

The Blazing Star



NEWSLETTER OF THE NORTH AMERICAN NATIVE PLANT SOCIETY

Native Plant to Know

Virginia Spring Beauty

Claytonia virginica

by *Stephen Johnson*

Ralph Waldo Emerson said that the “Earth laughs in flowers” and few plants symbolize the glorious flush of spring or the way the Earth might smile in springtime quite as well as Virginia spring beauty (*Claytonia virginica*). It isn’t the earliest to flower or the most flaunting. It is often, however, the most abundant and gleaming of the spring ephemerals.

Spring beauty was once a diminutive member of the Portulacaceae, now the Montiaceae, having 25 congeners in North America, sharing the east with only two others. Morphologically simple, it has a small cluster of basal leaves and a paired set of succulent, grass-like stem leaves. Its flowers are nearly symmetric stars, with petals ranging in colour from pearl white to pale rose pink. It is often striped with darker pink starkly contrasting with the bright petals; this creates a pattern suggesting a discoid candy cane. This floral characteristic is found in other *Claytonia* species. The west coast species *C. sibirica* is even known as candy flower.

The genus is named for one of the first botanists in the Virginia colony, Dr. John Clayton. Virginia spring beauty was but one of Clayton’s many contributions to the modern Linnaean classification system. Clayton also

essentially authored the first Virginia flora, *Flora Virginica*, in 1742. Two hundred and fifty years later, the second *Flora of Virginia* was published and features John Clayton’s spring beauty on its dust jacket.

Despite the plant’s simple morphology, several visible and chemical variations occur, enough to make *Claytonia virginica* a model organism for scientific studies. One study showed that throughout eastern North America there are four distinct flavonoid races. Flavonoids are phytochemicals responsible for aromas and flavours as, for example, in tomato fruits. Race I is mid-Atlantic ranging west to Kentucky. Race II is southern ranging to Louisiana. Race III is northern ranging from Virginia to Iowa and north to Quebec and Ontario.



ILLUSTRATION BY STEPHEN JOHNSON

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The *Blazing Star* is . . .

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NANPS BRANCHES OUT INTO SOCIAL MEDIA

Social media has become increasingly important to non-profit groups for building awareness about environmental and social issues. The North American Native Plant Society is well aware that, to stay current on native plant issues today, you must be connected to the world of social media. Currently, the organization has a presence on Facebook and Twitter, and has recently opened a LinkedIn group. The Wikipedia page about our organization and its activities was viewed 486 times in the first 30 days after it was created.

Facebook

The NANPS Facebook page serves to promote the organization and provide details about NANPS events. Members are welcome to post articles on native plant issues. We also promote events that are not organized by NANPS but touch on related environmental topics. People are allowed to comment and suggest things on Facebook posts; more often than not you get different viewpoints on a topic. Currently, 269 people "Like" our Facebook page and each day we get a few more.

Twitter

The Twitter group is slightly different from the Facebook page in that we have to get the message out to our members in 140 characters or less. Twitter allows NANPS to inform members about upcoming events and conferences in short updates and to provide links to the relevant websites. People choose to be a part of this group by selecting to "Follow" us. When they follow us on Twitter they subscribe to each new update or tweet. We post links to websites that have articles on native plants or to other native plant societies in North America. We can also re-tweet messages to our NANPS group from like-minded organizations such as the New York Flora Association. The hope is that we can create a network where NANPS can exchange information and ideas with other North American native plant societies or associations. Currently, we have 149 tweets, we are following 339, and we have 195 followers; no doubt this will continue to grow.

LinkedIn

Launched in 2012, the NANPS LinkedIn group is geared towards professionals and people involved in the native plant industry across North America. The LinkedIn group allows professionals to stay connected to our organization and native plant issues. Events and conferences such as the 2013 Pollinator Conservation Conference are posted on this group. Anyone who has a LinkedIn account can join the group and comment on any discussion. There is even a section to post job offers or requests related to native plants, horticulture and restoration. The LinkedIn group is a work in progress (currently there are 24 members) and, like the other social media networks, it continues to grow.

NANPS' ultimate goal is to use various social media to spread the word about native plant and ecosystem study, conservation, cultivation and restoration across North America. Please support us by "Liking" us on Facebook and "Following" us on Twitter. We hope with these tools to help foster change among young people and for future generations. It will be a long process but it is well worth the journey to prevent future ecological mistakes.

Links to Social Media

Facebook: <https://www.facebook.com/nativeplant>

Twitter: <https://twitter.com/tnanps>

LinkedIn: <http://www.linkedin.com/groups?gid=4743266&trk=group-name>

Wikipedia: http://en.wikipedia.org/wiki/North_American_Native_Plant_Society

Adam Mohamed
NANPS Director

NANPS 2013 EVENTS

MAY 6th Pollinator Gardens Galore!

7pm – 9pm

Garden Hall, Toronto Botanical Garden, 777 Lawrence Avenue East, Toronto. Discover the how, why and where of creating pollinator gardens.

- Cathy Kozma, Toronto Master Gardener and bee-keeper
- Paul LaPorte, President of the North American Native Plant Society
- Deb Woods, Outreach Coordinator, Scarborough Garden and Horticultural Society (SGHS)

Note: The first 20 participants to register will receive a gift of 18 native wildflowers. If you have vegetable seedlings to spare, please bring them. They will be donated to the YouthLink garden in Scarborough which will be planted this spring in partnership with SGHS and the Toronto and Region Conservation Authority.

This event is free, but please register at www.trcastewardshipevents.ca. For more info, contact Randi Shulman at 416-661-6600 x 5765.

JUNE 8th Markham Civic Centre Wildflower Community Planting

10am – noon

Markham Civic Centre, south side of building, south side of pond.

