

Continued from page 1

The glory of wild yam is, in fact, the leaves. They are distinctly veined, giving the leaf a quilted or puckered look. The veins commence where leaf petiole meets leaf, and run towards the acuminate tip of the leaf. In fall, the green fades to a clear yellow. Make no mistake, this is a plant grown for its delicate, heart-shaped, shiny foliage.

There is also some hairiness on the underside of the leaves which explains the Latin binomial, *villosa* (villous means hairy in English). The *Dioscorea* part of its botanical name comes from Dioscorides Pedanius (c.40-90 AD), a Greek physician who was born in Anazarbus (today's Turkey). He wrote a text on botany and pharmacology (free from superstition, rare in its day), *De Materia Medica* ("On Medical Matters"), and served in Nero's armies as botanist.

The leaves of wild yam are wonderful, but the flowers are nothing to write home to mother about. They are pendulous, and consist of small, greenish-yellow flowers along a central stalk. The pollinated flowers form a three-parted seed capsule. (If you hold a seed capsule, and look at it straight on from top or bottom, it is exactly the same as the Mercedes-Benz logo. Mercedes-Benz cars are in good company indeed!) The seeds fall when the parchment-like outer covering is worn away in late autumn or over winter.

*Dioscorea* species are widely used in modern medicine to manufacture progesterone and other steroid drugs. This plant affords one of the best and fastest cures for bilious colic (hence the other common name, colic-root) and is especially helpful in treating the nausea of pregnant women. It is also taken internally in the treatment of arthritis, irritable bowel syndrome, gastritis, gall bladder complaints and other ailments.

The root is harvested in the autumn and dried for later use, although it should not be stored for longer than one year, since it is likely to lose its medicinal virtues. Caution is advised in the use of this plant. When taken fresh it can cause vomiting and other side effects. Note that edible species of *Dioscorea* have opposite leaves whilst poisonous species have alternate leaves.

But are the common edible tuber from New Guinea and eastern North America's wild yam the only yams in the world? Far from it. A Chinese yam, *Dioscorea batatas*, is a more vigorous plant, with larger, shinier green leaves than our native. It is hardy in many locales in North America, which is both blessing and curse as introduced plants can escape and

trample the native varieties. *D. elephantipes*, a.k.a. Hottentot's bread, is a South African plant and an unusual succulent. Its main feature is a large, corky caudex\* that grows up to one metre (three feet) in the wild, resembling an elephant's foot (hence the popular name). In Central America, several species of yam are found, including a relatively new one discovered in Costa Rica, *Dioscorea natalia*, which loves the wet regions of both the Pacific and Caribbean coasts of that country. And new species of wild yams are being discovered (to science) fairly regularly.

I have yet to introduce a friend or fellow naturalist to *Dioscorea villosa* and have a negative, or even neutral, reaction. People are delighted with this simple, yet elegant, vine.

*Tom Atkinson is a native plant propagator living in Toronto. His primary interests are in rare woody and herbaceous plants, indigenous, of course, and those which are found in southern Ontario down through the eastern mountains of the USA.*

#### Additional reading for the Web-literate:

- New Guinea: [http://www.hridir.org/countries/papua\\_new\\_guinea/](http://www.hridir.org/countries/papua_new_guinea/)
- *Dioscorea alata*: [http://www.efloras.org/florataxon.aspx?flora\\_id=2&taxon\\_id=110295](http://www.efloras.org/florataxon.aspx?flora_id=2&taxon_id=110295)
- *Dioscorea natalia*: (<http://www.mobot.org/mobot/research/dioscorea/welcome.shtml>)
- North American yams: [http://www.efloras.org/florataxon.aspx?flora\\_id=1&taxon\\_id=110295](http://www.efloras.org/florataxon.aspx?flora_id=1&taxon_id=110295)
- Medicinals: <http://www.rain-tree.com/dioscorea.htm>

## Growing Wild Yam from Seed

I first encountered wild yam on a walk around what became the North American Native Plant Society nature reserve, the Shining Tree Woods, in autumn 12 years ago. Next spring that vine had many seeds, and I received permission to take a few. (Please note: Ethically, one should always seek permission to collect seed. And no more than 10% of any crop should be taken. We need to let nature work her wonders.)

The seed of wild yam will germinate readily. When you start your plants, you will find that within a few years they will spread by both a more robust root system (which is like five-millimetre or two-tenths of an inch-thick pasta, interconnected versus discrete, and a dark reddish colour) and new shoots from these roots, or by seeds being dispersed by wind and creatures.

- collect seed from the vines in late fall or anytime in winter
- separate the seed from the seed capsules
- in a plot in the garden, clear away any plants there now, and loosen the soil:
  - the plot will need a few hours of sun during the spring season
- mark the garden plot!
- scatter the seed on the bare ground, cover with a sprinkling of garden soil and some leaf litter:
  - to be safe, plant the seed in rows
  - when you see identical plantlets growing in a row, you will know it is seed that you planted
- water
- if you have squirrels or other seed mavers, cover the garden plot with chicken wire, and secure it at the perimeter
- wait!

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\* *caudex* – thickened, usually underground, base of the stem of many perennial herbaceous plants from which new leaves and flowering stems arise

# The Blazing Star



NEWSLETTER OF THE NORTH AMERICAN NATIVE PLANT SOCIETY

## Native Plant to Know

### Wild Yam

*Dioscorea villosa*

by Tom Atkinson

Most of us know yams from the produce shelf at the local grocery store, farmers' market or organic growers. They tend to be solid, relatively dense (when raw), orange in both skin and flesh, and the shape of a warped football. When cooked, the flesh becomes tender, soft even, and succulent. These yams, as we all know, are exotic. They come originally from Papua New Guinea. But did you know that there's a yam native to eastern North America? I was amazed to learn of its existence, and to discover that it too is edible.

Wild yam (*Dioscorea villosa*) grows naturally from New England to Minnesota and Ontario, then south to Virginia and Texas. It is found in moist woods, swamps, thickets and hedges. The plant was commonly used throughout its range in North and Central Americas, being favoured by tribes in those regions for pain relief, especially for menstrual cramps. The root also helped to balance hormones (bringing the libido back into balance) and ease the pain of childbirth. The tubers were used for food.

