said Joseph Poore, an environmental researcher at the Queen's College, University of Oxford. "It presents an ambitious but essential vision for climate and biodiversity." But he said many of the reforestation areas identified are currently grazed by livestock including, for example, large parts of Ireland.

"Without freeing up the billions of hectares we use to produce meat and milk, this ambition is not realisable," he said. Crowther said his work predicted just two to three trees per field for most pasture: "Restoring trees at [low] density is not mutually exclusive with grazing. In fact many studies suggest sheep and cattle do better if there are a few trees in the field."

Crowther also said the potential to grow trees alongside crops such as coffee, cocoa and berries - called agro-forestry - had not been included in the calculation of tree restoration potential and neither had hedgerows: "Our estimate of 0.9bn hectares [of canopy cover] is reasonably conservative."

Editors Note

To me this sounds a lot better than a "carbon tax" as it can be measured and it is much more cost effective than an ever increasing price on carbon. There are countries that are already working on plans to plant billions of trees which are England and Australia, China has been planting very large number of trees over the past several years.

During the recent election I heard our Prime Minister say that he wants some two billion trees planted in Canada in the next 10 years. This is something that we the WAA should monitor as there may be an opportunity for our us in becoming a distributor of trees in Alberta. As most of these trees will be planted on private land that is non productive. Of course this will partly depend on the funding attached to this program, plus we would have to have some employed staff to carry this out effectively, because with only volunteers it will not work as the program would be much too large.

Up Coming Events

Board of Directors - Teleconference

January 27, 2020

February 24, 2020

March 30, 2020

All calls at 7pm

*Merry Christmas and a
Happy New Year*

From your hard working Board of Directors

*May you spend many happy moments in your
Woodlot in the up coming year, in all seasons*

President's Report

Laval Bergeron

It is truly a wonderful day, watching the gentle snow fall through the window and dreaming of the woodlot and all that is going on in it, then the idea comes of what a wonderful day to write a president's report... this is the email I got from our Editor to get me writing. Thanks Jurgen.

Well this morning, December 1st, is a beautiful sunny morning and the dreams that are going on is getting the report done, getting the firewood done, finish cleaning up the mess that was done 2 years ago which is just about finished, dream about xcounrty skiing which there is hardly enough snow but still good to go, dream about seeing the huge buck caught on the trail came not about my neighbours dog leaving the wolves alone which nearly cost her her life 3 weeks ago, hope that the wind is blowing in the right direction so's that we don't get the smoke from the burning of the - hog fuel - left behind by the chippers, Hog fuel is the bark, branches, etc, left behind after they have left with the chips. There are more dreams but also real life.

We missed our FF meeting due to stormy weather which was replaced by a teleconference call All 10 Directors were present. Thanks,

We missed our meeting with the Minister of Agriculture and Forestry. Last minute cancelation on his part. Will try again next year.

CFWD is still struggling to fill the position of Executive Director after the tragic death of Peter Demarsh. Peter Demarsh's Foundation are still looking for donations..

Thanks to Jim Szpajcher for bringing to our attention the Alberta Conservation Ass. Landowner Habitat Program, an eye opener.

And yes, about the AGM, which is still a ways away, June, it's been mentioned before but this year is our 25th anniversary and if anyone has a good idea about that please let us know.

On that note I wish you a pleasant winter and pleasant dreams!!

cut →

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Spruce Broom Rust 101

This summer, a local wood lot owner contacted me to ask about his spruce trees and what I knew about spruce broom rust. Unfortunately, I knew very little about spruce broom rust (*Chrysomyxa arctostaphyli*) and had always assumed that the 'witches-broom' masses of thick branches in spruce were caused by dwarf mistletoe. I thought that as I did research on spruce broom rust lifecycle, impacts to the spruce tree and methods to mitigate the spread of spruce broom rust, that I should summarize my findings in a short article for the avid Bugs and Diseases readers.

Spruce broom rust, unlike dwarf mistletoe, is a fungal infection rather than a parasitic plant. The fungus (or rust) itself acts parasitically and requires two hosts to complete its lifecycle. The primary host is spruce; *Chrysomyxa arctostaphyli* has been known to infect Black spruce, White spruce, Red spruce, Norway spruce, Sitka spruce, Blue spruce, as well as Engelmann spruce. In the summer, the lifecycle starts as an orange rusty substance appears on the spruce needles. This orange substance is actually a pustule filled with spores, which will rupture and then release the spores into the wind so that they can settle on their secondary host: common bearberry, or kinnikinnick (*Arctostaphylos uva-ursi*).

The spores will settle and germinate onto the leaves of the kinnikinnick during the summer if there is moisture on the leaves for the spores to adhere to. The spores over-winter on the leaves of the kinnikinnick and in the spring the infection will appear as small purple brown spots. In the spring if you flip over the kinnikinnick leaf and see orange-brown spots on the underside, you'll know the next type of spores have formed and are ready to disperse in the wind. The spores will land on new growth spruce needles and then the lifecycle starts again.

Once a spruce tree is infected, it will start to develop signs and symptoms of the infection. Two of the signs were described above in the lifecycle description: the orange-rust substance on the spruce needles and the spots on the kinnikinnick leaves. A dead top on your spruce tree could be a symptom of spruce broom rust, but the most obvious symptom is the 'witches-broom': a mass of branches that can often appear as a ball in the tree, and can be up to 2 meters in diameter (see Figure 1). The witches-brooms take a year to develop after the tree has been infected, and develop either on the bole of the tree or a branch. The broom's growth is caused by a change in hormones caused by the infection. The branches within the broom will drop their needles every year, so mid-summer the needles of the broom may appear orange, and then these branches will be bare by fall.



