

The Turk's Cap

THE NEWSLETTER OF THE DELAWARE NATIVE PLANT SOCIETY SPRING 2000

IN THIS ISSUE

- Page 1** ○ *A Call for Articles*
 ○ *New Members*
 ○ *Letter From the President*
- Page 2** ○ *Letter From the Editor*
 ○ *Plant-animal Highlight*
 ○ *Resources and Reviews*
- Page 3** ○ *Natural Community Highlight*
 ○ *Feature Article*
- Page 4** ○ *Feature Article continued*
 ○ *Natural Community Highlight cont.*
- Page 5** ○ *Letter From President continued*
 ○ *Native Plant Highlight*
- Page 6** ○ *Native Plant Highlight continued*
 ○ *Feature Article continued*
 ○ *Pick the Turk's Cap*
- Page 7** ○ *Upcoming Events*
 ○ *DNPS Website*
- Page 8** ○ *Membership Application*

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 SPRING DAY WELCOME TO OUR NEWEST MEMBERS

April through June

Robert and Jean Bewick

Lynn Broadus

Dorothy Domingue

Bob and Nan Edelen

Robert and Nancy Faass

Pat Groller

Garth McCabe

Octoraro Native Plant Nursery

David Paterson

Dr. Arthur O. Tucker

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LETTER FROM THE PRESIDENT

I do believe spring has sprung! Although flowers have been blooming for several months now (yes I saw some blooming in mid-January), they're bursting forth now. I am anxious to finish this letter so I can get outside and enjoy the warmth of the sunshine, the smells of the blooms, the buds bursting forth, and (much to the dismay of many) the pollen raining down on my head (fortunately I am not allergic to those irritable 2- or 3-celled, typically, microscopic gametophytes). After a long and cold winter I always begin to feel rejuvenated when I begin to see the first of the spring flowers.

Just thought I would update everyone on

The DNPS Vision

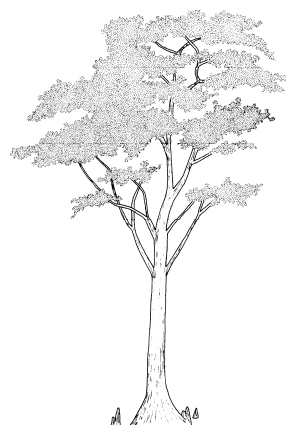
The purpose of the Delaware Native Plant Society (DNPS) is to participate in and encourage the preservation, conservation, restoration, and propagation of Delaware's native plants and plant communities. The Society provides information to government officials, business people, educators, and the general 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, fieldtrips, and a statewide membership organized by the DNPS.

HOW CAN I GET INVOLVED?

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

The DNPS is working on several significant projects at this time. We are working on a forest conservation act that we hope will soon afford protection to our rapidly vanishing forests. A second initiative underway is the establishment of native plant nurseries. It looks like we will be breaking ground on one of these nurseries shortly. We encourage everyone to participate in these endeavors.

For more information on how to get involved, call 302.674.5187, or E-mail at



LETTER FROM THE EDITOR**THE WILDFLOWERS ARE BACK!**

Though a zoologist at heart, I do love all these spring ephemeral wildflowers. Mainly because they're the easiest to identify; but I still give my Newcomb's guide a good workout from time to time with some of the tougher ones. I always have to work fast though, because the deer and bugs start munching on them pretty early. Speaking of that, this issue's Plant-animal Highlight has some interesting facts about herbivory. And if you plan on planting some shrubs in your yard this season, then check out the native plant highlight for some good tips. If some creative landscaping with a water garden is in the plans for this summer, then the pick the Turk's cap will be of interest. And of course, I'm sure all your plantings will be native in origin, but if not, then our feature article might give you some inspiration to go native. But first, break out those field guides and enjoy nature at it's  busiest and brightest.

shorter floral tubes had fewer seeds).

Seed predators such as squirrels, mice and some birds and insects can have an even more direct effect on plant reproductive biology and population dynamics as they can consume anywhere from 10 to 100 percent of available seeds. They also attack at a critical stage in the life cycle of a plant. One study with White-footed mice showed that seed predation on woody vegetation can significantly alter the rate of and spatial pattern of tree invasion into an old field habitat. Direct consumption of seeds is not the only way seed predators affect plants. Several studies have shown that many species of plants will spontaneously abort seeds or flowers that have a critical number of predator eggs or larvae.

Herbivory has a very important role in the ecology of the planet. Just think how overgrown and choked up it would be without all that browsing and grazing. 

oooo Eric Zuelke, Editor

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RESOURCES AND REVIEWS
PLANT-ANIMAL HIGHLIGHT**TO PARTAKE OF PLANTS**

In the world of plant-animal interactions, plants sometimes get stepped on, chewed on, sucked dry, tugged at and generally beat up. The culprits of all this havoc range from large mammals like giraffe and bison down to caterpillars and aphid larvae. Plants face tremendous challenges because of their role as a food source for so many. The classic definition of herbivory is the consumption of plant material, and the worst result for a plant is being completely consumed. But what about specialists such as folivores (leaf eaters), florivores (flower eaters), and granivore/frugivores (seed/fruit eaters). They more subtly effect the long-term fitness and population dynamics of plants in terms of changing their ability to photosynthesize and reproduce.

One study revealed the fundamentals of this concept. Two researchers in California excluded voles from a patch of grassland using wire fencing. At the end of two years, they measured the seed production and species composition of the annual grasses in the experimental plot and the control plot. It was discovered that plants in the experimental plot (the one without the voles) had greater species diversity and higher levels of seed production. These sorts of enclosure experiments have revealed that grazing herbivores affect seed production by reducing the amount of vegetative growth plants need for reproduction.

A similar study examined the relationship of leaf damage to flower production. It showed that for *Oenothera macrocarpa* (Onagraceae), a higher percentage of leaf damage resulted in lower resource availability for flowers, the production of fewer flowers that had smaller corolla diameters and shorter floral tube lengths, lower fruit set and fewer seeds. The study showed that folivory did not reduce the seed production directly, but that the changes in floral traits affected the preferences of the pollinators that normally visit this species (flowers with smaller corollas received fewer visits). The efficiency of pollen delivery was also affected (flowers with

NATIVE PLANTS JOURNAL

Published twice each year by the Forest Research Nursery, Dept. of Forest Resources, University of Idaho. The objective of Native Plants Journal is to provide a forum for dispersing practical information about planting and growing native plants for conservation, restoration, reforestation and landscaping. Annual subscription is \$30.00. For more information, visit their website at www.uidaho.edu/nativeplants.

ANDERSEN HORTICULTURAL LIBRARY'S SOURCE LIST OF PLANTS AND SEEDS

The new edition lists more than 70,000 types of plants (including lots of cultivar varieties) sold by U.S. and Canadian nurseries -- and which of 500 nurseries are selling them. The price is \$39.95 in the U.S. (including postage). For more information, write to the Andersen Horticultural Library, Minnesota Landscape Arboretum, 3675 Arboretum Drive, P.O. Box 39, Chanhassen MN 55317-0039.

COMING IN THE SPRING OF 2000: CHECKLIST OF THE FLORA OF DELAWARE

Want to know what plants occur in Delaware? Want to know whether that *Fothergilla gardenii* recommended by your landscaper is actually native to our state? The answers can be at your fingertips when you order your own copy of the first ever Checklist of the Flora of Delaware, by William A. McAvoy and colleagues. McAvoy, through the Delaware Natural Heritage Program (DNHP), is the Delaware Division of Fish and Wildlife's Botanist and is one of the most widely respected field botanists on Delmarva. If you'd like to be on the advance mailing list, or are interested in bulk orders, please contact the DNHP at 302.653.2880, or through e-mail: wmca-voy@state.de.us.

NATIVE PLANT COMMUNITY HIGHLIGHT*Woodwardia virginica*/*Sphagnum* (*cuspidatum*, *palustre*) Herbaceous Community

Virginia chainfern/sphagnum moss Community

Introduction

The Virginia chainfern-sphagnum moss Community is an emergent pteridophyte-dominated community often referred to as a fern swale or glade. This fern and moss-dominated community may be quite expansive, covering several acres, or only a few square meters in size. In Delaware it is only known from scattered openings within the otherwise swamp forest community of the Great Cypress Swamp. It can be an impressive site and one cannot but wonder whether this community was more widespread here and elsewhere in southern Delaware prior to wholesale changes at the ecosystem level. Widespread logging and extensive ditching has rendered The Great Cypress Swamp only a remnant of its earlier grandeur.

Community structure/composition

This community occurs in seasonally flooded wetland depressions characterized by an abundance (upwards of 90 percent cover) of *Woodwardia virginica* in a tall (to 1.5 meters) herbaceous layer. The two *Sphagnum* species are also abundant with very high covers in the layer below the *Woodwardia*. *Sphagnum cuspidatum* is restricted to the low flooded zone surrounding the hummocks that support and are composed of the *Woodwardia*, while *S. palustre*, on the other hand occurs on the hummocks amongst the leaf and petiole bases of the ferns. Additional herbaceous associates include *Hypericum mutilum* (a St. John's-wort), *Triadenum virginicum* (marsh St. John's-wort), *Decodon verticillatus* (Virginia willow), and several others. *Nymphaea odorata* (white water lily) and *Utricularia* spp. (bladderworts) may be present in small openings within these emergent wetlands. Shrubs and small, stunted trees may be abundant or restricted to the perimeter of the wetland depression. These include *Acer rubrum* (red maple), *Pinus tadea* (loblolly pine), *Chamaecyparis thyoides* (Atlantic white cedar), *Liquidambar styraciflua* (sweet gum), *Clethra alnifolia* (sweet pepperbush), *Rhododendron viscosum* (swamp azalea), *Vaccinium corymbosum* (highbush blueberry), and others. These wetlands stay flooded much longer than the surrounding swamp forest.

Community dynamics/succession

Believed to be dependent on seasonal flooding of the proper duration and depth to maintain the fern-moss dominance and open canopy. If the water table is lowered and/or flooding duration lessens, woody plants are likely to become established and this community may die out. There are several areas within the Great Cypress Swamp where *Woodwardia virginica* is present as a dense component of the herbaceous layer but is overtopped by a tree canopy. Such areas are probably indicative of a drier hydrologic regime at the present. Likewise, they are also possible reminders that at one time that area was wetter and consisted of an emergent, open wetland dominated by Virginia chainfern and sphagnum mosses. The preceding statements in this section are speculative and need to be tested in the field. Otherwise, little is known of this community's dynamics and

Continued on page 4

NATURAL QUOTES

"The "control of nature" is a phrase conceived in arrogance, born of the Neanderthal age of biology and philosophy, when it was supposed that nature exists for the convenience of man.

Rachel Carson, *Silent Spring*

FEATURE ARTICLE**NATIVES: A POSITION SUPPORTING THE USE OF NATIVE PLANTS**

Editors note: This is the second of a two-part feature addressing the pros and cons of native vs. exotic plant use in urban landscapes.

Intentionally or not, humans have introduced plants into areas in which they did not evolve and where their presence has led to a number of negative impacts. Negative impacts of introduced species include displacement of native plants and animal communities, alteration of ecological processes, and economic loss. Perkins (1999) in a briefing paper prepared for the U.S. Fish and Wildlife Service estimated economic losses due to "alien invasive plants" to be as high as \$12.3 billion a year. Alien invasive plants can be defined as species introduced to an area where they do not naturally occur, and where they proliferate, displacing native communities and threatening ecosystem process. Increasing concern with the negative impacts of alien invasive plants and animals has resulted in a number of actions at a national, state, and regional scale.

A National Effort

At a national scale, President Clinton stipulated in 1994 the use of native regional plants on all federal grounds and in all federally funded landscaping projects. Most recently, on February 3, 1999, President Clinton issued Executive Order #13122, Invasive Species. This order directs federal agencies whose programs could affect the status of invasive species to take a number of actions including: identifying those programs; preventing introduction of invasive species; monitoring and controlling populations of invasive species; restoring native species and impacted habitats; and ceasing to authorize, fund, or carry out actions that are likely to cause or promote introduction or spread of invasive species. In an effort to control alien species, federal agencies may eradicate, suppress, reduce, or manage invasive species populations as appropriate. Section 3 of the Order establishes the Invasive Species Council, which is the coordinating body for federal efforts to control invasive species. Members of the council include the Secretaries of State, Interior, Agriculture, Commerce, Transportation, and the Administrator of the Environmental Protection agency.

A Regional Effort

On a regional scale, the Mid-Atlantic Exotic Pest Plant Council held their first meeting on March 5, 1999. The Council's draft charter identifies Delaware, Maryland, New Jersey,

Pennsylvania, Virginia, West Virginia, and the District of Columbia as members. The council was formed to address the problem of invasive exotic plants and the threats posed to regional flora, fauna, and natural ecosystems. The council's goals include serving as a regional information clearing house, developing workshops and training programs for identification and management of invasive exotic plants and habitat restoration techniques, promoting use of locally grown native plants for landscaping, cooperating with regional/local nurseries and garden centers to develop responsible approaches to exotic plant promotion and marketing practices, and coordinating with cooperative extension offices to educate staff regarding exotic species and native plant alternatives. The group also plans to develop recommendations to alleviate continued use of invasive exotic plants and will support Executive Order #13122 by establishing and maintaining liaison with the Presidential Council on Invasive Species.

A State Effort

Closer to home, the Pennsylvania Noxious Weed Task Force held its initial meeting in Harrisburg, in March, 1998. The Task Force represents state and federal agencies, universities, and private organizations with an interest in preventing further establishment and spread of exotic noxious weeds within Pennsylvania. Current task force members include representatives from the Pennsylvania Department of Agriculture; the Pennsylvania Bureau of Forestry; the Pennsylvania Department of Transportation, the Bureau of Parks; the Pennsylvania Game Commission; the U.S. Department of Agriculture (Animal and Plant Health Inspection Service and the Forest Service); the U.S. Department of the Interior (National Park Service); the Pennsylvania State University, the University of Pennsylvania Morris Arboretum; Gannon University and the Western Pennsylvania Conservancy. The memorandum of agreement developed by the Noxious Weed Task Force creates an organization that will coordinate noxious weed management in Pennsylvania. The task force will also contribute to development of strategies to educate industry, private interest groups, and the public regarding noxious weeds. Additionally, the task force will be active in implementing the national initiative identified in Executive Order #13122. [Editor's Note: Delaware, likewise, in 1998, established the Delaware Invasive Species Council].

What Does This Mean for Community Forest Programs?

During the past decade natural resource agencies have embarked on an ecosystem-based approach to natural resource management. For urban and community forestry this new paradigm recognizes that the community forest is all of the "green infrastructure," anything green, or any area that has not been built upon. This recognition suggests that urban forestry has moved beyond a focus on planting and maintaining street trees to more inclusive resource management goals. Today, urban forestry must integrate urban and community forestry goals and objectives into the goals and objectives of related disciplines such as land use planning and landscape ecology; taking an interdisciplinary approach that integrates water, soil, vegetation, animals, and people.

Consideration of community ecology, which is an idea that integrates water, soil, vegetation, animals, and people in urbanized areas, reveals simplified plant and animal communi-

ties dominated by opportunistic species, many of which are invasive non-natives. While urbanization has played a major role in the loss of biological diversity, metropolitan areas also offer a largely untapped potential to increase biological diversity. Urban and community forestry projects that take a broader view than just planting cultivated varieties of street trees represent an important component of that potential. Elimination and control of dominant invasive exotic vegetation and reestablishment of native plant communities is an ecosystem-based resource management goal that national, regional, and state initiatives clearly support.

It has become apparent in the last decade that use of native plants is not without controversy. Does promoting the use of native species mean the achievements of individuals who have cultivated non-native tree species into some of our most widely used street trees are no longer appreciated? Does it mean that non-native, non-invasive species have no role in urban forestry? The answer to both of these questions is no.

Rather, promoting the use of native plants means that we broaden our concept of the urban forest to include all vegetation establishment and maintenance strategies. Within a broader ecosystem approach to community forestry, interdisciplinary strategies that include control of exotic invasives, restoration of wildlife habitat, and water quality protection must be included as goals. Federal and state agencies should provide technical and funding assistance to communities to control invasive alien species, and support development of projects that reflect the growing awareness of the need to reestablish our native

Continued on page 6

NATIVE PLANT COMMUNITY HIGHLIGHT

Continued from page 3

succession.

Distribution

In Delaware this community is currently only known from the Great Cypress Swamp, of southern Sussex County. Overall, according to The Nature Conservancy it has a discontinuous range from Maryland to Florida.

