

Native Plant News

The Newsletter of the North Carolina Native Plant Society

Volume IV, Issue 1

February/March 2006

NCNPS Spring Trip scheduled for May 21-22, 2006

Up on the back side of Sugarloaf Mountain at 3,800 feet above sea level, almost 600 acres of windswept mountainside known as World's Edge is slated next month to become the first piece of a future state park.

Two conservation groups, the Carolina Mountain Land Conservancy and the N.C. Nature Conservancy, paid \$16 million in August to buy 1,568 acres at World's Edge. Here the Blue Ridge drop 2,000 feet to Lake Lure and Hickory Nut Gorge, offering longrange views of the Piedmont and flatlands to the south and east.

With private developers eyeing World's Edge, the conservation groups moved quickly, borrowing money to save the land for the state's planned Hickory Nut Gorge State Park.

The Carolina Mountain Land Conservancy, a nonprofit group based in Hendersonville, expects to sell the 588 acres it is holding to the state soon, said executive director Keiran Roe.

"The state property office, working on behalf of the Parks and Recreation Department, has said they want to acquire that portion of the property and they want to do that in early December," he said. "We are still waiting eagerly for the closing date. That is good news for us."

The acreage the group owns is the highest portion, at the end of World's Edge Road, where Henderson County meets Rutherford and Polk counties. It may be a year or two before the state buys the remaining almost 980 acres being held by the Nature Conservancy's N.C. Chapter.

The N.C. Natural Heritage Trust Fund last month approved \$3.9 million, while the N.C. Clean Water Management Trust Fund earmarked the same amount toward the purchase, Roe said. The N.C. Parks and Recreation Trust Fund in late October also approved a \$4 million grant toward buying the land at World's Edge, said Charlie Peek, spokesman for the N.C. Parks and Recreation Division.

Even as the deal moves forward, it will probably be 2007 before the state can budget money to hire staff for the new state park. The process of creating the park will stretch over several years

and hinge on developing a master plan with input from residents of the surrounding area, Peek said.

Roe said the N.C. Property Office is moving to buy the land held by the Carolina Mountain Land Conservancy first. The group, which has about 500 members, pledged \$6 million to secure the land. Four of its directors pledged their own stocks or buying certificates of deposit to secure loans.

Even as the land changes hands to the state, it will be several years before a new state park is up and running, Peek said.

"We have to get in there and really study that land, first by taking inventory of natural resources on that land, flora and fauna and where it is, also to see if there is anything we don't know anything about," he said.

In the meantime, the state is discouraging people from visiting the land because of the lack of staff and potential damage to natural resources, he said.

The General Assembly last year approved \$2.9 million to start developing park infrastructure such as roads, parking lots and underground utilities. Work is slated to start in coming months at Gorges, located off N.C. 281S near Lake Toxaway.

How much land the state would need before starting the planning process is in question, although "it appears the World's Edge property would give us a good core property for a state park," Peek said.

"In two to three years you might start to see a start park begin to coalesce," he said.

Harrison Metzger
Hendersonville News

Watch for details on the NCNPS trip to the area in our next newsletter. In the meantime, save the date!!

May 20 – 21, 2006

Condensed and reprinted with permission from a full article published November 25, 2005 and accessed online at <http://harrison.metzger@hendersonvillenews.com/apps/pbcs.dll/frontpage>

Membership news .

From Tom Harville:

Would you put a blurb in the newsletter asking/begging/cajoling members to send us their current email address. They can send it to: tom@ncwildflower.org.

From Jean Woods:

I am on an advisory council for Parks and Rec here in Mecklenburg County and received a copy of a letter from a Parks and Rec official to a developer of a property near one of the parks. Below is an excerpt from the letter, which shows that people use our web site and know about Misty Franklin's list of invasives!

"The Division is greatly concerned about the use of any invasive exotic plants in the new community's landscaping. The spread of invasive exotic plants is among the greatest threats to Mecklenburg County's natural areas and presents a challenging management issue for the Division. Thus, we strongly recommend that the developer consults the North Carolina Wildflower Preservation Society's Invasive Exotic Plant List (see www.ncwildflower.org/invasives/invasives.htm) and ensures that none of those species are planted in the subdivision."

From Carole Madan

My first electronic transmission of our newsletter came to me in all its glory - filled with color pictures and an incredible account of events at the Cullowhee conference. I live out of state (but am a Lifetime Member) so will be unable to fill a volunteer position open currently. Please consider choosing one of these incredible opportunities to grow our Society. We all grow when we share equally in the work.

Carole Madan

NCNPS Executive Board & Committee Nominations

The NCNPS board requests nominations for the officer positions on the NCNPS executive board. These positions include: president, vice president, recording secretary, corresponding secretary and treasurer. It also happens that we are going to need three at-large board members. The basic requirements for all of these positions are the same: a desired to make the NCNPS a vibrant, viable organization, a willingness to commit some time and a concern for our North Carolina native plants. Candidates will attend four board meetings which normally occur in February, May, August and November. They should also attend the Fall and Spring meetings and the June picnic.

There are also positions open on the committees as designated by the by-laws:

education committee

program committee

finance committee

publications committee – chair Kathy Schlosser

membership committee

scholarship & grant committee – chair Tom Harville

history & archives committee

media relations committee

Stewardship committee

Advocacy committee

Please send your nominations to the chair of the nomination committee, Alice Zawadzki at alice@ncwildflower.org or 1624 Park Drive, Raleigh, NC 27605, no later than March 15, 2006.

Coming Events .

May 20-21, 2006

We will visit the Chimney Rock, NC area.

Saturday, James Padgett will lead us to World's Edge, Eagle Rock, or Rainbow Falls.

Saturday night Ron Lance (naturalist at Chimney Rock Park) & Sarah Martin (the 2004 NCNPS Shinn Grant recipient) will make presentations.

Sunday morning we will visit either Bat Cave, Rumbling Bald, or other Hickorynut Gorge sites.

June 10, 2006

Our annual pot luck picnic and plant auction will be held 12:00- until at Hagen Stone Park, just south of Greensboro. We hope everyone will bring plants to auction!

We have a special treat for the morning, 10:00 – 12:00. Ken Bridle, EcoLogic's principal biologist and past NCNPS President will use NCNPS member, Diane Laslie's backyard stream in Pleasant Garden to describe a stream's characteristics and if it needs restoration and do a benthic bug sampling to determine the water quality and discuss how different aquatic critters indicate different water quality and pollutant impacts. As a bonus you will get to see Diane's beautiful garden. Attendance will be limited to 25. Registration will open April 1st and will be 1st come 1st served.

