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# South Carolina Native Plant Society

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## Frank Holleman Receives Governor's Environmental Awareness Award

In recognition of his outstanding contributions to the protection, conservation and improvement of the state's natural resources, Upstate Chapter board member Frank Holleman recently received the 2010 South Carolina Environmental Awareness Award. Frank's leadership was instrumental to the success of the Blue Wall Connection, which links lands in the Saluda watershed with conservation properties across the state's Blue Ridge escarpment. Frank was also a driving force rallying over 1000 private donors, state, city and other organizations to protect the environmentally sensitive and culturally significant Stumphouse Mountain from development. He has worked closely with the SC Department of Resources and the US Fish and Wildlife Service to help protect the endangered bunched arrowhead and Miccosukee gooseberry, and to educate others to that need. The SC Native Plant Society is proud to claim Frank as our own, a true steward with dedication, creativity and a talent for bringing together citizens, conservation organizations and governmental agencies to protect ecologically and culturally sensitive lands.

# Declining Shoals Spider Lily Populations in the Savannah River

## (You know, that boundary between Georgia and South Carolina).

*Drs. Judy Gordon and Donna Wear*
*Augusta State University*

For several years, the authors have been examining the decline of populations of state protected Shoals Spider Lily, *Hymenocallis coronaria*, in the Augusta Shoals area of the Savannah River, where it was first discovered in 1773 by famous naturalist, William Bartram. We recently published our research in the January 2011 issue of *Natural Areas Journal*, and here we share our findings with SCNPS members.

**Background:** Populations of this aquatic lily are declining throughout its southeastern range in Alabama, Georgia, and South Carolina. Several investigators have suggested factors that could possibly contribute to the decline of the Augusta Shoals populations, including river flow rates, sedimentation, water quality, and herbivory by deer and aquatic animals such as beaver and muskrat. We knew that a population on Stevens Creek, a tributary of the Savannah River, was doing well (See Fig. 1) so we decided to compare the two habitats. We examined many parameters, including a lot of animal scat, water quality, production of flowers and seeds, clump size, and flow rate records (both actual and US Geological Survey) from 1892 to 2007. We also examined historic maps from the US Army Corps of Engineers (US-

*(See **Spider Lily**, page 4)*

*What the excitement's all about! Photo courtesy of Judy Gordon*

# Bradford (Callery) Pear: An Invasive Plant Problem

*By Bill Stringer*

## Like most of us, Bradford pears have a dark side.....

*Figure 1. A swarm of Bradford pear seedlings developing in a stand of native grasses. They arose from the clump of landscape trees in the background. Photo courtesy of author.*

Bradford Pear (*Pyrus calleryana*) has endured a long history of ambivalence. Its huge show of white flowers in early spring has made it a very popular landscape tree in home, urban and industrial site landscapes. But then, its weak stem and branch structure create huge splitting problems in our occasional winter ice storms, when folks have to saw it up and haul it away. However, *Pyrus calleryana* has a third side which makes it a very poor choice for our landscapes. It is proving to be highly invasive of surrounding open land.

Why invasive? Most Bradfords produce copious crops of small (1/2 inch) hard pears. With the onset of cooler weather, these fruits soften up a bit and become very popular with birds. The seeds pass through the birds and get deposited on the surrounding land. These seeds are very viable, and germinate and establish in large numbers. The result can be dense populations of young pear seedlings (see Figs. 1 and 2) which can quickly become a large thicket in areas that are not mowed at least annually. If not mowed, the fast growing seedlings will become a dense "forest".

"Well, what's wrong with that?" you might ask. "Won't that be a spectacular sight in early spring?" Maybe, but there are actually several severe problems that arise from such a development:

1) The dense cover of pear trees rapidly shades out native grasses, forbs, shrubs and native tree seedlings. This will dramatically reduce the native plant diversity of the site. A site that might contain an attractive, interesting community of native grasses, sunflowers, asters and native legumes is converted to an ecologically barren monoculture of Bradford pears. This loss of plant diversity has impacts far beyond the plant world.

2) Bradfords are known to have few insect herbivores, so a dense thicket of them produces very little biomass of native caterpillar and other insect larvae. "Well, that's wonderful", you might say, but you'd be wrong. A strong connection has been established between the amount of insect biomass produced on a landscape and the breeding success of songbirds on the landscape. Caterpillars and other insect larvae are the staple food needed to grow songbirds to maturity. Adult songbirds have to work really hard to find enough food for their babies in areas with low density of insect larvae. What kinds of plants produce insect biomass? The answer is: native trees, shrubs, vines and herbaceous plants. Introduced species like Bradfords have low numbers of insect species that can reproduce on them. Thus a dense planting of Bradford pears will be an empty plate for breeding songbirds. The diverse native plant community that was displaced by pears would be a much better habitat for breeding songbirds

3) Seeds from the thornless Bradford trees used in landscaping actually produce seedlings with long, sturdy, woody thorns (See figure 3). So the trees that develop from the dense stand of seedlings in Figure 1 will grow into a hostile thicket that will be dangerous place to walk your pet, or for your children to play in.

