The Blazing Star

Winter 2016, Volume 17, Issue 1

A Publication of the North American Native Plant Society

Native Plant to Know

Rock Elm

Ulmus thomasii

by Bill Moses

Rock elm first came to the attention of the botanical world in 1831 when the *American Journal of Science and Arts* published its description and scientific name. The author was David Thomas, an American engineer in charge of building the Erie Canal, who reported finding the tree in Cayuga County, New York. Thomas was a serious amateur botanist in what was an exciting time for naturalists. Many new species were being found and the explorers Lewis and Clark, for example, made a point of acquiring botanical skills so they could properly document their discoveries.

Thomas, as was his right, named the "new" tree *Ulmus racemosa* (the species' name means raceme, a flower cluster in which each flower grows on its own stalk from a common stem). In 1902, Charles Sprague Sargent, a well-known botanist and the first director of Harvard University's Arnold Arboretum in Boston, Massachusetts, changed the species' name to *thomasii* in Thomas's honour when he discovered that the *racemosa* species name already belonged to a European elm.

Sargent described rock or cork elm as "heavy, hard, very strong and tough, closely grained, and susceptible of receiving a beautiful polish." He noted that it was used in the manufacture of heavy agricultural implements such as mowing and threshing machines. Rock elm was also crafted into chair frames, wheel hubs and the beams of stump pullers. The wood was put to good use as railway ties, bridge timbers and traditional timber framed buildings. Less appropriately perhaps, rock elm was used to build log cabins and even burned as fuel to heat them. Decades later, automobile bodies, pianos, hockey sticks and axe handles were made from rock elm. Sadly, the wood is no longer commercially available. Trees that were once 25 to 30 metres (80 to 100 feet) in height, with a trunk that sometimes reached one metre (three feet) in diameter with 20 metre (60 foot) logs clear of knots are nearly all gone.

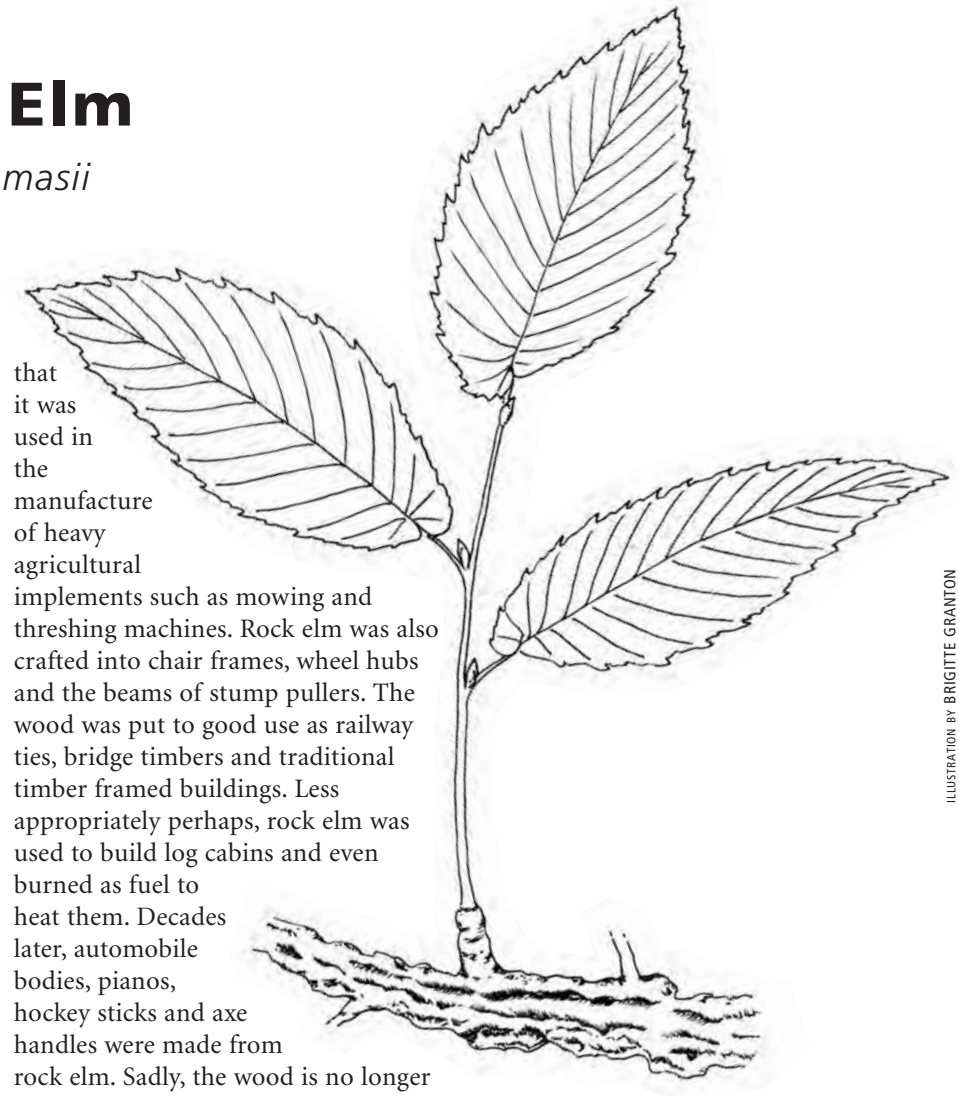

ILLUSTRATION BY BRIGITTE GRANTON

Locating a rock elm and collecting its seed had been on my bucket list for years. It took me a while to learn to recognize them but after identifying my first one I found I had been overlooking them, thinking they were scrubby American elms (*Ulmus americana*). While American elm produces seed pretty much every year

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The *Blazing Star* is . . .

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The North American Native Plant Society is dedicated to the study, conservation, cultivation and restoration of North America's native flora.

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Join online or send cheque or money order to North American Native Plant Society, Box 84, Stn D, Toronto, ON M9A 4X1.
Telephone: (416) 631-4438.
E-mail: info@nanps.org
Web: www.nanps.org.
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Editorial

You've heard this before, but it bears repeating: The North American Native Plant Society has a dedicated board of directors who work tirelessly to bring us great programs and educational materials, advocate strongly for the native plant movement among the public, landscapers, nurseries and governments, and maintain two ecologically significant properties in Ontario. Like the green above ground part of the plant, that's all the members see. But, like the deep, spreading roots of native grasses, there is much more going on that is not apparent.

My point is, our directors are overworked. In 2013, when funding was available, Peter Kelly was hired as NANPS executive director and did a superb job, even staying on in a volunteer capacity for a year after the funds had dried up. At our 2015 AGM, Karen Stephenson was hired part-time to provide organizational assistance, but we need more help than that and the money to fund it.