Take part in a planting of native wildflowers such as butterfly milkweed (*Asclepias tuberosa*) and purple coneflower (*Echinacea pallida*) to create a beautiful pollinator and butterfly garden! Experts from NANPS will be there to answer your native plant gardening questions. Other participants include staff from City of Markham Operations (Parks), Toronto and Region Conservation Authority, Evergreen and Rouge Park. For more info, contact Karen Boniface, City of Markham, 905-477-7000 ext. 2700.

SEPTEMBER 21st Fall Excursion to Shining Tree Woods

A bus tour to this unique Carolinian ecosystem featuring tulip trees (*Liriodendron tulipifera*), pawpaws (*Asimina triloba*) and other unusual species. Contact excursions@nanps.org.

Check the NANPS website frequently for more updates: www.nanps.org



PHOTOGRAPH BY EILEEN ATKINSON

NANPS President Paul LaPorte (on the left) brings in the crowds at Vaughan's Seedy Saturday.

MAY 11th NANPS Annual Native Plant Sale

10am – 3pm

Markham Civic Centre, 101 Town Centre Boulevard, N/W corner of Hwy 7 & Warden Avenue, Markham.

Don't forget to check out the woodland display garden, inspirational slide show and information booths in the Canada Room.

To volunteer contact volunteer@nanps.org. Other inquiries contact plantsale@nanps.org.

JUNE 1st Native Pollinators and Native Plants

2pm – 4pm

Sheridan Nurseries, 4077 Highway 7, Markham

NANPS President Paul LaPorte will present his native plant/pollinator talk at Markham-Unionville's Green Party Riding Association AGM. The afternoon will begin with a native plant seedling sale. Attendees are invited to bring native plants to exchange.



PHOTOGRAPH BY EILEEN ATKINSON

NANPS seed cleaning and packing party! From left to right are board members Joanne Fallowfield, Miriam Henriques, Heidi Eisenhauer and Janice Keil.

NANPS AWARD NOMINATIONS

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.

The Lazy Thrill of My Shade Garden

by Paul Sakren

For years I have wanted to tell others about my shade garden in New Preston, Connecticut which is planted with native perennials (and a few spectacular non-natives), including many spring ephemerals. For 20 years, this garden has taken care of itself, changing a little every year but always maintaining its character and balance with the least amount of work.

The backbone of my shade garden has become a mass of giant leopard's bane (*Doronicum pardalianches*), a non-native but one of my favourites. It glows with bunches of golden "daisies" three feet tall (one metre) for weeks on end and spreads by rhizomes at a quick but manageable rate. It is one of many groundcovers, including *Podophyllum peltatum* (the umbrella-leaved mayapple), the statuesque *Cimicifuga racemosa* (black cohosh), non-indigenous lungwort cultivars (*Pulmonaria* spp.), the pretty blue-flowered *Phlox divaricata* (wild sweet William),

Asarum canadense (wild ginger whose ant-pollinated burgundy flowers trail on the ground), *Trillium erectum* (known by many names including wake-robin or red or purple trillium), *Hydrophyllum virginianum* (the easy spreader, Virginia waterleaf), *Tiarella cordifolia* (foamflower with flowers just as pretty as the name would imply), *Polemonium*

reptans (abscess root – much more attractive than it sounds) and late-summer-flowering *Solidago flexicaulis* (zigzag goldenrod).

Planted within this tapestry of spreaders are small groups of lemon-scented *Collinsonia canadensis* (stoneroot), *Hydrastis canadensis* (goldenseal of the deeply lobed leaves and solitary flower), *Sanguinaria canadensis* (short-blooming but lovely bloodroot with its fantastic leaves), *Polygonatum canaliculatum* (giant Solomon's seal), *Caulophyllum thalictroides* (squaw root or blue cohosh, obviously used for women's health), *Mertensia virginica* (the hugely popular Virginia bluebells), *Dodecatheon meadia* (shooting star, a delightful pink spring bloomer), *Ageratina altissima* (the poisonous white snakeroot), *Aruncus dioicus* (frothy goatsbeard) and *Aralia racemosa* (American spikenard). Ferns add a grace of their own to the garden including *Polystichum acrostichoides* (Christmas fern which persists

through the winter – only snow hides it from view), *Adiantum pedatum* (maidenhair fern of the feathery leaves) and royal fern (*Osmunda regalis*). A few small specimen trees add structure to the garden: the native burning bush (*Euonymus atropurpureus*), prickly ash (*Zanthoxylum americanum*), cramp bark or cranberry viburnum (*Viburnum trilobum*) and a Japanese maple (*Acer palmatum*) which I couldn't resist.

A wonderful variety of volunteers spring up among these groundcovers: biennials and perennials, and even shrubs and trees. I do have to weed out or transplant some of them, such as wild cherry (*Prunus* spp.), ash (*Fraxinus* spp.) and the black walnuts (*Juglans nigra*) which the squirrels plant everywhere. *Phlox paniculata* (garden or perennial phlox), *Scutellaria ovata versicolor* (woodland skullcap), columbines (*Aquilegia* spp., much beloved of hummingbirds), *Echinacea purpurea* (purple



Trillium erectum, Virginia bluebells, mayapples and other glorious natives in Paul Sakren's shade garden

PHOTOGRAPH BY PAUL SAKREN

coneflower), *Stylophorum diphyllum* (yellow-flowered celandine poppy) and *Thalictrum pubescens* (the aptly named tall meadow rue) need management once in a while.

Noteworthy points about this garden:

1. Most of these plants are growing under sugar maples (*Acer saccharum*) where it is considered difficult to grow things because of the dense summer shade and extensive spreading root system that tends to rob vital moisture and nutrients from the soil. But my plants seem comfortable with this arrangement, partly because so many of them are tough and resilient. No doubt it helps that I give them topdressings of a balanced organic fertilizer in spring and leave most of the leaf litter from the maples on them over winter. The mulch conserves moisture, stabilizes soil temperatures and protects them from our strong, cold north winds. I don't cut back any of the tops and dried stems until spring, which helps to keep the leaf litter from blowing away.

