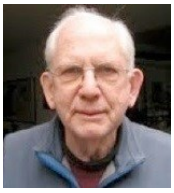
Greenleaves

Newsletter of the Bruce Grey Woodlands Association

AUTUMN 2016

www.bgwa.ca

Introduction



Malcolm Silver, Newsletter Editor

A sincere thank you to Neil Baldwin for getting the last issue out during my absence overseas; he did it so well he may get a full-time job. Thanks are also due to Board Members and Others who have been writing articles. I found Donna Lackey's, about leaf cutter bees in this issue, fascinating. I had noticed round holes cut in leaves but had no idea of their cause nor had I ever seen a bee's nest; will look closer now. This issue contains the usual mix of reports, articles and information about new science in our area of interest. If you would like to see a change in format or wish to contribute please advise.

The segment when Steve Paikin interviewed Peter Wohllenben, who worked for the German Forestry Commission for 20 years on The Agenda was interesting. If you missed it look at : http://tvo.org/video/programs/the-agenda-with-steve-paikin/talking-to-trees. Even more fascinating is Wohllenben's book *The Hidden Life of Trees*. I can recommend it.

Compliments of the Season

Exclusive for Members!
CALL OF THE FOREST
Feature Movie
FREE SCREENING
see back page

IMPORTANT NOTICE

Renewal Time for 2017

We hope you will continue membership in the coming year!

Renew instantly, online: bgwa.ca/renew

BGWA is run by volunteers. Please help them use their time effectively by not having to track you down for renewal.

We are repeating the early-bird contest "Win a free additional year of membership" again this year... RENEW TODAY!!

Save the Date!

March 25th

Annual Woodlot Conference

Watch web site for details

GREENLEAVES

is the member newsletter of the Bruce Grey Woodlands Association, published quarterly and distributed to current BGWA members. Submissions are always welcomed on any topic related to BGWA's vision:

Promoting healthy forests and ecosystems in Bruce and Grey Counties through education, recreation and sustainable management practices.

Information, opinions, and directions in this publication are those of the authors and do not necessarily reflect BGWA advice or policy.

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President's Message

Chris VanderHout

Wow, another year is about to slip by and I wonder where it has gone. After a very dry, hot summer followed by a dry warm fall, I look forward to and anticipate lots of moisture through the coming months to help recharge a low water table. Most things in the forest have gone into rest mode with me eagerly awaiting a slow-down in the construction world so I can rest a bit more as well!

Since our last newsletter we have had a few directors meetings and other goings-on. We enjoyed each other's company at the Annual BBQ, shared some food, and had a marvelous guided hike with presentation on edible wild plants by Alexis Burnett from Earth Tracks. It was great to see so many members out and Alexis did a fantastic job teaching us what the forest had to offer in the way of nutritional bounty. Alexis was extremely knowledgeable and gave us all lots of food for thought! A special thanks to Cam Bennett and the events committee for putting on such a great event.

After finalizing our logo and the text for our name this year, we have now purchased a set of display banners to represent our association. Donna Lacey from our Membership committee presented the directors with a couple of options and we selected a set that are very professional-looking. It is so nice to now represent our group with such quality.

Later in September, I had the pleasure of staffing our great new display booth at the opening night of the Extraordinary Tree lecture series. Many people interested in trees and forests attended and it was a great night with great company. Congratulations to Steven Hogbin for arranging the event and BGWA member Gord Edwards for all the work he did in assisting with that lecture series.

In October we again had our new booth display at the Bruce Peninsula Biosphere Associations Forest Fair. V.P. Neil Baldwin represented BGWA, staffing the booth and making a short presentation about all the things that make BGWA necessary and great. That same weekend was the Webwood Falls hike that we were invited to join with the Beaver Valley Bruce Trail Club. That day was rainy and our group had no attendees. BVBTC will invite us to another of their hikes this coming spring.

We will be continuing to reach-out to the joint associations targeted in our planning document to share events and engage in community outreach. Also now coming to fruition is our planned movie session we have organized as a treat for our members only. I am pleased we are able to support the makers of this Manitoba-made film by purchasing a license for an advance screening. It is a good example of how our association supports like-minded organizations and assists in spreading the message into the world about the importance of our forested lands. I hope to see most of you there.