Here's an example of a wonderful project that needs your support: Janice Keil and Myles Mackenzie have put together a curriculum-based manual and games for schoolchildren to teach them about our natural heritage. We need funding to print and distribute these materials.

Janice and Myles have also developed an accordion-style guidebook for identifying tree species in Toronto's Rouge Valley along with the seasonal variations, seeds, flowers and other identifying features. Parks Canada generously funded this "seedling" project. Our directors see this as the prototype for similar funding proposals we will prepare in the future.

Funding agencies are encouraging partnerships among like-minded organizations, so NANPS will be collaborating with the Oak Ridges Moraine Land Trust and other environmental organizations on projects that promote sustainability and protection of nature.

NANPS annual spring plant sale – our main funding source – is immensely popular. Our seed exchange is beloved by our members but is not a revenue generator. Expanding upon the popularity of the program though, Bill Ford is developing a native seed donation project through which seed heads of selected species, such as blue vervain (*Verbena hastata*), are packaged in glassine envelopes, each accompanied by seeding instructions, history of the plant, uses and photos in all four seasons. A series of native seed collections (e.g. wetland or meadow species) will then be offered to NANPS members and the public to purchase as tax-deductible gifts for all occasions.

The bottom line: We need your help! Please make a donation to NANPS and, as a registered charity, we will send you an income tax receipt. You might also consider putting NANPS in your will, donating securities or naming NANPS in an insurance policy that you pay into annually. Make NANPS one of your preferred charities this year and help us expand our invaluable work preserving our native plants and ecosystems.
Thank you.

Irene Fedun
Editor of The Blazing Star

PHOTOGRAPH BY MIRIAM HENRIQUES

NANPS volunteers Janice Keil and Zack Harris at the Guelph Organic Conference

NANPS EVENTS

BUILDING BIODIVERSITY WITH NATIVE PLANTS

Tuesday, March 29, 2016, 7:30 p.m.

Fairview Mall Public Library, 35 Fairview Mall Drive, 4th Floor, Room 3, North York, Ontario

Paul LaPorte, the owner of Ephemeral Arts Nursery and a past president of NANPS, will be speaking about how to establish a native plant garden and habitat that supports critical food chains for birds and pollinators. Paul's beautiful photos and amazing animation and video clips will delight his audience.

NANPS ANNUAL PLANT SALE:
Discover the Wonder and Beauty of Native Plants

Saturday, May 7, 2016, 10 a.m. – 3 p.m.
Markham Civic Centre, 101 Town Centre Blvd., Markham, Ontario
Native trees, shrubs, forbs, ferns, sedges, grasses all supplied by NANPS-approved ethical growers. Knowledgeable volunteers will be on hand to provide help with your gardening decisions.

VOLUNTEER OPPORTUNITIES

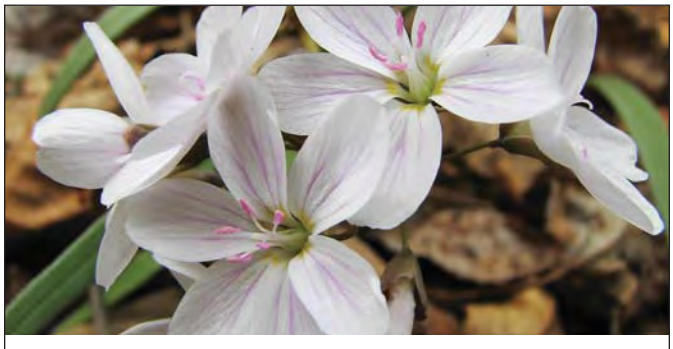
Volunteers are the lifeblood of our organization. We couldn't do all the things we do without your help. If you have the time, come and help us at any or all of these events. Please contact us at volunteer@nanps.org.

March 11-15 – Canada Blooms, Toronto. We'll be needing lots of help with this one! Free admission for volunteers.

April 2 – Carolinian Canada Coalition Go Wild Grow Wild Expo, London, Ontario, 10 a.m. to 4 p.m.

April 8-10 – Peterborough Garden Show, Evinrude Centre, Peterborough, Ontario

May 6 & 7 – NANPS Annual Native Plant Sale at Markham Civic Centre. Come help with the setup on Friday or with the sale on Saturday. Enthusiasm a must, native plant knowledge can be learned from experienced volunteers!



PHOTOGRAPH BY PETER FULLER

*Spring beauty (*Claytonia virginica*) at Fuller Native and Rare Plants in Belleville, Ontario*

IMPORTANT NOTICE FOR SEED EXCHANGERS

Our second round seed list is not being sent out with this newsletter. It has been published online at nanps.org. This allows us to send out seed requests in a more timely fashion and keep the list up-to-date. This is especially important for seeds that require cold stratification. Visit nanps.org to see which seeds are available. Best of luck with your growing!

NOMINATIONS OPEN FOR NANPS AWARDS

The **NANPS Conservation Award** recognizes the extraordinary contribution of an individual or group to the conservation, protection or restoration of the natural heritage/flora of North America at the community, regional, provincial, state, national or continental level. Deadline for submissions is May 31, 2016.

NANPS Garden Awards recognize and celebrate the amazing gardens that support diverse habitat and shared accommodations for our native flora and fauna. Deadline for submissions is July 31, 2016.

The **NANPS Volunteer Award** is given to a volunteer who makes an outstanding contribution to the fulfilment of NANPS goals.

Visit nanps.org for more information.