So the invasive nature of Bradford pear has the potential to radically change the natural landscape in your neighborhood. Diverse native plant communities will be converted to a boring thicket of pear trees. The

*Figure 2. Bradford seedlings at the base of a handy bird roosting site across the street from several landscape specimens. Photo courtesy of the author.*

*Figure 3. Heavy thorns on Bradford pear seedlings. Ouch!! Photo courtesy of author.*

loss of native species communities, and their complex web of insect herbivores, will create an ecologically barren community of little value in the support of breeding populations of songbirds and other wildlife. And the pear forest will be a hostile, thorny, dangerous place, fit for neither man nor beast. All this from a home landscape tree that at best will last 15-20 years? In my opinion, it doesn't add up.

But there are some beautiful native tree species alternatives that are not invasive, and that are compatible with songbirds and other wildlife. These include:

**Various hawthorns**, *Crataegus* L. *

**Serviceberry**, *Amelanchier* Medik.

**Redbud**, *Cercis* L.

**Fringetree**, *Chionanthus* L.

**Red maple**, *Acer rubrum* L.

**Southern sugar maple**, *Acer barbatum* Michx.

**Latin names are hyperlinks to information pages on the USDA Plants website)*

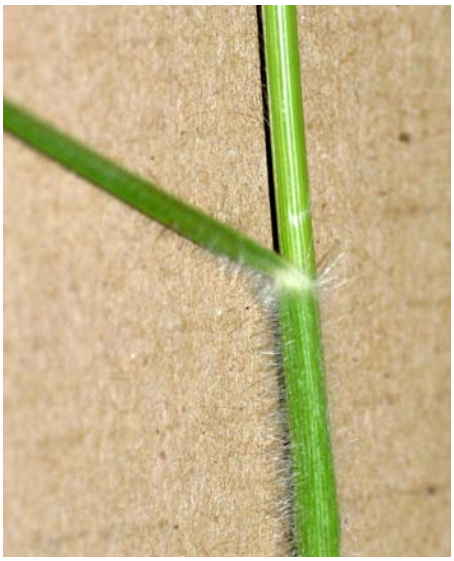
**For more information on invasiveness of Bradford pears, go to:**
Plant Invaders of Mid-Atlantic Natural Areas at:
http://www.invasive.org/eastern/midatlantic/pyca.html

**For information on the links between native plants, native insects and songbirds read:**
Bringing Nature Home: How Native Plants Sustain Wildlife in Our Gardens, by Douglas Tallamy.

# Name That Native Plant

I am a cool-season grass, so I am flowering and making seed this spring. Here you can see my flower, and you might say, "That's not much of a flower." Well, this flower serves me just fine! I am wind-pollinated, so I don't need to worry about attracting insects to help me with passing my pollen around. Both my male and female flower parts are exposed in the photo below. My flowers are typical of the grasses. Notice that the leaf and sheath on my shoot base are very hairy, almost silky, which may be the derivation of my Latin species name. Look for me on a roadside near you.

Flowering (a spikelet with two open florets and two not yet open.)



Basal stem and leaf (blade and sheath)

My name is embedded in text somewhere in this newsletter.

***Spider Lily**, from page 1*

ACE) describing pre-dam shoals on the Savannah River from Augusta to the (Georgia) Broad River. (For those not familiar with the Savannah River, there are three USACE dams on the Savannah River. Discharges from Thurmond Dam, about 15 river miles above Augusta, heavily impact flow rates through the Augusta Shoals.)

**What we found:** The major differences between the thriving Stevens Creek population and populations in the Augusta Shoals were severe deer herbivory in one Augusta Shoals population, and, just as important, too high, or sometimes, too low flow rates through the Augusta Shoals compared to pre-dam historical flows.

