

The Turk's Cap

THE NEWSLETTER OF THE DELAWARE NATIVE PLANT SOCIETY SPRING 2002

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HOW CAN I GET INVOLVED?

The Delaware Native Plant Society is open to everyone ranging from the novice gardener to the professional botanist. One of the primary goals of the society is to involve as many individuals as possible.

The DNPS is working on some significant projects at this time. We have begun a reforestation project at Prime Hook State Wildlife Area and will be undertaking a direct seeding reforestation project along Blackbird and Cedar Creeks in the fall of 2003. In addition, help is needed with our recently established native plant nursery at the St. Jones Reserve outside Dover. We encourage everyone to participate in these, and other DNPS endeavors.

For more information on how to get involved, E-mail us at dnps@delawarenativeplants.org. Or visit the new DNPS website at www.delawarenativeplants.org. Our new website has all of the past issues of *The Turk's Cap* along with a large section on native plants, as well as links to other environmental and

A CALL FOR ARTICLES

If you would like to write an article for The Turk's Cap, we would love to print it. With like minded individuals as an audience, The Turk's Cap is a great venue for plant or habitat oriented writings.

We'll take just about anything from gardening tips to book reviews to poetry. Of course, it has to be about native plants, or issues related to native plants; just a minor constraint. Your imagination is the real key.

Contact Eric Zuelke for more information at (ezuelke@juno.com), or Keith Clancy at 302.674.5187.

A FRAGRANT WILDFLOWER WELCOME TO OUR NEWEST MEMBERS

January through March

Christine Besche
Janet & Mike Friedberg
Jeff & Bridget Lynch
James Metzger
Joann Price
Barbara Reader
Ellen Roca
Glenn Shealy
Linda Shinn
Mark Young

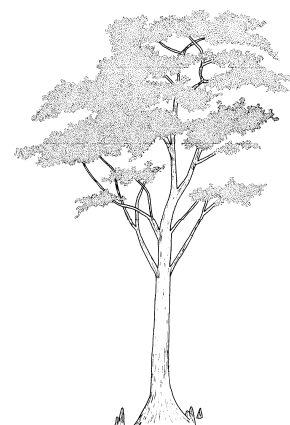
LETTER FROM THE PRESIDENT

It's that time of year to start planning and implementing your native landscaping projects. As the weather warms many of us will be outside planting native plants we germinated from seeds, or purchased from a native plant nursery or from one of the native plant sales that take place around the state and region at this time of year. If you want to restrict your plantings to Delaware natives, use caution when making your selections. A fair number of the advertised "native" plants offered for sale are, in fact, not native to Delaware. The definition of native, by some, can be quite liberal. Some of the plants offered for sale that I have seen, although native somewhere in eastern North America, are not native to Delaware. In several cases, I have noted species, advertised as native to

Continued on page 5

The DNPS Vision

The purpose of the Delaware Native Plant Society (DNPS) is to participate in and encourage the preservation, conservation, restoration, and propagation of Delaware's native plants and plant communities. The Society provides information to government officials, business people, educators, and the general public on the protection, management, and restoration of native plant ecosystems. The DNPS encourages the use of native plants in the landscape by homeowners, businesses, and local and state governments through an on-going distribution of information and knowledge by various means that includes periodic publications, symposia, conferences, workshops, field trips, and a growing statewide membership organized by the DNPS.



LETTER FROM THE EDITOR**BREAK OUT THEM SHOVELS**

Well, this was the lamest Winter I've experienced in Delaware yet! I've been here for five years now and never seen a Winter as mild as this one. By my unofficial count, Dover only got 1 inch of snow. That's amazing. But all is made up for with the wonderful sights, sounds and smells of Spring. I'm definitely going to put my shovel through its paces in the next few weeks. We had a great DNPS event at one of our members houses back in March. Bob Edelen and his wife graciously opened up there property to us and let us dig up anything we wanted that was in the way of a trail he was making. Bob also gave us a tour of his greenhouse and they fed us pizza. What a day! Our feature article has given me some great tips for my plantings I got from that day, and it might help you as well if you're in the market for some trees. Have a great Spring. 🌱

oooo Eric Zuelke, Editor

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PLANT-ANIMAL HIGHLIGHT**THE YUCCA AND THE MOTH**

There is an ecological concept that exists between certain plants and animals that is called mutualism. Mutualism is an evolutionary relationship between two organisms in which they evolve together over time (coevolution) and neither one is harmed and each benefit from the other.

One of the most famous examples of this relationship is between the yucca plant (*Yucca glauca*) and the Yucca Moth (*Tegeticula yuccasella*). This unique bond between plant and insect was discovered in 1876 by a Missouri entomologist named C. V. Riley. The events of this unusual coupling unfold every May and early June across the Midwest and Great Plains regions of the United States.

The yucca plant-yucca moth system is a textbook case of coevolution. The yucca plant has no ability to reproduce seeds without the moth. Yuccas can propagate small rosettes of 20-60 white flowers per vertical raceme around the parent plant, but these vegetative sprouts are genetically identical to the parent. Over decades, the plant can only move a few feet, and there is no possibility for genetic variation. Without the moth, the whole flowering effort (expensive to the plant in terms of energy) is a total waste. The only pollinator of the plant is the yucca moth as bees are not attracted, and neither wind nor bees can pick up the sticky pollen. The yucca moth is likewise dependent upon the plant. There are no alternate host plants known for the yucca moth; the yucca moth caterpillars must eat yucca seeds or starve, and without the plant will die off in a single generation. Without the moth, the plant cannot reproduce, become genetically varied, or disperse, and both species would go extinct simultaneously with an event like major climate change. Therefore, the system is tightly coevolved.

The adult moth resides inside the yucca flowers, and the active larval stages are all contained inside the developing yucca fruits. Males and females mate inside a flower after which the male plays no part in the pollination process. The female moths pollinate the flowers between dusk and midnight. The moth gathers pollen from the flower anthers by using her specially adapted mouthparts, called palps. She forms the sticky pollen into a ball which she carries between her tentacles and

her thorax (under her "chin" so to speak). The pollen ball is then "stuffed" or "combed" into the stigma of the various flowers she visits. When the female moth visits a flower, she backs up to the flower base and inserts her ovipositor to lay an egg in one or more of the six locules (the compartments of the ovary). By the time the egg hatches into a microscopic caterpillar, the yucca will have begun to develop a pod with little seeds. The small gray-to-pinkish yucca moth caterpillars may feed anywhere in the core of the seed rows. If they burrow toward the end and run out of food, they bore sideways into another locule or across a carpel wall. When the larvae are mature, they excavate an exit burrow to the surface of the pod, although they may continue feeding for a time. When they completely chew through the surface, they leave an exit hole or scar.

There are a couple of variables that have helped this \coevolution along. One is that because the yucca flowers male stamens bend away from the female stigma, and reach only two-thirds the length of the pistil, the plant is favoring pollination by the moth and preventing self-fertilization. Also, the moths have a strong tendency to go only to white flowers.

Researchers have questioned how the moth knows what flowers they have visited and why they don't lay enough eggs to decimate the populations of the plants over time. They theorize that the moths leave a pheromone scent behind to reveal what flowers they have visited, and that in many cases the plants force the moths to lay few eggs scattered over many flowers which would always result (as the researchers have found) in a great number of viable seeds being produced that escape getting eaten.

This fascinating connection between a plant and an insect is but one of the many examples of how interconnected our natural world is, and how we, as a species who can control the fate of many of these relationships, should behold this as something to cherish. 🌱

oooo Eric Zuelke, Editor

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FEATURE ARTICLE**HOW TO BUY AND PLANT TREES**

The list of benefits that trees provide is really amazing when you think about it. Trees reduce pollution, control erosion, provide wildlife habitat, act as wind-breaks and provide shade to conserve energy in your home, and enhance human comfort, well-being and enjoyment of the outdoors. But too often the focus is on the quantity of trees to plant rather than their individual quality and proper planting. It is important to know you are planting the correct tree in the right location the right way. These are issues that will determine an individual tree's health and longevity.

Choose a Tree Adapted to Your location

There are numerous resources available to help in choosing trees that are suitable for your geographic location. Many books with general information about tree adaptation are available at libraries. Also, check with your cooperative extension agent, master gardener, or parks department for a list of locally suitable trees. Factors to consider include tree size as well as shape and growth rate, whether it is deciduous or evergreen, climate adaptation, soil and water requirements, and potential pest problems. Naturally, a tree's visual characteristics such as flowers, fall color, foliage texture, bark and other fea-

tures are also important.

Once you have a list of candidates, check it with what's available at local nurseries and ensure that you selecting a native species. Your list will narrow quickly, and you can use factors such as flowers, flowering time, or fall color to make the final selection. Finally, find a mature tree of the species you want growing in your neighborhood or in a natural area to see what it's going to look like twenty or thirty years from now.

If the tree you choose is not readily available, don't hesitate to place a special order for it, or to order it from a mail-order supplier. It is more important to get a healthy specimen of the right tree than to plant right away. But even more important is to get a tree that is indigenous to your area, so be sure that the supplier has grown their trees from local seed sources.

Choose a Healthy Tree

It pays to be a smart shopper when buying trees. As hard as most nurseries and garden centers try to properly care for their trees, the longer a tree has been in the nursery, the greater the chance for something to go wrong. Missed waterings and accidental neglect can cause a tree to suffer. Such trees are likely to grow slowly or poorly once they're planted in your yard, or elsewhere.

Trees are sold three ways: bare-root, balled & burlapped (B&B), and in containers.

Examine a tree carefully before buying. The largest individuals of a group may be too large for their root-balls. The smallest trees of a group may be stunted from some type of stress. In general, select a tree of modest proportions. Look for a tree with a balanced canopy and evenly spaced branches extending out in all directions. The best growth form is when branches are distributed along the entire length of the trunk.

The trunks of some trees have been cut off at the top to prevent the tree from growing to high while in the nursery. This causes several branches to grow from just below the cut. Trees like this may appear attractive and in good proportion, but for large-growing trees, the branches may be too low and weakly attached unless most need to be pruned out.

Foliage growth along the lower trunk contributes to its strength. The trunk should be straight and evenly tapered from top to bottom. Ideally, the tree should be able to stand up by itself without staking. If not, it will require staking for a longer time after planting.

Avoid trees with broken branches, wounds on the trunk, poorly colored foliage, obvious signs of insects or disease, or poor growth from the previous season.

If you can't plant as soon as you get your trees home, make sure you take care of them until you can. Temporarily place all types of young trees in a shady location. Partially bury the roots of bare-root trees by digging a shallow hole, placing the roots in the hole, and covering them with moist soil or organic matter like leaves or mulch. Make sure that the root-balls of B&B and container trees don't dry out by keeping them watered regularly until you can plant them.

Check Drainage

If you suspect drainage problems, dig a test hole near the tree's site a few days or weeks before planting. Fill the hole with water, let it drain, then fill it again. Time how quickly the water drains. If it is less than 1-inch per hour, or if it hasn't drained completely in 24 hours, you have a drainage problem. Solutions include planting elsewhere, planting in raised beds or mounds, or installing a drainage system. You may be able to improve the drainage by drilling through the hard soil or clay in

NATURAL QUOTES

'And April weeps - but, O ye hours!

Follow with May's fairest flowers.'

Percy Bysshe Shelley

'Art is the unceasing effort to compete with the beauty of flowers - and never succeeding.'

Marc Chagall

the bottom of the hole. Ask your county cooperative extension office or nursery to find out about local soil conditions and probable depth and thickness of the hard soil.

Planting Procedures

For Bare-root Trees:

Set bare-root trees atop a small mound of soil in the center of the planting hole, and spread the roots down and away without bending them too much. Identify original planting depth by finding color change from dark to light as you move down the trunk towards the roots. Make sure to tamp out all air pockets as you fill in the soil to ensure that the roots don't dry out in the ground.

For Balled & Burlapped Trees:

Handle the root-ball carefully so it doesn't break or crack. Lift the soil ball and position it centered in the hole. Gently tamp to remove air pockets as you fill. Once stabilized with backfill, remove the burlap. Continue backfilling and watering to settle the soil. Don't cover the top of the root-ball with backfill because it could prevent water from penetrating.

For Container Trees:

Lift the plant out of container prior to setting the root-ball in the hole. Eliminate circling roots by laying the root-ball on its side and cutting through the roots with shears. Don't cover the top of the root-ball with backfill because it could prevent water from penetrating.

Water After Planting

Create a watering basin at least 4 to 6 inches high just outside the root-ball. Fill it with water, let it drain, and repeat. Recheck the planting depth. If the tree has settled below the surrounding soil level, it should be raised. For bare-root trees, gently pull up on the lower trunk. For container or balled & burlapped trees, carefully push a shovel under the root-ball and pry it upward while lifting up on the lower trunk. In each case, moist soil will settle under the roots and raise the planting depth.

Stake and Mulch

A tree with a strong trunk will stand on its own without staking. However, if the tree was staked in the nursery or if you are planting in a windy location, staking will support the tree during its first years in the ground. Drive in two or three stakes, one on each side of the tree and just outside the root-ball. Position the stakes so that a line drawn between them is perpendicular to the strongest prevailing wind when the tree is in leaf, and put the third stake in parallel to the prevailing wind. Tie the tree to the stakes with wide flexible ties. Determine how high to attach the ties by running your hand up the trunk from the base. The minimum height at which the top of the tree remains upright is where to secure the ties. Use wide ties to

reduce damage to the trunk, or put the tying material through lengths of rubber garden hose against the trunk, and don't tie the tree too tight. A tree that can sway somewhat in the wind will develop a stronger trunk.

Apply 3 to 4 inches of organic mulch around the base of the tree to conserve moisture and reduce weeds. Keep it at least 6 inches away from the trunk.

After Planting

Watering:

Bare-root trees do not need to be watered again until two to four weeks after growth resumes. Container and B&B trees need regular watering until their roots grow into surrounding soil. During hot weather, these trees may need to be watered every two to three days to keep the root-ball moist. Occasionally wetting the soil outside the basin will ensure that roots develop into the surrounding soil. Remove support stakes soon after the tree can stand on its own.

Pruning

Most new trees need no pruning the first season other than to remove broken branches. Pruning may reduce the total growth of a young tree, but if large, vigorously growing branches are too low or competing with more desirably placed branches, you can safely cut them back. Pinch out the tips of vigorous growth in order to stimulate side branching. If the leader is growing vigorously and no laterals are forming at a height you would like, pinch out an inch of the tip growth when it is at the height where you would like a permanent branch. Several shoots will grow from below the pinch. When the new shoots are 3 to 4 inches long, select the most vigorous for the leader and pinch back the other shoots. If growth is vigorous, this can be repeated a couple of more times.

Fertilizer

If young trees are growing slow, or have poorly colored foliage may result, and they may benefit from adding a nitrogen fertilizer. 🌿

oooo Eric Zuelke, Editor

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NATURAL COMMUNITY HIGHLIGHT

INTERDUNAL SWALES

Introduction

Scattered in amongst the dunes of the Atlantic Coast, interdunal swales are tiny wetlands, frequently only a few square meters in size. However, despite their small size, interdunal swales have great conservation significance. Part of this significance comes from the fact that, although they are often little more than a few hundred meters from the ocean, their water comes entirely from precipitation, making them freshwater wetlands. These freshwater conditions, in conjunction with the extremely nutrient-poor sandy soils, creates an unusual habitat that is home to unique communities of plants. In addition to these plant communities, there is an insect, the Bethany Beach firefly (*Photuris bethaniensis*), that is known only from Delaware's interdunal swales, and nowhere else in the world. It is another reminder that the conservation of natural communities helps to protect the full range of native species. Although there are several communities described for the interdunal swales of Delaware, two of the more frequent types are listed below.

Juncus scirpoides – *Schoenoplectus pungens* Herbaceous Vegetation

Round-head Rush – Common Threesquare Interdunal Swale

Description

This herbaceous swale community is typically dominated by the sedge *Schoenoplectus pungens* (common threesquare), with *Juncus scirpoides* (Round-head rush) often occurring as a co-dominant. Other associates include such typical swale species as the graminoids *Juncus canadensis* (Canada rush), *Juncus dichotomus* (forked rush), *Panicum amarum* (panic beachgrass), *Panicum verrucosum* (warty panic grass), *Panicum rigidulum* (redtop panic grass), *Spartina patens* (salt-meadow cordgrass), and *Dichanthelium spretum* (Eaton's witch grass), as well as *Triadenum virginicum* (marsh St. John's wort), *Drosera intermedia* (spoon-leaved sundew), *Utricularia juncea* (southern bladderwort), *Vaccinium macrocarpon* (large cranberry), and *Sphagnum* spp. (peat mosses).

Distribution

This is the most common interdunal swale community in Delaware, and it can be found from Cape Henlopen south to the Maryland state line. Rangewide, similar communities probably occur from Delaware south to Virginia.