October 6 – 8

We will visit the Charlotte, NC area

We hope to visit a piedmont prairie site, a *Helianthus schweinitzii* site and perhaps one of the institutional gardens nearby.

New members since the last newsletter

Sally Rhodes

Mari Connen

Tina Oberle

David Wuosmaa

Judy Baily

Paula & Jeff White

Susan Posey

Gerald Clifton

Margaret, Shirley, George and Brian Cox

Melvin Holland

Nancy Fraley

Mary Doll

Lela Walker

Patty Fallar

Dawn Sheppard

Irene Underwood

Michael & Lynn Gussman

Christopher Dobbins

Welcome!

Members of The Margaret Reid Chapter (Triangle area) have been enjoying the rather ambitious schedule of two activities per month since October. With the exception of our Christmas Party, kindly hosted by Robert and Julia Mackintosh, we have focused on walks in natural areas no more than an hour away. With the multitude of places to visit, and the hope that frequent outings will allow more people to fit at least some of our activities into their schedule, we decided to plan events for both the first and third Sundays of the month. We usually meet at the Margaret Reid Wildflower Garden in Raleigh at 1:00 and carpool. I send out notices via email with directions for those who want to meet at the site. If you are not receiving these notices, please send your email address to Margaret@ncwildflower.org, or you can always give me a call at 919467-2727.

The places that have been chosen included significant natural areas listed in the county inventories, Triangle Land Conservancy (TLC) holdings, and additional places suggested by a committee which included Misty Franklin, Amy Mackintosh, Ed Schwartzman, and Alice Zawadski. I am most appreciative of the help they have given in planning our activities. Some of these areas, (Harrelson Tract and Juniper Springs already visited; Stefan Bloodworth's family property planned in May), are not open to the public and we obtained special permission for our walks. Although many places are available to you to go on your own, the good company of other native plant enthusiasts can make the experience so rewarding. Even when we have visited the more commonplace areas, I for one, have always learned something. (Did you know that the twining tendrils on smilax are an adaptation of the sepals, while those on the cross vine are adapted from the petioles? I learned that on our last walk to the Buckeye Trail, Raleigh Greenway.)

Here is our planned schedule for this spring (subject to change):

- 2/5/06 Umpsted Park
- 2/19/06 Sharon Harris grounds
- 3/5/06 Donnelly Hardpan Bog
- 3/19/06 White Pines
- 4/2/06 La Grange Riparian Preserve
- 4/16/06 Private garden TBA
- 5/7/06 Stefan Bloodworth's family property

As our natural areas become more and more scarce due to the tremendous development occurring in the Triangle, the need for preservation becomes more acute. We are indeed

fortunate that there are agencies working to safeguard natural places, but even areas set aside and protected from development are often in need of help. At the Harrelson Tract, we witnessed the restoration of prairie plant communities after the proscribed burn and selective tree removal carried out by Rob Evans and the NC Department of Agriculture's Plant Conservation Program. Now that the NC Botanical Garden has taken charge of Battle Park the massive influx of exotic pest plants from private gardens is being set back through the great effort of staff and volunteers. There are numerous opportunities to get involved and I would urge you to find a place close to you that needs your help. Here is a short list of some possibilities:

- TLC schedules regular workdays for their properties and you can also sign up to be a site steward. Contact Doug Sprouse at dsprouse@tlcnc.org, 833-3662.
- Battle Park workdays are Thursday mornings and occasional Saturdays. Contact Autumnne Thoyre at authoyre@hotmail.com, or 9620522.
- Join the NC Botanical Garden Green Dragons working at Mason Farm and the Coker Pinetum. Contact ncbg@unc.edu, or 9620522
- The Reid Garden workday is the second Saturday morning of the month. Contact Julia Mackintosh at juliamack5@aol.com or 571-3542.
- The Town of Cary holds workdays at Hemlock Bluffs. Contact Gigi WainwrightBaker at Gigi.WainwrightBaker@TownofCary.org or 387-5980.

Knowing that native plant and animal communities are badly impacted by exotics as well as development, our Chapter intends to organize to combat this problem. We want to establish Green Invader Corps in each of our communities, who would work on halting the spread of exotic invasives in our parks, greenways, and open spaces. We would do this by developing a training program for organizations such as garden clubs and scout troops to enable them to go out and participate in workdays. I would love to see areas adopted and kept free of invasives, similar to the program that reduces litter. We are in the beginning planning stages and anyone interested in participating may contact me at 919467-2727 or margaret@ncwildflower.org.

Triad Chapter

Members of the Triad Chapter (Greensboro/HighPoint/Winston Salem and surrounding areas) continue meeting twice monthly for "Walk & Looks" or more formal programming when the weather is blustery.



In November, member Nell Lewis talked with the group on the topic of gardening with rescued plants.

A plant drawing was a hit at our holiday meeting, with everyone taking home something special for their gardens. In addition to plants, David McAdoo contributed greeting cards made from his spectacular photograph collection of native orchids in bloom.



In early January we met at Historic Bethabara Park for an informative presentation by Emily Allen on the History of Ferns.

On January 31st, Dr. Todd Læseigne, Director of the Ciener Botanical Garden in Kernersville,



addressed our largest group yet, 47 in the audience, with an energetic and enthusiastic program on "North Carolina's Big Cousin: China." He explained the nature of the disjunct plant populations that exist in both China and southeast North America, with lots of slides of examples.

Our Plant Study Group has been exploring floral outbreeding mechanisms this year. A summary of Dan Chamber's presentation on Leaf Litter Pollination is found elsewhere in this newsletter. Look for more reports in future newsletters. The group meets on the 3rd Monday of each month from 6:30 – 8:00. We usually meet at the Kernersville Library, but that changes, so call ahead if you would like to join us.

Plant Study

February 20	Butterfly Pollination	Shelley Rutkin
March 20	Wind Pollination	Judy West
April 17	Buzz Pollination	Kathy Schlosser

We were sorry to see an end to Plant Rescues opportunities at the Randleman Dam site, but will always fondly remember the beautiful, incredibly diverse area, and most



A heartbreaking site along the "trail" that we used to follow. Photo courtesy of Tom Harville.

especially, the camaraderie that developed among the rescuers.

Lynda Waldrep continues to spearhead rescue efforts around the Triad, and the Chapter has begun to formulate a Position Statement on the sometimes controversial issue of plant rescue. Once complete, the statement will be forwarded to the NCNPS board.

