The Journal of the

South Carolina Native Plant Society

Winter 2010

In this issue

Name That Native Plant!

This tall (3 to 6 feet) native perennial grass is much more comfortable in warmer conditions, but alas, winter comes every year. It is common in the tall-grass prairies, but is also native to the Carolinas. It grows in large bunches, with numerous short, thick rhizomes, and has an open panicle inflorescence. This grass travels in important circles, having had its name dropped in the great halls of power. But as we well know, into each life a little freezing rain must fall.

The answer is embedded in the text somewhere in this newsletter. Photo by Bill Stringer.

Figure 1. Pawpaw flowers - Asimina triloba
Photo courtesy of Wendy VanDyk Evans, Bugwood.org

Understory Tree - Pawpaw

By Ken Gohring

Some understory trees provide edible fruit in addition to their value as landscaping plants. The native plant considered in this article, the pawpaw (*Asimina spp.*), has fruit that is valued for human consumption. The tree's fruit-bearing quality also makes it attractive to gardeners with an interest in providing something for wildlife. The pawpaw has attracted significant attention because of its desirable culinary properties, so much so that it is offered by numerous fruit tree nurseries throughout the country.

The most common and widespread species of this genus is *A. triloba*, which is found throughout the eastern United States and north to New York, Michigan, and Ontario, Canada. In fact there is a city in Michigan named Paw Paw. The range extends west to Nebraska and south to Texas and Florida. There are eight other closely related species, found predominately in Georgia and Florida. These species have a variety of common names such as big-flower pawpaw, polecat-bush, and gopher-berry. The majority of these species are found primarily in Florida, which is not surprising considering the close kinship of pawpaws to other tropical species. Several of these are called dwarf pawpaw, including *A. parviflora*, which is discussed in some detail below.

*(See **Pawpaws**, page 4)*

The View From Here

Jeffery Beacham

Greetings, fellow SCNPS members.

As you are likely aware, new state board officers were elected in October at our annual symposium. As your new president, I am looking forward to this new year and working with the State Board of Directors on the many exciting projects throughout the state, and assisting local chapters in program development.

Let me give you some background on myself and my prior involvement in the SCNPS. I have a doctorate in Biological Science with a concentration in ecology. I have held several university academic positions, and spent a considerable portion of my career in environmental consulting. My work has involved research in animal behavior and ecology, and applied projects in ecological restoration, environmental impact assessments, and natural resources management. I am presently the Executive Director of the Conestee Foundation and an Adjunct Professor in the Department of Biological Sciences, Clemson University. The Conestee Foundation's mission is development of a regional nature park along the Reedy River in Greenville County. This park, Lake Conestee Nature Park (www.conesteepark.com), currently is a 400-acre facility that is the southern hub of the developing Swamp Rabbit Greenway that courses from Travelers Rest to the Village of Conestee just south of the City of Greenville. The park has been a regional recourse for environmental education for many groups from public schools and universities to government agencies to environmental advocacy organizations; and there are several on-going graduate student and faculty research projects at the park. It is our mission to develop a comprehensive regional environmental outreach program and construct an environmental education and research center to serve the public, upstate K-12 schools, and universities. My involvement in the SCNPS has been primarily associated with the Upstate Chapter through several projects at Lake Conestee Nature Park. These projects involve native plant restoration and enhancement, including an exciting Piedmont prairie restoration.

Thomas Angell from the Low Country Chapter is our new Vice President, and Secretary Kim Counts, also from the Low Country Chapter, is our new Secretary. Thomas is the principle of Verdant Enterprises, LLC in Walterboro, specializing in environmental site planning and design; and Kim is a stewardship biologist for the SC Department of Natural Resources on the ACE Basin National Estuarine Research Reserve. We all look forward to rolling up our sleeves and supporting the growth of the SCNPS, and working with other environmental organizations and agencies to promote the value of native plants and effective stewardship of the rich and abundant ecological resources of South Carolina.

I know you all join me in thanking Bill Stringer and Wes Burnett for their dedication and accomplishments as past President and Secretary. Their service has been exemplary. Their jobs on the board are not over, however. Bill and Wes will continue their service in helping us new board members come up the curve in the operations of the society's business and initiatives. Thanks, Bill and Wes. For now, I look forward to visiting each of our chapters, hearing your ideas, and understanding your initiatives and how we collectively can fulfill our mission.

Cheers,
Jeffery Beacham

SC Native Plant Society Native Plant Seed Collections

Bill Stringer

For several years the SC Native Plant Society has been leading native plant seed collection field trips in various parts of our State. We have been working with funding from US Forest Service to collect small amounts of local native grass and forb seeds for use by the USFS in their restoration efforts in the National Forest districts across the state. This program came about because SCNPS and USFS agreed that we should use, to the degree possible, only local-source native seeds on our public lands. So we have collected seeds in the Piedmont to use in the Pickens, Long Cane and Enoree NF districts, and in the Francis Marion NF for use in that district. We were able to locate significant populations of native warm-season and cool-season native grass and forb species for collection. We have been running four field trips in October and November to collect warm season species, and two field trips in early summer to collect cool-season species.