Kenesserie Tallgrass Prairie

by Steve Rankin

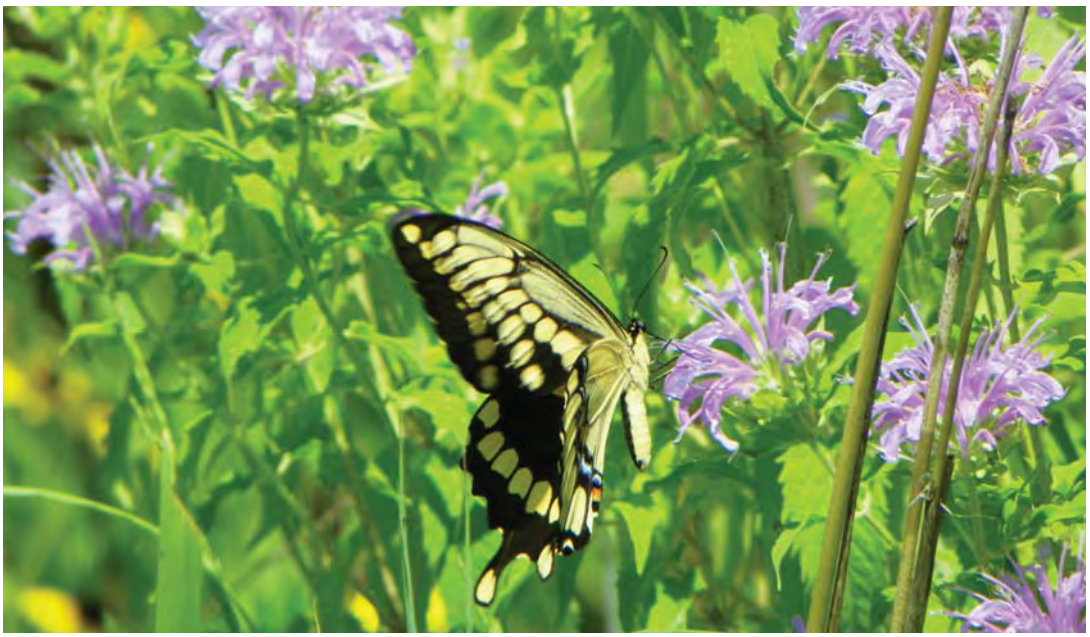
While taking photographs one warm spring day in my tallgrass prairie, I encountered a young fawn, maybe only a few days old. The fawn reacted to my presence by attempting to hide among the forbs. He remained perfectly still no doubt hoping that I was not a predator and would not notice him. I got a photo of his butt sticking through the vegetation before I slowly moved away.

I purchased this five-hectare (12-acre) property located near Ridgetown, Ontario in 2009 and decided to call it Kenesserie Tallgrass Prairie. My intention was to return grassland habitat to an area where it was once common, at the same time providing a refuge for increasingly rare butterflies and pollinating insects. I have had the pleasure of managing this prairie and the adjacent woodland and wetland as a retirement hobby for the past six years.

Tallgrass prairie was once abundant in Ontario but less than three percent remains in widely scattered pockets. As a motivated landowner, I did my research and partnered with Tallgrass Ontario (TgO), an environmental non-governmental organization that helped me secure grants to create the prairie.

About one-third of my property consists of a small hardwood remnant and an historic wetland with deep histosol soils (composed mainly of organic matter) and a diverse community of native plants. I've identified 65 species of flowering plants in the wetland with more awaiting identification. Examples of plants growing there are white turtlehead (*Chelone glabra*), aptly named for the shape of the flower, cut-leaved water-horehound (*Lycopus americanus*), larger blue flag (*Iris versicolor*) and wingstem (*Verbesina alternifolia*), whose dome-shaped panicle of flowerheads resembles a bunch of little sunbursts.

Fortunately, this small wetland has never seen the plow. A previous owner failed in his attempt to drain it for farming. TgO and Ducks Unlimited worked together to develop a plan to restore the wetland hydrology. The property is small, but having contiguous tallgrass prairie and wetland of this size is exceedingly rare in Ontario, which makes these adjacent ecosystems valuable to birds, amphibians, reptiles and *Odonota* (dragonflies and damselflies). I've identified 66 species of birds nesting, overwintering or stopping to rest and feed during migration.



Photograph by Steve Rankin

Giant swallowtail on wild bergamot

The remaining three hectares (eight acres) had been used for pasture and cash crops for the past century. This parcel was the ideal spot to create a prairie because it had the right soil type and was located on a flat sun-facing slope. Another allurement of this property as a potential site for a grassland creation was its location: sandwiched between a century-old hydro corridor and two abandoned rail lines which harbour rare plants and insects. Remnant populations of tallgrass prairie have been recorded in the adjacent rail lands. Remnant species include dense blazing star (*Liatris spicata*) and round-headed bush clover (*Lespedeza capitata*). The former lures butterflies, including monarchs and other beleaguered species. The latter is pollinated largely by long- and short-tongued bees such as bumblebees and large leaf-cutting bees. The caterpillars of several species of skipper feed on its foliage.

Preparation of the fields began in 2010, a full year before the seeding of prairie plants. Three herbicide treatments were spaced out over spring, fall and the following spring with the goal of depleting weed seeds stored in the soil. The prairie was seeded on May 20, 2011 (Year 2). Spring and summer that year were warm and wet, ideal conditions for prairie seed germination. The seed mix consisted of 34 locally sourced native plant species – five warm-season grasses and 29 forbs. Warm-season grasses grow in bunches and

provide superior habitat for wildlife. Forbs which are associated with prairie grasslands are sun-loving, herbaceous flowering plants which provide food and nectar for birds and insects. If you have good weed control at the outset and good germination of the prairie seed after seeding, tallgrass prairie habitat is fairly simple to maintain and a delight to behold when it transitions into full bloom in late July and August.

In the second and third years, I invested considerable effort removing invasive non-native plants by hand-pulling them by the roots or by clipping and removing seed heads from the property for disposal off-site. By the fourth year, the four most pernicious weed species that had been there at the outset were gone. Many invasive weeds take advantage of soil disturbance. They are less likely to colonize an area that has not seen major disturbance (such as that caused by the drilling equipment used to seed the prairie in Year 2) for several years which explains why I don't see them creeping in from the edges in Year 5. Over time, the developing root structure of tallgrass prairie inhibits non-prairie plants from getting established.

Photograph by Steve Rankin

Round-headed bush clover

Tallgrass prairie is maintained by prescribed fire that destroys woody plants. The first prescribed burn at Kenesserie was conducted in Year 4 (mid-December, 2013) to remove unwanted woody plants. More than 2,000 poplars (*Populus* spp.) and willows (*Salix* spp.), whose seeds are dispersed efficiently by the wind, had taken root after the prairie seeding in the second year (2011). The prescribed fire two years later appeared to burn hot but killed only about 20% of these trees. I surmise that in a late fall burn situation the moisture content of the biomass is still quite high so that the fire burns cooler. Heat is required to vaporize the moisture so the overall effect is a cooler fire. Biomass is usually much dryer and thus burns hotter in an early spring burn if the preceding winter had been very cold and desiccating.

After the first prescribed burn, fire should be used every five to eight years to clear out accumulated biomass and unwanted woody plants that may shade out prairie forbs. An

Photograph by Steve Rankin

Dense blazing star

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example of this is the rare tallgrass community known as oak savanna, a prairie ecosystem with fire-tolerant trees such as black oak (*Quercus velutina*) or burr oak (*Quercus macrocarpa*) spaced to block 25% of the sun. The best remaining example of this prairie ecosystem is found at Pinery Provincial Park in southwestern Ontario. I have planted several hundred native black and burr oak seedlings in my prairie. It will be a century or more before the oak savanna is fully mature, provided that sufficient oak seedlings survive beyond their first five years, a time period which has been identified by experts as critical.