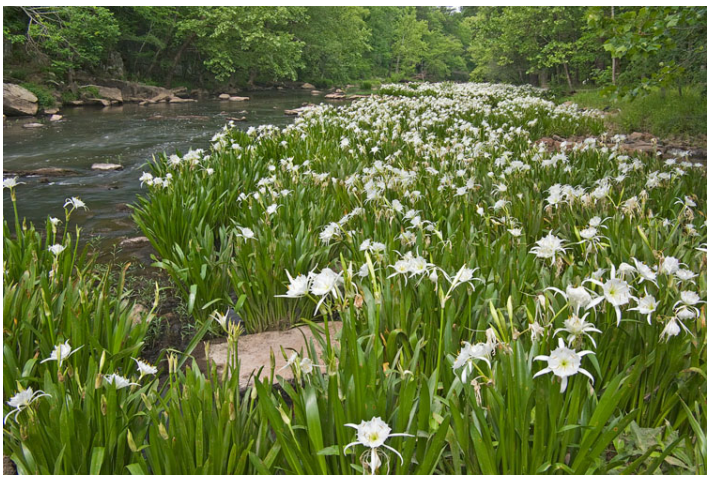


*Figure 1. Stevens Creek Shoals Spider Lily site. Photo courtesy of Judy Gordon*

The Stevens Creek population can also be impacted by fluctuating flow rates, but such flows, by comparison to the Savannah River, are less frequent and of much shorter duration. This is important because the individual lily flowers last for only one-two days, and appear to be pollinated by evening hawk moths. Plants flattened by high flow rates cannot be pollinated, and in addition, seeds and seedlings are washed down stream by excessively high flow rates (See Fig. 2). When there were many shoals, pre-dam, on the Savannah River, seed and seedling dislodging probably allowed for re-establishment in the next downstream shoal. Now the only two shoals remaining in the Savannah River are where the Broad River enters the top of Thurmond Lake and the Augusta Shoals. Historical records indicate that there were at least 15 shoals between Augusta and the Broad River prior to dam construction and at least one (if not more) had a population of Shoals Spider Lily as evidenced by a specimen in the UGA herbarium from shoals at Price Island, now underwater in Lake Thurmond.

*Figure 2. Stevens Creek site after a rain event. Photo courtesy of Judy Gordon.*

**What to do:** Deer herbivory in the Augusta Shoals needs to be addressed by a cooperative effort involving both Georgia and South Carolina Departments of Natural Resources which, unfortunately, are underfunded and unable to do anything at this point in time. More regulation of discharges from Thurmond Dam would help, but the demands of supplying electricity, recreation, and flood control make this a big challenge. We (unpublished) have tried to establish additional populations in the Augusta Shoals by using heavily weighted, loose-weave burlap bags containing seeds and young seedlings of the lily, marked and placed in rock crevices. We tried this in September of 2007, but were unable to find any bags or seedlings the next spring (See Fig. 3). Working in the Augusta Shoals is not easy, given difficult access and the frequent high flow rates!

**And finally consider these points:** managing water flows for the lily in the Augusta Shoals would also enhance fish spawning in the only shoals remaining below Lake Thurmond. And of course, it would be a shame to lose the Augusta Shoals Spider Lily populations where William Bartram first saw and wrote about this beautiful plant.

Judy Gordon, Professor Emerita, and Donna Wear, Professor, Augusta State University.

*Figure 3. Donna Wear and Bill Quinn looking for seedlings in the Savannah River, using a bucket with a plexiglass bottom which Donna designed. Photo courtesy of Judy Gordon.*

# Laurel Wilt, a Growing Disease Problem in Bays and Other Woody Species

*Joel Gramling, Department of Biology, The Citadel*

South Carolina's coastal plant communities have been changing over the last eight years. Visitors to barrier islands from Hilton Head to Dewees Island may have noticed redbay trees (*Persea borbonia*) with lots of brown leaves hanging off of their limbs (See Fig. 1). In the late fall or winter one might assume these understory trees are simply dropping their leaves for the season, but these are evergreens. This change has little to do with new residential developments or management practices. South Atlantic maritime and swamp forests have been stricken with a new plant disease called laurel wilt. What we are witnessing is actually a complex biological cascade set in motion by something as small as the arrival of one or more ¼ inch-long beetles at Port Wentworth in Savannah, Georgia in 2002.

*Figure 1. Understory redbay trees showing laurel wilt symptoms. Photo courtesy of author.*

Laurel wilt is caused by a fungal pathogen that invades the vascular structures of trees and shrubs in the laurel family (Lauraceae). The fungus (*Raffaelea lauricola*) is not known to spread from plant to plant on its own via spores the way that many fungi do. Instead, an exotic insect that has become known as the redbay ambrosia beetle (*Xyleborus glabratus*) (Fig. 2) inoculates trees with this pathogenic fungus. Ambrosia beetles are a diverse group of over 3,000 species related to bark beetles. Their name comes from the fact that the adult typically carves out galleries in dead or dying wood exposing the woody tissue to one or more fungal symbionts. These fungi become established inside the beetles' galleries and put up fruiting structures that the adults and larvae will feast upon like "the food of the gods." Ambrosia beetles have long been known to transport associated species of fungi, but the laurel wilt pathogen is the first ambrosia beetle symbiont to be associated with a lethal vascular wilt disease.


*Figure 2. Redbay ambrosia beetle. Photo courtesy of Michael C. Thomas, Florida Department of Agriculture and Consumer Services, Bugwood.org*

What is particularly disturbing about this beetle-fungus dynamic is that the aromatic properties of bay trees, sassafras and other laurel family members may actually attract the beetles to a living host tree. Something as simple as a broken branch or deer rub can produce a scented wound. The female beetle may be drawn to the wounded tree (See Fig. 3) and attempt to carve out a gallery. She may be unsuccessful at colonizing the living tissue and so fly to a rotten individual nearby, but she has just exposed the woody tissues of the living tree to the laurel wilt pathogen. In such a scenario the living tree will then exhibit localized or even complete die-back, providing lots of dead or dying tissue for redbay ambrosia beetles to colonize.