2. Few weeds invade this garden except at the margins where there is more light. I mainly have to weed out the plants themselves when they set seedlings or spread where I don't want them. But for the most part I let them spread into each other as long as they get along. This makes a wonderful woven tapestry punctuated with patches and clumps of an enormous variety throughout the season.

3. The mat of vigorous groundcover plants is so strong that it has managed to hold in check an invading army of *Aegopodium podagraria* (bishopsweed) which has weaseled its way in from the nearby roadside entirely covered by it.

4. I have a nine-month succession of blooming beauties, from the first, admittedly non-native *Adonis amurensis* in February to the last of the *Phlox paniculata* in early



PHOTOGRAPH BY PAUL SAKREN

Solomon's seal stands tall in the foreground near woodland skullcap while black cohosh, Virginia waterleaf, abscess root, wild ginger and others romp in the background.

November.

5. I don't water except in summers of extreme drought. I have discovered that even marginal shady wetland plants like royal fern can survive and prosper from year to year on this site without supplemental watering if they have enough shade protecting them in summer.

6. Many of the plants in this shade garden have a history with me. I can remember when I first discovered local species of giant Solomon's seal, wild ginger and stoneroot growing by the

roadside, or bloodroot and trillium growing by the brook where I grew up in the northwest hills of Connecticut. The celandine poppy was a gift from a former president of the Rock Garden Society. For me it has become a garden of history and old friends who perennially thank me for rescuing them and giving them a happy home. Some of the original stands are now gone from the roadsides along with many wonderful denizens of hedgerows, thanks to the barbaric practices of town roadside maintenance crews.

7. Although I have lost thousands of plants over 20 odd years (especially those that were planted in the sun and quickly became overrun by invasive weeds), this shady oasis has persisted in spite of everything—the droughts, the maples, the severest winters and hottest summers. No animals have eaten a leaf that I've noticed except for the voracious slug devils on the Solomon's seal and stoneroot. No pests have ravaged the garden except for the spider mites on the *Phlox paniculata* in extremely dry summers. No diseases have plagued my garden.

8. *Echinacea purpurea* persists longer at the edges of this shade garden – where it gets enough light, but not much sun – than it does in the open, where it gets strangled out by goldenrods, aggressive grasses and others. It also blooms much longer (although a bit paler in colour) in this situation. My observations of other gardens tell me *E. purpurea* is most successful on garden edges and in meadows where it has an even moisture regime (neither wet nor dry extremes). The slight shade on its roots at these edges provides the optimum conditions.

People talk about low maintenance. You can't get any lower than this. And it was not planned, it just happened, little by little. The work was done by the plants themselves, and they have spent their lives teaching me....whenever they can get me to pay attention. I thought I was pleasing myself by gathering together a



PHOTOGRAPH BY PAUL SAKREN

A happy clump of bloodroots (Sanguinaria canadensis)

wonderful assortment of species. But I was really pleasing them by allowing them to score a symphony that elaborates on its theme layer upon layer. It now pleases me in a way I could never have imagined. This is what I would call good garden design!

Paul Sakren became infatuated with the wild plants that grew in the gardens, meadows, wetland and woodlands of his parents' historic former tobacco farm in Northwest Connecticut when he was still a teenager. His

landscape design business, Native Sun Natural Landscapes, focusses on the use of native plant species. With his wife, he designs, installs and maintains landscape gardens, and propagates an endless variety of plants, mostly native and medicinal species, to use in his design work and sell locally.



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Bats Without Passports: Managing Cactus in the Sonoran Desert

by *Evan Cantor*

Over 850 species of bats inhabit planet Earth in almost every habitat imaginable save the most extreme. Most of these species are insect-eating creatures (insectivorous); we have all heard about their prodigious feasting on mosquitoes. About 150 species of bats, however, are nectar-feeding animals, meaning that they feed on the nectar and pollen of blossoming plants.

Most of these creatures are found in the Old World tropics, but Central America hosts quite a few, both nectar-feeding (nectivorous) and fruit-eating bats (frugivorous). Over 500 different plants in the New World Tropics are pollinated and seed-dispersed by 50 different varieties of energetic bats. But only three or four make it to North America “proper”.

This is because very few bats undertake the continental migrations familiar to so many birds. In the north, beyond the range of the Sonoran Desert, the bat species are all insect eaters and they survive winter by hibernating in, hopefully, warm, moist hideaways. South of the Sonoran zone, in the Yucatan and Central America, most bats don't come north. But a few species make the trip from as far as Jalisco in southwestern Mexico to Arizona, New Mexico, Texas and back each year.

Two of these visitors are a pair of *Leptonycteris* species. The Lesser Long-Nosed Bat, sometimes called a Lepto, (*L. yerbabuena*) is an Endangered North American cousin to a South American species (*L. curasoae*) and is often seen in Arizona. The Mexican Long-Nosed Bat (*L. nivalis*), on the other hand, is usually noted along the Rio Grande in Texas. Another traveler is the Mexican Long-Tongued Bat (*Choeronycteris mexicana*), sometimes called a Choero, who appears to favour agaves over cacti. In an odd case of adaptation, an insectivorous species, the Pallid Bat (*Antrozous pallidus*), has in recent years joined

the party after discovering the joy of cactus nectar. The Pallid is common in the high plains and mountains from southern British Columbia to central Mexico.