We have used USFS funds to support SCNPS and other volun-

*(See **Collections**, page 12)*

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The Flora of Little Mountain: The first year of a floristic project

Dr. Charles Horn
Professor of Biology, Newberry College

Shortly after starting my academic career at Newberry College in 1986, I learned of an interesting area in Newberry County known as Little Mountain. In looking at a topographic map, I thought it would be an interesting place to visit (even though it isn't really a mountain) and expected to find some unusual plants there. But, I never seemed to get there. Now, some 23 years later, the idea has become a project: to survey the plant species on and around the mountain.

Figure 1. Little Mountain and vicinity. Courtesy of Google Earth

In March 2009 I was invited to visit Rocky Branch Creek, an area east of and adjacent to Little Mountain. The project at that time was being headed up by Bert Pittman of DNR and Buddy Johnson, the mayor of Little Mountain. I was told that some unusual plants had been found along the creek. I received a short species list from a couple of field trips by a SC Association of Naturalists group. They had been to the site in 2007 and had seen 95 species of plants in their excursions. We scheduled a field trip for April 10.

That morning we gathered in downtown Little Mountain along highway 76. I already knew Bert and his colleagues, Cathy Boyle and Herrick Brown and I was introduced to Buddy Johnson. Buddy is not your typical small town mayor. He is excited about the many potential facets of running a small town and is also excited about preserving the natural beauty of the mountain. He had already convinced a couple who owned property along a stream to the east of the mountain that it would be ideal to put it into a conservation easement.

Quickly the simple afternoon hike along a stream in Newberry County to see silky camellia and fraser magnolia became a two year project to document the plants of the mountain. In talking to Buddy, I reviewed my previous project at Lynch's Woods Park (also in Newberry County) and how I had identified over 500 species of plants during a four-year study. I suggested that similar numbers might be found in the Little Mountain area with an in-depth survey. Buddy was excited about the prospect of taking monthly field trips to all areas of the mountain to look for all kinds of plants. Not only was he excited about the idea that so many plants might be found, but he wanted to go along on the field trips. He didn't just want to know there were a bunch of plants, he wanted to see each species and hopefully learn a few.

Little Mountain is a geologically interesting place to visit. It is located in the piedmont of South Carolina, adjacent to the city of the same name. Geologically, it is composed of rocks resistant to erosion (including kyanite quartzite) which has resulted in a monadnock. The surrounding rock formations are part of the Carolina Slate Group which covers much of central South Carolina northeastward into North Carolina near Charlotte. Little Mountain is actually a series of three peaks along a line extending about 2.5 miles, oriented northeast to southwest (**see Figure 1**). The peaks have been measured at 773, 796 and a little over 810 feet elevation. The surrounding piedmont is at about 550-600 feet elevation; giving an elevation difference of about 250 feet. On the first field trip Buddy was quick to point out the rusty red kyanite rock, which is common on the slopes (**Figure 2**).

Figure 2. Kyanite and quartz outcrop near top of ridge. Courtesy of Charles Horn

*(See **Little Mountain**, page 6)*

***Pawpaws**, from page 1*

Pawpaws, with their large leaves and pleasing shape, make attractive native garden plants. They are said to be the only plants that the larvae of zebra swallowtail butterflies will eat. Another distinguishing characteristic is that the pawpaw's fruits are the largest of any American native fruit tree.

Asimina triloba

There are many interesting common names for this species, such as poor man's banana, Hoosier banana, and custard apple. It is native to the forests of the eastern U.S., and American Indians are credited with spreading the species to other locales farther west. Fossil records indicate that the species is indigenous to the US. However, it is related to various tropical fruit plants of the *Annonaceae* genus, such as cherimoya (*Annona cherimola*) and sweetsop (*Annona squamosa*). Pawpaws share many of the characteristics of these tropicals, such as aromatic fragrance, sweet taste, and short shelf life of the fruit. It is believed that the name "pawpaw" is derived from the Spanish word "papaya" because of the similarity of their respective fruits. In the botanical name, *Asimina* means "food of the gods," and *triloba* probably refers to the plant's three-lobed blossom.

The pawpaw is a deciduous, pyramid-shaped tree that can grow as high as 20 feet or more. The tree is found in fertile soils near streams and adjacent areas as an understory tree or in shrub-like clumps or thickets. This tendency to form thickets is primarily due to the fact that the species forms root suckers; secondarily, seeds may fall to the ground and germinate close to the parent plant.

The tree has a tropical appearance with its large, dark green, oblong, drooping leaves that grow up to 12 inches in length. The leaves resemble those of young hickory trees and are said to emit the smell of green peppers when crushed. That is what my forester son and one of the GNPS's program speakers have stated, but I personally cannot detect that fragrance.

