The Blazing Star

Winter 2014, Volume 15, Issue 1

A Publication of the North American Native Plant Society

Native Plant to Know

Eastern Flowering Dogwood

Cornus florida

by Gregor G. Beck and Kevin Kavanagh

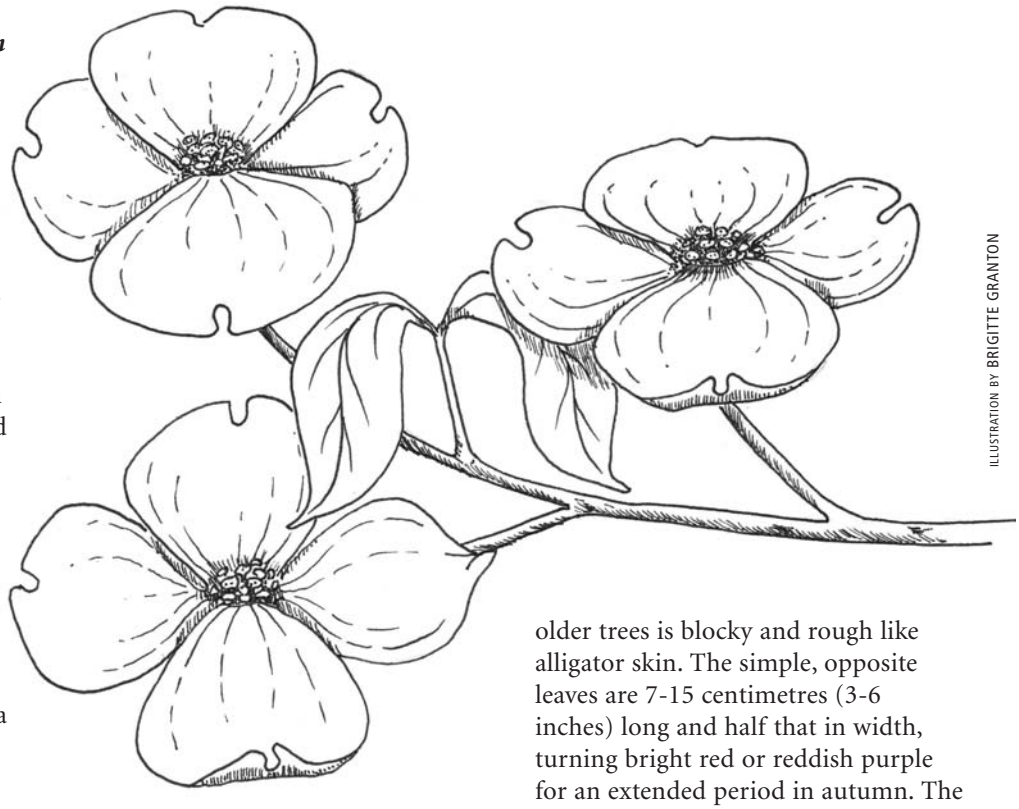

ILLUSTRATION BY BRIGITTE GRANTON

Once widespread throughout eastern and south-central North America, the eastern flowering dogwood (*Cornus florida*), with its bold white spring bloom, is becoming an increasingly rare sight in nature. In the United States, this much loved tree is widely celebrated in spring with community dogwood festivals. It is recognized as the state flower of North Carolina, the state tree of Missouri and as both the state tree and flower of Virginia. Even within its restricted Canadian range, it has been adopted as the floral emblem of Norfolk County, Ontario in the heart of the Carolinian forest region. This understorey forest tree ranges from southern New England, New York, Ontario and Michigan south to Florida and westward to eastern Texas and Oklahoma. There are also isolated populations known from Mexico which are described as *Cornus florida* subsp. *urbiniana*.

Despite its seeming preference for full to partial shade, the species also thrives in sunny, open locations. Its preferred soils are well drained, acidic and rich in organic matter. Flowering dogwood is associated with a diverse range of ecological communities, including mixed deciduous, oak-hickory, oak-pine forests, as well as open oak woodlands.

Eastern flowering dogwood grows to a height of 6-9 metres (20-30 feet), with some specimens reaching 12 metres (40 feet). Trunk diameter can reach 30 centimetres (one foot) near the base, but most specimens are smaller. The horizontal pattern of branching is not unlike candelabra. Young twigs are smooth with a green to purplish hue while the bark on older trees is blocky and rough like alligator skin. The simple, opposite leaves are 7-15 centimetres (3-6 inches) long and half that in width, turning bright red or reddish purple for an extended period in autumn. The overall impression is one of stateliness; the University of Georgia's Michael Dirr refers to it as the "aristocrat of small flowering trees."

The spectacular spring show of flowers is produced just as its leaves – and the leaves of surrounding forest trees – emerge, adding to the dramatic effect. Each inflorescence consists of a crowded cluster of small, yellowish-

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The *Blazing Star* is . . .

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Editorial

PHOTOGRAPH BY JOHN GERRATH

I have the pleasure of introducing you to the first executive director of the North American Native Plant Society, Peter Kelly. Peter is an accomplished writer, researcher, public speaker and photographer with six public exhibitions to his credit and countless media appearances under his belt. Passionate about protecting native habitat and a great lover of trees, Peter has co-authored numerous publications, including the book *The Last Stand: A Journey through the Ancient Cliff-face Forest of the Niagara Escarpment* published in 2007.

Peter received his Master of Science in Geography from the University of Western Ontario in 1989 and almost everything he has done since then has involved habitat conservation. As president of Nature Guelph for the past three years, he has helped that organization rebrand itself. From 2008 to 2012, Pete was research director at the *rare* Charitable Research Reserve in Cambridge, Ontario.

Among his many accolades: Peter was co-recipient of a Niagara Escarpment Achievement Award from the Niagara Escarpment Commission in 2002 for "extraordinary accomplishment on behalf of Ontario's Niagara Escarpment." He was also one of 60 artists honoured at *Celebrate Imagination*, an evening with Guelph authors and illustrators, as part of the Guelph Public Library's 125th anniversary in 2008.