Vaccinium macrocarpon Dwarf-shrubland Large Cranberry Interdunal Swale

Description

This swale community is defined as a "dwarf-shrubland" because of the dominance of *Vaccinium macrocarpon* (large cranberry), which is an evergreen trailing shrub. While this species is generally dominant, a number of rushes, sedges, grasses, and forbs co-occur and often obscure the low-growing cranberry. Other woody species that occasionally occur in the swales include *Acer rubrum* (red maple), *Vaccinium corymbosum* (highbush blueberry), and *Myrica cerifera* (wax-myrtle). Associated herbaceous species include *Drosera intermedia*, *Lycopodiella appressa* (creeping clubmoss), *Utricularia juncea*, *Xyris difformis* (pink-based yellow-eyed grass), *Xyris torta* (twisted yellow-eyed grass), and a moss species *Polytrichum commune*. Less frequent species encountered often include species found in adjacent swale communities, including the previously described type: *Cladium mariscoides* (twig-rush), *Schoenoplectus pungens*, *Juncus canadensis*, *Juncus dichotomus*, *Juncus biflorus* (grassleaf rush), *Euthamia tenuifolia* (slender fragrant goldenrod), *Polygala cruciata* (crossleaf milkwort), *Pogonia ophioglossoides* (rose pogonia), *Platanthera blephariglottis* (white fringed orchid), *Panicum rigidulum*, *Panicum verrucosum*, *Rhynchospora capitellata* (brownish beak-rush), *Rhynchospora scirpoides* (long-beaked bald rush), and *Andropogon virginicus* (broom-sedge).

Distribution

The only occurrences of this community in Delaware are found at Cape Henlopen State Park. Cranberry swale communities can be found from Maryland to Massachusetts. 🌿

oooo Peter Bowman, DE Natural Heritage Program Ecologist

LETTER FROM THE PRESIDENT*Continued from page 1*

Delaware, with ranges only as far north as Georgia. Additionally, many of the plants offered are horticultural 'varieties.' If this issue matters to you, then please refer to the DNPS's recent publication, *Delaware Native Plants for Landscaping and Restoration* booklet or McAvoy and Bennett's *Flora of Delaware: An annotated checklist* to help in your plant selections. Both of these resources list species that are known to be native to the state, with the latter being a comprehensive checklist. If you're not sure about that 'native' rhododendron you've got your eye on, then check it out in one of these books.

Why does it matter if one uses natives or not, you may ask? There are many good reasons to restrict your plantings to native plants derived, if possible, from indigenous stocks (either from locally collected seeds or cuttings). Indigenous plants are uniquely adapted to local environmental and ecological conditions. These plants are often best suited to local soil conditions, temperature regimes, and microhabitats. In addition, the natives may be more likely to have developed defenses to withstand many types of insect predations and diseases. Native plants are also part of our state's natural heritage. Their use supports and strengthens the overall ecological functions of surrounding intact habitats by providing a continuity of native vegetation. This is important in the context of pollination biology, seed dispersal, biodiversity, habitat corridors and amelioration of impacts from disturbances in natural areas. Native plants provide a source of seeds for dispersal to adjacent natural areas and provide beneficial habitats for a myriad of wildlife species.

I also can't help but wonder what impacts, if any, the introduction of species native to eastern North America, but not to Delaware, might have on our state's overall flora and fauna. Am I over-reacting? I don't know. Has anyone seen literature that addresses this topic? I have seen both small and large populations of several of these species that have become established in natural habitats. For example, a large population of Carolina allspice, *Calycanthus floridus*, a species native further south, is well-established on sandy soils within a pine-oak community within the Nanticoke State Wildlife Area. Is it having any impacts on the local native flora and fauna?

Our native plant nursery at the St. Jones Reserve offers a great opportunity to grow a diversity of Delaware native plants propagated from locally collected seeds and, in some cases, from plants 'rescued' before the bulldozer and chainsaw find them. It is our hope that we will be able to propagate large enough quantities of these natives to fill many of the needs of land restorations throughout the state, and for annual plant sales to the public. The success of this nursery depends on you. We need your help. I encourage anyone interested in helping out at the nursery to contact me. Also, in the coming weeks I will be announcing days and times that we will be meeting at the nursery.

I would like to personally welcome all the many new members that have joined the DNPS in recent months. Our society is continuing to grow. This growth shows that there is a tremendous interest in native plants. I encourage every member, both new and old, to play a more active role in the Society. Attend a field trip or a bi-monthly meeting, and there are many Society activities where your help is needed. For example, we could be more involved in public outreach. We need someone to open dialogue with local municipalities and state agencies,

encouraging them to only plant native trees, shrubs and herbs in their landscaping projects. Maybe we could undertake a native plant landscaping project in one or more of our communities. We could give talks about the benefits and beauty of using native plants. We need someone that could become involved with the State's biodiversity initiative, as well as someone to participate in the Delaware Invasive Species Council. There is more that we could do to promote a forest conservation act and state legislation for rare plants.

Also, it would be great if we had someone to monitor and comment on development projects. If a project were to result in forest loss, we could discuss the opportunity for DNPS members to rescue many of these plants from destruction. Help is needed with our Prime Hook State Wildlife Area reforestation project this spring and our direct seeding reforestation projects this fall along Blackbird (New Castle County) and Cedar (Sussex County) Creeks. Our field trip coordinator position is vacant; this would be a great opportunity for someone to provide their own input on when or where we have our field trips.

Finally, please come to our annual meeting on Saturday, May 4, 2002 and share in the fun of celebrating native plants. ♡

Sincerely,

Keith Clancy

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THE DNPS WEBSITE

At long last, our website is being completely revised and updated. Check out our newly designed website at www.delawarenativeplants.org. The site is still under construction so please check back on a regular basis. We plan on having a photo library that will allow visitors to view high quality images of Delaware's flora and native plant communities. Accompanying each image will be a brief description of the plant or community, information on the plant's distribution, planting needs, wildlife and ornamental attributes. There will be sections on Delaware's invasive and exotic species, upcoming events, publications, and an online version of our newsletter, and related links among other topics.

Please take some time to check out our site. All comments and suggestions for improvements are welcomed. Also, if you have any photos that you would like to see added to the site please contact dnps@delawarenativeplants.org with details.

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EVENT HIGHLIGHTS
COPELAND NATIVE PLANT SEMINAR

On Saturday, 16 March 2002, the DE Museum of Natural History hosted this event. One of our members wrote the following (this is an excerpt): the speaker shared five observations from nature that should govern any native plant design project:

1. The design should be experientially rich – there should be character, complexity and coherence.
2. It should be environmentally sound.
3. There should be a sense of place – it should reflect the

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NATIVE PLANT HIGHLIGHT**BLOODROOT**

One of the first native woodland wildflowers to bloom each spring is bloodroot (*Sanguinaria canadensis* L.), of the Papaveraceae, or Poppy Family.

In Delaware, bloodroot blooms from March to April. Simultaneously, before leaf-buds break in the forest canopy, a leafless stem containing a single terminal flower bud, along with a deeply lobed leaf, emerge from a stout rhizome. Initially, the stem and flower bud are wrapped-up tight by the leaf, and in time the leaf gradually unfolds while the bud slowly swells into a blossom. The blossom is composed of 8-16 snowy white petals and the center appears golden due to the numerous stamens that are coated with bright yellow pollen. The petals fall quickly in just a few days, quicker if the days are windy, so the window of opportunity to view this species in flower is short.

The buds containing leaves and flowers develop a year before they appear in the spring, and sometime after flowering, the leaves begin to enlarge and will last into fall. Fruits mature in late spring and seeds have a large white growth along their edge that contains oil. This oil is attractive as food for ants and as a result, ants help to disperse seed throughout the woodlands.

Although the flowers of bloodroot lack nectar, the species is usually pollinated by bees. Bees will visit the flowers of bloodroot when the weather is warm and sunny, but during days that are cold or rainy, which frequently happens in the spring, the plant will self-pollinate.

Bloodroot is a perennial plant and the thick rhizome contains a red juice that will stain anything it comes in contact with. This juice was widely used by Native American's to decorate their skin and also their tomahawks. The rhizome of bloodroot also contains a substance called sanguinarine, which has potential for use in modern medicine. Currently, sanguinarine is used as a toothpaste additive and in other oral care products.

If multiple leaves are observed on one plant, it is an indication of a branching rhizome, and a single intact rhizome can produce up to ten leaves and flowers.

Bloodroot is a monotypic species, meaning it is the only species belonging to the genus *Sanguinaria*. The native geographic distribution of bloodroot is from Nova Scotia south to Florida and west to Nebraska. 🌿

◊◊◊◊ William McAvoy, DNPS member

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DON'T MISS THIS UPCOMING EVENT**DNPS 4TH ANNUAL MEETING**

Please mark your calendars for this date and plan on attending. Everyone welcomed.

The DNPS Annual Meeting is set for Saturday, May 4, 2002, at the St. Jones Reserve, Kent CO. DE. Lots of activities are on-tap so I hope you will be able to attend.

Potluck: Please bring a dish for lunch. Refreshments will be provided.

2002 DNPS Annual Meeting AGENDA:

9:00-12:00 - Field trip to an old growth (at least relative to Delaware's coastal plain) forest right in Dover. We will meet at the Reserve and then carpool to the site.

This is an exceptionally high quality and relatively large, mature (old growth) forest along the Mudstone (also called Maidstone) Branch that flows into the Fork Branch, a tributary of the St. Jones River. The mixed hardwood forest is an approximately 130-140 year old community that is comprised of a mixture of oaks, hickories, tulip tree, sweet gum and beech in the canopy. It also has many of the characters of an old growth forest: diverse species composition (few, if any, invasives), excellent structural diversity, coarse woody debris and scattered snags. We will also get a glimpse of a large beaver pond that occurs along this stretch of the Mudstone. This forest occurs on private property and the owner is interested in protecting the site.

12:00-1:30 -- Potluck lunch at the Reserve

During lunch we will have an Update of Society Activities and ballots for election of new officers will be distributed.

1:30-2:30 - Featured Speaker: Dr. Sue Barton of the University of Delaware will present a seminar entitled "Enhancing Delaware's Highways."

2:30-4:00 (or whenever) Anyone wishing to is encouraged to take a tour of the native plant nursery and, if you feel so inclined, help with some spring cleaning activities.

Also, anyone that has started seeds at home and have seedlings please bring these (less the ones they want to keep for their properties) to be planted in the nursery.

Several free native plants will also be raffled off.

We hope to see everyone at this event. For more information contact the DNPS at dnps@delawarenativeplants.org or 302.674.5187. Also, please RSVP if you plan to attend.

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EVENT HIGHLIGHTS

Continued from page 1

region where it is placed.

4. It should change over time with the natural migration of plants in the landscape.

It should not lead to a loss of biodiversity/not diminish biotic diversity.

DNPS member Bill McAvoy gave a very interesting overview of "The Historical and Extirpated Native Flora of Delaware – a Reflection on the Environmental Health of the State". Basically, plant losses can be attributed to several cause and effect relationships.

There was also a presentation about the new "Backyard Wildlife Habitat" program that is being promoted by DNS. Trained stewards assist landowners with information and projects to improve water quality, restore wildlife habitat and protect biodiversity. 🌿

◊◊◊◊ Rick Mickowski, DNPS member

UPCOMING EVENTS

SATURDAY, 13 APRIL 2002 – ECO WALK AT BRECKNOCK PARK IN KENT COUNTY. SPONSORED BY THE DELAWARE SOLID WASTE AUTHORITY. FUN ACTIVITIES FOR KIDS AND ADULTS, EXHIBITS, THE DELAWARE ENVIRONMENTAL ECO-WALK AND MORE. FOR MORE INFORMATION CALL 302.698.6446 OR 6445

SATURDAY, 20 APRIL 2002 – FROM 10 AM TO 2 PM (OR WHENEVER). A SPRING WILDFLOWER WALK ON THE PIEDMONT. WE WILL EXPLORE A MIXED HARDWOOD FOREST ALONG STEEP SLOPES OF THE RED CLAY CREEK. WE SHOULD SEE MANY OF THE SPRING EPHEMERALS THAT ARE SURE TO BE BLOOMING ON THIS DATE. THIS WALK WILL BE LED BY JANET EBERT, AN EXPERT ON THE FLORA OF THE PIEDMONT. DRESS APPROPRIATELY FOR EARLY SPRING WEATHER. WE WILL MEET IN THE PARKING LOT AT ASHLAND NATURE CENTER (HOME OF THE DELAWARE NATURE SOCIETY), OFF BARLEY MILL ROAD AT BRACKENVILLE ROAD (SOUTHEAST OF YORKLYN). FOR MORE DETAILS AND TO SIGN-UP FOR THIS TRIP PLEASE CALL MS. EBERT AT 610.459.0585 OR 302.674.5187 OR EMAIL AT DNPS@DELAWARENATIVEPLANTS.ORG.

THURSDAY, 25 APRIL 2002 – PLANTS AND PLANT COMMUNITIES OF THE DELMARVA PENINSULA. FROM 7 PM TO 9 PM AT ADKINS ARBORETUM. KEITH CLANCY, BOTANIST, PHOTOGRAPHER, WRITER, AND PRESIDENT OF THE DELAWARE NATIVE PLANT SOCIETY, WILL SHARE HIS EXTENSIVE FIELD EXPERIENCE AND FANTASTIC COLLECTION OF PHOTOGRAPHS OF RARE AND COMMON PLANTS AND PLANT COMMUNITIES OF THE DELMARVA PENINSULA. FEE IS \$5 FOR MEMBERS, \$8 FOR THE GENERAL PUBLIC. CALL THE ARBORETUM AT 410.634.2847 FOR ADDITIONAL INFORMATION AND TO REGISTER, OR ON THE WEB AT [HTTP://WWW.ADKINSARBORETUM.ORG](http://www.adkinsarboretum.org).

SAURDAY, 27 APRIL 2002 – UNIVERSITY OF DELAWARE BOTANIC GARDEN SPRING PLANT SALE. MORE INFORMATION ABOUT THE PLANTS AND AN ONLINE ORDER FORM AT [HTTP://AG.UDEL.EDU/UDBG](http://ag.udel.edu/udbg).

SATURDAY, 4 MAY AND SUNDAY, 5 MAY 2002 – DELAWARE NATURE SOCIETY'S ANNUAL NATIVE PLANT SALE. FOR MORE DETAILS GO TO THEIR WEBSITE AT WWW.DELAWARENATURESOCIETY.ORG.

MONDAY, 13 MAY 2002 – THE NEW CASTLE COUNTY MASTER GARDENERS IS HAVING A WORKSHOP CALLED "GO NATIVE", 6:30 PM TO 8:30 PM AT THE COOPERATIVE EXTENSION BLDG. (910 SOUTH CHAPEL STREET, NEWARK.) THERE WILL BE A DISCUSSION OF THE ADVANTAGES OF USING NATIVE PLANTS IN HOME LANDSCAPES USING THE MASTER GARDENERS TEACHING GARDEN AS AN EXAMPLE. LISTS OF NATIVE PLANTS, AS WELL AS RETAILERS, WILL ALSO BE SUPPLIED. COST IS \$12.

6-8 JUNE 2002 – NATIVE PLANT CONFERENCE AT MILLERSVILLE UNIVERSITY. INFORMATION ONLINE AT [HTTP://MUWEB.MILLERSVILLE.EDU/~NPITL/SCHEDULE.HTML](http://MUWEB.MILLERSVILLE.EDU/~NPITL/SCHEDULE.HTML).

6-8 JUNE 2002 – SEDGES 2002: INTERNATIONAL CONFERENCE ON USES, DIVERSITY, AND SYSTEMATICS OF CYPERACEAE. THIS CONFERENCE IS HOSTED BY THE CLAUDE E. PHILLIPS HERBARIUM, DEPARTMENT OF AGRICULTURE AND NATURAL RESOURCES, DELAWARE STATE UNIVERSITY, DOVER, DE. CO-SPONSORED BY NRCS, USDA, SOCIETY OF NATURAL HISTORY OF DELAWARE, AND THE DELAWARE NATIVE PLANT SOCIETY. FOR MORE INFORMATION GO TO OUR WEBSITE AT WWW.DELAWARENATIVEPLANTS.ORG OR CONTACT DR. ROBERT F. C. NACZI AT RNACZI@DSC.EDU OR 302.857.6450.

DNPS BI-MONTHLY MEETINGS FOR 2002 – ARE CURRENTLY SCHEDULED THE 3RD TUESDAY OF EVERY OTHER MONTH (EXCEPT MAY). OUR NEXT MEETINGS WILL BE JULY 16, SEPTEMBER 17, AND NOVEMBER 19, 2002. MEETINGS WILL TAKE PLACE, UNLESS OTHERWISE NOTIFIED, AT 7 PM AT THE AQUATICS RESEARCH AND EDUCATION CENTER, WOODLAND BEACH WILDLIFE AREA, RTE 9 (4876 HAY POINT LANDING ROAD) ABOUT 1 MILE NORTH OF RTE 6. WITH THE EXCEPTION OF THE JANUARY MEETING, WE WILL HAVE GUEST SPEAKERS AT EACH MEETING (SPEAKERS AND THEIR TOPICS TBA AT A LATER DATE). ACTIVITIES MEETING WILL TAKE PLACE AFTER EACH SEMINAR. CHECK OUR WEBSITE FOR ADDITIONAL DETAILS OR EMAIL US AT DNPS@DELAWARENATIVEPLANTS.ORG.