Pawpaws have relatively small, maroon blooms (**Figure 1**), which one writer has described as being "upside down." They appear before the leaves and are borne on the previous year's wood. Blooming occurs in late March in some locales, or later depending on latitude and climatic conditions. Each flower contains several ovaries, enabling a single flower to produce several (up to eight or nine) fruits. The pawpaw flower is perfect, having both male and female parts. However, the flowers are also **protogynous**, a term botanists use to describe a phenomenon where the male and female portions of the bloom mature at different times and thus the plant avoids self-pollination. Virtually all pawpaws are said to be self-incompatible in any event, requiring pollination from an unrelated individual.

Flies and beetles are the main pollinators of the pawpaw. They are attracted by the maroon coloration of the bloom and the flower's fetid fragrance, both of which mimic the characteristics of rancid meat. Avid native plantsman and former GNPS president Jim Smith related an interesting story of his experience trying to pollinate his pawpaw tree. He described, in an edition of NativeSCAPE, his attempts to attract flies to his pawpaw tree by hanging a small piece of spoiled meat in the plant, hoping to attract them from afar to pollinate his tree. Alas, all Jim was able to attract was a stray cat and the curiosity of his neighbor. Some references tell of individuals using road kill in the same manner. Jim eventually solved his pollination problem by planting an unrelated pawpaw nearby. In general, the setting of fruit in the wild is very low; however, in cultivated environments large crops of fruit are produced. The fruits are oblong in shape and frequently appear in clusters, with each individual fruit resembling a mango.

Some describe the taste of the pawpaw fruit as a mixture of banana, mango, and pineapple. I located a bearing stand of pawpaws not far from my home a few years ago. I observed the green fruit (**Figure 2**) and intended to come back to the site later to pick some of the fruit when ripe. However, when I did return, all of the fruit were gone, probably consumed by raccoons or opossums. The next year I returned to the site to taste the fruit and collect a few seeds.

Figure 2. Pawpaw leaves and fruit - Asimina triloba Photo courtesy of Troy Evans, Eastern Kentucky University, Bugwood.org

Shaking the trees vigorously to fell the fruit was necessary as these trees were about 15 feet tall. I tasted the fruit but was not impressed with it. Perhaps the trees were not representative, as there appears to be significant variability in pawpaw fruit. I did save the seeds from the fruit that I ate and planted them. They went through the winter and I had a dozen or so seedlings the following spring. My experience withstanding, pawpaws have attracted significant interest. Renowned native gardener and troubadour Eddie Rhodes related finding a fellow gardener who was quite knowledgeable

about pawpaws and was able to get some plants that produced delicious fruits.

The shelf life of ripe pawpaws is two to three days. They can be refrigerated up to three weeks and maintain good eating qualities. The fruits have two rows of relatively large, bean-shaped seeds that can be as large as lima beans. The seeds contain materials that can cause digestive problems if chewed. The fruits are best used like bananas, and it is said that they can serve as a substitute in recipes. The fruit is quite rich in vitamins, exceeding apples and other popular fruits in nutritional value.

Figure 3. Smallflower pawpaw flower- Asimina parviflora. Photo courtesy of Ted Bodner, Southern Weed Science Society, Bugwood.org

Pawpaws are not currently a commercially important crop due to factors that limit their potential. However, other positive factors may overcome the limitations, such as the species' adaptability to existing climatic conditions, the nutritional value of the fruit, the plant's potential as an aid in fighting cancer, and its use as a natural insecticide. The fruit's tropical flavor and pleasant aroma are factors that make it potentially useful in blended drinks, baby food, and ice creams. The fruit purees and freezes well; however, heating the fruit causes it to lose flavor.

For several reasons, the pawpaw has attracted significant interest throughout its natural range, especially in Kentucky and Indiana. Kentucky State University in Frankfort has established a pawpaw germplasm repository and has tested and named more than 60 cultivars. Kentucky State also has an **excellent website devoted to the pawpaw**. In addition to some interesting and amusing pages, the website lists over 40 pawpaw cultivars, along with nursery sources for plants. An examination of the descriptions of the various cultivars indicates that factors such as low seed count, ripening time, plant size, fruit size and shape, resistance to frost, leaf habit, and fruit taste are considered in selecting cultivars.

Pawpaws are frequently found on rescues, but they are hard to transplant because of their brittle root structure and stoloniferous nature. One should avoid digging a plant that is a stolon, regardless of size. However, smaller, seedling plants can be moved successfully. The plants are relatively disease-free and resistant to insects.

Asimina parviflora

On several occasions, I have brought home a plant dug on a plant rescue, only to find the same plant growing in the areas around my house. One day among a bunch of sweet shrub growing near my storage shed, my son found and identified a pawpaw. He used the aforementioned pepper test to help verify the identity. Later, I found other similar plants growing elsewhere on the property. But these plants were much lower growing than those I had seen elsewhere. None of the plants grew over 5 feet tall. Since that original discovery, I have come to the conclusion that the pawpaw plants growing on my property are the dwarf pawpaw also called small-flowered or small-fruited pawpaw (**Figure 3**).

