

NORTH
CAROLINA

wild flower

PRESERVATION
SOCIETY



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North Carolina Wild Flower Preservation Society, Inc.

Aims and Objectives

The North Carolina Wild Flower Preservation Society was formed in 1951 by a group of individuals appreciative of native plants throughout the state and region. The purpose of the Society is to promote the conservation and enjoyment of native plants and their habitats through education, protection and propagation.

Quarterly meetings are held at "natural gardens" across the state. Members exchange seeds and propagated plants at these meetings. Other excursions are organized on a local basis throughout the year.

The Society newsletter is usually issued twice a year with articles and illustrations by professional and amateur contributors.

The Shinn Scholarship/Grant Fund sponsors research on native plants by undergraduate and graduate students. The fund is supported by member contributions and by gifts and memorials. Applications are made to the Scholarship/Grant Fund Committee for awards in May of each year.

The Society is a nonprofit organization under North Carolina and Internal Revenue Service regulations. Donations are tax deductible.

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NEWSLETTER
OF
NORTH CAROLINA WILD FLOWER PRESERVATION SOCIETY, INC.

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Cover artwork: *Solidago nemoralis* and *Aster novae-belgii* K. Schlosser

President's Message

Alice Zawadzki

On February 13, 1994 at a White Pines Triangle Land Conservancy field trip, Benson Kirkman started by saying: "Hi, I'm Benson Kirkman, President of the North Carolina Wild Flower Preservation Society." I said: "What? North Carolina has a Wild Flower Preservation Society? Sign me up!" Benson said: "The annual membership is \$15 or lifetime is \$180." "Make that lifetime membership!" was my reply as I wrote the check.

Little did I realize how that event would change my life. Four years later I would be vice-president and now NCWFPS president.

I remember my first trip with the Wild Flower Society at Black Ankle Bog with Harry LeGrand in 1994, when folks got excited about the frog eggs in the ephemeral pond in a tire rut and at the same time someone said: "Look at the bluets! Norma would be so happy if she were here." I knew I was with the right group.

In May 1995 I made the difficult decision to leave teaching chemistry and physics at Saint Mary's College and School after 24 years. With ever more challenges from chemical sensitivities, I chose to retire early while I could still associate with people in public settings, though in a limited way.

The first thing I did when I retired was to sign up for tour guide training at the NCBG. It worked out that I could also do the training for Duke Gardens in November and the NCSU Arboretum in the spring of 1996. I fell in love with native plants and delighted in the opportunities at NCBG and Duke Gardens. Then Bob Tuggle invited me, in August of 1996, to begin attending NCWFPS Board meetings.

At my first NCWFPS Board meeting as vice-president elect in May 1998 in Wilmington, Cecil Frost joined the meeting. I felt as though I

had met him in a different life. As There was not much business on the agenda, I ended up interrogating this person who was to be our tour guide and speaker for Merchant's Mill Pond. I learned I first met Cecil Frost in 1979 on a canoe trip to MMP. Cecil was its first park ranger.

That meeting changed my life and gave me the cause for which I had long been searching—native plants. When I learned that North Carolina funds only ONE person in NC Plant Conservation whose job it is to protect the native flora of our state and to assure that no plant species goes extinct, I realized how unbelievable that was. Our Plant Conservation Act, enacted in 1979 with the efforts of NCWFPS and led by Dr. C. Ritchie Bell through the legislative process, has been a severely underfunded mandate. Rob Sutter was the lone state-funded person in NCPCP for 10 years and Cecil Frost has since filled that position. Marj Boyer, ginseng coordinator, is funded with federal monies. Moni Bates and others do contract research for NCPCP as grants become available.

At that same meeting, the NCWFPS Board agreed to start a fund with \$400 for education materials to spread the rare plant message and spearhead efforts to ask the legislature to increase funding and positions in the Plant Conservation Program. NCWFPS became an advocate for NCPCP. It is our hope to form a management team in NCPCP to help direct and manage many collaborating agencies and a corps of volunteers to steward rare and endangered native plants.

Since 1999 NCWFPS has helped NCPCP in many ways. NCWFPS was very fortunate to receive several grants that help our efforts to be advocates for the NC Plant Conservation Program. These grants included \$25,000 from Z. Smith Reynolds Foundation; \$10,000 from Carolina Power and Light Foundation; and \$10,000 from a family foundation in the Triangle area.

The grants helped fund several people in small contracts. These include: Ann Kelly who served as our Rare Plant initiative coordinator during the time we were successful in introducing a special funding bill H1313 and S1711 in 1999. Until the last 5 minutes the bill was in the budget, but got axed in the final moments. Since then the state budget has gotten

worse. Before Jim Graham retired in 1999, he included increased funding for NCPCP in his departing expansion budget in NC Department of Agriculture and Consumer Services. When Meg Scott Phipps was elected as Commissioner, she visited the NCPCP Board meeting, was enthusiastic about native plants, and included the request in her expansion budget.

Unfortunately, state budget woes have gotten worse with time. Many important positions throughout state government are being eliminated through downsizing and employees leaving for better paying positions.

It is important that we educate citizens and legislators regarding implications to programs as funding is reduced. I believe it is important for citizens to become active in education efforts as well as initiatives to help raise state revenues. Our state employees are often under-funded and overworked, especially as positions are lost to budget limitations. For the most part, people who serve in state positions are there because they are dedicated to the cause. This week I learned via the grapevine that my contact at the NC Museum of Natural Science left his position at the Museum to teach at a local school where his pay was \$1,000 more each month. Folks, we have some budgetary problems in state government. If we want government services, we need to do something about the situation.

Besides working to raise state revenues, we can consider volunteerism as a way to make a difference. We can try to be multipliers of our efforts. By that I mean to try to be involved in activities where we can bring more people to native plant causes.

A part of NCWFPS grants funded my computer, printer, and 4 in 1 machine, along with funding the telephone and Internet connection, web-domain hosting, and my cell phone for a year. In December of 1999, my Mom funded the purchase of my new Venture van. Because of all these kind fundings, I have been spending my time in three ways: I have been taking some courses at the NC Botanical Garden in their plant studies certificate program. When I am in Raleigh, I spend a lot of time on the phone and on the computer. NCWFPS belongs to the Conservation

Council of North Carolina, the NC Center for Nonprofits, and the North Carolina Conservation Network. Through these groups and others, we get lots of great information that I filter and send to a network of native plant folks including some of our members who have email.

If you are interested, I can include you on my email group for conservation and native plant information and activism opportunities.

With great interest I read in the anniversary edition that NCWFPS members wrote hundreds of postcards to legislators regarding different conservation issues. It was wonderful to read about the strong conservation ethic that our organization has had throughout its history. Writing handwritten letters and postcards, telephoning legislators, and personal meetings with government officials are effective means for achieving successful outcomes to our causes.

Email is a very quick way for conservation groups to get out the word that immediate action is critical to a cause. It was wonderful to stand at the steps of the State Capitol in Raleigh as Governor Easley signed the Clean Air/Smokestacks bill this summer. The concerted efforts of so many people across the state was made easier with the prudent use of email, web sites, and personal communications with decision makers. If you do not yet have computer experience, please consider dipping your toe in those computer waters for access to timely information. You can tell 100 or more people the same message with one click.

Our grants also funded our NCWFPS information brochures and membership invitation; the 10' x 10' festival tent that we own; a great 3' x 10' NCWFPS banner; 4 tables for the tent; two green and black folding display boards with storage case; two digital cameras for Jean Woods and Alice Zawadzki; a map storage case for NCPCP use in land acquisition studies; a 4 in 1 printer for Ann Kelly.

Our grants also provided money to help begin critical functions for NCPCP. Along with other federal grants, Jean Woods worked on a database for NCPCP for its use in its land protection efforts. Ann Kelly, together with Moni Bates, developed criteria for ranking potential land

acquisitions and investigated some possible candidates for protection. Erin Lunsford did research and began forming the nucleus for a volunteer corps. Wendy Weiher continues this work as volunteer coordinator and has added grant research and writing in her role as development coordinator. Wendy has applied for several grants and we are hopeful for continued funding for these important functions to enhance the efforts of NCPCP. Carla Handrinos has been serving as our education coordinator. She is developing information sheets and has prepared materials for our display board. Carla also represented us this spring at Triangle area festivals. Carla is finishing her masters degree at the Nicholas School of the Environment at Duke University and chose to intern with NCPCP and do her masters research on the public's knowledge of the state of native plants and related issues. It would be wonderful if we could fund both Wendy and Carla in full-time positions in support of NCPCP.

Our advocacy for NCPCP has made a difference. Not only have our grants provided the above-mentioned additions, but also our support has contributed to the success of land acquisitions to protect endangered plant species. Prior to our involvement in 1998, NCPCP had successfully protected two mountain bogs each with a few acres with grants from the NC Natural Heritage Trust Funds.

Our spring 1999 Rare Plant Initiative trip to the southeast coast that included a visit to Boiling Springs was the prelude to NCPCP acquiring over 5000 acres for about \$5 million for this site. Our fall 2002 NCWFPS trip will include a Friday workday and Saturday visit to Boiling Springs Natural Area near Southport October 11 & 12, 2002.

In October of 2000 our NCWFPS botanical foray to the Troy area resulted in our finding several roadside sites of *Helianthus schweinitzii*. One of them at Denson's Creek was just recently funded with Natural Heritage Trust Funds and additional funds to the City of Troy from Clean Water Management Trust Funds.

To date about 8000 acres have been protected by NCPCP with about \$8 million from Natural Heritage Trust Funds. Other sites include: Paddy Mountain and Tater Hill in the northwest NC mountains and Pondberry

Bay that we will visit on Sunday October 13, 2002.

It is wonderful to see our outings and discoveries directly result in endangered plant protection and land acquisition.

We have had work/play days in conjunction with some of our meetings in recent years including wonderful participation from our members at Roan Mountain, Hanging Rock State Park, Denson's Creek, several sites in the Charlotte area, Picture Creek near Butner.