Figure 1. Spruce Broom Rust witches-broom on a Spruce tree near High Level. Photo: Tom Hutchison.

Like most fungus, spruce broom rust will thrive during a wet cool season as these conditions are favorable for fungus development. The climate is out of our control, but in order to decrease the incidence of spruce broom rust, it's advised to avoid planting pure spruce stands as well as avoiding planting spruce if there's kinnikinnick in the area. I did not find any reference to a successful chemical treatment for spruce broom rust, but it is noted that pruning off the witches-broom is a possible treatment. If the broom is on the bole of the tree, the trunk above the broom should be removed.

Diseased trees can also be removed in their entirety and it's said that this will not cause the infection to spread.

Spruce broom rust isn't always the first thing on everyone's mind when thinking of spruce health, but with local changes in temperature and precipitation, it may become a more prevalent disease in our forests. Witches-broom growth is a drain on the tree's resources and can decrease the tree's growth. Spruce stands should be monitored for this disease so preventative or mitigatory measures can be taken to reduce negative impacts to spruce.

the most obvious symptom of broom rust is the 'witches-broom'...a massed ball of branches up to 2 meters in diameter

Canada has no standardized method for tracking native bee species 'until it's too late,' researchers say

Before the rusty-patched bumble bee was listed as endangered in 2010, researchers wanted to know how many were still buzzing around. They spent more than 600 hours over eight years navigating through Ontario's brush looking for the bees, but only spotted three, one in 2005 and two more in 2009.

Researchers were unable to come up with a population estimate and Wildlife Preservation Canada says a rusty-patched bumble bee hasn't been seen since.

While the federal government works to protect the honey bee, its money-making counterpart, experts across the country say it has stolen the spotlight from the rusty-patched bumble bee and more than 800 other wild bee species native to Canada, leaving them in ruins.

"We need to recognize they are declining ... We can't even track how many there are and we aren't measuring them," said Carolyn Callaghan, a senior conservation biologist for terrestrial wildlife at the Canadian Wildlife Federation.

"I remember having to stop at a gas station without needing gas to clean off my windshield and grill, just covered in insects ... now I can go back and forth 10 times and I don't need to clean."

Ecosystems without pollinators would be in a very deprived situation

Wild bee species are responsible for every one in three bites of food at the supper table and help maintain natural ecosystems, but the government has no standard measures for counting or protecting them.

"Management companies don't need to report what the prevalence of bees are or where the bees go," said Sheila Colla, an assistant professor of Environmental Studies at York University.

"We haven't learned our lesson yet from other wild stock ... People don't realize the vast majority of free pollination comes from wild bees."

Right now, eight wild bee species are listed under Canada's species risk registry. The rusty-patched bumble bee, gypsy cuckoo bumble bee and the macropis cuckoo bee have lost at least 50 per cent of their total population and are classified as endangered, which grants them protection.

The sable island sweat bee and western bumble bee occidentalis subspecies are threatened while the American bumble bee, yellow-banded bumble bee and western bumble bee mckayi subspecies have a special concern status — both categories mean at least 30 per cent of their total population is gone, but only threatened species receive any further safety.

And Callaghan says the species on the list are only the ones we know about.

"I'm concerned this isn't a chicken little thing," she said. "I don't think we've recognized the value of pollinators and haven't done much in the way of addressing the problem ... Ecosystems without pollinators would be in a very deprived situation."

While the government has no standardized approach to tracking and protecting wild bees, Steve Jarovek, a research biologist with Agriculture and Agri-Food Canada, says the issue isn't as bad as it seems.

"There's a lot of research on 180-190 species of wild bees and we have a good handle on their abundance and diversity and how it changes through time," he said.

But Jarovek added that the stats rely on independent researchers across the country whose papers are not compiled in one place and may have their own methods with hyper-specific focuses, making the data harder to generalize.

While he did say some researchers are trying to put all the numbers in one place, he hopes a new government initiative called the Living Laboratories Initiative can be the start of the standardized protocol, although the idea would only work if bee researchers successfully apply to the program.

"We could have monitoring sites within these labs to know what the bee fauna is and track the goal over time," Jarovek said. "It's a big undertaking, but we want to try it within the living lab network."

Honey bees are imported from South America and are valued for their honey and wax. They act as livestock, with coddling from beekeepers and annual population reports. This year's report accounted for half of Canada's honey bees and showed about one in four died during the winter, an average loss. But their colony numbers are growing each year.

"The relationship with honey bees has been over millennia with human beings, so it's a long and very important relationship," Callaghan said.

But they also carry infections when arriving in Canada, which can be fatal for Canadian bees.

"The problem with a novel disease brought into a population that hasn't evolved with it, you don't catch the decline until it's too late," York University's Colla said. "We don't have a lot of data on the 800 species, if a disease was introduced tomorrow ... I'm not sure we have resources for that."

Leonard Foster, a professor of biochemistry and molecular biology at the University of British Columbia, says beekeepers and farmers also need to be mindful of how their practice can affect wild bees.

"The industry has the tools, for the most part, to fight the issues with bees, but not everyone follows the rules or is aware of what they could be doing ... the effort (to protect bees) makes their business non-profitable," he said.