For now, Peter's position is part-time. His responsibilities include administrative work (giving the NANPS hard-working directors a break) and fundraising. As he gets to know the organization, Peter will expand his vision for NANPS and develop ideas for achieving these goals: 1) stretching the organization's borders beyond Ontario, thus making NANPS more North American 2) increasing the membership base and 3) raising funds to allow us to undertake new projects and expand existing activities.

Although Peter acknowledges that NANPS has done a good job of branching out into social media, he will seek out new ways to engage youth. As he says, "We need to look beyond our niche group."

"On behalf of the NANPS board of directors, I am thrilled to welcome Peter Kelly as our first executive director," says Cass Stabler, NANPS new president. "In a few short months, Pete has made significant contributions. He quickly adapted to his new position and has helped the board move forward on several projects. One of Pete's strongest skills is his ability to communicate information about science and botany in a way that the general public not only understands, but finds engaging. His enthusiasm and knowledge will encourage many people to learn more about the natural heritage of North America. We look forward to working with him."

PHOTOGRAPH BY DOUG LARSON

*Peter Kelly, NANPS new executive director, with one of the ancient cedar trees (*Thuja *sp.) on the Niagara Escarpment*

Irene Fedun, Editor of The Blazing Star

NANPS EVENTS

MARCH 4, 2014 **Garlic Mustard Control in Native Habitats**

7:00 p.m.
The last talk in the Barbara Fallis Speakers Series featuring
Dr. Dawn Bazely
York University, Toronto
NANPS members $12, general public $20

MARCH 27, 2014 **Gardening: Planting the Right Seeds for Biodiversity**

The Beaverton Horticultural Society hosts a presentation by NANPS past president Paul LaPorte at St. Paul's Anglican Church in Beaverton, Ontario starting at 7:30 p.m. Explore the intricate connections between native plants and pollinators in the garden food chain. Learn how to establish a native plant garden with minimal effort and no chemicals. Discover how NANPS promotes native plants as an essential part of our ecology. By donation.

MAY 10, 2014 **North American Native Plant Society Annual Plant Sale**

Watch our website at www.nanps.org for details.

MAY 12, 2014 **Gardening: Planting the Right Seeds for Biodiversity**

NANPS presentation at the Carden Community Centre, Lake Dalrymple, Ontario at 7 p.m. By donation.

NANPS will have an info booth at the following events:
Jump on Spring, Toronto Botanical Garden, Feb. 22
Seedy Saturday, Vaughan, March 1
Canada Blooms, Exhibition Place, March 14-18

For more information about NANPS Speakers Series and other events please visit www.nanps.org.

TAKE THE GROW WILD CHALLENGE

Take the Carolinian Canada Coalition Grow Wild Challenge and do more for healthy habitats in 2014. Visit www.growwild.ca and pledge to help nature by committing to a "habitat action". If you already "grow wild", tell your story and inspire others.

Visit the Grow Wild Challenge Facebook page to find out more about weekly Grow Wild prizes: www.facebook.com/caroliniancanada.

SLIPS AND CUTTINGS

I have had a 30-year, intimate love affair with native plants. But only now do I appreciate what this love has given me in terms of a healthier, more positive outlook on life. As the spiritual teacher Seth said, "Live each day as fully and joyfully as possible." My time with native plants is ever thus.

A book titled *Your Brain on Nature*, by Drs. Selhub and Logan, compiles hundreds of studies worldwide showing the wonderful benefits to us of connecting regularly with Nature in all of her diverse forms. Now I know why I always feel so good when I'm at my Stoney Lake Reserve northeast of Toronto, enveloped by Nature's love.

Jim French
Jim is NANPS honorary president

ASK AN EXPERT

In this issue's Ask an Expert column *we are asking you, our readers, to step into the role of expert if you've had experience relevant to this question.*

In the last two years, I have had difficulty growing *Liatris cylindracea* (dense blazing star) from seed. It is supposedly endemic, but I am seeing no germination despite having a quantity of seed. I am also uncertain about the best place to site the plants. Some established plants did not do well in my front garden last year – too much sun perhaps? If anyone has information about this species, I would be most pleased to hear from them (mckelvey@pathcom.com). Perhaps there is interest from NANPSter seed growers on an e-mail collaboration regarding growing and siting some of our rarer Ontario species.

Darcie McKelvey
Caledon, Ontario

NANPS AWARD NOMINATIONS

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

NANPS Garden Awards recognize and celebrate the amazing gardens that support diverse habitat and shared accommodations for our native flora and fauna. The **NANPS Volunteer Award** is given to a volunteer who makes an outstanding contribution to the fulfillment of NANPS goals. Deadline for submissions to these awards is July 31st.

Visit www.nanps.org for more information.

Granitic Outcrops of the Piedmont

by Hugh and Carol Nourse

The granitic outcrops of the Piedmont in the Southeastern U.S. began to form about 300 to 350 million years ago, when molten granite bubbled up from the earth's mantle and intruded into the existing country rock of the continent. It did not rise all the way to the surface, but stopped about 10 miles (16 kilometres) below, where it gradually cooled to form granite and closely related rock. Over millions of years the softer overlying rock eroded away, exposing the outcrops.

Granitic outcrops occur in the southeastern Piedmont from east-central Alabama through the Carolinas to south-central Virginia. They are most numerous in Georgia, especially to the east and south of Atlanta. Some are domes, such as Stone Mountain, Panola Mountain and Arabia Mountain. Others are flat rocks, such as Rock and Shoals Outcrop Natural Area in Athens, Georgia. Besides these protected outcrops, there are many protected rocks including Heggies Rock, Camp Meeting Rock and 40 Acre Rock on Lake Oconee in Georgia, 40 Acre Rock in South Carolina and Mitchell's Mill, The Rock, Salem Lake Natural Area and Rocky Face in North Carolina. Many outcrops without protection from a state or federal agency or The Nature Conservancy have been lost to quarrying or development.

It is difficult to estimate how long the outcrops have been exposed. Stone Mountain may be a relative youngster at 15 million years. The outcrops support a unique community of plants including some that grow nowhere else, and some that are very rare. It must have taken them a long time to adapt to that environment, so granite outcrop habitats have probably been around even longer than 15 million years.