When sites are being developed, many of our members have participated in plant rescues throughout the state. At a recent NCWFPS Board meeting Peter Schubert reported that his plant rescue email list included over 500 volunteers. Peter, Tom Harville, Jean Woods, Sheilah Lombardo, Judith West, and Robert Eidus coordinate many plant rescues in their areas. I am sure that many others of you are involved in your local efforts. It would be wonderful if you would write reports for our NCWFPS newsletter to tell us about your success stories in your locale.

It is important for us to continue and enhance our native plant efforts. I am sure that many of you are involved in local, state, and national efforts. Many thanks for all you do.

Every thing you do means so much. Some of your activities include: leading field trips; bringing native plants to the classroom; creating native plant gardens and meadows in schoolyards and in communities; speaking at garden clubs and civic groups; writing letters and calling on local and state elected officials; volunteering at local native plant gardens; participating in plant rescues; writing articles and letters to the editor in local papers; obtaining free air time at area radio, TV, and cable providers for native plant messages; photographing native plants; keeping native plant records of blooming and fruiting times; conserving water; minimizing the use of chemicals; decreasing lawn size; encouraging your neighbors to plant natives; propagating native plants; asking your local nurseries to sell nursery-propagated native plants; making conservation easements on your property; financially supporting your

local land trusts and other conservation organizations including NCWFPS; buying plants at our plant auctions in support of the Shinn Fund; adding funds and making bequests to our NCWFPS Wells Stewardship Endowment; sharing information on sites that need protection. The list is expansive and each action makes a difference.

The third thing I do is travel around the state attending conferences and meeting people. Over the last three years, I have added about 25,000 miles to my WYLDLWR van in traveling to these and NCWFPS events. It has been wonderful making new friends and learning about all the fabulous work that people are doing to protect the beautiful natural gifts that we have in our great state of North Carolina. It is my hope that we develop alliances with many groups to form a network or web of native plant partners in our mission to enjoy, protect, and propagate the wealth of native plants under our stewardship.

Wildflowers and the wonderful host of people associated with their enjoyment and preservation have been my life's greatest blessing. Many thanks for the opportunities you are giving me in our shared efforts to protect native plants.



Bluets

Characterization of Three Carolina Bays in Bladen County, North Carolina.

LEES, BRITTA, JON M. STUCKEY, AND THOMAS R. WENTWORTH
North Carolina State University.

Carolina Bays are unique ovoid depressions that dot the Atlantic Coastal Plain from Florida to Virginia, with high concentrations in North Carolina and South Carolina. These wetlands, unless altered by human operations, are consistently elliptical in form, oriented along a northwest to southeast axis, exhibit a sand rim along the eastern side of the depression, and range in size from less than 50m to 8km (5 miles) across (Sharitz and Gibbons, 1982). The origin of these bays has puzzled geomorphologists for some time, and theories, such as ancient meteor showers (Prouty, 1952), iceberg thaws (Kelly and Dachille, 1953), and extra-terrestrial launching pads (Justis, 1974), have been proposed. Although no conclusive evidence exists, the most current and widely accepted theory suggests that the bays' similar shapes and orientation are a function of prevailing wind and consequent wave activity within existing water filled depressions (Kaczorowski, 1976).

Between North Carolina and South Carolina, an estimated 13,000 Carolina Bays exist, although 79% of those identified have been cleared of native vegetation and only 21% appear in their historically natural state. Previous counts have tallied Carolina Bays at 400,000 - 500,000 total (Prouty, 1952). However, it is thought that these numbers were grossly overestimated, perhaps resulting in a low conservation priority, and consequently, high exploitation (Nifong, 1998). Throughout the 19th and 20th centuries, the Carolina Bays have been a source of timber, peat, and productive agricultural land (once drained). Due to the rapid rate of wetland conversion in the early to mid 1900s, most Carolina Bays have been partially or totally developed. More than 95% of the Carolina Bays in Bladen County were unaltered prior to 1974. By 1981, 25% of those bays had been completely developed and 15% were currently under conversion (Weakley, 1982). These bays function as

wildlife habitat for several endangered animals, are home to several endangered plant species (Weakley, 1982), support a unique plant community, collectively provide stormwater storage, and act as carbon sinks (Richardson et al., 1981; Bridgham et al, 1991). Therefore, it is important to understand the structural attributes (vegetation), physical settings (geomorphology), hydrologic regimes, and soil chemistry that make up the Carolina Bay ecosystem of this area so that we can preserve, manage, and restore these bays to their maximum functional capacities.

The North Carolina Department of Transportation (NCDOT) is in the process of restoring a 750 acre Carolina Bay in Robeson, County, NC, that was ditched, drained, and converted into agricultural land in the early 1970s. North Carolina State University's Botany, Soil Science, and Forestry Departments are conducting a collaborative study aimed at characterizing the vegetation, soil properties and hydrologic regimes of three intact Carolina Bays in order to 1) assess plant communities typically found in Carolina Bays of this region; 2) identify target communities for the DOT restoration site; 3) understand the ecosystem requirements of Carolina Bay communities; and 4) supply resources for identifying the natural communities located in other Carolina Bays through the use of GIS.

The three reference bays and restoration bay contain deep organic soils at their centers with a water table at or near the surface throughout most of the year. The organic soil depth decreases towards the outer limits of the bays and eventually grades into mineral soil. The reference bays are dominated by thick shrubby pocosin vegetation, with bay forest, gum forest, and/or wet pine forest ringed around the periphery of each bay. These reference bays are typical of the Carolina Bays found in Bladen County and Robeson County (where the NCDOT restoration site is located), North Carolina.

The Causeway Bay, Charlie Long Millpond, and Tatum Millpond are the three reference bays used in this study. The limiting factor for choosing the reference bays was ultimately property owner cooperation, however, Tatum Millpond was designated a reference bay by NCDOT.

Causeway Bay is a 600 acre wetland located on private property north east of Elizabethtown, and adjacent to Bay Tree Lakes. This bay contains wet pine forest along the periphery and grades into pocosin as the depth of organic material increases. The bay was logged along the north side and throughout the south-central side between 1938 and 1966. Hurricane Hazel hit on October 15, 1954, bringing down most of the large trees. Logging operations are understood to have stopped following Hurricane Hazel. Locals say the bay (or portions of the bay) may have burned in the 1970s, however historical aerial photographs do not depict any sort of a burn pattern within the last 60 years (Ray Hudson, personal communication).

Charlie Long Millpond, a 500 acre bay, is located on Bladen Lakes State Forest property. The north side of the bay is dominated by wet pine forest with a band of deep organic soil where a typical pocosin community is identifiable. Although I have not walked through the south half of the bay, aerial photography reveals that it is most likely dominated by pocosin. According to retired forest service workmen, the bay was never logged, however wildfire burned portions of the bay during the summer of 1954. The fire was eventually extinguished when Hurricane Hazel hit in October 1954 (Carson Tatum, personal communication). This bay has an outlet at the northwest end, which was dammed prior to 1938, probably for the millpond. The dam was removed between 1938 and 1951, but reconstructed after 1966 for farming operations.

Tatum Millpond is approximately 1400 acres and the largest of the reference bays. This bay is also located on Bladen Lakes State Forest property, and was logged selectively for pond pine and Atlantic White Cedar under forest service supervision between 1938 and 1954. Hurricane Hazel damaged the majority of the large trees, and therefore, logging operations ceased in 1954 following hurricane. This bay contains very deep organic soils in the center, where pocosin vegetation is dominant. The pocosin community grades into shallower organic soil (75cm deep) where a black gum (*Nyssa biflora*) forest is located. As the organic soil grades into mineral soil, the vegetation transitions into a wet pine forest community.

Based purely on observation, it is apparent that the vegetation in the reference bays exhibit changes in structure, composition, density, and strata as the depth of organic material increases/decreases. Vegetation data will be correlated with any significant trends in soil chemistry/structure and hydrologic regime. Therefore, this project is aimed at assessing changes in the structure and composition of the vegetation as the organic soil transitions into mineral soil. The result will be a characterization of the communities present in each bay within specific soil categories: mineral soil (organic material 0-20 cm deep), histic epipedon (organic material 20-40cm deep), shallow organic soil (organic material 40-80cm deep), and deep organic soil (organic material >80cm deep). The soil categories are correlated to depths of organic material present in the NCDOT restoration site, also called Juniper Bay. This will facilitate the use of the reference bay data for setting targets for the restoration of Juniper Bay and for gauging the success of the restoration activities.

A transect has been cut into the center of each of the three reference bays to allow access for the purposes of this research. Sampling along the main transects will include a detailed vegetation assessment, hydrologic monitoring, and analysis of soil chemistry/nutrient/structure analyses.

In addition, sample plots will be located using a geographic positioning system, georeferenced to current aerial photographs, and analyzed for the purpose of developing remote sensing techniques that can be used to map vegetation communities within Carolina Bays. Once the reference bay community zones have been mapped on their aerial images and correlated to remote sensing data, other Carolina Bays will be investigated to determine the accuracy of remote sensing in identifying the natural communities of Carolina Bays.

The data collected from the three reference bays will be used to develop a range of standards for gauging the success of the restoration at the Robeson County site while characterizing the vegetation, soils, and hydrology that maintain the Carolina Bay ecosystem. The data analysis will be used to characterize each bay individually and to develop restoration objectives that are applicable to the Carolina Bays of this area.

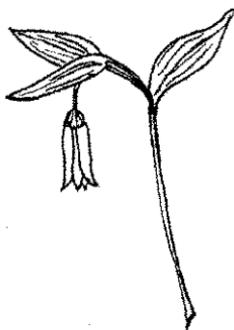
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*Sessile-leaved
Bellwort*

Restoring the Ghost of the Big Savannah

SUSAN SHELINGOSKI

The Big Savannah, or Burgaw Savannah, was an ecologically significant ecosystem in Pender County, North Carolina until its conversion to agriculture in the late 1950's. It was first described by North Carolina State University plant ecologist Dr. Bertram W. Wells in 1928. Big Savannah consisted of 1500 acres of grassland unlike any others in the state. The savannah was unique in that it was completely treeless, was burned annually, and occurred in an area with a high water table and a rare type of soil. Wells began studying the savannah in the 1920's, and published a technical bulletin describing the unique plant communities in 1928. Wells and many others who subsequently visited this site were enthralled by the beauty of the diverse, nearly year-round wildflower display found there.