The Leptos, Long Noses and Choeros follow migration corridors along the Pacific coast and inland from as far as southwestern Mexico all the way to the southwestern United States. The greatest concentration of these creatures, as well as their nectar sources, is in the central highlands of Mexico. All three of these species are small, little more than three inches (76 millimetres) in length and weigh no more than four-fifths of an ounce (226 grams). It is mostly females that do the hard work of migration. They congregate in great maternity roosts at the northern edge of their ranges to birth and raise their pups.

Migration corridors follow the nectar sources, columnar cacti and agave species. Agave is often confused with cactus and while it does sometimes have sharp, spiny points, it is a succulent belonging to the lily family. Of most concern commercially is the blue agave (*Agave tequilana*), from which mescal and tequila are made. The blue agave reaches the edge of its northern range just over the border into the United States. To make tequila, the plants are cloned



A Mexican Long-Tongued Bat roosts with agave pollen on its face

PHOTOGRAPH © MERLIN D. TUTTLE, BAT CONSERVATION INTERNATIONAL, www.batcon.org

vegetatively and harvested before blossoming to maximize the sugar content in the plant fibres. In this way, the fermented beverage business steals nectar from bats, threatening them with loss of their primary, perhaps only, source of nectar in those migration corridors.

Indeed, the Lepto is an Endangered species and is ostensibly protected in both the United States and Mexico. Because a number of different species often share caves, Leptos have suffered from misguided efforts to eradicate vampire bats. They are also threatened by construction along the Mexico-U.S. border and generalized habitat loss. Ironically, narco-trafficking activity may be helping these very private creatures by keeping people out of large rural areas of Mexico.

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The nectar sources most often admired by human visitors to the Sonoran Desert are the huge, picturesque cacti found from Jalisco to Arizona. In Arizona, they hang on at the edge of their northern range. The saguaro (*Carnegiea gigantea*), the cardon (*Pachycereus pringlei*) and the organ pipe (*Stenocereus thurberi*) have all co-evolved with nectar-feeding bats. All three cacti feature hardy, pale white, bowl-shaped flowers that open at night, producing copious amounts of nectar and protein-rich pollen.

large numbers of indigenous, non-migrating nectar feeders. In their northern ranges, they produce more flowers in an effort to attract pollinators. Many adjust their flowering schedule accordingly, earlier in the south and later in the north, and at different times than neighbouring species. They have evolved alongside one another, competing for the attention of pollinators at the northern edge of their habitat. While they may be pollinated nearly exclusively by nectar-

a taste for nectar has certain advantages for the cactus.

Co-evolved with their nectar sources, nectivorous bats all have long, cylindrical snouts, designed especially for poking into the firm, deep blossoms of columnar cacti. Unlike their insect-feeding cousins, nectar feeders have small ears, long noses and big eyes. They seek nourishment both by sight and smell and have little to no echo-location capacity.

The Pallid Bat, on the other hand, is typically insectivorous, with small eyes and huge ears for echo-location. The Pallid Bat can locate a scorpion scuttling on the ground, swoop down and pick it up for dinner. Because the Pallid is a larger bat (about five inches or 12 centimetres) and has a more rounded, furry face, it must bury its head deeper into a cactus blossom to drink nectar. In the process, it spends more time burrowing into the flower, picking up that much more pollen on its fur before visiting another flower. Researchers at University of California Santa Cruz documented that the Pallid Bat delivers up to 13 times more pollen than the co-evolved nectar feeder, Lepto, the Lesser Long-Nosed Bat. This is great for the cardon, but maybe not so great for the Endangered Lepto.

What is so desirable about this nectar that would interest the Pallid Bat, or any bat for that matter, to this extent? Nectar is sweet, a great source of natural sugars (mainly fructose). Tequila producers go to great lengths to increase the sugar content of their blue agaves, the same plant that produces the commercial sweetener, agave nectar. While nobody is yet producing saguaro or cardon-nectar sugar substitutes, these cacti produce gobs of nectar specifically to attract bats. While agave is clearly a source of sweet nectar, columnar cacti attract



PHOTOGRAPH © MERLIN D. TUTTLE, BAT CONSERVATION INTERNATIONAL, www.batcon.org

A Lesser Long-Nosed Bat pollinates a saguaro cactus

Almost 70 species of columnar cacti inhabit Mexico. The richest diversity, nearly 45 species, is found in the central part of the country, where as many as 12 different species co-exist in the same cactus forest. This includes a range of individual cacti in the style of saguaro, several times the height of a person, to multiple clusters like the organ pipe all the way through to gigantic branched cactus trees.

Columnar cacti are nothing if not industrious evolvers. In the southern end of their ranges, columnar cacti produce fewer flowers because of the

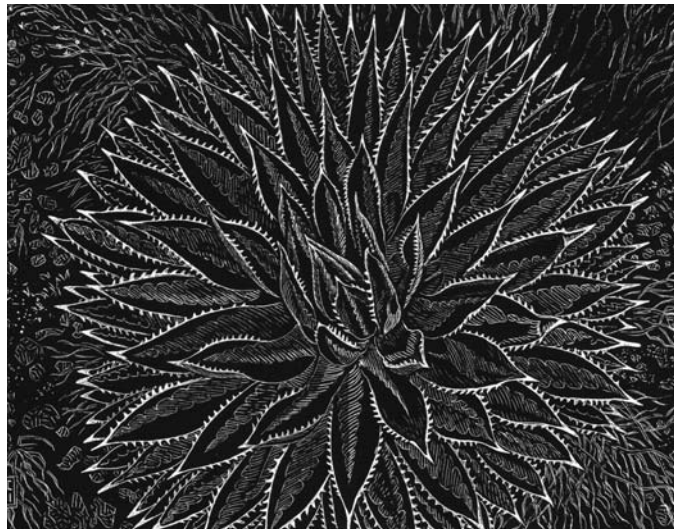
feeding bats who live year-round in the territory farther south, they must also attract birds and insects in their northern range where bats are only migratory visitors.