Membership Application

DELAWARE NATIVE PLANT SOCIETY

Member Information

Name: _____

Business Name or Organization: _____

Address: _____

City and Zip Code: _____

Telephone (home/work): _____

E-mail address: _____

- ☐ Individual \$15.00
- ☐ Full-time Student \$10.00
- ☐ Family or Household \$18.00
- ☐ Contributing \$50.00
- ☐ Business \$100.00
- ☐ Lifetime \$500.00
- ☐ Donations are also welcome \$ _____

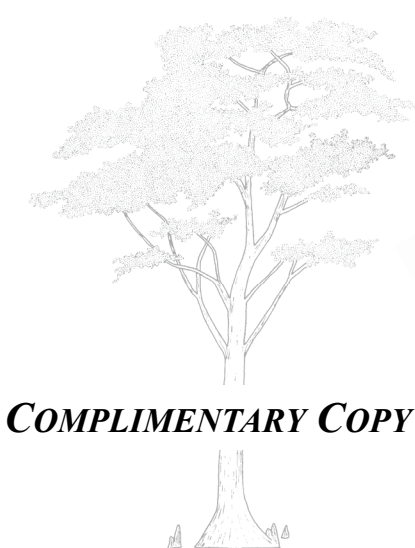
Membership benefits include:

- * The DNPS quarterly newsletter, *The Turk's Cap*
- * Native plant gardening and landscaping information
- * Speakers and field trips

Total Amount Enclosed: \$ _____

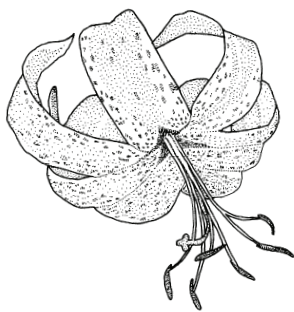
**Make check payable to:
DE Native Plant Society
P.O. Box 369, Dover, DE 19903**

**DELAWARE NATIVE PLANT SOCIETY
P.O. BOX 369
DOVER, DELAWARE 19903**



COMPLIMENTARY COPY





The Turk's Cap

THE NEWSLETTER OF THE DELAWARE NATIVE PLANT SOCIETY SUMMER 2002

IN THIS ISSUE

- Page 1** ○ *A Call for Articles*
○ *New Members*
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○ *Event Highlights continued*
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A CALL FOR ARTICLES

If you would like to write an article for The Turk's Cap, we would love to print it. With like minded individuals as an audience, The Turk's Cap is a great venue for plant or habitat oriented writings.

We'll take just about anything from gardening tips to book reviews to poetry. Of course, it has to be about native plants, or issues related to native plants; just a minor constraint. Your imagination is the real key.

Contact Eric Zuelke for more information at (ezuelke@juno.com), or Keith Clancy at 302.674.5187.

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A COOL, REFRESHING RAINFALL WELCOME TO OUR NEWEST MEMBERS

April through June

Kathryn B. Bostock
Debbie & Clay Heaton
Richard J. Hutton
Vikram Kh Krishnamurthy
Patricia & Charles Robertson
Raymond & Marguerite Zuelke

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HOW CAN I GET INVOLVED?

The Delaware Native Plant Society is open to everyone ranging from the novice gardener to the professional botanist. One of the primary goals of the society is to involve as many individuals as possible.

The DNPS is working on some significant projects at this time. We have begun a reforestation project at Prime Hook State Wildlife Area and will be undertaking a direct seeding reforestation project along Blackbird and Cedar Creeks in the fall of 2002/2003. In addition, help is needed with our native plant nursery at the St. Jones Reserve outside Dover. We encourage everyone to participate in these, and other DNPS endeavors.

For more information on how to get involved, E-mail us at dnps@delawarenativeplants.org. Or visit the new DNPS website at www.delawarenativeplants.org. Our new website has all of the past issues of *The Turk's Cap* along with a large section on native plants, as well as links to other environmental and

LETTER FROM THE PRESIDENT

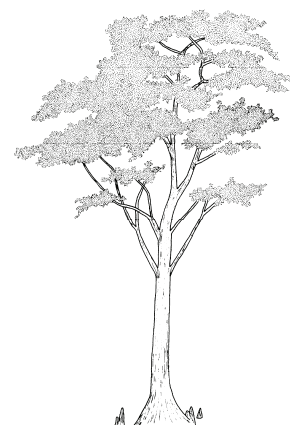
The dog days of August are starting earlier than usual this summer as the July sun, and a paucity of rainfall, bakes the landscape dry and stresses many a native plant. The media reports that more than 60 percent of the country is in the midst of a drought; the fires out west and north in Quebec sure seem to bear that out. The smoke-filled air, that came down out of the north, and settled over this area on the Sunday after the 4th of July was quite something.

I made a brief visit to the New Jersey Pine Barrens that weekend and when I awoke that Sunday morning I was greeted to a very hazy sky. And as the day progressed, the sky became ever more hazy and it seemed the air was permeated with smoke. I would later learn from a radio announcer

Continued on page 5

The DNPS Vision

The purpose of the Delaware Native Plant Society (DNPS) is to participate in and encourage the preservation, conservation, restoration, and propagation of Delaware's native plants and plant communities. The Society provides information to government officials, business people, educators, and the general public on the protection, management, and restoration of native plant ecosystems. The DNPS encourages the use of native plants in the landscape by homeowners, businesses, and local and state governments through an on-going distribution of information and knowledge by various means that includes periodic publications, symposia, conferences, workshops, field trips, and a growing statewide membership organized by the DNPS.



LETTER FROM THE EDITOR**WOW, IS IT DRY!**

I had no idea how dry it was until I drove out to the Aquatic Resources Education Center on July 16th for our DNPS meeting and saw how low Taylor's Gut was. I'm a big frog and salamander fan, and bet they are having a rough time.

Speaking of amphibians, if you have a woodlot on your property, your amphibians may have taken shelter in the kind of downed log that our Feature Article talks about. And if you take a dip in a local millpond during all this heat you may get some bladderwort stuck in your swim suit, but don't worry, you can learn more about it from our native plant highlight. And make sure you read the natural community highlight to see what kind of plants you may encounter during a stroll through a Piedmont floodplain forest.

But whatever you do, have some lemonade and run through the sprinkler first. 🌿

oooo Eric Zuelke, Editor

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PLANT-ANIMAL HIGHLIGHT**PLANT TOXINS AND CHEMICAL DEFENSES**

Plants have various methods of combating the ever present problem of insect and mammal herbivory. Some of these methods are mechanical, but a vast majority of plants use chemicals as their weapon of choice.

All poisonous plants can contain one or more different types of toxins. The main categories of toxins include: alkaloids, glycosides, proteins, amino acids and derivatives, carbohydrates, lipids, glycoproteins, glycolipids, metal-binding substances, resins, phenolics, quinones, terpenoids, and sesquiterpene lactones. These toxins can cause millions of different reactions in whatever consumes them. Some plants manufacture toxins that poison the attacking herbivore, whereas others produce complex compounds that interfere with the attacker's growth cycle or its ability to digest the plant. In many cases, the poisonous substances are merely by-products or wastes from the metabolic functions of the plant. Often, toxic compounds- or at least substances that are unpleasant to taste or smell- have evolved in plants to discourage or repel vegetarian insects or grazing animals. Plant toxins don't bother the plant that produces them, and often, they don't bother many other living things.

Some examples include:

° Tropical rain forest plants that contain alkaloids and other chemicals that make them distasteful or poisonous to foraging insects.

° In humans, two examples of carcinogenic (cancer causing) plants are bracken ferns (*Dennstaedtia*, and *Pteridium*) and tansy ragwort. A plant is said to be co-carcinogenic when it causes cancer only in conjunction with some other substance. Roquefort and camembert cheese moulds; daphne; and poinsettias can cause cancer only if eaten while taking certain prescription drugs.

° Bird's-foot trefoil (*Lotus*) and white clover (*Trifolium*), are capable of producing cyanogenic glycosides, compounds made of sugars bound to cyanide complexes, and storing them in their leaves. If two particular enzymes are present when the plant's leaves are damaged, the cyanogenic glycosides are broken

down to release the cyanide complex, from which free cyanide is eventually liberated.

° The trichomes, or hairs, of many desert plants are storehouses of toxic natural products. The trichomes of the desert plant, *Phacelia*, for example, contain numerous poisons, insecticides and allergenic substances. The trichomes of another desert plant, the thistle *Parthenium hysterophorus*, contain certain allergenic chemicals that deter herbivores from feeding.

° Some allelochemicals protect plants that produce them not by poisoning or repelling herbivores but by interfering with the predator's normal cycles of growth and development. Bugleweed, *Ajuga remora*, when fed to a number of insects, resulted in a striking developmental aberration: in metamorphosing from larvae to pupae, each insect grew not one but several head capsules.

° A juvenile-hormone antagonist kills insect larvae by causing them to molt prematurely into the adult stage. Two such substances have been isolated from *Ageratum houstonianum*, a small plant that grows in temperate regions. The two compounds are named prococene I and prococene II because of their ability to elicit precocious metamorphosis by preventing the secretion of juvenile hormone. Prococene II has a number of other effects as well: it terminates the production of sex attractants by the American cockroach, causes several types of insects to lay infertile eggs and forces the Colorado potato beetle to enter a hibernational state called diapause.

° When a Sitka willow is attacked by certain caterpillars, the nutritional quality of the leaves of neighboring willows-even those that have not been attacked-deteriorates.

All of these amazing plant chemical defenses have great potential for humans, as many of them could be the precursors to very novel, environmentally responsible pest control methods. 🌿

oooo Eric Zuelke, Editor

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FEATURE ARTICLE**SNAGS AND LOGS**

Vigorous, living trees provide wildlife with food and shelter, but what about dead or dying trees-or even logs? Just as they did when they were healthy and living, dead and dying trees are critical elements of habitat for many animals. Trees are like any living thing-they have an infancy, youth, maturity, old age, and death. And, as a tree ages and eventually dies, changes in its bark, wood, and other parts create habitat for animals suited to each stage in the life and death of the tree. Dead, standing trees are called snags, and when snags fall to the ground they are then called logs. Biologists are increasingly calling standing dead or dying trees "wildlife trees" in recognition of their enormous value to birds and other creatures

How Do Snags Help Wildlife?

Animals find shelter in snags. Cavities that have formed in the heart of a tree from disease or from the loss of limbs provides a place to nest for woodpeckers, nuthatches, chickadees, bluebirds, some owls, wrens, tree swallows, and many other birds as well as raccoons and squirrels. Snakes use tree cavities to shed their skin. Inside a tree, the snake is well hidden during this very vulnerable time. Existing cavities can form at any time during the maturity of a tree but woodpeckers

can actively excavate a nesting cavity much easier in the soft wood of a dead tree. When they move out of their hole other animals can enlarge the entrance hole and move in. Bats may also roost in tree cavities. Some bat species prefer to roost under the loose bark of a dead tree. The brown creeper, a small forest bird, will nest under loose bark. Ospreys, some hawks, and great homed owls will nest or use nests built on the tops of very tall snags. Cavities and loose bark can also serve a safe place to hibernate or metamorphose in the case of moths or butterflies.

Snags are very attractive to insects that help to decompose the various parts of trees. Birds, reptiles, and mammals eagerly seek these insects. Animals also eat the fungus that grows on dying trees. Besides using snags to find food, some animals use cavities and loose bark to store food. Snags, with their stripped and bare branches, also serve as great lookout perches for hawks, eagles, vultures, and other carnivorous birds that are large enough to find it awkward to perch on leafy branches.

How Do Logs Help Wildlife?

When a snag falls down and becomes a log, a completely new ecosystem is created. Tiny soil organisms, which add to soil nutrients through their metabolism, begin to decompose the log, only to be preyed upon by other organisms and insects, which also eat the bacteria and fungi that add to the decomposition process. These insects in turn provide food for all kinds of animals. Pileated woodpeckers, for example, can sometimes be found hammering a log apart with a powerful beak that has evolved for this purpose. Within the log, the woodpecker could find ants, beetles, and termites. What the pileated leaves behind in the gap it has made in the log, other birds can now easily reach the inner sanctum of the tree. Holes in logs can become traps for rain water which can become a place to drink or bathe. The rotting wood itself is wet because of chemical changes. This wetness in turn attracts salamanders and tree frogs. Logs can even become nurseries for the seeds of other trees, providing all the moisture and nutrients to nurture a seed into a healthy, new tree. Ferns and other forest plants also grow on rotting logs. Logs that have fallen in rivers and ponds provide resting areas for birds and turtles and safe havens for fish.

Snags and Logs in Your Backyard

If you are lucky enough to have a small woodlot, locate the snags or dying trees that are there, as well as the logs and other fallen woody debris. Diseased or dying trees or trees with hollow insides may have bracket fungi clinging to the bark. Noticeable populations of beetles can also indicate a dying tree. Trees that are dying begin to lose their leaves, then the small branches that support the leaves, then the larger branches and so on until there is only a single trunk left. This will then eventually fall to the ground. Trees may fall before this point because of lightning, storm breakage, fire, disease, insects, or a variety of other factors and begin the cycle of a log earlier in the decaying process.

In fact, you can never have too many snags or logs to suit your wildlife neighbors. However, you will need to decide which to keep and which to remove based on their height and their distance from your home. If a snag is likely to fall and hit your home, your neighbors' homes, or any other personal property of value, remove it. But save all snags that are not potentially dangerous. Try to also save as much fallen woody debris, including logs, as possible. This serves as important habitat for

NATURAL QUOTES

'There is pleasure in the pathless woods, there is rapture in the lonely shore, there is society where none intrudes, by the deep sea, and music in its roar; I love not Man the less, but Nature more.'

Lord Byron

ground-dwelling birds, mammals, and reptiles. "Cleaning" up the forest floor actually removes a whole layer of habitat, which in turn causes local extinction of all the animals that depend on it. Cleaning up the forest floor should be limited to small dry branches if it is done at all. Try to always keep the larger logs and branches where they have fallen.

If you do not have a forested property, it is possible to bring small logs in as part of your landscape. Logs placed in a backyard are especially useful if they are shaded most of the time and are positioned perpendicular to the line of a slope so that the soil moving down the slope is trapped against the log. The soil that accumulates next to the log will begin to foster soil organisms that will break down the log, and help make it more useful to larger animals.

Snags and logs can be improved for wildlife by encouraging vines to grow on them. Virginia creeper, greenbrier, and trumpet vine can be used as food and shelter for the animals using your snags and logs.

If you have a pond, a log partially submerged will help make the water more accessible to small animals and can serve as a resting area for turtles, frogs, and birds.

It is possible to create a fallen tree or log by cutting a living tree about 3/4 through the trunk and pushing it over. Called a hinge tree, this can provide food and shelter for ground-dwelling animals. It is also possible to create a snag by "girdling" the tree. Girdling involves cutting a band between one and six inches wide through the bark and completely around the tree. This prevents water and nutrients from moving up the bark from the ground to the leaves and eventually kills the tree.

A standing dead tree can remain in place for many years. Smaller trees come down sooner than large ones, but even they can last for several decades. This should be borne in mind by anyone considering the safety aspects of snags.

Beware of termites that can be brought into your house when you bring decaying logs into your yard. Keep decaying logs far away from your house and exclude them altogether from small yards. Check with your community association or local government about the legalities of having decaying logs in your backyard.

Not everyone views dead trees the same way and if your neighbors complain about your snag, tell them what you are doing and why; you might change their way of looking at standing dead trees. It is only by changing how we view the land around us that we can begin to help restore and nourish both it and its wildlife. 🌿

oooo Eric Zuelke, Editor

NATURAL COMMUNITY HIGHLIGHT**PIEDMONT FLOODPLAIN FORESTS**

Along the larger streams of the Delaware Piedmont, particularly White Clay Creek and Brandywine Creek, is a rich and diverse community that blurs the line between wetland and upland. These areas—floodplains—are flat terraces that are found adjacent to the river and just above the typical water level of the stream. However, during periods of high rainfall or snowmelt, these areas become inundated by the rising waters of the river. This periodic flooding has two important functions in the development of the floodplain community: it creates very rich, loamy soils through the deposition of alluvial sediments, and it functions as a frequent disturbance of natural community processes. While these soils provide habitat for some of our most diverse plant communities, this combination of nutrient-rich soils and frequent disturbance also creates ideal conditions for the establishment of invasive exotic species. Unfortunately, much of Delaware's floodplain habitats have become overrun with these invasive aliens. Nowhere in the state are the threats posed by invasive exotics more apparent than our floodplain forests.

Description

The canopy of Piedmont floodplain forests is typically dominated by *Platanus occidentalis* (sycamore) and *Fraxinus pennsylvanica* (green ash), with *Acer negundo* (box elder) predominating in the subcanopy. Other trees frequently encountered include *Juglans nigra* (black walnut), *Betula nigra* (river birch), *Acer saccharinum* (silver maple), *Liriodendron tulipifera* (tulip tree), *Acer rubrum* (red maple), and *Cornus florida* (flowering dogwood). *Lindera benzoin* (spicebush) is typically abundant in the shrub layer. The herb layer can be quite diverse, with common species including *Podophyllum peltatum* (mayapple), *Hydrophyllum virginianum* (Virginia waterleaf), *Arisaema triphyllum* (jack-in-the-pulpit), *Polemonium reptans* (Greek valerian), *Symplocarpus foetidus* (skunk cabbage), *Boehmeria cylindrica* (false nettle), *Impatiens capensis* (orange jewelweed), and *Viola* spp. (violets). One of our most spectacular wildflowers, *Mertensia virginica* (Virginia bluebells), is essentially restricted to these Piedmont floodplains. However, the herb layer of this community is prone to invasion by exotic species, which may reduce the diversity of native species. Common invasive exotics include *Rosa multiflora* (multiflora rose), *Microstegium vimineum* (Japanese stiltgrass), *Ranunculus ficaria* (lesser celandine), *Lonicera japonica* (Japanese honeysuckle), *Celastrus orbiculatus* (Oriental bittersweet), and *Alliaria petiolata* (garlic mustard). *Toxicodendron radicans* (poison ivy) is a common native vine that frequently climbs into the canopy.