"Beekeepers don't work in a vacuum — if they bring bees to a crop that has been sprayed with something they doesn't know about, they could all die."

But while honey bees may pose problems, their spotlight is useful.

"Honeybees are the flagship insect which helps the others," Foster said. "The public has an easy time getting behind them. Many things we might do for honeybees can help wild bees."

All bees face some of the same threats including a lack of biodiversity, climate change and pesticides but, wild bees also have to deal with fewer habitats and a lack of food, moving into the urban sprawl for a chance at survival.

"Cities are a refuge for wild bees because of the pesticides and insecticides for honey bees," Colla said. "Cities are pesticide free and buffer against climate change because people plant and water flowers, but in recent years, more people bring honey bee hives into cities and they compete with wild bees."

Experts say replacing beehives in cities with gardens full of native plants, especially ones that blossom in April and sending pictures of bees in the wild to research projects are some of the ways people can help.

Callaghan says Canada should also look to Ireland's model for protecting pollinators, which includes action plans for each sector of society and involves 68 organizations including the government.

"It's almost too late," Callaghan said. "We don't have a good record of recovering species on list."

Deadly parasite 'jumped' from gorilla to humans

A rare and unfortunate sequence of events allowed a deadly type of malaria in gorillas to "jump" species and attack humans, according to scientists.

Hundreds of thousands of people die from malaria every year and *Plasmodium falciparum* - the type the researchers studied - accounts for most cases.

African great apes were the original host to the parasite.

But a chance genetic mutation about 50,000 years ago turned it into a threat to humans, experts have found.

Mosquito bites

The findings, published in the journal [PLoS Biology](#), could help uncover new ways to fight malaria, the Wellcome Sanger Institute researchers hope.

Malaria is caused by a parasite that gets into the bloodstream when an infected mosquito bites humans - or animals.

There are lots of different strains of parasite and one of the most important ones, which now affects only humans, is *Plasmodium falciparum*.

It switched host from gorillas at about the same time as the first migration of humans out of Africa, some 40,000 to 60,000 years ago, the researchers say.



They studied the genetic make-up of different ancestral types of malaria parasite, focusing in particular on a gene called *rh5* - the vital bit of DNA code that enables malaria to infect human red blood cells.

It is a target doctors are very interested in for developing new malaria vaccines.

- [Malaria vaccine rolled out for tens of thousands of children](#)

The researchers believe thousands of years ago, two types of malaria parasite happened to co-infect a gorilla and they exchanged some genetic material between them.

Plasmodium falciparum picked up the *rh5* gene.

Lead author Dr Gavin Wright said: "This was a very rare event that led to so much death and disease in humans.

"We were quite surprised by the findings. It was very satisfying because it makes sense with lots of other research that has been done by colleagues. It provides this molecular explanation now as to how this jump could have occurred.

"*Rh5* currently is an important blood stage vaccine candidate for malaria and so if we can get any more information on this gene, that could really help us in trying to combat this disease."

He said the chances of the parasite mutating again soon were "very, very slim", although theoretically possible.

Nearly half of the world's population is at risk of malaria. The most cases and deaths occur in young children in sub-Saharan Africa, caused by *Plasmodium falciparum*.

Plants can offer protection against terror attacks: study

Plants can offer protection against terrorist attacks in cities, a study published on Friday by the Bundeswehr University Munich, a higher education institution of the German Armed Forces, found.

According to the study, certain types of plants were found to significantly reduce the force of pressure waves created in explosions. The researchers argued that large squares in cities could be used to protect against terrorism more effectively in this fashion, for example by planting trees and bushes.

The findings were based on systemic explosion tests at a site near Berlin in September in which a range of different plants were placed a distance of five meters to five kilograms of TNT. Yew trees offered the most comprehensive protection against the blast, weakening the pressure thereof by as much as 45 percent.

A statement on the website of the Bundeswehr University Munich noted that research into the protective effect of plants in explosions was still at an early stage. Some tests have suggested that Thuja trees could result in an even greater reduction in blast pressure by around 60 percent.

"They are enormously important as elements of landscape architecture, as well as the design of urban spaces and make a valuable contribution to the urban ecology. If plants can also serve the purpose of explosive protection beyond this, we will have made a big step on the path to protection systems which meet the demands of modern society for transparent and open architecture," the statement read.

The university's tests were commissioned by Germany's Federal Office of Civil Protection and Disaster Assistance (BKK) as part of a broader effort to explore security concepts for city centers.

Review of Two Books of Interest for Prairie Landscapes

Growing Fruit in Northern Gardens, by Sara Williams and Bob Bors, 2017; 312 pp; \$39.95. Publishers Group Canada, 2440, Viking Way, Richmond, B.C. V6V 1N2.

This is a definitive guide to growing fruit in colder climatic zones, especially adapted to the Canadian Prairies. It is written by two prominent horticulturists associated with the University of Saskatchewan, and includes an encyclopaedic collection of information gained from years of practical experience and includes current research. Included in the book are more than 20 species and over 170 varieties of fruit - from heritage plums to the more recent releases of dwarf sour cherries. The book covers basic information on practical problem solving of hardiness, propagation, pollination, soil, water, mulch and pruning. It also gives good coverage of weeds, insect, disease and other pest problems and gives information on prevention and control. The book is well illustrated with a major coverage of tree fruit, shrub fruit, vines and hazel nuts.