By the 1940's, Big Savannah was a well-known natural area, renowned for its remarkable attributes. Wells used the savannah as a teaching tool well into the 1950's, at which time efforts began to save this unique ecosystem from encroaching development. Wells worked extensively with Richard H. Pough, a founder of the Nature Conservancy, and others to preserve the savannah as a state park. Their efforts ultimately failed due to the misconception of state officials that the savannah did not need to be preserved. They believed it was nothing more than a wasteland, too wet for cultivation, and, thus, would be undesirable to developers and farmers. Despite Wells' continued efforts, the savannah was ultimately lost to agricultural conversion in the late 1950's.

Although the Big Savannah has been lost, there is new hope that the restoration of a tract of land sharing a number of ecological attributes with the former Big Savannah may serve as a memorial to the savannah as well as its discoverer and spokesperson. The 128-acre tract, located just 5 miles northwest of the former Big Savannah, was purchased by The Coastal Land Trust in April of 2002. The Coastal Land Trust is working closely with scientists at North Carolina State Univer-

sity and the North Carolina Natural Heritage Program to develop and implement a restoration and management plan for the newly acquired land. Although specific restoration goals have not yet been named, the hope is to restore the tract to a historically typical wet pine savanna. The Coastal Land Trust has dedicated the land to Dr. B.W. Wells, and has re-named the land Wells Savannah.

The Wells Savannah was discovered in 1997 by Richard J. LeBlond during a North Carolina Natural Heritage Program Natural Area Inventory. Preliminary surveys have revealed that the savannah not only shares the same rare soil type and high water table as that reported for the Big Savannah, but also supports a very similar plant community. This suggests that, historically, this site could have very closely resembled Big Savannah. Wells Savannah consists of two mowed transmission line rights-of-way and adjacent pond pine woodland. The wooded area is sandwiched between the two power line corridors. Approximately 9 acres of typical savannah habitat currently exist within the two corridors. Both corridors are maintained by mowing every three years, thus eliminating potential overstory growth and allowing a diverse assemblage of native plants associated with wet pine savannah communities to thrive.

It is believed that the woodland is the result of fire suppression and would be more open if maintained by a historically natural fire frequency of 2 to 5 years. One of the first restoration objectives for this site will be to open the canopy in the wooded area and implement a fire management program. Initial investigations of the woodland at Wells Savannah indicate that a number of species typical of wet pine savannahs already occur there.

Over 170 species, 7 of which are rare, have been identified thus far at Wells Savannah. These include the State Endangered Carolina Goldenrod (*Solidago pulchra*), State Candidate bog bluestem (*Andropogon mohrii*) and feather bristle beak sedge (*Rynchospora oligantha*), the State Rare savannah Indian plantain (*Arnoglossum ovatum*) and white-seeded beak sedge (*Rynchospora divergens*), and 9 watch list species including 1 of 3 North Carolina populations of southern winged loosestrife (*Lythrium lanceolatum*).

My research at North Carolina State University involves gathering the baseline vegetation and soil data needed to develop and monitor the success of the management objectives. My ultimate goal is to select an appropriate target plant community for restoration of the savannah association that once occurred throughout Wells Savannah. This will be accomplished in part through compiling plant community inventories of Wells Savannah and appropriate reference savanna sites.

Plant community inventories were conducted in May of 2002 by a team of volunteers at both Wells Savannah and the reference sites. All six-reference savannas are located within Holly Shelter Gamelands. The reference sites were chosen primarily on the basis of soil characteristics. Since the determination of a target community is the primary objective of this study, it would bias the results to choose sites based on their species composition alone. Although, all reference sites do contain species that are typical of high quality Coastal Plain wet pine savannas. All of the reference savannas within Holly Shelter Gamelands are managed by burning every other year.

The inventories were conducted by gathering species composition data from the Wells Savannah and the reference sites using the North Carolina Vegetation Survey (NCVS) methodology. NCVS methods result in a complete species inventory of chosen plots, and assign a cover percentage for each species observed. 10-meter by 10-meter plots were surveyed and permanently marked for re-observation in the future. The NCVS system was chosen primarily for its flexibility and practical applications. Using NCVS ensures that the data generated during this study can be used as the baseline data for the long-term monitoring of the conditions at Wells Savannah after restoration efforts begin. I will also be able to extract data from the NCVS database on other wet pine savannas that have been surveyed in the past, allowing me to expand my study without visiting each and every site.

Another large component of this study will be to conduct a complete soil analysis for each plot. Soil samples were taken from each horizon level for each plot. They will be analyzed for chemical properties such as pH and cation exchange capacity by the state agronomic labora-

tory. I will also be analyzing the soil samples for the percentage of silt, sand and clay found within each. This is important for this study in that the soils found at Wells Savannah, and formerly at Big Savannah, are unlike any others in Pender County. Although reference plots were chosen based on soil similarities such as color and moisture, determining these percentages will offer additional aid in identifying the reference plots with the most similar texture characteristics.

The data gathered from Wells Savannah will be compared with the data from the reference plots for similarities and differences using ordination techniques. Both the vegetation data and the soil data will be used in the comparison. We hope that this ordination will lend insight as to which soils Wells Savannah most closely resembles, and which plant communities are typically associated with those soils. The target plant community will be extrapolated from the results of the ordination. All of the data will be entered into the permanent NCVS database for future use by the Coastal Land Trust and other researchers working at Wells Savannah to track the successes, or failures, of restoration efforts

Wet pine savannas were once prevalent in the southeastern United States. Today, the area of extant savanna is a fraction of its original range due primarily to fire suppression and landscape development. As the number of natural savannas that occur on the Coastal Plain of North Carolina continues to decline, those found within transmission line corridors are gaining importance as both preservation and restoration sites. There are very few pond pine savannas, such as Wells Savannah, remaining in North Carolina. Prior to April, there were no representatives of this type of ecosystem under protection within the state of North Carolina. This project will assist in the restoration of Wells Savannah, returning to Pender County a rare ecosystem of unparalleled natural beauty.

Holly Shelter Game Land and the future B.W. Wells Savanna

NCWFPS 2001 Fall Meeting

JEANNIE KRAUS

On October 14, a group of wildflower enthusiasts met at the Topsail Baptist Church parking lot about 4 miles north of Hampstead on U.S. 17. From there we carpoled into the sandy roads of the Holly Shelter Game Land, a nationally significant wildlife area. It was important to go on Sunday when no hunting is permitted! We were fortunate to have the leadership of Harry LeGrand, vertebrate zoologist with the N.C. Natural Heritage Program, who is knowledgeable about anything that moves or grows especially birds, butterflies and plants. It was an unusually warm Indian summer day adorned with so many colors of fall wildflowers - gold, yellow, orange, lavender and purple.

Several stops along longleaf pine savannas revealed a wide array of wildflowers and a wonder to enjoy. Right away, we saw four rare or Federal Species of Concern including Venus fly trap (*Dionaea muscipula*) and bog asphodel (*Tofieldia glabra*). A highlight was Carolina grass-of-parnassus (*Parnassia caroliniana*) in peak bloom. Shadow-witch orchid (*Ponthieva racemosa*), blooming along the savanna ecotone, is associated with edges of swamp forests on calcareous soil.

The savannas and pine flatwoods are interspersed with pocosin wetlands, dominated by pond pine (*Pinus serotina*) and loblolly bay (*Gordonia lasianthus*). Dense shrub layers include titi (*Cyrilla racemiflora*), fetterbush (*Lyonia lucida*), inkberry or gallberry (*Ilex coriacea*) and sweet pepperbush (*Clethra alnifolia*).

The group saw numerous wildflowers in related or similar genera and species. The comparisons proved to be a good exercise in distinguishing various species. For instance, the similar purple members of the aster family challenged us to observe inflorescent types such as corymbs, panicles, racemes and spikes. Good examples of this were the blazing stars (*Liatris graminifolia*, *L. spicata*) and chaffheads (*Carphephorus*

bellidifolius, *C. tomentosus*). Vanilla plant (*C. odoratissimus*) and deer tongue (*C. paniculatus*) are both formerly in the genus *Trilisa*. Dried leaves of the vanilla plant do indeed smell like vanilla although the source for flavoring is the vanilla orchid.

Various asters provided good species comparisons, differing by leaf shapes and inflorescence types: stiff-leaved aster (*Aster linariifolius*), frost aster (*A. pilosus*), scale-leaved aster (*A. squarrosus*), white-topped aster (*A. tortifolius*) and swamp aster (*A. paludosus*).

Another lesson was in distinguishing the false foxgloves or gerardias (*Agalinis obtusifolia*, *A. purpurea*, *A. setacea*, as well as the rare *A. aphylla*). Primary differences are leaf types and the presence of yellow stripes within corolla throats.

Stem pubescence and glandular petals distinguish the lovely, lavender meadow beauties (*Rhexia mariana*, *R. purpurea*, *R. alifanus*). The similar four-petaled, yellow seedbox (*Ludwigia* sp.) was also present.

We were fortunate to spot several of the fringed orchids (formerly *Habenaria*): crested-fringed orchid (*Platanthera cristata*), white-fringed orchid (*P. blephariglottis*) and the rare, yellow fringeless orchid (*P. integra*).