The effects of laurel wilt were first noted in 2003 as redbay trees were dying on Hilton Head Island. A year later the beetle and fungus were identified as the culprits. By 2005 laurel wilt had spread to a dozen counties primarily around the mouth of the Savannah River in South Carolina and Georgia. One population had also popped up in northern Florida. This was the first of many observed jumps in the

distribution of Laurel Wilt. Today there are satellite populations as far west as Jackson County in coastal Mississippi, as far south as Miami-Dade County in Florida and as far north as Horry County. There are no recorded outbreaks yet in the adjacent counties of these three satellite populations, suggesting that the disease has been transported at least in part by humans. To monitor the spread of laurel wilt, go to http://www.fs.fed.us/r8/foresthealth/laurelwilt/maps/regional_infestation_map_march3_2011.jpg

*Figure 3. Wound in redbay tree and an ambrosia beetle who found it. Photo courtesy of R. Scott Cameron, Advanced Forest Protection, Inc., Bugwood.org*

The laurel family includes several notable trees and shrubs in South Carolina (Table 1) and is most frequent in coastal plant communities. Redbay and swampbay (Persea palustris) have been the hardest hit species in South Carolina. Many dense stands of these understory trees have been nearly wiped out in both maritime forests (primarily redbay) and swamp forests (primarily swampbay) from the Savannah River to the Francis Marion National Forest. The recent identification of laurel wilt in Lewis Ocean Bay State Park suggests that this will continue into the near future.

Sassafras is a widespread tree in South Carolina that has been shown to die from laurel wilt, but its low density populations and infrequent occurrence across the Lowcountry have not resulted in large scale laurel wilt infestations. (Silky oatgrass, *Danthonia sericea)* This is good news for now; but given the broad distribution of sassafras across the eastern United States, we should be on the lookout for any instances of sassafras die-off in South Carolina. While spicebush (*Lindera* spp.), pondberry (*Lindera melissifolia*) and pondspice (*Litsea aestivalis*) are vulnerable to Laurel Wilt, current research suggests that the redbay ambrosia beetle prefers large diameter stems that are less frequent in these species. Nonetheless, pondspice does grow large enough in some areas to warrant concern and pondberry is a federally endangered shrub that should be closely watched for any signs of laurel wilt.

A close relative of our native bay trees is an introduced crop species: avocado (*Persea americana*). Florida farmers and agricultural agents are concerned about laurel wilt, because it has been shown to readily infect commercial avocado plants in Florida where it is a multi-million dollar enterprise. An even greater fear is that laurel wilt might get to California (the U.S. leader in avocado production) and Mexico (the world leader in avocado production).

Another introduced Lauraceous plant is camphortree (*Cinnamomum camphora*), a common ornamental in the Southeast which the South Carolina Exotic Pest Plant Council has identified as an invasive plant that is a "severe threat" to plant communities in the coastal plain. Unfortunately camphortree has shown resistance to laurel wilt and may not be as susceptible as our native laurels. Camphortree's ability to survive or even avoid laurel wilt might be associated with the fact that it is native to southeastern Asia where the redbay ambrosia beetle is thought to have originated. Whether ornamental or agricultural, native or introduced, the ultimate impact of Laurel Wilt on plants in the Lauraceae is unknown at this time, but continued vigilance is warranted.

Plants may not be the only group of taxa to suffer from the spread of laurel wilt. Larvae of spicebush swallowtail and palamedes swallowtail butterflies are known to feed upon Lauraceous plants in South Carolina. As the effects of laurel wilt become more widespread we may witness a domino effect: humans transport a minute exotic insect halfway around the world, which transmits a fungal pathogen to native plants, thus reducing the food supply of several native insects while threatening an agricultural enterprise. In this age of global connectivity perhaps the cascading effects of laurel wilt will provide a lesson on how truly interconnected the natural world is and how vigilant we must be to deal with current and future threatens to our natural systems.

What can you do? Here are several general guidelines that South Carolinians can adhere to in order to avoid spreading Laurel Wilt:

- Restrict the transport of firewood, logs, driftwood, mulch, and other unprocessed wood of redbay or other known hosts, out of counties (or other designated areas) in which laurel wilt is known to occur.

- When camping, use firewood from local sources only. Don't take home leftover wood; burn it all before leaving your campsite.
- Dispose of wood from killed redbays and other lauraceous species as locally as possible.
- Inspect Lauraceous plants in nurseries or containers for signs of Laurel Wilt and avoid transporting or importing such plants unless you are certain that they have not been infected. Purchase only plants that have been inspected by Clemson's Dept. of Plant Industry or other official agency.
- Report signs of Laurel Wilt to the SC Forestry Commission: (Laurie Reid, (803) 896-8830, lreid@forestry.state.sc.us )

**Table 1: Plants in the Laurel Family (*Lauraceae*) found in South Carolina**

| Scientific Name | Common Name |
|---|---|
| *Cinnamomum camphora** | camphortree |
| *Lindera benzoin* | *northern* spicebush |
| *Lindera melissifolia* | pondberry |
| *Lindera subcoriacea* | bog spicebush |
| *Litsea aestivalis* | pondspice |
| *Persea borbonia* | redbay |
| *Persea palustris* | swampbay |
| *Sassafras albidum* | sassafras |

**Note: Camphortree was introduced from southeastern Asia and may occur as a planted ornamental or an invasive plant.*

# Lespedeza Species in the Carolinas

*By Bill Stringer*

The genus and species names of plants sometimes have interesting origins. Take the genus *Lespedeza*, for instance. It is derived from a mistaken reading of the name of an early Spanish governor of Florida - *Senor Cespedez*. Erroneous derivation notwithstanding, the honorable governor's namesake genus contains some interesting species. The USDA Plants Database ( http://plants.usda.gov ) lists 36 entries for the continental US, a third of which occur in South Carolina. Most have lespedeza as a part of their common name, and some sources refer to them as bush clovers or prairie clovers.