I addressed the problem of the surviving poplars and willows after the saplings produced their first leaves in May of the fifth year by cutting them down at ground level with hand snippers and applying a few drops of Roundup® herbicide to the cut stump. The trees are easy to find because the biomass has been removed by the burn. I used a hand-held sprayer with pre-mixed Roundup® solution with the application set to the foam setting. You can buy these small pre-filled 950 millilitre (35 fluid ounces) sprayers in any garden store. Always follow label instructions before using any herbicide and wear protective clothing. Note that herbicides should never be applied in or near wetlands because of recognized harm to amphibians.

The tree removal was labour intensive but I followed a grid pattern to cover the entire eight acres. Follow-up inspections confirmed a kill rate close to 100%. I also used this method to successfully control staghorn sumac (*Rhus typhina*) creeping into the prairie on one side. Trees such as poplar and willow will become less of an issue over time because, like weeds, they rely on soil disturbance to gain a foothold. Once a prairie is established soil disturbance decreases over time.

Dense blazing star made its first appearance in my prairie creation in Year 5 – a welcome addition. Presumably seeds from nearby remnant populations found their way onto my property because this species was not included on the Kenesserie seed list. I have enhanced biodiversity in the small hardwood remnant by planting shrubs such as elderberry (*Sambucus* spp.), spicebush (*Lindera benzoin*, the early spring bloomer whose leaves give off a spicy aroma when crushed) and three *Viburnums*: high-bush cranberry (*V. trilobum*), nannyberry (*V. lentago*) and southern arrow-wood (*V. recognitum*). These species provide food for birds or host plant services for butterflies and moths (meaning food and shelter for larvae.) Kenesserie has two small stands of common prickly ash (*Zanthoxylum americanum*), the host plant for the largest butterfly in Canada and the United States, the rare Giant Swallowtail. Happily, this swallowtail is a common sight in both my prairie and wetland in the summer. Its favourite nectaring plant is mauve-flowered wild bergamot (*Monarda fistulosa*).

PHOTOGRAPH BY STEVE RANKIN

Kenesserie Tallgrass Prairie.

PHOTOGRAPH BY STEVE RANKIN

Prescribed burn conducted in the fall of Year 4 at Kenesserie Tallgrass Prairie.

After six years, I am very pleased with the evolution of this pocket ecosystem and the significant contribution it is making to neighbourhood biodiversity, which is under intense pressure from agriculture. Kenesserie is also providing opportunities for gene flow to more distant areas connected though the rail and hydro corridors, woodlots, fence rows and gravel pits, ensuring the health of endemic plant and insect species, many of whom are genetically isolated and threatened locally and nationally.

In the future, I want to do longitudinal surveys in both the wetland and prairie to track how diversity is changing over time. And I plan to install a pair of barn owl nesting boxes, a barn swallow shelter and snake hibernacula to further enhance biodiversity.

Steve Rankin is a board member of Tallgrass Ontario. TgO is a registered charity which assists landowners in the preservation of tallgrass prairie communities in Ontario. Visit tallgrassontario.org for ways to get involved.

Kinnikinnick Native Plant Society Arboretum

by Rae Charlton and Molly O'Reilly

Sandpoint is a small town on a very big lake, Pend Oreille. Locals often say, "We're almost to Canada" when explaining our location in northern Idaho, usually referred to as the Panhandle. *Sunset* magazine dubbed Sandpoint "the most beautiful small town in the West" a few years ago. It is blessed with stunning scenery, four distinct seasons and residents who cherish the quality of life here. The abundance of precipitation year-round supports a surprisingly rich variety of native plants.

Local wags have dubbed Sandpoint "the Inland Northwet," but the climate is hospitable to a broad range of plant types. Mountains on the east back up the clouds, creating almost double the rainfall of nearby Spokane, Washington, and substantially more snowfall. Coastal disjunct plants, already present before the Cascade Mountains arose to the west, thrive in the microclimates near waterways, shaded by the diverse, relatively open conifer forest that characterizes Bonner County. Boreal habitats from Canada reach us, making the book *Plants of Southern Interior British Columbia and the Inland Northwest* by Roberta Parish, published by Lone Pine Publishing, one of the better guidebooks available for this area. Alpine trees, forbs and annuals thrive at our higher elevations. As a tasty aside, over 20 varieties of huckleberry (*Vaccinium* spp.) are found here. The Rocky Mountains are neighbours to our east and some of their ecosystem flora flourishes locally; stands of quaking aspen (*Populus tremuloides*) are an example. Botanically, it's an exciting area!

We enjoy a wide range of forest habitat types, identified by the U.S. Forest Service (a major landholder locally). The ponderosa pine (*Pinus ponderosa*) woodlands are low, south facing and receive relatively little rainfall. At higher altitudes and closer to the mountains there's more rain. On south-facing slopes there are western white pines (*Pinus monticola*), western larches (*Larix occidentalis*) and other tree species that emerge in their shade. Wet habitats host western red cedar (*Thuja plicata*) and western hemlock (*Tsuga heterophylla*). Douglas fir (*Pseudotsuga menziesii*) and several varieties of spruce (*Picea* spp.) and true fir (*Abies* spp.) are also common. A number of alpine trees grow in the higher elevations. Among them is whitebark pine (*Pinus albicaulis*), a species in jeopardy from a variety of causes, including climate change.

PHOTOGRAPH BY MARILYN GEORGE

*Shrubby penstemon (*Penstemon fruticosus*) blooming in the KNPS Arboretum dry rocky habitat.*

Back in 1997, Sandpoint resident Lois Wythe, a long-time gardener, herbalist and teacher of plant cultivation and uses, posted a small notice in the library. The headline read, "Interested in the Native Plants of Northern Idaho?" Beneath that were queries such as, "Would you enjoy programs devoted to identifying our native plants and learning to know them? Field trips?" Finally, there was a request to join a meeting of like-minded individuals. When the chosen day and time rolled around Lois was thrilled with the attendance – more than 60 people! They invited speakers to make presentations and they organized nature walks and

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landscaping events using native plants and conducted research. In January 1998 they became a chapter of the Idaho Native Plant Society with the name Kinnikinnick Native Plant Society.

