

The Journal of the South Carolina Native Plant Society



Winter 2011

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Name That Native Plant

I like shady open spots in the woods or in woods edges, where I bloom in mid- to late summer. I am a perennial, with pink to light purple flowers. Most of my leaves are found spread around the base of the shoot, which is the derivation of one of my common names. I do not like this name, because it implies that I am ponderous, which I certainly am not! My other common name is even more misleading, given how obviously pretty I am in bloom! OK, maybe I am a bit plain in winter, but really.....



Photo courtesy of Bill Stringer



Rattlebox (*Sesbania punicea*) - native or introduced?. Photo by Linda Lee, courtesy of USC Herbarium. (http://cricket.biol.sc.edu/acmoore/herb/SS/Sesbania_punicea1.jpg)

What is a native?

By Patrick McMillan
Director of the South Carolina Botanical Garden

Native plant societies specialize in the culture and conservation of **native** plants. There is only one problem with this, the term **native**! Just what does native mean? A clear understanding of **native-ness** is important for several reasons.

My students will ask sometime during the semester something like this: "Dr. McMillan, is this pretty shrub (while pointing to *Eleagnus umbellata*-ugh!) native?" My answer is always the same and really gets the students thinking. "Of course it is", I answer, to which some advanced student says, "No it's not!" To which I reply that it is native to Asia, it is native to planet Earth, and native to the Milky Way Galaxy." Ok, I'm a bit of a smart-aleck, but it is a point worth thinking about. What does it really mean to be native?

Botany is a terminology-rich discipline with a lot of jargon. I love that stuff but most folks don't. Why so much jargon? Let's remember that this was a gentleman's science during the Victorian Age, and medical doctors were frequent among early botanists. It then evolved into a pastime enjoyed by the aristocrats and the elites created by the Industrial Revolution. But honestly, we must know some jargon to really get to the bottom line, so dust off that seersucker jacket,

(See **Native**, page 6)

Notes from the President:

We held our first state Board of Directors meeting for the year on January 9th, and I am happy to report that we have many exciting initiatives and events planned for 2011. The Piedmont Chapter, under the leadership of Mary Morrison, will host the 2011 Symposium on May 14th and 15th at the Museum of York County in Rock Hill. We have a great line up of speakers, workshops and field trips that you don't want to miss. Check out the details in this issue of the Journal. As always, our local chapters have many enriching lectures, workshops and plant sales planned for 2011. The schedules for these events can be viewed on our website.

In our board meeting, there was much discussion about one of our primary missions: education. Our state board vice-president, Thomas Angell, is heading up our newly established education committee. The committee's first task is to develop presentation material, in the forms of slideshows and poster boards, for use statewide by SCNPS members who give talks to other organizations and for displays at events where the SCNPS has a booth. Several of our members have such presentations, but having a basic presentation of our history, mission and programs will help us all in developing outreach programs locally and in presenting a consistent message. This committee will also take on the challenge of developing material that can be a resource for environmental education in our public schools and can support teachers in meeting formal state education standards. I know we have many talented folks in the SCNPS, and if you have any resources that may help us with these initiatives, please share.

Other exciting programs include four prospective habitat restoration projects that are being developed by our grants committee. One project, the Lisa Mathews Memorial Bay project in Bamberg County, is well underway and is described on our website (see <http://www.scnps.org/activities.html>). This project is focused on longleaf pine restoration in this 52-acre Carolina Bay to support preservation of the resident Canby's Dropwort (*Oxypolis canbyi*), a federally endangered species. We will soon hear on possible funding for this project from a SCNPS grant applica-

tion to the USDA Natural Resource Conservation Service Wildlife Habitat Incentive Program.

We have three other SCNPS grant applications in the works that we are hopeful of getting approved. These include two grant applications to the USDA Forest Service where the SCNPS will collaborate with the Francis Marion and Sumter National Forests. One of these projects is to conduct much needed prescribed burning within the wildland-urban interface of the Francis Marion Forest to reduce hazardous fuels, restore native habitat and improve forest health. The second grant is in the Sumter National Forest in Union County and would remove non-native privet (*Ligustrum sinense*) dominated riparian areas and restore over 300 acres of native canebrake (*Arundinaria gigantea*) habitat. The third grant is in-process for submittal of a similar canebrake habitat restoration on approximately 12 acres along the Reedy River at Lake Conestee Nature Park in Greenville County. There will be plenty of opportunity for SCNPS volunteers to support these projects in the field, and we will get the word out through our listserv and website as we proceed.

Finally, I am glad to report that again this year we have joined forces with the Conservation Voters of South Carolina (CVSC) as a partner in support of the 2011 Conservation Common Agenda. This program is led by the Conservation Voters of SC and developed by the Common Agenda partners to promote stewardship of our state's natural resources as a priority for citizens and the leaders we elect. See the CVSC website for details on the 2011 focus issues of the Common Agenda (http://www.conservationvotersofsc.org/common_agenda_issues/).