For members who have a few free hours, work continues on the Wildflower Walk at the Greensboro Arboretum. Our greatest concern in the area are the invasives (English ivy, *eleagnus*, and a few other noxious species). We are working with Arboretum staff to see that the invasives are removed, and we continue to move in some of the bounty from the Randleman Dam site.

As weather warms, we will move to weekend gatherings to watch the procession of blooming from spring through fall. A schedule of walks will be available later this month and will be made available on the NCNPS website (www.ncwildflower.org).



Horst & Judy Steirand, Patrick & Mimi Westervelt, Lynda Waldrep.

Northeast Coast Chapter

Kathy Mitchell and Susan Ruiz-Evans

The Northeast Coast Chapter, the newest Chapter of the NCNPS, has plans underway for getting a group together. If you live in the area, you won't want to miss the opportunity! Kathy Mitchell sent along a copy of their first announcement:

You are invited to become a charter member of the Northeast Coast Chapter of the NORTH CAROLINA NATIVE PLANT SOCIETY!

The NC Native Plant Society, founded in 1951 as the NC Wildflower Preservation Society, promotes enjoyment and conservation of native plants and their habitats through educational programs, advocacy for habitat protection, and propagation of native plants. Chapters feature programs of local interest and hikes to natural areas within an easy day's drive.

Find out more at the NCNPS website:
<http://www.ncwildflower.org/>

This is the newest chapter of the NCNPS, and the only chapter representing the coast. We need to hear from you:

- What can the NE Coast Chapter do for our native plants and natural areas?
- What can the chapter do for you?

Please let us know if you might be interested in becoming a member of the NC Native Plant Society. An informal get together will be scheduled in the near future, after we've gotten some feedback, so that we all can learn more about the Society and share our ideas and goals for the NE Coast Chapter.

No commitment required— just a great opportunity to meet and network!

Please share this invitation with friends, family, and anyone else who may have a passion for native plants.

We look forward to talking with you soon.

Thanks!

Kathy Mitchell
NC Aquarium on Roanoke Island
(252)473-3494, ext 264
Katherine.Mitchell@ncmail.net

Susan Ruiz-Evans
NC Cooperative Extension-Dare County Center
(252)473-4290
Susan_Ruiz-Evans@ncsu.edu

Charlotte Chapter

Jean Woods

Tom & Bruce Shinn Grant

If Charlotte/Mecklenberg area members will send their emails address to Jean, she will keep in touch with you and send updates for events.

Jean14424@aol.com

Schedule under construction. Contact Jean for details or watch the next issue of the newsletter.

The deadline for submissions for this grant is 30 April 2006. The grant in the amount of (\$100.00 \$500.00) supports research on native plants.

This grant will be awarded to United States citizens attending North Carolina schools who are graduate students, qualified undergraduate students working on projects with an advisor, or qualified professionals working in North Carolina to support basic or applied research in botanical or horticultural areas that fulfill the mission and/or objectives of the North Carolina Native Plant Society.

Applications can be found on the NCNPS web site <http://www.ncwildflower.org/scholarships/scholarships.htm>

At the November 21, 2005 Plant Study meeting for the Triad Chapter of the NCNPS, I volunteered to lead a discussion on pollination in the leaf litter. My interest had been peaked during a hike where different wildflowers were seen, one of which was *Asarum canadense*. Its flower is hidden under the leaf litter and therefore would not be pollinated by the usual suspects like bees and butterflies. New to study of the botanical world, I thought this topic would not be too difficult to research and then to share my findings with the group.

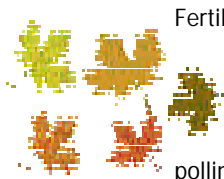
Starting online at home, I searched for leaf litter pollination, *Asarum canadense* pollination, grounddwelling pollinators, etc. My results were pitiful. Discouraged, I emailed the NC Botanical Garden for help. Assistant Director Johnny Randall answered with some pollination types and the suggestion to go to a university library to do "a genuine scientific journal search rather than a standard internet search."

With my home library being limited in the botanical realm, I went to the University of North Carolina at Greensboro's Jackson Library. Not being a student or staff member, I had to join the Friends of the Library to have check out privileges. Then, to print from their computers, you need to purchase a \$5.00 card to which you then add money to pay for the printing. I emailed the Jackson's Biology Librarian for help with my research but never heard back from her. I did find two resources dealing with the pollination of wild ginger. The resources were not in the UNCG library and would need to be accessed through the Inter-Library Loan (ILL) Department. Unless you are a student or staff member, you cannot use the ILL. It was suggested that I go to the Central Greensboro Public Library to use their ILL.

Up the stairs I climbed to the second floor of the Central Library to the Reference Desk to inquire about their ILL procedure. I was told that they do not do inter-library loans unless you have been a library card holder for six months. And if I wanted to use their computer lab (three-hour limit) I would need a library card and copy card to pay for printing. Both cards were obtained and more searching done with little success on finding research concerning leaf litter pollination. I emailed NC Knows Reference Ask-A-Librarian Online and chatted with Travis from Wake County Public libraries, who was able to help me with some search techniques (old dog, new tricks).

To establish some continuity, I would like to add some pollination syndromes to the Outbreeding Mechanisms handout received at the last meeting.

The definition of pollination is the placement of pollen onto the stigma of a carpel. This is to differentiate from fertilization, which is the union of haploid gametes to produce a diploid zygote.



Fertilization takes place after pollination has occurred.

The focus of today's Plant Study is to be leaf litter pollination, defined here as pollination which takes place in and under the leaf

Biotic Pollination Syndrome	Definition
Anthropophily	Pollination by man
Cantharophily	Pollination by beetles
Chiropterogamy	Pollination by bats
Cleistogamy	Self-pollination w/in a closed flower
Malacophily	Pollination by slugs or snails
Melittophily	Pollination by bees
Myophily	Pollination by flies
Myrmecophily	Pollination by ants
Ornithogamy	Pollination by birds
Phalaenophily	Pollination by moths
Psychophily	Pollination by butterflies
Abiotic Pollination Syndrome	Definition
Anemophily	Pollination by wind
Hydrophily	Pollination by water

litter of the forest floor. The leaf litter zone "rivals corals reefs as one of the most biodiverse places on earth."¹ It has been said that "if everything else were to disappear, the Earth's outline could still be recognizable

as a continuous sheet of leaf litter roundworms."² That is a lot of nematodes! Other organisms, like protists, bacteria, fungi, and arthropods, especially insects, inhabit this leaf litter zone. Some of them are involved in the pollination of plants found here, including *Asarum canadense*.