Trees for Northern Landscapes, by Wilbert G. Ronald and Philip S. Ronald. 2017; 151 pp. \$35.00. Printed and bound in Canada by Friesens. Copies are available from Jeffries Nursery Ltd., P.O. Box 402, Portage la Prairie, Manitoba, R1N 3B7. Tel. (204) 857-5288; Fax (204) 857-2877; e-mail: jeffnurs@mts.net.

This book addresses trees from the perspective of what grows well in colder climatic zones. It does not deal with every tree that might grow on the Prairies, but does cover those that can be grown well including the many superior cultivars that have been developed for hardiness zones 2, 3 and 4. The book deals mostly with northern tree species from the Canadian Prairie setting, and also native and introduced trees from northwestern Ontario and the northern American states, especially North Dakota and Minnesota. An interesting feature of the book is that it includes special tree stories which tell of new cultivar developments and the people behind the developmental work. The book provides coverage of the risks and spread of Dutch Elm Disease in the northern zones and of other introduced threatening problems of Bronze Leaf Disease and Emerald Ash Borer. Additional information is given on best practices for growing and establishing trees.

Submitted by H. Cerezke

GROWING OPPORTUNITIES IN CANADA'S FORESTS

If you surveyed 1000 Canadians, as pollsters often do, and asked them to provide an example of an innovative sector, most would not name forestry. Yet, in an age of increased trade protectionism, worsening forest fires and concerns about environmental impact of materials from cement to plastic, Canada's forest products industry is meeting these challenges head on.

Years of extensive collaboration with governments, Indigenous communities, and research partners has made Canada's forest products sector a global leader in product and process innovation, environmental stewardship, and international trade. Yet as science transforms the materials of daily life and new markets enter the global middle class, the question before us is how do we fully unlock the economic and environmental value Canada's forest products industry. Put another way, how can Canada's forest products sector go from good to great.

Let's begin by reviewing our assets.

Canada's forests are the envy of the world – a bountiful and renewable resource that is carefully managed and thus available to our people forever. Almost ten percent of the world's forests are here in Canada. And through a 'Made in Canada' approach to forest management, among the most rigorously regulated in the world, we have helped Canada retain more than 90% of our original forest cover. Less than 0.5% of Canada's forests are harvested each year, and every tree that is harvested is replaced. Last year, over 600 million seedlings were planted. After all, without healthy forests, one cannot have a healthy forest products sector.

Canada has become a leader in forest product and process innovation because companies in the sector and Canada's governments are genuine partners in leveraging this renewable resource. Our governments do not simply fund research in a vacuum or demand that the private sector does it on its own. Rather, there is a more collaborative approach. Private public partnerships through investments in organizations like FPInnovations, Canada Wood, and the Canadian Wood Council have been key in advancing the Canadian opportunity domestically as well as globally. The "forest products" model of government-industry collaboration in Canada is one that many other sectors – not to mention Canadians – would benefit from.

Canadian forestry has been recognized for its transformative work. In the federal government's *Report from Canada's Economic Strategy Tables: The Innovation and Competitiveness Imperative* (https://www.ic.gc.ca/eic/site/098.nsf/eng/h_00020.html), the forest products sector was lauded for the modernization of its operations. It also recognized the power of the sector's branding and marketing programs, its commercialization of new products, and the advancing sustainability and economic opportunity in northern and rural Canada.

Forestry in Canada is providing real solutions to fight climate change. The sector was the first in Canada to launch an industry-wide commitment to contribute to the federal government's commitments under the *Paris Climate Agreement*. Since 1990, Canada's pulp and paper mills have reduced their emissions by almost 70%.

Notwithstanding these advantages, one only needs to look to British Columbia today to see the real pressures that exist and the impacts they can have on families in rural and northern communities. The mountain pine beetle has chewed up over 60% of BC's pine trees and record-setting fire seasons have led to a reduced wood basket, resulting in a number of mill closures and job losses in the province. Slowing U.S. housing starts, increasing operating costs, and softwood lumber tariffs have not helped the cause.

Getting through this difficult period requires focusing with greater precision on the sectors' advantages in creating a growing forest bio-economy. In a recent report published by the C.D. Howe Institute, I offer a pathway for achieving this. Recommendations include:

- Scaling up government contributions to not-for-profit innovation hubs to accelerate innovation and commercialization of new forest-based products.
- Making Canada a world leader in tall wood building construction by continuing to support private-public partnerships.
- Ensuring regulatory neutrality for the use of emerging wood and wood-based products.
- Driving local solutions to forest management, adaptation, and mitigation.
- Expanding and diversifying markets in Asia through innovative partnerships in the construction sector.

Canada's working forests provide solutions to fight climate change while bringing good-paying jobs to families in communities where there are often limited options. To maximize the opportunity, we need an ongoing commitment from governments to build on the momentum of what's been started – making Canada's forest products sector THE global leader in innovation, environment, and internationalization.

The future will be made of wood. Let's all commit ourselves to making sure it's Canadian.

Introducing Canada's Family Owned Forests

While forests are an essential part of the Canadian identity, the connection may be a bit vague, especially for those of us who live in urban areas. Forests are often seen as a distant reality, far to the north. They have something to do with supplying raw material to the pulp mills and sawmills of isolated northern towns, and yet in our imagination, they are "wilderness," stretching great distances to the horizon and beyond. As for who actually owns them, we all do. These forests are called "Crown Land" and are the responsibility of our provincial governments.