The *Lespedezas* are members of the *Fabaceae* family (legumes). The most commonly seen *Lespedeza* species in the Carolinas are introduced, and are all more or less invasive species. Sericea lespedeza (*L. cuneata*) was widely planted in the past for soil conservation purposes, and is ubiquitous throughout the South. Bicolor lespedeza (*L. bicolor*) is a shrubby species that has been widely planted for game bird habitat, and often forms a continuous shrub layer, to the exclusion of native species. Thunberg's lespedeza (*L. thunbergii*) has been used to some degree for ornamental purposes, and does not appear as invasive as sericea and bicolor.

The native Lespedezas are an interesting group. They range in growth habit from sub-shrub to trailing or twiny. Hairy lespedeza (*L. hirta*) is 2-4 ft tall, with multiple stems, oval-shaped hairy leaflets, and white flowers with purple centers closely clustered near the tip of each stem (see http://www.namethatplant.net/plantdetail.shtml?plant=808 ) .

Round-headed lespedeza (*L. capitata*) is similar in appearance, but with longer, narrower, silver-green leaves (see http://www.missouriplants.com/Whitealt/Lespedeza_capitata_page.html).

Slender lespedeza (*L. virginica*) is 2 - 3 feet tall, with narrowly oblong leaves and pink flower, usually found

*(See **Lespedeza**, page 12)*

*Figure 1. Lespedeza virginica, Lespedeza capitata, and Lespedeza hirta leaves*

# The Hickories

*by Ken Gohring,*
*Georgia Native Plant Society*

In the backyard of my home, west of Marietta, GA, are two large trees whose presence dominates the area. The trees are about 80 feet tall and are among oak and pine trees. These trees are mockernut hickories (*Carya tomentosa*). Mockernut hickory is one of a dozen distinct species of hickories found in the United States. I was somewhat excited to have hickories in my backyard as I have had an attraction to hickories for some time. On the small farm where I grew up in Missouri, a large hickory stood on a small hill top at the rear of our home. It was quite a bit different from the hickories in my Georgia back yard. It was a shagbark hickory (*Carya ovata*), characterized by bark that appears in long plate-like strips, attached to the tree trunk in the middle but loose elsewhere along its length. This attractive shaggy appearance has resulted in the tree's common name.

The hickory trees growing on my small farm in Polk County are shagbarks. However, they are a special variety, sometimes called southern or Carolina shagbark (*Carya ovata* var. *australis* or *Carya ovata* var. *carolinae septentrionalis*). The southern shagbark has slightly smaller nuts and more narrow and less hairy leaves and the bark, while shaggy, is not as regular and tight as the standard shagbark. The southern shagbark is usually found in neutral soils, whereas the standard shagbark prefers acidic soils.

The reason for my attraction to hickories is the fruit, which as children we called "hicker nuts." The fruit production of hickories is quite variable and is one reason why hickories are not often grown as a commercial crop. The shagbark near the home where I grew up did not produce many nuts. The same was true of other hickories on our farm, but there were numerous hickory trees on neighboring farms that did produce large crops of nuts with relatively thin shells. These were eagerly sought for eating as a tasty treat and used in pies similar to the way pecans are used today. While the nut meats are not as easy to extract as pecans, the taste in my opinion is superior. Usually the desirable shagbark hickories would be found in open, relative dry pasture areas.

As a youth I noticed hickory nuts for sale in grocery stores. These nuts were quite a bit larger than the ones that we gathered. These nuts were the fruit of the shellbark hickory (*Carya laciniosa*). Shellbark hickory is less common than shagbark, but it does have a large natural growth range. It is primarily a Midwestern tree whose range extends from western New York to eastern Kansas. Its southern range includes Tennessee and some specimens have been found in northwest Georgia. Its bark is very similar to the shagbark, and in some areas the species is called shagbark.


*Mockernut hickory (Carya tomentosa). Photos courtesy of Chris Evans, River to River CWMA, Bugwood.org*

Trees of the Carya genus are found primarily in North America. While taxonomists differ regarding classification of some, 12 distinct species and many varieties are currently recognized as being native to the United States. Another is found in Mexico and two or more are found in Southeast Asia. Carya is part of the Juglandaceae family, which includes the walnuts. The Carya species found in the US are divided into two sections, Carya and Apocarya.