Distribution

As previously noted, this community can be found in areas along White Clay Creek, but it is most well-developed along the Brandywine, which has the highest quality examples in the state. Although there are floodplain forests along streams on the Coastal Plain, they often have different dominant species, and are generally not as species rich. 🌿

◦◦◦◦ Peter Bowman, DE Natural Heritage Program Ecologist

DON'T MISS THESE UPCOMING EVENTS**AUGUST FIELD TRIPS**

Exploring an Atlantic White Cedar swamp, 10 August 2002, from 10 AM to 3 PM (or until). We will explore Atlantic white cedar swamps, in Sussex County, Delaware. Cedar swamps are home to a myriad of plant and animal species, including many rare plants such as curly grass fern, pitcher plants, roundleaved sundews, several species of bladderworts, grass pink orchid, rose pogonia, several beakrushes, just to name a few. Participants should bring hip boots or a change of foot gear, insect repellent, hand lens. Field trip leader: Keith Clancy. Meet in the parking lot at the McDonalds restaurant, north end of Milford, Rte 113 at 10 am. We will then caravan to several nearby cedar wetlands. To sign-up for this trip, or for more information please contact the DNPS at dnps@delawarenativeplants.org or call 302.674.5187.

Back by popular demand, Canoe/Kayak trip, 24 August 2002, from 10 AM – until? Since last year's trip was so popular, another kayak/canoe trip is planned along the diverse Browns Branch (a tributary of the Murderkill River). We will observe freshwater and brackish marsh habitats, as well as floodplain swamps, and a remnant bald cypress community. Bring sun/rain gear, sun block, life jacket(s), **your own canoe or kayak**, plenty of water. We will meet at the Browns Branch at Fork Landing Bridge (off Fork Landing Road west of Rte 1 and south of Frederica). To sign-up for this trip, or for more information please contact the DNPS at dnps@delawarenativeplants.org or call 302.674.5187. Also check out our website (www.delawarenativeplants.org) for more details

REFORESTATION PROJECTS

Want an opportunity to make a difference to our environment? The Delaware Native Plant Society (DNPS) is looking for volunteers to help with its reforestation projects. The DNPS has projects that will take place at three sites throughout Delaware from September to November, 2002.

In the fall of 2000, six DNPS members spent about half a day using this method to collect and plant about 2000 seeds on an acre of former agricultural land at Prime Hook State Wildlife Area. In the spring of 2001 we observed about 700 seedlings that had germinated from these seeds, a remarkable percentage. Today these seedlings are thriving and hold great promise for restoring a forest that was long gone. The direct seeding method has two main advantages over conventional reforestation projects: it is much cheaper and it results in the establishment of native species collected from local and indigenous populations.

Our reforestation projects will take place in New Castle County along Blackbird Creek at the Blackbird Creek National Estuarine Research Reserve, along Cedar Creek within the Cedar Creek Natural Area, Sussex County, and at the Center for the Inland Bays' James Farm Ecological Preserve on Indian River Bay, also in Sussex County.

Continued on page 6

LETTER FROM THE PRESIDENT*Continued from page 1*

that, yes indeed, it was smoke that I was sensing and that its origin was from Quebec wildfires. It all seemed so surreal.

But I digress, I wanted to relate a bit about the purpose of my trip to the Pine Barrens. I went on an excursion to photograph several plants that were formerly known from Delaware but not seen since the nineteenth century. I was especially interested in taking pictures of the bog asphodel, *Narthecium americanum*, and the golden-crest, *Lophiola aurea*. I was directed to a botanically rich and very well known bog near Martha's Furnace where both species, among many other interesting taxa, could be observed and photographed. The bog asphodel, according to herbarium records dated 1894 and 1895 (the only known Delaware collections), and as noted in R. Tatnall's (1946) *Flora of Delaware and the Eastern Shore*, was once known from two locations in Delaware. The site in Sussex County, a "swamp near Lewes" seemed like a reasonable spot to find this plant but the New Castle County site, "on damp railroad bank at VanDyke," seemed a bit far-fetched. The golden-crest, on the other hand, was last collected in Delaware in 1874. This unusual and very attractive plant was found in "pine-barren bogs between Gumboro and Laurel." I would have liked to have seen those bogs; a habitat now virtually absent from the state but quite abundant in south Jersey. Likewise, the "swamp near Lewes" is likely an extensive salt marsh along the former Lewes Creek (obliterated after the construction of the Lewes-Rehoboth Canal and subsequent inflow of salt water). I knew that if I were to ever photograph these plants I'd have to travel outside Delaware.

So, with much anticipation I walked along the old logging road that traversed a typical pine-barrens community of pitch pine, scrub oak, blackjack oak, heaths and bracken fern. And after a mile and a quarter hike I crossed one of the numerous rivers of the Pine Barrens and then after a brief walk further east, per my directions, I made a 90 degree turn and walked a short distance through the pine lands and then down a slope that opened-up into a spectacular sphagnum bog. I was awe-struck. The image before me was one of true beauty.

It was an otherworldly looking place full of insectivorous plants and other odd or uncommon plants. The bog asphodel numbered in the thousands. However, I was just a little disappointed since it was a few days past its prime. Nevertheless, the golden-crest, in all its splendor and almost as abundant, was at its flowering peak. It nearly made-up for my being late for the asphodel. In addition, there was an abundance of thread-leaved sundews, *Drosera filiformis*, two-formed pink or lance-leaved sabatia, *Sabatia difformis*, horned bladderworts, *Utricularia cornuta*, purple pitcher plants, *Sarracenia purpurea*, Carolina redroot, *Lachnanthes caroliniana*, pipeworts, *Eriocaulon* spp., grass-pink orchid, *Calopogon tuberosus*, rose pogonia, *Pogonia ophioglossoides*, and many other herbs including various sedges and grasses; too numerous to mention them all.

I could have spent the whole day there, so it was with great reluctance that I pried myself out of the bog and ventured back to the road. On my walk back I passed a couple, and I wondered if they were going to the place I just left. I stopped along the way picking and munching on delicious blueberries that were at their peak.

As I crossed the Delaware Memorial Bridge stuck in thick traffic that originated from the Jersey shore I couldn't

help but think that I alone, amongst all the thousands of motorists on that afternoon trip home, had the privilege and good fortune to see another world. A world of such exquisite and indescribable beauty that is quite hidden from view, surrounded by a veil of greenery that makes-up the pine barrens.

I hope that everyone is able to get out into the elements, forget about or thumb your nose at the heat, humidity, ticks and mosquitoes and enjoy the wild places, plants and animals that share our surroundings. It is definitely worth it.

In fact, just today I had the great fortune to be shown, by the state botanist of Delaware, Bill McAvoy, the only known Delaware location for the purple fringeless orchid, *Platanthera peramoena*. While I and another DNPS member, David Smith, prepared our cameras, Bill carefully removed the netted cage that encircled the only flowering stem of this plant in all of Delaware. Immediately after Bill removed the protective net a bee zoomed in to have a closer look. In fact, this was the first year in half a dozen that this species has made an appearance in Delaware. It was a beautiful sight and if I was a birder, or if botanists did such things, I could now add this species to my life list. I think I will anyways. I just hope the photos turn out!

I'd like to conclude this letter by again, encouraging everyone to get involved with their native plant society and, if you have a story or two to tell about a native plant outing, write it down and send it to the Turk's Cap editor; he'd love to hear from you.

DNPS activities will be picking-up this August and throughout the fall (see this issue for details). I hope to see many of you at these events. But, if you can't make them I hope you are able to enjoy native plants and their habitats in your own way.

Best wishes for a very cool summer! 🌿

Sincerely,

Keith Clancy

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EVENT HIGHLIGHTS**TREE TOP WOODS, RED CLAY CREEK**

A small group attended this outing on 20 April 2002, led by Janet Ebert and Jack Holt. Janet reported that participants were treated to a plethora of native and, alas, alien plants. There was quite a lot to see as they meandered throughout a diversity of habitats along the Red Clay Creek, in northern Delaware. A total of 218 species, amongst 73 families were observed, including 74 (or 34%) alien species, and 17 state rare plants. Highlights of the trip included seeing goldenseal (*Hydrastis canadensis*) in bloom, an immature fly-poison (*Amianthium muscaetoxicum*), columbine (*Aquilegia canadensis*), and early meadow rue (*Thalictrum dioicum*) along the railroad, yellow toadshade trillium (*Trillium luteum*) (apparently planted, certainly not native), the native nodding trillium (*Trillium cernuum*), and wild leeks (*Allium tricoccum*). The rare plants observed included the following: marginal woodfern, *Dryopteris marginalis*, rock polypody, *Polypodium virginianum*, woodland club-rush, *Trichophorum planifolium*, wild leeks, *Allium tricoccum*, fly-poison, *Amianthium muscaetoxicum*, and columbine, *Aquilegia canadensis* to name a few.

Continued on page 6

NATIVE PLANT HIGHLIGHT**BLADDERWORKS**

Species within the genus *Utricularia*, family Lentibulariaceae, are carnivorous, herbaceous aquatic plants commonly known as bladderworks. The common name refers to traps, or urn-like bladders borne on finely dissected leaves of the branches.

The trapping mechanism consists of a bladder, a hanging door, and four stiff bristles attached to the lower edge of the door. Tiny animals, particularly crustaceans brush against the bristles causing the door to spring open. Water then rushes into the bladder and carries the animal with it. Once the bladder is filled, the door snaps shut. The prey is then digested by enzymes secreted by the plant.

Bladderworks are perennial plants that are either aquatic free-floating plants without roots, or are terrestrial; terrestrial in the sense that they are anchored to the substrate by underground creeping stems. *Utricularia inflata* and *U. radiata* are examples of species that are free-floating. These species have distinctive swollen branches that look like "floats" that radiate from a node of the flowering stem like spokes of a wheel. *Utricularia resupinata* and *U. juncea* are examples of species that are terrestrial. The lower portions of their stems are subterranean and form mats of branched slender rhizomes, usually in saturated sandy soils.

The flowers of bladderworks are either yellow or purple. The flowers are two-lipped, the upper lip is erect and the lower lip is usually three-lobed with a spur, or tube-like projection. Flowers are borne on a leafless stem, or scape, and are one to several flowered. Fruit is a pod with several seeds.

Bladderworks can be identified when flowering without too much trouble, but they are often found only in their vegetative state. Usually as a mass of finely dissected leaf-like branches. With some effort and study, species can be named using only vegetative characters.

Thirteen (13) species are known from Delaware and all occur primarily in the Coastal Plain physiographic province of the state.

All species of bladderworks in Delaware, with the exception of one (*U. macrorhiza*), are considered to be rare or uncommon by the Delaware Natural Heritage Program. One species, *U. cornuta*, is historical in the state (last collected in 1923 from Sussex Co.), and another, *U. minor*, is thought to be extirpated, or gone from the state (last collected in 1863 from New Castle County).

Bladderworks occur in a variety of habitat types in Delaware. Some types are unique or specialized, such as Atlantic white cedar swamps and bogs, interdunal swales, sea-level fens, and coastal plain seasonal ponds. Other types are not so unique, such as slow moving streams and rivers. Others are artificial in their origins, such as millponds and abandoned sandpits.

The genus *Utricularia* in Delaware:

<i>Utricularia biflora</i> Lam.	two-flower bladderwort
<i>Utricularia cornuta</i> Michx.	horned bladderwort
<i>Utricularia fibrosa</i> Britt.	fibrous bladderwort
<i>Utricularia geminiscapa</i> Benj.	hidden-fruited bladderwort
<i>Utricularia gibba</i> L.	humped bladderwort
<i>Utricularia inflata</i> Walt.	large swollen bladderwort

<i>Utricularia juncea</i> Vahl	southern bladderwort
<i>Utricularia macrorhiza</i> Le Conte (syn.= <i>U. vulgaris</i> L.)	large bladderwort
<i>Utricularia minor</i> L.	lesser bladderwort
<i>Utricularia purpurea</i> Walt.	purple bladderwort
<i>Utricularia radiata</i> Small	small swollen bladderwort
<i>Utricularia resupinata</i> B.D. Greene ex Bigelow	northeastern bladderwort
<i>Utricularia subulata</i> L.	zigzag bladderwort 

oooo William McAvoy, DNPS Vice-president

DON'T MISS THESE UPCOMING EVENTS

Continued from page 4

We are looking for volunteers to help in this environmentally significant project. For more information about this project and to volunteer contact the Delaware Native Plant Society, by mail, at P.O. Box 369, Dover, DE, 19903, telephone at 302-674-5187, or by email at dnps@delawarenativeplants.org, or visit our website at www.delawarenativeplants.org.

The DNPS acknowledges the cooperation and support, for this project, of land managers with the Division of Parks and Recreation, and Soil and Water, Delaware Department of Natural Resources and Environmental Control, the Blackbird Creek National Estuarine Research Reserve, and the Center for the Inland Bays.

This project has received generous funding from the Partnership for the Delaware Estuary, Inc, the Delaware Estuary Program and the Environmental Protection Agency.

2ND ANNUAL DNPS NATIVE PLANT SALE

The Delaware Native Plant Society's 2nd Annual Native Plant Sale is scheduled for Saturday, November 2, 2002. It will take place at the St. Jones Reserve outside Dover. Plans are underway to ensure that this event will be bigger and better than our inaugural sale. We will be having a planning meeting sometime in August. Stay tuned for additional details. If you are interested in helping with this event (remember all volunteers receive a free native plant of their choice) please contact the

EVENT HIGHLIGHTS

Continued from page 5

DNPS ANNUAL MEETING: AN ENJOYABLE AFFAIR

The annual meeting held on May 4th at the St. Jones Reserve was quite a fun time. The morning was consumed with a great field trip to an old growth forest along the Maidstone branch in Kent County where we saw some great rich woods pockets and a few state rare plants. After luxuriating in the coolness of the forest shade, we retired to the air conditioned building at the St. Jones Reserve to partake of a delicious pot luck lunch and a presentation by Dr. Sue Barton of the University of Delaware on enhancing Delaware's highways with native plantings. The event was a wonderful success and fun was had by all. We hope to see you at this event next year. 

UPCOMING EVENTS

SATURDAY, 10 AUGUST 2002 – DELAWARE NATIVE PLANT SOCIETY FIELD TRIP TO AN ATLANTIC WHITE CEDAR SWAMP. FROM 10 AM TO 3 PM. FOR MORE INFORMATION CALL 302.674.5187, OR EMAIL AT DNPLANT@AOL.COM, AND SEE DETAILS INSIDE THIS ISSUE.

SATURDAY, 24 AUGUST 2002 – DELAWARE NATIVE PLANT SOCIETY KAYAK TRIP ON THE BROWNS BRANCH. FROM 10 AM TO WHENEVER. FOR MORE INFORMATION CALL 302.674.5187, OR EMAIL AT DNPLANT@AOL.COM, AND SEE DETAILS INSIDE THIS ISSUE.

SATURDAY, 28 SEPTEMBER 2002 – HARVEST MOON REVEL AT THE COVERDALE FARM. FROM 5 PM TO MID-NIGHT. FARM TOURS, AUCTION, LOTS OF FOOD, SQUARE DANCING. FUN ACTIVITIES FOR KIDS AND ADULTS. FOR MORE INFORMATION CALL 302.239.2334, OR ON THE WEB AT WWW.DELAWARENATURESOCIETY.ORG.

SATURDAY, 28 SEPTEMBER 2002 – DELAWARE CENTER FOR HORTICULTURE TREE SPREE. AT THE CAROUSEL PARK FROM 10 AM TO 2 PM. THE FAIR WILL FEATURE TREE PLANTINGS, NATURE HIKES, LIVE DEMONSTRATIONS AND EXHIBITS, CHILDREN'S ACTIVITIES, HAYRIDES, AND A CEREMONIAL TREE PLANTING. FREE NATIVE TREE SEEDLING GIVEAWAY! CELEBRATION WILL BE HELD RAIN OR SHINE! FREE AND OPEN TO THE PUBLIC. FOR MORE INFORMATION CALL 302.658.6262, OR ON THE WEB AT WWW.DEHORT.ORG.

SATURDAY, 05 OCTOBER AND SUNDAY, 6 OCTOBER 2002 – HARVEST MOON FESTIVAL AT THE COVERDALE FARM. FROM 10 AM TO 5 PM. MUSIC, ARTS AND CRAFTS, FARM ANIMALS, HISTORY PROGRAMS, GAMES, HAYRIDES, HIKES. FOR MORE DETAILS CALL 302.239.2334, OR ON THE WEB AT WWW.DELAWARENATURESOCIETY.ORG.