Conservation Status

According to The Nature Conservancy this community is believed to be globally rare. More data are needed on the distribution and dynamics of this community in Delaware. This community has a Delaware Natural Heritage state rank of **S2** (very rare, typically between 6-20 occurrences statewide and may be susceptible to becoming extirpated) and a global rank of **G2?** (impaired globally because of rarity (6-20 occurrences), or because some other factor (s) making it vulnerable to extinction throughout its range; note: the question mark indicates uncertainty in assigning this rank to the community). Also, the state rank of S2 may not be conservative enough since the community is only known from the Great Cypress Swamp and the continued perturbation to the swamp's hydrology may be threatening the long-term viability of this community.



◊◊◊◊ Keith Clancy, DNPS President

Continued on page 5

LETTER FROM THE PRESIDENT

Continued from page 1

several DNPS initiatives that were discussed in the last newsletter. We are somewhat at a standstill with our Forest Conservation Act. We met with the State's Forest Service in February but they were reluctant to endorse our draft and thought that it would not be welcomed by the legislature. They mentioned that our draft needed some changes and made some recommendations. One recommendation was to send a copy of our draft to the Environmental Law Institute (ELI), a group that had just written a report on the state of Delaware's biodiversity, asking for their input and comments. We have done that but have yet to hear back from them. I know that forest conservation is an important issue among many of Delaware's citizens and I also believe that some form of forest conservation/protection is attainable. I think the time has come for developers, road builders and others that clear forests, to begin compensating or mitigating for those losses. Likewise, there should be better tax incentives to encourage landowners to protect and expand their forests in perpetuity. I would welcome any thoughts that DNPS members have on this subject. As for our proposed Forest Conservation Act we are now evaluating our options and trying to determine what our next steps will be.

Our native plant nurseries are moving closer to becoming a reality. We are waiting to hear back from New Castle County officials on our proposal for a nursery at Middle Run Natural Area. I am really excited about new developments regarding a native plant nursery in Kent County. We have been given verbal permission to start a nursery at the St. Jones River National Estuarine Research Reserve south of Dover. I will be meeting with the Reserve manager next week to work out the details. We will definitely be looking for volunteers as well as donations of materials and money to help with these projects.

A brochure, developed by Bill McAvoy, on native plants recommended for the homeowner and land steward is nearing completion; a draft is being reviewed. This important document will help members, and others, with their native plant selections (i.e., which species are really appropriate for Delaware?). This document should be available in a few weeks.

Since the newsletter editor has been clamoring for my material for this issue of The Turk's Cap I will conclude my letter. Plus, I need to get out of the house to find some big containers so I can rescue (if they survive the transplant shock) some plants from a forest about to be destroyed to make room for a highway.

As usual I would like to extend my invitation to all members to become more active in their society. We need your participation to become an even better organization. You can start by attending our annual meeting, taking place at Blackbird State Forest on April 29, 2000 (see elsewhere in this newsletter for details). Enjoy the Spring and our native plants. 🌿

Sincerely,

Keith Clancy

NATIVE PLANT HIGHLIGHT

NATIVE SHRUBS OF DELAWARE

A shrub is defined as a perennial woody plant, usually with several main stems arising from or near the ground, that is up to 5 meters in height. There are 123 species and varieties (taxa) of native shrubs known to occur in Delaware, represented by 42 families and 54 genera. The largest families are: Rosaceae (Rose Family) with 33 taxa; Ericaceae (Heath Family) with 23 taxa; Caprifoliaceae (Honeysuckle Family) with 9 taxa; Salicaceae (Willow Family) with 7 taxa; Cornaceae (Dogwood Family) with 6 taxa. The largest genera are: *Crataegus* (hawthorn) with 11 taxa; *Rubus* (blackberries and raspberries), *Salix* (willow), and *Viburnum* (arrow-wood) all with 7 taxa; *Vaccinium* (blueberry) with 6 taxa. There are 67 species of shrubs that are deciduous, and 14 species that are evergreen. There are 49 species of shrubs that are considered to be rare in Delaware, with 6 species known from only a single population. In addition, there are 23 rare species of shrubs that have not been reported in the state for 20 or more years. Within the Piedmont physiographic province of the state there are 18 species that are restricted to this area, and 41 species that are only found in the Coastal Plain physiographic province. Below is a list of just a few of the more common species of shrubs found in Delaware.

SCIENTIFIC NAME

Alnus serrulata
Amelanchier canadensis
Aronia arbutifolia
Asimina triloba
Baccharis halimifolia
Cephalanthus occidentalis
Clethra alnifolia
Cornus amomum
Cornus florida
Corylus americana
Crataegus macrosperma
Crataegus pruinosa
Euonymus americana
Gaylussacia baccata
Gaylussacia frondosa
Hamamelis virginiana
Ilex glabra
Ilex verticillata
Itea virginica
Iva frutescens ssp. *oraria*
Kalmia latifolia
Leucothoe racemosa
Lindera benzoin
Myrica cerifera
Myrica pensylvanica
Rhododendron periclymenoides
Rhododendron viscosum
Rhus copallinum
Rhus hirta
Rosa palustris
Rubus allegheniensis
Rubus occidentalis
Sambucus canadensis
Spiraea tomentosa
Vaccinium corymbosum
Vaccinium pallidum
Vaccinium stamineum
Viburnum acerifolium

COMMON NAME

brook-side alder
oblong-leaf serviceberry
red chokeberry
pawpaw
eastern baccharis
common buttonbush
coast pepper-bush
silky dogwood
flowering dogwood
American hazelnut
hawthorn
hearts-a-bustin
black huckleberry
dangle-berry
American witch-hazel
ink-berry
black holly
Virginia willow
marsh elder
mountain laurel
fetter-bush
spicebush
southern bayberry
northern bayberry
pink azalea
swamp azalea
winged sumac
staghorn sumac
swamp rose
common blackberry
western raspberry
common elderberry
hardhack spiraea
highbush blueberry
early lowbush blueberry
squaw huckleberry
maple-leaf viburnum

Viburnum dentatum southern arrow-wood

Viburnum prunifolium smooth black-haw

oooo William McAvoy

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FEATURE ARTICLE

Continued from page 4

plant communities. Furthermore, people and organizations interested in establishing native communities of plants and animals should participate in national, regional, and state initiatives.

Native Plants Are Important

Native plant communities support native communities of birds and other desirable wildlife. All of the trees that Dr. Margaret Brittingham, an Associate Professor of Wildlife Management at Penn State, recommends for wildlife food and cover are native to Pennsylvania. Native plants play a role in developing more sustainable communities because they generally are low maintenance, and thrive in native soils and climatic conditions. As a result, native plants require less fertilizer inputs and less pesticide use, which protects water quality. Many natives such as red maple and ash can tolerate urban conditions and be used to address a wide range of aesthetic considerations. Native trees and other plants provide historical connections and important shared and structured symbols for citizens and communities. Can you imagine Pennsylvania without the stately hemlock, sycamore, and oak? Very importantly, native plants species are increasingly more available. When considering these and other important facts, such as the invasive nature of many non-native plants, why would we not want to promote the use and reestablishment of native plants?



oooo Flavia Rutkosky, United States Fish and Wildlife Service

Reprinted with permission from the summer 1999 issue of Sylvan Communities magazine.

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PICK THE TURK'S CAP

WATER GARDENS

Q. I would like to set up a water garden in my yard. How should I do it?

A. Setting up a water garden, or small pond, is not too difficult. But you should follow some general guidelines to make the process go smoothly.

1. Size the pond to what you intend to use it for, and don't make it too deep or shallow.

The best rule of thumb is to make the pond as large as you can for the space where you want it to go. You should also be aware of how much water you will really need. Say, you want a pond that's 4 foot square and 2 feet deep. It will take two hundred and fifty gallons to fill that space. When it comes to depth, check with knowledgeable experts in your area to find out what works best in your climate. If the pond is too shallow or too deep, it will be difficult to care for fish or plants.

2. Use the right materials.

If you really want to start out small with an in-ground pond, then line the pond with EPDM rubber liner. Other materials for lining are permalon liners, PVC liners and pre-formed plastics molds in various shapes.

3. For a garden or pond with a stream or waterfall, make sure you buy the correct pump.

Measuring proper pump size should be given a lot of thought. A cheaper pump with lower capacity may seem like a bargain in the store, but once you bring it home and it barely powers a little fountain, it will not look like such a good deal. Make sure to pay close attention to the energy use of the pump. Buying a cheaper brand that uses a lot of electricity will end up costing you more money. You will spend more money on your electric bill than you would have if you had simply bought a better pump. Invest in a good pump with a decent warranty. There are a lot of different kinds of pumps, made from a lot of different materials, so do some research before you buy.

4. For that stream or waterfall, make sure it is the correct size for the size pond you have.

You have to keep in mind the amount of water that will be used by the stream or waterfall, because this will drain down the pond when that feature is running, and fill up the pond when the that feature is turned off.

5. Blend the pond into your yards landscaping or other natural features.

A pond should have areas that are scooped out along the perimeter forming small pockets where you can put water plants, with small stones lining it and interspersed in amongst the plants. You can even build a bog garden at the edge of the pond and link it to the main section of the pond.

6. Balance the amount of water with an appropriate kind and number of plants.

Not only does this look aesthetically pleasing, but the plants will oxygenate the water, help keep down algal growth in warm weather and shade water to keep it cool. Appropriate plants should first of all be native, and obviously be aquatic or semi-aquatic in nature. Pickerelweed (*Pontederia cordata*), twigrush (*Cladium mariscoides*), common hornwort (*Ceratophyllum demersum*), broadleaf arrowhead (*Sagittaria latifolia*), pennywort (*Hydrocotyle americana*, or *H. ranunculoides*), lizard's tail (*Saururus cernuus*), bristly sedge (*Carex comosa*), blueflag iris (*Iris versicolor*), and smooth rush (*Juncus effusus*) are just a sampling of some of the plants that could be used in Delaware.

7. Don't expect your pond to always look neat and clean.

Ponds always develop at least a little algae and the water inevitably turns cloudy, particularly in the spring. All of this is normal and should be expected, particularly if you want to keep fish or plants in it. The most important accessory in a pond should be a high-quality biological filter. This will go a long way in keeping the water healthy, along with a balanced number of, plants and scavengers.



oooo Eric Zuelke, Editor, and William McAvoy

UPCOMING EVENTS

SATURDAY, 29 APRIL 2000 – EARTH DAY AT BRECKNOCK PARK, WYOMING, DE. THIS EVENT WILL FOCUS ON PLANTING NATIVE PLANTS AND LEARNING ABOUT THE PARK AND ITS NATIVE PLANTINGS. FROM 9 AM TO 1 PM. CONTACT CARL SOLBERG AT 302.698.6445 FOR MORE INFORMATION.

FRIDAY, 28 APRIL AND SATURDAY, 29 APRIL 2000 – UNIVERSITY OF DELAWARE BOTANIC GARDENS PLANT SALE. FROM 2 PM TO 8 PM ON FRIDAY, AND 9 AM TO 4 PM ON SATURDAY AT THE FISCHER GREENHOUSE. CALL 302.831.2531 FOR MORE INFORMATION, OR ON THE WEB AT [HTTP://BLUEHEN.AGS.UDEL.EDU/UDBG](http://BLUEHEN.AGS.UDEL.EDU/UDBG).

SATURDAY, 6 MAY AND SUNDAY, 7 MAY 2000 – DELAWARE NATURE SOCIETY NATIVE PLANT SALE. FROM 9 AM TO 5 PM ON SATURDAY, AND 10 AM TO 3 PM ON SUNDAY AT THE ASHLAND NATURE CENTER. ON THE WEB AT WWW.DELAWARENATURESOCIETY.ORG FOR MORE INFORMATION.

13 MAY 2000 – PLANTS AND PEOPLES CONFERENCE 2000. U. S. WASHINGTON, JR. COOPERATIVE EXTENSION CENTER AND HERBARIUM AT DELAWARE STATE UNIVERSITY, DOVER, DE. FROM 8 AM TO 6 PM. REGISTRATION IS \$25/PERSON OR \$40/PERSON WITH LUNCHEON. DEADLINE IS 15 APRIL AND SEATING IS LIMITED. LATE REGISTRANTS CAN SEND AN E-MAIL TO DR. ARTHUR O. TUCKER AT ATUCKER@DSC.EDU FOR MORE INFORMATION AND TO INQUIRE ABOUT SEATING AVAILABILITY.

SATURDAY, 20 MAY 2000 – EXPLORE MARTINAK STATE PARK WITH THE EASTERN SHORE CHAPTER OF THE MARYLAND NATIVE PLANT SOCIETY. THIS PARK IS A MIXED DECIDUOUS/CONIFEROUS FOREST NEXT TO THE CHOPTANK RIVER IN CAROLINE COUNTY, EAST OF DENTON ON DEEP SHORE ROAD. FROM 10 AM TO NOON. CALL DANIELLE FITZKO AT 410.758.0166 FOR MORE INFORMATION.

SATURDAY, 17 JUNE 2000 – EXPLORE KING'S CREEK MARSH WITH THE EASTERN SHORE CHAPTER OF THE MARYLAND NATIVE PLANT SOCIETY. THIS FRESHWATER MARSH IS A NATURE CONSERVANCY PRESERVE EAST OF EATON AT BLACK DOG ALLEY AND DOVER ROADS. FROM 9 AM TO 11 AM. CALL DANIELLE FITZKO AT 410.758.0166 FOR MORE INFORMATION.

DON'T MISS THIS UPCOMING EVENT !

SECOND ANNUAL MEETING OF THE DELAWARE NATIVE PLANT SOCIETY

Join us at Blackbird State Forest on Saturday, 29 April 2000 from 3-7:30 PM for the 2nd Annual Meeting of the Delaware Native Plant Society. From 3 p.m. to 4:30 p.m. there will be a short native plant hike at Blackbird State Forest. We'll see what's blooming and explore the State Forest. You won't want to miss experiencing this part of Delaware in early spring; in addition to the requisite wildflowers there will likely be frogs croaking, birds singing, insects on the fly, ponds (Delmarva or Carolina Bays that is) worth exploring and a myriad other stimuli to process. After the walk, beginning at 4:30 and lasting till around 6:30 there will be a pot-luck meal (microwave on premises) and a members participatory show and tell program. Bring 10-15 slides of your favorite native plants or pictures that you took during a recent field trip you were on or from your native plant garden. Or, bring in a plant to talk about to the group. At 6:30 we will be raffling off a beautiful native plant (so you'll not want to miss

this). Please let us know if you plan on showing slides or bringing a plant or two (call or email us at 302.674.5187, dnplant@aol.com). From 6:30 to 7:30 there will be a short business meeting. New officers will be elected at this time. This will be an excellent opportunity to become active in the DNPS. The Blackbird State Forest Headquarters is located on Blackbird Forest RD, between Blackbird and Prices Corner, New Castle County, DE. Call 302.674.5187 for more information.

DNPS WEBSITE

The DNPS website is experiencing a bit of a lag at the moment. Our webmaster, Doug Janiec, has resigned his position with the DNPS, and our fearless leader (that's Keith) has volunteered to take over as webmaster. Managing a website takes a bit of specialized software and know how. So, please be patient during this transition. But until then, if you want to revisit any of our past newsletter articles, you can check them out at www.delanet.com/~dnpswp.

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: \$ _____

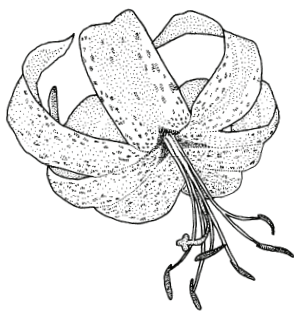
**Make check payable to:
DE Native Plant Society
P.O. Box 369, Dover, DE 19903**

DELAWARE NATIVE PLANT SOCIETY

P.O. Box 369

DOVER, DELAWARE 19903





The Turk's Cap

THE NEWSLETTER OF THE DELAWARE NATIVE PLANT SOCIETY SUMMER 2000

IN THIS ISSUE

- Page 1** ○ *A Call for Articles*
 ○ *New Members*
 ○ *Letter From the President*
- Page 2** ○ *Letter From the Editor*
 ○ *Plant-animal Highlight*
 ○ *Resources and Reviews*
- Page 3** ○ *Natural Community Highlight*
 ○ *Feature Article*
- Page 4** ○ *Feature Article continued*
 ○ *Natural Community Highlight cont.*
- Page 5** ○ *Letter From President continued*
 ○ *Native Plant Highlight*
- Page 6** ○ *Natural Community Highlight cont.*
 ○ *Native Plant Highlight continued*
 ○ *Event Highlight*
- Page 7** ○ *Upcoming Events*
 ○ *DNPS Website*
- Page 8** ○ *Membership Application*

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 BREEZY SUNRISE WELCOME TO OUR NEWEST MEMBERS

April through June

Arrowwood Nursery
 Diane Chance
 Gwendolyn Elliott
 Holly and Charles Johnson
 Deborah Paruszewski
 Jim Plyler

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, fieldtrips, and a statewide membership organized by the DNPS.