Photograph by Carol and Hugh Nourse

Arabia Mountain dish garden with vernal pool in spring.

Why is the plant community on the outcrops different from the surrounding Piedmont forest? These exposed rocks are harsh environments that will not support forests. Although they get just as much rainfall, there is little soil or plant cover to hold it, so 90 to 95 percent quickly drains away. In summer, the sun beating down on the bare rock can raise temperatures at ground level to over 120 degrees Fahrenheit (49 Celsius). These are essentially desert islands in a sea of Piedmont forest. Soil accumulates slowly on the outcrops, and soil depth is a major determinant of which plants grow where. A few lichens colonize the bare rock and, as sand particles and plant debris accumulate around them, other lichens, mosses, ferns and flowering plants gain a foothold. Where the soil is deep enough to support trees, eastern red cedars (*Juniperus virginiana*) are the most common. Loblolly pines (*Pinus taeda*) try to grow, but do not survive a series of summer droughts. A rare small tree, Georgia oak (*Quercus georgiana*), is a granitic outcrop endemic. Around the periphery of the rock outcrop, winged elm (*Ulmus alata*) grows, encrusted with lichens.

One strategy for surviving in this environment is to be a winter annual. Examples are elf orpine (*Diamorpha smallii*), sandwort (*Minuartia uniflora*), Puck's orpine (*Sedum pusillum*), and pool sprite (*Gratiola amphiantha*). These plants survive the hot summer as dormant seed, germinate with the autumn rains and exist over winter as a small rosette of leaves. In spring, they quickly elongate, flower and produce next year's seeds before summer's heat arrives. Other common adaptations include succulent stems and leaves to

conserve moisture, highly dissected or linear leaves, and silvery hairs that deflect the sunlight and shade the leaf surface.

In winter, the mosses and lichens look their best. In summer, they dry up and crunch underfoot but the abundant moisture of winter brings out their vibrant colours as they continue to photosynthesize. Four common lichens are peppered rock shield (*Xanthoparmelia conspersa*), granite thorn lichen (*Cladonia caroliniana*), Dixie reindeer lichen (*Cladonia subtenuis*) and jester lichen (*Cladonia leporina*). Mosses include resurrection moss (*Grimmia laevigata*), haircap moss (*Polytrichum commune*), medusa moss (*Hedwigia ciliata*) and spike-moss (*Salaginella* spp.). Resurrection moss lives up to its name. If it is dry and black, a bit of water poured on it will change its colour to green almost instantly as the chlorophyll in the tissues hydrates and prepares to photosynthesize.

The first flower to bloom is usually early saxifrage (*Micranthes virginiensis*) around the second week of March. By the middle of April, the thin soils of the outcrop are a carpet of flowers. Elf orpine covers the thinnest soils with mats of red succulent stems and leaves and small four-petaled white flowers. One flower, stitchwort (*Minuartia uniflora*), crowds next to it in slightly deeper soils. Spiderwort (*Tradescantia hirsuticaulis* or *T. ohiensis*), false garlic (*Nothoscordum bivalve*), sunnybells (*Schoenolirion croceum*) and woolly groundsel (*Packera tomentosa*) need still deeper soils.

On some outcrops, the rock erodes into depression pools which hold water seasonally. In these pools, the rare winter annual snorkelwort (*Gratiola amphiantha*) blooms. It is adapted to this specific uncommon habitat in the Piedmont plateau of Alabama, Georgia and South Carolina. Moreover, the pool must have a level bottom with about two inches (50 millimetres) of accumulated soil, be less than one foot (a third of a metre) deep and be entirely surrounded by bare rock. No wonder it is rare! As an annual, snorkelwort must complete its life cycle in the short period before summer heat dries out the pools.

Another rare plant, Puck's orpine, blooms at this time and is found only on the Piedmont Plateau of Georgia and North and South Carolina. It looks much like the common elf-orpine. Both are short plants with succulent leaves and stems, topped with white, four-petaled flowers. But while the stems and leaves of elf-orpine are usually red, those of Puck's orpine are usually blue-green, though they can be reddish if the plant grows in full sun. The two plants were considered the same species until 1875, when botanist Asa Gray saw them growing near each other at Stone Mountain and documented their differences. In fact, the two have a different number of chromosomes and do not hybridize. While elf orpine is happy in full sun, Puck's orpine prefers shadier sites nestled in medusa moss in the shade of old eastern red cedars.

Photograph by Carol and Hugh Nourse

Rock and Shoals Outcrop Natural Area in June morning light.

Summer flowering depends on the amount and frequency of rainfall during the summer months. Even if rainfall is low, but is spread evenly over the summer, plants will flower throughout the season. One big surprise for us has been the tiny false pimpernel (*Lindernia monticola*). One must look closely to see the details of its single flowers: two lips, the smaller upper one with two lobes, the lower one with three. They are lavender to white and marked with intricate violet spots, streaks and edgings. The flower stems arise from a rosette of small oval leaves. False pimpernel prefers depression pits that hold water for a

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long time after rains or seepy areas with a steady supply of water. It may flower only from April to June but, as long as there is enough water, it continues to bloom sporadically into fall. Curtiss's milkwort (*Polygala curtissii*) behaves similarly.

Spotted phacelia (*Phacelia maculata*) blooms in late spring and does not last long into summer. Each of the five pale bluish to lavender petals has two dark purple spots near its base. The leaves are divided into many leaflets. The rather weak stems may stand erect or trail along the ground. The flowers are borne in a cluster along the stem which unfurls like a fern fiddlehead as the flowers bloom. By the time those on the tip have opened, the stem has straightened out. Because the coiled stems resemble a scorpion's tail, phacelias are also called scorpion weeds. Another phacelia, (*Phacelia dubia*), also appears on stone outcrops.