There is another kind of forest in Canada, however. It is close to our cities and towns. It has been in intensive use for generations as a regular source of income and place of recreation in rural communities. It is privately owned, usually in small parcels, by families. These small, privately owned forests, commonly known as private woodlots, are the forests Canadians are most likely to see as we travel between our towns and cities. Driving by at 100 km per hour, we may not really notice them at all.

Across rural Canada, 450,000 families are owners of woodlots. Taken together, woodlots are a large proportion of the rural landscape. On average, each family owns about 45 hectares (112 acres). Many families live on or near their woodlot. It is virtually impossible to make a full-time living from 112 acres of forest, so most of their income comes from other pursuits: as farmers, professionals, in industry or the service sector, or as pensioners. The woodlot is an important source of supplementary income for many families, its importance rising or falling from one decade to the next.

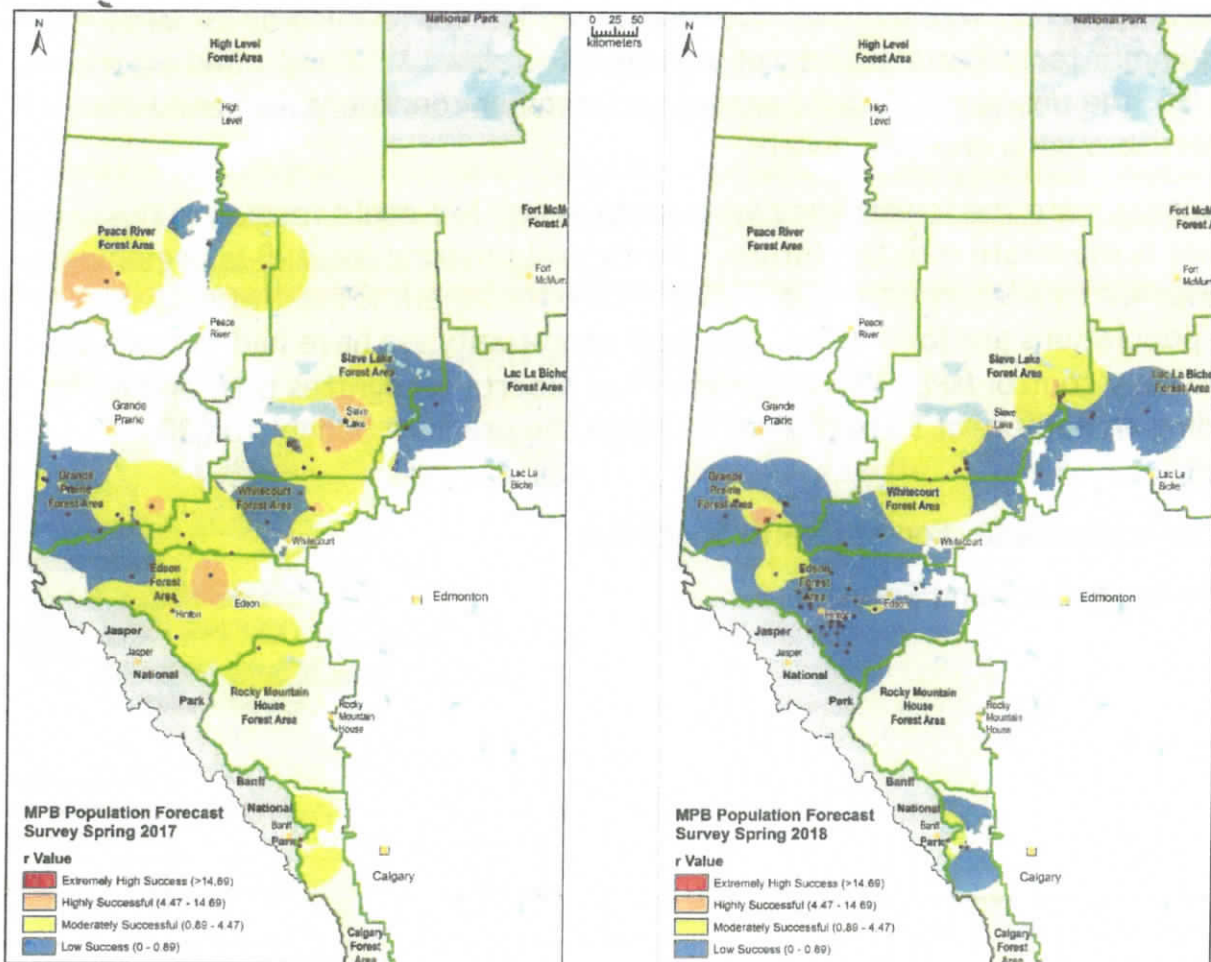
Sawlogs, pulpwood, and firewood are a common source of income, as are Christmas trees, maple syrup, and blueberries. Families may also use their woodlot for various types of recreation such as hunting, bird watching or cross country skiing. Some families have turned these uses of their land into commercial businesses (for example, outfitting for visiting hunters). A frequent activity is a simple stroll in the woods as a source of physical and spiritual contentment and relief of stress. For some families, the highest value of their woodlot is as an investment, available as a source of emergency cash in the event of a misfortune or other special need.



Overall, the contribution of most woodlots to the finances of the families who own them is modest. When the sum total of the economic importance of woodlot activity in a community, county, or region is considered, the picture is quite different. Woodlots provide a significant share of the raw material used by the forest industry in many parts of Canada, and are an important source of economic stability for many rural communities. Employment on woodlots is often more labour intensive than is the case on large scale industrial operations. Smaller scale equipment is used and horses are even making a comeback in some places.