HOW CAN I GET INVOLVED?

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

The DNPS is working on several significant projects at this time. We are working on a forest conservation act that we hope will soon afford protection to our rapidly vanishing forests. A second initiative underway is the establishment of native plant nurseries. We have broken ground on one of these nurseries and it looks great so far. We encourage everyone to participate in these endeavors.

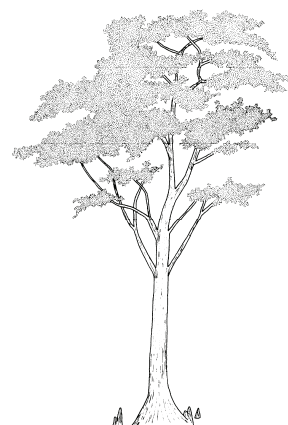
For more information on how to get involved, call 302.674.5187, or E-mail at dnplant@aol.com. Or visit the DNPS website at

LETTER FROM THE PRESIDENT

I trust everyone is enjoying their respective summers and finding the occasions to get out and enjoy our native plants in their intact habitats, a quickly vanishing resource in Delaware. We continue to see, at an unrelenting pace, loss of habitats through developments and road construction projects. As a result of these activities, we are seeing a further decline in native plant communities and in populations of our native plants and an increase in exotic species.

The Delaware Natural Heritage Program (DNHP) estimates that 44 percent (or 690 species) of the known native flora of the state is rare. Of

Continued on page 5



LETTER FROM THE EDITOR**OH THE HEAT!**

Ah, summer. Bugs, heat, barbecues, mowing the lawn, picnics, humidity, and gardening. The good, the bad and the ugly of summer! I hope everyone is having fun with their gardens, be them vegetable or flower, as gardens are one of the pleasures of this season. If you planted a flower garden of native drought resistant plants, then this issue's feature article will be of interest. Summer is also a great time to visit some of the more unusual habitats of Delmarva, such as the wet meadows and coastal plain ponds discussed in our Native Plant and Natural Community columns. And after you read the Plant-animal Highlight, go into your attic, get that old fish aquarium and turn it into a terrarium for carnivorous plants. These plants are quite easy to purchase, and are really fascinating. But in the midst of all these plant activities, don't forget the real purpose of summer: playing on a slip-and-slide and having mud fights. 🐸

oooo Eric Zuelke, Editor

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PLANT-ANIMAL HIGHLIGHT**TO PARTAKE OF ANIMALS**

In the last installment of this column, I talked about how tough it was to be a plant; all those herbivores out there munching away on all those little plants. Well, now it's the plants turn to get even. A plant is carnivorous if it attracts, captures, kills, and digests animal life forms. Only plants that do all four of these things are truly carnivorous. Protein digestion in plants is a truly amazing evolutionary turn of events. Your typical plant lives life as an autotroph. Autotrophic life forms survive on simple molecules that are not preprocessed by other life forms. Conventional, non-carnivorous plants require water, CO₂ (carbon dioxide), light, and simple mineral nutrients to survive and that's all. Heterotrophic life forms require complex organic molecules that have been preprocessed by other life forms. Animals, parasitic and saprophytic plants, and most bacteria are all heterotrophs. By these definitions it would seem that carnivorous plants are heterotrophic. However, scientists have grown carnivorous plants in laboratories, where they were not given any insects as food. In these cases, the plants still grew fine as autotrophs, although they grew more slowly, and produced less seed. So carnivorous plants occupy an evolutionary and ecological gray zone, but are mostly autotrophs just like other plants, though they use complex organic molecules to enhance their survival and fertility.

If you happen to be a rotifer, daphnia, mosquito larvae, gnat, fly, moth, ant, spider, fish fry, frog, or a sick rat or bird and you're near one of the nearly 600 species of carnivorous plants in the world, look out! Of course, not every species of carnivorous plant eats all these types of prey items. Some are aquatic, such as species of *Utricularia* (bladderworts) and *Aldrovanda*, that live with their traps submerged. Some are terrestrial and have sticky leaves, like species of *Drosera* (sundews), pitcher shaped spathes, like species of *Sarracenia* (pitcher plants), or have clamping jaw-like leaves, like *Dionaea* (Venus fly traps).

The mechanisms of how carnivorous plants digest their prey has been voraciously studied by scientists. Carnivo-

rous plants must have a source of enzymes to digest their prey. Some carnivorous plants produce the digestive enzymes themselves, while others rely on bacteria to produce the appropriate enzymes. In this case, the plants themselves do not excrete the digestive juices; the food simply rots, and the carnivorous plants absorb the decomposed molecules. Some plants, particularly *Sarracenia purpurea*, rely upon both their own enzymes and bacterially generated enzymes. A third mechanism for nutrient acquisition is the use of insects to process food for the plant. The most well known case of this type of co-evolution is the relationship between the Assassin bug and sundews (*Drosera* spp.). The Assassin bugs crawl around on the sundews, have the ability to not get caught themselves, and eat other bugs that have been captured. The Assassin bug then excretes its waste, and the plant absorbs the excrement. An extreme variation on this lifestyle is displayed by some species of *Nepenthes*-also called pitcher plants but native to Madagascar, Seychelles, Australia and New Caledonia-that grow in areas where birds routinely excrete their waste.

Carnivorous plants hold an important place in the ecology of the earth; just think how buggy it would be without them!

oooo 🐸 Eric Zuelke, Editor

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RESOURCES AND REVIEWS**NATIVES FOR THE EDIBLE LANDSCAPE: AN ARTICLE REVIEW**

"More and more gardens are going native these days." So begins an informative article in the May/June 2000 issue of The American Gardener, the magazine of the American Horticultural Society. Lee Reich states that "fruit plantings seem stalled in the past, with most people still planting apples or peaches or pears – all non-native species that reflect the European heritage of the first colonists."

In the article, Mr. Reich talks about several native, to North America, fruiting trees and shrubs (please note that some of these species are not native to Delaware and may not be appropriate for planting here) that would make excellent additions to our yards and landscapes. Some of the plants described are:

- American persimmon (*Diospyros virginiana*) – a plant deeply rooted in American folklore. The best-flavored persimmons have the rich flavor and texture of apricots that have been soaked in honey. Persimmon trees grow to 50 feet tall or more and are adorned with drooping slightly bluish leaves that turn a golden yellow in autumn. You should plant a male and female tree for fruit.

- Pawpaw (*Asimina triloba*) – this tree gives a lush, tropical look to the garden. It bears fruit that should be picked when their yellowish skins become speckled brown and exude a richly sweet fragrance. The trees grow 15-25 feet tall and are seldom bothered by pests or diseases. Plant two or three to ensure cross-pollination.

- Juneberries (*Amelanchier* spp.) – these small trees or large shrubs are known as serviceberries or shadblows. June

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NATIVE PLANT COMMUNITY HIGHLIGHT

Cephalanthus occidentalis/*Glyceria* spp.-*Polygonum amphibium* shrub Community

Buttonbush/Mannagrass-Water smartweed Shrub Community

Introduction

This community is rather common in a region of Delaware (NW Kent and SW New Castle Counties) known for its abundance of seasonal ponds, also referred to as Delmarva or Carolina Bays, or Coastal Plain ponds. These ponds are elliptical, round or irregular in shape, have a very gradual slope from the pond's edge to the deepest central part, and may have various orientations. Few in this region have the features of the classic Carolina Bay: i.e., mostly with elliptical shapes, a SE to NW orientation and a high sandy rim around the southeastern side of the Bay.

Community structure/composition

This community is characterized by an abundance of *Cephalanthus occidentalis*, several species of *Glyceria* (usually *pallida* or *septentrionalis*), and *Polygonum amphibium*. The buttonbush, between 1-1.5 m in height, usually forms a dense ring around the pond somewhere between the middle and the periphery, but may also occur as scattered individuals in ponds where it has not yet become well established. Additionally, the buttonbush is usually absent from the extreme periphery and center of the pond. The mannagrasses and the smartweed often may be co-dominants in the herb layer or, conversely, one may be more prevalent than the other. In many of the ponds of this region *Bidens frondosa* (devil's beggar's-tick) may be a co-dominant herb, "replacing" either the mannagrass or smartweed. Additional species, but usually in low numbers, include *Cyperus strigosus* (false nutsedge), *Echinochloa crusgalli* (barnyard-grass), *Dulichium arundinaceum* (three-way sedge), *Triadenum virginicum* (marsh St. John's-wort), *Lindernia dubia* (false pimpernel), *Lycopus rubellus* (stalked water-horehound), *Panicum verrucosum* (warty panic-grass), *Polygonum punctatum* (dotted smartweed), *Rhexia virginica* (Virginia meadow-beauty), *Decodon verticillatus* (water willow), *Scirpus cyperinus* (woolgrass), *Carex lupulina* (a sedge), *Carex striata* (a sedge), and *Proserpinaca palustris* (marsh mermaid-weed). Around the perimeter of the pond there is often a narrow zone that is devoid of vegetation; also in this zone there may be an abundance of *Sphagnum* spp. Within the pond there may be scattered trees of such species as *Diospyros virginiana* (persimmon), *Liquidambar styraciflua* (sweet gum), *Quercus palustris* (pin oak), *Populus heterophylla* (swamp cottonwood), and *Acer rubrum* (red maple). Around the edge of these ponds may be found such species as *Vaccinium corymbosum* (highbush blueberry), *Itea virginica* (Virginia willow), *Clethra alnifolia* (sweet pepperbush), *Leucothoe racemosa* (fetterbush), *Rhododendron viscosum* (swamp azalea), *Smilax rotundifolia* (roundleaved greenbrier), *Acer rubrum* (red maple), *Quercus phellos* (willow oak), *Liquidambar styraciflua* (sweet gum), and *Quercus palustris* (pin oak).

Other species

There may be a number of rare species present within this community and pond and these include *Eragrostis hyinoides* (teal

NATURAL QUOTES

'We can to a certain extent understand how it is that there is so much beauty throughout nature; for this may be largely attributed to the agency of selection.'

Charles Darwin, The Origin of Species

FEATURE ARTICLE**SUMMER BLOOMS WITH BUTTERFLIES**

I have long combined my love of gardening with my desire to preserve and create natural wildlife habitat. Because I garden on dry, sandy soil, I concentrate on using those adaptable native plants which can survive, and even thrive, in dry conditions. Many drought-resistant native perennials are attractive, beneficial to wildlife, and suitable for use in cultivated gardens.

One of the earliest to bloom (late-April-May) is the lyre-leaved sage (*Salvia lyrata*) with ten inch long blue flower spikes rising from a dark green rosette of leaves. It does well in part to mostly shade and, like all the salvias, is frequented by hummingbirds.

A mid-summer bloomer is clasping-leaf, or hemp dogbane (*Apocynum cannabinum*). It has small white to greenish white flowers that attract a number of butterflies and likes a dry soil. Blooming late in the summer is the horsemint, or spotted bee balm (*Monarda punctata*), with yellowish, purple-spotted flowers.

I've heard people say they get tired of black-eyed susans, but I can never have enough. The common *Rudbeckia hirta* is a biennial for me, but since it self-seeds so prolifically, it is always there. A member of the same family, roundleaf thoroughwort (*Eupatorium rotundifolium*) is also drought-tolerant and a true perennial.

The various goldenrods (*Solidago* spp.) begin blooming in this area in August and are still blooming in October. While they may wilt during drought conditions, they always manage to bloom well. I like them with blue and purple New England asters (*Aster novae-angliae*) that have done surprisingly well in an area where they received little irrigation since they generally prefer moist conditions. There are other asters that tolerate quite dry conditions. These include the late purple aster (*Aster patens*), purple-stemmed, or swamp aster (*Aster puniceus*), and the goblet aster (*Aster lateriflorus*). The most common here is the white heath, or hairy heath aster (*Aster pilosus*), which is an important late nectar source for bees and butterflies. It will bloom through the first heavy frost. Maryland golden aster (*Chrysopsis mariana*) is another good choice for dry areas in part-shade to full sun. All of these are valuable to bees and butterflies, and the seed heads provide food for songbirds.

Some of our native grasses are very drought-tolerant and provide interesting form and texture to meadows or gardens throughout the year. They are also important as nesting sites and seed sources for songbirds. Switchgrass (*Panicum virga-*

Continued on page 4

tum) holds up especially well in drought conditions.

One of my favorite plants is the butterfly weed, or butterfly milkweed (*Asclepias tuberosa*). I love the orange, red, or yellow flowers and so do many butterflies. The Monarch butterfly larvae feed on the foliage of all the milkweeds, absorbing a toxin which makes them unappetizing to birds. Even if they defoliate the plant, new growth will emerge, so I just let them eat. It's one of the reasons I plant it. One of the few benefits I can think of to last year's dry summer was the tremendous number of Monarchs, the most I have ever seen.

The Monarch butterfly (*Danaus plexippus*) is worthy of its name. A large butterfly, its wings are reddish-gold with black veining and white and orange (in the migratory generation) spots. The caterpillar is white, banded with black and yellow stripes, while the chrysalis (or pupa) is a pale, luminous green spotted with metallic gold.

It is the life-history of this butterfly, however, which makes it so unique. Alone of all the North American butterflies, it is unable to withstand freezing temperatures at any stage of its life and must seek a tropical climate during our winter. In the early fall of the year, these tiny, fragile creatures will fly up to 20 miles a day and travel 3,000 miles from southern Canada and the eastern U.S. to a remote mountain valley in Mexico. There they will remain for several months before mating and beginning the return migration to the north. As they travel, the females will lay their eggs on the underside of milkweed leaves before dying. These eggs will hatch into small larvae that will grow and shed their skins four times before pupating and then metamorphosing into the showy adults. These adults will then mate and continue to move northward, repeating the reproductive cycle two to three more times. An adult Monarch may live 2 - 5 weeks. The last generation to hatch, however, can live from 8 - 9 months and will make the fall migration to a place they have never seen! How they are able to do this is a wonderful mystery.

Adult Monarchs must have nectar sources to sustain them as they reproduce, move northward, and then begin the arduous return to Mexico. They feed on the flowers of many native plants, including milkweeds, buttonbush (*Cephalanthus occidentalis*), Joe-pye-weed (*Eupatorium maculatum*), ironweed (*Vernonia noveboracensis*), goldenrods, and asters.

The caterpillars do not have this luxury of choice. They must feed on milkweed leaves to survive. And human activity is taking its toll on all our native plants, including milkweed. They are being mowed, sprayed, and replaced by development of all types. In addition to this destruction of their only food source, we are using insecticides that not only kill undesirable insects but the butterflies which we all enjoy. We can help to mitigate this loss by encouraging our state and county road departments to mow and spray less - and to include milkweeds in their wildflower plantings - and by leaving and planting milkweeds on our own property. We can also avoid the use of controls harmful to butterflies whenever possible.

Because of their deep taproots, milkweed are extremely difficult to transplant and have little chance of survival if dug from the wild. Leave them where they are, unless you know they are going to be lost to development of some kind. Milkweeds are very easy to grow from seed whether in a seedbed or a flat. They need no chilling to germinate. Simply cover them lightly, keep the medium evenly moist, and they will germinate in 1-2 weeks. Just remember where you planted them, or mark them, because they are slow to emerge in the

spring.

Butterfly weed also roots easily from tip cuttings.

Any gardener is an optimist, or he/she wouldn't bother planting at all. I'm hoping this summer will be wetter and cooler than last. But just in case it's not, I'm trying to ensure that I will still have plants that will thrive and bloom, providing beauty, as well as cover and food for wildlife.

oooo Margaret Carter, DNPS member



NATIVE PLANT COMMUNITY HIGHLIGHT

Continued from page 3

lovegrass), *Hottonia inflata* (featherfoil), *Carex gigantea* (large sedge), *Fimbristylis perpusilla* (Harper's fimbry), *Ambystoma tigrinum* (tiger salamander), *Ambystoma maculata* (Spotted salamander), *Hyla chrysoscelis* (Cope's gray treefrog), and *Hyla gratiosa* (Barking treefrog). The featherfoil and Harper's fimbry are found in the lowest portions of the ponds and the former can be seen in full bloom in early spring.

