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THE SAP ALSO RISES

by

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It's coming up on that special time of year at Grass River Natural Area - tapping maple trees and syrup making. Here's the background and science about the origin of this sweet treat that is not just for pancakes and waffles but used to sweeten cakes, cookies, baked beans, and any other dish where sugar is desired.

During photosynthesis, trees make sugar in their leaves, and this sugar is conveyed by tissue in the inner bark called the phloem from the canopy down to the roots, where it's stored as starch. The xylem is the structure in the trunk that carries water and minerals to the branches and leaves - the opposite direction from the phloem. The cells in the xylem are long and tubelike, and they connect to one another to form a conduit that carries the water and minerals (sap) upward. In the early spring, the sap also includes sugars that

were stored as starch in the roots the previous year, so the tree can use that energy to begin new leaf and flower formation. As spring approaches, freezing nights and warmer days induce gas bubbles in the sap to contract and expand, which in turn causes the sap volume itself to expand on warm days and rise to fill the empty space in the xylem. This creates a lot of pressure in the xylem, and sap will flow out of the xylem if you put a hole in it, which is exactly what we are doing when we tap a tree!



Sugar Maples (*Acer saccharum*) are most often used for tapping because the higher concentration of sugar in the sap requires less boiling to make it tasty. Generally, it takes 40 gallons of sap to make 1 gallon of syrup. That's a lot of boiling! Paper Birch, Ironwood, and Walnut saps can be used but because of the lower sugar content, longer evaporation time is required. Sucrose is the sugar component of maple syrup. The sugar components of birch are glucose and fructose. Making maple syrup was a part of American history long before European settlers arrived. Native Americans have a legend about its origin.

“One cold night, Chief Woksis of the Iroquois threw a tomahawk which stuck in the trunk. The next day the sun warmed the sap in the tree and it drained out. Discovering its sweetness, the Chief's wife cooked their venison in it and found it so tasty that collecting sap and boiling it to syrup became a part of their life. Because it was easier to store, the heating process continued until maple sugar was formed. This was kept in cakes and moisture was added as needed. “

Whatever the story, it is true that maple syrup was the sweetener used by indigenous people for flavor and preserving food. When European settlers came, they had a readily available source of sweetener waiting for them, especially in the original colonies.

Until that discovery, honey and fruit juice were the sources of sugar in much of the Northern Hemisphere. Tree sap became the staple sweetener wherever maples and birches grew. The province of Quebec produces the largest amount of maple syrup in the world. Vermont is the largest producer in the U. S. Sweden has a history of making syrup and sugar from birch sap. Even Myanmar, a major importer of maple products, has begun making its own from the sap of a native maple, Snakebark Maple (*Acer davidii*). In areas of deforestation, varieties of maple are often planted to restore forests.



Methods of sap gathering and sugar making have evolved from the romantic and labor-intensive to more efficient fuel and labor-saving methods. The sap is no longer gathered in buckets and hauled by horse-drawn cart or by hand from the woods to the sugar shack. Now, a system of plastic pipelines generally carries the sap to the boiling shed. Reverse osmosis removes some of the water from the sap before it is finished in the cooker. Wood may still be used, but many operations have switched to natural gas or propane.

As GRNA is a small, commercial sap gatherer, we still tap our trees in the traditional way, hang buckets on the trees to collect the sap, carry buckets back to the Grass River Center, and boil the sap in a wood-fired evaporator inserted into the fireplace in the pavilion. If you want to learn about the process and participate in sap gathering and boiling, please join us:

MapleFest
Saturday, March 19
11:00am – 3:00 PM

You and your family can learn about the process from our GRNA educators who will be on hand boiling the sap and then go out and help gather sap and process it for boiling. We hope to have GRNA syrup ready for sale that day from previously gathered sap. Of course, we are dependent on Mother Nature for that.

If you can't join us on the 19th, visit GRNA soon to walk the trails, look for tapped trees, and watch the sap rise. You may even catch sight of our staff boiling sap. We hope to be able to tap the trees the last week in February or the first week of March.

**THEY CAME,
THEY SHIVERED,
THEY WON**



Sixteen people came out in very chilly temperatures to run on snowshoes in the GRNA 5k and 10k Shiver race held on Saturday, February 12th.

the winners are:

5k male: Greg Gogolin, 26:20

5k female: Juli Weir, 32:50

10k male: Kyle Kiel, 42:13

10k female: Mikkie Schemanski, 1:12:54

Congratulations to each of our winners and everyone who participated either in person or virtually.