The first section, Carya, includes what are called true hickories. The second, Apocarya, includes the water hickory (*Carya aquatica*) and the bitternut hickory (*Carya cordiformis*), which are both native to Georgia. Both of these hickories have bitter fruit which is quite a contrast to the other member of the section, the pecan.

Hickory trees are characterized as trees with deep taproots, having a compound leaf structure and being monoecious (having both male and female flowers on the same tree). The male flowers are catkins up to several inches long that produce pollen that fertilizes the smaller female flowers which are spikes at the end of stalks. The pollen is wind borne and is one of the tree pollens that can cause spring allergies in those susceptible.

Hickory trees are one of the most useful and commercially significant trees found in the forest. Native Americans used hickory nuts as an important food, produced by


*Shagbark hickory (Carya ovata). Photos courtesy of Keith Kanoti, Maine Forest Service, Bugwood.org; & Paul Wray, Iowa State University, Bugwood.org*

cracking the nuts, boiling them and skimming off the oily substance, and using it like butter. Early American settlers also used this product, called hickory milk, as well. Native Americans also used the wood in making bows.

For years the American chestnut was recognized as the most valuable tree found in the southeast because of its many uses. In many ways, the hickory has filled this role. Hickory wood is strong and durable, and is used in products needing to withstand strong vibrations. In pioneer days, it was used to make wagon wheels and textile looms. It is still used to make handles for tools. The wood is used by the furniture industry. The wood is also used for charcoal and for smoking meat. It is an excellent firewood and is highly desired for this purpose. Shagbark hickory bark is also used in making a syrup similar to that made from maple trees.

Pecan (*Carya illinoinensis*) is considered one of the most valuable cultivated plants originating in North America. Thomas Jefferson planted pecans at Monticello and gave some to George Washington. It is said that these pecans are the oldest trees at Mt. Vernon. A large number of pecan cultivars have been developed and named. They vary in nut size (from 1 to 3 inches), flavor quality, shell thickness, age at first bearing, disease resistance, bearing tendency and length of time for crop maturity. Some of these with thin shells are called "paper shells".

Even though pecans are most likely not native to Georgia, the state leads the nation in pecan production. One cannot drive through middle to south Georgia without seeing a large number of pecan groves. The pecan is the largest of the hickories, growing to 130 feet in height. Its large major limbs grow up and out in a distinctive spreading manner. It is fairly easy to spot these groves of pecans because of this growth feature. In addition to providing delicious nuts, the wood is used for flooring, cabinets and furniture.

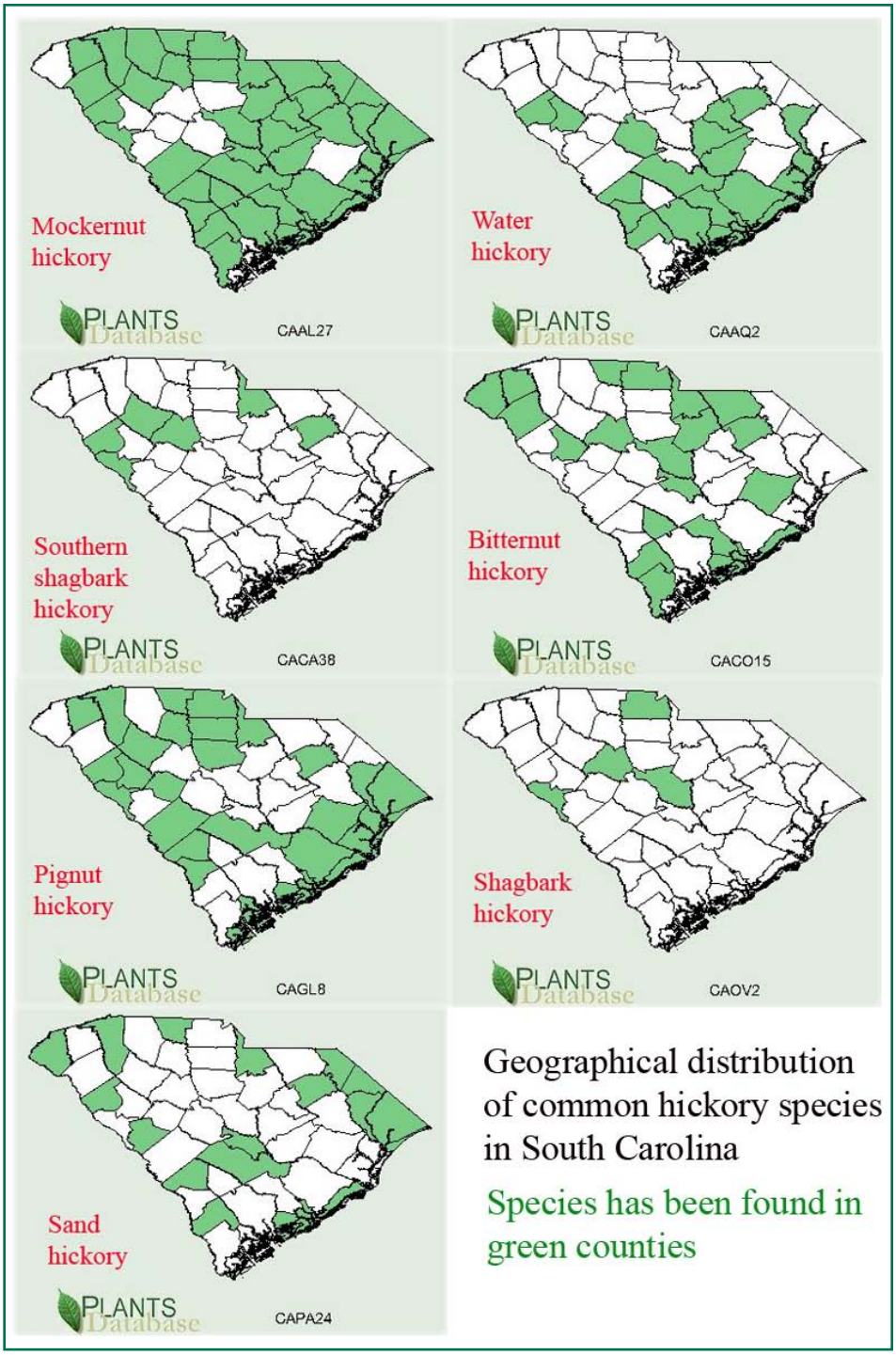
While the pecan is the state tree of Texas, it got its name because early settlers found it growing and being used by Native Americans in Illinois. It is somewhat difficult to determine its original range, but it is believed to be primarily along the Mississippi River drainage extending as far west as Texas and as far north as southern Illinois.