Community dynamics/succession

The dynamics of this community are very complex. In its simplest, this community type is driven by hydrology. The length and depth of flooding will determine, in large part, the species composition of the pond. The species composition or the abundance of each species may change from year to year as the flooding regime varies. While most years the water draws down to below the surface of the soil, in extremely wet years there may be standing water year round. Some species may "vanish" from the pond for years and only reappear when conditions are appropriate (e.g., Harper's fimbry). If conditions are right for the buttonbush you may see its expansion throughout the pond, if not, it may contract and its numbers become reduced. Ultimately, it is thought, that these open shrub and herb-dominated wetlands will succeed to a closed canopy forest. More studies are needed to determine the true dynamics and successional attributes of this community.

Distribution

In Delaware, primarily restricted to northwestern Kent and southwestern New Castle Counties.

Conservation Status

The so-called Delmarva Bays (which includes this community type as well as others) is considered to be a habitat type of conservation concern and one which merits attention and protection. The *Cephalanthus occidentalis*/*Glyceria* spp.-*Polygonum*

Continued on page 6

NATIVE PLANT COMMUNITY HIGHLIGHT

LETTER FROM THE PRESIDENT*Continued from page 1*

this number, 187 are known from only 1-5 populations (with 78 known from a single population!), 147 are known from 6-20 populations and 241 are characterized as being historical or extirpated (Bill McAvoy pers. comm.). At the same time, the number of non-native (i.e., exotics or aliens) vascular plants found in Delaware as reported by the DNHP in December 1998 was at 541 species, or 25% of the state's total vascular flora. This number is currently being revised, as many newly reported non-native species have been discovered since the date of this report. As more and more surveys of the state's flora are undertaken it seems likely additional exotic plant species will be discovered and the further declines of native plant populations will be noted.

But all is not doom and gloom. The DNPS is in a unique position to act proactively to reduce or even reverse some of the actions that result in the deterioration of our native plant communities and the plants and animals dependent on them. But we cannot do so effectively without the participation of our members. I would like to mention, probably for the second or third time, some of the projects that we are working on and to appeal for your help.

The DNPS recently signed a Memorandum of Agreement (MOA) with the Division of Soil and Water, DNREC, to establish a native plant nursery at the St. Jones National Estuarine Research Reserve near Dover. This MOA covers a period of three years and will give US an opportunity to propagate the many species of native plants that are in demand throughout the state by land restorationists and stewards. We have broken ground on this nursery and have recently planted nearly 3 dozen plants rescued from a DelDOT Route 1 construction site. We plan to propagate many species of trees and shrubs and some herbs in the coming months and hope to be able to fill some of the huge demand for native plants that exists. We need help with the nursery to ensure its success. In the fall we will be looking for volunteers to help in several seed collecting outings (stay tuned for dates and times). Anyone interested in helping with the nursery please contact me in the near future.

Related to this effort we are working to ensure that we can be advised, well in advance, of construction projects that will result in habitat loss so that we can mobilize plant rescue efforts. The plants rescued from these sites will then find a home in our nursery for future habitat restoration projects (e.g., reforestation projects), future annual plant sales, or to be planted on members' properties. We need someone to make the necessary contacts so that we are "in the loop" on these projects.

A second major initiative that needs further work and refinement is our draft Forest Conservation Act. This is a draft document, adapted from Maryland's Act of the same name. We are currently considering discussing this Act at the next meeting of the Governor's Biodiversity Working Group. We are also planning on drafting a letter to certain (all?) members of the legislature that would focus on developing legislation that requires all state agencies mitigate for the loss of upland forest habitats. Currently, the state's most imperiled habitat has no protection afforded to it. Your help on this front is needed.

We will be working with the Division of Fish and Wildlife, DNREC, on a reforestation project beginning this fall and will need help in collecting seed, planting and direct seed-

ing, as well as weeding.

Finally, a third major project that we are working on, though it has been on the back burner for the last six months is legislation that will result in a state list of endangered and threatened plants. The numbers for Delaware's rare and historical plants, as calculated by the DNHP, should be sufficient reason to develop a state list of T & E plants with corresponding habitat protection measures. We need help in gathering information on other states that have state listed plants. We will use the best aspects from these states' respective legislations to produce a draft for Delaware. We will then lobby for its passage in Delaware.

So, the next time you happen to pass by a forest that is being cleared to make room for a new road or subdivision (progress they call it), or visit a favorite natural area to discover its overrun with exotic species or is now surrounded by urban sprawl, rather than grumble about it and complain (which I always do), think about what you could have done or can do to lessen this onslaught. I hope that you remember this letter and my plea for your help. Delaware's natural resources, and specifically its plants and plant communities need your help. Your participation in DNPS projects could mean the difference.

Savor the most that you can this summer from the native plant communities and native plants you encounter in the wild and join us in the struggle to protect what we see vanishing before our eyes.

Sincerely,



Keith Clancy

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NATIVE PLANT HIGHLIGHT
COMMON NATIVE PLANTS OF WET MEADOWS

"Wet meadows" in Delaware are open, freshwater non-tidal wetlands that occur on the landscape in topographical low areas that contain poorly drained soils. The hydrology of wet meadows is primarily driven by ground water that percolates to the surface. Their origins may be somewhat artificial, in that they may be an artifact of past land-clearing activities, usually for agricultural purposes. Nevertheless, they are often quite diverse botanically. Below is a list of the more common plants seen in wet meadows in Delaware. Many of these species are available commercially and can be used in native gardens. All these species prefer poorly drained areas with full sun.

SCIENTIFIC NAME

Alisma subcordatum
Asclepias incarnata
Aster novae-angliae
Aster puniceus
Bidens laevis
Boehmeria cylindrical
Carex stricta
Chelone glabra
Eupatorium fistulosum

COMMON NAME

broadleaf water-plantain
 swamp milkweed
 New England aster
 swamp aster
 smooth bur-marigold
 false nettle
 tussock sedge
 white turtlehead
 hollow Joe-Pye weed

Continued on page 6

Continued from page 4

amphibium Shrub Community has a Natural Heritage state rank of **S2S3** (intermediate between the two, 6-20 occurrences versus 21-50 occurrences); more surveys are needed to accurately assess its rank.

Comments

While many examples of this community and of Delmarva Bays, as a whole, do occur on protected lands (e.g., within Blackbird State Forest), many more are threatened. These threats include pressures from development (urban sprawl), road construction and hydrologic changes.

oooo Keith Clancy,  DNPS President

o o o o o o

NATIVE PLANT HIGHLIGHT

Continued from page 5

<i>Eupatorium perfoliatum</i>	common boneset
<i>Juncus effuses</i>	smooth rush
<i>Lobelia cardinalis</i>	Cardinal flower
<i>Ludwigia alternifolia</i>	bushy seedbox
<i>Lysimachia terrestris</i>	swamp loosestrife
<i>Mimulus ringens</i>	square-stem monkeyflower
<i>Onoclea sensibilis</i>	sensitive fern
<i>Polygonum arifolium</i>	halberd-leaf tearthumb
<i>Polygonum pennsylvanicum</i>	Pennsylvania smartweed
<i>Polygonum punctatum</i>	dotted smartweed
<i>Polygonum sagittatum</i>	arrow-leaved tearthumb
<i>Rudbeckia laciniata</i>	cutleaf coneflower
<i>Sagittaria latifolia</i>	broadleaf arrowhead
<i>Sambucus Canadensis</i>	common elderberry
<i>Schoenoplectus tabernaemontani</i> (<i>Scirpus validus</i>)	long-stem bulrush
<i>Stachys hispida</i>	hispid hedge-nettle
<i>Thelypteris palustris</i>	marsh fern
<i>Verbena hastata</i>	blue vervain
<i>Vernonia noveboracensis</i>	New York ironweed

oooo William McAvoy, DNPS member

RESOURCES AND REVIEWS

Continued from page 2

berries offer year-round beauty from the white flowers in spring, to the delicious blueberry-like fruit, to the outstanding fall color. For tree-like dimensions try *A. arborea* or *A. laevis*.

Blueberries (*Vaccinium* spp.) - can be grown almost anywhere that moist, humus-rich, acidic soil can be provided. In our area, plant highbush blueberry (*V. corymbosum*) or low-bush blueberry (*V. angustifolium*). They offer white blossoms in the spring, luscious fruit in the summer and great color in the fall.

For more information check out Lee Reich's book, "Uncommon Fruits Worthy of Attention: A Gardener's Guide."

oooo Rick Mickowski, DNPS member

EVENT HIGHLIGHT

DNPS ANNUAL MEETING: AN ENJOYABLE AFFAIR

If you didn't attend the Annual meeting on April 29th at Blackbird State Forest, you missed a beautiful day of learning, sharing and planning. Our time started off with a tour of the flora of Blackbird State Forest. The walk was led by Jim Dobson, the New Castle County forester, and Keith Clancy, DNPS President.

After the plant hike, we returned to the new meeting facility for a potluck meal, show and tell session and a native plant raffle. Joining us were Dave Paterson and his wife who run a plant nursery in Maryland. We enjoyed homemade sausage, baked beans, chicken wings, a mexican dish, broccoli salad and a delicious soup prepared by Mrs. Paterson. After the meal, some members showed slides related to native plant issues. Rick Mickowski showed slides of a project enhancement of a stormwater facility, Rick McCorkle shared slides of some of his home landscaping efforts using native plants, and Keith Clancy addressed the issue of plant loss due to habitat destruction from highway construction.

We then had a raffle for some really great plants. Jim Plyler of Natural Landscapes, Inc. was made an honorary member to the DNPS for his donation of approximately a dozen native plants to the raffle. Species donated by Jim included coast azalea (*Rhododendron atlanticum*), pinxterbloom azalea (*Rhododendron periclymenoides*), mountain laurel (*Kalmia latifolia*), sheep laurel (*Kalmia angustifolia*), red chokeberry (*Aronia arbutifolia*), sweet-bay magnolia (*Magnolia virginiana*), flowering dogwood (*Cornus florida*), and Atlantic white cedar (*Chamaecyparis thyoides*). The public can visit his establishment by appointment only and he can be contacted at 610.869.3788. Dave Paterson and his wife, Jan, also donated plants to the raffle. If you'd like more information about the Paterson's plant nursery, please contact them at pater-son@shoren.net

We closed out the event with a business meeting. A big thanks is due to Jim Dobson and Blackbird State Forest for hosting our event and for all those who took the time to attend and be involved. We especially appreciated the donations of plants, and the food was excellent. We hope everyone can make it to next year's event.

oooo Rick Mickowski, Rick  McCorkle and Eric Zuelke



UPCOMING EVENTS

SATURDAY, 12 AUGUST 2000 – JOINT FIELD TRIP WITH THE MARYLAND NATIVE PLANT SOCIETY. WE WILL EXPLORE A 52 ACRE PRIVATE PROPERTY THAT CONTAINS A VARIETY OF HABITATS THAT INCLUDES AN OPEN MEADOW WITH AN ABUNDANCE OF WILDFLOWERS, GRASSES AND SEDGES, AND A PINE-OAK FOREST THAT GRADES INTO A WETLAND FOREST. THIS PROPERTY IS ADJACENT TO THE NANTICOKE WILDLIFE AREA WHICH MAY BE EXPLORED FOR THOSE WHO WANT TO STAY LONGER. BRING WATER, INSECT REPELLENT, APPROPRIATE CLOTHING AND LUNCH. FROM 10 AM TO 12 NOON. CONTACT KEITH CLANCY AT 302.674.5187 FOR MORE INFORMATION.

SATURDAY, 23 SEPTEMBER AND SUNDAY, 24 SEPTEMBER 2000 – FALL CONFERENCE, ANNUAL MEETING AND NATIVE PLANT SALE OF THE MARYLAND NATIVE PLANT SOCIETY. THIS CONFERENCE INCLUDES GUEST SPEAKERS, CONCURRENT SESSIONS RELATED TO NATIVE PLANTS, FIELD TRIPS, A POSTER SESSION, NATIVE PLANT SALES, AND A SATURDAY EVENING SOCIAL. TO BE HELD AT THE HARTFORD GLEN ENVIRONMENTAL EDUCATION CENTER IN BEL AIR, MARYLAND. CONTACT JERRY HUDGENS AT 410.836.2469, OR AT GAHUDGENS@JUNO.COM FOR MORE INFORMATION.

SATURDAY, 30 SEPTEMBER 2000 – HARVEST MOON REVEL AND AUCTION. HOSTED BY THE DELAWARE NATURE SOCIETY AT THE ASHLAND NATURE CENTER. THIS IS A FUNDRAISER FOR DNS'S EDUCATION PROGRAMS THAT INCLUDES A SILENT AUCTION, DINNER AND LIVE MUSIC. FROM 6 PM TO MIDNIGHT. REGISTRATION IS \$70 FOR MEMBERS AND \$80 FOR OTHERS. ON THE WEB AT WWW.DELAWARENATURESOCIETY.COM FOR MORE INFORMATION.

SATURDAY, 7 OCTOBER AND SUNDAY 8 OCTOBER 2000 – HARVEST MOON FESTIVAL. HOSTED BY THE DELAWARE NATURE SOCIETY AT THE ASHLAND NATURE CENTER. THERE ARE MANY EXHIBITS, DEMONSTRATIONS, GAMES AND WALKS AT THIS FAMILY EVENT. FROM 10 AM TO 5 PM BOTH DAYS. ON THE WEB AT WWW.DELAWARENATURESOCIETY.COM FOR MORE INFORMATION.

SATURDAY, 7 OCTOBER AND SATURDAY, 21 OCTOBER 2000 – TENTATIVE DATES FOR SEED COLLECTING TRIPS TO THE PRIME HOOK AREA AND BLACKBIRD AREA FOR DNPS REFORESTATION PROJECTS. DETAILS TO COME.

DON'T MISS THIS UPCOMING EVENT ! TREE SPREE 2000

New Castle County Tree Commission is planning activities that tree lovers won't want to miss: the seventh annual *Tree Spree* event at the Red Clay Reservation near Hockessin, Delaware. The event will be on Saturday, October 14, 2000, from 10:30 a.m. until 2:30.

On *Tree Spree* day, the 250-acre reservation will be filled with tree plantings, exhibitors, Treecture Creature activities, nature hikes, hayrides and live demonstrations on everything to do with trees from pruning to building oak baskets, and attendees will be guided on scenic forest walks throughout the day. New for this year will be an "ask the experts" on a one-on-one basis about pruning, planting and basic tree care. A big hit last year was the children's activities and this year, expanded children's activities are planned.

Shuttles and guided hayrides will showcase the cultural and biological splendor of Red Clay. At 12:00 Noon, Mrs. Lamot Copeland and last year's honoree and former governor, Russell Peterson will bestow the honors on this

year's honoree Ned Cooch with a special tree planting.