I hope to see you all in Rock Hill this May.
Jeffery L. Beacham, SCNPS state president
jeffbeacham@gmail

Note: State and Chapter leaders and committee chairs' e-mail addresses can be found at <http://www.scnps.org/contact.html>

Private Property Rights as Related to Invasive Exotic Plant Species: “Right to Plant” versus Other’s “Right to Maintain Landscape”

Johnny Stowe
SC Dept. of Natural Resources

In the United States, few things are held as sacrosanct as private property rights (PPR). The National Woodland Owner’s Association (2005) survey of its members and affiliates ranked “Private Property Rights” as second only to “Fair Income, Inheritance and Property Taxes.” While I have no data to support my contention, I doubt that PPRs are more highly esteemed and defended anywhere in the nation than in the Southeastern U.S. (SE US). Most landowners have a general understanding of PPRs, and that level of understanding usually suffices for most common situations. But as the landscape becomes increasingly fragmented -- and as we get more and more neighbors, and they are often “outside” (not local) folks that we do not know, the specifics and nuances of landowner rights will take on greater importance. In this paper, I will review the four main tenets of PPRs, and use them as a lens through which to examine the issue, invasive exotic plant species management in the SE US.

Private Property Rights: The Precious Bundle The principles of PPRs can be described as a bundle of sticks that collectively represent the rights we hold so inviolate as landowners. They are exclusivity, specificity, enforceability, and transferability. Let’s examine each of these.

Exclusivity refers to the exclusivity of ownership; e.g., single owner, and various partnerships such as joint tenancy and tenancy-in-common. Easements of ingress-and-egress and conservation easements are also examples of limited exclusivity.

Specificity refers to the particular rights assigned to the owner. Most private landowners hold fee simple title to their land, which represents absolute ownership, as opposed to leasing, renting, life estates, and mineral, timber and other rights of use. Easements are also defined in these terms.

Enforceability refers to the means to enforce one’s landowner rights, i.e., if those rights are impugned, infringed upon or usurped, then our legal system has, or should have, mechanisms to protect the landowner.

Transferability refers to the ability to sell, give away, rent, lease or otherwise divest a portion, or all, of the rights held.

These four principles overlap and underpin each other to varying degrees depending on the specific issue.

Invasive Exotic Plant Species. Invasive species, are regarded as: 1) harmful to “economic activity, ecosystems, and human welfare” in the U.S. (Ecological Society of America 2006); 2) second only to habitat destruction and more harmful than pollution, over-exploitation and disease as a threat to imperiled species in the U.S. (Wilcove et al. 1998); 3) costing the U.S. \$ billions per year in economic losses; 4) a threat to homeland security (U.S. Army War College - Pratt 2003); and 5) “a significant component of human-caused global change” (Vitousek et al. 1997).

These dire appraisals from eminent scientists relate

to all invasive exotic organisms (plants, animals and pathogens). However, plants comprise a major part of the invasive threats. This paper deals only with invasive exotic plant species.

Jim Miller’s (2003) *Nonnative Invasive Plants of Southern Forests: A Field Guide for Identification and Control* (www.srs.fs.usda.gov/fia/manual/exotic_pest_plants.htm) is one of the most significant conservation

developments of the last few decades. It provides information on invasive exotic plant species, including identification, ecology, nature of threat, principles of control, and specific methods to combat them, as well as rehabilitation of lands where infestations have been successfully



Figure 1. *Lespedeza bicolor*, an exotic invasive shrub that has been planted for purported wildlife habitat benefits. James H. Miller, USDA Forest Service, Bugwood.org.

controlled. Also, Dave Moorhead and colleagues at the University of Georgia have published *Invasive Plant Responses to Silvicultural Practices in the South*, a complement to Miller's field guide. This body of work is prescient and much-needed. The public is only marginally aware of the invasive plant threat. Wide use of the publications of Miller, and Moorhead et al. will be of huge benefit to our society and our natural resources.

A particularly insidious characteristic of invasive plant species is that there may be a decades-long time lag between introduction and the onset of invasiveness. In light of this, *The Precautionary Principle*, which suggests that we conservatively act in anticipation of harm in order to prevent it, and that shifts the burden of proof to those who would "develop" or otherwise alter a natural ecosystem, becomes important.

The Law of Public Nuisance, If a Land Ethic Fails. Freyfogle (1998), in an essay titled "Land Ethics and Private Property" discusses how the law of public nuisance decades ago worked "to protect communities from bad land use," and maintains that the concept could today become a tool for discouraging bad land practices. Once the legal system becomes involved, of course, the matter lies partially outside the arena of ethics, since the fear of legal penalties, rather than any moral obligation, may be the primary impetus for "right" behavior. Ideally, the fewer legal restraints we have the better, but this works only as long as ethical and other non-coercive societal mechanisms suffice. The very existence of our legal system is evidence that these mechanisms often do not suffice, whether we are dealing with land or other issues. Granted, some laws are superfluous, but most are not.