Last year I noticed one of the plants in fruit. It had a single, rather small fruit growing near the ground. This year the same plant produced several fruits growing about 2 feet above the ground. These fruits are relatively small compared to the fruit of the common pawpaw. I have a common pawpaw that I purchased that is about 7 or 8 feet tall. I have not noticed any fruit on this plant. I believe that the dwarf pawpaw's lower height enables it to become pollinated much easier since the insects do not have as large a distance to travel to reach the flower.

The dwarf pawpaw will grow in drier soils than the common pawpaw. On rescues I have seen pawpaws growing in relatively dry areas, and the size of these specimens would indicate that they are the dwarf species. The species is very similar to the common pawpaw but with smaller fruit, leaves, and structure (**Figure 4**). It is best described as a miniature version of *Asimina triloba*. It reaches tree size in some parts of Florida, but grows as a shrub elsewhere. It is found in most of the states that constituted the Confederacy.

Reprinted from NativeSCAPE, quarterly newsletter of the Georgia Native Plant Society.

Figure 4. Smallflower pawpaw Leaves and fruit - Asimina parviflora Photo courtesy of Ted Bodner, Southern Weed Science Society, Bugwood.org

***Little Mountain**, from page 3*

By the end of 2009 I had taken eight trips to the mountain to study its flora. In the process I have located and documented 299 species of vascular plants in the area. The most common types of plants included grasses (58 species) and composites (45 species). This is not too surprising, as these are large plant families, so a greater number of species should be found. Several interesting and rare species have already been located during the survey. Along the stream are a number of Fraser magnolia trees *Magnolia fraseri* **(Figure 3)**. This is a mountain species, typically found in Oconee, Pickens and Spartanburg counties. At first we noticed the large trees, including one with a trunk over six inches. On subsequent visits I found additional specimens, many as seedlings and saplings scattered along the flood plain. The magnolia is clearly doing well and spreading. Another mountain species is the mountain laurel (*Kalmia latifolia*). Unlike Fraser magnolia, mountain laurel is commonly seen scattered around the piedmont, along slopes above streams. At Little Mountain it produces some thickets along the slopes above the stream, especially on the rocky soils. I also spotted Indian cucumber (*Medeola virginiana*), which is not very common in the piedmont. This was the first time I had seen it in over 20 years; an exciting find for me. Along a power-line on a slope above the stream I found the rare piedmont aster (*Eurybia mirabilis*), a species with a limited distribution in North and South Carolina. The population at Little Mountain is one of less than 20 sites known in our state. One of the most exciting finds for Buddy Johnson was the silky camellia *Stewartia malacodendron* **(Figure 4)**, a species more common in the coastal plain, but scattered in other parts of the state. Soapwort gentian (*Gentiana saponaria*) brought some color to the floodplain in October. This species is widely scattered across the state, but not very commonly encountered. It grows right at the stream banks and produces a blue floral tube that barely opens. In the upland area we found a number of longleaf pines (*Pinus palustris*). Little Mountain seems to be out of place for this species of pine, which we found mixed in with loblolly and short leaf pines. Buddy's impression was that the longleaf pines were planted at some time in the past, but he did not know when or by whom.

Figure 3. Fraser magnolia in canopy of other forest trees on floodplain of Rocky Branch. Courtesy of Charles Horn

In addition to the survey for species, I have also started working on describing the plant community structure. I will be doing this by systematically sampling plots and recording the tree species present, their numbers and size, as measured by tree diameter. This combination of number of individuals and their size can be mathematically manipulated to produce an Importance Value for species in a forest area. This last fall I was able to take my ecology class from Newberry College out to make the measurements on over 244 trees along a slope near the top of Little Mountain. From this we determined that the most important trees were mockernut hickory (*Carya alba*), black gum (*Nyssa sylvatica*), white oak (*Quercus alba*), post oak (*Quercus stellata*), and pignut hickory (*Carya glabra*). This data suggests that the community is a typical upland oak-hickory forest. Mature examples of this forest community type are not common in switchgrass *Panicum virgatum* South Carolina, thus I felt privileged to be able to measure and document this type of community in Newberry County.

For the coming year I will continue with monthly trips to the Little Mountain area. On each trip I hope to visit areas I have not previously explored. In 2009 I concentrated on the ridge tops and the stream bottom to the east. I need to look more

Figure 4. Silky camellia, Stewartia malacodendron. Courtesy of Charles Horn

at the slopes, especially to the north and west of the main mountain ridge.

Little Mountain is not only of interest to naturalists, but has long been of interest to those needing to communicate. Since the mountain is the highest point around, a number of communications towers have been built there. Several of the towers are still in use, but not all of them. Buddy would like to see the area around one of the towers, including a building, be used for a nature center. Let's hope we will be hearing about the Little Mountain Nature Center in the near future!

Definitions:

Monadnock - an isolated rocky hill, knob, ridge, or small mountain that rises abruptly from a gently sloping or virtually level surrounding plain.