Woodlots are also a source of important environmental benefits, not only for their owners but also for the larger community. They provide much of the wildlife habitat and biodiversity in inhabited rural areas, and may be all that remains of the original forest ecosystem. They are the source of much of the clean water for nearby towns and cities. They contribute to the pleasant roadside scenery across rural Canada. They play a vital ecological role cleaning the air of pollution and providing oxygen, trapping dust and removing chemical pollutants. They also contribute to a sense of security in rural communities for owners and non-owners alike. For instance, woodlots are a nearby and locally owned source of energy if the oil runs out.

Mountain Pine Beetle population forecast survey results, 2018 & 2019



How is mountain pine beetle doing in 2019?

Colder-than-average temperatures are the main reason mountain pine beetle (MPB) die each winter. Alberta definitely had some pretty chilly days last winter! Thermometers in some locations registered between -36 to -42 °C in February, 2019. With temperatures like this we predicted that 90% of the MPB in those locations would die. Even though 90% is a really high number, this level of mortality would only stop MPB numbers from increasing but not to decline. Did we see this level of mortality during spring surveys? We did! The number of MPB still alive after the winter was lower compared to previous years.

To really understand the effect of the winter cold temperatures on MPB, we had to wait until we did fall surveys. Beginning in late August, from the air we locate pines that were attacked by MPB during 2018 - these trees have died and the needles are now red. We use the red-needled trees to help us locate the newly attacked trees - this is done on the ground. When taken together the ratio of newly attacked trees to red trees tell us if MPB numbers are increasing or decreasing.

Although we found more red trees in 2019 compared to 2018, the number of newly attacked trees was much lower than the previous three years. There is another reason why we found fewer MPB-attacked trees. The cold winter was followed by a cool, wet summer - not great weather for farming or for MPB. Cold summer temperatures and wet weather slow down MPB flight and attack rates. So, the unseasonably cold winter and summer conditions reduced MPB numbers through a one-two punch.

MPB numbers are the lowest they've been in years, but could recover if the weather is moderate into the future. The control program for MPB is beginning now that we're headed into winter. Single tree treatment is most effective when populations are low - this is the best opportunity we have had in years to aggressively control MPB. The Government of Alberta recognizes this, and is providing an additional \$5 million to increase the program budget to \$30 million.

Caroline Whitehouse, Forest Health Specialist

Alberta Agriculture and Forestry

Go inside the Carbon Vault: why it's critical to know what's beneath the Boreal Forest

Forest ecosystems sequester large amounts of carbon in vegetation and soils, off-setting the carbon emissions we produce and mitigating climate change. The boreal forest and its associated wetlands, in particular, provide critical carbon storage to the world. Wetlands throughout Canada store nearly 100 times the carbon emissions produced by Canada and the United States combined and roughly four times the emissions produced around the globe annually.

"You Can't Manage What You Don't Measure"

There is currently a scientific gap (<https://www.src.sk.ca/blog/wetlands-and-carbon-filling-knowledge-gap>) in having a proven, practical method for measuring wetland carbon storage. While protocols do exist for upland forests, they don't for the vastly more productive wetlands. Developing methods to assess carbon within forested wetlands will also help managers understand other environmental benefits. With long-lived tree species and deep deposits of peat, wetlands are unique in the role they play in regulating water quantity and quality and in the biodiversity of their bird and plant life.

New Conservation Research Seeks a Better Accounting

The Saskatchewan Research Council (SRC) (<https://www.src.sk.ca/blog/why-we-need-learn-more-about-how-wetlands-store-carbon>) has connected with key partners in the forestry community to complete a three-year study of the carbon stores in the boreal forest and to develop a rapid assessment tool to measure carbon storage in wetlands (<http://www.sfiprogram.org/archives/conservation-community-partnerships-grant-program/active-grants1/saskatchewan-research-council/>). SRC is one of Canada's leading providers of applied research, development and demonstration, and technology commercialization.

According to SRC Distinguished Scientist Mark Johnston, "We - industry, society, government - need to understand how wetlands function...The right tools and analysis can help us figure out how to minimize our impacts and maintain the health of our ecosystems."

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Stumped – Searching for trends in the global trade of forest products

There is nothing easy about searching out supply and demand trends in the global trade of forest products. With the U.S.-China tariff war, the global economic slowing, climate change and environmental challenges, looking for market trends can be like trying to read the tea leaves spinning in a stirred cup.

Stumped. Where do you begin? Over the past two years the tariff war between the United States and China certainly has been a major factor stirring up difficulties in the global trade of forest products (and just about everything else...as soybean farmers can attest). Is it **THE** factor that is problematical? There are other factors influencing global supply and demand for forest products. Pricing and product availability matched against the demand economics and the regulatory guidelines push and shove forest products from market to market.

Nonetheless, China's imports of forest products – just as steelmaking commodities – shape the global market. As for market makers, consider the People's Republic of China (PRC), according to the UN's Food & Agricultural Organization (FAO) 2017 statistics (prior to the tariff dustup), imports over 40% of the world's industrial roundwood [logs], 22% of the veneer sheets, 37% of pulp for paper and 46% of the recovered paper (scrap paper). In all of these forest product categories, China easily leads the world.

But these numbers only outline China's near insatiable demand for forest products. RISI Inc., which provides analysis on the Forest Product sector, in a presentation on China pointed out, "Over the past 20 years, China's total need for imported wood has grown 14% annually, with the pulp and paper sector accounting for half of the demand." The same RISI report noted that since 2000, imports of softwood logs had risen 11% (CAGR) while softwood lumber imports grew 26%.