Many of the hickories are native to Georgia. One of these is the pignut hickory whose nuts were gathered


*Pignut hickory (Carya glabra). Photos courtesy of Rebekah D. Wallace, Bugwood.org; and Chris Evans, River to River CWMA, Bugwood.org*

by early colonists and fed to swine, resulting in the common name. Pignut hickory (*Carya glabra*) is quite common in the southern Appalachians. Other hickories found in Georgia and South Carolina are the sand hickory (*Carya pallida*) and the mockernut (*Carya tomentosa*).

*South Carolina's champion shagbark hickory, in the Sumter National Forest. Photo courtesy of Karen Burnett, SCNPS*




The nutmeg hickory (*Carya myristiciformis*) is rare and has a quite limited range. The only substantial population is near Selma, AL. It is sometimes called swamp hickory because of its growth habit. The red hickory (*Carya ovalis*) is much more common that the nutmeg hickory. At one time it was thought to be a hybrid of the shagbark and pignut hickories.

The following tables detail some features of the hickories found in the US. They are not intended to be a definitive aid to species identification. Most of the references cited below have keys that can be used for this purpose.



*Bitternut hickory (Carya cordiformis). Photos courtesy of Paul Wray, Iowa State University, Bugwood.org*

***Editor's note:*** *Hickory syrup is not analogous to maple syrup, in that it is* ***not*** *made by concentrating tree sap.*

*Sources:*

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## American Hickory Species

| *Common Name* | *Species* | *Height* | *Nut Size* | *Leaf Size* | *# Leaflets* |
|---|---|---|---|---|---|
| SECTION CARYA | | | | | |
| Pignut | C. *glabra* | 60 - 80 ft | 1/2 to 1-1/2 in. | 8 - 12 in. | Usually 5 |
| Shellbark | C. *laciniosa* | 70 - 100 ft. | 2 to 2/12 in. | 15 - 24 in. | 5 - 9 |
| Nutmeg | C. *myristiciformis* | To 80 ft. | 1 to 1.2 in. | 7 - 14 in. | 5 - 9 |
| Red | C. *ovalis* | 80 - 100 ft. | 1 to 1-1/2 in. | 8 - 12 in. | 5 - 9 |
| Shagbark | C. *ovata* | To 120 ft. | 1-1/4 to 2-1/2 in. | 8 - 14 in. | 5 or 7 |
| Southern Shagbark | C. *ovata var.australis* | 65 - 100 ft. | 1 to 1-1/4 in. | 5 - 12 in. | 5 - 7 |
| Sand | C. *pallida* | 30 - 80 ft. | 3/4 to 1-1/2 in. | 7 - 14 in. | 5 - 9 |
| Scrub | C. *floridana* | 10 - 20 ft. | To 1-1/4 in. | 8 - 12 in. | 3 - 7 |
| Black | C. *texana* | 20 - 30 ft. | 1-1/4 to 1-1/2 in. | 6 - 12 in. | 5 - 7 |
| Mockernut | C. *tomentosa* | 50 - 80 ft. | 1-1/2 to 2 in. | 9 - 14 in. | 7 - 9 |
| Water | C. *aquatica* | 70 - 100 ft. | 1 to 1-1/2 in. | 8 - 16 in. | 7 - 15 |
| Bitternut | C. *cordiformis* | 60 - 80 ft. | To 1 in. | 7 - 10 in. | 7 - 11 |
| Pecan | C. *illinoinensis* | To 130 ft. | 1-1/2 to 2 in. | 12 - 18 in. | 9 - 15 |