Wild yam is a climbing vine. It climbs by

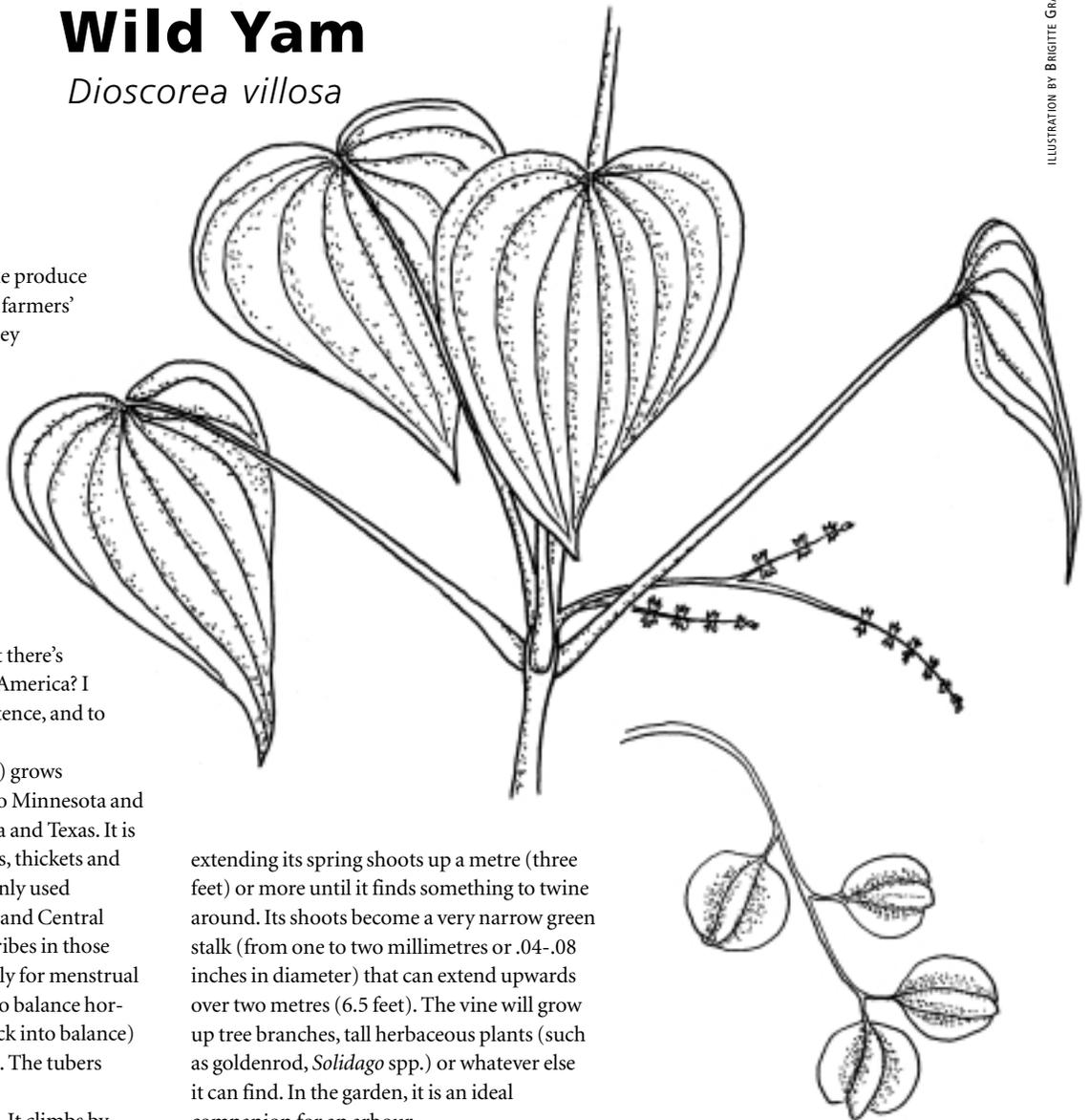


ILLUSTRATION BY BRIGITTE GRANTON

extending its spring shoots up a metre (three feet) or more until it finds something to twine around. Its shoots become a very narrow green stalk (from one to two millimetres or .04-.08 inches in diameter) that can extend upwards over two metres (6.5 feet). The vine will grow up tree branches, tall herbaceous plants (such as goldenrod, *Solidago* spp.) or whatever else it can find. In the garden, it is an ideal companion for an arbour.

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## The *Blazing Star* is . . .

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## From the Editor...

Early in October, the North American Native Plant Society (formerly the Canadian Wildflower Society) celebrated its 20<sup>th</sup> Anniversary. To mark this auspicious occasion Canada's Governor-General, her Excellency, the Right Honourable Adrienne Clarkson, accepted our invitation to be an Honourary Director of the Society. During her residence at Rideau Hall, Ms. Clarkson, a noted plant lover and long-time NANPS member, has encouraged the installation of a native plant garden and promoted native plant conservation in Canada.

NANPS anniversary celebrations, combined with our AGM, were held in Markham, Ontario where the organization was first formed under the visionary leadership of Jim French. Highlighting the day's events was the Founders' Luncheon, where Jim had the opportunity to wax nostalgic about the early days.

Before lunch, Markham City Councillor Erin Shapiro presented cheques from the Markham Environmental Sustainability Fund to several environmentally-enlightened organizations and school groups. One recipient was Markham Gateway Public School. Their fragmented woodlot was dying as a result of high salt concentrations (from the salt used by the school to make the playgrounds safe), trampling and even mowing of the lush undergrowth by area residents. Environmental leaders at the school initiated tree planting and created an outdoor classroom program, raising over \$40,000 in eight years for conservation.

The first afternoon speaker was Larry Lamb, University of Waterloo lecturer and former CWS president, who outlined diverse threats to our native plant populations from urbanization and lawns to genetic disruption. He particularly focused on invasive alien species and North American natives planted in areas where they may not have grown historically. Botanist Charles Kinsley, the owner of Ontario Native Plants, spoke about the virtues of fragmented, uneven borders and multi-layered understories. They are needed to blur the

## A2A

This year's recipient of the Paul McGaw Conservation Award is the Algonquin to Adirondack Conservation Association Initiative. Executive Director Emily Conger accepted the award and made an excellent presentation at the AGM.

A2A, as it's colloquially known, looks at the "big landscape perspective". Recognizing that animals – and with them, plants – are always on the move and need viable corridors as well as intact habitats, A2A works with all segments of society to ensure harmonious decision-

edges between woodlot or meadow and lawn, increasing habitat for all wild creatures.

Several of this year's board members have chosen to step down. Susan Slottow, an enthusiastic gardener, and Ruth Zaugg who was exposed to gardening at an early age, but whose love of native plants grew out of ecological concerns, have joined the board. More board members would be welcome. We also need a bookkeeper familiar with QuickBooks and a website manager. Please contact Darcie McKelvey at mckelvey@pathcom.com or call 416-631-4438 and leave a voicemail if you are interested.

Very much missed will be Deborah Dale, our President for the last three years, and Kathy Edgar who served as Treasurer for the past two. Both women gave countless hours to their respective jobs, and were helpful with everything from the plant sale to event coordination. Kathy was forced to leave due to family commitments but Deb has merely taken a year away from the Board in accordance with Society regulations governing the length of term. She plans to continue as an active volunteer. On behalf of the Board and myself, I thank them for their generous contribution. I would also like to thank Barb O'Malley, who was not only our thorough and business-like Secretary this past year, but nurtured the plants left over from our spring sale, staffed displays and sorted seeds as well. Thanks and best wishes!

In this issue you will find the list from the first of our two Seed Exchanges. The first deadline for seed requests is January 15th, 2005.

Finally, NANPS is raising its membership fees to \$15/year. This is the first increase since our inception but may not be the last. It is prompted by increased operating costs, including the cost of the tree-free paper used for this newsletter. For those of you whose membership expires at the end of the year, a renewal notice is enclosed. Please attend to this promptly to ensure you continue to receive the *Blazing Star*.

Irene Fedun

making that benefits ecosystems and people. Acknowledging the astonishing richness of plant and animal life in the wetlands and forests of the Frontenac Arch which connects the two great parks, A2A has engaged in a number of projects to protect the area. These include connecting habitat as in the Lake to Lake Project and shoreline restoration work.

Congratulations and best wishes for future conservation successes!

*P. orbiculata* (large round-leaved orchid) and *P. hookeri* (Hooker's orchid). It is disturbing that both these rather inconspicuous orchids (considered at risk in Manitoba) are failing to thrive under these new conditions, at least so far. Still, there was good news. We saw an increase in *Cypripediums* like *C. pubescens* (the familiar large yellow lady's slipper). *Platanthera orbiculata* and *P. obtusata* appeared in two of the plots where none had been in 1999.