The common name, wild ginger, is given because its roots make an excellent ginger substitute.³ Additional common names are snakeroot, coltsfoot, and ginger root. It belongs to the Aristolochiaceae or Birthwort family. *The Manual of Vascular Flora of the Carolinas* lists three genera (*Aristolochia*, *Asarum*, and *Hexastylis*) and 11 species of this Birthwort Family which are found in North Carolina. Some references have just the genera *Aristolochia* and *Asarum*. Other references put the family evergreen species in the genus *Hexastylis*.⁴ There are many differences found in the research as to the taxonomy of this family.

Asarum canadense grows in rich, moist woods. It spreads by rhizomes, "usually elongated, horizontal underground or subsurface stem, usually rooting at the nodes."⁵ In early spring, leaf buds begin to peak out of the leaf litter. These leaves will grow into two large heart-shaped leaves with a smooth upper surface and a hairy underside.⁶ It is the leaves that we see. At the base of the leaves is a single tubular flower, often hidden under the leaf litter. Once again, to connect to Kathy's November talk on Outbreeding Mechanisms, *Asarum canadense* is a hermaphroditic species having perfect flowers.

The flower attracts flies and gnats in early spring that are looking for food from the bodies of animals that have died during winter. The purple-brown or puce color of the single wild ginger flower is similar to that of carrion.⁷ Some references say the flower also has a fetid smell as an attractant.⁸ The flower provides shelter and is a place to escape chilly early spring breezes. Some gnats perform their mating dance inside the flowers and accomplish

pollination in the process.⁹ Some gnats lay their eggs inside the flowers. The tissues of the plant contain a poison (aristolochic acid, which is not only carcinogenic, but sufficiently toxic to injure human liver and kidneys)¹⁰ that kills the gnat larvae as they feed, allowing future seeds to grow to maturity.

How does wild ginger avoid self-pollination? It is dichogamous. Dichogamy is defined by Webster's Ninth New Collegiate Dictionary as "the production of male and female reproductive elements at different times by a hermaphroditic organism in order to ensure cross-fertilization." There are two forms of dichogamy—protandry and protogyny. Protandry is when pollen dispersal precedes stigma receptivity and protogyny is when stigma receptivity precedes pollen dispersal.¹¹ *Asarum canadense* has the protogyny to ensure outbreeding. (The female portion of the flower matures first. Later the flower will turn male and the flower's 12 stamens produce pollen, which the insects eat and some pollen is transferred by the insect's bodies to other flowers. The plant's pistil and stamens are not mature at the same time. This ensures cross pollination and therefore diversity for *Asarum canadense*.)

After pollination and fertilization the flower bends toward the ground to eventually release its seeds. Ants in a seed dispersal process called myrmecochory carry the seeds to their burrows and eat the elaiosomes, tasty coatings of the seed. They discard the rest of the seed in their "dump" where it can germinate protected from predators, like birds and rodents, in the underground, ant-made compost. Some other wildflower seeds dispersed by ants are bloodroot, trout lily, mayflower, Dutchman's breeches, hepatica, trillium, and violets.¹²

Another plant found in the leaf litter is *Hexastylis naniflora*. This threatened species (Federal Register, April 14, 1989) has the smallest flowers of any North American plant in the genus *Hexastylis*. The flowers are less than 10 millimeters long and never more than seven millimeters wide. Thrips and flies are the major pollinators for the genus *Hexastylis*. These insects spend most of their lives in the plant's flower tissues and feed on pollen grains or on portions of the plant's outer skin.¹³ Another species, *Hexastylis virginicum* is believed to be pollinated by beetles and slugs.¹⁴

Three sources were found which question cross-pollination by insects in some leaf litter plants. Harvey Wildman in a 1950 article in the magazine *Science*, writes about an experiment he did with *Asarum canadense* showing the plants to "normally self-pollinate and that cross-pollination occurs rarely, if at all."¹⁵ Karen Lu studied *Asarum Caudatum* (not native to NC) and published her findings in *Systematic Botany* in 1982. She found that the plant is predominantly autogamous, pollinating its flower with its own pollen.¹⁶ And finally, Lawrence Kelly's analysis in the *American Journal of Botany* in 1997 that *Asarum* species have autonomous self-pollination. *Hexastylis* species are herkogamous. The plants have spatial separation of male and female reproductive elements¹⁷ and therefore cannot self-

pollinate without the help of insects. Kelly found no evidence that insects brought pollen from other plants but instead transferred the plant's pollen to its stigma. "Herkogamy is generally interpreted as a means to promote outcrossing and its evolution in the absence of a corresponding increase in outcrossing seems inexplicable."¹⁸

Questions posed for discussion at the Plant Study meeting include: Why would a plant (*Asarum canadense*), which spreads by rhizomes, spend the energy and resources to produce sex organs if only to self-pollinate: Would seed dispersal ensure the increase in range of habitat? Why would *Hexastylis* spatially separate its reproductive organs (herkogamy) if to just self-pollinate?