Yellow or orange members of the ubiquitous aster family featured rayless goldenrod (*Chondrophora nudata*), narrow-leaved coreopsis (*Coreopsis angustifolia*), flat-topped goldenrod (*Euthamia minor* formerly *Solidago microcephala*), narrow-leaved and variable sunflowers (*Helianthus angustifolius*, *H. heterophylla*) and golden asters (*Heterotheca mariana*, *H. nervosa*). Especially notable were the fragrant, sweet goldenrod (*Solidago odora*) and the rare, Carolina goldenrod (*S. pulchra*). Less colorful composites included the thoroughworts (*Eupatorium leucolepis*, *E. rotundifolium*) and rattlesnake root (*Prenanthes autumnalis*). What a list!

We also discovered blooming wild indigo (*Baptisia cinerea*), screw stem (*Bartonia paniculata*), button snakeroot (*Eryngium integrifolium*),

redroot (*Lachnanthes caroliniana*), snakeroot (*Pterocaulon pycnostachyum*), white horsemint (*Pycnanthemum flexuosum*), gaywings or milkwort (*Polygala cruciata*), seymeria (*Seymeria cassioides*) and yellow-eyed grass (*Xyris caroliniana* and others). The showy carnivorous, yellow trumpet (*Sarracenia flava*) accented the site. The brilliantly deep blue, autumn gentian (*Gentiana autumnalis*) with green/yellow stripes inside the corolla throat, offered a spectacular showing.

Several shrubs of interest included St. John's worts (*Hypericum stans*, *H. hypericoides*), dwarf azalea (*Rhododendron atlanticum*), swamp and dwarf wax myrtles (*Myrica heterophylla*, *M. cerifera* var. *pumila*) and the vine-like, creeping blueberry (*Vaccinium crassifolius*).

Prominent grasses included toothache grass (*Ctenium aromaticum*), that when chewed numbs the mouth, and wiregrass (*Aristida stricta*), that depends on fire to flower. Love grass (*Eragrostis* sp.), beard or plume grass (*Erianthus giganteus*), broomsedge (*Andropogon* spp.) and beak-rush (*Rhynchospora* spp.) were also identified among the numerous grasses and sedges.

Virginia chain fern (*Woodwardia virginica*) and cinnamon fern (*Osmunda cinnamomea*) occupy the wetter sites while bracken fern (*Pteridium aquilinum*) grows in dry sand. The clubmosses (*Lycopodium* spp.), associated with bogs, were scattered beneath our feet.

Colorful and energetic butterflies flitting among the wildflowers were pointed out by Harry: gray hairstreak, great purple hairstreak, palomedes swallowtail, clouded sulfur, cloudless sulfur, and wood nymph.

A small depression pond bordered by pond cypress (*Taxodium ascendens*) proved interesting. Surrounding the pond in a ringed zonation was rush featherling (*Pleea tenuifolia*). The pond margin contained the rare Hooker's milkwort (*Polygala hookeri*), crow poison lily (*Zigadenus glaberrimus*), savanna cowbane (*Oxypolis ternata*), hatpins (*Eriocaulon decangulare*), bog buttons (*Lachnocaulon* sp.), screw-stem (*Bartonia paniculata*, *B. virginica*) and clubmoss (*Lycopodium compressum*). Diminutive carnivorous plants included sundews (*Drosera intermedia*, *D.*

brevifolia formerly *D. leucantha*) and bladderworts (*Utricularia gibba*, *U. juncea*). The rush (*Juncus abortivus*), with its habit of producing new seedlings on the inflorescence, occupied much of the pond center. Outside the pond border was Canada goldenrod (*Solidago canadensis*), thistle (*Carduus virginianus*), autumn gentian (*Gentiana autumnalis*) and creeping blueberry (*Vaccinium crassifolium*). The wet soil of the savanna allows for the unusual mix of pond cypress with longleaf pines.

Seen nearby was a red-cockaded woodpecker nest tree easily identifiable by the ring of white sap on the longleaf pine (a state endangered bird). This rare woodpecker has the unusual habit of nesting in live trees, thus the sap is a deterrent from predators climbing the rough tree bark.

Before heading home, we stopped briefly to visit the Pellam Road Tract. Called "Ghost of Big Savanna," the future B.W. Wells Savanna is a remnant of a vast savanna type of diverse wildflowers and grasses.

In 1920, B.W. Wells discovered a 1,500-acre savanna near Burgaw bursting with wildflowers. The "Big Savanna" became an important part of his book, *The Natural Gardens of North Carolina*. Unfortunately, the savanna was eventually put into cultivation. Richard LeBlond, a Natural Heritage Program botanist, discovered the Pellam site and its unique plants beneath a CP&L power line. The N.C. Coastal Land Trust is working with the Conservation Trust for N.C. to purchase this 117-acre tract near Wallace. The site shares the same rare Liddell soil type as the Big Savanna, probably formed as a lakebed during glacial times. The clay layer keeps the ground surface wet.

We glimpsed some of the site's diversity of over 180 native plant species. Flowers in bloom were Nuttall's lobelia (*Lobelia nutallii*), blue lobelia (*Lobelia elongata* or *glandulosa*), seedbox (*Ludwigia maritima* or *hirtella*), Carolina goldenrod (*Solidago pulchra*), goldenrod (*Solidago puberula*), white sabatia (*Sabatia difformis*) and Barbara's buttons (*Marshallia graminifolia*). The savanna Indian plantain (*Arnoglossum ovatum*, formerly *Cacalia lanceolata*) is significantly rare in N.C. savannas over marl limestone. Tiny sundews (*Drosera brevifolia*) dotted the moist ground. Several rare species of beakrush (*Rhynchospora*), dis-

tinguishable by minute features, were among the numerous grasses such as cane (*Arundinaria tecta*). The rare broad-winged sedge grasshoppers jumped ahead of our footsteps. As we walked out, we admired a lovely Catesbaei's gentian (*Gentiana catesbaei*).

Once acquired, fire will maintain this globally rare savanna and perhaps restore it to its former diversity. Mowing has been the only maintenance activity, but fire management will remove the invading shrubs. Some of these are sheep laurel or sheep kill (*Kalmia angustifolia*), St. John's wort (*Hypericum galioides*), titi (*Cyrilla racemiflora*), horse sugar (*Symphlocus tinctorum*), sweet bay magnolia (*Magnolia virginiana*) and inkberry or gallberry (*Ilex coriacea*).

Our appreciation goes to Alice Zawadzki and Harry LeGrand who organized the trip and helped make it a memorable day. The multitude of wildflowers and enthusiastic and congenial people brightened my day.



Lobelia nutallii

A Conversation on Roadside Wildflowers

Editor's Note: A series of emails was generated this past spring on the issue of roadside wildflowers and the use of burning as opposed to mowing. The series culminated in a response from Ed Ingle that is interesting and informative. Thanks to the participants for their permission to reprint their notes, which have been edited for continuity.

Tom Blue (Principal with BLUE: Land, Water, Infrastructure; PE, PLS; CCNC Board) wrote to **Carrie Oren** (NC Conservation Council):

Do you know of any proposals that have been made to NCDOT regarding the use of “real” native wildflowers and vegetation along our roadways as well as the use of periodic burning as opposed to mowing?

During a teleconference sponsored by the Center for Transportation and Environment, I was told that the North Carolina Department of Transportation (NCDOT) already uses wildflowers. There didn't seem to be an appreciation of the difference between techniques derived from tobacco farming (soil sterilization and chemical application combined) with planting non-native vegetation and the implementation of true native species along roadsides.

I've wondered for years what expenditures are made on roadside/shoulder maintenance and how this cost could be reduced while improving habitat with native species. The potential for roadside disturbance would actually be a plus – as on power line rights-of-way and military bases.

Alice Zawadski (President, NCWFPS) wrote to **Ed Ingle** (NCDOT):

Can you please address the questions posed by Tom Blue?

Ed Ingle wrote:

I'm not sure that I entirely understand the question, so like a good bureaucrat, I'll most likely answer some other question. Let me be the first to tell you that I am a long way from Raleigh and have not been privy to

native versus non-native 'inner circle' discussions in our Department. I feel sure that native wildflowers and grasses have been recommended since the inception of the wildflower program. Here are some facts that I do know.

1. Full season show has always 'trumped' native only plantings.
2. The NCDOT has always planted some natives: lance-leafed coreopsis, black-eyed susan, and showy primrose are examples. They often were not native to the region that we planted them in and it is always possible that we may have weakened the local population by bringing in non-native genetics, as with black-eyed susan. We do not generally take local genetics into consideration. That would be difficult for a DOT to do. If genetic crossing is known to be a problem, it should be brought to NCDOT's attention and we should quit importing non-local cultivars.
3. In western North Carolina we started collecting some native species in the late 1980s in order to have a fall wildflower show. We massed plantings of New England Aster, Narrow-leafed Sunflower, Maryland Golden Aster, and Bidens species. Over time these drew enough public support for the Raleigh Office to take notice and Roadside began growing Narrow-leafed Sunflower and Bidens at down east experiment stations for distribution to the other highway divisions. Our fall native program in Highway Divisions 13&14 was fairly large using these species, along with a few others that we collected for several years, until the Roadside Engineers who ran the program retired.

Division 14 still has a few acres of these species every fall. The plantings worked but there is really little incentive for the divisions to grow them. The annual awards presented by the Garden Clubs of North Carolina are based primarily on photographs of annual flowers. The Garden Clubs, consisting of about 16,000 members, have been a fountain of support for other DOT issues and are held in considerable regard.

Anyone wanting the NCDOT to use more natives would do well to work with the Garden Clubs. It can be done collectively through the garden media as well as by engaging individual garden clubs in educational

presentations. Those who support the use of native species need to put some energy into educating the public as well. Until those things happen, I don't expect to see much change.

4. Trees and shrubs need to be considered as well as flowers and grasses. Natural succession and management of rights-of-way also need to be considered by native plant proponents. We all tend to focus on what we like, sometimes missing the bigger picture. Few seem to notice reforestation of native trees on highway rights-of-ways. The NCDOT cannot focus on a relatively small area in the same way as do Arboreta and Botanical Gardens.