*Goodyera repens* or lesser rattlesnake orchid, a species not previously seen in the plots, appeared in large numbers in one plot in 2001. A large cedar tree near that plot had been uprooted by the wind and fallen down across the plot that year. The lesser rattlesnake orchid, known for its striking leaves of a green and white checkered pattern, suddenly appeared in two other plots that year. Perhaps this is not too surprising since this is one of the few native species that need only three to four years to go from seed to maturity. (By contrast, lady's slipper orchids take 12-15 years from seed to maturity in the wild.)

Sad to say, *Amerorchis rotundifolia*, initially found in one plot, completely disappeared, possibly as a response to increased light and heat resulting from the selective cutting. Commonly known as small round-leaved orchid, it is a pretty little plant with tiny pink and white flowers covered in pink polka dots. It tends to grow in large patches in cool shady forests. *A. rotundifolia* needs cool roots to survive and some orchid experts believe it may be one of the first to fail as a result of climate change affecting the boreal forest.

We saw regeneration of other plant species in the more open plots. Grass species overgrew in a number of the plots along with bunchberry (*Cornus canadensis*), Indian hemp (*Apocynum cannabinum*), thistles (*Carduus* spp.), raspberry (*Rubus* spp.) and poplars (*Populus* spp.). Balsam poplar (*Populus balsamifera*) seedlings grew very quickly, but twinflower (*Linnaea borealis*) seemed to disappear in some of the plots. In the shady plots, change was much slower since vascular plants (especially invasive species) generally grow faster with more sun. Fallen cedar logs rotted down very quickly, however, no doubt due to the high temperature and humidity. In August, throughout the forest the temperature was often around 32°C (89F) and the relative humidity around 92%.

After five years, we have insufficient data to make firm conclusions. It is difficult to distinguish the effects of selective cutting of mature trees from other factors, such as changes in

precipitation (amount and timing), increased animal predation and climate change. We wondered about the orchid seeds and protocones in the soil and if their presence might explain the sudden emergence of species like *Goodyera repens*. The increased light and thinning of the trees promoted the growth of grass

many wind-blown seeds, but when the large trees were cut out and other conditions became favourable, seeds dispersed by wind were able to come in and start growing.

We decided that our study was perhaps too ambitious (keeping track of 11 species and 100-plus orchids over several hectares) and



The same plot four years later.

PHOTOGRAPH COURTESY RICHARD REEVES

and other opportunistic native species like thistles and poplars, not usually found in a white cedar forest. Many other changes may take place over time.

We determined that it's not possible to use selective cutting to set back plant succession incrementally. It was the hope of foresters and conservationists that selective cutting would be a big improvement on clearcutting and that the forest would regenerate quickly to its original state. Unfortunately, the species mix has changed considerably, at least in this case.

In a coniferous forest the removal of the large trees disturbs the soil and opens up the canopy to increased light, thereby providing an opportunity for fast-growing, invasive species to colonize the site. Primary succession occurs when a site not previously influenced by a particular community is first colonized. However, in this case, we have an example of secondary succession where vegetation was removed but the well-developed soil, seeds and spores remain. The heavy branches of cedar trees in Sandilands Forest held back

that five years is too short a time to understand what is happening in a forest of this type. Long-term monitoring of plant regeneration, perhaps up to 20 years, would lead to a clearer understanding of forest dynamics and would be well worthwhile. The tracking of individual orchids is especially valuable. Certainly rare or beautiful species have been studied long-term, but most of the others have not. This research is necessary so that conservation plans can be made to ensure the survival of native orchids and their habitat. The work is fascinating with often unexpected results. We gained an appreciation for the intricate behaviour of orchids and their relationship with other plant species.

*Doris Ames is the president of Native Orchid Conservation Inc. She encourages native plant societies to undertake similar projects. To see the complete report, collected data and photographs of the orchids in this article visit <http://native-orchid.com/sandilandsreport.htm>.*

Continued from page 9

need to re-moisten.

- If you have sown seed in a flat, wrap it in a large plastic bag to prevent drying and store it in a fruit cellar or an unheated garage until May. It is a good idea to check the moistness occasionally. If the seeds should dry out, re-moisten and try again. You have another chance if dormancy has not yet been broken.
- If space that is reliably cold for six - 12 weeks is not available to you, consider dedicating some shelf space or a crisper bin in your refrigerator; the steady 4-5 C temperature is ideal for cold stratification. Medium to large seeds can be cold-stratified on moist paper toweling in a plastic sandwich bag, using a minimum of space; when it is time to germinate, transfer the seeds to containers of Pro-mix. Zip-loc freezer bags will accommodate a four-pack or two four-inch (10-centimetre) pots; this is a good choice if the seeds are very small.
- If the seeds need light to germinate and must be surface-sown, the zip-loc freezer bag will minimize moisture loss. A good indicator of adequate moisture is the presence of condensation on the inside surface of the plastic bag. Remember that if the surface dries out, so have the seeds. If necessary, moisture can be replenished by gentle misting and/or bottom watering. Once germination is obvious, remove the bag to prevent damping off.
- Finally, the length of cold stratification for optimal germination varies with the species. In seeds with a shallow dormancy, e.g. butterfly weed (*Asclepias tuberosa*), a six-week, cold, moist incubation is adequate. On the other hand, common milkweed has a deeper dormancy and requires a full 12-week stratification to give comparable results. Sometimes a compromise is necessary in order to get an early start on the growing season; the cold stratification period can be shortened if you are willing to accept the likelihood that a smaller percentage of seeds will complete germination.

Barbara Hallett is the past-president of the Waterloo-Wellington Wildflower Society and co-author of a paper on seed dormancy recently published in the journal *Seed Science Research*. This article was originally published in *Dogtooth*, the *WWWS* newsletter.

## Sandilands' Orchids: Effects of Selective Logging

by Doris Ames

Native Orchid Conservation Inc. undertook a five-year project to study the effects of selective cutting of mature trees on native plant regeneration, especially native orchid species. The hope was that this less-intrusive practice might improve orchid growth. The study was carried out in a mature white cedar (*Thuja occidentalis*) forest in the Sandilands Provincial Forest east of Winnipeg, Manitoba. The 14 original native orchid species were declining

No fertilizer, water or other enhancers were added. Once the plots were set up they were not manipulated in any way.

Light-level readings using a luxmeter were taken every two years, at three times during the growing season. Orchid growth was monitored in the plots from June 1999 to August 2003. An annual orchid count was carried out around August 15th, when each orchid in each plot was identified and its stem-height, number and size of leaves, and number of flowers and seed capsules were recorded. Unusual



PHOTOGRAPH COURTESY RICHARD REEVES

One of the Sandilands plots at the beginning of the study.

as the forest matured and canopy closure became more extreme.

In 1997 and 1998, some of the larger trees were removed to let in more light. Plots five metres by five metres (about 16 feet by 16 feet) were laid out reflecting different light treatments or levels of canopy closure: complete shade, heavy shade, moderate shade and light to no shade. Within each larger plot, five sub-plots were randomly selected and marked. In each entire plot every tree was identified and its diameter at breast height recorded, every tree seedling was identified and counted, the percent-cover was estimated for each shrub species and the percent-cover was also recorded for grasses, mosses and debris. Within each subplot every plant was identified by species.

conditions in the plots were noted at this time. As well, each plot and each sub-plot was photographed at this time. In 2003, the canopy closure was re-estimated in each plot using several methods.