J. Owens Smith, who taught Natural Resources Law at the University of Georgia, introduced me to the term "Private Property Perverts." He defined them as landowners who claim total autonomy as to the use of their land. His example was someone who insisted on the unfettered right to dump toxins in the creek because it ran through his land, and maintained that the folks downstream must deal with it as best they can. I am a landowner myself,

and have strong convictions about my private property rights. But I cannot fathom someone taking private property rights to the extreme "perverted" end of the continuum. I have never actually met anyone like this -- but I don't doubt that they exist. Most of the landowners in the SE US are reasonable folks who, while standing



Figure 2. Bradford pear, *Pyrus calleryana*, an invasive tree commonly used in landscaping. David J. Moorhead, University of Georgia, Bugwood.org

firmly behind their PPRs, don't irrationally insist that those rights extend to activities that impact their neighbor's land or *public trust resources*. But the issue is not as straightforward as it might seem: e.g., I maintain I have a right to conduct prescribed fires on my land, but my hypothetical "rurban" neighbor may feel that he/she has a right to not be exposed to my smoke. The intricacies of that issue are beyond the scope of this paper, but you can see that this type of polemic is often complex.

Let's briefly and generally look at invasive plant species, through the lens of the four tenets of PPRs:

Exclusivity: A landowner holds the PPRs, not others. I have the right to manage my land for native species, and to not have destructive invasive exotic species introduced onto my land by the choices of a careless neighbor.

Specificity: The usage rights to a land tract, unless legally partitioned to another party, are the landowner's. As in exclusivity above, I have the right to manage my land for native species, and to not have destructive invasive exotic species introduced onto my land by the choices of a careless neighbor

Enforceability: At present there are few if any nuisance laws to enforce, but if ethical and other societal constraints do not protect landowners from harm from other's actions, then this principle calls for such laws to be enacted to prevent harm and/or provide redress for harm from invasive exotic species.

Transferability: The ability for landowners to transfer their property, and at a fair price (i.e. at least market value), can be infringed upon by others, via invasive exotics being forced on them.

A Pernicious Example – Bicolor Lespedeza. Consider this: my neighbor plants an exotic plant species known to be invasive, such as bicolor lespedeza (*Les-*

pedeza bicolor) and it invades my land. My ability to burn (and thus maintain native vegetation) is affected, since fire causes *L. bicolor* to spread even faster (David Moorhead, personal communication, 2006). My soil is contaminated by allelopathic chemicals produced by this pernicious invader. My forest management is impacted since the invader stymies regeneration. The aesthetics of my land are ruined since the native flora, and thus my ability to experience them and their animal associates such as butterflies is diminished. *Elephantopus tomentosus* elephant's foot or devil's grandmother. My hunting and hiking are impacted because wildlife communities are affected, and just walking my land may be more difficult due to the altered structure of the vegetation. The market value of my land may also be decreased because of altered vegetation structure (see Fig. 1). Less tangible, but of utmost importance to me, the land's spiritual value is damaged, as I place a high value on maintaining an intact native ecosystem.

Sadly, wildlife managers have long touted *L. bicolor* as desirable for wildlife, particularly bobwhite quail, and many are loath to stop using it, even though research evidence does not support it. Before the destructive impacts of *L. bicolor* were established, introduction of the species could be forgiven on the basis of ignorance of the true nature. Now, to continue to use it, because "that's the way it has always been done" is land-ethically wrong. To persist in this wrong-headed behavior may call for a role by the legal system.

What, then, to plant and promote? A Simple Alternative – Go Native! Many have appealed to our sense of pride of place and natural heritage by encouraging the use of native rather than exotic invasive species. Dr. Chris Moorman of NC State has appealed to our pride-of-place and heritage by encouraging the use of native species, rather than invasive exotics ([Think American: Manage Native Plants for Wildlife in Forest Landowner](#) magazine, 2003). Also Moorman et al. have written [Landscaping for Wildlife with Native Plants \(2002\)](#) that provides detailed, user-friendly information on the topic.

Conclusion

As the landscape and demography of our region become more fragmented by urban sprawl, neglected implications of PPRs must be openly discussed, so that the assumed rights of one landowner do not impinge upon the rights of others. The time to do this is now, before the situation worsens. In light of the extremely destructive nature of recently-introduced species like cogongrass (*Imperata cylindrica*), this is a matter of property rights, as well as important to the economic welfare the region. This issue leads into the related one of urban sprawl, land

use planning and the sensitive topic of zoning. Although controversial, dealing with these issues sooner rather than later will benefit us all, and as change is inevitably thrust upon us, some folks may find that they have views divergent, even diametric, to the ones they thought they held.

Aldo Leopold (1949) pointed out that his land ethic operates like any other ethic – by "social approbation for right actions: social condemnation for wrong actions." Making mistakes in land management is blameworthy but can be understandable; denying and continuing these mistakes in the face of the best-available-science compounds the culpability many-fold. We must either develop and implement a true, holistic land ethic, as Leopold implored us to do, or we must take the less-effective, more divisive path of legal coercion. The choice is ours. Now or later.

Conservation is paved with good intentions which prove to be futile, or even dangerous, because they are devoid of critical understanding either of the land, or of economic land use. Aldo Leopold (1949)

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Johnny Stowe manages several SC Department of Natural Resources Heritage Preserves. He writes frequently and well on the broad issue of care of and respect for our natural resources. And he is a landowner who puts his passions to work on his property. He is not an attorney, and his article is designed to stimulate our thinking about an important land management concern. Readers should consult an attorney before actively pursuing any issue that is covered here. Editor

Native, from page 1

don that bow tie, strap on those \$400.00 birdshooter boots and get ready to wade into the cesspool of jargon!