5. Invasive species are becoming a tremendous problem on rights-of-way and are moving directly to private lands, causing economic damage that is not being quantified. Reforestation of native trees can help slow this process by shading the ground and limiting the problem to fewer exotic invasive species. Native plant proponents should support native reforestation, native regeneration and management of forest species, and control of exotic invasives on highway rights-of-ways. Also to be encouraged would be a NCDOT management plan for control of exotics and long range goals for rights-of-way.

What I am trying to point out is that we are dealing with a complex issue when we think of management of NCDOT rights-of-ways. Here are some things to think about:

- the complexity of the plant material itself, species, and succession
- DOT is a Civil Engineering organization, and the Roadside Unit plays only a limited role before and during construction.
- After construction, responsibility for maintenance goes to District Engineers. This includes most vegetation decisions such as removal and mowing (personnel and equipment). The Division Roadside Engineer reserves some areas for wildflowers, does some reforestation and some herbicide work, but the rest of the R/W responsibility belongs to the District Engineer. When one considers our chain of com-

mand, it is amazing that the State looks as good as it does. Even though vegetation is not under direct control of 'Roadside,' the Engineers do listen to many of our recommendations.

There was one other point, about the use of periodic burning on highway rights-of-way as opposed to mowing. Due to safety issues caused by reduced visibility, there are laws prohibiting the burning of brush within a thousand feet of the right-of-way of a state highway.

Derek Smith, Vegetation Management Section Engineer, NCDOT on the issue of burning:

The issue of burning as a means of controlling undesirable/invasive exotic plants and as a general vegetation control tool have been examined by many individuals across the United States. NCDOT does not use burning to control vegetation because of various safety concerns. Primarily, controlling the direction of the smoke so as not to impede motorists or impact the surrounding residential areas is a concern.

I am reminded of the tragic events that took place several months ago involving the NC Forestry Service and their use of fire as a means of vegetation control. As I understand it, the wind shifted and smoke was blown over the highway causing motorist to lose their visibility. This smoke resulted in a multi-vehicle accident with fatalities.

Burning primarily controls above-ground plant growth but is limited in its control of underground rhizomes and root structures. For this reason, perennial weeds, as a general rule, are not controlled with fire. We do, however, realize there are positive impacts associated with the use of fire, especially in forest management situations.

Again, thanks to Ed Ingle for his thoughtful and informed response to Tom Blue's questions, and to Derek Smith for his quick response. Now, it is time to formulate a plan and get started on that education campaign recommended by Ed. The Editor.

The Odor of Galax

Jame Amoroso

True or False: The skunky odor associated with *Galax urceolata* (galax) is produced by its leaves.

Nearly anyone who has been on a field trip in the southern Appalachians (including the piedmont) and has passed a large patch of galax has smelled the skunky, or even somewhat garlicky, odor associated with the plant. The field trip leader will pass along the lore that yes, the stinky smell is coming from the galax patch and he or she will then espouse one of several theories as to its origin. Some will say that the odor emits from either a bacteria or a fungus associated with the roots, others will talk about the odor produced from decay of the leaves. Most do not detect any odor from collected specimens or from crushing the leaves which creates the mystery of its production.

So the upshot is that the source of the odor is not known, and neither is the exact chemical producing the smell. In a recent exchange on an e-mail list serv to solicit literature citations on any research done on galax, the following was determined: no one knew of any published reports on the odor of galax and several were willing to speculate on the chemical responsible for the smell.

Dr. Howard Neufeld, plant physiologist at Appalachian State University, has made some preliminary investigations into the chemical causing the odor. To shorten a long story, he and his wife were on their first date and discussing the odor of a patch of galax on the Blue Ridge Parkway. He thought the odor was due to amine compounds, and she thought it smelled like a selenium compound, something with which she had professional experiences. So they set up a carbon trap to try and capture the volatile compound. After pulling air through a PVC tube across a carbon filter in a patch of galax for several hours they desorbed whatever might have been adsorbed onto the filter by heating it up in a glass apparatus and tried to collect the volatiles in a cold trap filled with methylene chloride in which selenium compounds would dissolve. The result?

Nothing. Dr. Neufeld further notes now that selenium compounds are in low supply in the Southern Appalachians. Farmers in the area have to supplement their animal feed with selenium to avoid nutritional disorders.

The next step of Dr. Neufeld? He is thinking of trying adsorption columns to collect the volatiles, rather than simply using carbon filters, which will be more selective and efficient. Dr. Neufeld now thinks the odor is due to a volatile sulfur compound of some sort, perhaps a mercaptan.

Alice Zawadzki, Professor Emeritus of Chemistry and Physics from Saint Mary's College, has this to say about skunk odor:

Galax smells like skunk to me, probably due to release of butyl thiol or very similar thiol. Skunk odor is due to n-butyl mercaptan or butyl thiol. 1-butanethiol C_4H_9SH which has a molecular weight (MW) of 90 and a boiling point of 98.4 deg Celsius (almost near the boiling point of water which is 100 deg C). That would make it liquid at room temperature due to its very polar thiol group similar to alcohols and water. The similar boiling point of non-polar organic heptane (C_7H_{16} , MW 100, b.p. 98.4 deg C) is 40% longer and 10% heavier to get the same effect.

With a molecular weight of 90, it is much heavier than air which has a MW of 29 (nitrogen MW 28 & oxygen MW 32). So it would stay near the ground, much like propane that leaks out of tanks stays close to the ground. With its polar nature and high boiling point, it would have a low vapor pressure. Since kinetic energy of molecules is inversely proportional to the square root of molecular weight and directly proportional to temperature, butyl thiol would tend to diffuse very slowly. August temperatures would tend to increase the speed of molecules and have more escape into the air and travel further off the ground.

My guess is that there are longer chain sulfur containing compounds in the leaves of galax that would not have a scent. When they die, decomposers begin their work and smaller fragments results. One may be butyl mercaptan. Neither leaves nor the flower, nor the root would smell but the leaf detritus from previous years might, as the butyl thiol is being produced. It mainly vaporizes into the air and hovers above the plant.

So the chemical with the skunky odor may not be a selenium compound, but rather, may be a volatile sulfur compound such as a butyl - mercaptan. Only a very small amount has to be produced by the leaves or roots or by decomposition by fungi or bacteria of the leaves or roots in order for it to be detectable by human noses.

A recent personal inspection of a plant brought indoors for a plant study group revealed a skunky odor emanating from the underside of the youngest leaf of the clump; several of us were able to detect it. My current theory is that galax has bad breath since most stomata for gas exchange occur on the underside of the leaf. And I consider the beginning statement of this article to be true. I dare you to prove me wrong.

Lessons In Pollination Ecology

From a Rare Species

Misty Franklin

Lysimachia asperulifolia Poir., otherwise known as Rough Leaved Loosestrife, is a federally endangered plant species endemic to the Sandhills and Coastal Plain of North and South Carolina. I recently completed two years of research to understand causes of low seed production in natural populations of the species. I found that several key ecological links had been broken as the plant has become increasingly rare. These missing links seem to create a negative feedback that suppresses seed production. In fact, Rough Leaved Loosestrife seems to be a good model for the types of problems facing rare plants, because this one species appears to combine several of the possible problems afflicting our rare plant populations: loss of habitat, apparently extirpated specialist pollinators, low genetic diversity, isolated populations, and self-incompatibility. I will discuss these problems as they affect Rough-Leaved Loosestrife, but keeping in mind the larger implications these factors have for other rare plant populations.

The genus *Lysimachia* is represented by ten species across North Carolina. A member of the primrose family, *Lysimachia asperulifolia* produces racemes of 1-30 radiant yellow flowers on stalks up to almost 1 meter tall. The flowers are about 1.5 cm broad and are produced during a short flowering season from late May to mid June. The leaves are produced in whorls of 2-5 leaves, which turn a dark red in the autumn.

I conducted research in five sites: two populations in the Croatan National Forest, two populations at the Green Swamp, and one population at Camp Lejeune Marine Corps Base.

Rough Leaved Loosestrife is thought to be rare due to a combi-

nation of fire suppression and loss of habitat. The plant naturally grows in the narrow transition zone between long-leaf pine savannas and pocosins (peat bogs dominated by dense thickets of shrubs). As wetlands were drained and converted to agriculture or urban development in the early 20th century, suitable habitat became increasingly rare. This reduction in suitable habitat was further compounded by the emphasis on fire suppression that was so popular during most of the 20th century. Rough Leaved Loosestrife appears to be fire dependent, at least in the sense that it takes advantage of gaps in the dense vegetation created by fires.

As the species became more rare due to loss of habitat and flowering became less frequent due to fire suppression, the specialist pollinator of the species seems to have become unable to find enough flowers to sustain pollinator populations. A small bee in the genus *Macropis* is predicted to be the most likely pollinator of Rough Leaved Loosestrife. *Macropis* is known to be a *Lysimachia* specialist, with a known range completely enclosed within the range of *Lysimachia*. Bees in the genus *Macropis* are known to collect oils produced by *Lysimachia* flowers. During the process of collecting oils, they deposit pollen on stigmas. Our very own *Lysimachia asperulifolia* produces these oils, but during my two summers of study, I was unable to find any *Macropis* bees at my study sites. It should be noted that bees in the genus *Macropis* have previously been found in North Carolina. Therefore, it is likely that they were at one time present in eastern North Carolina.

Instead of finding *Macropis* pollinating Rough Leaved Loosestrife, I found that flowers are infrequently visited by small sweat bees (*Dialictus* and *Lasioglossum*), which are generalists and are too small to regularly transfer pollen to stigmas. By marking anthers with fluorescent powder to mimic pollen and by noting where the powder moved after several days, I was able to confirm that pollen is not moved very far or frequently within populations of Rough Leaved Loosestrife. Without effective pollen transfer, the flowers have limited opportunities to produce seeds.