Orchid counts fluctuated widely from year to year but the 2003 total turned out to be almost identical to the 1999 total. Heavy rains in June resulted in standing water in the plots that contributed to orchids rotting some years. Increasing predation by white-tailed deer may have caused some of the fluctuation, but we know orchid populations normally fluctuate.

After tree removal there were changes in the kinds of orchids in the plots. We noticed a marked decrease in *Platanthera* species like

# Tribute to *Wildflower*

After an amazing 20 years at the helm of *Wildflower*, James Hodgins chose to suspend publication of "North America's Wild Flora Magazine" last June. Jim and his wife, Art Director Zile Zichmanis, have decided to take a well-deserved retirement from the magazine and pursue other, no doubt, related activities.

Three native plant organizations are currently considering the feasibility of taking on publication of *Wildflower*. We are hopeful that one will have the wherewithal to bring back this important and much-loved magazine.

We salute Jim, Zile and the multitude of writers, photographers, artists and other contributors to the magazine with a few highlights from two decades of *Wildflower*.

"GOING WILD IN SUBURBIA" by Eva Hoepfner, winter 1985: "Chances are that once you start adding wildflowers to your garden, the horticultural species that once dominated your landscape will increasingly end up on the compost heap."

"CHILDREN HUNGER FOR FLOWERS", by Alice Hayek, spring 1988: "Living in condensed apartments and condominiums with

gardens, children are hungry for flowers, for the joy of picking them, not the flamboyant exotics treasured by their parents but the wild flowers which are barred from the sheared lawns and geometrical borders."

"ECOLOGICAL CONCERNS IN NATIVE LANDSCAPING" by John Ambrose, winter 1990: "Forest populations today are much different than during other interglacial periods. Now they are mere islands, disconnected and out of genetic communication with other forests, rather than a continuous system in which adaptations could quickly spread as a result of changing climate. Thus, an important role in restoration plantings is to connect and enlarge these many isolated islands of green: forests as well as meadows, marshes and prairies."

"HEALING THE PRAIRIE", by Adele Kleine, autumn 1998: "When you walk through a prairie, you can pause to admire its open vistas, its gently waving grasses, how the sunlight



gleams on vivid flowers, the whole a pastoral splendor that moves artists and writers to capture its fleeting spirit, but have you ever given any thought to the soil that has produced this lush panorama? There is a busy life underground, consisting of bacteria and fungi that make the soil a living

dynamism, as busy and challenging in its way, and more complex and unknown, as the above-ground landscape."

"THE ECOLOGICAL IMPERATIVE", by Alexander Wilson, spring 2000: "In recent years, ecological science has begun to change the way North Americans think about and work their gardens. Ideas of ecosystem and habitat have become new models for landscape work. There is new interest in native plants and wildflower gardens, in biological pest control and organic foods, as well as in planting for wildlife. These are all symptoms of a new understanding of urban land as animated, dynamic and diverse."

## Lessons from a Prairie

by Peggy Staite-Wong

In the Blazing Star, spring 2002 Peggy shared the experiences of the Barrie Garden Club as they planted a tallgrass prairie in Barrie, Ontario. Two years later she muses on the lessons learned.

The success of our tallgrass prairie pilot project in the Barrie Arboretum encouraged us to expand. What was once a swale of turfgrass is now a riot of native grasses and flowers. Starting with a knee-high haze of prairie smoke (*Geum triflorum*) in spring, our prairie soars upwards throughout the summer, peaking with a wave of yellow Indian grass (*Sorghastrum nutans*), tall sunflowers (*Helianthus giganteus*), cup plants (*Silphium perfoliatum*) and green-headed coneflowers (*Rudbeckia laciniata*). As autumn approaches the golden glow of these petals is perfectly punctuated by the stately purple of New England asters (*Aster novae-angliae*).

In this, its third summer, the TGP (for tallgrass prairie), as it's affectionately known, has become an integral part of the arboretum. We're still learning and experimenting as we balance the wild and the tame in our urban site. Here's what we've learned.

- The TGP attracts birds, butterflies and insects. It hums from early spring to late fall! In winter, the birds systematically strip the seeds from the flowers and grasses. What did they eat before?

- The TGP isn't carefree - yet. To keep ahead of the invaders, we dig out as many weeds as we can in spring and continue weeding once a month. We hope that weeding will soon cease to be a regular activity.

- Different plants mature at different rates. Seems obvious, but we're hoping that our butterfly milkweeds (*Asclepias tuberosa*) are developing deep strong taproots and preparing for future blooms even though at this point they're overwhelmed by the taller and more aggressive goldenrod (*Solidago* spp.).

- Tall sunflowers are definitely tall. In a home garden, tall is in the order of two metres (six feet). We read that tall sunflowers grow to four metres (12 feet) plus, but we never imagined this would happen on our site. It did. Tall sunflowers need lots of space and careful placement.



Cup plant

- The tallest plants should be in the centre. Occasionally, passersby can't resist breaking the stems of tall outside plants - do they want to smell the flowers or see how strong the stems are? A buffer of mid-size plants such as asters and goldenrod may deter the temptation.

- People want to walk through the prairie. Where else can you stand among flowers and grasses that tower over your head? How do you peek into a cup plant without getting close? We have been busy with our pruners (and shovels) formalizing walking paths.

As our TGP matures, we are planning a burn, and would appreciate learning from others who have conducted an urban prairie burn. Please contact us at: arboretum@barriegardenclub.on.ca.

Peggy Staite-Wong is co-ordinator of Barrie's Arboretum, a joint project of Barrie's Garden Club and the City of Barrie, located in Sunnidale Park. Illustrator Gwen Petreman is a retired teacher and an active member of the Arboretum Committee.

# Kentucky's Natural Bridge

by Zeb Weese

Fifty miles (80 kilometres) southeast of Lexington, Kentucky, near the small town of Slade, lies one of the largest forest blocks in the Bluegrass State. Natural Bridge State Resort Park (NBSRP) has over 2,000 acres (800 hectares) of rugged sandstone cliffs and ephemeral creeks adjacent to the 25,000-acre (10,000-hectare) Red River Gorge National Geologic Area and Clifty Wilderness (RRG), part of the Daniel Boone National Forest. From Virginia big-eared bats to green salamanders to spotted mandarins, the Cumberland Plateau region of eastern Kentucky is one of the most ecologically diverse areas in eastern North America, an excellent example of mixed mesophytic forest. After more than a century of extensive logging and development eastern Kentucky's ecosystems have been drastically altered, but this area still boasts species – both animal and plant – that cannot be found anywhere else in the region.

Species diversity here is so great that the Kentucky Native Plant Society's annual conference has been held at Natural Bridge every year for more than a decade, at the peak of the wildflower bloom in early May. Natural Bridge Wildflower Weekend centres on educating the general public about the importance of biodiversity and the sensitivity of some of the habitats that these rare species require. The botanical diversity here is due to the soil chemistry and abrupt elevation changes of the sandstone cliffs in the area, which lie atop limestone outcroppings and shale beds.

At least one plant on the U.S. Federal

Endangered Species list, white-haired golden-rod (*Solidago albopilosa*), is found at Natural Bridge, restricted to the dripline of just a few sandstone rockhouses and ledges. Other rarities on the cliffs include round-leaved fire pink (*Silene rotundifolia*) and cliff meadow-rue (*Thalictrum clavatum*). During the annual conference professional biologists from universities and government agencies lead dozens of field trips over park trails and into the Gorge in search of plants - both rare and common.