The first problem with **native** is deciding what geographic modifier to attach to it. For instance, is the plant you're talking about native to South Carolina, native to eastern North America, or native to the United States? This is an important question—some plants such as Big Bluestem (*Andropogon gerardii*) are native to South Carolina, **and** to most of the US east of the Rockies (see Fig. 1). In the case of wide-ranging plants

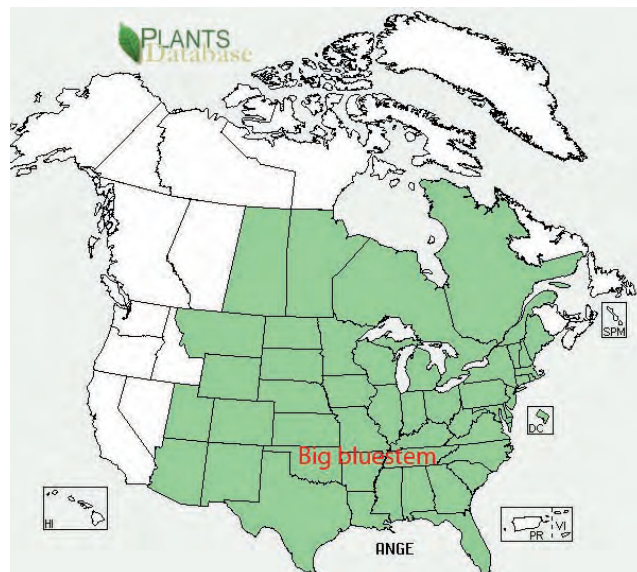


Figure 1. Distribution of big bluestem in North America. Map courtesy of Plants National Database (<http://plants.usda.gov/>)

we also need to be concerned about local native gene pools. Big Bluestem seed from Minnesota may not be a good choice for planting in a longleaf pine flatwoods in Florida. Local gene pools have long experienced natural selection under local conditions, and thus been crafted to do well there. While some plants adjust others don't, and in the end we are trying to promote native (locally adapted) plants. I learned this early on in my gardening career with Trillium. I was given *Trillium maculatum* by a friend in Florida. When planted in Raleigh, it emerged at the same time as in its hometown of Alachua County, Florida - December! It froze off rather

abruptly and didn't reappear until the following December. After three years of this it gave up. I learned a good lesson, that you must know the conditions at the source of a **population**, not just a where a **species** is native. Locally adapted genetic stocks are also referred to as **ecotypes** of a species.

Should we care about planting local natives? Isn't a native of North America better than anything from Asia? Not necessarily. You can actually "pollute" a wild native gene pool by introducing species native to your region but not adapted to the local environs. Think how different the conditions are for a Red Maple (*Acer rubrum*) growing in Florida and one growing in Nova Scotia. If the maple from Florida survives in Nova Scotia, what happens when it flowers and shares genes with the local population? You are introducing genes from hundreds of miles away, genes that may reduce the fitness of the local population. So, we may do more harm by planting a North American native that is not a local genotype than if we planted a non-native species.

Another good lesson is that not all invasive species are exotic, though that's the way we typically hear them portrayed—invasive exotics. An **exotic** is simply a species from somewhere else. The vast majority of our problem invasives here in the East are from eastern Asia, probably because the climate is similar, and when Asian plants are brought here, their native pest organisms don't come along. They find themselves in a pest-free zone, and they go bananas! This happens with North American natives too.

Travel to Aiken, South Carolina to see an example. Carolina Laurel Cherry (*Prunus caroliniana*), originally from the outer coastal plain, with maritime influence, is now a serious

pest in woodlots and fire-suppressed longleaf pinelands there. Southern Magnolia (*Magnolia grandiflora*) is another offender, even as far north as the piedmont of North Carolina. Evergreen species like these can easily alter the light, water and nutrient characters of native forests and change them in the same way a thicket of Chinese Privet can. The moral of the story is: if you want to really promote local natives, get your plants from local sources, ideally your portion of the state or at least your region of the country.

Luckily, there are other terms we use to clarify the nativity of plants that are more precise than **native**. One of my favorite books as a kid was *The Geography of Plants* by Cronquist and Gleason (yeah, I was a geek!). I remember reading there about **endemics** and **autochthons**. What cool words, but what did they mean? I had seen **endemic** in the context of diseases...eg, Malaria is endemic in Guatemala. In botanical terms, endemic refers to a plant that grows in only one area. But endemic also is subject to the problem of scale. A plant can be endemic to three mountaintops in the southern Appalachians, like Blue Ridge Goldenrod (*Solidago spithamaea*), found only on Grandfather Mountain, Hanging Rock Ridge, and Roan High Knob (Fig. 2), or endemic to South Carolina (Eastman's Rhododendron (*Rhododendron eastmanii*), or endemic to North America, like Little Bluestem (*Schizachyrium scoparium*) or endemic to the planet Earth like Bracken (*Pteridium aquilinum*). It is however, useful to know the term endemic because it makes understanding botanical literature all the more useful in determining what is truly endemic, or "native" to your region.