Low genetic diversity within populations is, apparently, a factor equally or more limiting to seed production than are infrequent pollinator

visits to flowers and limited pollen movement. As I mentioned previously, many of the remaining populations of Rough Leaved Loosestrife are isolated from each other by miles of dense thickets, urban development, or farm fields, so it is unlikely that pollen moves between populations. The plant sustains itself through the growth and fragmentation of underground rhizomes. It is likely that plants growing in dense clusters are genetically identical, having formed as extensions from one original rhizome. The plant is self-incompatible, so when pollen moves between flowers that are genetically identical, seeds are not produced. Healthy populations need pollen representing a diversity of genetic material in order for seeds to be produced.

Through a series of hand-pollination experiments in three populations in the Croatan National Forest and at Camp Lejeune, I learned that, unfortunately, my study populations do not represent a diversity of genetic material. In fact, when I artificially pollinated flowers using pollen from distant neighbors **within** the same population, I consistently got zero seeds produced per stem. I was only able to get flowers to produce seeds in significant quantities when I moved pollen **between** populations! Since natural populations, which probably differ genetically, are so widely separated, it is unlikely that pollen is moving between populations. Therefore, natural populations of this self-incompatible species have become so genetically uniform and isolated that they are no longer able to produce many seeds.

Seed production is an important component of a healthy population. Assuming that dispersal of rhizome fragments is limited, the plants cannot disperse and colonize new areas without seed production. They also cannot genetically recombine to produce new genotypes that could resist potential diseases or changes in the environment. It will be essential to re-establish healthy sexual reproduction in natural populations before we can claim to have restored the species and removed the threat of extinction.

Rough Leaved Loosestrife appears to have several strikes against seed production. Loss of habitat, fire suppression, low rates of pollinator visitation, apparently ineffective pollinators (when they **do**

visit flowers), and low genetic compatibility within populations, all work against the species. While I have documented these problems in this one species, many of these components could be acting against other rare plants in North Carolina.

Preserving existing populations of Rough Leaved Loosestrife through conservation may not be enough to restore the species. Human activities have been the historical causes of its rareness. Therefore, we have an ethical responsibility to be proactive in restoring the ecological elements that will be essential for survival. Currently, most populations on public lands are on some kind of regular burn cycle, which appears to promote flowering. Through a program established by the North Carolina Plant Conservation Program, populations on public lands are also monitored annually and stem counts are reported and tracked each year. My research suggests that stem counts may not be enough to assess population functionality. The number of stems in a given population may not be an adequate basis for assessing whether the species is restored or stable. Instead, the ecological elements that I have discussed may be more pertinent to deciding whether the species is stable.

In order to restore the species, land managers may need to take an active role in restoring diversity to populations by moving genetically distinct plants between populations, but still within population centers (this is an idea that will no doubt warrant careful consideration and debate before it would be undertaken). Importing effective pollinators may be another important option. Restoring populations of *Macropis* bees, a bee that is historically native to North Carolina, might ensure movement of pollen.

My research has been the result of collaboration from numerous governmental and non-profit entities, including a grant from the National Forest Service, generous cooperation from the National Forest Service, U.S. Marine Corps, the Nature Conservancy, collaboration from scientists at N.C State University, and the N.C. Plant Conservation Program. After the research was completed, I was awarded the 2002 NC Botanical Garden award for research benefiting rare native plants in NC. Luckily, although key ecological interactions are missing in populations of Rough

Leaved Loosestrife, the community of concerned scientists and conservationists in NC is not equally lacking in pertinent interactions. Through continued discussion and planning, we may be able to restore these essential components to natural populations of this and other rare plants in North Carolina. A complete scientific account of my research has not yet been published, but can be obtained online by searching by author at the NCSU library website at <http://www.lib.ncsu.edu/> .



Helianthus angustifolius

Counting Cohosh

Katherine Karr Schlosser

Black cohosh, stem 33 centimeters-height 47 centimeters-width 49 centimeters; black cohosh, stem 19 centimeters- height 32 centimeters – width 35 centimeters, blight.....

Voices echoed through the forest, calling out names and numbers in cadence, competing with the crunch of fallen leaves and the snap of broken branches underfoot as twenty-seven volunteers, mostly female and primarily members of the Garden Clubs of America, moved steadily and noisily through the forest, counting the number and size of black and yellow cohosh plants (*Actaea racemosa*, previously *Cimicifuga racemosa*, and *Actaea podocarpa*). Not your flower-arranging/table setting garden clubbers of old, these women, clad in jeans and well-worn hiking boots, are active in conservation efforts and are genuinely concerned for the environment. Undeterred by the presence of rattlesnakes and black bears, they are participating in a study of the sustainability of forest products.

Sponsored by the Plant Conservation Alliance – Medicinal Plants Working Group, facilitated by U.S. Fish & Wildlife Service in partnership with the Forest Service and including representatives from the medicinal commerce, government, academia, and environmental organizations, and with woman-power provided by the Garden Clubs of America-Partners for Plants Initiative and others, the study seeks to determine sustainable levels of harvesting black cohosh, yellow cohosh, and bloodroot. Because of their commercial value, black cohosh and bloodroot face the same fate as that of *Panax quinquefolius* (American ginseng), which has been harvested to near extinction. Yellow cohosh, with foliage so similar to that of black cohosh that it is indistinguishable to the untrained eye, also faces declining numbers as it is indiscriminately pulled from the ground. Botanists Gary Kauffman of the Nantahala and Pisgah National Forests (U.S. Forest Service) and Mary Maruca (Fish and Wildlife Service); and Ed Fletcher, commerce representative, provided leadership for the group.

Black cohosh has long been prized for its use in the treatment of a variety of disorders, from “fevers, nervous disorders, lumbago, rheumatism, snakebites, menstrual irregularities, and childbirth [...] Research has confirmed estrogenic, hypoglycemic, sedative, and anti-inflammatory activity” (Foster, 56). According to James Duke, in a study of 110 menopausal women, “half of whom were given black cohosh root extract, while the other half took an inactive preparation” (Duke, 323), blood tests in those receiving the black cohosh revealed estrogenic activity. According to Pat Ford (US Fish and Wildlife Service botanist) “In 1998 black cohosh was identified as one of the fastest growing herbal products with an annual increase of over 511 percent from sales in 1997. [In 2001] an amount estimated between 300,000 and 500,000 pounds (dry) were wild-collected .”

Bloodroot (*Sanguinaria canadensis*) has a similar long-term history as a medicinal herb, and shows promise as a new crop in the cattle industry. Among other uses, bloodroot extract has been used as a means of treating gingivitis and preventing tooth decay, though there are concerns about its possible exacerbation of glaucoma. More recently, the Commission of European Communities has stimulated interest in bloodroot as it “ordered synthetics phased out of European livestock feed by the end of 2005 because of concerns that antibiotics in meat make pathogens in humans more resistant to certain drugs” (Clark). Added to livestock feed, bloodroot contributes to the fattening of animals without the use of synthetic antibiotics.

Because of the growing interest in these plants by the phytochemical industry, wildcrafting—harvesting from public lands—is on the increase and puts the plants in danger of over-collection. Phytobiotics GmbH, a German company, needs 120 – 150 metric tons of bloodroot per year to produce livestock feed. That’s a lot of plants and represents the needs of only one company.

Wildcrafters are happy to supply the need. But unlike wildcrafters of old, who were taught by their parents and grandparents how and when to harvest so there was a crop for the following year, many of today’s wildcrafters have no such history. Finding a patch of black cohosh, blood-

root, ginseng, or any other economically desirable plants, they are likely to strip the patch bare, leaving nothing to regenerate.

The Plant Conservation Alliance – Medicinal Plants Working Group, including 10 federal agencies and 145 non-governmental groups, designed a means of studying various harvesting rates on the population of the targeted plants. Two days in early September, Gary Kauffman and Mary Maruca led a group of volunteers deep into the Nantahala National Forest. They had already plotted out twenty-one 10 meter x 10-meter plots in several locations within forest coves, some separated by as much as three miles to allow for the study of plant populations at varying elevations. The volunteers were divided into working groups of four, with each group assigned to survey four plots. The job of the volunteers was to enter each plot, count the number of targeted plants within the plot, the height and width of each plant, and assess the percentages of associated plants in each plot. Each plot was assigned as a control, a 33% harvest, or a 66% harvest plot.).

After recording the numbers and sizes of the plants, and whether there were seeds or bight present, black cohosh was harvested at the assigned rate. The harvested roots and rhizomes were washed and weighed the same day, then sent with Ed Fletcher for replanting and further study. It is estimated that it takes 15 – 20 plants to equal a pound of dried root.

Among the list of associated herbs identified were Christmas fern (*Polystichum acrostichoides*), Jack in the pulpit (*Arisaema triphyllum*), violet (*Viola canadensis*), white snakeroot (*Ageratina altissima*), Dutchman's pipe (*Aristolochia macrophylla*), Rattlesnake plantain (*Goodyera pubescens*), Rue Anemone (*Thalictrum thalictroides*), Lady Fern (*Athyrium filix-femina*), buffalo nut (*Pyrularia pubera*), orange fruited horse gentian (*Triosteum aurantiacum*) and American ginseng (*Panax quinquefolius*).

Conducting the study may not sound terribly difficult until you understand that these plots were on steep sides of the western North Carolina mountains. Maintaining footing while measuring and digging, and trying to keep from destroying other plants, was a challenge. But the most ex-

citement came as one small group of volunteers sat in the middle of the dirt road, eating lunch and resting after a couple of hours of work. Forty-five minutes into the forest on a gravel road, a gentleman was spotted walking toward the group of eight women. Exchanging greetings, one brave volunteer, Anne Abbot, spoke up and said, "What do you have that gun for?" All eyes quickly moved to the side of the walker, and to the pistol strapped to his waist. "It's for rattlesnakes and pit bulls," he explained. "This is heavy rattlesnake country, and there are bear hunters out here who use pit bulls with radio collars to circle in on the bears. I'm more afraid of the dogs than the bears," he said. After a bit of pleasant discussion, and a discernible degree of suspicion on the part of both parties, it was ascertained that this was, in fact, a wildcrafter in search of ginseng. He was particularly interested in knowing about our efforts, for he knows that where black cohosh and bloodroot grow, ginseng is often found.