There are over 100 spring-blooming plants, including four species of trillium - erect trillium (*Trillium erectum*), large-flowered trillium (*T. grandiflorum*), sessile trillium (*T. sessile*), and red trillium (*T. sulcatum*) and four species of lady's slipper orchids - pink lady's slipper (*Cypripedium acaule*), Kentucky lady's slipper (*C. kentuckiense*), large yellow lady's slipper (*C. calceolus pubescens*), and small yellow lady's-slipper (*C. c. parviflorum*). Some of these can be seen from the park's parking lots while others grow in more secluded places. It's an unfortunate commentary on society that the locations of some species must remain secret lest a few unscrupulous collectors, like the infamous "orchid thieves", discover their whereabouts. However, collectors are not the main threat to plant diversity on our cliffs.

Invasive species are a growing problem, no pun intended. Kudzu (*Pueraria montana*), long associated with erosion control in the Deep South, has been working its way up the Appalachians for decades and has become a real threat to native species on the Cumberland Plateau. Other exotics, particularly Japanese honeysuckle (*Lonicera japonica*),

Japanese stiltgrass (*Microstegium vimineum*), multiflora rose (*Rosa multiflora*), periwinkle (*Vinca minor*), wineberry (*Rubus phoenicolasius*), fuzzy deutzia (*Deutzia scabra*), and Chinese silvergrass (*Miscanthus sinensis*) are also



Rue anemone (*Thalictrum thalictroides*)

PHOTOGRAPH COURTESY ZEB WEESE

crowding out our natives in some areas. Many were planted by the private railroad companies that first operated Natural Bridge as a tourist attraction from the 1890s until the 1920s for "beautification." Others have made their way to the park as seeds on the boots of tourists. Park staff have recently begun concentrating their efforts on removing or reducing the populations of invasive species, a slow and labour-intensive process.

The other major impact is habitat degradation from recreational overuse, popularly known as "loving the parks to death." The rarest species, especially those found on clifflines, suffer because people basically step on them a lot or disturb their habitat, determined to explore every sandstone rock shelter they see. Habitat disturbance has reached epic proportions in both the park and the national forest.

Still, at Natural Bridge there remains much to be positive about for botanists. An additional 150 acres (60 hectares) were recently added to the State Nature Preserve portion of the park. This newest addition brings the total up to nearly 1,100 acres (445 hectares) dedicated specifically to the preservation of rare species and the integrity of the natural communities. This acreage is protected from further facilities expansion, such as parking lots or playgrounds. Protection of our fragile areas, in conjunction with active management and educational programs such as Wildflower Week-



Kentucky's Natural Bridge

PHOTOGRAPH COURTESY ZEB WEESE

# Understanding Seed Dormancy

by **Barbara Hallett**

found on forest floors or rotting logs, and also on hummocks in wetlands.

The pincushion moss, *Leucobryum glaucum*, is another acrocarpous moss that grows on forest floors and is easy to spot. As its Latin name indicates, it is whitish-green and looks exactly like a domed pincushion with the pins sticking out. In contrast, small black cushions of species of *Grimmia* are often seen on exposed rock.

Pleurocarpous mosses are sprawling and form mats rather than turfs. One of the commonest of these is *Brachythecium salebrosum*, often found forming golden-green masses in lawns where, for some reason, the grass is reluctant to grow. One newly created soil bank in my lawn refused to grow grass for some years, so the moss moved in and stabilized it and now moss and grass are fraternizing quite happily.

Also in the pleurocarpous group are the showy feather mosses. In the boreal forest they dominate the forest floor. *Hylocomium splendens* with its layers of sprays is known as stair step moss.

Another very common forest species is *Rhytidiadelphus triquetrus*, known to foresters as electrified cat's tail! Commonest of all, however, is *Pleurozium schreberi*, easily identified by its red stems and golden-green branches. Less common, but very beautiful, with tightly curled leaves and fronds that could almost be mistaken for tiny ferns are *Ptilium crista-castrensis* and *Hypnum curvifolium*. Further south where I live in Grey County, the commonest feather moss is *Thuidium delicatulum*.

The study of mosses is challenging and really requires a microscope. Mosses are generally despised, especially by gardeners, as annoying plants that grow in places where they are not wanted. But in the natural environment mosses are extremely important. They prevent erosion, retain water, oxygenate the atmosphere and modify habitats, creating seedbeds for vascular plants. Start looking at them and you will be surprised at how many different kinds there are. You will develop a whole new perspective on the plant world.

*Joan Crowe is a naturalist with a special interest in mosses and liverworts. She recommends Howard Crum's Mosses of the Great Lakes Forest (published by University of Michigan at Ann Arbor) and Robert Ireland's Mosses of the Maritimes (National Museum of Canada) to anyone embarking on a serious study.*

Growing native plants from seed can be either a fascinating and rewarding experience or a frustrating experience, depending on one's success. Many native plant gardeners began as traditional gardeners and have considerable experience starting from seed. Every year, seed catalogs introduce new varieties of flower and vegetable developed by plant breeders through selection and hybridization. It is of little consequence for a plant in cultivation that seed dormancy has often been lost in the process.

However, the seeds of most plants native to a temperate climate are dormant and this dormancy is necessary for the survival of the species. Consider what would happen if a seed released from a pod of common milkweed (*Asclepias syriaca*) in mid-October settled to the ground and germinated during a warm, sunny week of Indian summer. Chances are the combination of progressively shorter days and colder temperatures that follow would prevent that tiny seedling from developing an adequate root system and sufficient reserves to survive winter and reestablish in the spring. Generally, seeds that germinate at inopportune times don't survive long enough to flower and set seed, but those with an appropriate dormancy have the potential to do so.

With a little thought, one can develop an intuitive approach to dormancy breaking that is effective for seeds of most species. If you can answer the following questions, you are off to a good start. At what time of year do the seeds mature? When are they naturally dispersed? When do they normally germinate? What are the environmental conditions between the time of dispersal and the time of germination? Let's use common milkweed as an example again. Since I know from experience that milkweed seeds collected when they are naturally dispersed in mid-October do not readily germinate, I can deduce that the several months of cold temperatures characteristic of our winter are somehow connected to breaking their dormancy. You have probably recognized this as "cold stratification," but what is not always appreciated is the simultaneous requirement for moisture. The fall rains and the melting snow in late winter and early spring keep the soil damp. Cold stratification, then, is a cold, moist incubation.

And, if these same questions are asked about bloodroot (*Sanguinaria canadensis*), the seeds

of which mature in late spring to early summer, but do not germinate until the following spring, a somewhat different picture emerges. Here, a period of "warm stratification" (a warm, moist incubation) must precede a period of cold stratification. Warning: seeds that require this dormancy-breaking strategy usually have the additional complexity of being intolerant of dry storage and are described as "recalcitrant" or "hydrophilic." Ideally, these seeds should be sown immediately after collecting, but often retain viability for up to a year of storage if kept cool and moist.