SATURDAY, 02 NOVEMBER 2002 – SECOND ANNUAL DELAWARE NATIVE PLANT SOCIETY NATIVE PLANT SALE. MORE DETAILS WILL BE GIVEN LATER. FOR MORE INFORMATION CALL 302.674.5187, OR EMAIL AT DNPLANT@AOL.COM, AND SEE INSIDE THIS ISSUE.

DNPS BI-MONTHLY MEETINGS FOR 2002 – ARE CURRENTLY SCHEDULED THE 3RD TUESDAY OF EVERY OTHER MONTH (EXCEPT MAY). OUR NEXT MEETINGS WILL BE, SEPTEMBER 17, AND NOVEMBER 19, 2002. MEETINGS WILL TAKE PLACE, UNLESS OTHERWISE NOTIFIED, AT 7 PM AT THE AQUATICS RESEARCH AND EDUCATION CENTER, WOODLAND BEACH WILDLIFE AREA, RTE 9 (4876 HAY POINT LANDING ROAD) ABOUT 1 MILE NORTH OF RTE 6. WITH THE EXCEPTION OF THE JANUARY MEETING, WE WILL HAVE GUEST SPEAKERS AT EACH MEETING (SPEAKERS AND THEIR TOPICS TBA AT A LATER DATE). ACTIVITIES MEETING WILL TAKE PLACE AFTER EACH SEMINAR. CHECK OUR WEBSITE FOR ADDITIONAL DETAILS OR EMAIL US AT DNPS@DELAWARENATIVEPLANTS.ORG.

Announcement New Officers* elected

Congratulations to the following individuals who were elected to 2 year terms (2002-2004) at the DNPS 4th Annual Meeting which was held 4 May 2002:

President	Keith Clancy
Vice-president	William McAvoy
Secretary	Rick Mickowski

* Eric Zuelke remains as Treasurer (his term ends in 2003)

Membership Application

DELAWARE NATIVE PLANT SOCIETY

Member Information

Name: _____

Business Name or Organization: _____

Address: _____

City and Zip Code: _____

Telephone (home/work): _____

E-mail address: _____

- ☐ Individual \$15.00
- ☐ Full-time Student \$10.00
- ☐ Family or Household \$18.00
- ☐ Contributing \$50.00
- ☐ Business \$100.00
- ☐ Lifetime \$500.00
- ☐ Donations are also welcome \$ _____

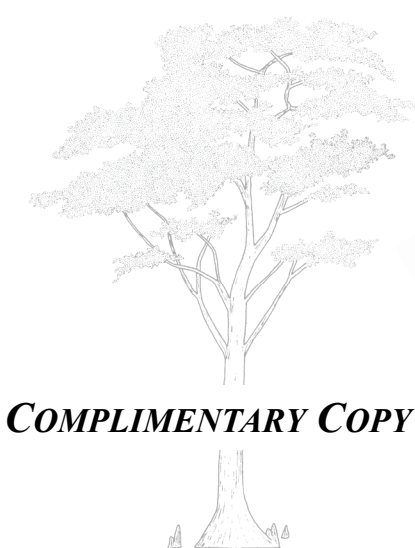
Membership benefits include:

- * The DNPS quarterly newsletter, *The Turk's Cap*
- * Native plant gardening and landscaping information
- * Speakers and field trips

Total Amount Enclosed: \$ _____

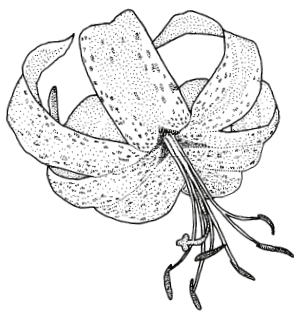
**Make check payable to:
DE Native Plant Society
P.O. Box 369, Dover, DE 19903**

**DELAWARE NATIVE PLANT SOCIETY
P.O. BOX 369
DOVER, DELAWARE 19903**



COMPLIMENTARY COPY





The Turk's Cap

THE NEWSLETTER OF THE DELAWARE NATIVE PLANT SOCIETY AUTUMN 2002

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HOW CAN I GET INVOLVED?

The Delaware Native Plant Society is open to everyone ranging from the novice gardener to the professional botanist. One of the primary goals of the society is to involve as many individuals as possible.

The DNPS is working on some significant projects at this time. We have begun a reforestation project at Prime Hook State Wildlife Area and will do direct-seeding reforestation projects along Blackbird and Cedar Creeks, originally scheduled for 2002, but now postponed until 2003. In addition, help is needed with our native plant nursery at the St. Jones Reserve, near Dover. We encourage you to participate in these, and other DNPS endeavors.

For more information on how to get involved, E-mail us at dnps@delawarenativeplants.org. Or visit the new DNPS website at www.delawarenativeplants.org. Our website will have all of the past issues of *The Turk's Cap* along with a large section on native plants, as well as links to other environmental and

A CALL FOR ARTICLES

If you would like to write an article for The Turk's Cap, we would love to print it. With like minded individuals as an audience, The Turk's Cap is a great venue for plant or habitat oriented writings.

We'll take just about anything from gardening tips to book reviews to poetry. Of course, it has to be about native plants, or issues related to native plants; just a minor constraint. Your imagination is the real key.

Contact Eric Zuelke for more information at (ezuelke@juno.com), or Keith Clancy at 302.674.5187.

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A WARM SLICE OF PUMPKIN PIE WELCOME TO OUR NEWEST MEMBERS

July through September

Leo Brady
 Sandra Dennison-James
 Keith Fitzgerald
 Dale Hendricks/North Creek Nurseries, Inc.
 Terrance Higgins
 Gina Mullen
 Sara Romano
 Debbie Soja
 Regina Toy

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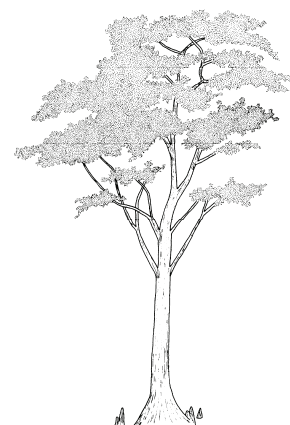
LETTER FROM THE PRESIDENT

Oh where, oh where did the summer go? I blinked and it was gone. Now, we are in the midst of the usually colorful and always cooler days of autumn. However, this fall colors look like they will be less spectacular and more muted than usual; possibly due to the ongoing drought. Also, because of the drought our direct-seeding reforestation projects planned for September and October have been postponed until the fall of 2003. Forest stands, near the Blackbird and Cedar Creek reforestation sites, were surveyed in late August. The surveys were not very promising, as lots of aborted or empty acorns and hickory nuts were observed on the ground and very little seen on the trees. We were able to obtain an extension on our grant because of this situation, and hopefully, the fall of 2003 will

Continued on page 3

The DNPS Vision

The purpose of the Delaware Native Plant Society (DNPS) is to participate in and encourage the preservation, conservation, restoration, and propagation of Delaware's native plants and plant communities. The Society provides information to government officials, business people, educators, and the general public on the protection, management, and restoration of native plant ecosystems. The DNPS encourages the use of native plants in the landscape by homeowners, businesses, and local and state governments through an on-going distribution of information and knowledge by various means that includes periodic publications, symposia, conferences, workshops, field trips, and a growing statewide membership organized by the DNPS.



LETTER FROM THE EDITOR**THE ALASKA-DELAWARE CONNECTION**

Hello all. I hope everyone has had a super summer. Mine was hot, but I got to escape the heat for awhile as I had the fantastic opportunity this past August to visit Alaska for 8 days, specifically Denali National Park, and was it great!

I saw some incredible sights; Grizzly bear, Caribou, Dall sheep, a wolf, a wolverine, 8 new species of birds for my life list, the 20,320 foot Mt. McKinley (the tallest point in North America), glaciers and an ice cave. But some of the most intriguing sights were the plants. In fact, I was so in awe by the similarity of certain plants in Alaska to those of Delaware that I decided to design this issue of *The Turk's Cap* with an Alaskan theme. Much of Alaska is considered arid in terms of annual precipitation levels and soil characteristics, so certain plants that grow on our Delaware beaches and dunes have something in common with their Alaskan brethren. And believe it or not, Delaware and Alaska are in the same floristic region because of evolutionary, climatologic and geologic forces, as our Feature Article illustrates. Our Native Plant Highlight is about *Arc-tostaphylos uva-ursi* (bearberry) of which we only know of one population here in Delaware, but was plentiful on the open tundra of Alaska. And the Natural Community Highlight presents cranberry swale habitats, which occur in similar dune habitat as bearberry here in Delaware, and is a very common community on the Alaskan tundra.

If you ever get the chance to go to Alaska, do it, regardless of time or money. It's a beautiful place, and the opportunities for adventure are limitless. 🍄

°°°° Eric Zuelke, Editor

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PLANT-ANIMAL HIGHLIGHT**THE BIG AND LITTLE OF ALASKA****What do blueberries, mosquitoes and grizzly bears have in common?**

That may sound like the start of a joke, but in Alaska it's serious business. It turns out that one of the largest mammals in North America is dependent on one of the smallest insects for its survival. About the time August rolls around in Alaska, the Grizzly bears (*Ursus arctos horribilis*) are getting ready for winter by consuming as much food as possible on a daily basis to build up insulating layers of fat on their muscle to help them survive their semi-hibernation during the six to eight months of winter snow and ice. And one of the primary food sources on their list is blueberries (*Vaccinium* spp.). Though most of us think of mosquitoes as vicious predators out for blood, they are important pollinators as well. Male mosquitoes drink only sugary fluids such as flower nectar. Since they vigorously probe the flowers of certain plants, and can distinguish between different types of sugars, they play an important role in the pollination of certain plants. Female mosquitoes also drink sugary fluids, but will normally require the nutrients and protein of a blood meal to help the maturation of eggs they will later lay in stagnant water sources.

Blueberries have entomophilous (insect loving) flowers and though they are primarily pollinated by bees and black flies, the morphology of blueberry flowers is one factor that makes them attractive to mosquitoes as well. They have fused petals that are only open at the end, the nectaries are at the base

of the ovary and are very fragrant so they attract the insect deep into the flower, the pollen is heavy, sticky, and not wind blown, the stamens are shorter than the style so pollen cannot fall onto the stigma, and the style is flanged to prevent self pollination. These characteristics of the flower also make it hold heat and the mosquitoes use them as a heat source too while inadvertently pollinating them.

Mosquitoes are one of the least liked insects, but their role in blueberry pollination, makes them a significant part of the life cycle of this plant, and a noteworthy player in the survival of the Alaskan grizzly bear. 🍄

°°°° Eric Zuelke, Editor

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FEATURE ARTICLE**PHYTOGEOGRAPHY**

Plant biogeography-or phytogeography- is a science that seeks to establish patterns of order to the tremendous diversity of global plant life and attempts to explain why certain species occur in one geographical area but not another.

One of the most basic concepts of this discipline is focusing attention to the hierarchy of the assemblages of organisms. This hierarchy begins with the massive scale of the biosphere (the complete worldwide environment of the planet). As you descend the hierarchy of assemblages, you encounter biomes first (the broadest subdivision of the biosphere: an assemblage and association of plants and animals, with some examples of major biomes being: forest, grassland, desert, tundra, etc.). Next are ecosystems, then communities, habitats, micro-habitats, populations, and finally the individual organisms themselves.

Another basic concept to this hierarchy of organization and the overall geographic distributions of plants is that it is wholly defined by different aspects of time. Prehistoric, present moment, and future time frames have all played, currently play, or will play a role in phytogeographic distributions. It is agreed among many scientists that the earth has experienced several major phases of rapid environmental change, and the period that affects us most directly now is traced back to the Cretaceous period. At this time, land masses were uniform in elevation and climate was less varied than today. This allowed for the unchecked spread of organisms throughout the continents. During the Tertiary period the earth began to take on the shape we see today; many land bridges were covered by rising seas, volcanism and plate tectonics formed many of the high mountain ranges of the world, which consequently created new patterns of air movement in the upper troposphere. It was also in this time that a period of global cooling occurred and that set the stage for the Pleistocene ice ages. All of these changes gave rise to significant global diversification of plant groups by breaking up old cosmopolitan groups and forming new regional and local populations that caused species to remain in areas with similar environmental and geological characteristics, but spread out within the confines of those areas. The boundaries of these areas are formed by temperature, water, radiation (light in different wave lengths), chemicals, wind, magnetic and electrical components.

Present moment and future time frames define plant distribution by physical and biological factors that either supply the requirements for the biochemical processes that sustain

plant life (light, temperature, humidity, and moisture), or that represent sources of stress and disturbance (humans, erosion, fire, pollution, flooding, wind, insects, grazing, avalanches, topography, and characteristics of the soil). Included in this list of factors are two additional features. The first is plant tolerance-the range of stress and disturbance that a plant is able to withstand without damaging effects: plants with high tolerance have high habitat versatility (and larger geographic ranges), and the second is adaptation-the response to stress and disturbance by increasing tolerance and thereby habitat versatility. There are two types of adaptation; acquired (the change in form or function of an individual plant during its lifetime, an example is growing away from shade), and genetic (new traits in a plant population inherited by future generations). Climatic changes, the evolution of competitors, disease and animal activity also help to destroy, separate, alter or enlarge the areas where certain taxa will thrive. Then, the nature and efficiency of seed dispersal, the speed with which a species can establish itself in new localities, the ecological requirements of the plant, and the taxon's geographic center of origin are all factors that affect the spread of a taxon within a particular ecological area. One result of all these processes and facets to biome formation is that North America from Florida north to Hudson Bay and west to Colorado and northwest through the Yukon Territory and southern half of Alaska is all in the same floristic region.

Phytogeography is a huge topic and this is just the tip of the iceberg. There are many books on the topic if you have an inquisitive mind. Also refer to *The Turk's Cap*, Volume 3, Number 4 for a discussion on phytogeography in Delaware. 🐿

◊◊◊◊ Eric Zuelke, Editor

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LETTER FROM THE PRESIDENT

Continued from page 1

be better for seed production, though we will make one attempt to find some seeds at Blackbird State Forest this fall.

I want to invite all members to attend our upcoming second Annual Native Plant Sale, scheduled for November 2, 2002 at the St. Jones Preserve (see announcement elsewhere in this newsletter). We have more than 300 specimens of native trees, shrubs, vines and a few herbs for sale at very low prices. Many of these have been donated by DNPS members. I hope to see you there.

We also have scheduled a field trip on 20 October 2002 to The Nature Conservancy's Jackson Coastal Plain Pond Preserve near Henderson, Maryland. Bill McAvoy will lead us to a series of Delmarva Bays or seasonal ponds where we will get a glimpse of these pond's interesting flora and unique ecology (more details in the Upcoming Events).

Our final field trip this fall will be to collect seeds at Blackbird State Forest on November 10, 2002 (details in the Upcoming Events). I hope that all of you will be able to attend one or more of these events.

Please accept my apologies for this short letter but since I have assumed the position of visiting assistant professor at Delaware State University (for the fall semester only) my time for DNPS business has been significantly reduced. I am teaching 2 courses (new for me) and I am designing a laboratory for one of these (basic ecology) from scratch as the

NATURAL QUOTES

As if some little arctic flower,
Upon the polar hem,
Went wandering down the latitudes,
Until it puzzled came
To continents of summer,
To firmaments of sun,
To strange, bright crowds of flowers,
And birds of foreign tongue!
I say, as if this little flower
To Eden wandered in--
What then? Why, nothing, only
Your inference therefrom!

Emily Dickinson

semester progresses. I will be able to devote more time to the society at the end of this semester.

I hope everyone has a great Autumn!

Sincerely,

Keith Clancy

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NATIVE PLANT HIGHLIGHT

BEARBERRY

Arctostaphylos uva-ursi (L.) Spreng. (bearberry, kinnikinnick) is in the family Ericaceae (Heath family), and is a native perennial evergreen shrub/subshrub. This shrub usually grows no more than six inches tall and has multiple stems that snake along the ground. The finely textured velvety branches are initially white to pale green, becoming smooth and red-brown with maturity. The shiny, leathery, spatula-shape leaves of this broadleaf evergreen are alternately arranged on branches. Each leaf is held vertically by a twisted leaf stalk. The dark green leaves are an inch long and have rounded tips tapering back to the base. In fall, the leaves begin changing from a dark green to a reddish-green to purple. It is normally found in well drained soils and has a high tolerance to salinity and drought conditions. Terminal clusters of small urn-shaped flowers bloom from May to June. The perfect flowers are white to pink, and bear round, fleshy or mealy, bright red to pink fruits called drupes. This smooth, glossy skinned fruit will range from 1/4 to 1/2 inch in diameter. The fruit will persist on the plant into early winter. This long-lived, low growing shrub is very cold tolerant. It prefers coarse well drained to excessively drained soils of forests, sand dunes, bald or barren areas. It does not tolerate moist or poorly drained habitats. Although bearberry is often found growing on the open sand dunes, like those on our Delaware beaches or the open tundra like that in Alaska, it can grow well under the partial shade of forest canopies also.

This plants native range is from Labrador to Alaska, south to Virginia, Illinois, Nebraska, and in the mountains from New Mexico north through California to Alaska. A lone population was recently discovered in Delaware along one of our

southern beaches, and is the only known population of bearberry for the state.