Importance value - Importance values rank species within a forested site based upon three criteria:

1) how commonly a species occurs across the entire forest;
2) the total number of individuals of the species;
3) the total amount of forest area occupied by the species.

Mayor Buddy Johnson next to beech tree on floodplain of Rocky Branch. Courtesy of Charles Horn

Janie Marlow Wins SCWF Harry Hampton Award

Wesley Burnett

Our very own Janie Marlow is this year's winner of the South Carolina Wildlife Federation's Harry Hampton Woods and Waters Conservation Journalism Award. Harry Hampton was a writer and editor for The State newspaper, and an early supporter of preserving natural habitats in South Carolina. He launched a one-man campaign to save the Congaree River floodplain as a natural preserve, and is considered the father of the Congaree

Bill McCabe, Janie, Ben Gregg, Bill Stringer

National Park. The Harry Hampton Memorial Wildlife Fund is an important supporter of protecting South Carolina's natural resources.

Janie, a member of the Upstate Chapter, spearheads its publicity and publication efforts, including editing its monthly news letter. She has also designed table-top displays that are widely used throughout the upstate and have appeared at several NPS state functions. She gives generously of her time and talent at both the chapter and state level of the SCNPS

While we all appreciate her valuable contributions to the SCNPS, they pale next to the real reason Janie was honored this year by the South Carolina Wildlife Federation. She was selected because of her *magnum opus*, NAME THAT PLANT: NATIVE AND NATURALIZED PLANTS OF THE CAROLINAS AND GEORGIA (www.namethatplant.net). This web site facilitates access to plant identification by using photos of plants growing in different season and locations. It includes taxonomic information on a large and growing number of regional, naturalized, and invasive plant species, and an interactive guide to pronouncing those awful Latin names. Other information includes references to the plants at major national plant identification sites under both old and new taxonomic names, and considerable information on the ecologic structure of South Carolina and surrounding areas. This is a work of love that remains in progress so we can expect it to develop and add new features in the near and the distant future, but it has already made a huge amount of important information easily accessible and useful to thousands of people. If you haven't visited the site as yet or haven't bothered to become familiar with its many features, you really should.

The award was bestowed on Janie at the South Carolina Wildlife Federation's 45th Annual Conservation Award Banquet held on January 23, 2010, at the Clarion Hotel in Columbia, SC. Those attending the banquet with Janie were her husband, Steve, and Rick Huffman, Bill Stringer, Eva and Sam Pratt, and Wesley Burnett. It was a very special evening for a very special person.

Janie Marlow, Wesley Burnett, Eva Pratt and Steve Marlow

Identifying Native Bamboos

Margaret C. Cirtain, Department of Biological Sciences, University of South Carolina,

The bamboos native to the southeastern United States are *Arundinaria* species (grass family, Poaceae); *A. gigantea* (river or giant cane), *A. tecta* (switch cane), and *A. appalachiana* (hill cane). They are unique globally as the only temperate native bamboos in this hemisphere. Rarely found in urban areas, they are most often located in rural areas with infrequent to no disturbance, for example along stream banks and field and fence edges. They are also often understory plants in forested landscapes, such as in Congaree National Park (**Figure 1**).

Figure 1. Switch cane is a common understory component of the Congaree National Park forest.

Historically, native bamboos formed extensive canebrakes, often stretching for miles and so dense that early travelers and explorers would detour around them. Using these canebrakes as habitat, many animals foraged and nested within the thick, protective cane stands. The diversity of canebrake dwellers was large, from many invertebrate species including butterflies and moths, to avian species (Swainson's warbler), reptiles (canebrake rattler), and mammals (black bear, swamp rabbit). The native bamboo canebrake is now an endangered ecosystem, having declined by 98% from its former extent. The loss of canebrakes has had a negative impact on these faunal species, with some being extirpated or extinct. Additionally, ecosystem services provided by canebrakes have been drastically reduced. Researchers have found that river cane impacts two critical ecosystem services, 1) improving water quality contaminated by agricultural runoff and 2) reducing erosion on stream banks and road sides (**Figure 2**). This loss also had a negative impact on Native American cultures that relied heavily on cane for artisan crafts, basketry being one.

While many of the bamboos found in the southeastern United States are invasive non-native species, they may be distinguished from the native species fairly readily. One of

Figure 2. River cane found along a stream bank, Coldwater River in northern Mississippi.

the most aggressive non-native species is golden bamboo, *Phyllostachys aurea*. This species is found along the Broad River in Columbia, SC. The stand shown in **Figure 3** is typical of those found in the landscape across much of the United States. **Figure 4** shows another exotic *Phyllostachys* species, *P. makinoi*. Golden bamboo, as well as other bamboos in the genus *Phyllostachys*, were introduced as ornamental plantings as early as the mid-1800's throughout the US. Another common introduced ornamental was *Pseudosasa japonica*, or arrow bamboo, (**Figure 5**).

