The Sewanee PLANT PRESS

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Getting a Jump on the Hemlock Woolly Adelgid

An invasive, non-native pest has been creeping its way toward the forests of the Cumberland Plateau since it was first discovered in Tennessee in the Great Smoky Mountains National Park in 2002. The hemlock woolly adelgid, which is native to Asia but has become problematic since its introduction to North American forests, will kill an adult hemlock within four years of infestation. It has entirely wiped out the infected forests of the Southeast. Because the Cumberland Plateau, including local state parks such as Savage Gulf State Natural Area and Fall Creek Falls State Park, has large populations of old-growth eastern hemlock trees, our forests are in danger.

As an Ecology and Biodiversity major at the University I have come to understand the importance of these trees in our ecosystem, as well as their beauty and magnificent presence in our forests. Thus, when I learned about the problems the adelgid will cause, I was immediately very concerned about the future of our forests. After talking with Nick Hollingshead, the manager of Sewanee's Landscape Analysis Lab (LAL), I learned that there was no information about the abundance and distribution of hemlocks in our area of the Cumberland Plateau, including the state parks. Therefore, through funding from a Yeatman Summer Internship, I worked closely with Mr. Hollingshead to map the old growth hemlocks of Savage Gulf State Natural Area using geographical information system (GIS) software and techniques. This area was chosen because we had appropriate imagery for the area and because Jon Christof, manager of South Cumberland State Park, had approached the LAL for help in combating the adelgid problem.

My research involved mapping every hemlock that could be seen from infrared aerial photography, which was acquired during the National Aerial Photography Program in the late 1980's. This would give the park managers and interested officials an idea of the distribution and abundance of hemlocks, especially within areas of concern like view-sheds, trails, streams, and major points of interest in the park. With this information a detailed plan could be made identifying which trees were most important to save, for both aesthetic and ecological reasons. After the project was completed approximately 8150 trees had been identified, and maps were made that showed exactly where these trees were located.

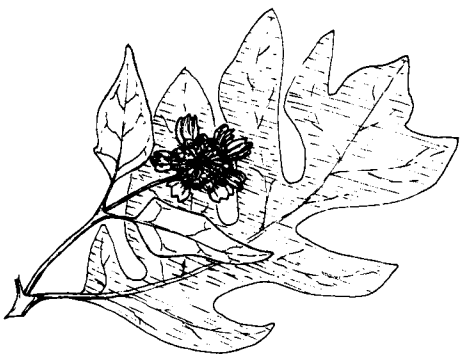
This internship was a great learning tool for my interests in environmental conservation and GIS. I put in many hours learning about how GIS works, how to make informational maps, and how to communicate GIS work to others. As a result of this work Savage Gulf managers have been able to involve state park officials in their hopes to save many of their hemlock trees. This culminated in a symposium at Sewanee that Mr. Hollingshead and I arranged, which brought together experts from the Great Smoky Mountains National Park, the University of Tennessee at Knoxville, the state park service, and local interest groups into a think-tank situation to share ideas for what we can do to help save our local trees.

This experience has been one that I will be able to take with me in all of my future endeavors with GIS work, science research, and communication of science. I hope to continue my work with hemlocks beginning in June as I begin a job as a GIS tech with the Tennessee State Park Service. I can attribute this new job to the work and experience I gained while at Sewanee, and I hope to bring new ideas and knowledge to their GIS lab. In addition, the LAL will be getting new imagery for Savage Gulf and Fall Creek Falls, so I expect that a new interested undergraduate will step in to give the parks updated information on their hemlock populations so that they may be treated and saved from the infestation. I hope that generations of students after me will be able to enjoy these giants of the forest.

—Erin Tyrell, C'08

A systemic pesticide in combination with predator beetles is showing promise as a defense, but it's expensive. The Friends of South Cumberland State Park are investigating the establishment of a fund to help pay for the treatments. For updates, please check www.friendsofscsra.org. —MPP

Tennessee Leafcup – an Uncommon Plant



In the woods of Sewanee flowers a plant in the late summer that at first glance seems to be a weed at best, an invasive exotic at worst—tall, ragged, not especially pretty, forming great masses in the herbaceous layer of the forest. In the spring, the overwintering rosettes, from which it may bolt, are often mistaken for a fern. Yet this a native plant, with a very limited range, and "is probably more abundant in the Cumberland Plateau of southern Tennessee than anywhere else in its known range" (Kral, 1983). This plant is called, appropriately, the Tennessee leafcup, *Polymnia laevigata* Beadle.