The other term Gleason used was **autochthon** - a very useful term. An autochthon is a species that originated in the place where it is growing—the place it is endemic, or native to. I would suspect that a species like Blue Ridge Goldenrod is an autochthon of the high elevations of the southern

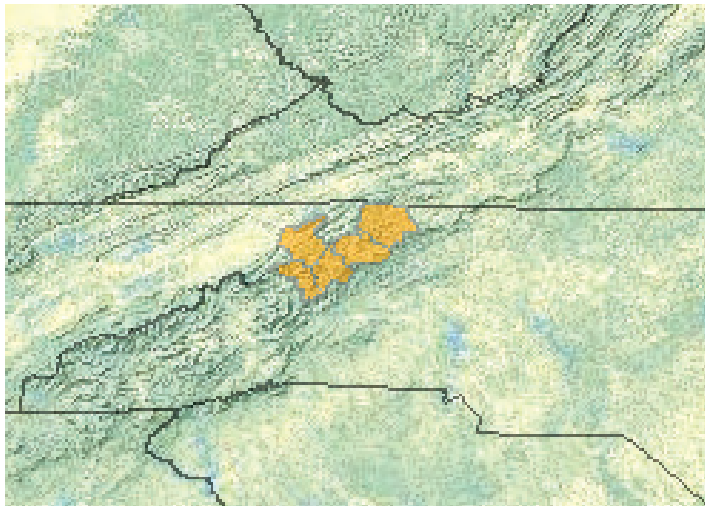


Figure 2. World range of Blue Ridge goldenrod, a narrowly endemic species. From USFWS (<http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=Q2J7>)

Blue Ridge, where it evolved. The nice thing about *autochthon* is you can use it for local genotypes. There is certainly a unique *autochthon* in the gene pool of Oconee Bells (*Shortia galacifolia* - Fig. 3) in the South Carolina foothills as compared to those of the foothills of McDowell County, North Carolina. They differ in a small morphological variation, the length of the style (*S. galacifolia* var. *brevistyla* is found only in McDowell County, NC). The two populations are obviously related and members of the same species but they have diverged because of chance events, small gene pools, and local selective pressures to become two segregate populations, *autochthons*.

And then there is the terminology applied to the non-*autochthons*, to the exotics. We have **intentionally introduced** species—plants man has purposefully moved into the landscape. This is how we added Kudzu, Chinese Privet, Mimosa, Chinaberry and many others to our list. We have **adventive** species—those that came on their own or without the purposeful introduction by man, as is the case with many pasture weeds. Many exotic plants are termed **ruderal** (occupying primarily disturbed habitats), but there are ruderal natives too.

Terminology aside, there is yet another problem with applying the words *native*, *endemic* or *autochthon*—

in some cases we don't know where a plant species originated. There are some great examples, like the Coconut Palm (*Cocos nucifera*). This plant has perfect fruits for traveling the globe, and is today found throughout the tropical world. The coconuts float in ocean water and travel from beach to

beach, where they spring up and soon start producing more bobbers to travel the oceanic currents. We're pretty sure that they are not native to the Caribbean or Atlantic basin, but where did they come from? Odds are that they are Pacific Islanders, but they made such good food stores on ships that they made their way around the world well before the science of ecology was worried about nativity. There are examples right here in our own back yards. Is Poisonbean (*Sesbania drummondii*) native where I found it on Turtle Island in Jasper County, SC? The plant is best known from the Gulf Coast, but could it have been brought to this remote location by man accidentally, or did it make its way on its own? Is Rattlebox (*Sesbania punicea* - see cover photo) native to the United States? Did it get introduced from the Neotropics or was it already in Florida when Europeans arrived? What about Florida Betony (*Stachys floridana*)? Is it native to the coastal plain of the Carolinas, where it grows in abundance in ditches and roadsides or did it move up from farther south? We still don't know for sure, and we may never know.

There are also plants that we long thought to be exotic that we now know are at least partially native. Two good examples are common here in the Carolinas. Yarrow (*Achillea millefolia*) was long thought to be native only to Eurasia, but now it appears there are local and unique genotypes found in high elevation grasslands in the Appalachians. Yeah, we may not need to eradicate them from grassy balds! Heal All (*Prunella*) is another good example, there are Eurasian and American populations which are now thought to be so distinct that they are considered different species, *Prunella lanceolata* (native) and *Prunella vulgaris* (exotic, but common now in the Carolinas). So we can't always say that a plant that is common in Europe was introduced to the US.

So...that's the long and the short of it. **Native** needs a modifier and so do all other terms. Sometimes it is even difficult to divine where a particular species or genotype is native to. To keep things simple, and to promote local gene pools and keep natural selection moving in our local area, it is best to obtain plants and seeds from as local a source as possible.



Figure 3. Oconee bells (*Shortia galacifolia* - note the long style emerging from the middle of the flower). Photo courtesy of Patrick McMillan.