Figure 3: Stand of golden bamboo found along Highway 72 near Corinth, MS.

Differences in distribution and vegetative characteristics help to distinguish among *Arundinaria* species and from non-native species. Typically river cane is more widely distributed in the southeastern US, switch cane in coastal plains and lower elevations, and hill cane in higher elevations (Appalachian Mountain region).

The morphological characteristics of the bamboos are unique. The underground system is primarily composed of

Figure 4. Stand of Phyllostachys makinoi in North Carolina near the Joyce Kilmer Memorial Forest.

Figure 5. Arrow bamboo commonly found in midtown Memphis, TN.

segmented rhizomes, with roots extending from the rhizome nodes. Bamboos are divided into two rhizomal types, **pachymorph** (or clumping), and **leptomorph** (or running). The aboveground culm and branches are composed of segmented components consisting of solid nodes and hollow internodes.

Monopodial branching (one main axis with secondary branches arising from it) develops from axillary buds at the nodes, on alternating positions along the culm. Bamboo bud or branch grouping at the node is called a branch complement. The number and pattern of the branches composing the branch complement (typically at mid-culm) is a useful means of species identification. There are two types of bamboo leaves, culm and foliage. The culm leaves form protective sheaths around the culm; the primary function of foliage leaves is photosynthesis. Bamboos rarely flower and produce seed, but primarily propagate vegetatively. It has been estimated that Arundinaria species flower at 20 – 30 year intervals (**Figure 6**) and seed is often not viable.

All three *Arundinaria* species have leptomorphic rhizomes differing only in presence (switch cane and sometimes in hill cane) or absence of air canals (river cane). River cane culms are generally taller than the other two species with a height from 2 to 8 meters and a slightly larger culm diameter. The branch complement characteristic for the *Arundinaria* spp. is one of the most useful in not only distinguishing among the three species, but from other bamboos as well (**Table 1**). All three species exhibit multiple branch complements, in that 3 – 5 primary branches grow from a single node. They differ in the number of unexpanded basal internodes that appear like scales at the base of the primary branches. Foliage is another distinguishing characteristic among the three species with hill cane having papery, deciduous foliage leaves while switch cane and river cane have leathery, persistent foliage leaves.

Additional information can be obtained from two excellent sources:

American Bamboos by E. J. Judziewicz, L. G. Clark, X. Londono, and M. J. Stern; and Bamboo for Gardens by T. J. Meredith.

Figure 6. Flowering Arundinaria gigantea

Figure 7. Topknots of Arundinaria. Photo courtesy of Ron Lance.

Dichotomous Key for identification of ARUNDINARIA Michx. (Lynn G. Clark and J.K. Triplett)

1. Primary branches with 0–1 compressed basal internodes; culm internodes usually sulcate; culm leaves deciduous ... *A. gigantea*
1. Primary branches with 2–5 compressed basal internodes; culm internodes usually terete; culm leaves persistent to tardily deciduous ... 2
2. Foliage blades coriaceous, persistent, abaxial surfaces densely pubescent or glabrous, strongly cross veined; primary branches usually longer than 50 cm, basal nodes developing secondary branches; topknot blades 20–30 cm long ... *A. tecta*
2. Foliage blades chartaceous, deciduous, abaxial surfaces pilose or glabrous, weakly cross veined; primary branches usually shorter than 35 cm, basal nodes not developing secondary branches; topknot blades 9–22.5 cm long ... *A. appalachiana*

Arundinaria gigantea (Walter) Muhl. (River Cane, Giant Cane)

Rhizomes normally remaining horizontal, sometimes hollow-centered, air canals absent.
Culms 2–8 m tall, to 3 cm thick; **internodes** typically sulcate distal to the branches.
Culm leaves deciduous; **sheaths** 9–15 cm; **fimbriae** 2.2–7 mm; **blades** 1.5–3.5 cm.
Topknots of 6–8 leaves; **blades** 16–24 cm long, 2–3.2 cm wide, lanceolate to ovate-lanceolate.
Primary branches to 25 cm, erect or nearly so, with 0–1 compressed basal internodes, lower elongated internodes flattened in cross section.
Foliage leaves: abaxial ligules usually ciliate, sometimes glabrous;
blades subcoriaceous, persistent, evergreen, 8–15 cm long, 0.8–1.3 cm wide, bases rounded, abaxial surfaces glabrous or pubescent, strongly cross veined, adaxial surfaces glabrous or almost so.
Spikelets 4–7 cm, greenish or brownish, with 8–12 florets.
Glumes unequal, glabrous or pubescent, lowest glumes obtuse to acuminate or absent;
lemmas 1.2–2 cm, usually appressed-hirsute to canescent, sometimes pubescent only towards the base and margins.
Caryopses oblong, beaked, without a style branch below the beaks. 2n = 48.

Arundinaria gigantea forms extensive colonies in low woods, moist ground, and along river banks. It was once widespread in the southeastern United States, but cultivation, burning, and overgrazing have destroyed many stands.