Tennessee leafcup looks very much like the more common *Polymnia canadensis* L., whiteflower leafcup, and both are found in the Sewanee area. They are in the family Asteraceae (the Aster family) and the tribe Heliantheae (the Sunflowers). Both can reach a meter and a half in height, with branching stems bearing leaves, the larger ones usually pinnately lobed, similar to some fern fronds. The leaves are in pairs along the stem, and the bases of the leaf "stems" or petioles clasp the plant stem from each side, forming a kind of cup, from which (presumably) comes the name, leafcup.

The flowering head looks somewhat like a very small daisy with most of the white "petals" (ray florets) plucked, leaving only six or fewer. The Tennessee leafcup, however, is smooth, with few or no hairs on the stem, while the whiteflower leafcup has hairs, often sticky ones, on the stem. The leaves of the Tennessee leafcup are smoother and more deeply dissected, with narrower leaf segments, and the flowering heads are smaller and less showy.

Polymnia canadensis L. is the plant with the older name. The "L." means that the name was given by Linnaeus himself, probably based on a specimen sent to him by those adventurous botanists collecting in the new world in the 1700's and possibly even collected in Canada. The genus *Polymnia* was also named by Linnaeus for the Greek muse of sacred song and dance. *Polymnia laevigata* Beadle is a much newer name. The specific epithet, *laevigata*, refers to the smoothness of the stems.

The type specimen, on which the scientific name is officially based, was actually collected near Sewanee, in Cowan, in Franklin County, on August 21, 1897, collection number 5837 by Beadle. This Beadle is most likely Chauncey Delos Beadle (1866-1950), a "Canadian-born botanist and horticulturist active in the southern United States" (www.wikipedia.org), who worked at the Biltmore Estate in Asheville, North Carolina, from 1890 to 1950 and traveled over a fifteen-year period studying and collecting native plants.

Both leafcups are endemic to eastern North America and, in fact, all species of the genus Polymnia occur in the western hemisphere. They grow best in damp, shaded sites on calcareous soils but may also occur on acid soils. *Polymnia canadensis* L. ranges widely from eastern Canada into the southeastern United States and west to Oklahoma and Kansas.

Polymnia laevigata Beadle is found only in scattered localities in the Cumberland Plateau, the Coastal Plain, and the Interior Highlands—one county in Missouri on the Mississippi River, one in Georgia, two counties in Alabama on the Warrior River, three in Kentucky on the Ohio River, and in Florida where it is locally abundant in the Marianna Caverns State Park. In fact, it is listed as endangered in Kentucky and Florida. Only in Tennessee is it found in a larger number of localities (including Obion, Lauderdale, Polk, and Rhea Counties), and in a number of contiguous counties (Franklin, Marion, Coffee, Grundy, Warren, and Sequatchie Counties, all on the southern Cumberland Plateau).

"Whether *P. laevigata* has spread from a center of distribution, e.g., in Tennessee, by saltatory advances or represents the remnants of a much more general distribution remains an unsolved problem" (Wells, 1971?). In any case, when Tennessee leafcup is seen in Sewanee's woods this summer, it can be appreciated as an outstanding population of an uncommon plant species, perhaps flourishing better here than anywhere else in the world.

—Yolande Gottfried

References:

Kral, Robert. 1983. *A Report On Some Rare, Threatened, or Endangered Forest-Related Vascular Plants of the South*, Vol. II. USDA Forest Service.

Flora of North America, Vol. 21, ed. by Flora of North America Editorial Committee. 2006, Oxford University Press, New York. <plants.usda.gov>

Wells, James R. 1965. A taxonomic study of Polymnia (Compositae). *Britonnia* 17:2 , pp. 144-159.

Wells, James R. 1971(?). Specific relationships between Polymnia canadensis and P. laevigata (Compositae). *Castanea*, pp. 179-184. <www.wikipedia.org>

Summer Calendar of Events

Lake Cheston Stroll
Wed., June 25, 4 PM, Yolande Gottfried
Ramble around Lake Cheston and see what can be found—wetland and aquatic plants, meadow plants, trees and shrubs, maybe even mosses and liverworts. Meet at the Lake Cheston pavilion for this easy one-hour walk. Bring hats and insect repellent if desired, though the insects usually are not a problem.