Native North Americans have used the berries of this plant, which they call kinnikinnick, for generations as a food source. The berries are also used by trappers, traders, and explorers. Most native Americans rely on game animals as a source of meat and they will often make pemmican with the meat as a travel/trail food. Pemmican is a mixture of meat (both dried/smoked and powdered) with rendered animal fat (aka suet, lard) and dried berries (kinnikinnick berries, blueberries, chokeberries, wild cherries, or apples), and nuts. Coastal native Americans would often substitute the red meat with fish. The berries of this plant are also used by native Americans as a stew flavoring and for medicinal purposes, and the dried leaves to make tea for medicinal purposes, and a tobacco for smoking. ♣

oooo Eric Zuelke, Editor

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NATURAL COMMUNITY HIGHLIGHT

INTERDUNAL SWALES

Scattered in amongst the dunes of the Atlantic Coast, interdunal swales are tiny wetlands, frequently only a few square meters in size. However, despite their small size, interdunal swales have great conservation significance. Part of this significance comes from the fact that, although they are often little more than a few hundred meters from the ocean, their water comes entirely from precipitation, making them freshwater wetlands. These freshwater conditions, in conjunction with the extremely nutrient-poor sandy soils, creates an unusual habitat that is home to unique communities of plants. In addition to these plant communities, there is an insect, the Bethany Beach firefly (*Photuris bethaniensis*), that is known only from Delaware's interdunal swales, and nowhere else in the world. It is another reminder that the conservation of natural communities helps to protect the full range of native species.

Cranberry Interdunal Swale

Vaccinium macrocarpon Dwarf-shrubland
Large Cranberry Dwarf-shrubland

Description

This swale community is defined as a "dwarf-shrubland" because of the dominance of *Vaccinium macrocarpon* (large cranberry), which is an evergreen trailing shrub. While this species is generally dominant, a number of rushes, sedges, grasses, and forbs co-occur and often obscure the low-growing cranberry. Other woody species that occasionally occur in the swales include *Acer rubrum* (red maple), *Vaccinium corymbosum* (highbush blueberry), and *Myrica cerifera* (wax-myrtle). Associated herbaceous species include *Drosera intermedia*, *Lycopodiella appressa* (creeping clubmoss), *Utricularia juncea*, *Xyris difformis* (pink-based yellow-eyed grass), *Xyris torta* (twisted yellow-eyed grass), and a moss species *Polytrichum commune*. Less frequent species encountered often include species found in adjacent swale communities, including the previously described type: *Cladium mariscoides* (twig-rush), *Schoenoplectus pungens*, *Juncus canadensis*, *Juncus dichotomus*, *Juncus biflorus* (grassleaf rush), *Euthamia tenuifolia* (slender fragrant goldenrod), *Polygala cruciata* (crossleaf milkwort), *Pogonia ophioglossoides* (rose pogonia), *Platanthera blephariglottis*

(white fringed orchid), *Panicum rigidulum*, *Panicum verrucosum*, *Rhynchospora capitellata* (brownish beak-rush), *Rhynchospora scirpoides* (long-beaked bald rush), and *Andropogon virginicus* (broom-sedge).

Dynamics

Interdunal swales are a unique part of the mosaic of beach and dune communities that occur along our Atlantic coast. Swales are not static communities. Because of the intense forces of wind and water along the coast, swales are subject to potentially rapid changes. They can be highly stressed by salt water that washes over the dunes during a strong storm. These strong storms can also shift the dune sands to the point that the swale is buried entirely. However, the forces that can destroy these swales are the same ones that can create them. Strong storm winds can create a "blow-out," or depression in the dunes that is deep enough to intersect the water table and provide appropriate conditions for the establishment of characteristic swale species.

Succession

The successional processes at work in interdunal swales have not received significant study. However, it is reasonable to presume that, like in other habitats, if the conditions remain fairly stable, that larger woody species will invade and eventually take over the habitat by shading out herbaceous competitors. Of the woody species listed above, wax-myrtle is the species most likely to dominate as succession proceeds, while woody vines such as poison ivy (*Toxicodendron radicans*) and Virginia creeper (*Parthenocissus quinquefolia*) would also become increasingly abundant. Of course, in such a dynamic habitat, the storm surges that can inundate a swale with saltwater can also kill these woody species, creating sunny openings that would allow the cranberry and other herbs to become re-established, beginning the process anew.

Distribution

The only occurrences of this community in Delaware are found at Cape Henlopen State Park. Cranberry swale communities can be found from Maryland to Massachusetts. ♣

oooo Peter Bowman, DE Natural Heritage Program Ecologist



EVENT HIGHLIGHTS**BROWNS BRANCH KAYAK/CANOE TRIP**

This trip was taken on 24 August 2002 in Kent County. The day dawned to a downpour that lasted several hours before it stopped just as the trip began. As we put in at Fork Landing Bridge at Big Cripple Swamp, two crabbers were casting their crab pots off the bridge and in just a few minutes had caught several crabs.

Under cloudy and threatening skies we paddled effortlessly downstream along the Browns Branch towards Frederica. The Browns Branch, a tributary of the Murderkill River, is a beautiful, meandering stream that is bordered by floating and emergent marshes, shrublands and narrow fringe forests. After an hour of paddling, we entered the Murderkill River and then continued downstream another hour or two. The scenery along both these waterways was similar. The vegetation of these streams was quite diverse. A few examples of plants we observed included: spatterdock, *Nuphar lutea*, pickerelweed, *Pontederia cordata*, barnyard grass, *Echinochloa walteri*, swamp rosemallow, *Hibiscus moscheutos*, spotted water-hemlock, *Cicuta maculata*, water parsnip, *Sium suave*, Virginia wild-rye, *Elymus virginicus*, cardinal flower, *Lobelia cardinalis*, water willow, *Decodon verticillatus*, royal fern, *Osmunda regalis*, marsh fern, *Thelypteris palustris*, ground-nut, *Apios americana*, fringe tree, *Chionanthus virginicus*, sweet bay magnolia, *Magnolia virginiana*, arrowwood, *Viburnum dentatum*, winterberry, *Ilex verticillata*, smooth alder, *Alnus serrulata*, silky dogwood, *Cornus amomum*, marsh dogwood, *Cornus foemina*, sweet pepperbush, *Clethra alnifolia*, swamp rose, *Rosa palustris*, poison-ivy, *Toxicodendron radicans*, red maple, *Acer rubrum*, green ash, *Fraxinus pennsylvanicum*, and many others.

On our paddle back the skies opened-up and we were drenched by the late afternoon thunderstorm. The rains only lasted about 10 minutes, enough to soak us but also served to refresh. 🌿

OCTARARO NATIVE PLANT NURSERY

This joint trip with the Pennsylvania Native Plant Society was held on 28 September 2002. It was hosted by Jim Mackenzie, manager of the nursery. The folks up there have quite a setup to say the least! We were shown the entire nursery and even some streamside restoration projects they have going on right now. The Octararo Nursery is a wholesale operation only, and they do some big business with thousands of plants going out each spring and summer for contracted jobs. They do a fair amount of business in the autumn, but this is really the time that they clear the shelves to get ready for propagation activities in the late winter and early spring. Their operation employs some great technology like drip irrigation, temperature controlled greenhouses, specialized pots for certain species of plants, water beds for aquatic species and other assorted tools to help them with the high volume of business they do. But they also have some old fashioned elbow grease in the form of the local Amish community who come and work at the nursery and get their hands dirty every spring filling pots with dirt and planting seeds and cuttings in them.

The tour of the nursery was great. Jim was a perfect host, and we came home with some great ideas for our nursery. 🌿

RESOURCES AND REVIEWS**PLANTS DATABASE WEBSITE**

This is a fabulous website created by the US Department of Agriculture, National Resources Conservation Service. The site consists of a database of thousands of plants and each entry includes photographs, a range map, the full taxonomic classification (from kingdom down to species), threatened and endangered status, wetland status and species accounts. This database is full of information and could be invaluable to anyone needing specific information about just about any plant in the country. You can find it at <http://plants.usda.gov>.

WEBSITE FOR MEDICINAL AND EDIBLE PLANTS

If you're into cooking with wild plants, or using plants for holistic or herbal medicine then this website could be a great resource. At <http://www.herbalartsclearinghouse.com>, you can find a ton of information on topics ranging from guides to plants, uses of medicinal plants, conservation organizations, cooking with wild plants, identifying poisonous plants in the wild, and wilderness survival. This website has something for everyone, from cooking tips for the family to surviving those wilderness backpacking adventures to Alaska, or your favorite mountain climbing spot.

PLANTS OF THE NORTH WEBSITE

This is an equally informative website about the vegetation of the northwoods. The site also consists of a database with hundreds of plants and each entry includes photographs, alternate common names, the full taxonomic classification (from kingdom down to species), a description of the plant, habitats, plant and animal associates, uses, and reproduction. While limited to species of the northwoods only, it is packed with data and would be particularly useful for an adventure to Alaska, Canada, or the Northeast US. You can find it at <http://www.rook.org/earl/bwca/nature/flora.html>.

BOTANICAL SOCIETY OF AMERICA WEBSITE

If you happen to be a hard-core plant enthusiast, then you're probably already a member of this society. If not, then you should check out this website. Created by the Society, it has membership information and services, access to many different botanical journals with search engines, employment announcements, and lots of links to other botanical websites. You can find it at <http://www.botany.org>.



2nd Annual Native Plant Sale

When: Saturday, 2 November 2002, 10:00 am – 3:00 pm

Where: DE Native Plant Society's native plant nursery. Directions: St. Jones Reserve, take Route 1/Route 113 to just south of the Dover Air Force Base to the Route 9/Kitts Hummock Rd. intersection; go east on Kitts Hummock Road about 1 mile to the entrance of the St. Jones Reserve (located right next to the John Dickinson Mansion).

What's for sale: Hundreds of trees (oaks, hickories, maples, pines), shrubs (blueberry, chokeberry, pepperbush, viburnum), and a few native herbaceous species will be available at very reasonable prices.

For more information: Call 302.674.5187 or email dnp@delawarenativeplants.org.

We had a great sale last year (despite the wind and rain) and hope to have an equally great sale this year. So come out and join the fun!



UPCOMING EVENTS

SUNDAY, 20 OCTOBER 2002 – DNPS FIELD TRIP TO VISIT SEASONAL PONDS (AKA COASTAL PLAIN PONDS, DELMARVA BAYS). WE WILL MEET AT THE PARKING AREA AT MUD MILL POND, SOUTH EAST CORNER OF POND ON MUD MILL RD, KENT CO., DE, AT 10 AM. MUD MILLPOND IS ABOUT 12 MILES SW OF DOVER, AND ABOUT 3.5 MILES SOUTH OF MARYDEL. ONE WAY TO GET THERE: FROM RTE 10/RTE 13 INTERSECTION TAKE RTE 10 WEST THROUGH CAMDEN TO WILLOW GROVE. AT WILLOW GROVE TAKE MUD MILL ROAD WEST TO MUD MILLPOND (WHICH IS ON THE MD-DE STATE LINE). WE WILL TRAVEL ABOUT 5 MINUTES INTO MARYLAND TO VISIT THE NATURE CONSERVANCY'S JACKSON LANE COASTAL PLAIN SEASONAL POND PRESERVE. WE WILL BE EXPLORING A COMPLEX OF 9 PONDS WITH THE FOLLOWING RARITIES: ELEOCHARIS MELANOCARPA, FIMBRISTYLIS PERPUSILLA, HOTTONIA INFLATA, BOLTONIA ASTEROIDES, AND HYPERICUM DENTICULATUM. WE WILL BE STUDYING THE PLANT LIFE OF THESE PONDS AND DISCUSS THE ECOLOGY AND FORMATION. FIELD TRIP LEADER WILL BE WILLIAM MCAVOY. PLEASE DRESS APPROPRIATELY FOR LATE OCTOBER. IF YOU PLAN ON ATTENDING THIS TRIP OR NEED ADDITIONAL INFORMATION PLEASE CALL 302.674.5187.

SATURDAY, 02 NOVEMBER 2002 – MIDDLE RUN NATURAL AREA TREE PLANTING. HELP DELAWARE NATURE SOCIETY PLANT 500 TREES ALONG THE EAST SIDE OF MIDDLE RUN IN NEW CASTLE COUNTY'S MIDDLE RUN NATURAL AREA PARK, NEWARK, DELAWARE. PLEASE DRESS FOR THE WEATHER AND WEAR LONG PANTS, GLOVES AND STURDY SHOES; WE WILL PLANT RAIN OR SHINE. PLANTING INSTRUCTIONS AND REFRESHMENTS WILL BE PROVIDED. PLEASE BRING A SHOVEL AND A GALLON MILK JUG FULL OF WATER AND TO REFILL. THANKS!! IMPORTANT !!!! IF YOU OR YOUR GROUP ARE PLANNING TO ATTEND, PLEASE CONTACT THE DELAWARE NATURE SOCIETY, 302.239.2334 EXT. 34; MELISSA@DNSASHLAND.ORG. WE NEED TO KNOW NUMBERS FOR REFRESHMENTS AND WE MAY NEED TO CALL YOU IN CASE OF SEVERE WEATHER. GROUPS SHOULD PARK ACROSS THE STREET AT THE POLLY DRUMMOND HILL SHOPPING CENTER AND WALK ACROSS THE ROAD. PLEASE CONTACT MELISSA MCDERBY AT THE MORE INFORMATION, AND ON THE WEB AT WWW.DELAWARENATURE SOCIETY.ORG.

SATURDAY, 02 NOVEMBER 2002 – SECOND ANNUAL DELAWARE NATIVE PLANT SOCIETY NATIVE PLANT SALE. FOR MORE INFORMATION CALL 302.674.5187, OR EMAIL AT DNPLANT@AOL.COM, AND SEE INSIDE THIS ISSUE.

SATURDAY, 10 NOVEMBER 2002 – FROM 10 AM TO 1 PM. WE WILL MEET AT THE HEADQUARTERS OF THE STATE FOREST OFF OF BLACKBIRD FOREST RD. (NORTH OF VANDYKE-GREENSPRING RD.). SEEDS THAT WE COLLECT, MINUS THOSE THAT MEMBERS WANT TO KEEP, WILL BE CLEANED AND STORED AND GIVEN PROPER PRE-TREATMENT FOR THE BEST RATE OF GERMINATION POSSIBLE. SEEDLINGS WILL ULTIMATELY MAKE THEIR WAY TO OUR NURSERY AT THE ST. JONES RESERVE. CALL 302.675.5187, OR EMAIL US AT DNPS@DELAWARENATIVEPLANTS.ORG IF YOU PLAN ON ATTENDING OR HAVE ANY QUESTIONS.

DNPS BI-MONTHLY MEETINGS FOR 2002 – ARE CURRENTLY SCHEDULED THE 3RD TUESDAY OF EVERY OTHER MONTH (EXCEPT MAY). OUR NEXT MEETINGS WILL BE, 19 NOVEMBER 2002, AND 21 JANUARY 2003. MEETINGS WILL TAKE PLACE, UNLESS OTHERWISE NOTIFIED, AT 7 PM AT THE AQUATICS RESEARCH AND EDUCATION CENTER, WOODLAND BEACH WILDLIFE AREA, RTE 9 (4876 HAY POINT LANDING ROAD) ABOUT 1 MILE NORTH OF RTE 6. WITH THE EXCEPTION OF THE JANUARY MEETING, WE PLAN TO HAVE GUEST SPEAKERS AT EACH MEETING (SPEAKERS AND THEIR TOPICS TBA AT A LATER DATE). CHECK OUR WEBSITE FOR ADDITIONAL DETAILS OR EMAIL US AT DNPS@DELAWARENATIVEPLANTS.ORG.

Membership Application

DELAWARE NATIVE PLANT SOCIETY

Member Information

Name: _____

Business Name or Organization: _____

Address: _____

City and Zip Code: _____

Telephone (home/work): _____

E-mail address: _____

- ☐ Individual \$15.00
- ☐ Full-time Student \$10.00
- ☐ Family or Household \$18.00
- ☐ Contributing \$50.00
- ☐ Business \$100.00
- ☐ Lifetime \$500.00
- ☐ Donations are also welcome \$ _____

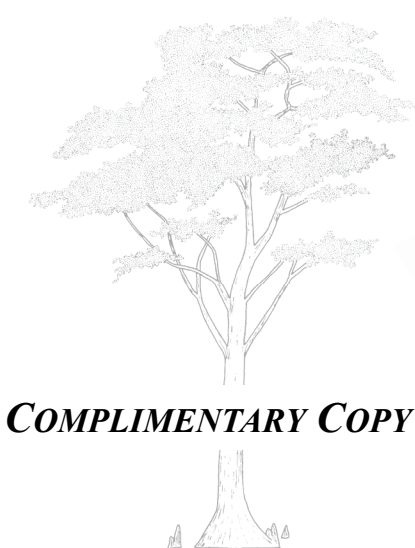
Membership benefits include:

- * The DNPS quarterly newsletter, *The Turk's Cap*
- * Native plant gardening and landscaping information
- * Speakers and field trips

Total Amount Enclosed: \$ _____

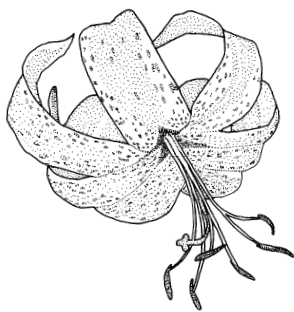
**Make check payable to:
DE Native Plant Society
P.O. Box 369, Dover, DE 19903**

**DELAWARE NATIVE PLANT SOCIETY
P.O. BOX 369
DOVER, DELAWARE 19903**



COMPLIMENTARY COPY





The Turk's Cap

THE NEWSLETTER OF THE DELAWARE NATIVE PLANT SOCIETY WINTER 02-2003

IN THIS ISSUE

- Page 1** ○ *A Call for Articles*
○ *New Members*
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○ *Thoughts From the Edge...*
- Page 3** ○ *Letter From the President continued*
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A CALL FOR ARTICLES

If you would like to write an article for The Turk's Cap, we would love to print it. With like minded individuals as an audience, The Turk's Cap is a great venue for plant or habitat oriented writings.