The SC Native Plant Society Symposium at a Glance
Understanding Our Natural World and Our Role Within It
 May 14-15, 2011, Rock Hill, SC
 Sims Hall, Winthrop University

<i>Time</i>	<i>Topic</i>
9:00 am - 10:00 am	Registration/Coffee
10:00 - 11:00	Understanding Our Natural World and Our Role Within It, <i>Rick Huffman</i>
11:00 - 12:00 noon	Soul Mates for life: Native Plants and their Fungal Partners, <i>Tradd Cotter</i>
12:00 - 1:30	Lunch/General Business Meeting
1:30 - 5:00 pm	Workshop/Field Trips <ul style="list-style-type: none"> • Composting with Mushrooms, <i>Tradd Cotter</i> • Tour of Blackjack Preserve, TBD • Rain Gardening, <i>Rick Huffman</i> • Nature Photography, <i>Will Stuart</i>
Catawba Cultural Center 6:00 - 9:00 pm	Saturday evening program- Dinner: Indian Taco Program: Traditional Uses of Plants by the Catawbas
9:00 am - 1:00 pm	Sunday Field trips Tour of 40-acre rock Heritage Preserve, <i>Kathy Boyle</i> Walking Tour of Landsford Canal State Park, TBD Native Plants of Daniel Stowe Botanical Gardens, TBD

Meet the SCNPS Symposium Keynote Speakers

Rick Huffman,
Founder of Earth Design
*Understanding Our Natural World and
 Our Role Within It*

Imagine your residential landscape - an oasis and sanctuary where hummingbirds and butterflies flutter through a diverse kaleidoscope of native perennials. Come and learn about diverse ecological concepts, such as rain gardens and low maintenance landscapes through the use of non-chemical fertilizers, water-saving xeriscape principles, and minimal pruning and weeding. Turn your yard into a landscape that works in harmony with nature by creating diverse native plant communities that provide a serene outdoor space that is inviting for both people and wildlife.

Biography: Rick Huffman is founder of Earth Design, one of the Upstate's leading landscape architecture and environmental design/build firms. Rick demonstrates innovative runoff and erosion control, habitat restoration and ecologically diverse landscaping with native plants based upon natural plant community models. Mr. Huffman has worked extensively with local schools to promote environmental education and implementation of indig-

enous plants on school grounds. As a leader of the South Carolina Native Plant Society, he has brought awareness of these natural models to the forefront through public presentations and workshops on a statewide and regional level.



See some of Rick Huffman's landscaping work at www.earthdesignsc.com/

Tradd Cotter
Founder of Mushroom Mountain
Soul Mates For Life: Native Plants and their Fungal Partners

Explore the relationships between some of our native plant communities and their beneficial fungi. Learn about the complex inter-kingdom dependence and chemical signaling that is streaming and evolving through Earth's "natural internet". The mushroom's webby underground roots help trees absorb nutrients, create a better mulch, and attract worms. Mushroom habitat restoration and nutrient cycling balance the scales of life. And they taste good too!

Biography: Tradd Cotter is part-time scientist, part-time farmer, who has learned to grow mushrooms on everything from logs to denim jeans. Tradd and his wife, Olga, have created Mushroom Mountain, an 8-acre farm in the upstate that is devoted to growing thousands of mushrooms. The Cotters have learned how to identify and harvest mushrooms in the wild and then use that knowledge to figure out how to grow these mushrooms anywhere. Tradd is developing techniques to use mushrooms in bio-remediation to clean up oil and break down the paper that we throw away, as well as potential use as insecticides.



Take a tour of Mushroom Mountain with Tradd Cotter at <http://www.mushroommountain.com/>

Saturday Afternoon Workshops/Field Trips

Tradd Cotter
"Recycling and Composting with Mushrooms"

Are you wondering how you can help reduce pollution and lessen your impact on landfills? Join Tradd Cotter to learn how to grow edible mushrooms on trash you thought you couldn't compost! Turn cardboard, cereal boxes and more into fresh mushrooms, then add your leftover "fungus farm" to your garden to attract worms and enrich the soil. Create a circular system that's a winner!

Will Stuart
"Nature Photography"

Join Charlotte-area photographer, Will Stuart, as he shares tips to taking outstanding nature-based photographs. Will is an outstanding nature photographer, who has created a diverse portfolio of hard-to-photograph birds, insects including butterflies, and native plants. Learn about some of Will's favorite spots to photograph wild flowers. View some of Will's photographs at <http://www.flickr.com/photos/willstuart/>



Sweet white trillium. Photo courtesy of Will Stuart

Rick Huffman
"Create a Rain Garden"

Rick Huffman, founder of Earth Design, will lead the group through the steps of creating a rain garden. Learn how to identify the proper location, select the right plants, install and maintain a rain garden. Rick teaches techniques to harvest rain water from your rooftop and use that runoff to create a natural landscape while reducing pollution.

Field Trip Leader TBD
"Tour the Blackjacks Heritage Preserve"

Early explorers, such as John Lawson, described vast piedmont "savannas" in the Carolinas. The zones between field and forest were rich in diversity – diversity that declined when the prairies disappeared, taking with them the last of a host of plants and animals. A few remnant grasses and forbs bear witness to a once-thriving community. Come view one of the last prairie remnants that is home to the Schweinitz's Sunflower and 21 rare plant species. The Blackjacks Heritage Preserve covers 291 acres and contains a large array of prairie plant species.

(Story continued on back cover)

How the Eucalyptus Came to California - A Cautionary Tale

Reprinted courtesy of Teisha Rowland, author

It seems harmless enough; how can releasing a few plants or animals into a new area hurt anything? But again and again, we've seen how devastating purposeful or inadvertent introductions of foreign organisms can be. Results have included: declining populations of bats, honeybees, and amphibians, among others, and exploding populations of garden snails in California. Even when the harm from a non-native organism is not apparent, it's still tilting a long-term ecological balance.