References

- 1 Online resource of Biodiversity in Soil and Leaf Litter at http://www.aronline.net.au/factsheets/biodiversity_litter.htm (accessed 1-14-06).
- 2 Ibid.
- 3 Online resource of *Asarum canadense* at <http://www.paghat.com/asarum4.html> (accessed 1-10-06).
- 4 Online resources of *Asarum canadense* at <http://www.todaysgardener.com/perennials-asarum-wild-ginger.html> (accessed 1-15-06)
- 5 Albert E. Radford, Harry E. Ahles, and C. Ritchie Bell, *Manual of the Vascular Flora of the Carolinas*. Chapel Hill, NC: The University of North Carolina Press, 1968. 1vi.
- 6 Online resource of Wild Ginger at <http://www.chicagowildernessmag.org/issues/spring2001/wildginger.html> (accessed 1-11-06)
- 7 Jack Sanders, *The Secrets of Wildflowers: A delightful Feast of Little Known Facts, Folklore, and History*. Guilford, CT: The Globe Pequot Press, 2003. 83-85.
- 8 Online resource of Wild Ginger at <http://www.chicagowildernessmag.org/issues/spring2001/wildginger.html> (accessed 1-11-06)
- 9 Online resources of *Asarum canadense* at <http://www.todaysgardener.com/perennials-asarum-wild-ginger.html> (accessed 1-15-06)
- 10 Online resource of *Asarum canadense* at <http://www.paghat.com/asarum4.html> (accessed 1-10-06).
- 11 Risa D. Sargent and Sarah P. Otto, "A phylogenetic analysis of pollination mode and the evolution of dichogamy in angiosperms", *Evolutionary Ecology Research*, 2004, 6:1183-1199.
- 12 Online resource at Myrmecochory at <http://www.academics.skidmore.edu/wikis/NorthWoods/index.php/Myrmecochory> (accessed 1-14-06)
- 13 Online resource of Dwarf-flowered Heartleaf, *Hexastylis naniflora* at <http://www.permanent.access.gpo.gov/websites/endangered.fws/i/q/saq/5g.html> (accessed 1-15-06)
- 14 Online resource of Heartleaf Ginger, *Hexastylis virginicum*, at <http://www.pcs.k12.va.us/vtrail/wd.htm> (accessed 1-15-06)
- 15 Harvey E. Wildman, "Pollination of *Asarum canadense* L.", *Science*, New Series, Vol 111, No. 2890 (May 19, 1950), 551.
- 16 Karen L. Lu, "Pollination Biology of *Asarum caudatum* (Aristolochiaceae) in Northern California", *Systematic Botany*, Vol. 7, No. 2 (Apr.-Jun., 1982), 150-157.
- 17 Online resource of Herkogamy at <http://www.hal.weiheinsteph.de/genglos/asp/genreq.asp?nr=585> (accessed 1-15-06).
- 18 Lawrence M. Kelly, "A Cladistic Analysis of *Asarum* (Aristolochiaceae) and Implications for the Evolution of Herkogamy", *American Journal of Botany*, Vol 84, No. 12 (Dec., 1997), 1752-1765.

Dan Chambers is a new member of the Triad Chapter, joining just this year. He learned about NCNPS through a joint project of the Triad Chapter and the Pearson Chapter of the Audubon Society, of which he is a member. We appreciate his willingness to jump right in as an active member! Dan also serves as one of the Triad Chapter's photographers.

North America's Most Vulnerable Pollinators

The first step to effectively protect pollinators at risk of extinction is to identify those species in need of conservation. To that end, the Xerces Society, in cooperation with scientists across the United States and Canada, has produced the *Red List of Pollinator Insects of North America*.



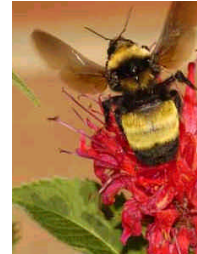
Pipevine swallowtail. *Battus philenor*.

The Xerces Society Pollinator Red List includes 115 species and subspecies: 57 butterflies, 2 moths, and 56 bees from across the US and Canada. Each species has a brief status review that distills the current state of knowledge of life history, distribution, threats, conservation needs, and research needs into a single document. The status reviews also include discussions of taxonomy and identification and lists of contacts, publications, and Web sites. "For many of these species more research is needed into population distribution, life history, and habitat needs so we can determine the course of conservation action," said Scott Hoffman

Pollinators are keystone species in terrestrial ecosystems. They provide the critical ecological function that guarantees rich and diverse plant communities, which, in turn, provide food and other commodities for us, and form habitat for wildlife.

Many of the pollinators included in the Red List suffer from destruction of their habitat for intensive agriculture and urbanization. Pesticides have negatively impacted pollinator populations, and pose a continuing threat. Introduced diseases and parasites are a leading factor in the decline of several species.

The Red List of Pollinator Insects of North America, the most complete assessment of the state of the continent's at-risk pollinators, is published as a CD-ROM and is also accessible on the Xerces Society's Web site <<http://www.xerces.org>>. To contact the Xerces Society, visit their Web site or write to the society at 4828 SE Hawthorne Blvd., Portland, Oregon 97215, USA.



Help Wanted ..

Tom Harville recently received a note from Linda Chafin (Conservation Botanist, State Botanical Garden of Georgi, University of Georgia), who is looking for photographs. She had seen his photo of *Macbridea caroliniana* on our website and wrote asking permission to use the photograph in a field guide to Georgia rare plants, which she hopes to publish in the fall.

Ms. Chafin has need of other photos, and Tom thought some of you might be willing to contribute one to the project. If you have one that you are willing to give, please contact Tom Harville (tomhar@bellsouth.net). Tom will make a disk with all photos and send it along to Ms. Chafin. You will receive credit if one of your photos is used.

Ms. Chafin sent the following list to Tom:

Alnus maritima
Arnoglossum diversifolium
Austragalus michauxii
Berberis canadensis

Brickellia cordifolia
Carex radfordii
Chamaecrista deeringiana
Crataegus triflora
Desmodium ochroleucum
Dicerandra radfordiana
Eleocharis wolfii
Eustachys floridana
Fimbristylis perpusilla
Fimbristylis brevivaginata
Glandularia bipinnatifida
Helianthus glaucophyllus
Helianthus smithii
Hymenophyllum tayloriae
Isoetes boomii
Isoetes tegetiformans
Justicia angusta
Listera smallii
Lythrum curtissii
Macbridea caroliniana
Malaxis spicata
Myriophyllum laxum

Paronychia virginica
Portulaca biloba
Rhynchospora macra
Rhynchospora punctata
Rhynchospora solitaria
Rhynchospora thornei
Rudbeckia auriculata
Sageteria minutiflora
Sagittaria secundifolia
Schoenoplectus hallii
Solidago simulans
Sporobolus teretifolius
Stachys hyssopifolia var
lythroides
Thalictrum debile (need habit-
have flowers)
Thaspium pinnatifidum *Torreya*
taxifolia
Tridens carolinianus
Verbesina walteri
Viburnum bracteatum

This showy plant of swampy open meadows and wet ground along roadsides and ponds is the only genus of Melastomataceae in North America.¹ Within the genus *Rhexia* are twelve species, eight of which occur in North Carolina.² *Rhexia mariana* is the most widespread in the state, occurring in all but a few counties. *Rhexia cubensis* is rare, found only in two counties along the southeast coast.

Rhexia virginica populations are concentrated in the western part of the state and in 15 counties of the coastal plain—mostly inland—where sandy soil and swampy areas are common. *Rhexia virginica* occurs naturally in moist, sunny locations where the soil is acidic and low in nutrients.³ The Piedmont, with its neutral, clay soil does not provide an ideal habitat for *Rhexia virginica*.