If you have any questions about this celebration of the benefit of trees or other tree planting initiatives, please give Gary Schwetz, Greening Program Manager for Delaware Center for Horticulture, and New Castle County Government Tree Commission Secretary, a call at 658-6265. 🌿

~~~~~ Gary Schwetz

### ***DNPS WEBSITE***

The DNPS website is continuing to experience a bit of a lag at the moment. Keith has volunteered to take over as webmaster but hasn't yet managed to find the time to get into it. Your continued patience is appreciated. A notice will be placed here in a future issue when the website has been updated. Until then, if you want to revisit any past newsletter articles for Vols. 1 and 2, you can check them out at [www.delanet.com/~dnpswp](http://www.delanet.com/~dnpswp).

# 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: \$** \_\_\_\_\_

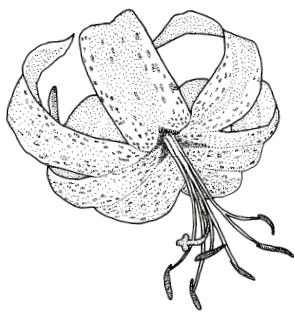
**Make check payable to:  
DE Native Plant Society  
P.O. Box 369, Dover, DE 19903**

**DELAWARE NATIVE PLANT SOCIETY**

**P.O. Box 369**

**DOVER, DELAWARE 19903**





# The Turk's Cap

THE NEWSLETTER OF THE DELAWARE NATIVE PLANT SOCIETY AUTUMN 2000

## IN THIS ISSUE

- Page 1** ○ *A Call for Articles*  
 ○ *New Members*  
 ○ *Letter From the President*
- Page 2** ○ *Letter From the Editor*  
 ○ *Plant-animal Highlight*  
 ○ *Resources and Reviews*
- Page 3** ○ *Natural Community Highlight*  
 ○ *Feature Article*
- Page 4** ○ *Feature Article continued*  
 ○ *Natural Community Highlight cont.*
- Page 5** ○ *Letter From President continued*  
 ○ *Native Plant Highlight*
- Page 6** ○ *Natural Community Highlight cont.*  
 ○ *Native Plant Highlight continued*
- Page 7** ○ *Upcoming Events*  
 ○ *Feature Article Continued*  
 ○ *DNPS Website*
- Page 8** ○ *Membership Application*

## HOW CAN I GET INVOLVED?

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

The DNPS is working on several significant projects at this time. We are working on a forest conservation act that we hope will soon afford protection to our rapidly vanishing forests. A second initiative underway is the establishment of native plant nurseries. We have broken ground on one of these nurseries and it looks great so far. We encourage everyone to participate in these endeavors.

For more information on how to get involved, call 302.674.5187, or E-mail at [dnplant@aol.com](mailto:dnplant@aol.com). Or visit the DNPS website at

## 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](mailto:ezuelke@juno.com)), or Keith Clancy at 302.674.5187.

## A RED, YELLOW AND ORANGE WELCOME TO OUR NEWEST MEMBERS

### July through September

Claudia Alesi

Hillspring Landscape Architecture

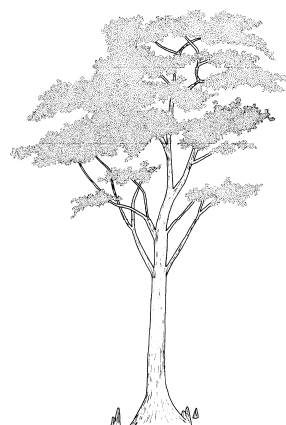
## LETTER FROM THE PRESIDENT

It has been quite the summer for plants. The numerous rain days we endured (I mean enjoyed) provided optimal growing conditions for plants, native and otherwise, macroscopic and microscopic. Like everyone else, I had to mow my lawn more times than I cared to; wishing I could just let it go. Believe me I would if I wasn't living in a community with zoning laws that frown on unkempt yards. In any case, the summer was quite a change from the previous one that saw consistently high temperatures and an unrelenting drought take their toll on human and plant alike. And while there were many discussions about the drought and water resources last summer, this summer there was nary a word on these topics. Instead, we were constantly fed updates on fish kills, algal blooms and red tide-like organisms in our Inland Bays.

DNREC and its biologists were scratching their heads trying to find the cause(s) for these

## 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, fieldtrips, and a statewide membership organized by the DNPS.



**LETTER FROM THE EDITOR****THE LEAVES ARE A FALLIN'**

Well, my second favorite time of the year is back. The first frost is just around the corner, my cats have quit shedding (a welcome relief for my vacuum), the apple cider has shown up at the farmers markets and it's time to fire up my stove for some power apple pie baking! And if you have the inclination to go seed collecting this autumn and disperse some acorns (perhaps to reforest an old field in your back 40) then our plant/animal highlight will enlighten you on how nature disperses those seeds. Our plant community highlight talks about a very rare plant community and the native plant highlight is about an autumn favorite with many gardeners; asters. Of course, it's never too early to think about next summer's gardening and reforestation activities and a good place to start is learning about soil, which our feature article reprint is about. So there's lots to do, but first remember that October is all about candy! 🍬

oooo Eric Zuelke, Editor

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**PLANT-ANIMAL HIGHLIGHT****GO WEST YOUNG SEED**

In nature, autumn is a time of change, movement, life and death, decay and dormancy. These characteristics are especially relevant in the life of plants. Flowers wither and vegetation dies or goes dormant. But before they reach this point, many plants display one last burst of color and have made assurances that life, in the form of their progeny, will carry on. While all of us have been going about our business over summer, so have the plants-producing seeds within fruits of all shapes, sizes and kinds (e.g., nuts, berries, pomes, drupes, achenes, capsules and caryopsis, to name a few). These fruits and their associated seeds are the final result of successful fertilization of all those brilliant and drab flowers. But now comes the hard part; getting all this potential life out into the world.

This is where successful seed dispersal systems come into play. Plants have evolved numerous methods of seed dispersal that include passive dispersal through water, wind, or animal mediated movement, and active dispersal through explosive release or hygroscopic awns or bristles. All these different methods have evolved because of factors working against seed survival. Research has shown that seeds dropping directly below a parent plant suffer higher mortality rates than those that are dispersed. A seed that is dispersed has less competition from sibling plants and the parent plant, has less potential for disease, are harder for seed predators to find and may colonize new areas of suitable habitat, thus expanding the range of that species and enhancing genetic variation over time. Of all the dispersal methods known, animal dispersal (zoochory-pronounced zô-a-chorry) is one of the most effective.

Seeds are dispersed by animals in many different ways. Some fly off with birds to be cached in a tree trunk hundreds of meters away from the parent tree (ornithochory). In the temperate zone, well known examples of this are the caching behaviors of Acorn Woodpeckers and different species of jays. Scientists have even suggested that Blue Jays may be solely responsible for the overall maintenance of oak forest ecosystems, particularly in areas where few other acorn dispers-

ing animals are present. Mammals, such as squirrels, chipmunks and mice also aid in this nut dispersal. These critters will frequently bury nuts they pilfer from the jay's caches. Often these buried nuts are never retrieved and thus, have the opportunity to germinate.

Another dispersal strategy is to produce an irresistible fruit with an extra strong seed inside. Many species of birds live solely on fruit at certain times of the year, and because the inner seed is so tough, it passes through the digestive tracts unharmed and can be deposited miles away from the parent plant (endozoochory). Though this method is very hit and miss.

Some seeds hitchhike onto the disperser via long or short barbs or sticky seed coats that hold on to fur, hair, pant legs or tennis shoes, and drop off only when they eventually become dislodged or are picked off. Large mammals, including humans, are normally the unwitting participants in this system of epizoochory. This type of dispersal can result in a seed being transported great distances from the parent plant.

One of the more interesting dispersal system is that of myrmecochory, or ant dispersal. Certain species of herbaceous plants produce seeds with a fleshy eliasome (or oil bodies) of fat that is an attractive food source for ants. After the ants transport these seeds to their nests and eat the eliasome, the seed is discarded. Ants also will gather and transport seeds without eliasomes to their nests; these to be eaten and fed to their young. Some of these seeds will germinate in the nest. In these cases, the seedlings are then carried out and deposited at some distance from the nest.

This is just a sampling of the numerous methods of seed dispersal, so take advantage of the great autumn weather and go outside and study as many of them as you can. 🍬

oooo Eric Zuelke, Editor

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**RESOURCES AND REVIEWS****WILDFLOWERS AND NATIVE PLANTS COMIC BOOK**

This new comic book is designed to teach young people about the benefits of encouraging the growth of plants that are native to an area. The 16-page comic book is sponsored and distributed by the National Association of Conservation Districts. It was created and produced by Discovery Comics in Doylestown, PA. Comment and review was provided by the Center for Plant Conservation at the Missouri Botanical Garden, the New England Wildflower Society in Framingham, MA, and the Lady Bird Johnson Wildflower Center in Austin, TX. While this educational guide does focus mostly on wildflowers, it does describe the importance of native plants in general and the danger of introduced plants that have caused problems in native habitats. It also makes the point of planting and using native species and even talks about native plant nurseries. If you are interested in receiving a copy of this comic book (it's geared to ages 8-14 but all ages can enjoy it) please contact Rick Mickowski at the New Castle Conservation District at 832-3100 ext. 113. Bulk quantities can be ordered from NACD by calling 1-800-825-5547 ext. 32. 🍬

**NATIVE PLANT COMMUNITY HIGHLIGHT***Pinus virginiana-Quercus* spp./*Carya pallida***Forest Community****Virginia pine-oak/Sand Hickory Forest Community****Introduction**

Within the Nanticoke Wildlife Area of southwestern Sussex County, Delaware, one encounters an interesting, almost mystical, undulating xeric landscape of pines and oaks on very well-drained, sandy substrates. The so-called ancient sand dune ridges of this area are believed to have their origins some 10,000 (or more) years ago when the climate was cooler, evergreens more prevalent and the land more exposed. Prevailing winds deposited large amounts of sands here. On the sandy ridge tops trees are extremely reduced in size, frequently only reaching 3 to 5 meters in height, species diversity is very low, and much bare sand is present. Lichens (species of *Cladonia* and *Cladonia*) may be abundant in areas. Virginia pine (*Pinus virginiana*) and a combination of oaks are the dominant tree species. The shrub layer may be well-developed at lower elevations.

**Community structure/composition**

These forests occur between 3 and 10 meters above sea-level on xeric, well-drained, sandy substrates characterized by an abundance of *Pinus virginiana*, which typically comprises 51-75 (some areas to 76-100) percent of the canopy coverage. The oaks include *Quercus alba* (white oak), *Q. falcata* (southern red oak), *Q. nigra* (water oak), *Q. stellata* (post oak), and *Q. marilandica* (blackjack oak). The most common of these oaks is *Q. nigra*, which may contribute up to 75 percent (though usually less) of the canopy component (except in areas that contain dense *P. virginiana* coverage). *Carya pallida* is usually present in the sub-canopy. Canopy height varies from < 10 meters, on xeric sandy ridges, to > 20 meters at lower, more mesic elevations or in sheltered areas. Additional canopy and sub-canopy associates include *Q. rubra* (northern red oak), *Sassafras albidum* (sassafras), *Pinus taeda* (loblolly pine), *Acer rubrum* (red maple), *Prunus serotina* (black cherry), *Nyssa sylvatica* (black gum), and *Diospyros virginiana* (persimmon). The sparse to dense shrub stratum may contain shorter individuals of all of the previously mentioned species, as well as *Ilex opaca* (American holly), *Vaccinium pallidum* (hillside blueberry), *V. stamineum* (deerberry), and *Gaylussacia frondosa* (dangleberry). Less frequent associates include *Gaylussacia baccata* (black huckleberry), *Magnolia virginiana* (sweet bay magnolia), *Cornus florida* (flowering dogwood), and *Epigaea repens* (trailing arbutus). *Gaylussacia brachycera* (box huckleberry) is a rare associate. Herbs are usually sparse, though they may be more abundant in openings. The most frequently observed herbs, usually in low numbers, include *Cypripedium acaule* (pink lady's-slipper), *Carex* spp. (montanae group), *Panicum commutatum* (a panic grass), *P. commonsianum* (a panic grass), *Chimaphila maculata* (striped wintergreen), *Melampyrum lineare* var. *lineare* (cowwheat), and *Mitchella repens* (partridge berry). Less frequently encountered herbs include *Euphorbia ipecacuanhae* (wild ipecac), *Baptisia tinctoria* (wild indigo), *Lupinus perennis* (blue lupine), *Pteridium aquilinum* (bracken fern), *Chimaphila umbellata* ssp. *cisatlantica* (pipsissewa), *Monotropa uniflora* (indian

Continued on page 4

**NATURAL QUOTES**

'I need no inspiration other than Nature's. She has never failed me yet. She mystifies me, bewilders me, sends me into ecstasies.'

Ghandi

**FEATURE ARTICLE****THE SOUL OF SOIL**

(Editor's note: This is a condensed version of an article, reprinted with permission, from the Sep/Oct 1999 issue of *Countryside Magazine* taken from the 1909 book *Elements of Agriculture* by G. F. Warren).

Most people see soil as "dirt." They almost invariably think of it as a dead thing. But in reality, soil is teeming with life, and is full of activities of the most complex and interesting kinds.

The almost universal idea is that soil consists of small particles of rock that have been made fine by the process of weathering. But no crop could grow on a soil composed entirely of rock particles. An agricultural soil also needs water, air, decaying organic matter, and living organisms in order to be productive. (Organic matter is defined as any material that is, or once was, an organism or living thing, such as wood, straw, manure, etc.).

**Rock particles**

Rock particles are 65 to 95 percent of the weight in most soils. (One exception is muck soils, where nearly all the solid matter is made up of organic materials. These are some of the most fertile soils on the planet.) Organic matter usually constitutes 2 to 5 percent... Most of the remaining weight is water.

The finest soil particles are called clay, the next smallest silt. The larger particles are different grades of sand and gravel.

**How soils are named**

The soils that contain a large proportion of the finest particles are called clay. At the other extreme we have sands and gravels. Soils that are intermediate in texture are called loams. Those with a large proportion of silt particles and not too much clay are called silt-loams.

Then these words are joined together to describe intermediate types. There are gravelly loams, sandy loams, fine sandy loams, clay loams, etc.

Soils are also named in many other ways. Glacial soils are those formed as a result of glaciation. Arid soils are those that do not receive enough rain to produce regular crops without irrigation. Humid soils are those that receive sufficient rainfall to produce crops.

**The importance of the size of soil particles**

The size of the soil particles influences the water-holding power of the soil, the amount of food that can be dissolved for plant use, the ease of movement of water and air, the growth of organisms in the soil, and the crop-producing power.

The rock particles of the soil can hold water on their surfaces only. Therefore the water-holding power of the soil

increases when the surface area of the particles is decreased.

The finest soil particles are extremely small - less than four hundred-thousandths of an inch in diameter... Such fine particles do not always act as individuals in holding water: some of the particles usually stick together.

The water capacity of a soil is the amount of water it will hold when all the free water is allowed to drain out. Some clay soils will retain about 40 percent of water. A cubic foot of clay weighs about 80 pounds and could, therefore, hold about 32 pounds of water... Sandy soils might have a water capacity as low as five percent...

#### Air

About half the volume of a dry soil is air; that is, a cubic foot of such soil contains about half a cubic foot of air. The small particles of which a clay soil is composed do not pack so closely as do the larger sand particles, because they are lighter. Therefore, there is more pore space in clay than in sand. But the spaces in a sandy soil are larger, so the air moves more freely, making such a soil better aerated.

#### Temperature

The temperature of a soil is influenced by its color, topography, humus content, and several other factors. But the chief factor is water capacity.

It requires about 20 heat units to raise the temperature of 100 pounds of dry soil 1 degree F. To raise the temperature of the same weight of water 1 degree requires 100 heat units. This is why gardeners often speak of "wet" and "cold" soils in the same breath.

But the effect of water is most striking when it evaporates. To evaporate 100 pounds of water requires 966.6 heat units. This explains why wet soils are always cold soils. Clay soils are cold chiefly because of the large amount of water that evaporates from them.

Few crops begin growth until the soil is 45-50 degrees...

Sandy and other well-drained soils are not only easier to till, but the number of days on which they can be worked is much greater. They can be tilled earlier in the spring, and more quickly after rains.

#### Flocculation

When a silt or clay soil is in good condition, many of the particles are united into compound particles. Such a soil is "flocculated." Good management of such a soil consists very largely in maintaining this granulated condition...

The relative fineness of the soil is called its texture, just as the word is used when speaking of the texture of cloth. If the soil is composed of very small particles that are flocculated, it can still be of a coarse texture.

Structure refers to the arrangement of soil particles. If small particles are united, it is possible to have a soil of fine texture and coarse structure.

#### Soil water

Soil water is very different from rain water. It contains all the plant foods in solution. The solution is very dilute, but plants use a large amount of it.

Water also evaporates within the soil, into the soil air. There is a constant movement of this air in and out of the soil, and this aids in drying a soil. If there is not an abundance of rainfall, it is desirable to stop this movement of water to the surface where it evaporates. Any loose mulch, like straw, on the surface of the soil will accomplish this purpose.