Part of Lois' dream was to create a native plant arboretum. "Maybe a greater awareness of our fast disappearing native treasures will help save some of what is left of our natural world," she noted. She also hoped to "painlessly" educate people about native plants (without lectures or formal instruction but simply by piquing their curiosity through contact with the natural world). She wanted visitors to the arboretum to discover how indigenous plants could be used to great advantage in gardening. A committee was formed, including master gardeners, experts in the fields of botany, forestry and plant pathology, educators, designers and local residents. Several possible sites were rejected. The committee decided that a city park would be an ideal location and Lakeview Park, in south Sandpoint, had much to recommend it.

A young girl learning to bore a tree to determine its age at the arboretum educational field day in 2006.

Lois drafted a letter to Sandpoint's parks director. The *Bonner County Daily Bee* reported some of the pertinent points made by the chapter: "We believe an arboretum of Idaho native plants would enhance the Bonner County Historical Society's heritage facility (museum), and add a major point of interest to Sandpoint's park system…coordinated with the parks department and appropriate city agencies, as well as the historical society and the Lions Club…We would like to establish native plant groupings suitable to the various micro-climates surrounding the existing trees and site features, with winding paths to connect them. All plants and trees would be correctly identified with labels and described in a self-guiding brochure…the envisioned project area is currently shaded with mature native conifers, and replicates original N. Idaho, which was primarily a forest. We would only be adding the missing understory plants which co-habited with the trees at that time and, in sunnier areas, make groupings of plants appropriate

PHOTOGRAPH BY PHIL HOUGH

PHOTOGRAPH BY MARILYN GEORGE

Arboretum Manager Sylvia Chatburn speaking to 3rd graders at the educational field day in May 2014.

ARBORETUM HABITATS

Dry Forests – often characterized by shallow, rocky soils, usually dominated by ponderosa pine (*Pinus ponderosa*), Douglas fir (*Pseudotsuga menziesii*) or grand fir (*Abies grandis*) with an understorey that may include grasses such as Idaho fescue (*Festuca idahoensis*) or the common low-growing shrub known as kinnikinnick (*Arctostaphylos uva-ursi*).

Dry Rock Habitat – many plants found here also occur in dry or moist forests but some occur only in the soil deposited between rocks that receives ample moisture in the spring before drying up in the summer. Typical plants are the delightful trumpet-flowered scarlet gilia (*Ipomopsis aggregata*) and purple-blue kittentails (*Besseya bullii*).

Interior Rain Forest/Rare Plant Habitat – unique to North Idaho. Warm Pacific maritime weather patterns support the wettest forest habitats in the state which include western red cedar (*Thuja plicata*) and western hemlock (*Tsuga heterophylla*) towering over devil's club (*Oplopanax horridus*) and numerous ferns and forbs.

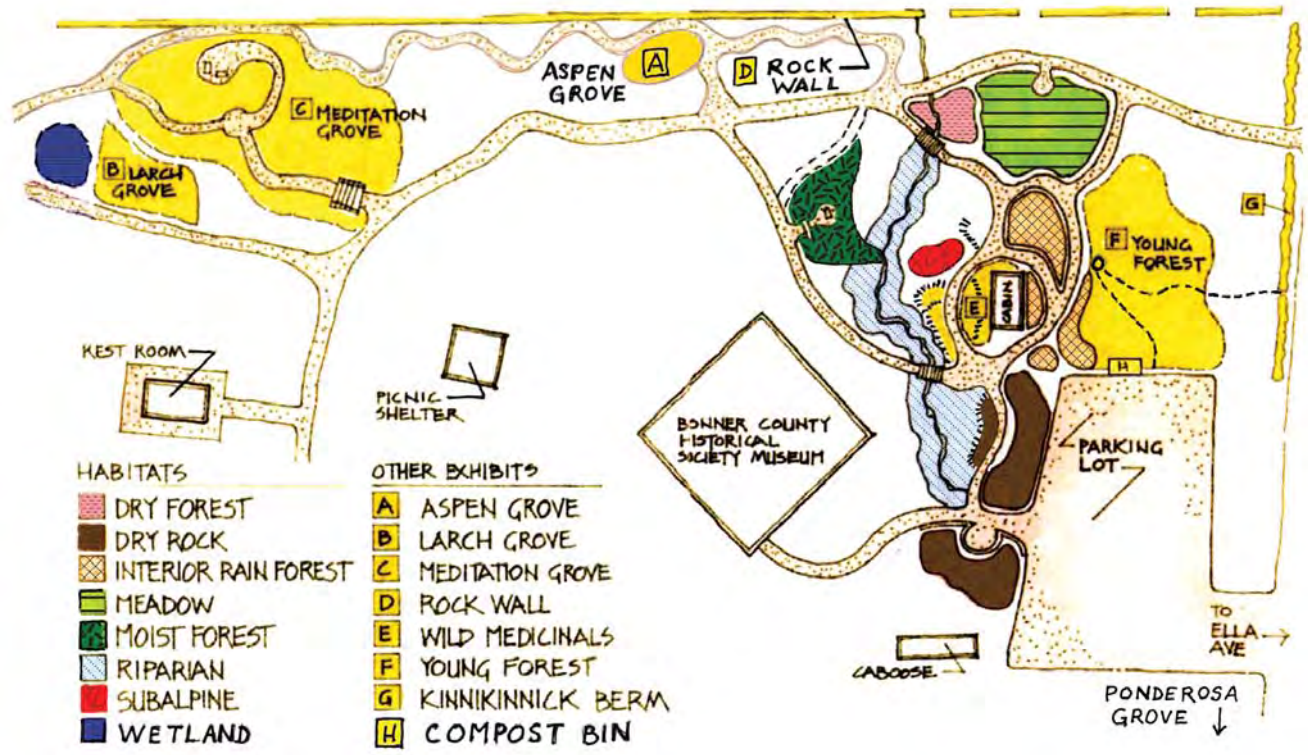
Meadow Habitat – dry to moist ecosystems that support the feathery prairie Junegrass (*Koeleria macrantha*) and sticky geranium (*Geranium viscosissimum*) and other grasses and flowering plants.

Moist Forest – these habitats occur in ephemeral draws and swales and on mountain slopes. Mixed conifers shelter wild ginger (*Asarum canadense*), queen's cup (*Clintonia uniflora*) and twinflower (*Linnaea borealis*), among others.

Riparian Habitats – found along streams and large rivers, but also on the margins of ponds, fens and marshes. Evergreens and fast-growing hardwoods such as water birch (*Betula occidentalis*) grow here.

Subalpine Habitats – occur at middle to higher elevations, on mountain slopes, ridges and in draws or at lower elevations in cold air drainages. Subalpine fir (*Abies lasiocarpa*) and Engelmann spruce (*Picea engelmannii*) often dominate.