When we think of introduced organisms wreaking havoc upon natives, animals are our first thought. But often over-looked **plant** invaders have had significant negative impact on the California landscape. In the late 1700s, the first Europeans settled in California, and brought non-native plants with them. By the early 1800s, there were 16 non-native plants and 134 species by 1860. Today, there are over 1,000 non-native plant species living in California (and nearly 5,000 native species). While less than 10% of these non-native plants are considered to be a "serious threat" to native organisms, every new plant affects its environment in ways both subtle and profound.

The cost of introducing "foreign" plants. Just how much damage can a few non-native plants do? Actually a great deal. For example, they compete with native plants for nutrients, and some non-native plants can alter nutrient levels in the soils (such as nitrogen levels). This changes the entire local environment, often in favor of the introduced species. In turn, this can prompt even more non-native plants, animals, and microorganisms to become established in these "disrupted" areas. The entire ecosystem balance can be thrown off.

While not all non-natives cause such noticeable damage to their new environments, the potential for serious disruption is always present, and

each introduction should be given much thought and research. The story of how the eucalyptus came to be embedded in much of California's scenery is a great example of a lack of forethought when introducing a plant to a new area.

Australian Roots. In 1770, eucalyptus specimens first made their way to Europe. On his first trip to the Pacific Ocean, Captain James Cook explored part of the Australian coast, and botanists onboard collected several different species and took them back to London. European botanists gave the trees the name "eucalyptus" because of how the flowers are in hard, protective cup-like structures; the Greek root "eu" means "well" and "calyptos" means "covered."

Soon interest in eucalyptus swelled in Europe. In the early 1800s, wealthy merchants and aristocrats were excited about rare or "exotic" plants and, together with people in the plant business, made cultivating eucalyptus trees popular. Horticulturists also wanted to better study such novelties, to understand them scientifically and to assess their potential economic value. And of course, the new European settlements in Australia were eager to sell the abundant eucalyptus. Promoters of eucalyptus touted the trees as not only being aesthetically pleasing, but also as satisfying many practical needs. The eucalyptus quickly spread in Europe.

Eucalyptus is a very large genus that consists of over 600 species, which are native to Australia, Tasmania, and some surrounding islands, in a range of soil conditions and temperatures (though prolonged frost is



Blue gum (Eucalyptus globulus) along a roadside.
Photo courtesy of Forest & Kim Starr.

usually detrimental). They do very well in Australia; 80% of the open forests there are eucalyptus. With some aromatic species majestically soaring over 300 feet tall, their height is second only to California's coastal sequoias. It's easy to see their appeal.

On an economic level, many early promoters believed the eucalyptus could be used for many purposes: timber, fuel, medicine, pulp, honey, and both medicinal and industrial oils. Not only could eucalyptus grow quickly in many conditions, but several species will sprout back rapidly from cut stumps. It all seemed too good to be true. Later, we learned that it was.

The Eucalyptus Goes to California. After it was spread throughout Europe, northern Africa, India, and South America, settlers in California became interested in eucalyptus. Not only was eucalyptus a fascinating novelty, but the Gold Rush of the late

1840s and early 1850s created high demand for wood for lumber and fuel. Deforestation became a serious concern, so much so that the California Tree Culture Act of 1868 was created to encourage people to plant more trees, particularly along roads. Many entrepreneurs rushed to capitalize on the situation.

Ellwood Cooper. Ellwood Cooper, an educator and entrepreneur, was one of the key individuals who helped eucalyptus take off in California, and is a local legend in Santa Barbara. After seeing eucalyptus in the San Francisco area, in 1870 Cooper settled in Santa Barbara. On his ranch, among many different types of produce trees (including olives, walnuts, and figs), he grew over 200 acres of eucalyptus. The eucalyptus forest he started lives on at Ellwood Bluffs. Cooper became a vocal advocate for eucalyptus, emphasizing its unique, pleasing appearance, and its useful qualities. He even wrote the first book in the U.S. on the species. It became very appealing to foresters in the 1870s and 1880s as native hardwoods were being severely depleted.

Starting in the 1870s, the first large-scale commercial planting of the blue gum eucalyptus (*E. globulus*) began. The blue gum, a mid-sized eucalyptus reaching around 150 to over 200 feet tall, is the most common eucalyptus in California. They're easily recognized by their waxy blue leaves and grayish bark that reveals a smooth, contrasting yellowish surface when the bark sheds off in long strips. Like many other eucalyptus species, blue gum can sprout back from stumps.

By the early 1900s, many would-be forest tycoons planted countless acres of eucalyptus for timber production. There were over one hundred companies involved in the eucalyptus industry at this time, and they changed the landscape of much of California. But they soon discovered that eucalyptus wasn't all they'd hoped it to be.

Sadly, Frank C. Havens' experience was the typical outcome. Ha-

vens was an Oakland developer who opened a mill and planted eight million eucalyptus trees in a 14-mile-long strip from Berkeley through Oakland. But when he tried to sell the timber, it was found that the trees were too young to make suitable wood; the young wood had an irregular grain, and it bent, cracked, and shrank when dried. It was soon found that eucalyptus trees would need at least 75 or 100 years to produce good lumber. Young eucalyptus fence posts and railroad ties decayed rapidly. Havens closed shop.