Wishing you all a happy and safe holiday season!

Forest Health Review

By Susan McGowan
Forest Health Technical Specialist, OMNRF

The 40th Annual Forest Health Review was held on October 25h at Geneva Park north of Orillia on Lake Couchiching. The event attracted over 300 participants with a keen interest in forest health including landowners, private industry, academia and representatives from NGO's, conservation authorities and all levels of government.

Hosted by the Biodiversity and Monitoring Section of the Ministry of Natural Resources and Forestry, the event began with the annual presentation of major forest disturbances determined through ground and aerial surveys conducted by the provincial Forest Health Program, given by Dan Rowlinson, program coordinator. Results featured an overview of native pest infestations and ranges including spruce budworm, white-spotted sawyer beetle, large aspen tortrix, fall cankerworm and balsam fir sawfly.

2016 map of forest tent caterpillar infested area in Ontario

A highlight from the season included an expansion of areas affected by forest tent caterpillar (FTC) defoliation. A total of 1,123,440 hectares of FTC defoliation was captured during aerial surveys across all regions of the province. In Grey County the population of FTC has fallen to 2,200 hectares from 22,000 in 2015.

Alien invasive insect damage on the landscape was also reported including the delimitation of the northern extent of decline and mortality of ash caused by emerald ash borer (EAB), and larch stands in the southern region affected by larch case bearer. Annual insect trapping program results were also revealed including jack pine budworm and spruce budworm trapping for population monitoring, as well as walnut twig beetle trapping for early detection of this non-native pest.

The day featured a full agenda of speakers including the Canadian Food Inspection Agency, Canadian Forest Service - Natural Resources Canada, Invasive Species Centre, and the Michigan Department of Natural Resources, all delivered updates on forest health monitoring efforts and research projects

Forest Health in Chile and Zika Virus brought a global perspective to identifying pests and problem resolution. Common themes of continuous long-term monitoring were conveyed; in terms of tree health to answer questions about changing air quality and resulting changing climate, as well as surveillance and monitoring of biological controls for EAB management in southern Ontario.

The day wrapped up with keynote speaker, Bob MacDonald, acclaimed Canadian author and science journalist and best known as host role of CBC radio show "Quirks and Quarks". Bob`s address captivated the audience and received a standing ovation! His love for science and space was the theme for his address, as he highlighted recent space missions and fascinating scientific discoveries on other planets. He reinforced that the beyond Earth, the environment is harsh and that we are fortunate to live on a planet with so much life and natural beauty. Bob placed a new perspective on the day and reminded audience members to continue doing their part in taking care of the planet, particularly protecting the health of our forests, "*because there's nowhere else to go*."

Conference Speakers (L to R): Dave Nisbet – Invasive Species Centre, Fiona Hunter – Brock University, Phillip Kurzeja – Michigan DNR, Justin Gaudon – University of Toronto, Dan Rowlinson – OMNRF, Taylor Scarr – NRCan, Alvaro Duran - OMNRF

Your Travelling Editor

By Malcolm Silver

I returned to Australia in late fall visiting relatives on the east coast, Darwin & Perth. Thus, I saw many forest forms. However, the main reason was a bird-watching tour in the Kimberley region of NW Western Australia, travelling by road from Kununurra to Broome. The area is geologically fascinating, mainly sandstone rolling hills of great age & unusual beauty. Much between is open savanna with trees varying slightly from drier to wetter zones. Banks of the Ord, Fitzroy & other rivers were home to a greater variety of vegetation while in sheltered gorges of high rainfall there were patches of tropical, broadleaf forest. This is a place of enormous cattle stations of 4000 sq. km. or more. The region is north of the Tropic of Capricorn and has a tropical monsoon climate with two seasons. May to October is dry, and November to April wet. Thus, while southern Australia was experiencing winter there, towards the end of the dry season, daily temperature were 30 C or more & the sunshine fierce. During the wet the enormous rivers, now mostly dry flood huge areas.