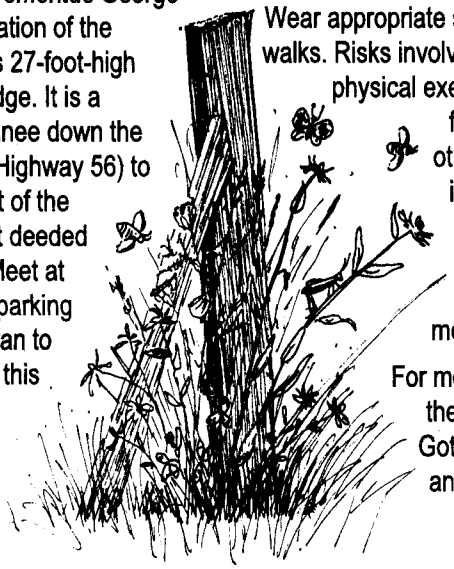
Sewanee Natural Bridge State Natural Area
Wed., July 9, 4 PM, George Ramseur
Join botany professor *emeritus* George Ramseur in an exploration of the vegetation around this 27-foot-high natural sandstone bridge. It is a short drive from Sewanee down the Sherwood Road (TN Highway 56) to the area, formerly part of the University Domain but deeded to the state in 1974. Meet at the Sewanee Market parking lot to carpool or caravan to the Natural Bridge for this short, moderate walk.

Late Summer Wildflowers
Sat., August 23, 8:30 AM, Mary Priestley
The Meadow Trail at the Visitors' Center at South Cumberland State Park is unique: it winds through a former golf course that has been converted to a flower-studded grassy meadow. Come see what's blooming; learn some names, ecological information, and tidbits of lore about these plants. The Visitors' Center is located on Hwy 56 between Monteagle and Tracy City. Phone 931.924.2980.

All times are CST or CDT.

Wear appropriate shoes on all of these walks. Risks involved in hiking include physical exertion, rough terrain, forces of nature, and other hazards not present in everyday life. Picking flowers and digging plants are prohibited in all of the above-mentioned natural areas.

For more information on these events call Yolande Gottfried at (931.598.5327) and leave a message.



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Drawings, by Mary Priestley, are of trumpet creeper vine (*Campsis radicans* (L.) Seem. ex Bureau); Eastern hemlock (*Tsuga canadensis* (L.) Carriere) tree and adelgid-infected twig; Tennessee leafcup (*Polymnia laevigata* Beadle); leaf of white-flowered leafcup (*P. canadensis* L.); and an overgrown fencepost.

Membership Application/Renewal

The Friends of the Sewanee Herbarium support the work of the Herbarium: education, research, and conservation. A $10.00 annual contribution would be very much appreciated. The date of your most recent contribution is printed on your address label.

Name and Address (if different from that on the mailing label on the back):

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Amount Enclosed: ❑ $10.00 ❑ Other: $ _____

Please make check payable to The University of the South. Gifts are fully tax deductible. Send to:

Sewanee Herbarium
c/o Mary Priestley
735 University Avenue
Sewanee, TN 37383

Others who might like to receive *The Sewanee Plant Press*: _____

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Domain in Focus

In April, the first annual Domain in Focus nature photography contest was held at the University. The contest was open to all students, staff, faculty, and Sewanee community members, and was sponsored by the Herbarium, the Landscape Analysis Lab, the Biology Department, and two student organizations: Students for an Environmentally Responsible Plateau (SERP) and WasteNot. These groups also judged the photographs with advice from Julie Püttgen (Department of Art and Art History).

The level of interest was excellent, with nearly 400 images submitted. Photos were judged within five categories: Plants, Wildlife, Landscapes, Creative/ Abstract, and Human Impact on the Environment. There were several excellent snail photographs, which made the Wildlife category quite competitive.

The winning photographs in each category will be on display in duPont Library this summer. All images will become part of a permanent archive depicting the natural diversity and beauty of the Domain and the Cumberland Plateau.

—Nick Hollingshead

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