He is identified as a wildcrafter, for he has a 30-day permit to gather up to one pound of ginseng. Actually, during the course of this study, only three or four ginseng plants were spotted creating excitement when they were found. What had once been an abundant plant in this area is now so rare that a sighting is an event. The goal of the current study is to prevent the same fate for black cohosh and bloodroot.

Last year a volunteer group surveyed and harvested twenty-one plots in another location. Next year, another series will be surveyed in still another location. Then the fourth year, a group will go back to the original site to assess the condition of the various plots. As it takes five years or so for a black cohosh plant to grow to maturity (the seeds lay dormant for 12 – 18 months), it is hoped that this study will provide forest service personnel with the information they need to determine how best to manage the limited resources of the forest.

Armed with that information, they can begin to educate wildcrafters and place some limits on the harvesting permits that are issued. Of course, that doesn't help with the poachers who enter the national forests illegally—without permits—and gather plants at will. Given the size of na-

tional forests and the limited personnel to oversee the public lands, it is difficult to cope with those who strip the forests of plants and animals, some of whom see the activity not as poaching but as their heritage. They follow in the footsteps of their parents and grandparents from days before the federal government bought up the land. Other poachers, those without a family history of plant collecting, simply see the quick, though not so easy, money available for the taking.

The wildcrafter encountered during this study said he gets \$280 a pound for dried ginseng root. Gary Kauffman says it can take an average of 300 ginseng plants to yield a pound of dried root. While neither black cohosh nor bloodroot command such lofty prices, over-collection is still a major concern. With this study underway, and efforts of organizations such as Yellow Creek Botanical Institute, Inc. (which works to encourage phytomedicals as cash crops for farmers), non-timber forest products and mountain farmers might just be saved from extinction.

The volunteers in the black cohosh/bloodroot study, who braved treacherous terrain, snakes, hornets, stinging nettle, poison ivy, and gun-toting wildcrafters, are essential to the process. Their good works yielded much more, though. Camaraderie developed among the workers, along with a growing appreciation of our forests and what they offer. Other groups, and our environment, can benefit from the example set by the Garden Clubs of America by getting involved in similar sustainability studies.

Clark, Paul. Asheville Citizen-Times, May 19, 2002 "*Scientists hope bloodroot could be new crop for farmers*"

Duke, James A. *The Green Pharmacy*. Emmaus, Pennsylvania: Rodale Press, 1997.

Foster, Steven and James A. Duke. *Eastern/Central Medicinal Plants*. New York, Houghton Mifflin Company, 1990.

Suggs, Robin, Yellow Creek Botanical Institute Inc., P.O. Box 1757,
Robbinsville, NC 28771. www.yellowcreek.org

For a full copy of the report from 2001, see:

<http://www.nps.gov/plants/medicinal/pubs/2001appendixc.htm>

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Actaea racemosa

Minutes of the Board Meeting on February 17, 2002

Present: Ginny Bacik, Treasurer; Ken Bridle, President; Carla Handrinos, N C Plant Conservation Program; Marlene Kinney, Corresponding Secretary; Carla Oldham, Trustee; Charlotte Patterson, Past President; Pete Schubert, Trustee, Plant Rescue Coordinator; Wendy Weiher, Volunteer Coordinator; Charlie Williams, Trustee; Jean Woods, Trustee; Alice Zawadzki, Vice President

The NCWFPS Board convened at Ken Bridle's house and shared lunch before getting down to business. Other attendees were Luann Bridle, Margaret Schubert, Teresa Schubert, Paul Weiher and baby daughter Adelle Weiher. The agenda included the following issues:

Budget:

Alice and Ginny discussed plans to close two accounts that had been opened years ago for the purpose of publishing the propagation handbook. The revised propagation handbook has now been published and plans are to consolidate our money. The accounts are currently in the names of Benson Kirkman, Past President, and Alice Zawadzki in B B & T. Discussion centered on whether to put all of the money into one account, and if so, which account should be used to consolidate the money. One of the accounts to be closed is a checking account and the other is a certificate of deposit that matures March 1, 2002. The board decided that Alice would close the accounts after the CD matures and deposit the money into an account with one of the banks we are currently using. Alice would determine the choice of bank based on interest rates at the time.

Ginny reported that there is currently \$20,257.02 in the regular checking account. \$15,000 of this money is from Maude Wells' bequest to the Society in her will. There is \$7,050.02 remaining in the Z. Smith Reynolds grant account and \$1567.77 in the C P & L Grant account. The Shinn Fund checking account has \$8,839.16, and the Shinn Fund money market fund contains \$14,170.81. The Society currently has \$51,884.78 in all accounts. Ginny stated that current figures did not include \$1,100 in funds shifted from one of the B B & T accounts. Ginny asked that reimbursements for expenses incurred as a result of Society business be submitted on a regular basis and not be held until larger sums and quantities of receipts need to be processed.

Discussion turned to how to spend the remaining money from the C P & L Grant account. Possibilities included getting a digital projector for future

presentations about rare plants or spending \$500 on a display about rare plants. Alice suggested that we get a report from Cecil Frost, Director of the NC Plant Conservation Program, to determine what is planned and how best to spend the money. Ginny reported that the Z. Smith Reynolds account should be zeroed out after paying Wendy Weiher for her services as Volunteer Coordinator. Both Z. Smith Reynolds and C P & L accounts should be closed by June.

Ginny reported that lifetime memberships had dropped off since increasing the cost from \$180 to \$300. \$126 of each lifetime membership goes to the Shinn Fund.

Nomination of Officers and Trustees:

After much discussion, the board agreed upon the following slate of officers for the election in the Spring of 2002:

Alice Zawadzki – President

Jean Woods – Vice President

Ginny Bacik – Treasurer

Marlene Kinney – Corresponding Secretary/Membership chair

Zack Murrell – Recording Secretary

Three Trustee slots were also filled. Carla Oldham and Pete Schubert agreed to extend their terms as Trustees. Wendy Weiher agreed to take the remaining Trustee position. Charlotte Patterson volunteered to take the position of Historian. Committee appointments were discussed. Our current by-laws do not include education and conservation committees. The Board agreed that these committees should be added to the by-laws. Carla Oldham was appointed to be the chairperson of an ad-hoc committee in charge of revising the by-laws, which have not been revised since 1989.

Several members of the Board suggested other people who would be good candidates for committee members. Dale Suiter, Moni Bates, Linda Meehan, Haywood Rankin and Sheila Lombardo were suggested as possible candidates. Members volunteered to call the candidates to determine their willingness to serve in committee positions.

Shinn Grant Nomination:

Ken presented for approval a research proposal submitted by Susan Shelingski. She is planning to do a botanical survey of the Ghost of Big Savanna property that is currently being acquired by the Coastal Land Trust. The Ghost of Big Savanna is a 117-acre remnant of savanna that is similar to the

unique property owned and studied by B. W. Wells. The Board approved a grant of \$500.

Ken suggested that we make the Board the reviewing body for the Shinn Grant proposals rather than having a committee as had been done previously. The Board agreed to review proposals and to bring in technical advice from Universities as needed.

Royalties from the New Edition of B. W. Wells' *Natural Gardens of North Carolina*:

Maude Wells has bequeathed to the NCWFPS the royalties of the *Natural Gardens of North Carolina*, which may be available in the fall of 2002 from UNC Press. The Society would get a check once a year. We do not know what percentage of the proceeds we will receive. Current projections are that there will be 6,000 copies printed. If a book club deal can be arranged, they are considering printing more than 6,000 copies.

There is a possibility that there will be special editions of the book that are leather bound and have gold leaf on the pages. The Coastal Land Trust is interested in doing special editions as a joint venture with the Society. The book could be useful in helping to raise money for the Ghost of Big Savanna.

Alice made a motion that we place the royalties for the book into an endowment account that was approved in a previous board meeting. Carla Oldham seconded the motion. Alice suggested that the endowment be named for B. W. Wells. The motion was seconded and passed.

Maude Wells Bequest:

Maude Wells left the NCWFPS \$15,000 in her will. There was much discussion about how to use the money, since specific details were not available about how Mrs. Wells wanted the money to be used. The board discussed the suggestion by Ken Moore, past president and Assistant Director of the NC Botanical Garden – Chapel Hill, that all of the money be used to help the Coastal Land Trust purchase the Ghost of Big Savanna. Some board members felt that all of the money should not go into one project, but that the money should be placed into the endowment and be used for stewardship programs in the name of B. W. Wells. After much discussion, the Board decided to give \$5000 of the bequest toward the purchase of the savanna property, \$1000 to the Charlotte Chapter for the purpose of developing a wildflower trail at Van Landingham Glen (details below), and the remaining \$9000 to the endowment for future stewardship projects in North Carolina's "natural

gardens". The board felt that the memory of B. W. Wells could best be preserved by granting the money, in his name, to a variety of stewardship projects around the state. Jean made the motion and Alice seconded. The motion passed with all in agreement.

Newsletter Issues:

Ken is serving as chair of the Publications Committee. He stated that we need to reprise the theme format for the newsletter used by Craig Moretz, former editor. Ken suggested that our natural gardens would be an appropriate theme for a newsletter. Ken announced that the propagation handbooks were printed and were stored in his garage. Everyone was expected to take some for sale to organizations and to individuals.