GRNA SUMMER CAMP REGISTRATION OPENS

TUESDAY, FEBRUARY 22
AT HIGH NOON - 12:00 PM

5 weeks from which to choose June - August
Be on your computer and ready to click here

<https://www.grassriver.org/summer-camp.html>

Even with expanded availability, spaces will fill fast.

PROGRAMS ON THE HORIZON



The Science Behind the Signs of Spring

Wednesday, February 23

12:00 pm - 1:00 pm

Free Zoom Class - advance registration required

From birds that start singing their breeding songs in mid-January to plants that sprout when there's still snow on the ground, late winter/early spring is perhaps the time of year that most embodies hope and optimism. In this virtual class, join self-professed "spring junkie" Emily Burke as we discover the very first signs that warmer temperatures and longer days are just around the corner. We'll also learn the science behind why and how these phenomena occur, including discussing the environmental cues that regulate them as well as the fascinating adaptations that make them possible.

[Register here in advance for this online program.](#)



Lantern-lit Ski and Snowshoe

Friday, February 25

6:00 pm - 9:00 pm

\$5 per person

Lantern light reflecting off of freshly fallen snow is a great way to enjoy the forest in winter. Enjoy an evening ski on GRNA's groomed ski trails, or snowshoe the boardwalk to the river. We will have a warm campfire at the Center pavilion and the heated building will be open and staffed. Come any time during the 3-hour, self-guided, "open-house" style ski or snowshoe. Bring a flashlight or headlamp. Skis and snowshoes for all ages are available for rent at the Grass

River Center for an additional \$5 rental fee during the program or bring your own. [Register here.](#)



Tapping Maple Trees

Saturday, March 12

11:00 am - 12:30 pm

\$10 per person, limited space

Must pre-register

Discover the ceremonial art of maple tapping by learning both traditional and modern methods. This program will cover all of the equipment you need to get started, as well as how to do it at home. Get a chance to tap a tree, and see maple syrup being made, from tree to bottle. Limited space. Must pre-register. [Register Here.](#)

Classes at GRNA through NMC are available:

February 24 and March 3, The Science of Making Maple Syrup

[For more information and registration - click here.](#)

GRASS RIVER CENTER HOURS

Winter hours: 10:00 am - 4:00 pm, Saturdays and Sundays

B-R-R-R-R COLD TEMPERATURES ARE HERE

Purchase a long-sleeved shirt or hat to stay warm and GRNA benefits



Choose from any of the logos featured above, printed on a variety of styles, colors, & sizes from youth to adult. Order online by clicking on this box. A portion of the sale comes back to GRNA as a donation.

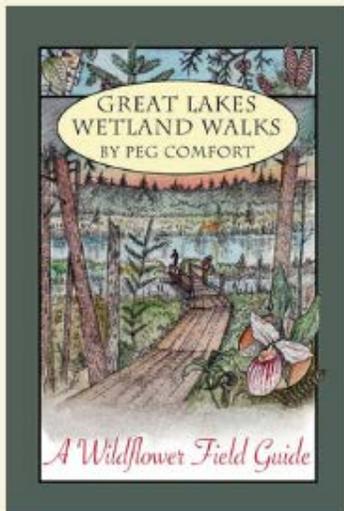
**The 2nd Edition of
Grass River Natural Area's
FIELD GUIDE
to Northwest Michigan
is now available.**



This guide is written and compiled by GRNA Education Director James Dake. It features several new and expanded sections and a new Foreword by Executive Director Jenn Wright.

Cost is \$18.87 plus tax

Order online by clicking on this box or available at the Grass River Center Gift Shop



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Grass River Center Gift Shop.**

**It is perfect for hikers, gardeners, and
nature enthusiasts.**

**Artistic illustrations and photographs
add to the book's appeal.**

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Grass River Natural Area is a nonprofit organization that has flourished for fifty-two years because of the generous support of people who value our mission "to manage the Grass River Natural Area, conserve and protect its watershed, and provide opportunities that increase knowledge, appreciation, and community-wide stewardship of the natural environment".

If you believe in our mission and want to help us fulfill it for many years to come, please click on the Donate button below. Your support is greatly appreciated.

D O N A T E



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