Here I encountered the Australian baobab tree (called boab locally) and my topic. Baobabs are members of a Malvaceae family with 9 species in the genus Adansonia. Of these 6 are native to Madagascar, two to mainland Africa and the Arabian Peninsula, and *Adansonia gregorii* (which honors an early Australian explorer Augustus Gregory) found in the Kimberley region & adjacent eastern part of Northern Territory.

The tree thrives in arid regions. It is easily recognized (Figs 1 and 2). Australian baobabs range from 5 to 15 m tall with a broad bottle-shaped trunk that is usually single but sometimes multiple. Single trunk bases may have a diameter of over 5 m. *A. gregorii* is deciduous, losing its leaves during the dry winter so all seen had skeletal limbs & really looked like one of their alternate names the upside down tree. The trees grow very slowly and reach a great age, upwards to 1000 years. When the wet season approaches they produce new leaves, often before the first rains fall, and large white flowers. Baobab nuts, found surrounding trees, were woody capsules of varied shape. When open some showed several kidney-shaped seeds inside a white pith.

Seeds, pith, in fact most parts of the tree are edible and have long been used as a staple food by indigenous people who also used this species to make string from root fibers and decorative crafts from fruits. Baobab trees are now grown commercially in the Kimberley and sold as a gourmet food. Young leaves can be used in salads but when grown commercially baobab trees are harvested after 6 - 8 weeks when their root has the size and shape of a very large carrot, very big for the little tree top it supports. Like carrots they are sold in bundles with the tops still attached and are peeled, then sliced or grated. I did not sample these products.

The Australian baobab and an African species, *A. digitate*, are almost identical, having separated less than 100,000 years ago. The tree's transfer to Australia is a mystery. Timelines do not favor its movement with continental shift. Furthermore, the nut is too thin for seeds to survive a seawater passage across the Indian Ocean.

An Australian baobab tree in the Kimberley.

The current theory is that human ancestors carried fruit pods with them when they migrated out of Africa and introduced the baobab's ancestor when they arrived in NW Australia. The geographical distribution of the Kimberley species overlaps almost perfectly with a particular type of ancient rock art known as Bradshaw paintings (named after the pastoralist who first discovered them). Their origin is hotly debated:

My guide, nonchalantly holding-up this baobab, was 1.8 m tall.

some maintaining they are part of the extensive Aboriginal rock art found across Australia, others that these images were painted by a distinct culture which no longer survives. Bradshaw rock art is significantly different from other Australian rock in style, materials used and the presence of a biofilm of pigmented micro-organisms that define contours and ensure an indefinite life. Scenes from daily life are strikingly well executed and fauna is very accurately depicted. There are many references in the art that support a relationship between the artists, the baobab and intercontinental travel. For example, fruit and flowers of baobabs appear well represented in images and large boats that carry up to 30 passengers and have a very high prow indicating oceanic capability, are featured in some paintings. Baobab nut remnants have been found at archeological digs.

Other studies examined the genetics of Kimberley baobabs. There are distinct biological barriers in the Kimberley that have influenced the evolution of mammals, Scientists expected similar patterns of variation in baobabs, assuming that they had spread by floods and animals. Results showed the opposite. There was very little variation between baobabs in different parts of the Kimberley, despite the existence of barriers. This meant seeds were carried by an agent capable of moving across these barriers; humans were the most likely one. However, there was no way of proving it just with genetic data. One way of tracking a human agency is to look for linguistic clues. When people carry things from one place to another, they also bring their words for them. If the things are new people who receive them will usually borrow the words for them and modify them into their own languages. Or if they are already familiar with these things, they may just add the new word into their vocabulary. When the patterns of baobab gene flow and the movement of baobab words between Aboriginal languages of the Kimberley, were studied the two closely corresponded. This overlap was strong enough to prove that humans were the main agents responsible for dispersing baobabs in NW Australia.