Rhexia virginica grows from 24 – 36 inches with four petalled purplish-pink blossoms, each about an inch across, that form at the terminal ends of branches. Eight yellow stamens with prominent anthers (46 mm long) give the appearance of a large spider at the center of each flower. Square, slightly winged stems with opposite, toothed leaves give the plant a bristly appearance because of glandular hairs.⁴ The corollas form above the ovaries on a “vaselike structure (hypanthium) which is free from the enclosed ovary. The 4 sepals spread from the rim of this hypanthium...,”⁵ ultimately forming a distinctive structure holding the seeds which Thoreau once compared to a “little cream pitcher.”⁶ *Rhexia* blooms from late summer into early fall with self-compatible flowers that are dependent on insects for pollen transfer? (See article elsewhere in newsletter for a discussion of buzz-pollination.)

Propagation: seeds are easily shaken out of their little “urns” in early fall. Keep an eye on them, for many flowers will turn toward the ground, and as seeds ripen they will drop to the ground. The seeds will require 90 days of moist, cold stratification to germinate, which can be accomplished by

sowing out-of-doors in the fall, or by placing them in a pot covered with a plastic bag and refrigerated. Equal parts of sand, sterile soil, and peat moss provide a good planting mix for the seeds, with no need to cover the seeds. Following the period of cold stratification, the seeds will need warmth and light to

germinate. Once germinated, the seedlings require fertilization, and once transplanted into the garden, will bloom the second year. Remember that this plant prefers moist, sunny locations, so try to duplicate those conditions as you germinate the seeds and select a garden spot for the little plants.



Note: the lovely illustration for *Rhexia virginica* is courtesy of Beth Guy of Palo Alto, CA. Beth read the “Help Wanted” ads in our last newsletter and responded with an offer to provide illustrations from time to time. Her talent is obvious, as well as her

generosity.

1. Online resource. Rhode Island Wild Plant Society, “Meadow-beauty,” Hope Leeson. http://www.riwps.org/PlantLibrary/native/CultivationNotes/Rhexia_virginica.htm (accessed 01-08-2006).
2. Albert E. Radford, Harry E. Ahles, and C. Ritchie Bell, *Manual of Vascular Flora of the Carolinas*. The University of North Carolina Press, Chapel Hill, NC, 1968. 741-744.
3. See note 1 above.
4. See note 2 above.
5. B. W. Wells, *The Natural Gardens of North Carolina*. The University of North Carolina: Chapel Hill Press. 1932. 365-67
6. William A. Neiring and Nancy C. Olmstead, *The Audubon Society Field Guide to North American Wildflowers: Eastern Region*. Alfred A. Knopf, New York, 1979. 631.
7. Online resource “The pollination ecology of buzz-pollinated *Rhexia virginica* (Melastomataceae)”, Brendon M. H. Larson and Spencer C. H. Barrett. *American Journal of Botany*. Accepted for publication 10-08-1998. <http://www.amjbot.org/cgi/content/full/86/4/502>.

Poll: Ginkgo is firm favourite
Source: China Daily – China, 13 October 2005

The ginkgo is all set to become the national tree of China. According to a public opinion poll conducted by the Chinese Society of Forestry through mail and Internet voting, nearly 99 per cent chose the ginkgo which is considered a "living fossil."

The nominees included davidia, also known as the "Dove Tree," eucommia and arborvitae, which are found around the world, and others, such as the ginkgo and metasequoia, Dawn Redwood, that are unique to China. Ju Zhangwang, deputy to the 10th National People's Congress China's top legislature, has been advocating the ginkgo as the national tree since 2003. His reasons are simple: The ginkgo is unique to China, it looks splendid with its straight trunk and thick crown, and it also has medical and economic value.

Palaeobotanists say the ginkgo has an estimated age of 270 million years. The first reference to the ginkgo was found in an 18th century Chinese book on agriculture. To Beijing resident Yan Bing, however, the choosing of a national tree is not a particularly significant issue. "China is so vast in territory and the plants it boasts are so diverse," he said. "So it's hard to say any kind of tree can represent the merit of the whole Chinese nation."

For full story, please see: http://www.chinadaily.com.cn/english/doc/2005-10/07/content_482984.htm

Medicinal plants in Scotland: Bog myrtle (*Myrica gale*)

Source: Edinburgh Evening News - Edinburgh, Scotland, UK, 8 October 2005

Myrica gale, sweet gale, bog myrtle. This shy Scottish plant, well known to our ancestors, is finally taking centre stage again. Bog myrtle is a small deciduous shrub with reddish brown buds that grows in bogs, wet heaths and fens. It used to be common throughout the UK, but as we gradually drained wetlands its habitat was removed and it retreated further north, finally making its home in the Scottish Highlands.

The leaves of this sweet scented plant are resinous and it was used to flavour beer. Another well known use was as an insect repellent. The bark was hung in wardrobes and stuffed into mattresses to repel fleas.

Recently, a Scottish company has started harvesting this

plant to extract the oil, which has insect repelling properties. With £750,000 of commercial and government funding for research into this plant, this has huge commercial potential for the Highlands.

Bog myrtle, like many plants, was thought of as a medicine, and at one time was the standard treatment for scabies. The leaves were made into "gale tea", which was a cold remedy as well as being a useful astringent for upset stomachs.

Belonging to the Myricaceae family, there are about 50 species of wax myrtles worldwide. They are nearly all aromatic and have a history of being used as a medicine. They are found in soaps, stomach remedies and catarrh mixes and can still be found in many herbal dispensaries: For full story, please see: <http://edinburghnews.scotsman.com/opinion.cfm?id=2059952005>

...and a little closer to home

Moss is a cash crop for mountain people in the USA

Source: ENN Daily Newsletter, 17 October 2005

Deep in the forest, miles from anything resembling a town, even logging roads and rutted four-wheeler paths dissolve. It is there that J.P. Anderson spots it: a long fallen, rotting tree covered in a blanket of brilliant green moss some 2 inches thick and several feet long. Quickly and gently, he rips up a long section of the living carpet and stuffs it into one of eight woven plastic sacks he'll fill in an hour. Moss is the all-purpose sponge of the forest, storing water, releasing nutrients and housing tiny critters. But across Appalachia and in the Pacific Northwest, it's more than that. It's a way to make ends meet when jobs are few. Picking is hard work on a hot day. And it pays only about \$5 a sack.

What Anderson picks could end up in a floral arrangement or a craft project, maybe even on a movie set. Along the way, it will support more than a dozen jobs, from people who sort it, dry it and package it to those who ship and sell it.

But biologists, businessmen and pickers themselves say the good stuff is getting harder to find - and the money harder to make.