| *Common Name* | *Nut Taste* | *Bark* | *Husk* | *Range* |
|---|---|---|---|---|
| SECTION CARYA | | | | |
| Pignut | Bitter | Scaly ridged | Thin | SE US, Mo east to NY, north to ME |
| Shellbark | Good | Shaggy | Thick | MO east to PA, south through TN |
| Nutmeg | Edible | Fissured | Thick | Rare, scattered SC to east TX, most in AL |
| Red | Sweet | Shaggy & Ridges | Thin | SE US, MO east to NY, north to ME |
| Shagbark | Delicious | Shaggy | Thick | Eastern US, excluding so. part of so. States |
| Southern Shagbark | Edible | Shaggy | Thick | Heart of Dixie, NC through MS |
| Sand | Edible | Deep furrows | Thick | Confederacy excluding TX, FL, so. GA & so. SC |
| Scrub | Edible | Smooth, ridges | Thick | Central FL |
| Black | Edible | Deep furrows | Thin | TX north to OK & MO |
| Mockernut | Edible | Ridges, furrows | Thick | So. states north to IL & PA |
| SECTION APOCARYA | | | | |
| Water | Bitter | Fissured, scales | Thin | MS River Valley & Coastal South to NC |
| Bitternut | Very Bitter | Furrowed | Thin | Eastern States excluding Gulf coast |
| Pecan | Excellent | Thin broken strips | Thin | MS River Valley west to central TX |


*Figure 2. Sericea lespedeza and slender lespedeza. Photos: James H. Miller, USDA Forest Service & Ted Bodner, Southern Weed Science Society, Bugwood.org*

*Figure 3. Fruits of Lespedeza (legume) vs. Desmodium (loment).*

on the upper one quarter of the stem. (see http://www.namethatplant.net/plantdetail.shtml?plant=1913 ). ***Compare the leaves of these species in Figure 1.*** It can be hard to discriminate between the invasive sericea lespedeza and the native slender lespedeza. Sericea has white to pale violet flowers all along the stem (see Fig. 2), while slender has pink flowers on the upper part.

There are two low-growing Lespedezas found in the Carolinas. Trailing lespedeza (*Lespedeza procumbens*) has upright branches growing from prostrate stems. Pink flowers are produced on the branch tips. A key identifying character is the hairy stems and branches. Creeping lespedeza (L. *repens*) is similar in growth habit and appearance, but with no hair on the stems and branches (see http://www.southeasternflora.com/view_flora.asp?plantid=55# ). Two introduced short-growing annual species were once in the genus Lespedeza - Korean lespedeza (L. *stipulacea*) and striate lespedeza (L. *striata*). Introduced as forage plants, they are no longer planted, but chances are very good that you can still find them in your lawn. These species have been moved to the genus Kummerowia.

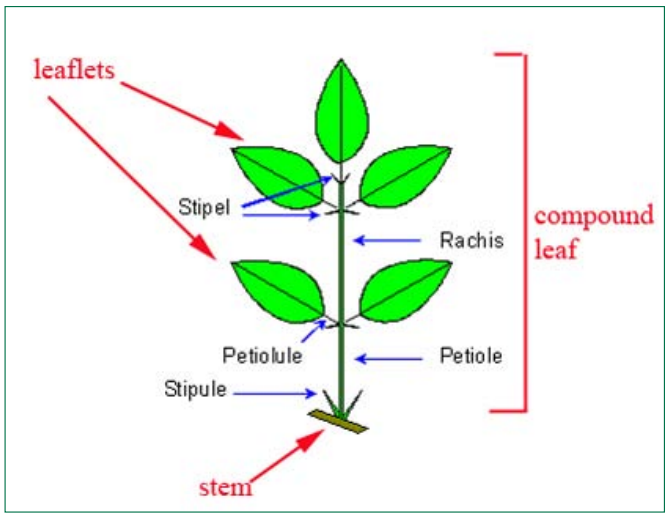


*Figure 4. Parts of a typical compound leaf.*

Some Lespedezas are commonly confused with similar-looking *Desmodium* species, as both have trifoliate leaves. And, there are both prostrate and upright species in both genera. However, there a couple of dependable discriminating characters: *Desmodiums* have **stipels** at the bases of the individual leaflets of a leaf (see definitions below), whereas *Lespedezas* don't. Also, the fruits of *Lespedezas* are borne singly, whereas *Desmodium* fruits are borne in long series of single fruits (loments) - see Figure 3. We all recognize these as the infamous "beggar ticks" that stick to our clothing at maturity.

**Definitions:**

**Stipule** - A small leafy or spiny outgrowth at the base of a **leaf** or its petiole; usually occurring in pairs.

**Stipel** - Similar to stipules, except that they are found at the bases of the **leaflets** of a leaf. Found on compound leaves.

(See Figure 4 for illustration of definitions.)

***NOTE: Blue text represents active links in .PDF file format.***

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