Grant Request:

Jean Woods, President of the Charlotte Chapter and Trustee of the Society, and Charlie Williams, Trustee, presented a project for consideration. The UNC Charlotte Botanical Garden is developing a wildflower trail in the Van Landingham Glen in honor of Andre Michaux. The Van Landingham Glen is a 7-acre garden containing more than 1000 species of native plants of the Carolinas, recreating natural plant associations that can be found from the mountains to the sea. The Michaux Trail would be an area dedicated to displaying in a natural setting as many of the 283 Carolina species discovered by Michaux as can be accommodated with the habitats available. The Charlotte Chapter would provide volunteers to propagate, plant, weed, label and lead tours for the Trail. The botanical garden would mentor the volunteers in the propagation of wildflowers and credit the NCWFPS donation in its brochures at the Garden. The volunteers would then propagate plants named by or named after Michaux for the botanical garden to sell. They requested \$1000 to be used in the following manner:

Purchase 3 signs at \$150 each	\$450
Design and print a simple brochure	\$250
Purchase 100 plant labels	\$ 70
Purchase additional plants	\$330

The Board saw this proposal as an appropriate project to fund through the B. W. Wells Endowment and the Board unanimously passed the motion to grant the funds. Charlie also passed out brochures and encouraged members to publicize the Michaux Symposium being held at Belmont Abbey in May 2002.

Charlie is one of the organizers of the Symposium.

Future Meeting Dates:

Jocassee Gorges	April 13-14
Michaux Symposium	May 15-19 (to included field trip to Grandfather Mt. with Ritchie Bell)
NCWFPS picnic	June 22 – Hagan Stone Park, Greensboro
Holly Shelter or Southeast Coast environs	October 11-13

There was no further business and the meeting was adjourned. Ken distributed the newly printed NC Native Plant Propagation Handbooks to board members.

Submitted by Charlotte Patterson
Acting Recording Secretary



Minutes of the NCWFPS Board Meeting Held August 24, 2002

The Board shared lunch at the home of Katherine Schlosser. Katherine treated us to her delicious homemade black-eyed pea and kale soup. Katherine is the newly appointed newsletter editor who is taking the place of Ed Tokas, who is stepping down. Those present included Emily Allen, Past President; Ginny Bacik, Treasurer; Vonda Frantz, Membership Chair; Marlene Kinney, Corresponding Secretary, Membership Chair; Carla Oldham, Trustee; Charlotte Patterson, Past President; Katherine Schlosser, Editor; Pete Schubert, Trustee, Plant Rescue Coordinator; Wendy Weiher, Trustee; Charlie Williams, Trustee; Jean Woods, Vice President; and Alice Zawadzki, President.

Bylaws:

Alice called the meeting to order and the first issue of discussion was related to the bylaws revision. Carla agreed to chair an ad-hoc committee to review and revise the bylaws. She sent all members of the Board an electronic copy of the by-laws for review before the meeting. Several issues were discussed related to terms defined by the bylaws. The distinction between the Executive Board and the Board of Directors was clarified: the Executive Board consists of the elected officers and the Board of Directors consists of the elected officers plus chairs of committees, past presidents, and trustees. A quorum was defined as the majority of the members of the Board. Alice suggested that the Nominating Committee might need to be a standing committee for longer than is required by the bylaws (developed prior to each election). Jean expressed her concern that all nominations should be brought before the Board before individuals are asked to serve. Jean motioned that we table the issue of bylaws until a committee can present a revision for discussion. Alice suggested that we select issues from the agenda that needed a vote and concentrate on those issues.

Meetings:

The Board discussed several scheduling options for board meetings. Several options have been tried and all were discussed, including their problems. Friday nights before weekend meetings did not allow all members to get there in time. Friday nights are now better used for social gatherings and informal discussion of issues. Saturday afternoon meetings and Saturday night meetings allowed limited time and were often exhausting due to the hiking activities of the day. Jean stated that she had been told that board meetings had

traditionally been held a few weeks prior to the general meeting in order to straighten out details of the weekend. Charlie suggested that, due to his work schedule, he would be better able to participate in board meetings if they occurred on Sunday and were scheduled well in advance. Jean felt that we should have two business meetings and that committees should bring their business to these meetings after having met separately. Vonda suggested quarterly meetings. Jean added that all board members should be expected to be at all four board meetings, and that they should be removed if they miss two meetings in a row. Alice felt that our weekend gatherings were best used for bonding and brainstorming with the general membership. Vonda made a motion that the Board should have quarterly meetings. Marlene seconded the motion, which was passed unanimously. Since attendance has traditionally been better at board meetings that were located centrally to the state, central locations will be sought for future board meetings. Four dates were selected for the next year:

November 10, 2002

February 23, 2003 in advance of the Spring meeting

June 7, 2003 at 10:00 a. m. prior to the picnic activities

August 24, 2003 prior to the Fall meeting

Jean stated that our next Spring meeting is scheduled for April 11, 12, and 13 at the Coker Arboretum. A casual meeting of board/membership will be scheduled for that weekend. Alice suggested that we make the informal gatherings a time to discuss issues as specified by the meeting notices that are mailed.

Wells Bequest:

Alice asked that we reconsider our allocation of money from Maude Wells' bequest to the Society. Ken Moore and Nancy Hillmer had communicated to Alice that, based on their close association with Maude, they felt she would have preferred that the whole \$15,000 be used to preserve the Ghost of Big Savanna property being purchased by the Coastal Land Trust (CLT). B. W. Wells and Maude had hoped to preserve their savanna property, but since they were unable to sell it to a conservation-minded group, it was eventually developed. The Ghost of Big Savanna property contains the same types of plants and soil as the Wells savanna now lost to development. Alice reviewed the discussion that led to our original decision and reviewed the costs of the land purchase and maintenance. The CLT campaign is to raise \$120,000. \$60,000 of the money will be used for land purchase and the other \$60,000 will be

used for stewardship and maintenance.

The Board discussed modifying the original proposal by taking \$1,000 out of our operating funds and the \$9,000 designated for the B. W. Wells Endowment fund and creating an endowment which we would then donate to the CLT for stewardship of the Ghost of Big Savanna. Marlene stated that the royalties from *The Natural Gardens of North Carolina* should go to the Endowment. Carla made a motion that all royalty payments from the Wells book go to the Endowment fund. Charlie seconded the motion.

The Board continued with a discussion of finances. Ginny reported a total of \$49,329.52 in all accounts. The Shinn Fund has, in rounded figures, \$9,000 in checking and \$14,000 in money market funds. Approximately \$23,000 is in the regular checking account, including the remaining \$9,000 which had been earmarked for the Wells Endowment. An additional \$2,600 is remaining in grant funds, which we discovered was overdue to be paid to Wendy for Volunteer Coordinator duties.

Ginny said that \$126 of each \$300 lifetime membership goes into the Shinn Fund, which Pete determined is a 70% share of the original \$180 cost of a lifetime membership. Members also become lifetime members automatically after being a paying member for thirty years. There are currently 64 lifetime members and 280 members who pay yearly. Vonda suggested that we might want to look at raising our dues in the future.

Pete made a motion that we give the \$10,000 to the CLT. Jean amended the motion to state that we transfer the \$10,000 to the B. W. Wells Endowment fund and refer the issue of refunding the Endowment to an audit committee. Pete seconded the motion. Further discussion was related to concerns that we were modifying our original proposal from February. Pete stated that he felt we were making the decision we would have made if full information had been available at the time. Vonda suggested that we start a campaign to refund the Endowment. The 2-part motion was restated: (1) \$9,000 from the Wells money and \$1,000 from the checking account should go to the CLT, and (2) an audit committee should look into ways to refund the Endowment. Both motions carried unanimously. The Audit Committee, according to the by-laws, is composed of the President, Vice President and one other member. Wendy volunteered to be on the audit committee. Vonda made a motion, seconded by Jean, that Wendy be placed on the Audit Committee. The motion carried unanimously.

Mailing Lists:

The question of whether or not to make our mailing list available to other organizations was discussed. Alice stated that in the past, organizations have sent us their invitations to events along with postage and we have mailed them ourselves. Pete moved that we establish a policy not to share or sell our mailing list, but to decide on a case-by-case basis if information from other organizations should be mailed. We would do the mailing of invitations. Pete added that this policy should not preclude us sending out information at the request of our members. Jean added that the events shared with members in this manner should meet the objectives of the Society. Marlene seconded the motion. The motion carried unanimously.

Other Business:

Jean went over the plans for the Fall 2002 trip. Vonda recommended that we need a directory of the Board. There was also discussion about how contact information for board members should be listed in the front cover of the newsletter. All decided that phone numbers and email addresses would be listed for board members in the front cover of the newsletter. The need for a membership directory was also discussed, although Ginny stated that the current membership list would have to be purged of delinquent and deceased members. Current policy has been to continue to send information to delinquent members for a period of three years. All those present felt that this length of time was excessive, and that perhaps a "We miss you" reminder should be sent after the first year. If no response is received, membership should be terminated.

The Board appointed a strategic planning committee. The members are: Vonda Frantz, Jean Woods, Wendy Weiher, Charlie Williams, Alice Zawadzki, and Charlotte Patterson.

Emily Allen shared an article from the Pickens County Progress (Thursday, June 20, 2002) about the exploding deer population and its disastrous effect on wildflower populations and on the dwindling bird populations due to loss of vegetation. Emily expressed her concern that organizations bring this problem to the attention of the public and discuss the need for deer management plans.

Since there was no more business, the meeting was adjourned.

Submitted by Charlotte Patterson
Acting Recording Secretary

NCWFPS

Membership Application

Annual Dues:

- | | |
|--|----------|
| <input type="checkbox"/> Individual or Family | \$15.00 |
| <input type="checkbox"/> Sustaining | \$25.00 |
| <input type="checkbox"/> Life Membership | \$300.00 |
| <input type="checkbox"/> Local Chapter Dues | \$5.00 |
| <input type="checkbox"/> Scholarship Fund Donation | \$ _____ |

Total Enclosed \$ _____

Your Name: _____

Address: _____

City _____

State _____ Zip Code: _____ - _____

Telephone _____

Email: _____

Send completed form and check to:

North Carolina Wild Flower Preservation Society, Inc.
c/o North Carolina Botanical Garden
Totten Center 3375 UNC-CH
Chapel Hill, NC 27599-3375

Contact the NCWFPS by calling 919-834-4172 or visit our web site at

www.ncwildflower.org

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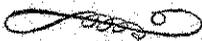
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