

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

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 WARM SPRING DAY WELCOME TO OUR NEWEST MEMBERS

April through June

Robert and Jean Bewick

Lynn Broaddus

Dorothy Domingue

Bob and Nan Edelen

Robert and Nancy Faass

Pat Groller

Garth McCabe

Octoraro Native Plant Nursery

David Paterson

Dr. Arthur O. Tucker



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

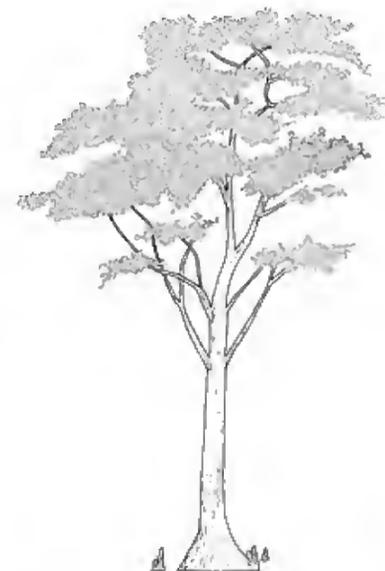
The purpose of the Delaware Native Plant Society (DNPS) is to participate in and encourage the preservation, conservation, restoration, and propagation of Delaware's native plants and plant communities. The Society provides information to government officials, business people, educators, and the general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

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 exclosure 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

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. 

Eric Zuelke, Editor

RESOURCES AND REVIEWS**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: wmcavoy@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 taeda* (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

NATIVE PLANT COMMUNITY HIGHLIGHT**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 Co-

lumbia 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 communities 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

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FEATURE ARTICLE

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?** (imperiled 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.

oooo 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

COMMON NAME

<i>Alnus serrulata</i>	brook-side alder
<i>Amelanchier canadensis</i>	oblong-leaf serviceberry
<i>Aronia arbutifolia</i>	red chokeberry
<i>Asimina triloba</i>	pawpaw
<i>Baccharis halimifolia</i>	eastern baccharis
<i>Cephalanthus occidentalis</i>	common buttonbush
<i>Clethra alnifolia</i>	coast pepper-bush
<i>Cornus amomum</i>	silky dogwood
<i>Cornus florida</i>	flowering dogwood
<i>Corylus americana</i>	American hazelnut
<i>Crataegus macrosperma</i>	hawthorn
<i>Crataegus pruinosa</i>	hawthorn
<i>Euonymus americana</i>	hearts-a-bustin
<i>Gaylussacia baccata</i>	black huckleberry
<i>Gaylussacia frondosa</i>	dangle-berry
<i>Hamamelis virginiana</i>	American witch-hazel
<i>Ilex glabra</i>	ink-berry
<i>Ilex verticillata</i>	black holly
<i>Itea virginica</i>	Virginia willow
<i>Iva frutescens</i> ssp. <i>oraria</i>	marsh elder
<i>Kalmia latifolia</i>	mountain laurel
<i>Leucothoe racemosa</i>	fetter-bush
<i>Lindera benzoin</i>	spicebush
<i>Myrica cerifera</i>	southern bayberry
<i>Myrica pensylvanica</i>	northern bayberry
<i>Rhododendron periclymenoides</i>	pink azalea
<i>Rhododendron viscosum</i>	swamp azalea
<i>Rhus copallinum</i>	winged sumac
<i>Rhus hirta</i>	staghorn sumac
<i>Rosa palustris</i>	swamp rose
<i>Rubus allegheniensis</i>	common blackberry
<i>Rubus occidentalis</i>	western raspberry
<i>Sambucus canadensis</i>	common elderberry
<i>Spiraea tomentosa</i>	hardhack spiraea
<i>Vaccinium corymbosum</i>	highbush blueberry
<i>Vaccinium pallidum</i>	early lowbush blueberry
<i>Vaccinium stamineum</i>	squaw huckleberry
<i>Viburnum acerifolium</i>	maple-leaf viburnum

Viburnum dentatum southern arrow-wood
Viburnum prunifolium smooth black-haw

William McAvoy

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?

Flavia Rutkosky, United States Fish and Wildlife Service

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

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.

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.ag.s.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 potluck 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**