These are the basic strategies for dormancy breaking, but it is also useful to know that some seeds have impermeable seed coats, e.g. New Jersey tea (*Ceanothus americanus*), and require "scarification," a brief roughening with fine sandpaper. Others, usually very small seeds, such as cardinal flower or *Lobelia cardinalis*, require exposure to light after they are fully imbibed (hydrated) in order to germinate; these are surface-sown so that the tiny seedlings can reach light before exhausting the reserves stored in their endosperm. Those seeds enclosed within a fleshy fruit, e.g. elderberry (*Sambucus canadensis*), are often dormant due to the presence of chemical inhibitors within the fruit; in order to germinate these seeds, they must be cleaned from the pulp soon after collecting. Lastly, it is not at all uncommon for seeds of some species to require two or sometimes three dormancy-breaking treatments! For example, seeds from white turtlehead (*Chelone glabra*) must be surface-sown to satisfy a light requirement and then cold-stratified; seeds of eastern prickly pear (*Opuntia humifusa*) must first be separated from the gelatinous fruit which contains chemical inhibitors, followed by scarification and cold stratification of the cleaned seed.

Cold stratification is a common dormancy-breaking strategy. Here are a few helpful tips:

- Begin with a sterilized, soil-less mix as your growing medium, e.g. Pro-mix. It is light and fluffy even when moist and thus perfect for seed germination and seedling growth.
- Small batches of Pro-mix can be moistened in a dishpan by gradually adding water while stirring with a fork until the Pro-mix is moist, but not soggy. Care at this step will save time later, as you won't

Continued on page 10

# Mosses

by Joan Crowe

The word moss has been used in the past to denote anything small, green and insignificant. In modern terms mosses are defined as green plants with no water-conducting tissue or roots. This automatically limits their size. Water-conducting tissue in vascular plants not only enables them to raise water some distance above ground level but also stiffens the stems so they can grow much taller.

Mosses may be small but they are green and photosynthetic. Every moss plant absorbs carbon dioxide and contributes its mite of oxygen to the atmosphere. Soil covered in moss is much more productive than the bare soil between plants which is so beloved of conventional gardeners.

Mosses almost certainly evolved long before vascular plants, but exactly how or when is not clear because they do not fossilize well. As Darwin said, "The fossil record is like a book with most of the pages torn out." In the case of mosses, you could say that the first volume has been lost.

The early evolution of mosses has resulted in many species being widespread throughout the world. In the northern hemisphere a large number are found on both sides of the Atlantic and a significant proportion are circumpolar or circumboreal. A few are even found in both hemispheres – survivors of continental drift.

Mosses do retain one advantage over vascular plants and that is the ability to absorb water very rapidly over their whole surface. Allow a vascular plant to wilt beyond a certain point and it will never recover. A specimen of moss preserved in an herbarium for 100 years will reconstitute itself when water is poured on it, the leaves will immediately regain their original shape. That is not to say that it would grow, but many mosses that become dehydrated in their natural habitat can survive weeks or even months without water. This enables them to exploit habitats not available to vascular plants. Rocks, tree trunks, rotting logs and bare inorganic soil all have moss species adapted to them.

The term moss is still a catch-all for plants which may not be all that closely related. In this respect the peat mosses or *Sphagnums* stand out. Their structure is quite different and their spore capsules much simpler than in most mosses. In the computer-generated tree dia-

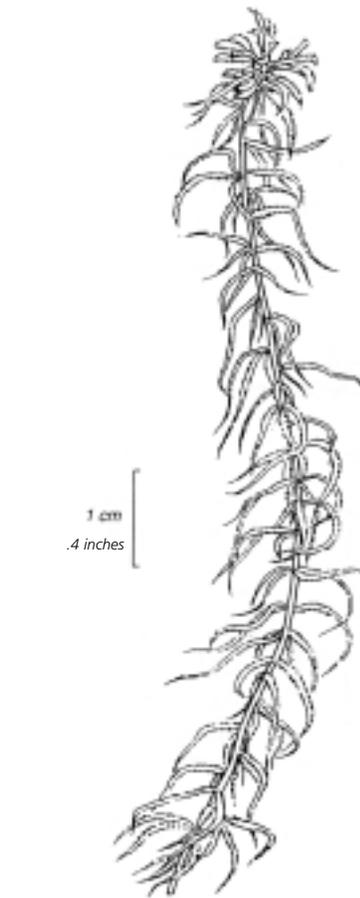


Illustration of sphagnum moss

grams produced by modern scientists to illustrate the evolutionary relationships between plant groups, the links between most groups of mosses and even liverworts and ferns are clear but the *Sphagnums* stand alone. They are enormously important in wetland areas where they are the dominant species, especially in the northern hemisphere where they extend far north beyond the tree line. Many of them have the ability to grow in shallow water. The active shoot grows on the decaying remains of previous generations. This is how peat is formed. This also gradually acidifies the area as the decayed remains of sphagnum accumulate. This process has been going on since the ice and postglacial lakes retreated and left huge areas of shallow water. Thus, the peat used by the horticultural industry in North America today has been accumulating for hundreds or even thousands of years.

*Sphagnums* in general are very easy to recognize but are divided into numerous species all occupying different habitats such as tops or bottoms of hummocks, open pools or the swampy forest floor. Some are red-tinged, such as the robust *Sphagnum magellanicum* of open peat bogs, or they may be yellow-green like *Sphagnum girgensohnii* found in swampy forest, or green flecked with red or purplish

like the fen species *Sphagnum warnstorffii*. None of them have common names!

The *Polytrichums* are another small group of mosses that are easy to recognize. They are known as hair cap mosses. The name is derived from the many hairs that felt or coat the calyptra which protects the capsule until the spores are ready for dispersal. Plants in this group have ridges called lamellae running down the leaf; these considerably increase the photosynthetic area. They are also much stiffer and more erect than the average moss.

One of the commonest of these mosses, found in a variety of exposed habitats, is *Polytrichum juniperinum*, juniper moss, with sharp-pointed leaves that have red tips. Closely related to it is *Polytrichum piliferum*. Its long silvery hairs at the leaf tips make it easy to distinguish. *Polytrichum commune* (common hair cap moss) is characteristic of wet habitats. Mosses in this group tend to be coarse and robust, the leaves rigid and erect when dry, spreading to recurved when moist. They have some primitive water-conducting tissue that accounts for their more rigid nature and enables them to grow a little taller than the average moss. Some species may form turfs several centimetres high.



*Polytrichum juniperinum*

That leaves all the rest of the mosses! For convenience, botanists divide these into two artificial groups. Acrocarpous mosses are erect like the *Polytrichums* but not so rigid and without the leaf lamellae. The *Dicranums*, sometimes called broom mosses, are a good example of this type of growth. They may be

ILLUSTRATION COURTESY A. MCCORM

PHOTOGRAPH COURTESY JOAN CROWE

# Some Favourites from Seed

end, will enable the ecological diversity at Natural Bridge to survive for generations to come.

*Zeb Weese is the Park Naturalist at Natural Bridge State Resort Park in Kentucky.*

## RECREATIONAL USES DAMAGE VEGETATION IN RED RIVER GORGE

"The Gorge" attracts a million visitors each year, drawn to the hundreds of natural arches, spectacular geology and diversity of life forms that call those cliffs home. Like many heavily visited recreational areas, its native vegetation has suffered serious negative impacts. While hiking and camping off the designated trails causes most of the damage, the habitat of some of the rarest endemic species and ecological communities in Red River Gorge is being compromised by recreational rock-climbing.

Over the past decade so-called "sport climbing" has become increasingly popular. Holes are drilled into cliff faces and iron bolts are permanently set into the cliffs as anchors for climbers' safety ropes. These bolts allow climbers to scale surfaces they could not access using traditional climbing methods that rely mainly on natural ledges and cracks. Climbers already have access to over 1,000 bolted climbing routes in the Stanton Ranger District (the 60,000-acre or 24,000-hectare area that includes the Gorge), but they are continually seeking to expand their hobby and actively lobby public and private land managers to open more of these delicate cliffline communities to bolting.