#### Amount of water

Optimum water content is 50 to 60 percent of the soil's capacity... The most serious result of too much water in the soil is the exclusion of air, which is essential for plant growth and for the activities of soil organisms. It also prevents roots from growing deeply into the soil, makes the soil cold...

One of the first effects of too-wet soil is yellowing of leaves. This is due to the lack of nitrogen. Not only does the fixation of nitrogen cease when air is excluded from the soil, but under these conditions the organisms that break down nitrogen compounds are very active, so that the nitrogen that was fixed previously is being lost.

#### Organic matter

*Continued on page 6*

### **FEATURE ARTICLE**

*Continued from page 4*

### **NATIVE PLANT COMMUNITY HIGHLIGHT**

*Continued from page 3*

pipe), *M. lineare* var. *pectinatum* (cowwheat), and *Desmodium strictum* (pine barrens tick-trefoil). Lichens, especially *Cladonia* spp. and *Cladina* spp. may be abundant. Vines such as *Smilax glauca* (glaucous-leaved greenbrier), *S. rotundifolia* (round-leaved greenbrier), *Parthenocissus quinquefolia* (Virginia creeper), and *Vitis rotundifolia* (muscadine) are common, but in low numbers.

### **Other species**

A total of 16 state rare plant species are known from this community; these are generally found in scattered openings, particularly along roadsides or along powerline cuts. This forest community is important habitat for neotropical migratory songbirds (C. Heck-scher pers. comm.).

### **Community dynamics/succession**

The dynamics and successional attributes of this particular community are not clear. While the Virginia Pine-Oak Forest is thought to be an early successional type that leads to a "climax" community of shade-tolerant oaks and other hardwoods, the successional status and dynamics of this community, on these xeric sandy ridges, is not so clear. Fire may be necessary to maintain a pine-oak mixture, while past logging activities have undoubtedly affected the current expression of this community. Studies are needed to determine the dynamics and successional characteristics of this community.

### **Distribution**

In Delaware, restricted to the inland sand dune habitats along the east side of the Nanticoke River, primarily south of Seaford. Also in the Nanticoke watershed in Maryland (W. Tyndall pers. comm.).

### **Conservation Status**

This is a community of conservation concern. Since much of it occurs on state owned land its protection is facilitated, though active management may be necessary.

*Continued on page 6*

### **NATIVE PLANT COMMUNITY HIGHLIGHT**

*Continued from page 4*

Continued on page 5

## LETTER FROM THE PRESIDENT

Continued from page 1

fish kills, without much success. In the meantime, a fellow named Bill Winkler floating on his surfboard, spotted some yellow-tinged water near the Indian River. He collected some water samples and sent them off for analysis. One sample made its way to the University of North Carolina's Center for Marine Research in Wilmington, North Carolina where it was found to contain single-celled microscopic algal cells identified as *Chattonella verruculosa*. This organism is known to have toxicity, similar to those organisms that cause red tides, and may be the culprit in the case of the fish kills (DNREC was looking for *Pfiesteria* spp.). Research studies have shown that increased levels of phosphates, as may occur from run-off after heavy rains, can cause outbreaks of algae and red tides (more correctly referred to as Harmful Algal Blooms, HAB, as red tides have nothing to do with the tides and are not always red). Could it be that all the rain we had this summer and the lack of buffers and filtering capacity of our shorelines led to excessive nutrient run-off, oxygen depleted waters, algal blooms and fish kills?

As our population continues to expand and our shorelines become more hardened and buffers (native plant vegetation) are reduced and more fertilizers are applied to our lands we shouldn't be surprised if we see more fish kills and algal blooms in our waterways. I hope I am wrong, but I believe it will get much worse before it gets better, despite the efforts underway to reduce the amount of nutrients running off into our waters.

So what's a body to do? What can our Society do?

We can support the efforts of the Biodiversity Implementation Strategy Working Group, or BISWG. This group was established by the Governor to address and develop implementation strategies for the recommendations listed in the Environmental Law Institute's (ELI) 1999 report: *Protecting Delaware's Natural Heritage: Tools for Biodiversity Conservation*. Among many other recommendations, this group is looking at ways to promote the establishment of vegetated buffers along Delaware's waterways; this could lead to a significant reduction in nutrient loads reaching open bodies of water, which in turn could lead to reductions in algal blooms and fish kills.

Over the past few months the DNPS has been taking part in regular meetings of the BISWG. By participating in these meetings the DNPS is able to give voice and support to several of our important conservation initiatives (e.g., forest conservation act, endangered & threatened plant legislation, habitat conservation act). If the BISWG is successful in its implementation of many of the recommendations made in the ELI report, significant progress will be made in protecting water quality of our estuaries and in restoring native plant communities.

Individually, if you own property along a waterway you can endeavor to expand its buffer by planting native trees and shrubs or allowing for natural regeneration of vegetation; the latter, however, may lead to an explosion of exotic plant species. You can talk to local government officials encouraging them to establish minimum vegetated buffer zones along streams that fall within their domain. If you live in rural settings talk to your farming neighbors about expanding buffers along streams and ditches.

You can also participate in a DNPS reforestation effort

beginning on Sunday, October 15, 2000 at Prime Hook Wildlife Area. On that day we will be collecting tree seeds from forest at Prime Hook and then directly planting most of the seeds onto cleared land that we are helping to reforest. The remaining seeds will be germinated and seedlings grown at our nursery site at the St. Jones Reserve before being transplanted back to Prime Hook. Or, volunteer to help at our nascent nursery and in return take home some native plants to plant on your property.

Well, I am going to have to rather abruptly end this letter as the editor is clamoring for my contributions to this newsletter and I need to do some preparation for tomorrow's (October 8) seed collecting trip to Delaware WildLands. I am still looking for volunteers to help out with the nursery so please email or call me (302) 674-5187 if you would like to help.



Sincerely,

Keith Clancy

## NATIVE PLANT HIGHLIGHT

### THE ASTERS OF DELAWARE

As the growing season comes to a close, there are several species of native asters that you can still find blooming, such as *Aster divaricatus* (white wood aster) and *A. pilosus* (heath aster). Although many species of asters have ceased flowering, late blooming species provide some of the last sources of sustenance for nectar feeding insects.

In the strictest sense, there are 30 native species and varieties of the genus *Aster* known to occur in the state of Delaware. The majority are quite common, but there are 7 species that are considered to be rare in the state (highlighted in bold in list below). In addition, there are five species (*Aster cordifolius* var. *sagittifolius*, *A. ericoides*, *A. macrophyllus*, *A. radula*, *A. concolor*) that are historical in the state (not reported for 20 or more years), and one species that is considered to be extirpated (*Aster nemoralis*). Native asters in Delaware can be found growing in both the Piedmont and coastal plain physiographic provinces. There are 6 species that are restricted to the Piedmont province (designated as PD adjacent to common name in list below), 10 species restricted to the coastal plain province (designated as CP) and 14 species common to both provinces. Aster species are found in a variety of habitat types with soils that range from well drained to poorly drained. Habitats include: woodlands, swamps, marshes, wet meadows, and old fields. The majority of our native asters require open, sunny conditions in which to grow, but there are a few species that prefer the shade of forests and woodlands. All of the asters known to occur in Delaware are perennials, but one, *A. subulatus* (small flowered saltmarsh aster) is an annual and can be found growing in saltmarshes along the bay and Atlantic coasts. Thirteen species of asters in Delaware have a more northern distribution (designated as N adjacent to common name in list below) and are at or near their southern range limits in the state. Six species have more southern affinities (designated as S), and the remainder (11 species) are widespread in their geographic distribution. The genus *Aster* in Delaware:

Continued on page 6

## Comments

Although *Pinus virginiana* is a widespread species and, generally, is thought to form early successional communities (frequently forming on sites that previously were in agriculture), this particular community found along Nanticoke's inland sand dunes probably resulted from past logging and fire suppression, rather than agriculture. The soils are extremely xeric sands and would not likely be agriculturally productive. In addition, the shrub, herbaceous, and non-vascular components found within this community appear to be reflective of undisturbed conditions (i.e., the presence of mostly native taxa and the large lichen component). It is for this reason, and the suite of state rare species, that this community is considered to be distinct and of conservation concern. Having said that it is also a community considered to be semi-natural in that the canopy component, especially the over-abundance of *P. virginiana* most likely arose because of past logging and fire suppression (much of the land encompassing this community was previously owned by a logging company and the suppression of fire has been an active management tool for forestry managers throughout this century). Controlled burns may be of benefit to this community; it is hypothesized that burns will reduce the pines, increase the oaks, and encourage the growth of the rare species (by increasing the amount of open areas). It is postulated that this community, during pre-settlement days, contained a higher percentage of oaks, particularly *Q. marilandica*. (W. Tyndall pers. comm.).

◊◊◊◊ Keith Clancy, DNPS President



## NATIVE PLANT HIGHLIGHT

Continued from page 5

| SCIENTIFIC NAME                                    | COMMON NAME                    |
|----------------------------------------------------|--------------------------------|
| <i>Aster concolor</i>                              | eastern silvery aster (S) (CP) |
| <i>Aster cordifolius</i> var. <i>cordifolius</i>   | heart-leaf aster (PD)          |
| <i>Aster cordifolius</i> var. <i>sagittifolius</i> | blue wood aster (PD)           |
| ( <i>Aster sagittifolius</i> )                     |                                |
| <i>Aster divaricatus</i>                           | white wood aster (N) (PD)      |
| <i>Aster dumosus</i>                               | <b>bushy aster (CP)</b>        |
| <i>Aster ericoides</i>                             | white heath aster (N) (CP)     |
| <i>Aster fragilis</i>                              | small white aster (CP)         |
| ( <i>Aster vimineus</i> )                          |                                |
| <i>Aster gracilis</i>                              | slender aster (S) (CP)         |
| <i>Aster infirmus</i>                              | <b>cornel-leaf aster</b>       |
| <i>Aster laevis</i> var. <i>laevis</i>             | <b>smooth blue aster</b>       |
| <i>Aster lanceolatus</i> ssp. <i>lanceolatus</i>   | eastern lined aster (N) (PD)   |
| ( <i>Aster paniculatus</i> )                       |                                |
| <i>Aster lateriflorus</i>                          | goblet aster                   |
| <i>Aster macrophyllus</i>                          | large-leaf aster (N) (PD)      |
| <i>Aster nemoralis</i>                             | bog aster (N) (CP)             |
| <i>Aster paternus</i>                              | stiff aster                    |
| ( <i>Sericocarpus asteroides</i> )                 |                                |
| <i>Aster novae-angliae</i>                         | New England aster (N)          |
| <i>Aster novi-belgii</i>                           | long-leaved aster (N) (CP)     |
| <i>Aster patens</i>                                | late purple aster              |
| <i>Aster pilosus</i> var. <i>demotus</i>           | smooth heath aster (N)         |
| <i>Aster pilosus</i> var. <i>pilosus</i>           | hairy heath aster (S)          |

## *Aster prenanthoides*

*Aster puniceus*

*Aster radula*

## *Aster schreberi*

*Aster solidagineus*

(*Sericocarpus linifolius*)

## *Aster spectabilis*

*Aster subulatus* var.

*subulatus*

*Aster tenuifolius*

## *Aster umbellatus*

*Aster undulatus*

## crooked-stem aster (N) (PD)

swamp aster (N)

rough-leaf aster (N) (CP)

## Schreber's aster (N) (PD)

narrowleaf aster (S)

## showy aster (S) (CP)

small-flowered salt marsh aster (CP)

perennial salt-marsh aster (S) (CP)

## flat-top white aster (N)

wavy-leaved aster

◊◊◊◊ William McAvoy, DNPS member

All productive soils contain decaying roots, leaves and animal life. This partly decayed organic matter is called humus. It is humus that gives soils their dark color.

Humus...increases the water-holding power of soils.... It loosens heavy soil and promotes aeration.... It furnishes food for bacteria. These, acting on the humus, change nitrogen to nitric acid so that it is ready for plant food.

Another extremely important function of humus is that it encourages the growth of bacteria that fix free nitrogen from the soil air, making it available as plant food.

...If a soil is saturated with water, the oxidation practically stops and organic matter accumulates. This is the way that peat and muck are formed...

### Life in the soil

As we have seen, soil is not a dead thing. It is much more than a collection of rock particles. It is teeming with life.

Earthworms serve a useful purpose in the soil by helping to break down the organic matter. They also do much good by making the soil porous. A soil that is full of earthworms is nearly always fertile.

The molds help in breaking down the organic matter, particularly the woody matter. But the most important forms of life in the soil are the microscopic organisms, yeasts and bacteria.

### Soil bacteria

...bacteria are present in all soils, ranging from less than 28,000,000 per ounce of soil (and far fewer than that in many soils today) to many times that number. In fertile soils like gardens there are many billions per ounce. There is usually a relationship between the number and kinds of soil bacteria and fertility. The different chemical changes produced by soil bacteria are quite numerous...

### Materials used as fertilizers

Naturally fertile soils were made that way over thousands, and sometimes tens of thousands of years, by a combination of the basic rock, plant growth and the return to the Earth of the plants, as well as the animals that fed on them, and their

Continued on page 7



## FEATURE ARTICLE

Continued from page 6

## UPCOMING EVENTS

**SATURDAY, 14 OCTOBER 2000** – SEVENTH ANNUAL TREE SPREE AT THE RED CLAY RESERVATION NEAR HOCKESSIN, DE. THIS EVENT, HOSTED BY THE DE CENTER FOR HORTICULTURE TAKES PLACE ON 250 ACRES OF ROLLING COUNTRYSIDE AND WILL BE FILLED WITH MANY EVENTS INCLUDING TREE PLANTINGS, EXHIBITORS, DEMONSTRATIONS, NATURE HIKES AND TREE CARE INFORMATION. FROM 10:30 AM TO 2:30 PM. CONTACT GARY SCHWETZ AT 302.658.6265 FOR MORE INFORMATION. THE DNPS WILL HAVE A DISPLAY AT THIS EVENT.

**SUNDAY, 15 OCTOBER 2000** – SEED COLLECTING AND REFORESTATION AT PRIMEHOOK WILDLIFE AREA. IN THE MORNING WE WILL BE COLLECTING SEEDS AND, AFTER A LUNCH BREAK, WE WILL DIRECTLY PLANTING SEEDS AT THE REFORESTATION SITE. BRING YOUR LUNCH (IF YOU PLAN ON STAYING FOR THE PLANTING ACTIVITIES). CONTACT KEITH CLANCY AT 302.674.5187 OR AT DNPLANT@AOL.COM FOR MORE INFORMATION AND DIRECTIONS TO THE SITE.

**SATURDAY, 21 OCTOBER 2000** – AUTUMN AT ABBOTT'S FESTIVAL. HOSTED BY THE DELAWARE NATURE SOCIETY AT THE ABBOTT'S MILL NATURE CENTER. LIVE ANIMALS, CANOE TOURS, GRISTMILL TOURS, NATIVE AMERICAN AND COLONIAL DEMONSTRATIONS, CRAFTS AND MUSIC. FROM 10 AM TO 4 PM. ADMISSION IS \$2.00 FOR ADULTS. CALL 302.422.0847, ON THE WEB AT WWW.DELAWARENATURESOCIETY.COM FOR MORE INFORMATION.

**SATURDAY, 21 OCTOBER 2000** – HOOTS, HOWLS AND HAUNTS. THE DELAWARE MUSEUM OF NATURAL HISTORY'S ANNUAL HALLOWEEN CELEBRATION. PUMPKIN DECORATING, SCIENCE EXPERIMENTS, A HAUNTED TRAIL, COSTUME PARADES AND LIVE ANIMALS. CALL 302.658.9111 FOR MORE INFORMATION, OR ON THE WEB AT WWW.DELMNH.ORG.

**19, 20 AND 21 NOVEMBER 2000** – FRESH FLOWER ARRANGING WORKSHOPS AT JUDGE MORRIS ESTATE (WHITE CLAY CREEK STATE PARK). LEARN FLOWER ARRANGING TECHNIQUES IN TIME FOR THE HOLIDAYS. \$20.00 REGISTRATION FEE. CALL 302.368.6900 FOR MORE INFORMATION, OR ON THE WEB AT WWW.DESTATEPARKS.COM.

waste products, all worked upon by the activity of soil biology.

Barnyard manure and wood ashes are among the oldest fertilizers used by humans to maintain or restore natural fertility. The Indians taught European settlers in America how to grow corn and use fish as fertilizer.

### Nitrogen

All nitrogen comes from the air. There is no nitrogen in stone. Nearly four-fifths of the air is nitrogen... No plants except legumes are able to use atmospheric nitrogen. Nitrogen from the air can be "fixed" by bacteria on legumes.

Note that the legumes themselves do not fix nitrogen. This is done by the nitrogen-fixing bacteria that live in the root nodules of the plants. If the right kind of bacteria are not in the soil, a legume cannot produce nitrogen, for itself or for subsequent crops.

Grasses don't have the power to obtain nitrogen from the air, but when land is left in sod there is usually a considerable gain in nitrogen... This is partly due to the humus added by the decaying roots... Probably the humus has much to do with the nitrogen fixation.

### Manure management

There are other organisms in the soil which accomplish the opposite results. They act on nitrogen compounds and break them up so that the nitrogen escapes into the air as free nitrogen. This is called denitrification. Composting manure is the best way to retain the nitrogen in it.

### **DNPS WEBSITE**

The DNPS website is continuing to experience a bit of a lag at the moment. Your continued patience is appreciated. A notice will be placed here in a future issue when the website has been updated. Until then, if you want to revisit any past newsletter articles for Vols. 1 and 2, you can check them out at [www.delanet.com/~dnpswp](http://www.delanet.com/~dnpswp).

# 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: \$**

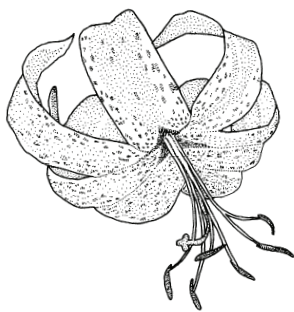
**Make check payable to:  
DE Native Plant Society  
P.O. Box 369, Dover, DE 19903**

**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 00-2001

## IN THIS ISSUE

- Page 1** ○ *A Call for Articles*  
○ *New Members*  