It is thought that a quirk of evolution developed the Pallid Bat's taste for nectar. Pallid Bats have been photographed catching moths at the mouths of cardon blossoms. This aggressive hunting style would have accidentally exposed the bats to the taste of sweet nectar in the blossoms. Although the Pallid Bat remains primarily an insect feeder, developing

bats with pungent, fetid-smelling blossoms. But fructose is powerful fuel, even if it comes from a flower that smells peculiar to *Homo sapiens*. These blossoms apparently smell just fine to the bats.

Although they have co-evolved with the nectar sources, it is not always easy for nectar-feeders to obtain a meal. When dining, nectivorous bats hover like hummingbirds before a blossom and this behaviour makes them burn sugar faster than any other known living mammals. In addition to this, female nectar-feeders migrate thousands of kilometres and that takes a lot of energy.

The vast majority of *Leptos* and *Choeros* form enormous colonies, usually in caves or mines. Private and secretive creatures, they are particularly intolerant of intrusion and vulnerable to humans who seek them for observation or persecution. Habitat loss looms as an ever larger threat to their survival. As more open land becomes developed along their migration corridors, there is less nectar to fuel their travels. Their



Agave

secretive nature means that key colony roosts, critical to a secure future, have not yet been located.

The good news is that Mexico is encouraging people to plant agaves along roadsides to provide nectar sources for migrating bats. The governments of both Mexico and the United States have recognized that nectar-feeding bats are a keystone species in the desert ecology. Once upon a time, the desert was viewed as

a wasteland, but that perspective has changed. The Sonoran Desert is perhaps the single most biodiverse dryland ecosystem on the planet and migrating bats have helped develop this array of succulent plant life.

Of course, nectar-feeding bats don't

recognize the international boundary between Mexico and the United States. Only the people of both nations can make it safe for bats to travel without passports.

Evan Cantor is a musician, artist and Batman fan living in Boulder, Colorado. He loves sipping a fine añejo in front of a blazing fireplace with lime in hand. He hopes that nectar-feeding bats get their share of the goods.

ILLUSTRATION BY EVAN CANTOR

Greening Your Grounds Workshop Series in Markham

Location: Markham Museum, 9350 Markham Rd. Markham, Ontario

To register: call City of Markham contact centre at 905-477-5530.

CREATING BEAUTIFUL GARDENS WITH NATIVE PLANTS

Saturday, May 4 – 10am – noon

You will leave this workshop with inspiration and know-how to create your natural garden oasis.

CREATING RAIN GARDENS AND DRY RIVERBEDS

Saturday, May 25 – 10am – noon

Learn how to add interest and functionality to your garden with these features.

RAIN BARRELS

Saturday, June 15 – 10am – noon

Rain barrels offer an inexpensive source of water for gardens. Learn to install, decorate and use them.

Note: Supervised activities for children ages 3 and up available at the workshops.

NYC Encourages Native Biodiversity

In February, New York City Council passed a law to increase native biodiversity in public landscapes. The law mandates that the city's parks department adopt a policy favouring plants native to New York. Botanical gardens and institutions that grow plants for educational or scientific use are exempt.

Another "green" measure signed into law requires that city plantings be stormwater-tolerant so as to facilitate stormwater retention and filtration. The plantings will help decrease flooding and the pollution caused by the overflow of sewage during storms which then ends up in New York Harbour.

The Council noted that "...it is in the best interests of the City, its water bodies, fisheries, wetlands, forests, and parklands to limit the use of non-native species and require greater biodiversity in our public spaces." U.S. ecologists estimate that invasive species overtake 3,000,000 acres (1,214,000 hectares) per year in that country at a cost of \$123 billion annually.

Erythronium revolutum and Heritage Breed Livestock Conservation: Two sides of the same coin?

by Zoe Dalton

For everything, there is a season.

Last time I wrote an article for *The Blazing Star*, I was a director on the NANPS board, pregnant with my second child, finishing up my PhD and participating in a wonderful collaborative relationship with Walpole Island First Nation. Researching how First Nations and non-Aboriginal people in southern Ontario could best work together towards the protection of species at risk was a manifestation of my love of – and concern for – native plants and ecology; it was my hope for a future of positive human-landscape interactions in my home region and beyond.

My personal environment at that time was urban. The view from my bedroom window was of laneways, progressively taller buildings as my eye travelled south and, in the distance, the CN Tower. But always near to my heart – and near to me even geographically in the impervious concrete jungle in which I lived – were native plants. They remain a testament to the miracle of life.

Now that life's season has changed, I look from my home in rural British Columbia at a significantly different view: acres of land with no houses, towering trees, glimpses of the ocean glimmering in the sun's rays and native plants everywhere the eye chooses to look. My aural landscape is different too: whizzing cars and whirring sirens have been replaced by the sounds (too often nocturnal) of my third child, now a nine-month old chubby babe, or my toddler waking in the night. Punctuating this nocturnal soundscape are the crows of roosters in the nearby coop. Roosters? Yes, indeed: Hamilcar, my husband and occasional *Blazing Star* artist, and I are now bona fide farmers, recognized by the local tax authority and recognizable by our gumboot/farm jacket fashion statements.

But perhaps life hasn't taken as much of a 180 degree turn as it might

seem. Our farm focus is heritage livestock breeds: their preservation, cultivation and reintroduction into production. We are part of a movement aiming to maintain genetic diversity in our agricultural systems, far from standard practice in today's monoculture-dominated food production systems. As all of us native plant lovers know, genetic diversity is fundamental to the maintenance of life. Animals (livestock and wildlife) interact with and impact ecological systems. And agricultural systems are, beneath it all, a part of their surrounding ecosystem.