Other clues that humans were the main agents came from this genetic analysis. First the source for the present tree population was in extreme NW Kimberley; and second a genetic bottleneck or reduction in population occurred between 6 and 17,000 years ago from which the present baobabs then expanded. Matching these clues with climate change since the end of the last Ice Age some 20,000 years ago, a clearer picture of human movement and the spread of baobabs emerges. During the Ice Age, the Australian continental shelf extended much further to the northwest, just under a few hundred kilometers from Timor. Baobabs would have been distributed mainly on the exposed shelf, and Aboriginal groups living there would have used them. When the Ice Age ended and sea levels rose, sea waters pushed Aboriginals further inland carrying baobab fruit pods with them as they moved into areas of central and eastern Kimberley. They would have settled here and introduced the baobab tree and words to other Aboriginal groups.

Sources

Adansonia gregorii From Wikipedia, the free encyclopedia

The Boab Tree - A Kimberley Icon - An Outback Australia Travel Guide

Origins of the Australian Boab (Adansonia gregorii)

www.uq.edu.au/nuq/jack/BoabOrigins.html

Iconic boab trees trace journeys of ancient Aboriginal people

theconversation.com/iconic-boab-trees-trace-journeys-of-ancient-aboriginal-people-3...\

Bradshaw rock paintings - https://en.wikipedia.org/wiki/Bradshaw_rock_paintings

The Bradshaw Paintings - Australian Rock Art Archive

https://www.bradshawfoundation.com/bradshaws/

Leafcutting Bees

By Donna Lacey
Forestry Technician, Saugeen Conservation

I must start by thanking Tim Keeling for bringing something new, something interesting, and something cool to our Annual BBQ this past September. Those in attendance pondered over the Leafcutting bee nest cell. Few people in the crowd were able to identify this nest cell. It quickly became apparent that none of us knew much about this insect, which immediately made it a great newsletter topic.

Leafcutting Bee Nest in Black Cherry firewood at BGWA BBQ

Leafcutting bees belong to the *Megachilidea* family. They were aptly named for the very neat cuttings that they make on leaves. If anyone spots a leaf with a very symmetrical, clean edged cut, odds are that it was made by a member of this bee family. They are mainly solitary and do not form large colonies like other bees. Often when bees are mentioned the first question is, 'do they sting?' Leafcutting bees are not an aggressive bee and do not sting unless handled; even then their sting is mild and far less painful than that of a honeybee 's or a wasp bite.

These bees are mainly black, quite hairy, and about the size of a honeybee. Close-up photography shows yellow bands on the back of the bee's abdomen; the bands are not easily seen with the naked eye as the bee buzzes around. This family is known to be excellent pollinators, with the females having an extra fuzzy patch on the underside of their abdomen to carry pollen.

The adult bees emerge from the nest cell in the spring. As with many insect species, they immediately look for a mate. Not too long after mating the male bees die. This leaves all of the work for the female bee. It will find an acceptable place to create a nest; build it; gather food to leave with each egg; lay the eggs and seal the nest.

Leafcutting bees nest in almost any void including man-made and natural spaces; some nest underground. To build the nest the bee must first excavate the nest area to its desired size and shape. Once the building site is ready the bee will then go out to a leafy plant and neatly cut segments of leaf to the appropriate size and shape for its nest. The bee will then fly each piece of leaf back to the nest site and place them tightly around the inside of the void. Once the bee has made a large enough outer wall for the nest, she will then lay one or more eggs in individual cells.

Following that the bee makes a pollen loaf out of nectar, pollen and bee saliva. This loaf feeds the newly hatched larva in its cell while it awaits pupation. Once eggs and pollen loaf are in place the bee will go out to cut another leaf piece. This will be round and is used to seal-off the egg chamber. The larvae will pupate into adult bees inside the larval chamber and await spring there.

The resulting nest will look a lot like a cigar, a long cylinder of leaves wrapped very tightly together. In the spring the new bees chew exit holes out of the nest and the life cycle continues.