Continued on page 11

Moss is not commercially grown, so buyers depend on the wilderness. Some state and national forests, though, have already banned harvesting, worried about what they are losing when moss leaves the ecosystem.

A less ethical picker will strip the logs bare, but Anderson and father James, who have witnessed the devastation of strip mining and clear-cut logging, always leave clumps behind to help the spore-driven plant regenerate. To thrive, it needs moisture, cool temperatures and shade. "You never pick it all," James says. "Not if you want it to grow back again."



Gary Kauffman
©K.Schlosser

How long that takes is a question that has some scientists and U.S. Forest Service officials wrestling with the regulation of this secretive industry, where there are plenty of opinions but few facts.

North Carolina's Pisgah and Nantahala national forests expect to ban moss collection Jan. 1 after studies there indicated a growback cycle "on the order of 15 to 20 years," says botanical specialist Gary Kauffman of the

Forest Service. That's twice as long as some veteran pickers and moss buyers think it takes. Though Kauffman agrees the science is still lacking, Pisgah and Nantahala will likely err on the side of caution. That means the forests will be off-limits to the 100-200 pickers a year who typically get permits. Nationwide, it's hard to tell how many people make a living from moss. Most search out private land, where they go unnoticed and untracked by hunt clubs and logging companies. Nor are all pickers alike. Some are chronically unemployed, living on society's fringe. Some are recreational, filling sacks while hunting or hiking. Some teenagers do it at county fair time, for pocket money.

Sue Studlar, a West Virginia University biologist who has studied the business, argues that overall, moss is "mined, rather than sustainably harvested." Large-scale removal can inadvertently damage other species, from ferns to salamanders. The Monongahela National Forest banned mossaing in 2001 until it could study the impact. Two years later, Studlar concluded that picking should be discouraged



Polytrichum commune Hedw. - polytrichum moss
Photo courtesy of USDA Plants Database: ©Michael Lüth. near

limestone cliffs and wet areas, that no log or rock should be stripped bare, and that known "biodiversity hot spots" should be off-limits. But "potentially, if you did it right," moss could be harvested without harming the ecosystem, Studlar says. It falls off in clumps naturally as it regenerates, and pickers could harvest those remnants.

The Monongahela, which covers nearly 1 million acres in West Virginia, may someday restore moss-picking permits. Ecologist Melissa Thomas-Van Gundy says that possibility is not a priority, but she agrees with mossers who say they and others should be allowed to take nontimber products from the forest, including ginseng root and medicinal herbs like goldenseal, before the loggers destroy them. Pat Muir, a botanist at Oregon State University, figures mossaing was an \$8.4 million to \$33.7 million business in 2003, with anywhere from 4.2 million to 17 million pounds being harvested in the two dominant regions, Appalachia and the Pacific Northwest. Data is hard to come by, and most moss dealers won't share sales figures, but Muir reached her conclusions by interviewing those who would talk, analyzing six years of export data from the U.S. Department of Commerce and making a series of assumptions.

For full story, please see: <http://www.enn.com/today.html?id=9039>

Stories courtesy of the Food and Agriculture Organization of the United Nations, Non Wood Forest Products
www.fao.org/forestry/site/6367/en

Harbinger of Spring ..*Symplocarpus foetidus*, Skunk cabbage

There is a bend in the road on the way to the top of Bent Mountain in southwestern Virginia. Just as you round the bend, there is a large swampy area to the left, loaded with skunk cabbage, *Symplocarpus foetidus*. It is an amazing display. I've only seen it a couple of times, which is amazing since my brother lives on Bent Mountain. Guess I just haven't visited at the right time often enough. A lot of us first learned about skunk cabbage as children. I remember being warned about them on foggy, frosty morning outings, for the early message heralded by this strange looking plant is "if you crush me, I'll stink up your walk!"

Skunk cabbage is in the Arum family, along with some of our favorites such as Green dragon (*Arisaema dracontium*) and Jack-in-the-pulpit (*Arisaema triphyllum*). It grows in muddy, swampy areas from Southern Canada to Northern Georgia, but is a single species. It has a distant cousin, the Western skunk cabbage (*Lysichiton americanum*), which is a different genus.

Botanists believe there is a "limiting factor" for the life of skunk cabbage, which requires a year-round muddy bed. "After hundreds of years swampy places tend to dry up as the accumulation of decomposing plant litter raises the ground level."¹ To beat this problem, the rhizome can survive for hundreds of years.

The roots, which can form a massive tangle (which, by the way, makes attempting to dig and move skunk cabbage futile) contract as they grow, pulling the crown (rhizome) deeper into the mud. This explains why you seldom see the flower stem on a skunk cabbage—it is beneath any leaf litter and often underground. Occasionally you will spot one, but ordinarily the stem is far enough underground that the spathe appears to be stemless, just sitting on the ground

In early spring the spathe rises from the earth so fast, in a process called "respiration," that heat is generated by burning carbs stored from the previous year. The spathe has a hooded shape characteristic of the Arums, and as it inflates around the spadix (flower stalk) creates a little "room" that is warm enough to melt surrounding snow. The heat, and the carrion odor, attract any nearby flies or other insects that are active this time of year. The skunk cabbage provides warm room and board for these insects, in return for exchanging pollen with other nearby plants.

This process only lasts for a couple of weeks, after which the leaves begin to unfurl. They can grow quite large, up to three feet long, and are inflated with air and water instead of the usual cellulose. They also lack any cuticle (waxy skin), which ordinarily helps plants retain moisture. Therefore, they require a swampy location to keep them inflated long enough to store energy for the following year. Once they have done their job, the capillaries are cut off and the leaves wither into a dark, mushy mess.



Photo courtesy USDA Plants Database.

In 1723, Thomas More sent a package of seeds to William Sherard in London, explaining that the native people called them "Skunkroot because of his stinking smell" and reported that it was used for smoking. "I dried and smoaked some on't but it stunk so wretchedly as to make me spew" he reported.² It also had a number of medicinal uses, including as a lotion for itching, for whooping cough, scurvy, seizures, and as an underarm deodorant.³

No recommendation is made here to try Skunk cabbage for anything other than observing in the wild, but it does serve as an early spring tonic for black bears, wild turkey, and Canada Geese. Squirrels and other rodents are also reported to eat the peasized seeds.