Wetland Habitat – the plant communities found in ponds, meadows, scrub shrub and forested areas with snags include sedges, grasses, rushes, cattails (*Typha* spp.), red osier dogwood (*Cornus sericea*), willows (*Salix* spp.) and other stunted trees.



to their sites." Lois' vision also included encouraging area school children, 4-H and Scout groups to become part of the development.

The parks director liked the idea so much he gave the committee approval to proceed to city council. Not only did the councillors give it a unanimous "yes" vote, the mayor complimented Lois on "a wonderful plan."

The city's approval came on December 16, 1998. The next morning the committee met to decide what projects might be accomplished despite winter's hardships. One was to map and label the existing native trees in the park (167!). Another was to begin working on a landscape plan. Elements under consideration included a native medicinal herb garden and native grasses around the historic log cabin; an alpine rock garden; a garden of tall native shrubs along the chain link fence to obscure the view of the sewage treatment plant; and a meditation garden with wild roses and berries to attract birds and butterflies. Individual donations, foundation grants and many volunteers would be needed to turn dreams into reality. All Lois asked of the group willing to tackle the project (the gang of 12) was that they commit "four hours a week, all summer, for the rest of your lives." Amazingly, no one budged.

The groundbreaking ceremony, attended by local and state officials, was held on Arbor Day, April 30, 1999. And then the real work began. The arboretum would occupy 1.18 acres (.48 hectares), in the southwestern corner of the park, adjacent to the Bonner Historical Society Museum. A comprehensive design by landscape architect Kirk Johnson made use of various ecosystems in the park. He added a "dry" streambed of rocks to showcase native grasses and unobtrusive seating that would allow prolonged enjoyment of each habitat. The gang of 12, now designated "straw bosses," supervised work in various areas, six days a week, 9 to 5. Volunteers with pickups were especially useful, as were those able to wrestle huge boulders into the dry rock area. Landscapers, diggers, path-makers, bench makers, backhoe operators, gardeners—professionals and neophytes alike—spent time raking, digging, setting plants, hauling in soil and compost, acquiring plants, tools and equipment, and more. One member created a beautiful dry stack stone wall along the southern perimeter. Another created unique alder benches and arbours to grace several habitats. The historical society rescued an early 1900's homestead log cabin originally located outside of town and relocated it to the site.

Beginning in mid-May, gardeners take responsibility for particular habitats, watering, planting, weeding and pruning one morning per week. From mid-May to mid-September a part-time coordinator organizes the gardeners' activities, takes care of on-going maintenance and planting needs and leads tours.

The spring clean-up is done before the annual Arbor Day celebration in June, which functions as an open house for the arboretum. Pre-arranged guided tours for school classes take place for a full week, and, thanks to local growers, we have a huge native plant sale on Arbor Day. Garden clubs and other groups make use of the "Arb" as a study location. Our book, *Landscaping with Native Plants in the Idaho Panhandle*, offers colour photos and excellent detail, including where each plant can be seen in the arboretum.

One of our gardeners, Gretchen Hellar, sums up the arboretum's work: "Our unique purpose is to educate the community on the importance of protecting our special environment, to showcase the beauty of our native flora, and to encourage the use of native plants in home landscaping, as well as providing a place of peace and calm for everyone to enjoy…It shows what wonderful things can happen when one person has a vision, shares that vision, and inspires others to work towards that vision."

Rae Charlton is the president of the Kinnikinnick Native Plant Society. Molly O'Reilly chairs the conservation committee. Visit nativeplantsociety.org to learn more about KNPS.

Seeding Native Plants for Fun and Profit

by Peter Fuller

Every summer there's a struggle between me and desperate mothers trying to feed their hungry children. The mothers are raising voracious broods of cedar waxwings, starlings and robins. The disagreement is usually over the fruit of serviceberries (*Amelanchier* spp.), pagoda dogwoods (*Cornus alternifolia*) and chokecherries (*Prunus virginiana*). While I try to attract a diversity of birds to my nursery (Fuller Native and Rare Plants in Belleville, Ontario), I have to act quickly to gather enough seed for propagation or they will take it all. The battles continue into the fall as hordes of immature goldfinches descend to pick out all the sunflower (*Helianthus* spp.), tickseed (*Coreopsis* spp.), pale purple coneflower (*Echinacea pallida*), coneflower and black-eyed Susan (*Rudbeckia* spp.) and cup plant (*Silphium perfoliatum*) seeds.

It's not just outside that I need to be vigilant. I have been experimenting with germinating local species of hawthorns (*Crataegus* spp.) inside. The process from seed to seedling is long because the hard-coated nutlets can take several years to germinate. I found an interesting grove of mixed hawthorns last summer. I waited until the fruit ripened, drove to the location, collected fruit, extracted the seed, and then washed and prepared it for sowing. I left the seeds on the counter overnight to dry. The next morning the counter was bare. A mouse had found its way into the kitchen and carefully removed every seed. Although I eventually caught the culprit, he refused to reveal the location of his cache, putting the hawthorn propagation program on hold for another 12 months!

At the nursery I try to propagate most of my stock from seed to promote genetic diversity. Whenever possible I use locally collected seeds. I have developed a network of friends with local woodlots, fields and wetlands where I can collect seed and establish stock in the nursery's demonstration gardens. I practise ethical seed collection by obtaining permission from property owners, never collecting seed from rare or endangered plant populations and only taking a maximum of 10% of the existing seed. Collecting from different individuals provides genetic diversity among the next generation of plants.

Seeding goes on all year long. Much of Ontario's flora needs a cold/moist period to break seed dormancy, conditions easy to provide by sowing seeds in pots that are sunk in the ground and mulched (with leaves) in a sheltered spot for the winter. I put most pots into plastic bags to retain moisture, but pots of shrub/tree seeds can attract rodents so I cover them

PHOTOGRAPH BY PETER FULLER

Seed gardens featuring showy tick-trefoil (Desmodium canadense)*, pale purple coneflower* (Echinacea pallida)*, ox-eye* (Heliopsis helianthoides) *and other plants at Fuller Native and Rare Plants nursery.*

PHOTOGRAPH BY PETER FULLER

Prairie smoke (Geum triflorum) *in seed*

with hardware cloth or place them in an unheated hoop house. If you use plastic bags, make sure they are not in direct sun and that you remove the bags in April. You can also put the seeds in the fridge in damp vermiculite for a few months using resealable plastic bags. I try to put as many pots as possible outside, but the space for food in my fridge still shrinks to one shelf as bags of seeds, tubers, bulbs and pots become the priority. Planning a dinner party requires ingenuity.

of the forest floor. Other species such as bloodroot (*Sanguinaria canadensis*), twinleaf (*Jeffersonia diphylla*), wild ginger (*Asarum canadense*), violets (*Viola* spp.) and hepatica (*Hepatica* spp.) retain their leaves but shed their seed quickly. Some species such as bellwort (*Uvularia grandiflora*), Solomon's seal *(Polygonatum biflorum*), trillium (*Trillium* spp.), mayapple (*Podophyllum peltatum*) and twisted-stalk (*Streptopus* spp.)