We'll take just about anything from gardening tips to book reviews to poetry. Of course, it has to be about native plants, or issues related to native plants; just a minor constraint. Your imagination is the real key.

Contact Eric Zuelke for more information at (ezuelke@juno.com), or Keith Clancy at 302.674.5187.

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A FLICKERING, CRACKLING FIRE IN A STONE FIREPLACE WELCOME TO OUR NEWEST MEMBERS

October through December

Wendy Carey & Tony Pratt
Rachael Coffey
Deloris Donnelly
Marji Entler
Bill Fintel
Beverly & Walt Gemmill
Jim MacGruther
John Mateyko
Joyce Ponsell
Lynn Redding (our 100th member)
David Rickards
Kurt Schwaninger
Lisa Sweder



HOW CAN I GET INVOLVED?

The Delaware Native Plant Society is open to everyone ranging from the novice gardener to the professional botanist. One of the primary goals of the society is to involve as many individuals as possible.

The DNPS is working on some significant projects at this time. We have begun a reforestation project at Prime Hook State Wildlife Area and will doing direct-seeding reforestation projects along Blackbird and Cedar Creeks, originally scheduled for 2002, but now postponed until 2003. In addition, help is needed with our native plant nursery at the St. Jones Reserve, near Dover. We encourage you to participate in these, and other DNPS endeavors.

For more information on how to get involved, E-mail us at dnps@delawarenativeplants.org. Or visit the new DNPS website at www.delawarenativeplants.org. Our website will have all of the past issues of *The Turk's Cap* along with a large section on native plants, as well as links to other environmental and

LETTER FROM THE PRESIDENT

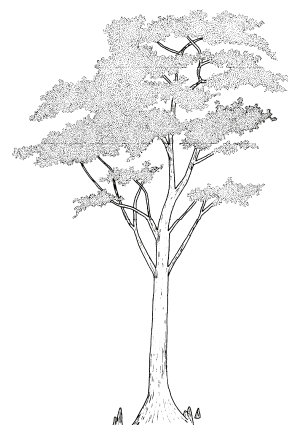
Brrrrrr! It sure is cold this winter! We seem to be having colder temperatures and more snow than in recent years. While I like the snow, I am beginning to yearn for spring, when warmer days and rains bring forth a plethora of spring wildflowers and a "re-birth" of plants that have been dormant during the cold days of winter.

I want to start the new year by first congratulating all that made our 2nd annual native plant sale, held on November 2, 2002, a rousing success. We received some great press coverage by The

Continued on page 3

The DNPS Vision

The purpose of the Delaware Native Plant Society (DNPS) is to participate in and encourage the preservation, conservation, restoration, and propagation of Delaware's native plants and plant communities. The Society provides information to government officials, business people, educators, and the general public on the protection, management, and restoration of native plant ecosystems. The DNPS encourages the use of native plants in the landscape by homeowners, businesses, and local and state governments through an on-going distribution of information and knowledge by various means that includes periodic publications, symposia, conferences, workshops, field trips, and a growing statewide membership organized by the DNPS.



LETTER FROM THE EDITOR**THE NEW YEAR CHANGES**

Winter and the new year are upon us once again. I always like this time of the year because it is one of change. Change is almost always a good thing and when it comes to The Turk's Cap, it's definitely a good thing. The newsletter has evolved a lot since its inception and the next step is, well, colorful. The change we have planned is that the basic black & white layout and text format will remain the same, but from now on we will present individual issues that contain photos or drawings in big, bold, vibrant color! I get quite a few visuals submitted to me from members and I've never liked presenting them in black & white—it just doesn't do them justice. Monetary concerns have always held us back from this, but the growth of the society has also provided for an augmentation of our newsletter budget.

As an editor it is wonderful to see your work (and the contributors work) shine and be presented appropriately, and I'm very excited about this. I hope everyone enjoys this bright change in our newsletter and I hope any changes you make for yourselves this year are successful. Happy New Year! 🍀

oooo Eric Zuelke, Editor

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PLANT-ANIMAL HIGHLIGHT**THE ACORN & THE WEEVIL**

In the world of oak tree propagation, there is one sight that acorn collectors can't stand to see—a seemingly perfect acorn with a tiny hole about the size of a pin head in the side of it. Upon breaking open such an acorn, one will find not a perfect beige, meaty nut, but rather a mess of rotten, black, sticky nut remains intermingled with caterpillar droppings and fine silk threads! The perpetrators of such dastardly acts are weevils (aka, snout beetles—Order Coleoptera: Family Curculionidae). Acorn boring weevils of the genus *Curculio* are the most commonly encountered acorn annihilators. Other species of insects such as *Conotrachelus* weevils, Lepidoptera like filbertworms (*Cydia latiferreana*), and acorn moth (*Valentinia glandulella*), and cynipid gall wasps have been found to feed on acorns. Though many species of insects are implicated, it has been found that virtually all oak species are attacked by one or more of 22 different species of weevils in the *Curculio* genus.

At this point, resistance is futile as 50-100% of the acorns in any region can be destroyed by weevil larvae in any given year (with an average around 70% or so). So ones thoughts would be better used by pondering on how these little crawling menaces got into the acorns in the first place. Three schools of thought have arisen on this question. All are based on the reproductive phase of the life cycles of many species of weevils, including weevils that did not evolve with oaks as host plants (such as cotton weevils, granary weevils, etc). 1) adult female weevils lay eggs on the outside of a growing seed embryo just after fertilization of the flower and the seed grows around the latent egg until both the seed and caterpillar mature at the same time and then the caterpillar eats the seed and bores its way out of the empty shell when ready to travel underground to pupate, 2) adult female weevils lay eggs on leaf surfaces near mature acorn clusters, or in tiny cracks directly on the shell surface, and after hatching the larva bores through the shell,

begins feeding, and bores its way out again when ready to pupate underground, and 3) adult female weevils bore a hole through the shell of nearly mature acorns (often under the cup where the shell is softer), deposit a single egg in the hole (but sometimes up to 4 eggs), seal it with a gelatinous material or a bit of fecal matter (or shell tissue will seal the hole during the continuing development), the egg hatches, the caterpillar eats the nut, and then bores its way out of the empty shell when ready to pupate underground.

Though these three life cycles have been identified for different species, the generalized life cycle of acorn boring weevils is that of number 3, and the literature seems to suggest this as the common method of acorn predation. None of the literature is consistent in relation to time of season, percentages of destroyed acorns, number of eggs laid, where the holes are bored, or manner in which the holes are sealed, so it seems as though some more focused research is in order.

Collecting acorns is hard work, and is made even harder when a "hole" bag of acorns ends up "wormy." But as with all things in nature, acorn boring weevils have their place and we should embrace the biodiversity that surrounds us! 🍀

oooo Eric Zuelke, Editor, with input from Michael Valenti, DNPS member and Forest Health Specialist with the DDA

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THOUGHTS FROM THE EDGE OF THE GARDEN**PLANT PROTECTION THREATENED**

On November 12, 2002, retiring U.S. House Resources Committee Chairman James V. Hansen (R-UT) filed a bill that would exempt all military land, all private property and all plant life from protection by the Endangered Species Act. The "Life, Liberty, and Property Protection Act" currently rests with the House Committee on Resources for comment. There are currently 746 plant species listed by the U.S. Fish & Wildlife Service's Threatened and Endangered Species System (TESS). Because a large proportion of all endangered species have the major share of their habitat on nonfederal land, and U.S. military installations account for nearly 25 million acres of federal land, this amendment could have serious consequences for all endangered species as well as the proposed exemption of all plants from federal protection. For more information, please visit the following websites, and act by writing to your governmental representatives:

- Text of the Life, Liberty, and Property Protection Act – enter "HR5709" as search: <http://thomas.loc.gov/>
- November 12, 2002 press release & comments from Congressman James V. Hansen: http://resourcescommittee.house.gov/press/2002/2002_1112ESA.htm
- The U.S. Fish & Wildlife Service (FWS) Endangered Species Program: <http://endangered.fws.gov/>
- FWS list of Threatened & Endangered Species for Delaware: <http://ecos.fws.gov/servlet/TESSWebpageUsaLists?state=DE>

Continued on page 3

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LETTER FROM THE PRESIDENT*Continued from page 1*

News Journal, and had many customers come out to the St. Jones Reserve. The sale itself operated smoothly and efficiently. We sold more than 500 plants and grossed over \$1300-which was pretty close to the net earnings as well. And you can see our average cost per plant was quite low also. I want to thank the following people (and I hope I don't forget anyone) for their help with this sale: Bob & Nan Edelen, Eric Zuelke, William McAvoy, Rick McCorkle, Rick Mickowski, Flavia Rutkosky, Lynn Redding, Diane Chance, Julia Lynch, and Betsy Archer. An extra thanks to Bob E. for the tables, tent and many donated plants.

This cold snap has me looking forward, with much anticipation, to attending DNPS field trips and getting my hands dirty working in our native plant nursery. I am especially excited about the possibility of purchasing a germination house or greenhouse that will aid in our propagation efforts. My appetite for spring was whetted last week when our Treasurer/Newsletter Editor, Eric Zuelke, and I attended the 2003 Mid-Atlantic Nurseryman's Trade Show in Baltimore. We caught the last day of this 3-day event and spent the 5 hours left trying to take in every exhibit. It was impossible to see everything but we did meet one of our goals: to get information about greenhouses/germination houses. It is our hope that we will be able to install a low-tech (i.e., no heat/cooling) growing/propagation apparatus at our nursery this spring that will improve our ability to propagate native plants and to start to meet the demand for natives.

My apologies for being a somewhat absentee president. Last fall I was overwhelmed with work and teaching two classes at Delaware State University and because of that was unable to devote very much time to the Society. This year I am not teaching and therefore will be able to spend more time on DNPS activities. Hooray! I look forward to getting out in the field more often and hopefully meeting many of you at DNPS-sponsored events. Also, look for major updates to our website in the coming weeks and months.

I look forward to a very successful and activity-filled 2003 and encourage all members to take a more active role in their society. We are always looking for more people to get involved with activities that foster the use of native plants. We have a need for people that could be field trip leaders (and we need your input on what kinds of field trips you want). Also, we are always looking for help with our native plant nursery. Volunteers are needed at our reforestation site at Prime Hook, and in the fall we will be looking for many volunteers to help out with our direct-seeding reforestation projects (more details later). We need someone that could monitor development projects; either those that we may want to comment on or, at the least, "rescue" plants from habitats about to be destroyed. We need some members to work on forest conservation and rare plant initiatives. We are beginning to plan for our 2003 annual meeting and need your help with those plans (e.g., Where should we have it and what events should we schedule? Should it be a one day or multi-day event?). Our Society's display needs a major overhaul – anyone interested in taking a stab at this project? I would like to see our society take a more active role in attending annual events such as Coast Day, Tree Spree, the Native Plant Conference at Millersville University, and the State Fair, to name a few. We also need someone that could line

NATURAL QUOTES

'If a man finds himself with bread in both hands, he should exchange one loaf for some flowers of narcissus, because the loaf feeds the body, but the flowers feed the soul.'

Muhammad

-up speakers for our meetings. I guess what I am trying to say is that our society needs more input from its members. Although I am encouraged by the growth of our society (we now have over 100 members and new members are joining regularly) there are still only a handful of active individuals. We need some new faces, with new ideas and enthusiasm for native plants that can complement the core active members. If you feel like you want to become more involved in your society, or more importantly, you have some time available to do so, please contact me directly at dnps@delawarenativeplants.org, 302.674.5187 or come to one of our bi-monthly meetings and find out what you can do. Your society needs your help and your passion for native plants.

Let me be the first to become more active. You should be hearing from me more often in the coming weeks and months. And I look forward to hearing from you. See you at an upcoming DNPS event. 🌿

Sincerely,

Keith Clancy

THOUGHTS FROM THE EDGE OF THE GARDEN*Continued from page 2*

- Protecting Endangered Species on Military Lands: <http://endangered.fws.gov/DOD/ES%20on%20military%20lands.pdf>
- U.S. General Accounting Office Information on Species Protection on Nonfederal Lands: <http://www.gao.gov/archive/1995/rc95016.pdf>

**** Vikram Krishnamurthy, Tree Program Manager, DE Center for Horticulture

Additional general resources on this topic and plant protection.

- North American Plant Protection Organization: <http://www.nappo.org>
- State Wildlife and Wildlife Habitat Protection Laws: <http://www.nrcs.usda.gov/technical/references/pdf/nrclawsch12.pdf>
- The Humane Society of the United States, DOD Wants to Duck Environmental and Animal Protection Laws: <http://www.hsus.org/ace/14419>

**** Eric Zuelke, Editor

FEATURE ARTICLE**A NATURAL HISTORY OF THE PINK LADY'S-SLIPPER ORCHID
(*CYPRIPEDIUM ACAULE*) AIT.**

Also known by the names pink lady-slippers, pink lady slipper orchid, moccasin flower, and pink moccasin-flower, this beautiful plant has the following taxonomic breakdown: Kingdom: Plantae (Plants), Subkingdom: Tracheobionta (Vascular plants), Superdivision: Spermatophyta (Seed plants), Division: Magnoliophyta (Angiosperms, Flowering plants), Class: Liliopsida (Monocotyledons), Subclass: Liliidae (lilies), Order: Orchidales (orchids), Family: Orchidaceae (Orchid family), Genus: *Cypripedium* L., Species: *Cypripedium acaule* Ait. (pink lady's-slipper), Synonym: *Fissipes acaulis* (Ait.) Small.

We often wonder why we can't transplant the beautiful native pink lady slipper into a seemingly appropriate habitat in our own back yard? The spectacular lady slippers vary widely in their habitat requirements. The most adaptable in its moisture tolerances is the pink lady's-slipper (*Cypripedium acaule*) which can grow and reproduce in both bogs and dry, sandy uplands or steep hillsides. Its main requirement is sterile, acid soil – wet or dry. However adaptable in moisture requirements, a mycorrhizal soil fungus (*Rhizoctonia*) must join a germinated lady slipper seed (protocorm) before it can absorb nutrition. The subsurface plant forms a radiating complex of spaghetti like roots and round tubers from which new shoots arise in spring. The initial growth process may require two years or more, and will produce two thick, elliptic, basal leaves 10-25 cm long. The plant may not produce a flower for three or more years, but when produced from mid-May to mid-July the flowers are solitary, terminal, pouch-shaped and 4-6 cm long by 2.5-4 cm wide with a gorgeous magenta to whitish-pink color. The aforementioned mycorrhizal fungus is an absolutely necessary orchid partner. It functions as and in place of root hairs; without it, orchid roots cannot absorb soil nutrients and disturbing this relationship between orchid and fungus (through transplanting) will almost certainly bring death to the plant. This symbiotic relationship makes collecting, transplanting, cultivating or propagating wild orchids very difficult. And often the attempted transplantation of wild plants will not only cause the death of that individual, but can impact the entire population.

Cypripedium, along with other orchid species, is listed in Appendix II of CITES, making it illegal to export any part of the plant without a permit. In 1988, the American Herbal Products Association issued a self-regulatory initiative for its members requiring them to discontinue trade in wild-harvested *Cypripedium*. Though harvesting is a threat, habitat destruction is by far the most significant avenue of loss because of the narrow habitat requirements of this genus and other related genera.

Unlike some of the lipped orchids, lady slippers are obligate outbreeders, that is they cannot (or rarely) self-pollinate. The flowers interior arrangement of reproductive organs requires that pollen be brought from another flower for fertilization to occur. The fruit capsules split to release clouds of powdery, wind dispersed seeds. Only a few of them find the right combination of habitat and symbiotic fungus to grow and thrive.

These bisexual, insect pollinated flowers are deceptive in the extreme. Offering little or no nectar, they lure pollinators by color and an odor from the sepals and lateral petals. The insect (usually a bee) enters the pouch through a front slit. Fine slanting hairs on the pouches smooth walled inner surface

nudge the insect towards the sticky, overhanging female stigma, a constricted passage from which it cannot backtrack. It continues to squeeze through the passage, finally brushing against the pollen-loaded anthers. There is one exit passage that is narrow and complex, but is the only way out and the only method for cross pollination from an insect that successfully navigated another flower beforehand. Sometimes the pouch becomes a trap for insects that miss their cue on where to go, and often inhabiting the pouch sacs are pollinator predators, the foremost being crab spiders (Thomisidae), which attack and devour entering insects.