There are many wonderful articles and pictures available on-line along with a few videos of the bees in action. Some of the resources that I used to create this article are included in the following list, as I mentioned at the beginning of the article, this topic was new to me.

http://entnemdept.ufl.edu/creatures/misc/bees/leafcutting_bees.htm

http://bugguide.net/node/view/84

https://en.wikipedia.org/wiki/Megachilidae

New Science

Compiled by Malcolm Silver

Sunflowers move by the clock

Plant biologists have discovered how sunflowers use their internal circadian clock, acting on growth hormones, to follow the sun during the day as they grow. Following the sun allows the plants to grow faster and put on more biomass. When plants were tracking the sun, the east side of the stem grew more rapidly than the west side. At night, the west side grew faster as the stem swung the other way. The team identified a number of genes that were expressed at higher levels on the sunward side of the plant during the day, or on the other side at night.

Journal Reference:H. S. Atamian, N. M. Creux, E. A. Brown, et al . Circadian regulation of sunflower heliotropism, floral orientation, and pollinator visits. Science, 2016; 353 (6299): 587 DOI: 10.1126/science.aaf9793

With designer lignin, biofuels researchers reproduced evolutionary path

When scientists reported in 2014 they had successfully engineered a poplar plant "designed for deconstruction," the finding made international news. The highly degradable poplar, the first of its kind, could substantially reduce the energy use and cost of converting biomass to a number of products, including biofuels, pulp and paper. To make the hybrid researchers incorporated an exotic gene conferring weak bonds into the plant's lignin, the hard-to-process compound that gives plant cell walls their sturdiness but makes them difficult to process in an industrial setting. The resulting lignin, dubbed zip-lignin, readily breaks down under simple chemical conditions. This new study shows those poplars and many other plants from all over the phylogenetic tree have actually evolved to naturally produce zip-lignin. In other words, not only can we potentially breed for degradability in plants, but humans may have been doing that -- selecting certain plants for easier processing -- for thousands of years.

Journal Reference: S. D. Karlen, C. Zhang, M. L. Peck, et al. Monolignol ferulate conjugates are naturally incorporated into plant lignins. Science Advances, 2016; 2 (10): e1600393 DOI: 10.1126/sciadv.1600393

Invasive plants dye woodpeckers red

An ornithological mystery has been solved. Puzzling red feathers popping up in eastern North America's "yellow-shafted" population of Northern Flickers, aren't due to genes borrowed from their "red-shafted" cousins to the west.Instead, the culprit is a pigment that the birds are ingesting in the berries of exotic honeysuckle plants.

Source: ScienceDaily, 12 October 2016. <www.sciencedaily.com/releases/2016/10/161012134912.htm>.

Unraveling the science behind biomass breakdown. Researchers uncover chemical reaction that helps break down biomass for biofuel

Lignocellulosic biomass—plant matter such as cornstalks, straw, and woody plants—is a sustainable source for production of bio-based fuels and chemicals. However, the deconstruction of biomass is one of the most complex processes in bioenergy technologies. Although researchers had already uncovered information about how woody plants and waste biomass can be converted into biofuel more easily, they have now discovered the chemical details behind that process.

Source: ScienceDaily, 18 October 2016. <www.sciencedaily.com/releases/2016/10/161018194926.htm>.