¹ Sweeney, Sue. "The Truth About Skunk Cabbage." *In My Garden* (April 3, 2005). http://www.inmygarden.org/archives/2005/04/the_truth_about_2.html

² Coffey, Thomas. *The History and Folklore of North American Wildflowers* (New York: Facts On File, 1993), 290-91.

³ Foster, Steven and Duke, James A. *Eastern/Central Medicinal Plants, Peterson Field Guides* (Boston: Houghton Mifflin Co., 1990) 202.

Katherine Schlosser

Southeastern Non-native Invasive Plant Information:

Ailanthus altissima (Mill.) Swingle

Tree of Heaven

Driving along the I85 corridor from the NC State line to Richmond, even the casual observer can have little doubt about the vigorous growth habit of *Ailanthus altissima*, or Tree of Heaven. That makes it all the more disturbing to see fullpage ads in the Sunday paper touting Tree of Heaven as the ideal choice for every garden and yard. What the ads don't tell you is that the wood is soft and weak, it grows rapidly, and colonizes to form impenetrable thickets¹ as well as crowding out native trees, shrubs, and wildflowers.

Ailanthus is native to China, was introduced to Europe in 1751 by a French Jesuit priest, and made its way to this country in 1784 by William Hamilton of Philadelphia². It was favored for its attractive foliage and rapid growth habit. Prolific seed production made it easy for this plant to escape cultivation, and it is now naturalized in 42 states³. Each tree can produce 350,000 seeds that can travel a good distance with the wind. The seeds, in papery sheaths called samaras, develop in September and October, and can persist on the tree through the winter. Seedlings can "establish a taproot three months from germination. Thus they quickly outrace many native plant species in competition for sunlight and space."⁴ The seeds germinate readily on disturbed sites, along railway embankments, highway medians, and fence rows.

In addition to seedlings, the tree spreads by suckers, some appearing as far as 150 feet from the parent tree⁵. *Ailanthus* trees also produce a toxin in the bark and leaves that, as it accumulates in the soil, inhibits the germination of other plants. The toxin is being studied as a source for a natural herbicide.

Ailanthus can reach 80 feet, with smooth, pale gray bark and twigs that are chestnut brown. The compound leaves are large, 1 – 4 feet, each with 11– 25 smaller leaflets, that alternate along the stems. Each leaflet has one to several glandular teeth near the base. In spring, clusters of small, yellow-green flowers appear near the tips of branches.

Control recommendations:

Seedlings should be removed by hand as soon as possible, being sure to get the entire taproot. "Larger plants should be cut: two cuttings a year may be necessary, once in the



Ailanthus altissima. Tree of Heaven

early growing season and once in the late growing season. Initially this will not kill the plant; it will vigorously resprout from the roots, but seed production will be prevented and the plants will be lowered in stature. If continued over a period of several years, cutting stresses the plants and may eventually kill them."⁶

A glyphosate herbicide sprayed onto the leaves or painted onto a freshly cut stump will kill the plant. This is best done late in the growing season.

A native alternative:

Rhus glabra, smooth sumac, gives the same feathery appearance in a smaller version, as it grows to only about 15 feet. It has excellent

fall color, as the leaves turn a scarlet red. The flowers are also striking, and turn a deep burgundy in fall.

It grows in average, dry to medium wet, well drained soil in full sun to part shade. Tolerant of wide range of soils except those that are poorly drained. Sumac attracts birds and butterflies.

¹ Swearingen, Jill and Pannill, Phil. "*Ailanthus altissima*." Plant Conservation Alliance—Alien Plants Working Group, <http://www.nps.gov/plants/alien/fact/aial1.htm>

² Shah, B. (1997). "The Checkered Career of *Ailanthus altissima*." *Arnoldia* 57(3): 20-27.

³ See note 1 above.

⁴ Virginia Native Plant Society. "*Invasive Alien Plant Species of Virginia*." (PO Box 844, Anandale, VA 22030).

⁵ Oregon State University. Landscape Plants Database. <http://www.oregonstate.edu/dept/ldplants/aial.htm>.



Rhus glabra. Smooth sumac – sometimes confused with the non-native look-alike.

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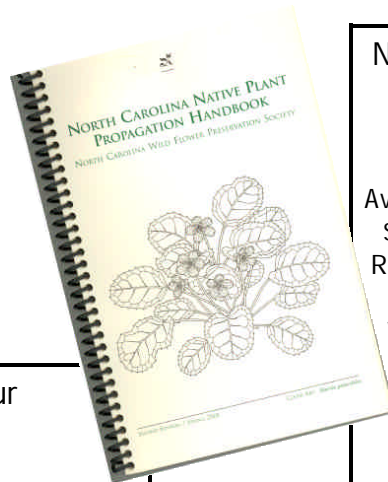
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I am willing to receive the newsletter via email in order to conserve resources.

I do not want my contact information in the membership directory.

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Local chapter

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NATIVE PLANT NEWS

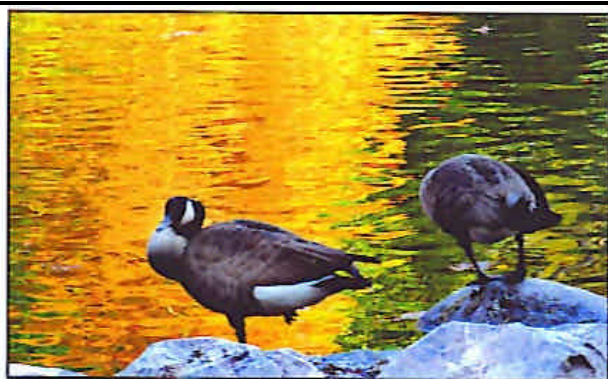
The Newsletter of the North Carolina

Native Plant Society

1402 Bearhollow Road

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~North Carolina's Native Plant Society since 1951~



Nature Photos by Roy Lindholm

"Chapel Hill Naturally"

at the Totten Center, UNC Botanical Garden

Jan. 3 - Feb. 28, 2006

All proceeds from sale of photos will go the building fund for the Garden's new Visitor Education Center.

The Garden is open M-F 8-5, Sa 9-5, Su 1-5

Call 962-0522 to be sure that the Exhibit Room will not be closed at the time that you would like to visit.



Some of you may remember meeting Roy and his wife Betty at our meeting in Boone last spring. Roy is also the author of "Lindy's Identification Keys for Native Plants Growing in the Triangle." The 8.5 x 11, 88 page booklet is designed specifically for plants in the Raleigh-Durham-Chapel Hill

Native Plant News

The Newsletter of the North Carolina Native Plant Society.

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Deadline for next issue: March 15, 2006

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