Studies of the effects of rock climbing on the vegetation of the Niagara Escarpment in southern Ontario and at Joshua Tree National Park in California have demonstrated that the frequency and richness of plant species declines with intensive climbing. The authors of the studies felt that conservation plans must take these findings into account, even banning the establishment of new climbing routes in protected areas. The United States Forest Service has recently begun a series of public meetings to determine management priorities in the Red River Gorge National Geological Area, so that the damage caused by recreational overuse will be contained to areas already heavily used. Thankfully, neither rock-climbing nor off-trail hiking is allowed at any Kentucky state park, so the cliffs at Natural Bridge are protected from these threats.

*by Jim French*

Is there anything more satisfying than to nurture a tiny seed to a beautiful native flower? How often can we be part of Nature's intricate process of life? More importantly, how often can we help restore our fast-disappearing floral inheritance?

I would like to share with you four of my beloved native perennials along with tips on how to grow them from seed.

**Butterflyweed (*Asclepias tuberosa*):**

My favourite of the sun lovers. Its large orange umbels provide a unique colour to mix with other plants. Some species have red or yellow umbels (if any reader has seed for these I would love to have some).

As a member of the milkweed family, it attracts Monarch butterflies (and many other insects) and sometimes acts as host for the Monarch larvae. Butterflyweed or butterfly milkweed ranges from southern Ontario to Florida, often growing in dry open areas.

The large seeds should be fully covered with sand. Germination is strong after six+ weeks of moist stratification but the seedlings require delicate handling. Great care must be taken to avoid disturbing the fine taproot that grows rapidly. The plants need to be transplanted to a larger container or planting bed as soon as possible. Try sowing the seed in large peat pots that can be planted directly into the garden (into soil amended with sand or gravel, if necessary) after gently cutting away the bottom.

**Tall bellflower (*Campanula americana*):**

I saw my first bellflowers with their metre-high (three-foot) spikes covered in large, open, pale blue flowers blooming on a dry alvar on Pelee Island. They actually looked "cool" in the blazing summer sun and I was determined to have these beauties in my prairie garden.

The genus derives from the Latin word *campana* meaning bell, although *Campanula americana* are less bell-shaped than others in the genus such as harebell, *Campanula rotundifolia*. Tall bellflower does fine in a variety of soils but flourishes in rich moist soil. It blooms in mid to late summer providing a pleasant blue to mix with the yellows so prevalent at that time. Often listed as an annual, it performs as a biennial in my gardens. It ranges from southern Ontario to Florida.

When sowing the fine seed, cover it very

lightly with the seed mix. Seedlings require no special care but because of heavy germination they should be thinned and re-potted early.

**Small's penstemon (*Penstemon smallii*):**

There are over 250 species of penstemons, all native to North and Central Americas. My favourite is Small's which grows on woodland margins and exposed cliffs in the southern Appalachians. I find it puzzling (but delightful!) that a plant confined to a southern habitat should thrive and re-seed itself so generously on the cold Canadian Shield.

The trumpet-shaped light mauve flowers, with a white throat, grow from the cracks and crevices of the huge granite rock around my cottage. They are also quite at home in the woodland garden but need some daily sun. They are not fussy about soil conditions, but they do prefer good drainage. Their display begins in late spring and may continue into early fall. Seeds are easily transferred to a large pot or planting bed once they have germinated.

**Tall ironweed (*Vernonia altissima*):**

I strongly urge you to give this plant a place in your sunny garden. Its magenta/purple flowerheads provide a welcome contrast to the many yellow-flowered species blooming at this time of year. Growing to three metres and more (nine feet+), this perennial thrives in rich moist soil but will tolerate drier conditions. It has a tendency to sprawl, so staking or planting among other tall species helps.

Widespread from Georgia and Louisiana north to New York and Ontario, the genus is named for the English botanist William Vernon. The one and only time I grew *Vernonia altissima* from seed, it germinated profusely, leaving me with more seedlings than I could handle. Sow lightly! It can be transplanted to larger pots or planting beds without special attention.

In the winter issue of the *Blazing Star*, I will write about four other favourite plants I grow from seed. In the meantime, please write to editor@nanps.org or the address on the masthead with your experiences with some of these beautiful natives.

*Jim French, NANPS Honourary President, sends native plant seeds to the NANPS Seed Exchange from his garden at Stoney Lake, northeast of Toronto. He urges everyone to get their orders in early!*

# Bucking the Trend

by Darcie McKelvey

Wayne Buck is a long-standing donor to the North American Native Plant Society Seed Exchange, contributing seeds from his native perennials, trees and shrubs. This piqued our interest and a friend and I visited his property in August.

Wayne owns 2 1/2 hectares (six acres) of rolling farmland west of New Hamburg, in Waterloo County, Ontario. He is fortunate to have diverse habitats. The soil is sandy loam, ideal for most plants. The area is hilly with moraines left by the last glacier. A stream runs through the property creating extensive wet meadows.

For the past eight years Wayne has been in the process of naturalizing. We found an unexpected adventure into several different habitats; each sported native herbs, shrubs and trees, including 15 species of oaks (11 are native to Ontario). Most of the plants were grown from seed including two 10-year-old bur oaks (*Quercus macrocarpa*) that produced their first crop of acorns last year. Wayne estimates the gardens host more than 300 species of plants. Included on his property are a tallgrass prairie, a sand prairie, an Appalachian shrub garden, a Carolinian floodplain, a wet meadow and pond area, and even a Great Lakes shoreline/alvar.

Wayne's mentor has been his son Graham. Graham began foraging in the countryside, taking on plant identification as a hobby after doing a course in plant taxonomy in his final year of university. When he visited a prairie in

Brandon, Manitoba Graham was gifted with a bag of seeds and decided to grow them. But where? He was living in downtown Guelph, sans garden, so he spoke to his father about the possibility of using the farmland as a test plot. Wayne, who had been spending eight hours a week mowing two-thirds of his property "so that it looked like a park", was ready for a change.

They chose a six-metre by six-metre plot (20 feet by 20 feet) out by the road, in what had been a rough pasture. This was the beginning of the tallgrass prairie. Walking there today, along the mown pathway, reminds me of a pilgrimage into a labyrinth with over two-metre high (eight-foot) "walls" of blooming flowers.

Wayne and Graham started by pulling weeds by hand and burning the area in April. Gradually they extended the prairie, asking a local farmer to plough an adjoining section. Then, five years ago they decided to expand the prairie again into what had been a vegetable garden for 40 years! They grew buckwheat on the site in an attempt to control the seedbank firmly established by four decades of manure piles and weeds such as pigweed.

They sowed primarily Canada wild rye (*Elymus canadensis*) as a pioneer species. It became one of the kingpins of this prairie along with big bluestem (*Andropogon gerardii*) and Indian grass (*Sorghastrum nutans*). Many of the herbs were grown as plugs in an old colony house (a chicken house that Wayne converted into a greenhouse using salvaged windows). Some plants such as compass plant

(*Silphium laciniatum*) and prairie dock (*Silphium terebinthinaceum*) were easy to grow. Some (butterfly milkweed or *Asclepias tuberosa*) were difficult. Others like colicroot (*Aletris farinosa*) were impossible. "It grew for two years in a flat but did not survive the outplanting. I have no regrets because I love to try everything once," says Graham.