An interesting summer flower, the Appalachian fame flower (*Phemeranthus teretifolius*), grows in very thin soil. The five-petaled rose-pink flowers bloom in open clusters atop a stem up to a foot long. It can be hard to catch in bloom since each flower opens for only a few hours in late afternoon on a single day. On overcast days, the flowers do not open. The pistil is the same length as the 15 to 20 stamens. If the flower is not cross-pollinated, it will self-pollinate when it closes. In a rare species, P. mengesii, the pistil is much longer than the 50 to 90 stamens and the larger flower does not self-pollinate. On both plants, the narrow succulent leaves crowd the bottom of the stem. The species name, teretifolius, comes from the shape of the leaves, circular in cross-section.

Other summer wildflowers found on granitic outcrops include sundrops (*Oenothera fruticosa*), pineweed (*Hypericum gentianoides*), large-flowered coreopsis (*Coreopsis grandiflora*) and prickly pear cactus (*Opuntia humifusa*). These are found in deeper soil than elf-orpine or sandwort. Mixed in with these wildflowers are warm season grasses: broomsedge (*Andropogon virginicus*), split-beard bluestem (*Andropogon ternarius*) and little bluestem (*Schizachyrium scoparium* var. *scoparium*).

Autumn colour is provided by the Confederate daisy (*Helianthus porteri*), also known as Stone Mountain daisy. It forms great drifts of gold on the granitic outcrops of Georgia and Alabama from September into October. Up to three feet (one metre) tall, with narrow leaves and many-branched stems, it bears numerous flower heads. The ray flowers are golden, while the conical disc bears tiny yellow flowers with brown anthers. This large plant's abundant flowering is amazing considering that it is an annual that does not germinate until spring and produces most of its growth during the hot dry days of summer. It seeds prolifically during normal years and, if the rains fail and few seeds are produced one year, some viable seed from previous years may remain in the soils and grow the next year. Slender false foxglove (*Agalinis tenuifolia*) blooms on the edges of the grassy areas.

The fascinating Piedmont granitic outcrops are bursting with flowers in spring and fall but in late autumn, the grasses dominate with their magnificent reddish browns. We once took an expert on grasses to a nearby outcrop to get her help in identifying the grasses. She exclaimed, "Why, this is a grassland!" Yes, it is, but we might add that it's so much more. As one person recently said after visiting the local outcrop, "I could hardly go to sleep that night after the visit thinking of the beauty of that environment." She saw it in winter!

Photograph by Carol and Hugh Nourse

*Confederate daisy (*Helianthus porteri*) in September at Rock and Shoals Outcrop Natural Area.*

Hugh and Carol Nourse are botanical photographers. They are the authors and photographers for three books: Wildflowers of Georgia, The State Botanical Garden of Georgia*, and* Favorite Wildflower Walks in Georgia*, all published by UGA Press.*

LICHENS

by Joan Crowe

According to the taxonomic pundits, lichens do not count as plants any more! The Five Kingdom classification allows for Plants, Animals, Fungi, Protista (including all unicellular organisms, seaweeds and green algae) and, lastly, Bacteria and Cyanobacteria (formerly Blue-Green Algae) in the Prokaryotae. Thus, the lichens are out on two counts, as the main part of the organism is fungal with unicellular green algae or cyanobacteria embedded in the thallus. Therefore, they are a combination of two organisms no longer classified as plants. Yet they stay in one place and reproduce like plants. The ordinary person confronted with a lichen and asked, "Plant or animal?" would undoubtedly say plant. Lichens are associated with many plants and are, therefore, of interest to botanists.

They are a remarkable symbiosis. As with twins, two plus two makes more than four! The structure of the fungus is modified by the presence of the algae, making it much tougher than a normal fungus and much more resistant to desiccation. The algae gain shelter and moisture and can go about their business of forming carbohydrates and producing oxygen for the benefit of the fungus, which is not photosynthetic. The complicated biochemistry of lichens produces an interesting range of colours from off-white through yellow-green to green or blue-green. They may also be yellow, orange, brown or black, but never the true chlorophyll green associated with photosynthetic plants. The colours and the almost rubbery texture of the moist thallus helps distinguish lichens from both green plants and fungi.

Lichens are probably the living organism most resistant to desiccation and they have a great capacity to rehydrate rapidly when moisture becomes available. They can grow on rocks where you could fry eggs in the summer. The one thing they cannot tolerate is air pollution, for the simple reason that they absorb moisture over their whole surface and take in any dissolved substances with it.

A very interesting study was done in England during the 1970's. School children collected lichens and carefully recorded their exact location. They were identified by experts and mapped. City centres showed up as lichen deserts. On the periphery a few hardy lichens appeared. Further into the countryside the number and variety increased; in remnant forests and pristine mountains they multiplied. Interestingly, by the end of the twentieth century lichens were beginning to reappear on roofs and sidewalks in suburban London – a tribute to the Clean Air Act of the 1960's which banned the burning of unmodified coal and allowed only smokeless fuels.

PHOTOGRAPH © CAROL L. EDWARDS

Hypogymnia physodes*, distinguished by its pale-grey narrowly branched thallus, dark underneath*

There is a sad story about lichens from Marathon, Ontario. Some years ago, new gold mines opened in the area bringing in an influx of people. On one new development, the contractors had left some trees with a good growth of lichens. The mining families moved in, looked at the trees, said "These trees are diseased!" and cut them all down. The trees were telling them that for the first time in their lives the people were living in a relatively pollution-free area. I grew up on the edge of London, England. I learned about lichens in high school but I never saw any until I went to a Girl Guide camp by the sea in Dorset where the air was moist and clean, just as it is in much of northern Ontario.

Lichens are notoriously slow growing. Interesting records of this have been derived by measuring the diameter of lichen patches on dated tombstones. Lichens will certainly appear in time on the large rocks that are popular as garden ornaments today. However, on the limestone rocks at least, they will most likely be preceded by black cyanobacteria – one of the oldest forms of life on earth. This may not be exactly what the gardener had in mind! Very often, the bright orange *Xanthoria* species, which make an attractive capping, will be invading lichens on rocks. Do not try planting them – they will come when they are ready.