Photograph by Peter Fuller

Trillium grandiflorum *berries/seeds with elaiosomes*

Even though the cold/moist treatment is a good default technique, there are ways to tweak it for different groups of plants throughout the seasons. Seed collecting starts for me in the spring as the woodland bursts into a frenzy of blooming before the canopy closes over. Most of these spring flowers produce abundant seed but it is moist/soft and shouldn't dry out; the seed must be collected as it ripens. To complicate matters, the leaves of plants such as trout lily (*Erythronium americanum*), spring beauty (*Claytonia virginica*), squirrel corn (*Dicentra canadensis*) and Dutchman's breeches (*D. cucullaria*) begin to yellow and die after flowering as the seed stalks fall among the leaves

don't ripen until July or August. In dry summers, the plants may go dormant early, but seeds may be present even when leaves have disappeared and should be collected before they dry out.

Timing is less crucial as the summer moves on. Many of the meadow and wetland plants produce dry seed heads which turn brown when ready and stay on the plant for some time. They can be cleaned and stored dry until November sowing. When I participate in summer bird surveys or go on hikes, I always stuff a few bags in my backpack – something interesting of a botanical nature

Guidelines for Propagating Seeds from Spring Bloomers

1. After noting where spring-flowering plants are blooming, make a return trip later in May or early June for those species that set seed right away. A second trip in mid-July will allow seed collecting from the others. It is worthwhile keeping a simple list of when and where you collected the seed of your favourites (and if you were too early or late).

2. Seeds are ready to harvest when they change colour (usually from white to brown/black). An exception is hepatica seed which remains green but is easily dislodged when ripe.

3. Watch for pods/fruit starting to break open. Many seeds such as those of *Sanguinaria canadensis* have fleshy attachments called elaiosomes which are rich in lipids and proteins. Ants take the seeds to their nests, feed the elaiosomes to their larvae and discard the seeds, thus helping to disperse them.

4. If you are too early for mature seeds and can't return at the right time, collect a fruit or stalk without breaking it open and leave it to ripen a few more days in a bag.

5. Store cleaned seeds immediately in damp vermiculite in a resealable plastic bag. Label and store in a dark place such as a cool cupboard. Some species such as trillium, wild ginger or hepatica may germinate and send out a radicle, but they still need to go through the next steps.

6. Provide seeds with a cold and moist period (outside for the winter in pots or a bed is best, but the fridge is possible) starting in November.

7. Seeds stored in the fridge can be sown in pots in late March or April.

8. Be patient – some species such as trilliums can grow an underground rhizome the first spring, but will only send up a leaf the second spring. For this reason, pots that are at least 14 centimetres deep are good (typical "gallon" pots.)

always shows up. When I see an attractive fern I flip over a frond to see if there are ripe spores. A tiny leaflet (pinna) can produce thousands of ferns.

Around the nursery a pleasant weekly task is to survey the rock garden for beardtongues (*Penstemon* spp.), sedums (*Sedum* spp.), nodding wild onion (*Allium cernuum*) or pussytoes (*Antennaria* spp.) that have gone to seed. I find it useful to have a few envelopes, a paper bag, a few paper coffee cups and a small sieve stashed in the garden so that I can shake, crush or sift the seed heads as soon as I find them; I almost never remember to come back later because of the millions of gardening jobs clamouring for my attention.

Fleshy fruits such as those of elder (*Sambucus* spp.), Jack-in-the-pulpit (*Arisaema triphyllum*), blueberries (*Vaccinium* spp.), raspberries (*Rubus* spp.) can easily be extracted by mashing the fruit inside a plastic bag and then washing the contents in a sieve. Most pulp will float and viable seeds will sink.

Early fall is the time to start collecting seed from many trees and shrubs. Nuts shouldn't dry out. These include black walnut (*Juglans nigra*), Ohio buckeye (*Aesculus glabra*), hickory (*Carya* spp.) and the acorns of oaks (*Quercus* spp.). Nuts shouldn't become squirrel food either (at least not the ones you want to plant!) I mix the nuts with damp vermiculite and store the bags either in the fridge or in totes of leaves outside. Fall-fruiting shrubs such as snowberry (*Symphoricarpos albus*), dogwood (*Cornus* spp.), viburnum (*Viburnum* spp.) and chokeberry (*Aronia melanocarpa*) are all processed using the mash and sieve method. I shake cones from pine (*Pinus* spp.), spruce (*Picea* spp.), tamarack (*Larix laricina*) and hemlock (*Tsuga* spp.) inside a tin to dislodge seeds. Seeds seem to be everywhere in the autumn, and I spend at least part of most days collecting, cleaning, labeling and storing seed lots.

When winter arrives, most of the nursery's seeds are planted or given a cold/moist treatment. But, contrary to what you may think, my outdoor seed-collecting does not end when the freezing weather arrives. Trees and shrubs such as birch (*Betula* spp.), bladdernut (*Staphylea trifolia*), buttonbush (*Cephalanthus occidentalis*), winterberry (*Ilex verticillata*) and some conifers will hold onto seeds even as the snow falls. Frozen wetlands become accessible in the winter allowing for easy seed collection from sedges (*Carex* spp.), wild iris (*Iris versicolor*) and shrubs.

After a long winter, April is much-anticipated. Each spring morning I search through the pots in our

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PHOTOGRAPH BY PETER FULLER

Collecting wetland seeds

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unheated hoop houses to see what has germinated overnight. Cherry seeds (*Prunus* spp.) can pop up all at the same time, while clematis seeds (*Clematis* spp.) may germinate over an extended period. Bags come out of the fridge and are sown in pots or the ground. Inevitably some pots reveal no growth but I keep them shaded and moist and wait to see if they will produce anything the following spring. I prepare for the next round of seed collection when the spring flowers bloom.

Propagation is one of the most satisfying of gardening pursuits and always full of surprises. It may take a year or two to get to know the preferences of a particular species, but seed propagation produces an endless supply of garden plants and brings with it a knowledge and appreciation of Ontario flora.