Arundinaria tecta (Walter) Muhl. (Switch Cane)

Rhizomes normally horizontal for only a short distance before turning up to form a culm, hollow-centered, air canals present.
Culms usually shorter than 2.5 m tall, to 2 cm thick; **internodes** terete in the vegetative parts.
Culm leaves persistent to tardily deciduous; **sheaths** 11–18 cm; **fimbriae** 1.5–8.5 mm; **blades** 2.5–4 cm. **Topknots** of 9–12 leaves; **blades** 20–30 cm long, 1.8–3.2 cm wide, lanceolate to ovate-lanceolate.
Primary branches usually 50+ cm, basally erect and distally arcuate, terete, with 3–4 compressed basal internodes, basal nodes developing secondary branches, lower elongated internodes terete in cross section.
Foliage leaves: abaxial ligules fimbriate to lacerate, sometimes ciliate;
blades 7–23 cm long, 1–2 cm wide, coriaceous, persistent, evergreen, bases rounded, abaxial surfaces densely pubescent or glabrous, strongly cross veined, adaxial surfaces pubescent.
Spikelets 3–5 cm, with 6–12 florets, the first occasionally sterile.
Glumes unequal, glabrous or pubescent; **lowest glume** obtuse to acuminate or absent;
lemmas 1.2–2 cm, glabrous or nearly so.
Caryopses oblong, beaked, a rudimentary hooked style branch present below the beak. 2n = unknown.

Arundinaria tecta grows in swampy woods, moist pine barrens, live oak woods, and along the sandy margins of streams, preferring moister sites than A. gigantea. It grows only on the coastal plain of the southeastern United States.

Arundinaria appalachiana Triplett, Weakley & L.G. Clark (Hill cane)

Rhizomes normally horizontal for only a short distance before turning up to form a culm, sometimes hollow-centered, air canals sometimes present.
Culms 0.5–1 (1.8) m tall, 0.2–0.6 cm thick; **internodes** terete.
Culm leaves persistent to tardily deciduous; **sheaths** 5.5–11 cm; **fimbriae** 1–4.6 mm; **blades** 0.8–1.4 cm.
Topknots of 6–12 leaves; **blades** 9–22.5 cm long, 1.4–2.8 cm wide, linear, linear-lanceolate, or ovate-lanceolate.
Primary branches usually shorter than 35 cm, erect, terete, with 2-5 compressed basal internodes, basal nodes not developing secondary branches.
Foliage leaves: abaxial ligules glabrous or ciliate, fimbriate or lacerate; blades 5–20 cm long, 0.8–2 cm wide, chartaceous, deciduous, bases rounded, abaxial surfaces pilose or glabrous, weakly cross veined, adaxial surfaces pilose.
Spikelets 3–5.5 cm, usually somewhat reddish purple, with 5–8 florets. 2n = unknown.

Arundinaria appalachiana grows on moist to dry slopes and in seeps. It is restricted to the southern Appalachians and upper piedmont.

Definitions:

Rhizome - a characteristically horizontal stem of a plant that is usually found underground, often sending out roots and shoots from its nodes. Rhizomes may also be referred to as creeping rootstalks, or rootstocks.
Culm - the aerial stems of grasses and sedges.
Sulcate - having deep, parallel furrows or grooves.
Chartaceous – having a thin papery appearance.
Fimbria, fimbriae(p) – a fringe-like structure.
Abaxial - the abaxial surface of a leaf is the underside or side facing away from the stem.
Adaxial - the adaxial surface of a leaf is the upper side or side facing toward the stem.
Coriaceous - having a leathery texture
Top Knot - see Figure 7, page 9.

Table 1. Morphological comparison of *Arundinaria appalachiana*, *A. tecta*, and *A. gigantea*.

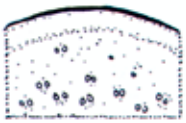
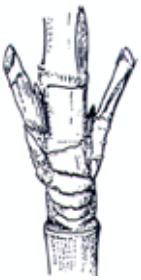
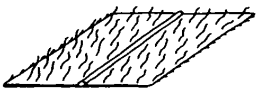
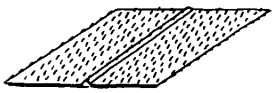
	A. appalachiana	*A. tecta*	*A. gigantea*
Rhizome air canals	 sometimes present	 Present	 Absent
Rhizomes	Horizontal short distance before turning up to form a culm; hollow centered	Horizontal short distance before turning up to form a culm; hollow centered	Normally remains horizontal; sometimes hollow-centered
Culm height	0.5 – 1 m	< 2.5 m	2 – 8 m
Culm diameter	0.2 – 0.6 cm	~ 2 cm	~ 3 cm
Culm internode	 round or flattened	 round or flattened	 sulcate or round
Culm leaf duration	persistent	persistent	deciduous
Culm leaf auricles (midculm)	 absent or weak	 often strongly developed	 often strongly developed
Top knot leaf blade length	9-22.5 cm	20-30 cm	16-24 cm
Midculm branch complement (1° branch base)	 2-5 unexpanded basal internodes	 2-4 unexpanded basal internodes	 0-1 unexpanded basal internodes
1° branch length	7-33 cm	Usually > 50 cm	15-25 cm
Foliage leaf pubescence	 sparse, long hairs or smooth	 dense, short hairs or smooth	 dense, short hairs or smooth
Foliage leaf duration	deciduous	persistent	persistent
Foliage leaf texture	papery	leathery	somewhat leathery
Foliage leaf abaxial tessellation	weakly tessellate	strongly tessellate	strongly tessellate
Distribution	Appalachian Mountains: ne. AL, n. GA, sw. NC, sw. SC and se. TN	Coastal Plain of se. US: e. MD to FL and s. MS (LA?)	Widespread in se. US: s. DE, s. IL, south to FL and west to e. TX.