Lichens are arbitrarily grouped into crustose, foliose and fruticose. Crustose lichens are embedded in the substrate surface and cannot be detached. Almost any rock surface will eventually be covered in crustose lichens, most often of a greyish or whitish colour with black spots that produce the fungal spores. An easily identified one is *Rhizocarpon geographicum* which is yellow and

decorated with black lines and patches making it look like a map – hence the name yellow map lichen.

Crustose lichens also occur on living trees. My favourite, and very easy to recognize, is *Graphis scripta* which looks like a child's black scribbles on greyish-white paper. Often seen well up the moist side of maple trees is the lemon-yellow *Chrysothrix candelaris* or gold dust lichen.

Foliose lichens are two-dimensional with leaf-like thalli. They have lobes which may be very narrow or quite broad. They can be detached from the substrate and are often a contrasting colour underneath, an easy way of separating them from thallose liverworts. They come in all colours but a very common one is *Parmelia sulcata* with narrow lobes, black below and a bluish-grey upper surface covered in white cracks. It occurs on rocks. A much larger yellowish-green one with broad lobes, found on trees in moist forest, is *Flavoparmelia caperata*. This can form loosely attached circular patches easily 10 centimetres (4 inches) in diameter.

On the ground, usually among mosses, will be similarly large patches of the mostly blackish-brown *Peltigera* species. The commonest one is *Peltigera canina*, dog lichen, supposedly so-called because it smells like a wet dog!

In more pristine areas, *Peltigera aphthosa* may be spotted growing on mossy rock shelves. It is bright grassy-green when wet, with black warts and white edges, but underneath it is black to dark brown. Also in this category are the jelly lichens which, as their name implies, have a jelly-like texture when wet and are somewhat translucent. Another odd little group is the rock tripes. These grow on rocks and are anchored at the centre of the thallus which gives them the Latin name *Umbilicaria*. They are considered to be survival food when lost in the bush, but you had best boil them first and throw away the liquid! Lichens contain an exotic array of chemicals which are unlikely to agree with your stomach. Caribou are better equipped to deal with them.

Photograph © Carol L. Edwards

Reindeer lichen

This brings us to the third group, the fruticose lichens. The best-known is reindeer or caribou lichen, *Cladina rangiferina*, the winter food of these two related mammal species who scrape off the shallow snow of the tundra and consume them. The fruticose lichens are three-dimensional, rising above the surface and sometimes, like reindeer lichen, forming little bushes. A popular one with miniature railway enthusiasts is *Cladina mitis* which they use to represent trees in their layouts. Also in this group are species with erect podetia such as the pixie cups (*Cladonia pyxidata*) or the red-capped British soldiers (*Cladonia cristatella*). Usnea lichens, known as old man's beard, which hang from tree branches, are also fruticose.

Lichens can dry out completely and become brittle, shattering when walked upon. These pieces are able to regenerate though, an advantage in caribou territory. The lichens will recover when the herd moves on but this will take time so the carrying capacity will be low. Crustose and foliose lichens may suffer permanent damage where there is excessive trampling or mountain bike or snowmobile usage. Foliose lichens often gouge out the rock surface as they grow.

Lichens, like bryophytes, serve a useful purpose in protecting surfaces from erosion. They reduce run-off by rapidly absorbing moisture from rain or snow then gradually releasing it back into the atmosphere. There is often a succession, with lichens moving in first and modifying the habitat so that mosses can take over. Subsequently, it is not uncommon to find flowering plants emerging from the bed of moss, or even tree seedlings. Activities which interrupt

this process degrade the environment and reduce biodiversity.

The definitive work on lichens is *Lichens of North America* by Irwin Brodo and Sylvia and Stephen Sharnoff published by the Yale University Press. It is expensive and very heavy but has wonderful colour illustrations. Much cheaper, and a good book for beginners, is *How to Know the Lichens* by Mason Hale, in the Pictured Key Nature Series published by Wm. C. Brown, Iowa. In some ways lichens are easier to identify than mosses and, with the illustrations in Brodo's book, it is possible to get a long way without using the chemical tests which are often necessary for accurate identification.

Joan Crowe received her Bachelor of Science at Lakehead University in Thunder Bay, Ontario and her Masters of Science from the University of Manitoba. She taught for a few years at Lakehead where she compiled a checklist of lichens recorded in Thunder Bay District. There were 439 species.

Resilient Ranching with Tallgrass Prairie Plants

by Bryan Gilvesy

Our journey into the world of native plants began on a literal journey. In 2002, my wife Cathy and I, cattle ranchers in Tillsonburg, Ontario, were in Glen Rose, Texas to judge the International Championship for Texas Longhorn Cattle. On our return trip, we were invited to stop by the Bruch Cattle Company in the Flint Hills of Kansas, home to the world's largest continuous expanse of tallgrass prairie. This visit left us both inspired and curious.

Photographs by Paula Gilvesy

Together with our children, Paula and Joe, we had been breeding these marvellous cattle since 1993 on the Norfolk Sand Plain and looking for a way to break free from a crop that had been grown on our land since the 1930's, tobacco. The longhorns have proven to be our salvation as we now raise them for emerging grass-fed beef markets and sell them under our Y U Ranch brand.

While our Kansas experience left us inspired about the possibilities of raising cattle on grass alone (without grain finishing as is common in the industry), it was the nature of those grasses that piqued our curiosity. Since these plants were native, did that mean they delivered nutrients from the soil to cattle better than the commercial grasses we were using?

Upon returning home and starting to investigate, we were astounded to learn that the Norfolk Sand Plain was originally occupied by almost 100,000 hectares (250,000 acres) of tallgrass prairie. Happily, we also discovered that Norfolk County was home to Mary Gartshore, a woman renowned for her technical expertise on native plants, but to me, a heroic figure for her dogged determination to identify, save and (eventually) propagate all manner of plant species native to our region, particularly the diverse tallgrass prairie plants that once anchored the soil here.

Mary introduced us to an important concept that drives our operation to this day: the pre-settlement prairie grasses received everything they needed to survive from the sky (water, carbon, sunlight) to complement the nutrients they garnered from the soil,

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and the diverse and interrelated nature of the many species that comprised the tallgrass prairie brought it strength and resilience. This was music to the ears of recovering monoculture crop-addicted farmers accustomed to purchasing all crop inputs. We had found a resilient, drought-tolerant, diverse, native crop that our cattle could forage that would provide the basis for entry into the growing market for grass-fed beef.