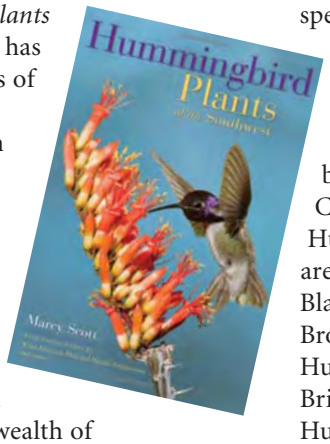
Polypodium virginianum *spores*

PHOTOGRAPH BY PETER FULLER

Peter Fuller is the owner of Fuller Native and Rare Plants and winner of the 2015 Richard Woolger Cultivation Award from NANPS. Contact him with questions about specific species or options for after-care of seedlings at 613-968-4643 or visit fullerplants.com.

New & Noted

Hummingbird Plants of the Southwest
by Marcy Scott
Rio Nuevo Publishers, Tucson, Arizona, rionuevo.com
ISBN: 978-1-940322-03-2
344 pages, 149 colour photos, $18.95 US



Hummingbird Plants of the Southwest has gorgeous photos of every bird and plant profiled in the book. The text is detailed and in depth. Marcy Scott has been working on this book for over a dozen years and it shows in the wealth of observations that such a long period of research can bring.

With her talented native plant landscape-designer husband Jimmy Zabriskie, she operates Robledo Vista Nursery near Las Cruces, New Mexico. At their home along the Rio Grande, they have created gardens and habitat that host thousands of migrating hummingbirds every summer.

Hummingbirds are native only to the Americas, mostly in the tropics of Central and South America. Fourteen species occur regularly in the American Southwest where Marcy lives and she has profiled each of these species, describing where they spend the winter, where they breed and the flowers that they feed on in each season.

A surprising number of these birds, she tells us, breed in or near Canada, and the Rufous Hummingbird, plus several vagrants, are seen as far north as Alaska. The Black-chinned, Anna's, Calliope, Broad-tailed, and Rufous Hummingbirds all breed up into British Columbia. The Blue-throated Hummingbird is found in North Dakota. Marcy's research indicates that these northern breeders are fairly recent colonists that followed the Sierra Madre Mountains northward.

Not surprisingly, hummingbird-pollinated plants in North America are also comparatively recent developments, with the oldest evolutionary forms in South America.

PHOTOGRAPH BY WYNN ANDERSON

Ipomopsis aggregata *(scarlet gilia or scarlet trumpet) is much loved by hummingbirds.*

I was surprised to learn that our native plants produce sucrose, not fructose like Old World plants. Many of these "specialized flowers have developed barriers to other potential pollinators such as bees and now largely depend upon hummingbirds to reproduce."

The bulk of the book consists of 120 profiles of hummingbird plants native from Zones 4 to 10, each with its own photo and information about its blooming season, water use and the temperatures its roots can endure.

Review by Sally Wasowski, *author of 10 books on landscaping with North American plants.*

Continued from page 1 – **Rock Elm**

in Ontario's Grey County, rock elm produces seed every five years, more or less. I was surprised to find that the elms are wind pollinated. They do have perfect flowers (both male and female parts) and I have seen bees "working" the flowers. I suspect now that they must have been just gathering pollen and not playing a role in the reproductive process. Another interesting fact is that rock elm is self-fertile, meaning you do not

Photograph by Bill Moses

need two trees to produce seed. American elm is not!

The rock elm has a strong central stem and, in the open, short gnarly side branches all the way up the tree. Closer inspection reveals corky branches and very fissured bark on the main trunk. The leaves tend to be concave with the lateral veins closer together than on white (American) and slippery elms (*Ulmus rubra*). The side veins are also rarely branched. If you run your finger from the tip of the leaf to its base, the leaf will feel smooth, or at least smoother than the other elms. Lacking the short stiff hairs that cause this roughness, the leaf might appear shinier/greener than those of its cousins. The winter buds are also an excellent identification feature. The buds are pointier, shinier and a bright yellowish/brown, lighter coloured than the other two elms. Although rock elm seed is classified as a samara (a seed with wings), the hairy seed does not travel far from its parent. It's full of nutrients and, therefore, a favourite with birds and small animals. Rock elm seed does not require cold stratification in order to germinate so you can plant it directly into the soil and have some nice seedlings within a few months. (Note to seed collectors: slippery elms are even harder to find than "rocks" but usually produce seed with the same frequency.)

Rock elm has a broad geographic range occurring throughout much of eastern North America including southern Ontario and southwestern Quebec, but its habitat is limited to drier, more upland sites than white elm, which occurs in lowlands and tolerates urban stresses. Rock elm is not shade tolerant but seems to grow anywhere except where there is standing water for part of the year. At one time rock elm could grow tall and strong enough to compete in forest conditions developing very long trunks (that translated into valuable logs) to support the crown. Nowadays rock elm appears to grow mostly in the open, a small tree with branches for most of its length. The shallow roots of older trees sucker up and form dense colonies.

We have rock elm seedlings at our Inglis Falls Arboretum propagation

Photograph by Bill Moses

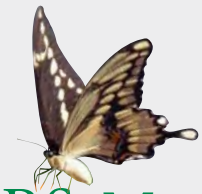
Older corky branches on rock elm

area in Owen Sound, but there is little demand for them. I urge native tree lovers to consider planting this species since it is endangered or threatened in much of its native range. Perhaps if we plant "rocks" now, our great-grandchildren will marvel at these magnificent trees.

THE ELM RECOVERY PROJECT

Dutch Elm Disease (DED), carried by the European elm bark beetle, arrived in North America in the 1940s and proceeded to devastate elms (including rock elm) across the continent. Surprisingly, some trees with strong immune systems have survived, living 60-90 years. The late Henry Kock, interpretive horticulturist at the University of Guelph Arboretum, designed a project where members of the public would report surviving mature elms to the arboretum. Arborists would collect cuttings from these healthy trees and propagate them for testing. The database now has over 1,800 records with 600 trees visited by arboretum staff to date. The most impressive specimens have been found in Wellington County, on the Niagara Escarpment and in eastern Ontario. The project now has breeding orchards where hundreds of trees are being evaluated for their resistance to the disease. Henry Kock had envisioned applying the techniques used on elms to other endangered trees such as butternuts (*Juglans cinerea*), ashes (*Fraxinus* spp.) and American beeches (*Fagus grandifolia*). Visit uoguelph.ca/arboretum/collectionsandresearch/elmrecovery to learn more about the project, obtain a reporting form or make a donation.

Bill Moses is retired and thus able to devote time to pursuits of a botanical nature. He restricts his botanical studies to native woody plants in Grey and Bruce Counties in Ontario. These 175 plants are more than enough to keep him busy.



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