Chart courtesy of Jimmy K. Triplett, Ph.D., Post Doctoral Fellow, Department of Biology University of Missouri, St. Louis

***Collections**, from page 2*

teers on training and collection field trips. We have collected in Oconee, Pickens, Greenville, Abbeville, Edgefield, McCormick, York, Union and Chester counties in the Upstate and Charleston and Berkeley counties in the Coastal Plain. In the process, we have been able to train hundreds of volunteers of all ages to recognize dozens of native plant species, to recognize seeds at the appropriate stage for collection, and to collect from native plant habitats in an ethical fashion.

USFS has used our collections over the years to plant gullied or logged areas in the Forest districts. In the process, they have established areas of native grasses from which they can harvest significant quantities of seeds. Consequently, they have been able to begin direct-seeding larger areas in the Forests.

This collaborative effort between our Society and USFS has been used as a model for USFS and other agencies around the region. It has been recognized with the Regional Forester's Technology Transfer Award. In addition, this successful program prompted the Steering Committee of the Eastern Native Grass Symposium to request that we host that Symposium in SC in 2008.

We will continue with these field trips for the foreseeable future as long as we can garner external funding to support the cost of program. So if you haven't been on 1 or more of these trips, there is still time to gain this valuable native plant experience. Please visit the SCNPS website to see the species that we have collected to date (http://www.scnps.org/activities.html), and to find schedules for future collections.

Lectures ~ Field Trips ~ Workshops

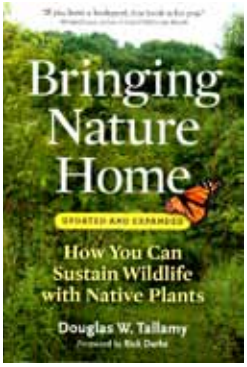
Lowcountry Chapter to host 2010 SCNPS Symposium May 7-9th Charleston, SC

In coastal South Carolina, life is nurtured by the ebb and flow of the tidal creeks and rivers, the rich dark earth, and the warm Carolina sun. This May, come enjoy a delightful and insightful weekend along the banks of the beautiful Ashley River observing this circle of Lowcountry life.

We are teaming up with historic Magnolia Plantation and Gardens to explore our theme: "Nurture Nature - It's Our Turn." Lectures, workshops and walks will be held in the beauty and bounty of a land that has felt the hand of man for centuries.

We'll kick things off Friday, May 7th, with something different for the early birds - a little group work project on the plantation. We'll help plant some natives, maybe attack some pesky invasives, so bring your gloves! This will be followed by our opening reception at the host hotel - Quality Suites Convention Center in North Charleston. We will have a silent auction and a collection of displays in various media interpreting the "Nurture Nature" idea. (Displays will be gathered from members and the public.) Plenty to look at as you re-acquaint with old friends and meet some new.

On Saturday we head to Magnolia. Our guest lecturer, co-sponsored by the Charleston Parks Conservancy, will be Doug Tallamy, author of the book Bringing Nature Home. (Buy his book early at one of our lecture meetings and read ahead! He'll be available to sign books at the symposium.) Doug will talk about his common-sense approach to why we should be using natives. He'll also guide a butterfly walk during our broad array of afternoon programs. We'll learn about Magnolia's current activities, including their new native azalea collection, and visit the very active wading-bird rookery (up close!) along the recently improved boardwalk through the Audubon Swamp Garden. Then we'll wrap up the day with an "Evening on the Ashley," featuring a local Lowcountry boil and inspirational Gullah singers.



Sunday, we will end the weekend with several field trip options, both structured and not: Francis Beidler Forest, tranquil Mepkin Abbey, historic Hampton Park, a few heritage preserves, Magnolia Plantation (in case you didn't see enough) and more.

So, mark your calendars for May 7th - 9th, 2010, and plan to spend a weekend in the South Carolina Lowcountry. You will find yourself surrounded by a great group of folks, talking and learning about our flora, discovering our history, and seeing how we can all help to "Nurture Nature."

Visit www.scnps.org **for upcoming agenda and registration information!**