Photograph by Paula Gilvesy

Bumble bees on compass plant at Y U Ranch

We had many questions. Would the fluffy nature of the seeds clog our existing equipment when we tried to plant large acreages? (Yes, they needed a specialized seeder.) When should we plant warm-season species? Which species would be palatable to our cattle?

Mary was a wonderful resource, our own internet research taught us a lot and then we had our second happy discovery at Christmas 2005, when we met Dave Reid, the stewardship coordinator for Norfolk County. He introduced us to a fledgling ecological goods and services program called Alternative Land Use Services (ALUS). Originally a project spearheaded by the Norfolk Federation of Agriculture, the fledgling program was geared to doing tallgrass restoration in the area and could offer start-up monies and ecological services payments to engage farmers as environmental solution providers. ALUS obtained seed from Mary Gartshore and borrowed a Truax seeder and, by May of 2006, we were in the field planting a small three-hectare (eight-acre) field to prairie.

Species selection was nerve-wracking. We didn't know if the cattle would even eat the prairie plants. From the potential list of 52 flowering species, we eliminated some immediately, like butterfly milkweed (*Asclepias tuberosa*), as potentially toxic to cattle. We started cautiously with two forbs, showy tick trefoil (*Desmodium canadense*) and round-headed bush clover (*Lespedeza capitata*). You'll notice both species include words familiar to farmers, clover and trefoil! The grasses were easier. We wanted them tall, so big bluestem (*Andropogon gerardii*), Indian grass (*Sorghastrum nutans*) and switchgrass (*Panicum virgatum*) were natural choices.

We planted on May 20 of that year (late for our part of the world). The field received a solid inch of rain followed by unusually high temperatures and a remarkable catch of grass was the result. We were warned not to have high expectations the first year but our first attempt was a resounding success!

Dave Reid taught us that tallgrass prairie has many environmental benefits and we were eager to learn more and begin experimenting. It was the first time it had occurred to us that we could farm successfully *and* provide environmental benefits to society. Restoration of these grasses was apparently important to grassland birds and we tested that premise by setting up a series of eastern bluebird boxes around the prairie. We had almost instant success. The bluebirds, along with tree swallows, provided fly control services for the cattle. Eventually, some species at risk came to make their nests and burrows in our prairie grass, including bobolinks and badgers. None of them hindered normal farm operations and we were quite happy to contribute to their recovery.

We began to understand these grasses better and, with Dave's help, participated in a research study to quantify the carbon sequestered by the massive root system of the prairie complex. The study proved that native grasses sink carbon at the same rate as a temperate forest (even with above-ground biomass removal), but it was the realization of what this meant in practical terms that astounded the farmers in us. The enormous root system was regenerating over 30% of its volume annually meaning that this complex was increasing soil organic matter, making more productive, healthier soil capable of retaining more water. What's more, those deep roots could reach water the cool season grasses on the farm could only dream of with their shallow roots. Combine these benefits with the fact that the tallgrass loved hot summers and a remarkable "new" way to raise cattle was born.

Some of our acreage is now planted

to cool season grasses and 36 hectares (almost 90 acres) are seeded to tallgrass prairie. We have the best of both worlds. The cool season grasses serve us well when it is cold and wet providing grazing for our cattle as early as April and often late into the fall. While our cattle are busy grazing the cool season grasses, the tallgrass serves nature as it matures, providing homes for grassland birds and badgers, sequestering carbon, filtering water and building soil quality. When the drought and heat arrives here in Southern Ontario, typically at the beginning of August, we simply open a gate and let the cattle into the prairie. The biomass of the living ecosystem provides food for the cattle that eventually provide us with nourishing, delicious, grass-fed beef.

For our part as farmers trying to make a living from the land, this system was the equivalent of nirvana. The cattle willingly consume these grasses during a time when the cool season grass species fall dormant to defend themselves against the heat. This means that we don't have to start our equipment and provide supplemental feed. We have also built in a level of resilience our farm did not have before; we are just as productive in a dry hot year as we are in a cool dry year. We no longer buy chemical fertilizers. Just as Mary Gartshore said, farming with native polycultures allowed us to get our farm resources from the sky.

Our understanding continues to grow. In 2009, Dave Reid pointed out that prairies provide floral resources and nesting sites for native pollinators. We returned to our original list of prairie flowers and decided on a blend of nine species edible for the cattle, including the tick trefoil and bush clover mentioned earlier, black-eyed Susan (*Rudbeckia hirta*), purple coneflower (*Echinacea purpurea*), cup plant (*Silphium perfoliatum*), compass plant (*Silphium laciniatum*), tall coreopsis (*Coreopsis tripteris*), lance-leaved coreopsis (*Coreopsis lanceolata*) and tall sunflower (*Helianthus giganteus*). These species would provide nectar and pollen resources to feed many of the bees, butterflies and other pollinators native to our region. The unbroken bare soil between the grasses would provide perfect nesting sites for them.

We were proud to have a team from the University of Guelph, headed by Dr. Thomas Woodcock, research associate at the Canadian Pollination Initiative, confirm that our efforts were responsible for raising the quantity of pollinators on our lands. Even better, these efforts have been noticed by other farmers in our area, some of whom are using prairie restoration sites planted on portions of their own lands to keep native pollinators on their farms. This saves them having to buy honeybee services for their pollination-dependent crops.

A casual visit to a ranch in Kansas led us to a place we could never have predicted. We now farm within nature and harvest benefits for our farming system from the natural world. We are contributing on many levels, pioneering healthy food systems, creating habitat for pollinators, songbirds and other species and rejuvenating the soil. The prairie grasses showed us what's possible for the future of our planet.

Bryan Gilvesy is the Eastern Canada lead of ALUS and co-chair of the Sustain Ontario Steering Committee (Alliance for Healthy Food and Farming). He leads conversations on sustainability and building sustainable value. Bryan holds a degree from the Richard Ivey School of Business at the University of Western Ontario. He received the Premier's Award for Agri-Food Innovation Excellence (Ontario) in 2007 and 2013, among many other awards.