○ *Letter From the President*
- Page 2** ○ *Letter From the Editor*  
○ *Plant-animal Highlight*  
○ *Feature Article*
- Page 3** ○ *Feature Article continued*
- Page 4** ○ *Feature Article continued*
- Page 5** ○ *Letter From President continued*  
○ *Feature Article continued*
- Page 6** ○ *Feature Article continued*  
○ *Native Plant Highlight*
- Page 7** ○ *Upcoming Events*  
○ *Feature Article Continued*  
○ *Natural Community Highlight*  
○ *DNPS Website*
- Page 8** ○ *Membership Application*

## HOW CAN I GET INVOLVED?

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

The DNPS is working on several significant projects at this time. We are working on a reforestation project at Prime Hook State Wildlife Area. A second initiative underway is the establishment of a native plant nursery. We have broken ground on this nursery and it looks great so far. We encourage everyone to participate in these endeavors.

For more information on how to get involved, call 302.674.5187, or E-mail at [dnplant@aol.com](mailto:dnplant@aol.com). Or visit the DNPS website at

## 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](mailto:ezuelke@juno.com)), or Keith Clancy at 302.674.5187.

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## A QUIET SNOWFALL WELCOME TO OUR NEWEST MEMBERS

October through December

Brad and Amparo Baker

○ ○ ○ ○ ○ ○ ○

## LETTER FROM THE PRESIDENT

Although the snow has melted, we are still in the midst of winter. The days are still short, a little too cold for my tastes, and a winter storm is on the horizon. It is during these long winter nights that I long for the spring, a time when buds burst forth with the promise of new life. A time when the forest floor is covered with blooms of may apple, spring beauty, bloodroot, or any number of other spring ephemerals. So while we all strive to keep warm and visions of spring occupy our thoughts I'll take this opportunity to briefly reflect on recent activities of the DNPS and share some thoughts on the upcoming year.

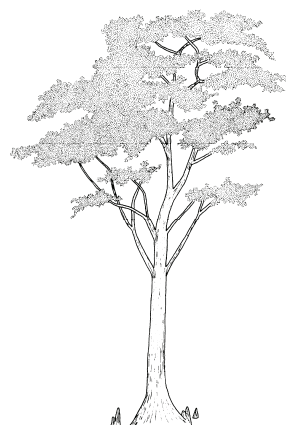
This past fall has been an active one for the DNPS. Members participated in several activities that, hopefully, will have long-lasting affects. Several members participated in collecting thousands of seeds of native trees from a mature mixed forest on Delaware Wild Lands property at Milford Neck. Many of these seeds (others will be planted in the spring) were then direct-seeded into a seed

*Continued on page 5*

**LETTER FROM THE PRESIDENT**

## 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, fieldtrips, and a statewide membership organized by the DNPS.



**LETTER FROM THE EDITOR****BRRRRRRR!**

Winter, with all its beauty and charm is a very demanding time of the year for humans, plants and animals. If you're struggling to keep warm this winter, as I am with my dinky little furnace, this issues Plant-animal Highlight may enlighten you on how all our plant and animal friends actually make it through. If you like to botanize, you will invariably run across the need to educate yourself about the distribution of plants. Our Native Plant Highlight will be quite helpful in figuring out some of the complexities of phytogeography. And if you're like me, gardening has already crossed your mind and the Feature Article is full of good tips on organic gardening. Happy New Year. 🌱

°°°° Eric Zuelke, Editor

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**PLANT-ANIMAL HIGHLIGHT****WINTER SURVIVAL**

Sometimes there are amazing similarities between plants and animals, specifically the adaptations plants and animals have evolved to survive the long, cold, dark days of winter.

Animals have evolved many different ways of handling the demands of winter depending on how they maintain their body temperature. Animals that regulate their own body temperature are known as endothermic, homeothermic or warm-blooded. Some simply migrate and head south to warmer climates, such as migratory birds. Non-migratory species have the adaptations of building up layers of fat, growing thicker coats of fur or hair, staying at an egg or larvae stage or going into states of highly reduced metabolic activity (hibernation or torpor, and usually underground). Animals that obtain heat from their environmental surroundings are known as ectothermic, poikilothermic, or cold-blooded. These species, such as reptiles, amphibians, fish and many invertebrates have adapted to be freeze-tolerant by having the ability to supercool fluids and tissues (being colder than the surrounding temperature without forming ice crystals) or just out right freezing. Surprisingly enough, the freezing process causes no damage because tissues and internal organs change the concentrations of water to the point where most of the ice crystals form outside of the organs, and the organs shrink in size. Some animals even produce glycoproteins that prevent the formation of ice crystals in tissues (a sort of glycerol-like antifreeze). Some snails and insects go into states of mammal-like hibernation.

Plants don't have the luxury of actively avoiding the cold like many animals do; however, they deal with winter survival with surprising similarities. Most species of herbaceous plants simply stop metabolism in the above ground portion of the plant and it dies away, leaving a subterranean root, tuber or bulb to pass the winter in relative safety. The first and most obvious reaction of many woody plants to shorter day length and dropping temperatures is a change in their metabolism to a quiescent or dormant state known as acclimation. The reduction in photoperiod and non-freezing, chilling temperatures combine to cease growth and reduce the amount of foliage. Woody plants must be exposed to temperatures at or below

freezing for some time before they become fully acclimated. The priority for woody plants is to preserve as much moisture in the cells and tissue to avoid the harmful effects of freezing. By dropping all their foliage, the rate of transpiration of water vapor into the atmosphere is significantly reduced. Once acclimated, many plants are quite capable of tolerating midwinter temperatures near -40 to -50° F! Plants are composed primarily of water, and that freezing of water inside living cells is fatal to individual cells and potentially deadly for the entire plant. Therefore, living tissues survive low temperatures by suppressing ice formation, or by allowing water to freeze, but only in areas of the plant that won't be injured by ice crystal formation. Many trees and shrubs have the ability to suppress ice crystal formation in their cells, even at temperatures far below the freezing point (supercooling again). This is seen in species such as oak, elm, maple, beech, ash, walnut, hickory, rose, and rhododendron. Very hardy woody species such as paper birch, red twig dogwood, willow, and quaking aspen prevent water from freezing within their cells using a dehydration mechanism. Here water moves out of the cells in response to freezing temperatures, freezing in areas between the cell walls where ice formation is not destructive. This slow dehydration concentrates solutes (sugars and other compounds) in the remaining cell sap which lowers its freezing point (similar to antifreeze again).

So the next time you turn up the thermostat on a white morning, or layer on another sweater, just remember the plight of our plant and animal friends and the amazing adaptations they've gone through to stay 🌱 with us.

°°°° Eric Zuelke, Editor

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**FEATURE ARTICLE**
**The organic gardener's guide to pest control**  
**Ten alternatives to poison in a healthy garden**

(Editor's note: This is a condensed version of an article, reprinted with permission, from the January 2001 online issue of Mother Earth News Magazine).

I'm not a control freak. That could be challenged by someone who knows that I like to have straight rows and pretty much square them up to the edges and have them running north and south. But if all the vegetables I like grew randomly around the area, I'd be happy to become a hunter-gatherer. I think.

Once we decide to do an unnatural thing like turning the topsoil upside down and planting seeds that aren't native to this climate, we are sucked into providing more care for the garden. We have to control the area so that nature's garden doesn't overrun ours. We have to provide the soil with additional nutrients, since our method of planting and the plants we want to grow need different things than the soil cover nature would plant and provide for.

The ultimate control would be to dig a moat around the garden, fence it and enclose it entirely in an insect netting. But that won't keep out disease organisms that float on the wind or come in on shoes or clothing. I suppose it should be a plastic- or glass-enclosed space with an air lock, where sterile clothing can be put on. That should work, but, of course, the space

would have to be water and temperature controlled. And it still needs... Oh, why go on. The more we try to control the growing conditions the more complex it gets and yet, inevitably, a disease organism or white fly or aphid or some other pest will get in. Much better, and far less expensive, is to try working with nature as closely as possible.

First, an attitude check. Don't think of the garden as a place where a wide variety of animals, miniscules and vegetables are lying in wait to attack your plantings. The vast majority of critters are beneficial. I'd even argue that everything I encounter in the garden is beneficial, including mosquitoes. It is important to remember this, lest you be tempted to spray something to kill an insect or bacterium that may be doing some damage to your crop. If you use a poison that kills on contact, you are killing hundreds of thousands of beneficial insects and microscopic organisms for every one of the critters you have identified as a problem. That said, let's begin.

#### Identification

Both knowing and spotting your culprits is the first step in any sensible method of pest control in the garden. The easiest and surest means of identification is to catch the pest in the act--whether it be ground ivy creeping into the garden or a rabbit eating lettuce.

Animals can also be identified by footprints, manure, sometimes scent, fur and, finally, their habits. Insects are most often identified by what they eat, as most have favorite foods and do not eat indiscriminately. Some insects are very hard to see, whether due to camouflage, size or because they don't wait around to be seen. Some of them generate telltale manure. Others can be identified by the part of the plant they eat or the way they eat.

Miniscules, or microscopic organisms, are fungi, bacteria, viruses and nematodes. The work of these organisms can be seen in wilting, curling, mottled, discolored, spotted, blistered, white or powdered leaves; in lumpy, swelling, oozing or pinched stems; in fruit or flowers with spots, lumps, watery places or rot; and in plants that are stunted, dying or wilting. If you've never gardened before, a list like that could cause your interest to wither. But rest assured it takes more than the mere presence of disease organisms to cause a plant to become diseased. Before anyone gives up on growing, consider that both Mother and I have been gardening and writing about it for over 25 years and have never, to the best of my recollection, tried to combat a disease in the same season it was recognized. I don't recall ever losing a crop, though yield has been decreased at times.

I consider a disease in my garden much like a disease in my body. It will run its course, and I will try to be wiser and take better care of my body so I don't get caught again.

I hope you got my "animals, miniscules and vegetables" reference as a takeoff on the game 20 questions--"animal, mineral or vegetable?"-- because I'm going to bail out on vegetable pests after this paragraph. Let's face it, natural control of weeds is mechanical-- either through cultivation or smothering with a mulch. Most weeds do not need to be identified to be controlled naturally. You do need to know how they propagate, however. Bind weed and witchgrass propagate through underground rhizomes and will come up through most mulch materials. To rid a field of these mechanically, it needs to be tilled several times at two-week intervals. This brings the rhizomes to

#### NATURAL QUOTES

'A man's nature runs either to herbs, or to weeds; therefore let him seasonably water the one, and destroy the other.'

Francis Bacon

the surface, where they will dry out and die. In a garden, you have the luxury (ha!) of chasing them by hand whenever and wherever they pop up until they are all gone. You need to know what they look like to do this. Weeds that propagate from seeds are best controlled by shallow cultivation every ten days in the spring and by keeping them from going to seed in the fall, or with a mulch.

#### Research

You will need a reference book to identify some pests. My favorite for many years has been *The Gardener's Bug Book*, 4th edition, by Cynthia Westcott (Doubleday, 1972). It has three features that make it wonderful. First in importance is actually the last chapter in the book, "Host plants and their pests." I may not be able to identify an insect, but I can surely identify the plant that is being damaged. Since most insects have favorite plants, this is the best place to start looking.

The bulk of the book is a listing of insects by type. I usually look up the plant first to find the most likely suspect, look up the suspect in the index, then turn to the description of the damage the insect does, its life cycle and how to control it. The controls are generally chemical, though not always. No matter, because the life cycle and description are what I'm most interested in. The third feature is color plates that help to find and identify the insect in the garden.

I have a half-dozen garden insect books that are newer, but Cynthia's is always my first choice. If you can't find a copy, look for a garden-insect reference book that is organized like it.

Once you can name the insect, any book describing controls will work fairly well. Of my more modern books, *The Organic Gardener's Handbook of Natural Insect and Disease Control* edited by Barbara W. Ellis and Fern Marshall Bradley (Rodale Press, 1992) is my favorite for organization. It has the advantage over *The Gardener's Bug Book* in that it also covers diseases and offers organic solutions.

Other gardeners are also good sources of information. If they have been gardening in the area for a few years, they will probably be able to quickly identify your problem and, though their solutions may not be natural, may provide some useful insights. The Cooperative Extension Service, listed under U.S. Government in the phone book, can also be helpful.

Ask at a local garden store and you're likely to get a recommendation for a general purpose poison. "Here--spray this and it'll kill whatever's eating your plants." Yeah, it will. It'll also kill whatever's eating the whatever's eating your plants and millions of other innocent and helpful insects and miniscules.

*Continued on page 4*

## **FEATURE ARTICLE**

*Continued from page 3*

Your garden is not a good place for chemical warfare.

### Understanding

Once you know what pest you are dealing with, you can figure out how best to approach the problem. How does it get into the garden? Does it walk, fly, burrow, float on the wind, ride on your clothes? To use an expression from my youth: Was it born, hatched or did it slowly accumulate in the garden? Will more follow? Will it multiply several times over the summer? How much damage is it likely to do? Will ignoring it this year be regretted next year?

But absolutely the most basic question is: "Does it need to be controlled?" Kind of silly to build a barrier or change the way you garden to control something that will pretty much go away if you ignore it. Even if an old timer who has been gardening in the same area for many years tells you an insect will devastate one of your crops, it doesn't mean it will. Your garden soil, your practices, your seed variety, the plants that are next to the one you are worrying about may all be different. Even the weather may be different. Plan a strategy for control if necessary, but use it on only part of the row and keep part for comparison.

For example, when cabbage leaves are being eaten and you have identified the culprit to be the cabbage worm, hand pick the worms that you can find. Do this for a few days just so you get an idea of how fast they are growing or how difficult they are to find. See if you can find some eggs, after looking in your reference book and learning that they are white, small and laid singularly on the underside of leaves. If you are worried the problem will get ahead of you, get an acceptable spray so you have it if needed. If real panic sets in, spray part of the row. No matter what happens to your crop, if you have been observant, you will have gained considerable knowledge for next year.

### Controls

Make your garden a heaven on earth where healthy plants resist disease and beneficial insects predominate. The way to have a healthy plant is to make sure it gets the nutrients it needs in the proper amounts at the proper times. Sounds complicated, but nature will take care of the timing if we provide it with the raw materials. One of the most important materials is water. Will it rain at the proper intervals throughout the season? Not likely. Do we need to monitor rainfall closely and turn on the sprinkler anytime a week goes by without a significant rainfall? There are a number of reasons not to do that. A better solution is to turn the garden soil into a sponge that will soak up excess water during heavy rains and hold it in the root zone for plants to find when they need it.

You can also do your part to ensure that the 18 or more elements plants need are available in the root zone for them to find. First, there is a basic difference between water soluble fertilizers and nonsoluble fertilizers. Chemical fertilizers are generally water soluble, though chemists have made some time-release fertilizers. Fresh manure is partially soluble. The problem with water soluble fertilizers is that they are leached out of the soil in heavy rains. If the soil is sponge-like, less water will percolate through the soil and more of the soluble nutrients will be retained in the root zone.

Nonsoluble fertilizers are converted to a usable fertilizer over time. Some of them, such as rock phosphate, dissolve

very slowly. Others, like the organic matter of manure and bedding, will be converted through the activity of microorganisms and insects. Nutrients in compost can be converted through a symbiotic relationship with roots. When the roots come into contact with the compost, they are able to absorb nutrients through cation exchange.

I am pretty close now to being in over my head, chemically. All we need to know is that if we put organic matter on our garden soil, it makes the soil feel nice, and nice soil does a pretty good job of keeping our plants healthy. Get the soil tested every few years and correct any imbalance as necessary.