The PRC wasn't always a major consumer of lumber products, nor a major importer. For example, in 2000 China imported about 47 million cu/m of wood products and now the tally is nearly 250 million cu/m. In the case of softwoods, the rise is even more pronounced – at less than 7 million cu/m in 2000 and now a total hitting 80 million cu/m. So, what happened?

China embarked on the economic reforms of the 1990s and adopted an export oriented economic policy (factory to the world).

The 1990s boom came with a rise in domestic construction and skyrocketing exports from industries like furniture and flooring. And China became the world's second largest consumer of timber. With the booming economy came a shortfall between domestic lumber production and demand. In 2017 the PRC announced a prohibition on the commercial cutting of natural forests. And the prohibition had an immediate impact on timber imports. From 2013 to 2017, the percentage of imports against demand rose from 48.4% in 2013 to 56.4% in 2017 – a year in which China's imports hit nearly 109 million cu/m and grew by over 16%. According to China Customs, the wood products trade (imports and exports) rose from just over \$120 billion in 2011 to \$165.3 billion in 2018. The biggest exporters to the PRC during this period were Russia, the U.S., New Zealand and Canada.

The Tit-for-Tat Tariff War

When the tariff war between the U.S. and China broke out in 2018, it set off a tit for tat tariffs battle – Washington announcing a tariff and Beijing responding in kind and the forest product industry was one of the first targeted.

The latest round of tariffs was particularly excruciating to U.S. lumber exporters. In late August, China announced effective September 1, 2019, the PRC will impose 10% additional tariffs on wood products (including fuelwood, softwood chips/pellets, sawnwood, plywood, wood). And from December 15th 2019 Beijing said it would levy further tariffs on logs, sawnwood, veneer, fibreboard, wooden wares, flooring, bedroom redwood furniture, bamboo and rattan furniture, plywood, particleboard, and natural cork products.

Of course, all the pain could go away if a trade deal could be negotiated between the respective Presidents Trump and Xi Ji-ping. (At this writing) negotiations are scheduled to start this week and China has lifted tariffs on pork and soybeans and Trump has postponed the October 1st tariff hike on Chinese imports until October 15th – presumably as part of the negotiating strategy.

There is a great deal of uncertainty on how the negotiations will fare. From one perspective, the slowing of the Chinese economy [hitting the magical figure of 6% GDP growth is looking out of reach] is pressuring Xi to settle the dispute. The timing is also important as China's National Day – October 1st and the "Golden Week" October 1-7 are coming up to celebrate the founding of the PRC some 70 years ago – and Xi would like something more to add to the celebration.

Trump likewise has his motivation with the U.S. economy slowing [will the U.S. GDP growth again hit 3.1% of the 1st quarter of 2019?] and a highly contentious 2020 election looming.

The governments of both China and U.S. seem to be more comfortable in their quasi-cold war disposition and their global competition than with any economic cooperation.

Finally, there is the commercial reality that the U.S. and China are decoupling and with or without tariffs and irrespective of political parties, the day-to-day business relationship between the world's two largest economies is unlikely to ever be the same.

Some food for thought is that a mature tree will on the average capture 18 pounds of carbon per year from the air and produce enough oxygen to last one person for two years. Also 18% of a human is made of carbon.

My Woodlot

Jim and Ann Szpajcher/ Jackie and Julien Schnegg

The woodlot borders the North Saskatchewan River, where the river runs almost straight east, on the extreme south side of the County of St. Paul, west of secondary highway #881. The property is covered by two Woodlot Management Plans, one which includes a full quarter section plus a partial quarter, and the second of a full quarter immediately to the west, for a total of 338 acres.

The property for the first woodlot management plan was acquired by the current owners in 1992, and the adjacent property was acquired in 1998. The steep valley terrain is not suitable for cultivation, and numerous, often steep slump structures, appearing as ridges ranging in roughly parallel rows to the river, step from the top of the valley on the north side of the woodlot, down toward the river. The elevation difference, from the level of the river, which runs at 1,750 feet, to the top of the valley, is generally 250 feet for the one mile of river frontage, and sits on three major topographic structures: the river flats, several hundred yards wide at about 1,800 feet elevation, a medium bench, also several hundred yards wide at about 1,900 feet, and the valley top, several hundred yards wide, along the north side of the woodlot, at about 2,000 feet.

The woodlot lies on the southern margin of the Boreal Forest Natural Region, in the Dry Mixedwood Subregion. To the north of the woodlot, across the terminal moraine features characterized by knob and kettle topography, numerous hummocks and esker/ drumlin glacial features have a strong forest cover of white spruce on the north-facing slopes, as does the south side of the river valley, with its north-facing slope. However, the woodlot is composed primarily of deciduous species, primarily aspen, with a lesser amount of black poplar.

A provincial aerial photograph from 1949 shows the east property to have been used as lightly wooded pasture, while the west property had partial deciduous forest cover: on north facing slopes of slump structures and along seasonal drainage channels fed by springs which flow from the banks of the valley.