Other options for selling California-based eucalyptus products were grim. In the early 1920s, it was realized that California eucalyptus oil was poorer in quality than Australian oil. The wood was increasingly used as fuel, but cheap electricity and gas soon replaced it. By 1950, eucalyptus was relegated to ornamentals or windbreaks. The trees hadn't lived up to the many premature claims and hopes.

Eucalyptus in Recent Times. Today, there are millions of acres globally of eucalyptus forests, shade trees, anchors along canals, ornamentals, windbreaks, or plantations. Their adaptability allows them to grow where other plants can't, such as land that has been ruined by mining or poor agricultural practices. They're still used in medical products (including antiseptics, decongestants, and stimulants), foods (such as cough drops and sweets), perfumes, toothpastes, industrial solvents, menthol cigarettes, and more. (But be careful; eucalyptus bark and leaves, and consequently eucalyptus oil, are toxic if ingested or absorbed through the skin at high doses. It's especially poisonous to cats.) Eucalyptus is also a source of quality pulp. As a result, eucalyptus plantations are cropping up in developing countries, particularly in Thailand. Due to the contentious social and environmental impacts of this, much criticism has been cast upon the international corporations spearheading these projects.

In addition to these plantations, there are other divisive issues sur-

rounding the eucalyptus today. Blue gum can be invasive in California, aggressively spreading from its original planting if enough water is present, such as in the form of fog. The bark strips that blue gum sheds are extremely flammable, and can feed intense fires, such as the Oakland Firestorm of 1991.

Additionally, introduced eucalyptus groves pose a hazard to natural ecosystems. Because most eucalyptus was were grown from seeds from Australia, few insect pests traveled with the eucalyptus to its new home. 57 species of Australian mammals and over 200 bird species didn't make the voyage either. Because of the toxicity of eucalyptus, native would-be herbivores had to evolve mechanisms to deal with these toxins. Many herbivores won't eat eucalyptus. This increases the competitiveness, and eucalyptus groves have lower biological diversity, as native plants and animals are pushed out. While eucalyptus has not been as invasive as some non-native plants and animals have been, its story should still serve as a cautionary tale: in essence, think before you plant.

For more on eucalyptus and non-native plants, see Robin W. Doughty's book *The Eucalyptus: A Natural and Commercial History of the Gum Tree*; Carla C. Bossard, John M. Randall, and Marc C. Hoshovsky's book on *Invasive Plants of California's Wildlands*; and Wikipedia's article on "Eucalyptus" (<http://en.wikipedia.org/wiki/Eucalyptus>).

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PS: Her apartment looks out over Ellwood Cooper's bluegum forest.

Saturday Evening Program



You're invited to share the Native American way first-hand with Ye Iswa (EES-wah) "The People of the River" - South Carolina's only federally recognized tribe. Start your evening with a tour of the Catawba Cultural Center, which is housed in the only remaining Reservation Schoolhouse and includes a crafts store, featuring unique hand crafted Catawba pottery. New and improved exhibits offer an educational glimpse into the Catawba past.

Scholars tell us that the Catawbas lived in the Carolinas and were mainly traders and subsistence farmers. In the early 17th century, the Catawba traded deerskins to the Europeans for trade goods such as muskets, knives, kettles and cloth. The Catawba villages became a major hub in the trade system with the Virginia traders and the Carolina traders. Settlers began to move into the Piedmont during the 18th century and bringing disease with them. In 1759, smallpox swept through the Catawba villages for a fourth time in a century bringing the population to less than 1,000 by 1760. Colonists believed the tribe was dying out. However, today over 2,600 members are on the rolls.

The evening program begins with a dinner of Indian

Tacos. Then sit back, relax, and enjoy an educational program on *Traditional Use of Plants by the Catawbas*. Your Native American guides bring to life, traditions that have survived contact with Europeans, wars, and other cultural stress. Learn about traditional foods, medicinal plants, and other common uses of plants!

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Sunday Field Trips

Forty-acre Rock Heritage Preserve

Standing atop the gigantic granitic rock, you feel on top of the world or close to it. From the crest of Forty-Acre Rock you can see for miles on a clear day. The entire Forty Acre Rock Heritage Preserves encompasses 2,267 acres of a highly diverse protected area where the Sandhills meet the Piedmont. While the rock is only 14 acres, it seems larger than life. This preserve features granitic flatrocks, waterfalls, caves, hardwood & pine forests and a variety of wildflowers and wildlife.



Landsford Canal State Park

A broad river, rich history and rare, hardy wildflowers come together at Landsford Canal State Park. Stretched along the Catawba River along the South Carolina fall line, the park is home to the well-preserved remains of the canal system that made the river commercially navigable from 1820 to 1835. Out in the river is one of the largest known stands of rocky shoals spider lilies, tough plants that hang tight in the swift water and bloom spectacularly in a huge blanket of white in late May and early June. An easy-to-walk trail along the river leads to a viewing deck.



Rocky shoals spider lilies at Landsford Canal SP. Photo courtesy of vann@miami-art.com