Move over, solar: The next big renewable energy source could be at our feet

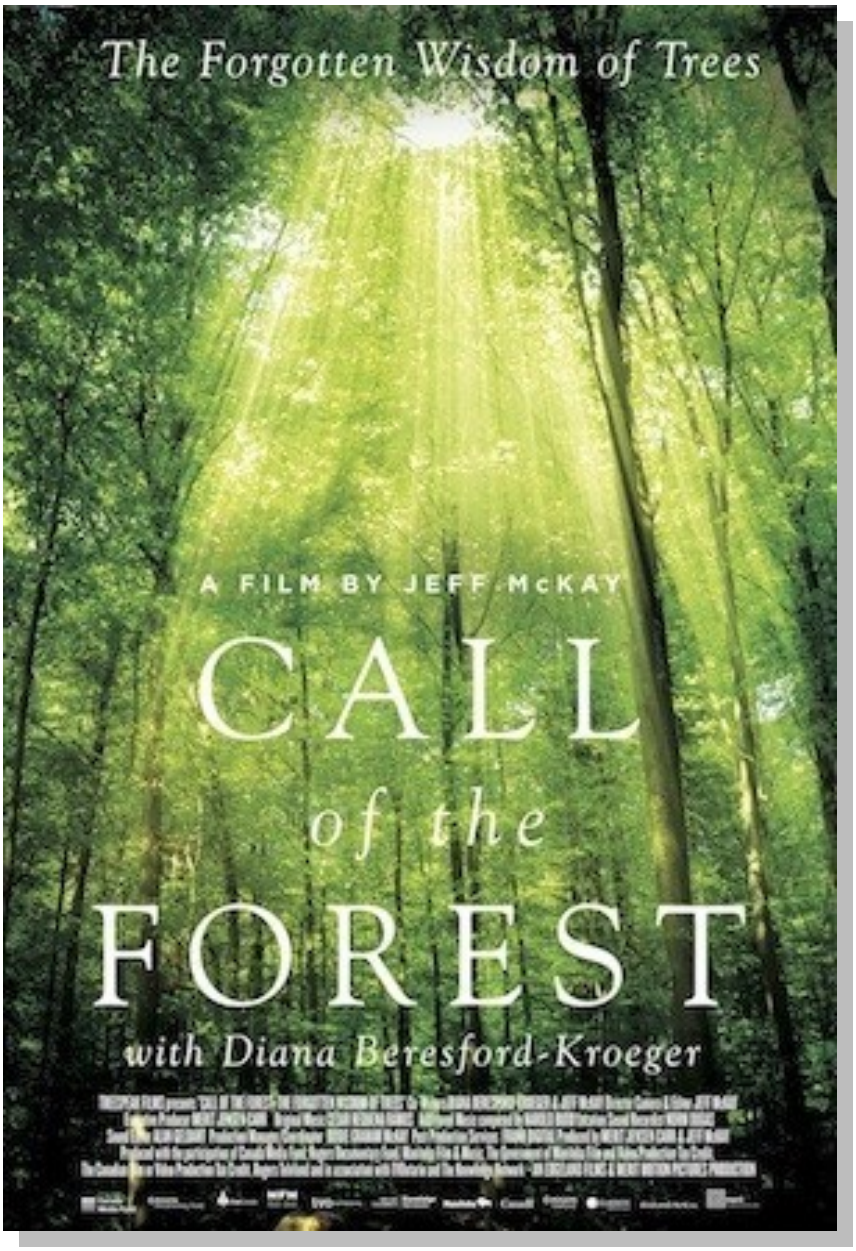
Flooring can be made from any number of sustainable materials, making it, generally, an eco-friendly feature in homes and businesses alike. Now, flooring could be even more "green," thanks to an inexpensive, simple method that allows them to convert footsteps into usable electricity.

Source: ScienceDaily, 20 October 2016. <www.sciencedaily.com/releases/2016/10/161020131916.htm>.

X-rays capture unprecedented images of photosynthesis in action

An international team of scientists is providing new insight into the process by which plants use light to split water and create oxygen. In experiments, ultrafast X-ray lasers captured atomic-scale images of a protein complex found in plants, algae, and cyanobacteria at room temperature.

Source: ScienceDaily, 21 November 2016. <www.sciencedaily.com/releases/2016/11/161121130953.htm>.



ADVANCE PREVIEW SCREENING

Exclusively for BGWA Members

BGWA has arranged a very special movie showing for its members, who will have the chance to see this feature documentary before it even hits the film festivals! To watch movie trailer and learn more see www.callofthetheforest.ca

WHEN?

Saturday January 21st, at 2PM

WHERE?

Grey Roots Museum
(Grey Rd 18, west of Inglis Falls Rd)

WHY?

The objectives of this film and the initiative behind it align with BGWA's Mission Statement.

HOW?

ONE free ticket per BGWA membership. Additional tickets for spouse/family/guest accompanying a BGWA member $10 each.

SPACE IS LIMITED - first-come, first-served

REGISTER IMMEDIATELY ONLINE www.bgwa.ca

or CALL 519-371-8465

While visiting Grey Roots Museum, see

The Extraordinary Tree Exhibit

& other exhibits at discounted admission rate
www.greyroots.com