So perhaps the season of my life has not changed all that much. We breed, sell the products of and advocate for these heritage breed livestock that range freely on our property. And in the midst of farming, we observe fascinating ecological relationships: the chickens and turkeys spend a great deal of their summer foraging hours eating berries from the invasive non-native blackberry (*Rubus discolor*) while the young fowl dash to take shelter beneath the alien Scotch broom (*Cytisus scoparius*) when aerial predators are spotted overhead.

And what about the native plants? What relationships have we observed



PHOTOGRAPH BY ZOE DALTON

Zoe's son Gilles discovering the joys of the natural world

between our farm critters and the flora in which we are so interested? In fact, my favourite native plant experience on our property has nothing to do with the farm animals or our farming endeavour. It is instead a hidden gem, removed from daily life and from common view. It is spotted only occasionally when, on sojourns through our emerald, moss-carpeted woodlot with my children, I may happen upon a diminutive forest lily, perfect and beautiful. *Erythronium revolutum*, the pink fawn lily, is almost imperceptible, at least in my moist, very low-elevation forest. Tucked away among the litter, thick moss and fallen twigs, it always seems like remarkable good luck when I spot the two or three individuals we have on our property.

The pink fawn lily is an herbaceous perennial. In January, its leaves are

small, delicate and mottled with white. It was the mottled appearance of the twin basal leaves that led the naturalist John Burroughs to name it the fawn lily, its foliage reminiscent of a pair of pricked-up fawn's ears.

Spring sees the pink, nodding inflorescences of *E. revolutum* showing off their bright beauty. But somehow the modest loveliness of just the leaves in the bleak, dull period of mid-winter charms me. Maybe it's the challenge of finding the few individuals here that makes them so alluring. Each time we walk through this area of our property, I wonder: will I be able to spot those elusive lily leaves this time?

E. revolutum is not considered an at-risk species; in fact, although localized in British Columbia, it is abundant in some areas of southern Vancouver Island (a stone's throw from the island on which I live). In sites with the right conditions, this small yet showy native

plant (about 30 centimetres or 10 inches high) can carpet the ground. Picture the woodland garden, or native setting, literally covered with the delicate mottled leaves and bright pink nodding flowers, some bell-shaped, some with tepals pointing back and upwards. A lovely sight indeed.

As I consider my doctoral research with its focus on species at risk and inter-cultural relationships in need of repair or my current endeavour, focussed as it is on livestock breeds in desperate need of conservation... perhaps it is the rarity of the pink fawn lily in my own domain, and the apparent fragility of these tender early leaves, that so endears this particular plant to me. We as native plant enthusiasts each have our own motivations and underlying rationale for why native flora means so much to us. And we all have

our favourites. What is it that attracts and draws us to a species? Perhaps two or three stand out for you as must-haves for your native plant garden. Why those?

Some believe that a person will always choose a dog that matches him or herself in revealing ways. Perhaps there is a theme or thread that runs through the lives of each of us that leads us to favour one native plant over another. I think, in my life, the thread has become obvious: the fragile, the rare, the almost-unrevealed, to these I am called.

And you? I now turn the tables and ask: What are your favourite native plants – and what do they reveal about you?

Zoe Dalton lives on Salt Spring Island with her human, animal and plant families.

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In Remembrance: Michael Hough 1928-2013

I learned with great sadness of the passing of Michael Hough, a great natural heritage pioneer and supporter of native plant landscapes, this winter. Michael was a maverick landscape architect, environmentalist, author, teacher, artist and musician. A professor in the Faculty of Environmental Studies at York University, Michael founded the Department of Landscape Architecture at the University of Toronto. His firm, Hough, Stansbury, Woodland, Naylor, Dance, Leinster (now part of Dillon Consulting Limited), designed Ontario Place, Scarborough College, the University College Quad and Earth Sciences Courtyards at UofT and numerous pioneering applications of ecologically based landscape design.

Winner of the 1991 City of Toronto Arts Award for Architecture and Design and the 2009 Lifetime Achievement Award from the Canadian Society of Landscape Architects, Michael brought natural landscapes into the professional field, sharing his passion for naturalization and mentoring many. Michael changed the thinking of many a government agency, developer and engineer.

I was greatly honoured to know Michael, a kind, thoughtful gentleman. We at NANPS are thankful for his leadership in a world of manicured and mown landscapes.

Karen Boniface, former NANPS Director

The Great Plains: Come for the Long – and Short – View

by Cindy Reed

Come to the Great Plains in early summer for the best view. Surrounded by ankle-high, or even knee-high,

dominating that a common cry of visitors has been: “There’s nothing out there!” Of course, people who enjoy native plants and wildflowers in any bioregion know that you have to slow

the plant. It’s not unusual for people to presume there is no other part. *Townsendia exscapa* is a frequent example of this. Another is the plains phlox (*Phlox andicola*) which, like



PHOTOGRAPH BY CINDY REED

green grasses stretching to a distant horizon that meets the huge, intensely blue sky can make you positively light-headed. This experience can be downright unsettling for people who live in towns or cities or even countryfolk unaccustomed to a 360 degree view. Once you’ve embraced the experience though, the thrill of the long view becomes addictive.

Mesmerized by the great distances spread out before you on the Great Plains, it’s easy to forget to look down at your feet at the immense variety of wildflowers half-hidden there. Even someone like me, who has lived on these rolling hills my entire life, can overlook flowers I know to be blooming there.... until I stop walking and just sit down on the ground.

The grasses and the distances are so

down to see them. Here, you’ll have to stop and look. This article will give you some suggestions on where to go and what you might find there.

I write this article from the headquarters of the Great Plains Native Plant Society (GPNPS) near Hermosa, South Dakota which sits nearly in the middle of the Great Plains, not only in latitude but also in longitude and altitude. Here, bloom-time starts in April, with the very early, flat-on-the-ground *Cymopterus montana*, the low-growing Easter daisy (*Townsendia exscapa*) and the bright white mats of *Phlox hoodii* leading the way.