It turns out that the lady slippers may have an unpleasant side, as well as being of medicinal value. For some at least the picking of lady slippers (especially showy lady slipper) may produce a skin rash similar to that of poison ivy, in this case caused by a volatile oil and the resinoid cypripedin. However, the sedative properties of *Cypripedium* roots were well known to native peoples and early pioneers alike. Root teas were taken to calm the nerves; ease insomnia, depression, and menstrual disorders; and treat epilepsy. The Chippewa applied the dried powdered roots to aching teeth; other tribes used root decoctions for kidney and stomach ailments. Root foragers heavily harvested yellow lady-slippers (*C. calceolus*) during the last century for medicinal uses, depleting populations that will probably never fully recover. ☞

SOURCES

- 1) Eastman, J. The Book of Swamp and Bog.
- 2) Griesbach, R. USDA.
- 3) http://www.nps.gov/plants/medicinal/plants/cypripedium_acuale.htm.
- 4) USDA Plants Database.

oooo Bob Edelen, DNPS member and Eric Zuelke, Editor



Cypripedium acaule
Keith Clancy

NATURAL COMMUNITY HIGHLIGHT**Coastal Plain Chestnut Oak Slope**

Quercus prinus—*Deschampsia flexuosa* Forest
Chestnut Oak—Hairgrass Forest

Description

Scattered along the slopes of the Appoquinimink River and its tributaries is an unusual forest type dominated by chestnut oak (*Quercus prinus*). Chestnut oak is a tree characteristic of dry ridges in the piedmont and mountains to the north and west, and is considered rare on the Coastal Plain of Delaware. However, along the Appoquinimink and Drawyers Creek, this species finds suitable habitat on the upper portions of steep, north-facing slopes. Because these sorts of suitable habitats are quite restricted, this community occurs only as very small patches, typically less than one acre in size.

The community is characterized by a canopy dominated by chestnut oak, with American beech (*Fagus grandifolia*) as an occasional associate. The tall shrub layer is thin or absent, although an occasional mountain laurel (*Kalmia latifolia*) may be present. The herbaceous layer consists of a typically dense cover of crinkled hairgrass (*Deschampsia flexuosa*), often forming savanna-like carpets. Species diversity is low, but lowbush blueberry (*Vaccinium pallidum*), trailing arbutus (*Epigaea repens*), Swann's sedge (*Carex swanii*), and black-edge sedge (*Carex nigromarginata*) are fairly common. The bryophyte *Hypnum imponens* is often quite abundant.

Distribution

Occurrences of this community are also noteworthy as being the only known locations of eastern hemlock (*Tsuga canadensis*) in Delaware. Although these hemlock occurrences typically only consist of a few individuals, they represent a highly unusual Coastal Plain population of this species.

Currently, examples are known from slopes above the Appoquinimink River and its tributaries, as well as other northern Coastal Plain streams. This community is also found on similar habitats in adjacent Maryland. Its range is unknown beyond the Delmarva Peninsula. 🌿

oooo Peter Bowman, DE Natural Heritage Program Ecologist

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NATIVE PLANT HIGHLIGHT**SKUNK CABBAGE**

When these cold winter days have you confined to the indoors and cabin fever begins to set-in, don't despair and pine for spring, go in search of the malodorous skunk cabbage to raise your spirits and enlighten your senses.

Skunk cabbage, *Symplocarpus foetidus* (L.) Salisb. ex Nutt. is a perennial monocot of the Araceae, the Arum family. Skunk cabbage is a monotypic genus, meaning that *Symplocarpus* is a genus with only one species.

Skunk cabbage is named for its smell, which is quite obvious when the plant is bruised or crushed and smells a bit like burning rubber. Insects, such as carrion flies, are attracted to such foul odors and thus help to pollinate the flowers. The specific epithet *foetidus* means fetid, or to stink.

Skunk cabbage is considered a wetland plant and is

common throughout Delaware. It is typically found growing in the shade, on poorly drained soils in swamps and in seepy floodplains. The overall natural distribution of skunk cabbage in North America is from Quebec and Nova Scotia, south to North Carolina, and west to Minnesota and Iowa. Skunk cabbage is also found growing in east Asia.

In Delaware, skunk cabbage often flowers in February even if the ground is snow covered!

The combination of the plants dark color, which absorbs heat from the sun, and the rapid growth of the flower-bud produces enough heat to actually melt snow immediately around the plant. Studies have shown that the plant starts to produce heat once the temperature is above freezing and can keep itself at a fairly constant temperature of slightly over 70 degrees Fahrenheit.

The leaves of skunk cabbage are ovate in shape and can be quite large, about 2-3 feet long and about 1-2 feet wide. The leaves contain calcium oxide crystals that cause a burning sensation when eaten and may protect the leaves from some predators. The leaves die back in the fall, but in late summer, a flower-bud and leaf-bud have already been produced underneath the leaves and this is how the plant will over winter.

In winter, skunk cabbage can be seen as two types of buds: a flower-bud that is enveloped by a hood-like covering (technically called a spathe), and immediately next to the flower-bud is a leaf-bud, which is a pointed cone with next seasons leaves tightly coiled inside. Both flower and leaf-buds are about 6-8 inches tall. The spathe is composed of a spongy material and is green in color and is usually mottled with dark brown or purple coloration. The leaf-bud is light green in color. As mentioned, the spathe encloses the flower-bud (technically called a spadix). The spadix is defined as a club-like stalk, or spike composed of small flowers crowded together on a thickened axis.

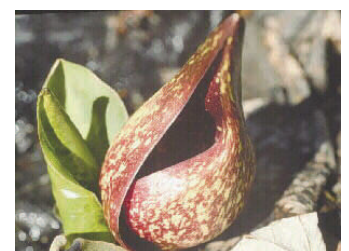
The roots of skunk cabbage slightly contract each growing season, which pulls the plant down into the earth just a fraction of an inch each year. In this way, the leaves and buds always stay low to the ground.

Flowers bloom before the leaves emerge and during flowering, one side of the spathe begins to open and you can see the spadix inside. The flowers are buried in the spadix and each flower is perfect, meaning they have both male and female parts. It may take up to 7 or more years for a single plant to be strong enough to produce flowers. The seeds mature inside the spadix and are grouped together into what is called a compound fruit. Consider the genus name, *Symplocarpus*, *symploce* means "connection," and *carpus* refers to fruit, taken together, *Symplocarpus* means a binding together of the fruits. Seeds are dispersed in late summer and they are usually about the size of marbles. 🌿

oooo William McAvoy, DNPS Vice-President



Craig Holdrege



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EVENT HIGHLIGHTS**JACKSON LANE COASTAL PLAIN SEASONAL POND PRESERVE**

It was a pleasant, sunny Autumn day on 20 October 2002 when a small contingent of hard core botanists went to the Jackson Lane Coastal Plain Seasonal Pond Preserve in Maryland. This preserve is owned by The Nature Conservancy. The preserve is approximately 5 years old and contains about 10 good to high quality coastal plain ponds. These seasonally flooded/dry wetlands are critical habitats for several very rare to uncommon species and we were lucky enough to see all of them. Some of the highlight plants were: *Fimbristylis perpusilla* (Harper's dwarf fimbry), *Fimbristylis autumnalis* (slender fimbry), *Hottonia inflata* (featherfoil), *Eragrostis hypnoides* (teal love-grass), *Proserpinaca pectinata* (comb-leaved mermaid-weed), *Torreyochloa pallida* (pale manna-grass), *Oldenlandia uniflora* (clustered bluets), and *Fontanalis novae-angliae* (a moss only found in coastal plain ponds).

THE 2ND ANNUAL DNPS NATIVE PLANT SALE

We had a perfect day on 2 November 2002 for our second annual native plant sale. We had a tremendous turn out for this event at the St. Jones Reserve and it was a great success. This year we had perfect weather, even more donuts (the best part, of course), and hot cider. We did \$1300.00 in total sales (more than twice what we did last year) and sold over 500 plants (also more than twice what we sold last year). The money is used entirely for operating the nursery and we now have enough to purchase a germination house/greenhouse which we are actively researching to find the best one to suit our needs. We couldn't be more pleased with the success of this sale, and everyone had a great time. Our vision of offering everyone the choice of native plants for their own planting projects is becoming reality and that benefits everyone in the end.

We'd like to thank everyone who came out and volunteered their time with labeling, and pricing, and digging, and hauling wheel barrows around, and... See everyone at the same time, same place next year!



Plant sale pictures courtesy of Rick Mickowski, DNPS member

SEED COLLECTING AT BLACKBIRD STATE FOREST

On our final field trip of the fall of 2002 (November 10, 2002) four members showed-up to collect seeds at Blackbird State Forest (the low turnout was probably due to the very short notice given). It was a bright sunny, but cool morning that was in the offing. We discovered that there really was a paucity of acorns and hickory nuts available; probably a result of the effects of the drought rather than hoarding by animals. But we did get enough nuts to make it worth it and we are attempting to germinate them.

RESOURCES AND REVIEWS**AMERICAN WOODLAND GARDENER BOOK**

The November-December issue of the *American Gardener* magazine has an article based on a new book by local author Rick Darke. In his book, *The American Woodland Gardener*, Darke shares his love of the eastern deciduous forest through stunning photographs and insightful prose. The book is available through Timber Press in Portland, Oregon. At 378 pages, it is priced at \$49.95.

THE IMPORTANCE OF DIVERSITY

At the "Growing Greener" workshop on 1 November 2002, former DNREC Secretary Nick DiPasquale talked about the importance of biodiversity conservation. He stressed the need to preserve the ecological services that nature provides. He stated that we need to maintain the connections of land to provide habitat for living resources and to protect ecological functions such as forests, buffers and water recharge areas to maintain water quality. Instead of "growing vinyl," we need to use incentives and we need to do a better job of quantifying the economic benefits and values of a diverse ecological landscape. He explained that there is an increasing economic benefit under "eco-tourism" such as bird watching, hiking, kayaking, outdoor recreation, hunting and fishing, and other outdoor activities. Economic justifications and values should be looked at when decision makers are determining how to use the land resource. Some of the books that Nick suggested for reading on this topic were:

- *Eco-Economy* by Lester R. Brown
- *The New Economy of Nature* by Gretchen Daily
- *Natural Capitalism* by Paul Hawken and Armory and L. Hunter Lovins
- *The Future of Life* by Edward O. Wilson
- *Cradle to Cradle* by William McDonough
- *The Ecology of Commerce* by Paul Hawken
- *BioMimicry – Innovation Inspired by Nature* by Janine M. Benyus

Ultimately, we need to identify areas that are biologically important to save and do all we can to make sure it is done. We need to value the ecological services that nature provides us.

oooo Rick Mickowski, DNPS member

ORGANIC GARDENERS HANDBOOK

The Organic Gardener's Handbook of Natural Insect and Disease Control. Edited by Barbara W. Ellis and Fern Marshall Bradley, ©1996. Rodale Press. An excellent book that is handily organized into four parts:

1. Plant Problem Solving Guide
2. Insects
3. Diseases
4. Organic Controls

Chocked with very useful information about fighting diseases and pests in a safe manner by pointing out the pros and cons of many different types of organic methods and how they work.

UPCOMING EVENTS

SATURDAY, 01 FEBRUARY 2003 – VOLUNTEER TRAIL MAINTENANCE DAY. FROM 9 AM TO 12 NOON AT THE SEASIDE NATURE CENTER, CAPE HENLOPEN STATE PARK. PLEASE CALL 302.645.6852, OR ON THE WEB AT WWW.DESTATEPARKS.COM FOR MORE INFORMATION.

WEDNESDAY, 12 MARCH 2003 – PRUNING WOODY PLANTS; 8 AM TO 3:30 PM; MILFORD TOWNSHIP MUNICIPAL BLDG., BUCKS CO., SPINNERSTOWN, PA. \$25 REGISTRATION FEE IS REQUIRED AND THERE IS A LIMIT OF 50 PARTICIPANTS; DEADLINE FOR REGISTRATION IS 5 MARCH 2003. PLEASE CALL THE COOPERATIVE EXTENSION IN MONTGOMERY COUNTY AT 610.489.4315, OR EMAIL AT MONTGOMERYEXT@PSU.EDU FOR MORE INFORMATION.

SATURDAY, 15 MARCH 2003 – COPELAND NATIVE PLANT SEMINAR. FROM 8:30 AM TO 4 PM AT THE ASHLAND NATURE CENTER. WILL INCLUDE A KEYNOTE SPEAKER, LUNCHEON, EXHIBITS AND A FIELD TRIP. PLEASE CALL 302.239.2334, OR ON THE WEB AT WWW.DELAWARENATURESOCIETY.ORG FOR MORE INFORMATION.

MONDAY, 24 MARCH THROUGH 29 MARCH 2003 – FRIENDS OF WHITE CLAY CREEK STATE PARK TREE PLANTING. THE ACTUAL PLANTING IS SCHEDULED FOR SAT., MARCH 29. UNLOADING THE TRUCKS THAT BRING IN THE TREES IS THURS., MARCH 27. DRILLING OF THE HOLES FOR THE TREES WILL BE MON., MARCH 24, AND THE 22ND & 23RD IS LAYING OUT THE FIELD IN ADVANCE OF THE DRILLING. VOLUNTEERS ARE PARTICULARLY NEEDED FOR HELPING TO UNLOAD TRUCKS ON THE 27TH AND THE ACTUAL PLANTING ON THE 29TH. EVERYONE IS ALSO WELCOME TO HELP WITH FIELD LAY-OUT AND TO WATCH THE DRILLING, OF COURSE. PLEASE CALL 302.239.6108 FOR MORE INFORMATION. THERE IS A SPECIAL NEED FOR PEOPLE WITH FULL-SIZE PICKUP TRUCKS AT THIS EVENT TO HAUL WATER TANKS AND MULCH, AND FOR EXPERIENCED PRUNERS AND INDIVIDUALS WITH TREE PLANTING KNOW-HOW TO ACT AS LEADERS.

SATURDAY, 29 MARCH 2003 – WHITE CLAY CREEK CLEAN UP. FROM 8:30 AM AT THE CHAMBERS HOUSE NATURE CENTER. PLEASE CALL 302.368.6900, OR ON THE WEB AT WWW.DESTATEPARKS.COM FOR MORE INFORMATION.

SATURDAY, 03 MAY & SUNDAY, 04 MAY 2003 – NATIVE PLANT SALE. FROM 9 AM TO 5 PM SATURDAY AND 10 AM TO 3 PM SUNDAY AT THE COVERDALE FARM. PLEASE CALL 302.239.2334, OR ON THE WEB AT WWW.DELAWARENATURESOCIETY.ORG FOR MORE INFORMATION.

DNPS BI-MONTHLY MEETINGS FOR 2003 – ARE CURRENTLY SCHEDULED THE 3RD TUESDAY OF EVERY OTHER MONTH. OUR NEXT MEETINGS WILL BE, 21 JANUARY 2003, 18 MARCH, 15 JULY, 16 SEPTEMBER, 18 NOVEMBER. MEETINGS WILL TAKE PLACE (UNLESS OTHERWISE NOTIFIED) AT 7 PM AT THE AQUATICS RESEARCH AND EDUCATION CENTER, WOODLAND BEACH WILDLIFE AREA, RTE 9 (4876 HAY POINT LANDING ROAD) ABOUT 1 MILE NORTH OF RTE 6. WE PLAN TO HAVE GUEST SPEAKERS AT EACH MEETING (SPEAKERS AND THEIR TOPICS WILL BE ANNOUNCED AT LATER DATES). CHECK OUR WEBSITE FOR ADDITIONAL DETAILS OR EMAIL US AT DNPS@DELAWARENATIVEPLANTS.ORG. WE WILL BE HAVING OUR ANNUAL MEETING IN MAY, DETAILS TO BE ANNOUNCED AT A LATER DATE.

Membership Application

DELAWARE NATIVE PLANT SOCIETY

Member Information

Name: _____

Business Name or Organization: _____

Address: _____

City and Zip Code: _____

Telephone (home/work): _____

E-mail address: _____

- ☐ Full-time Student \$10.00
- ☐ Individual \$15.00
- ☐ Family or Household \$18.00
- ☐ Contributing \$50.00
- ☐ Business \$100.00
- ☐ Lifetime \$500.00
- ☐ Donations are also welcome \$ _____

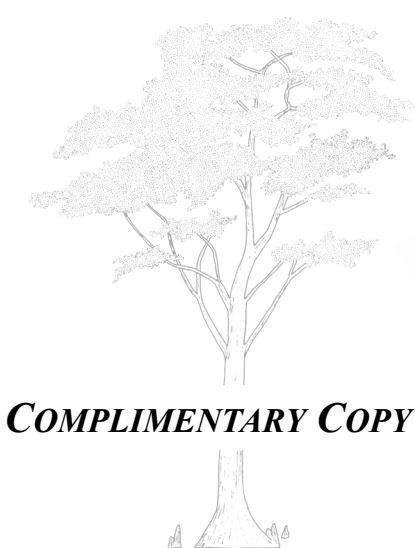
Membership benefits include:

- * The DNPS quarterly newsletter, *The Turk's Cap*
- * Native plant gardening and landscaping information
- * Speakers and field trips

Total Amount Enclosed: \$ _____

**Make check payable to:
DE Native Plant Society
P.O. Box 369, Dover, DE 19903**

**DELAWARE NATIVE PLANT SOCIETY
P.O. BOX 369
DOVER, DELAWARE 19903**



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