The west property was not privately owned in 1949 and has not been farmed. The east property was last used for pasture in the 1970's, and since that time the forest cover has grown to cover almost all of the property, composed of aspen, with the oldest trees showing an age, from ring count, of less than 70 years. The west property has approximately thirty acres of land on which over-mature aspen are the dominant forest cover. These trees are typically D4Aw and show ring counts between 80 to 100 years old. Some of these are now blowing down, and a modest harvest is taking place to recover a portion of this particular portion of the woodlot as firewood for personal use. Current harvest levels amount to approximately 15 cords or 50 cubic meters of aspen per year. Mature white spruce is evident in only a small grove on the extreme northern boundary of the woodlot. The spruce grove is situated in a broad, shallow drainage channel, which drains snow melt from several neighboring properties every April, creating suitable conditions for the establishment of this species on the woodlot. Over the past several years, young spruce have been observed grow up to 100m from this grove, as undercover amid the

dominant aspen, which indicates the suitability for the woodlot as an environment in which white spruce can thrive. To assist the natural transition from primarily deciduous timber cover to a more balanced deciduous/ coniferous forest, supplementary planting of white spruce seedlings was conducted to create an understory to aspen in portions of the woodlot in the spring of 2019. In the autumn of 2019, seed cones from white spruce on other parcels of land owned by the woodlot owners were collected. These will be broadcast on north-facing slopes of slump structures the river valley during the winter, as a supplement to the program of tree planting, which will continue in the spring of 2020.

Discussions with the County of St. Paul in 2017 and 2018 indicated that they intended to pursue a program of assessing land which was not actively being farmed at "market value." It was during this time that we became aware of the change to the Municipal Government Act, which included forested farmland. In 2018, we contacted the Woodlot Association of Alberta, and with the able assistance and recommendations, we completed the two woodlot management plans, notice of which was then forwarded to the County of St. Paul office. After vigorous consultation with the Woodlot Association of Alberta and the Provincial Government, the County of St. Paul accepted the woodlot as forested farmland. In discussions with county personnel and an elected councillor, it became evident that this option for wooded properties in the county was one that they had not foreseen in the campaign to assess such properties at market value. Two neighbors submitted and received approval of their own woodlot management plans, giving the south side of the County of St. Paul a total of four approved woodlots.

The undulating terrain common to the north of the woodlot restricts cultivation, with steep slopes and countless small ponds and lakes, so that quarter-sections in this area typically have 50 to 120 acres in tame pasture or grain crop production. This ensures that the region is rich in wildlife and game animals, primarily black bear, whitetail deer, mule deer, moose and a relatively new population of elk (which has grown to sufficient size to allow hunting.) Additionally, there are populations of rabbits, coyote, upland game birds, beaver, porcupine, fishers, weasels, badgers, skunks and an abundance of garter snakes. In the valley, which serves as a wildlife corridor, over the years, there have been wolves, cougars, and lynx. We saw a wolverine pass through our back yard, a number of years ago. Along the river there one often sees pelicans, herons, bald eagles, gold eagles, and turkey vultures. Therefore, the woodlot provides habitat, which is appreciated by those who hunt in the area.

During the annual meeting of the Woodlot Association of Alberta, mention was made of a program which is conducted by the Alberta Conservation Association. Known as the Landowner Habitat Program, the ACA may consider natural habitat for sponsorship, with modest compensation per acre, with terms ranging from five years and up. We have contacted the ACA for more information, and the woodlots have been inspected for suitability for compensation under their program. To this point, no contracts have been signed, but given the long period of time before suitable coniferous timber can be harvested, such a program may be an option for

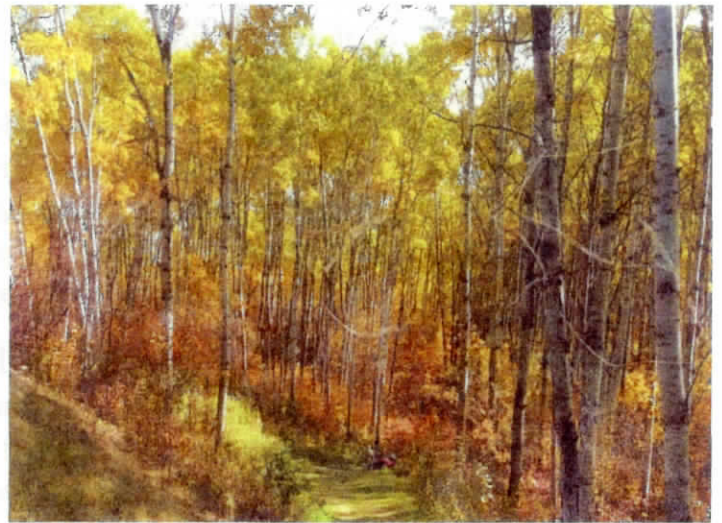
woodlot owners to consider, depending on their vision for their woodlots. For more information about the Landowner Habitat Program, the link to the ACA website is provided, below.

<https://www.ab-conservation.com/programs/land/projects/landowner-habitat-program/>

We are most satisfied with the outcome of our quest to preserve wooded habitat along the North Saskatchewan River valley for the foreseeable future, and we wait, with interest, to see what approach the County of St. Paul proceeds, with respect to the hundreds of other, similar, wooded properties within the county. If there is a move to assess such properties at market value, we expect to be able to convince others to consider the Woodlot Association of Alberta as a viable means to protect their wooded habitat, while gaining recognition that forested farmlands are a legitimate form of farming in Alberta.



View to the East from top of valley,
Dec 2000



Over mature Aspen, Oct 2019 Annie
at base of tree.



Looking East along seismic line on top
of valley, Dec 2000



Same view looking east on lane, Oct
2019