None of these gems is over an inch or two in height (2½ to five centimetres) and the blossom itself may be larger than the remainder of

many phlox species, often forms wide mats of flowers that almost completely cover the stems and leaves.

Blooming increases throughout



The great expanse of the Great Plains

May, peaks in early June and then continues through summer toward golden September fireworks. By May, the wildflowers taking their turn are taller, 10 inches (25 centimetres) or more as the season goes on. Look for bright blue, bell-flowered *Penstemon angustifolius*, bright magenta locoweed (*Oxytropis lambertii*) and the dangling bells of *Mertensia lanceolata* earlier. *Echinacea angustifolia* (narrow-leaved purple coneflower), knee-high (and taller) *Penstemon grandiflorus* and prince's plume (*Stanleya pinnata*) appear in June and later. (Note that many of the Plains wildflowers have no universally accepted common names. They are often referred to by the common name for another similar species or simply by their Latin genus.) You can find the iconic gumbo-lily, *Oenothera caespitosa*, flowering over a longer period than most, on otherwise barren places. It is beloved not only for its large and fragile flower but also for its affinity for that scourge of the Plains, the miserably heavy clay soil called gumbo. You will recognize many familiar eastern genera here, with their Plains counterparts showing as shorter plants with bluer or grayer leaves with more hairs, all adaptations to drier conditions and leaner soils.



PHOTOGRAPH BY CINDY REED

Townsendia exscapa

Badlands National Park in South Dakota and Theodore Roosevelt National Park in North Dakota both have large areas of wide-open grasslands where these and other Plains wildflowers can be found only a short stroll from your parked car. The Black Hills is an island of mountains within the sea of grass that is the Great Plains and within the Black Hills lies another large area of grasslands. Part of that grassland is the Wind Cave National Park, home to a large herd of bison, many other wildlife species and one of the largest caves in

the world.

You are welcome to visit the GPNPS headquarters near the Black Hills where we are preparing to open the Great Plains Garden, a place where you can see first-hand and close-up the charming plants that grow naturally “out there”. We have nearly 360 acres (145 hectares) more than three-quarters of which have never been disturbed; the only impact has been cattle-grazing by rotation which is the closest thing possible to having great herds of bison galloping across, and feeding off, the grasslands.

Our land is open by appointment for hiking. You can also join one of our field trips which are one-day excursions (often outside our botanic garden site) led by botanists or naturalists familiar with the area. Entrance is free to GPNPS members; we request a donation from non-members. The site is about 20 miles (32 kilometres) south of Rapid City, South Dakota on Highway 79. Visit www.gpnps.org or call 605-745-3397 to arrange your visit.

Cindy Reed is the President of the Great Plains Native Plant Society. She has a Bachelor of Science in plant science from University of Wyoming and a Masters of Science in biology with a focus on the wildflowers of the Great Plains from South Dakota State University.



PHOTOGRAPH BY CINDY REED

Phlox andicola

Ask an Expert

The Blazing Star is experimenting with an "Ask the Expert" section. If you have a native plant question you can't answer through the internet or other sources, please send it to us at info@nanps.org with Ask an Expert in the subject line.

You can also mail your question to NANPS, Ask an Expert, P.O. Box 84, Station D, Etobicoke, ON M9A 4X1. We will try to find an answer for you and share it with our readers.

HERE IS OUR FIRST QUESTION:

I am looking for advice on what native thorny shrubs I could use to block off trails that I want to close from trespassers on my rural property. I do not want to use a fence or any other unnatural constructed barrier. What plants could I use and where would I purchase them? Thank you.

Michael McGuire
Lakefield, Ontario

GREETINGS MICHAEL:

If you are serious about getting a handle on what native shrubs are best for various Ontario landscapes you will have to acquire a copy of *Shrubs of Ontario* by James Soper & Margaret

Heimbürger, 1982, Royal Ontario Museum, 495 pp. (illustrated). This outstanding reference tome can be purchased from the ROM, Amazon.com and AbeBooks.com. The latter two sources offer the title at low prices as copies are second hand.

When you decide which species you need, check the 16 Ontario native plant nurseries listed on our NANPS website at www.nanps.org. Search under Sources/Commercial Growers. Most of them have on-line catalogues. If you don't see what you want, email them with your request.

In selecting your NATIVE shrub barrier, I recommend planting as many different species as are appropriate to the site for several reasons:

- 1) Multiple species will maximize the visual beauty of the site, especially in the winter.
- 2) Multiple species will minimize the spread of plant pathogens.
- 3) Multiple species will maximize animal and soil biota diversity, especially bird and insect populations.

- 4) Multiple species will extend the life span of your botanical barrier.
- 5) Multiple species will maximize the fruit and seed bank for wildlife food source.

Some thorny/bristly shrub species to research for your project are *Ribes cynosbati* (prickly gooseberry), *Ribes hirtellum* (wild gooseberry), *Ribes lacustre* (bristly black currant), *Crataegus* species (hawthorns), *Malus coronaria* (wild crabapple), *Rosa acicularis* (prickly wild rose), *Rosa carolina* (pasture rose), *Rosa setigera* (prairie rose), *Rubus* (brambles) species with prickles and *Zanthoxylum americanum* (prickly ash, otherwise known as toothache tree).

Successful research.

May the forest be with you.

Jim Hodgins

Jim Hodgins is the former editor of *Wildflower* magazine and an instructor in biology at the University of Toronto. He is part of the NANPS Native Plant Advisor Committee.