Don't encourage pests to come into your garden. I have attracted deer and skunks to the garden with seaweed. Spread in the spring, that fresh, salty taste brought in the herd. Seaweed has to be dug in right away or composted to avoid this problem. I also had some rotting seaweed that attracted flies. The flies laid eggs, which hatched into maggots. I used them under tomato seedlings. Bad plan. Though they were buried several inches down, a skunk was able to detect the maggots and dug up my tomato seedlings to reach the food it wanted.

Crows love corn and have great eyesight. Don't let them see you plant and don't leave any seeds exposed. This will only entice them to come looking for more.

Slugs mostly eat dead plant materials and they need a moist shelter during the day, which makes the environment under mulch perfect for them. I am pleased to have gotten my slug population under control, while still mulching more than half of my garden. Unhealthy plants will attract insects to the garden. That may sound crazy but research has verified it.

Discourage pests from coming into your garden. If the pest is a mammal, it probably finds the garden strictly by chance. The odd deer, raccoon or groundhog is foraging for food, takes a taste and moves on. If the taste was to its liking and it didn't get sick, it will be back. A vigilant gardener will detect the animal quickly and make the second trip unpleasant.

One way to do this is to season the pest's favorite vegetables with hot sauce. Mix a tablespoon of liquid detergent and half a bottle of hot sauce in a watering can full of water. Sprinkle this on the vegetables the animal has sampled and any others that are likely to attract attention. The detergent will help the hot sauce stick to the leaves. The plants need to be reseasoned after a rain. The hot sauce will discourage most animals returning for round two at your garden buffet. However, should you allow them more than one pleasant experience, they are likely to become more difficult to discourage.

Night foragers can be discouraged by lights, sounds and activity. When an old friend stopped gardening, he gave me a homemade shielded light he'd constructed for keeping raccoons out of his corn. He had fashioned a cone around a 100-watt lightbulb, lined the inside with foil and suspended it on a stake so it shone into his corn patch. He put a Christmas-light flasher in the line, so the bulb flashed a bright light into the rows. It worked for him for many years.

You've probably heard the one about the fellow who put his radio in the garden tuned to an all-night talk show. When he got up in the morning the radio was on an all-music station and the corn had been well picked over by raccoons.

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*Continued from page 1*

bed at our native plant nursery at the St. Jones Estuarine Research Reserve. Members also participated in collecting seeds of native tree species from a mature forest at Prime Hook State Wildlife Area and then directly planting these seeds in an adjacent field that is being reforested. Most of the seeds collected and planted were of various oak species (primarily white, red, and southern red) with only a small percentage that included hickories, tulip poplars, or other hardwoods. Lynn Parks did an excellent article on the DNPS and this project that appeared in the October 18, 2000 issue of the News Journal.

We will be watching closely this spring to see how these projects are doing and will take an active role in making sure they succeed through the installation of tree tubes if necessary.

In addition, several members collected seeds from their own properties and these have been cleaned and are being given a cold treatment prior to their germination at the nursery this spring.

The native plant nursery continues to take shape as planting beds were established or expanded. The "rescued" plant bed was enlarged to accommodate additional plants that had been previously transplanted from a doomed forest and we established a direct-seed bed where we planted nearly 2000 acorns and hickory nuts. We will be watching with bated breath this spring to see whether or not this venture was successful.

The first year of the new millennium is full of opportunities for our society. While we continued our participation in the Biodiversity Implementation Strategy Working Group (BISWG) last fall we especially look forward to participating in the upcoming Biodiversity Symposium scheduled for February 20, 2001 and hope that this symposium will lead to aggressive efforts that serve to protect and conserve Delaware's landscape and its biodiversity (see Upcoming Events section for additional information). Another activity taking place this February (on the 22<sup>nd</sup>) that is sure to be of interest to DNPS members is the workshop: Using Natives in the Landscape: how, when and where (also see Upcoming Events section for more information). Our developing nursery holds great promise for being an excellent source for native plant material for restoration projects throughout the state as well as for the home landscaper. Finally, we have an excellent opportunity to participate in a national botanical gathering taking place this June in Delaware. There will be extensive all day field trips, to habitats throughout the Delmarva Peninsula, and evening lectures during 5 days in late June. This, the annual Joint Field Meeting of the Botanical Society of America (N.E. Section), the Philadelphia Botanical Club and the Torrey Botanical Society, is an excellent opportunity for DNPS members to meet many professional botanists and to learn more about the native flora and natural communities of Delaware. I for one am eagerly looking forward to these field trips and botanical lectures.

I hope that our paths may cross sometime during 2001 as we all strive to enjoy Delaware's native plants. While these cold winter days may make one long for warmer climes they also provide an excellent opportunity to begin planning for native plant gardening activities as well as botanical field trips throughout the state. Stay tuned for news on our spring field trips.

Sincerely,

Keith  Clancy

## FEATURE ARTICLE

*Continued from page 4*

The new motion detectors are interesting and probably more effective than the older methods. A woman I know rigged a garden sprinkler to come on whenever motion was detected. I can't remember how she did that, but she assured me that deer don't like surprise showers.

There are plants that some people feel deter insects. I remain somewhat skeptical, but I always plant green beans and potatoes side by side because supposedly the Colorado potato beetle shies away from green beans and the Mexican bean beetle is repelled by potatoes. I have no evidence to support this, but I plant them together anyway because I do think that larger patches of anything are probably not a good idea. The beans break up what would otherwise be the largest single crop in the garden.

Marigolds and nasturtiums are supposed to repel some insects, though we plant them in the garden more because they are pretty. Garlic is supposed to repel insects up to three feet away; there's no harm in planting it close to something that may be particularly susceptible to insect damage.

The best-known garden pest deterrent is the scarecrow. Inflatable snakes and plastic owls belong in the same category. I'm not sure any of these are very effective. I have found that once crows learn that pulled up corn seedlings will bring up a corn kernel, the best deterrent is deeper planting.

Put up barriers.

The electric fence that I string around my garden--one strand at woodchuck nose height and one at deer nose height--works best if put up early to ensure an unpleasant first visit. Once the animal knows that there is a reason to get through, over or around the fence, the fence has to be better--lower, higher, arching outward, below ground. Below ground won't work for an electric fence, of course. If you are using a mesh fence, you need to know the size of the animals. Shrews and moles can get through a one-inch mesh. A raccoon can climb over a mesh fence if it is strung too tightly. Leave a foot or so at the top unattached so it flops back on the climbing animal.

Slugs depend on moisture to get around. Dry areas are barriers to them. That is why I keep the grass short around the garden. I cultivate the lettuce and cabbage rather than using a mulch because the dry, dusty soil surface is very unappealing to them. Diatomaceous earth is a powder that will act as a barrier in wet weather when the dry soil does not. It is the calcareous remains of tiny sea animals that are sharp and cut the slugs.

One-inch netting will keep birds from eating berries. A fine mesh or gauze can be used to protect most plants from insects, since most get there on wing. I generally plant broccoli seed directly in the garden rather than in flats, mostly because I'm lazy and would rather have nature take care of light and

*Continued on page 6*

moisture. Flea beetles frequently wipe out these plantings at the baby-seedling stage when there are just two small tender leaves.

If the plants have the chance to get their first true leaves, they will grow vigorously enough to outgrow the beetles. A small piece of gauze held down with a few stones for the first few weeks of their life will do the trick.

After the year potato leafhoppers spread blight and drastically reduced my potato crop, I spread gauze (using some Remay that I had) over half the patch and tried to hold it down with boards. I left the other half of the potatoes uncovered to see if doing nothing would work as well as doing something (my usual approach). It did that particular year, but still, if I see leafhoppers, I will take some action. Barriers laid over rows of fairly mature plants are hard to keep in place because of the wind. I was also interested in what might be happening underneath the gauze. Were there potato beetle eggs hatching under there? To find out, I had to lift the covering.

Poison only those that feed on your plants.

*Bacillus thuringiensis* (BT) can be used on the same insects that I prefer to kill by handpicking. The Colorado potato beetle can be controlled with the strain BTSD and BTK, which will kill the larvae of any moths or butterflies that eat it. You don't have to worry that you will kill monarch butterfly larvae when you spray BT on tomatoes or cabbage because the monarch will not lay eggs on those plants. The monarch does, however, lay eggs on milkweed plants.

Occasionally, I will feel the insects getting ahead of me though. This usually happens after several very hot, humid days when the insects hatch and grow faster, and I move more slowly. It might also follow a time when I have been too busy or away for a few days. It's then that it is helpful to have BT as a tool. It is a safe spray, as the bacteria is not at all toxic to humans, only affects very specific target insects and breaks down in the environment fairly quickly.

There is reason for not spraying it whenever the urge strikes, however. The more exposure insects have to it, the sooner they will develop a new strain of insect that will be resistant.

Use traps.

For animals, I find all traps to be lacking except mouse traps, which are effective but have to be set so no domestic animal will get hurt. Slugs can be trapped in a dish of beer, as they are attracted to fermenting liquids. They'll crawl in, and stay in, until they drown. Not all that appealing, a dish full of stale beer and slugs. Any moist, dark area where they can hide from the midday sun can be a trap for slugs. One time when my garden was overrun by them, I put down boards for my walkways. During the day I would turn the boards over and skate back and forth until I figured most of the slugs were dead. I wasn't gardening barefoot in those days.

Insect traps often use a sticky substance like the old-fashioned fly traps. Tanglefoot can be spread around the trunk of a tree to trap insects that winter on the ground and crawl up the tree trunk. It can be spread on red spheres hung in apple trees to attract and trap flies that lay eggs in apples.

Flea beetles are attracted to yellow--so yellow cards covered with Tanglefoot will trap them, as will a yellow dish filled with water.

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## FEATURE ARTICLE

Continued from page 6

## NATIVE PLANT HIGHLIGHT

### PHYTOGEOGRAPHY

Phytogeography refers to the geographic distribution of plants. When considering the overall native geographic distribution of the eastern flora of North America, Delaware could be referred to as a "floristic crossroads" between the north and south. Of the 1564 native species of vascular plants known to occur in Delaware, 439 have a more southern distribution. In other words, 439 species are at or near their northern limits of natural geographic distribution. In comparison, 335 have a more northern distribution and are at or near their southern limits. The southern flora of Delaware comprises 28% of the known native flora of the state, and the northern flora comprises 21%. Within the Piedmont physiographic province, (the northern portion of Delaware, 93 species have northern affinities, while 22 have southern affinities. In the Coastal Plain physiographic province, the southern portion of the state, 307 have southern affinities, and 120 have northern affinities. Considering the rare and uncommon flora of Delaware: 256 species are more southern in their distributions, and 232 species are more northern in their distributions.

The primary limiting factor in a plant species overall distribution is climate, i.e., temperature and precipitation. Species with a more southern distribution obviously prefer warmer temperatures, and vice-versa for species with northern affinities. Delaware has a mild, temperate climate which is moderated by the effects of the Atlantic Ocean and Delaware Bay, and temperatures are fairly consistent throughout the state. The coldest month of the year is January, with an average temperature in northern Newark of 31.2°F and 34.5°F in Lewes. July is the warmest month with average temperatures of 76.0°F in Newark and 75.9°F in Lewes. Precipitation is distributed fairly evenly throughout the year with average annual rates of 43.3 inches (110.0 cm) at Newark and 45.5 inches (115.6 cm) at Lewes.

Soils, and hydrology are other factors that work to define overall species distributions. Soil chemistry, as related to pH and available nutrients have a strong influence on species distribution. Many species of the Coastal Plain prefer sandy, acidic soils which could prevent them from migrating further north into the Piedmont or Mountains. In these regions, there are many soil types that tend to be more nutrient rich with higher pH values. Regional hydrological conditions, such as tidal or non-tidal can determine which species are able to become established and persist, thus influencing their overall distributions.

Some examples of native Delaware species that are more southern include: *Aster tenuifolius*, perennial salt-marsh aster; *Solidago fistulosa*, pine barren goldenrod; *Woodwardia areolata*, netted chain fern; *Quercus falcata*, southern red oak; and *Taxodium distichum*, bald cypress. Some examples of native Delaware species that are more northern include: *Aster novae-angliae*, New England aster; *Vernonia noveboracensis*, New York ironweed; *Dryopteris marginalis*, marginal woodfern; *Betula lenta*, sweet birch; and *Acer saccharum*, sugar maple. 

oooo William McAvoy, DNPS member

Thanks to Pete Bowman for compiling the climate data.

## UPCOMING EVENTS

**TUESDAY, 20 FEBRUARY 2001** – DELAWARE'S FIRST BIODIVERSITY SYMPOSIUM, AT THE SHERATON DOVER HOTEL AND CONFERENCE CENTER, FROM 8:30 A.M. – 4:15 P.M.. RECEPTION FROM 4:15 P.M. – 6 P.M. SPEAKERS INCLUDE GOVERNOR RUTH ANN MINNER, RENOWNED AUTHOR THOMAS HORTON, AND DR. THOMAS LOVEJOY OF THE SMITHSONIAN INSTITUTION, WITH BREAKOUT SESSIONS SUCH AS ANALYZING LEGISLATIVE NEEDS AND EXISTING PROGRAMS TO PROTECT BIODIVERSITY, INCORPORATING BIODIVERSITY CONSERVATION INTO LAND USE PLANNING AND THE ECONOMICS OF BIODIVERSITY AMONG OTHERS. FOR MORE INFORMATION OR TO REGISTER CONTACT CONNIE MOORE AT 302.739.3423 BY 5 FEBRUARY 2001.

**THURSDAY, 22 FEBRUARY 2001** – USING NATIVES IN THE LANDSCAPE: HOW, WHEN AND WHERE. THE DELAWARE NURSERY & LANDSCAPE ASSOCIATION IN COOPERATION WITH THE DELAWARE INVASIVE SPECIES COUNCIL WILL BE HOLDING THIS ONE DAY WORKSHOP FROM 8 A.M. TO 4 P.M. AT THE DELAWARE DEPARTMENT OF AGRICULTURE, 2320 S. DUPONT HWY, DOVER, DE. THE WORKSHOP INCLUDES PRESENTATIONS FROM INDUSTRY PROFESSIONALS, HANDS-ON TRAINING, GROUP ACTIVITIES, INTERACTIVE LEARNING, AND ON-HAND PROFESSIONAL ADVICE. REGISTRATION IS LIMITED TO 50, SO REGISTER EARLY (THE REGISTRATION FEE OF \$20 INCLUDES BREAKFAST AND LUNCH). FOR MORE INFORMATION OR TO REGISTER CONTACT HEATHER APOSTOLOS AT 302.739.4811 OR HEATHER@DDA.STATE.DE.US.

**24-28 JUNE 2001** – JOINT FIELD MEETING OF THE BOTANICAL SOCIETY OF AMERICA (NE SECTION), THE PHILADELPHIA BOTANICAL CLUB AND THE TORREY BOTANICAL SOCIETY WILL BE HELD AT WESLEY COLLEGE AND DELAWARE STATE UNIVERSITY IN DOVER, DELAWARE. ALL DAY FIELD TRIPS WILL TAKE PLACE ON MONDAY, TUESDAY AND WEDNESDAY IN AREAS OF BOTANICAL INTEREST THROUGHOUT DELAWARE AND MARYLAND'S EASTERN SHORE. ON SUNDAY THROUGH WEDNESDAY THERE WILL BE EVENING PROGRAMS OF BOTANICAL AND ECOLOGICAL INTEREST PLUS A TOUR OF THE CLAUDE E. PHILLIPS HERBARIUM AT DELAWARE STATE UNIVERSITY. THE REGISTRATION FEE OF \$230 INCLUDES ALL EVENTS, DOUBLE OCCUPANCY LODGING, MEALS (SUNDAY DINNER THROUGH THURSDAY BREAKFAST) AND FIELD TRIP TRANSPORTATION. EVERYONE INTERESTED IN NATIVE PLANTS IS WELCOME TO ATTEND. A SEPARATE COMMUTER PACKAGE IS AVAILABLE WITHOUT LODGING. TO REQUEST A REGISTRATION FORM OR FOR FURTHER INFORMATION CONTACT TIM DRAUDE AT 717.393.7233 OR DR. LARRY KLOTZ AT LHKLOT@WHARF.SHIP.EDU.

The electric zapper traps are likely to kill more beneficial insects than pests. Pheromone traps fool male insects into thinking they are about to find a suitable female.

Mobilize beneficial insects.

Lady beetles and praying mantids are the beneficial insects most often cited, probably because they are such voracious eaters of other insects. Praying mantids probably eat more beneficial insects than potential problem insects. Lady beetles eat their weight in aphids every day or some such incredible amount--good to have around if you have a lot of aphids.

The garden is a special place for me, providing so much more than healthy food. It is a partnership with nature. It is not a place to do battle or to be afraid. It is a place for contemplation, for solving puzzles, for creating and perhaps being created. It is a place where self-respect flourishes, as does the life that abounds.

oooo Mort

✿ Mather, for Mother Earth News

### NATIVE PLANT COMMUNITY HIGHLIGHT

*(Editor's note: For this issue of The Turk's Cap, we decided to give the Native Plant Community Highlight a vacation. Stay tuned for more fascinating plant community descriptions starting with the next issue).*

### DNPS WEBSITE

The DNPS website is continuing to experience a bit of a lag at the moment. Your continued patience is appreciated. A notice will be placed here in a future issue when the website has been updated. Until then, if you want to revisit any past newsletter articles for Vols. 1 and 2, you can check them out at [www.delanet.com/~dnpswp](http://www.delanet.com/~dnpswp).

# 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**



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