Milkweed Pod Fluffing Party

by Carol Pasternak

My motto is, "It's gotta be fun." I apply this principle to my day job in personal fitness training and my advocacy work for the monarch butterfly. People know they should exercise and they should protect the environment, but to get them to do either you have to make it fun.

That's why I ran my first milkweed pod fluffing party on October 27 last year. It was held in a large milkweed patch, under the hydro wires in the Don Valley ravine near my Toronto home. The objective was two-fold: raise awareness of the plight of the monarch and encourage participants to provide monarch habitat.

Photograph by Cathie Ring

The population of monarch butterflies decreased by an alarming 80% in 2013. The main cause last year was severe weather but contributing factors include the loss of the mountainous forest habitat in Mexico (where the butterflies winter) and summer breeding habitat in the United States due to development, and pesticide use (especially neonicotinoids).

Most urbanites can do little to prevent these sources of mortality but one thing we can all do is help increase monarch habitat and feeding grounds. Milkweeds (*Asclepias* spp.) are crucial to monarch survival. They are the only larval host plant genus (of which there are 76 species in North America) for the monarch. The butterflies lay their eggs on milkweed leaves. When the eggs develop into caterpillars, they start to feed on the milkweed leaves. No other plant food will sustain them and enable them to mature into monarch butterflies.

I prepared for my party weeks in advance by collecting mature but not split common milkweed pods (*Asclepias syriaca*) from various locations. (I forgot to air dry one of the bags and all the pods became mouldy.) I wanted to make sure all participants would have a couple of pods to take home, without exhausting the supply at the party site. A few days before the party, I collected a bag of exploding pods.

I put signs in and near the ravine to direct invited guests and passersby to the meeting place. I dressed in theme and I invited the guests to do likewise. The Butterfly Whisperer arrived from Barrie, clad in gorgeous monarch wings, headdress and monarch mask. Many wore black, white and orange. Three came sporting green hats. I wore my monarch wings and rain boots together with my Monarch Teacher Network t-shirt and black pants.

Just before we got started, early arriving guests spotted two deer at the top of the hill close to where we were. I took this to be a sign that the event would be a great success. When everyone had arrived, I opened my jacket to expose the caterpillar question mark on my shirt and turned on my megaphone. I welcomed the group and set about answering the "whys." Why was this event important? Why didn't we see any monarchs this summer? I warned everyone about the danger of getting even a trace of milkweed sap in their eyes (will sting for weeks and can cause permanent damage – must go to emergency immediately), offered gloves to those who didn't have their own and sent them to collect a few closed but mature milkweed pods. Then I used my clippers to cut milkweed stalks that had bursting pods on them and handed each person a stalk. I invited them to take a big handful of the burst pods.

At the count of three, we all waved our stalks and threw our handfuls into the wind. It was magical! We laughed and squealed with delight. We then split up into groups to spread seeds in nearby areas of the ravine that had been disturbed by the construction of a pipeline. We met again to celebrate our achievements and to get final instructions. I asked participants to spread more seeds on their way back to their car and take home a few pods to plant in their gardens, in vacant lots, by roadsides, on paths or wherever they thought the plants would grow and flourish. Everyone left with a smile on their face, many telling me that they'd learned a lot and had a lot of fun!

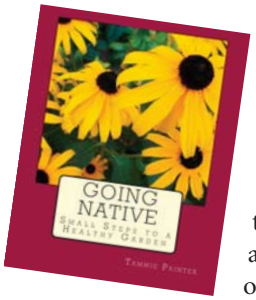
Cathie Ring, a Grade 4 teacher, took the photos and collected lots of her own milkweed pods to bring back to her class of 25 students. She organized

a day-long field trip so that all three Grade 4 classes in the school could learn about and enjoy butterflies. They visited the Ontario Science Centre to watch Flight of the Butterflies, an award-winning film about monarchs, and then came to the milkweed patch for another fluffing event to participate in the conservation of monarchs they had just learned about in the movie.

For more details and to see a short video and photo album of the event, please check my Facebook page from October 27 and 28, 2013, www.facebook.com/monarchcrusader.

Carol Pasternak is known as The Monarch Crusader. Her book, How to Raise Monarch Butterflies: A Step-by-Step Guide for Kids*, which was reviewed in the fall 2013 issue of* The Blazing Star*, is widely available. You can reach Carol at monarchcrusader@gmail.com.*

New & Noted



Going Native: Small Steps to a Healthy Garden
By Tammie Painter
A Sassy Garden Girl Publication, 2013
ISBN 978-1492114635
104 pages
In paperback, $16.99 U.S., available on Amazon
In e-book format, $4.99 U.S., available on Amazon, Barnes & Noble, iTunes, Smashwords and Kobo

The great thing about *Going Native* is its no-nonsense, engaging style. It spurs readers to become actively involved with their gardens. "Stop reading this book," writes Tammie Painter. "No really. Put it down for a minute and go take a look at your garden. While you're out there make a mental note of some of the plants you see." Then she says, "If you're like most gardeners, you probably came up with a list of several plants that aren't native to your state or province, your region or even your continent."

Tammie's tribute to native plants begins with the simple premise that although some nursery-grown aliens are well-behaved and easy to care for, far too many non-natives either require ridiculous expenditures of effort and money (read: chemicals and water) to grow or they take off running as soon as you pop them into the ground, rapidly overtaking other plants.

Although modest in size, the book is ambitious in scope, covering both the United States and Canada. It starts by breaking up the two countries into botanical regions based on information supplied by the U.S. Department of Agriculture. It defines such tricky terms as "native," "indigenous," "naturalized" and "endemic," and gives us a framework within which to view our own small parcel of land. It avoids long lists of plants for every corner of the continent but offers snapshots of the different regions, their climate and soil conditions, and suggests a few plants that might work well there. To the reader's delight, it's peppered with glorious photos of forbs, trees, shrubs, grasses and ferns, each accompanied by its common and scientific name and codes for each region that it inhabits.