Calendar of Events

June 20-22, 2013

PLANT ID WORKSHOP AT ROYAL BOTANICAL GARDENS: WETLAND GRAMINOID SPECIES
Hamilton, Ontario
RBG offers botanical identification workshops for conservation and environmental professionals, ecologists, horticulturists, graduate students, amateur botanists and master gardeners. This workshop will deal with grasses, sedges and rushes.
<http://www.rbg.ca/Page.aspx?pid=473#w>

July 11-12, 2013

GRASS IDENTIFICATION WORKSHOP AT ROYAL BOTANICAL GARDENS
Hamilton, Ontario
<http://www.rbg.ca/Page.aspx?pid=473#g>

July 17-20, 2013

CULLOWHEE NATIVE PLANT CONFERENCE
Cullowhee, North Carolina
The 30th annual conference focuses on increasing knowledge about propagating and preserving native southeastern plant species in the landscape. Contact hensley@wcu.edu for more information.

July 25-26, 2013

FERNS AND ALLIES IDENTIFICATION WORKSHOP AT ROYAL BOTANICAL GARDENS
Hamilton, Ontario
<http://www.rbg.ca/Page.aspx?pid=473#f>

July 26-28, 2013

MIDWEST NATIVE PLANT CONFERENCE
Dayton, Ohio
Keynote speaker Douglas Tallamy: Your Role in Building Biological Corridors: Networks for Life
Visit mwnpsconference@midwestnativeplants.org.

August 24-25, 2013

AQUATIC PLANT WORKSHOP
Mohawk, Michigan
Organized by the Gratiot Lake Conservancy – contact gratiotlakeconservancy.org/AquaticPlantWrkshp2012.htm for more info.

See page 3 for NANPS Events.

Continued from page 1 – **Virginia Spring Beauty**

Race IV is narrowly Midwestern ranging from western Kentucky to southeast Iowa. Another study found four distinct flower colour classes

PHOTOGRAPH BY DARCIÉ MCKELVEY



A mining bee (*Andrena* spp.) is one of several pollinators that visits Darcie McKelvey's Carolina spring beauties.

ranging from white to deep rose. It showed that pollinator selection favoured plants with redder flowers but that herbivores, such as slugs, tended to favour plants with redder flowers driving selection pressure toward plants with white flowers, maintaining the range of flower colours described in the first paragraph here.

Taxonomists have also played with a suite of morphological traits. *Claytonia virginica* var. *virginica* with broad stem leaves is typically northern while *C. virginica* var. *acutiflora* with narrow stem leaves is typically southern. Plants with pale yellow flowers belong to *forma flava* while plants with apricot to canary yellow flowers found in atypically moist habitats are variety *hammondiae*. The flowers of all forms and varieties are also dynamic being initially staminate for just one day. For a few days afterward the flowers are pistillate. This mechanism evolved to encourage cross pollination.

Over the course of two to three weeks Virginia spring beauty completes its floral trajectory. Its racemes unfurl, revealing a succession of up to 15 flowers pollinated by a plethora of native bees from the

mellifluously named *Ceratina* to *Andrena erigeniae*, a probable Virginia spring beauty specialist. By the time the tree canopy closes, spring beauty is difficult to find: its leaves have yellowed and it's now sprouting numerous cryptic capsular fruits. Seeds are typical of temperate forest herbs – shiny black orbs with attached fat bodies (eliasomes). Eliasomes are dinner bells for ants which avidly gather seeds, detach the delectable eliasomes and consign the seed to the garbage heap, a perfect substrate for growth.

The commonality of Virginia spring beauty makes the plant easy to find by pollinators but also by pathogens such as the fungus *Puccinia mariae-wilsoniae* var. *mariae-wilsoniae*, another specialist of this spring ephemeral which can devastate populations. The fungal infestation is spectacular in that it contorts the stem leaves into vertical orientations where numerous tan cups characteristic of *Puccinia* are easily observed. We hypothesize that this orientation presents the spore-generating cups to stronger wind currents and thus aids spore dispersal.

Puccinia mariae-wilsoniae is autoecious meaning it needs no other host. A dormant spore insidiously passes winter, germinating in spring to infect a new *Claytonia virginica* plant.

The densities of Virginia spring beauty also lead to copious herbivory. Mammals ranging from chipmunks and field mice to black bears excavate and eat the corms. In southern forests the diet of feral hogs may consist of

58% Virginia spring beauty corms.

There are few reports of Native Americans using Virginia spring beauty as food; only the Algonquin of Quebec are said to have boiled the corms rather like potatoes. In the 1940's, Harvard botanist Merritt Lyndon Fernald referred to the corms as "fairy spuds" and suggested harvesting from areas where the plants were abundant. Samuel Thayer, in *Forager's Harvest*, discusses harvesting methods and points out that the best time to find corms is when the plants are in flower. However, that is when the corms contain the lowest starch content. Before or after flowering, when the corms are hidden, is when spring beauties have the highest caloric content. Thayer notes that the leaves are welcome additions to a salad.

If you try to grow Virginia spring beauty at home you just might have some success. While it favours calcareous soils, it can tolerate a soil range from basic to neutral to even very low acidity as long as the



Carolina spring beauty (*Claytonia caroliniana*)

structure is loam. *Claytonia* is not fond of clay. So go ahead and plant them, just don't be surprised if a chipmunk decides that your spring beauty is its sprightly meal.

Stephen Johnson is fascinated by the stories of the early Virginia plant explorers. He studied Ralph Waldo Emerson in graduate school and looks forward to seeing the first spring beauty.

PHOTOGRAPH BY GRANT DOBSON

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Your donations and membership dollars help NANPS to study, conserve, cultivate and restore North America's native flora. Members receive our quarterly newsletter, *The Blazing Star*, and are eligible for NANPS-sponsored excursions and the Seed Exchange. NANPS is a registered charitable organization (no. 130720824 RR0001) founded in 1984. **Donations to the Society are tax-creditable in Canada. Tax receipts will be issued for donations of \$20 or more.**

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