Among the purple hyssop (*Agastache scrophularifolia*), sky

blue aster (*Symphiotrichum oolentangiensis*), grey-headed coneflower (*Ratibida pinnata*) and seven species of native sunflowers (including Maximilian's, *Helianthus maximiliani*) are the plants that Graham is most proud of: yellow false indigo (*Baptisia tinctoria*), purple milkweed (*Asclepias purpureascens*) and great-plains grass-leaved goldenrod (*Euthamia gymnospermoides*). He grew them from seeds collected at tallgrass prairie remnants in the city of Windsor.

Still, local seed is always the first choice. Graham usually gathers seeds from genotypes as close to their home as possible since he is concerned with seed from the property passing into the surrounding countryside.

As the prairie has evolved, two plants came to predominate: false sunflower (*Heliopsis helianthoides*) and giant sunflower (*Helianthus giganteus*), which are truly "as high as an elephant's eye", as the song from the musical "Oklahoma" would have it. Many of the original plants like rattlesnake master (*Eryngium yuccifolium*) and blanket flower (*Gaillardia* spp.) have been overtaken by the taller species. Wayne calls it "succession in action".

Every April they burn the tallgrass prairie which now occupies almost a hectare (two acres). Wayne says, "I'll never forget the first time we attempted a burn. We had both taken courses, but I feared having a fire get away and having to call the fire department. I had a hose hooked up. We had several shovels and rakes and other implements. I tilled up an area to act as a firebreak. I was really nervous. It turned out to be not much of a blaze."

The Bucks' Carolinian floodplain harbours woodland plants under a canopy of silver maple (*Acer saccharinum*), white ash (*Fraxinus americana*) and black walnut (*Juglans nigra*). The latter produces six to seven wheelbarrow-loads of walnuts each fall; the squirrels spread them all over the property. Smaller trees, including the very rare cherry birch (*Betula lenta*), the endangered butternut (*Juglans cinerea*) and the rare and unusual pawpaw (*Asimina triloba*) were also planted. When a soft maple (silver maple) in this woodland died several years ago the Bucks decided not to cut it down. Woodpeckers have riddled it with holes. Several large limbs have fallen and were left to decompose naturally.

Also in the floodplain are fascinating herbaceous plants including green dragon, *Arisaema dracontium* (one of Ontario's species at risk), the unusual white trout lily



Sand prairie with prairie smoke (*Geum triflorum*), butterfly milkweed (*Asclepias tuberosa*), lead plant (*Amorpha canescens*) in foreground and downy woodmint (*Blephilia ciliata*) and alumroot (*Heuchera americana*) in background.



Graham's alvar garden with roundleaf ragwort (*Senecio obovatus*) and wild chives (*Allium schoenoprasum* var. *sibiricum*) in foreground and red anemone (*Anemone multifida*) and upland white goldenrod (*Solidago ptarmicoides*) in the back.

(*Erythronium albidum*), twin-leaf (*Jeffersonia diphylla*), Virginia bluebells (*Mertensia virginica*) and hairy woodmint (*Blephilla ciliata*). This *Blephilla* grows in only one place in Ontario, along the Thames River. It was rediscovered after a 40-year absence by a friend of Graham's who gave him seed to plant in case it "disappeared" again. It is surprisingly easy to grow with hundreds popping up on the floodplain. There are also swamp thistles (*Cirsium muticum*) which Wayne has taken some time to learn to identify. "I killed the first ones Graham grew here, thinking they were alien. He was peeved!"

Adjacent to the Carolinian floodplain is the shaded spring garden. It contains a typical woodland collection, including trilliums. The Bucks started in 1999 growing *Trillium grandiflorum* (white trillium) from seed. Although the plants are five years old now, they have yet to flower. There is also a small section dedicated to the flora of Pelee Island planted with the threatened blue ash (*Fraxinus quadrangulata*), the majestic Chinquapin oak (*Quercus muehlenbergii*) and the very rare hoptree (*Ptelea trifoliata*).

The pond and wet meadow gardens are only two years old, started when some plants were rescued from a local field about to be ploughed for the first time. To create the gardens Wayne blocked the culvert that shunted water under the driveway. Then he diverted rainwater from the barn roof and piped it to the wet meadow. Native plants such as winterberry (*Ilex verticillata*), swamp milkweed (*Asclepias incarnata*) and the intensely-flowering blue vervain (*Verbena hastata*) share the space with a crabapple tree (*Malus* sp.), a gift from Wayne's father-in-law. "A great gardener,

he was the one who got me interested in plants," says Wayne.

His son Graham developed a love of Appalachian flora during a trip to Great Smoky Mountain National Park in 1999. Since then he has been collecting seeds in the south-eastern United States and he has propagated Maryland wild senna (*Cassia marilandica*), mistflower (*Eupatorium coelestinium*),

overcup oak (*Quercus lyrata*) and *Rhododendron* spp. They have found a home in his Appalachian shrub garden. Some of Ontario's rarest wildflowers are extremely common in Appalachia [hoary mountain mint (*Pycnanthemum incanum*), appendaged waterleaf (*Hydrophyllum appendiculatum*), white wood aster (*Eurybia divaricatus*) and wood poppy (*Stylophorum diphyllum*)] and, therefore, fit right in here. The Bucks have a strict rule about Ontario natives: unless they are extirpated in this province, the plants in their gardens are grown from seed collected in Ontario.

Graham also created an alvar garden in New Hamburg. He and Wayne trekked up to Manitoulin Island and loaded their pick-up trucks with rocks blasted along Highway 6 during road work. The flat rocks were laid on top of crushed stone and gravel to mimic the dry conditions found on alvars. The rocks were also placed around a white cedar (*Thuja occidentalis*) to provide shade for dwarf lake iris (*Iris lacustris*). Other plants growing in the garden are lakeside daisy (*Hymenoxis herbacea*), upland white goldenrod (*Solidago ptarmicoides*) and false pennyroyal (*Trichostema brachiatum*), a small annual that seeds itself down every year. Death camas (*Zigadenus elegans*), like all lilies, took a long time to grow from

seed to flower – in this case, four years.

The NANPS Seed Exchange is the source of many of the seeds planted in the Bucks' gardens. Wayne appreciates the opportunity it affords him and his son to add new species to their gardens while allowing them to share some of what they have grown with others. When you see seed donated by "wb" you'll now know something about the garden from which it came and the creative gardeners behind it.

*Darcie McKelvey is a NANPS board member and last year's Seed Exchange Coordinator. Her own garden in Tottenham, Ontario boasts many Seed Exchange plants.*

## Calendar of Events

February 14-17, 2005  
ECO-CULTURAL RESTORATION WORKSHOP  
Using First Nations' Management Systems to Heal the Land and Ourselves  
Galiano Island, British Columbia  
For more information: [galiano\\_conservation@gulfislands.com](mailto:galiano_conservation@gulfislands.com).

February 24-26, 2005  
10TH XERISCAPE CONFERENCE  
Adapting to Our Changing Reality  
Albuquerque, New Mexico  
For registration forms and details:  
<http://www.xeriscapenm.com>.

June 5-10, 2005  
26TH ANNUAL INTERNATIONAL WETLANDS MEETING  
Coastal Plain Wetlands: Ecological, Landscape and Regulatory Transformations  
Charleston, South Carolina  
Hosted by the Society of Wetland Scientists:  
<http://www.sws.org/charleston2005>.

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