Tammie does the groundwork: where to plant (in the chapter entitled Soil Matters), how to plant ("If you're spraying something on your yard that was once included in a chemical warfare arsenal, maybe you want to rethink your approach to gardening. Are you waging war or trying to grow plants?"), when to plant and why ("Every little thing you can do in your own yard to provide homes, resting places and food gives animals – endangered or not – a chance to survive in our world.").

Instead of fussing about our gardens, let's spend some quality time with them. The best way to do it: go native.

Review by Irene Fedun
Irene is the editor of The Blazing Star.

Continued from page 1 – **Eastern Flowering Dogwood**

green true flowers surrounded by four large white, or more rarely pink, petal-like bracts; the total inflorescence or bloom measures 7 to 10 centimetres (three to four inches) across. Flower buds are set the prior year, so even in the depth of winter it is relatively simple to gauge how impressive the spring flowering will be. Small clusters of two to 10 bright red fruit (each 10 to 15 milimetres or half an inch in length) mature by early fall and are especially conspicuous in October.

PHOTOGRAPH BY GREGOR G. BECK

Eastern Flowering Dogwood

Cornus florida is a member of the dogwood family (Cornaceae) which includes familiar eastern North American dogwoods such as roundleaf dogwood (*Cornus rugosa*), featured in the winter 2010 issue of *The Blazing Star*, red-osier dogwood (*Cornus sericea*), gray dogwood (*Cornus racemosa*) and alternate-leaved or pagoda dogwood (*Cornus alternifolia*). The fruit of dogwood species is important for wildlife. Many birds, including American robin, northern cardinal, ruffed grouse and wild turkey are known to feed on dogwood fruit and, for many species, it provides essential nourishment for the demands of migration. Twigs are frequently browsed by deer, rabbits and rodents.

Considered sensitive to disturbance, pollution, insects and disease at the best of times, the eastern flowering dogwood is now suffering major population declines in many parts of its range from the introduction of the dogwood anthracnose fungus (*Discula destructiva*). The impact of this fungus can be dramatic, especially for trees growing in deep shade, with annual population declines in the Carolinian Region of Southwestern Ontario estimated at seven to eight percent annually (Ontario Ministry of Natural Resources, 2010. Eastern Flowering Dogwood Recovery Strategy.) The species is listed as Endangered in the province. The decline of this showy white spring bloom in the eastern forests is obvious even to casual observers. Fortunately, trees in more open areas and along woodland edges fare better.

Cornus florida remains a highly desirable tree for the home garden, especially given its small size and adaptability to full sun or moderate shade. Flower buds are slightly less cold tolerant than the woody tissue so after severe winters flowering can be diminished even though the tree leafs out fully in spring. Siting the tree where it gets more sun and better air circulation greatly diminishes the risk of anthracnose. This dogwood is hardy in USDA zones 5b-9 provided soil conditions are suitable.

With ongoing research into management options to help native dogwood populations, the spring ritual of dogwood festivals should continue for generations to come.

Spooky Hollow Nature Sanctuary Case Study

The dramatic decline of eastern flowering dogwood from anthracnose fungus has triggered strong interest from governmental agencies, horticulturists and conservation groups seeking to help recover the species. One such group is the Hamilton Naturalists' Club, a charitable non-governmental organization working in Southern Ontario's Carolinian Region. Beyond its nature and educational activities, the club owns five private reserves, including the 66-hectare (165-acre)

Spooky Hollow Nature Sanctuary in Norfolk County – home to a relatively large population of *Cornus florida*.

The property comprises a diversity of habitats, including mixed older-growth forest, a cold-water stream and upland habitats. Much of it was reforested decades ago with conifers. For many years, club volunteers have been creating openings within the pine (*Pinus* spp.) plantations, with a goal of restoring more site-appropriate oak-pine savanna habitat.

Eastern flowering dogwood was well established historically throughout the property's mature forests. The anthracnose toll has been mounting though, with the tell-tale signs of leaf die-back, epicormic branching, general decline and eventual death. Happily, recent monitoring efforts have discovered a large, younger population amid the pine plantations and forest gaps of the sanctuary's sandier north tract. Project ecologists are actively monitoring the health and reproductive status of over 1,400 flowering dogwoods there.

The reserve provides an excellent opportunity to evaluate the benefit of management techniques that may help recover the species. While monitoring and management efforts are still in the early years, it is clear that the dogwoods are faring far better in the sandy forest gaps created by club volunteers within the maturing pine plantations. The thinning of pines increases biological diversity, allows more light to reach the dogwoods and improves air circulation, key factors to help reduce the impact of anthracnose.

With the discovery of this larger-than-expected population, the club has stepped up its efforts, including expanding the savanna habitat, which should benefit multiple species at risk. The club is tackling invasive exotic species, notably autumn olive (*Elaeagnus umbellata*), common buckthorn (*Rhamnus cathartica*) and multi-flora rose (*Rosa multiflora*), to reduce competition with native species. In addition, a prescribed burn was conducted in parts of the sanctuary in late March 2012 to see if this technique is beneficial to flowering dogwood, as suggested by recovery experts. The goal was to reduce competition and decrease the anthracnose fungus in the duff layer. While some negative short-term impacts were noted (e.g. direct tissue damage), the results were largely positive and, despite subsequent drought conditions in 2012, the population is responding well with continued healthy growth, flowering and fruiting.

It is too early to say with certainty which management techniques are most successful, but the continued monitoring, volunteer efforts and recovery work will doubtless benefit *Cornus florida* and other native species.

PHOTOGRAPH BY GREGOR G. BECK

Starting the prescribed burn at Spooky Hollow

PHOTOGRAPH BY GREGOR G. BECK

The advancing burn line at Spooky Hollow

Gregor G. Beck is director of conservation science with Long Point Basin Land Trust and a consultant in environmental communications, conservation and wildlife research. Kevin Kavanagh is owner of South Coast Gardens and a consultant to conservation groups. Beck and Kavanagh are project ecologists for the Hamilton Naturalists' Club.

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