

Mountain Lion Research on the Plateau

Most students, faculty, and community members at Sewanee take great pride in the rich forests and rolling coves that envelop our mountain home. The southern Cumberland Plateau, with some of the largest remaining tracts of native forest in the East, rises like an emerald jewel above the agricultural landscapes of the Highland Rim and the Sequatchie Valley.

Anyone familiar with the region and its forests has likely heard a story or two about mountain lions in the area, though these elusive predators have presumably been extirpated from the East since the 1940's. Stories of mountain lion sightings have been circulating the southern Cumberland Plateau for decades, and although they are unconfirmed, these stories reinforce the wild impression of this landscape.

In order to examine the evidence of a current mountain lion population and to determine the quality and extent of potential mountain lion habitat on the Plateau, I launched a three-pronged independent study in the summer of 2005. Focus areas for the study include mapping of sightings, maintenance of remote infrared cameras to capture photo evidence of a lion, and a habitat suitability model constructed using GIS computer mapping.

Mountain lions are highly adaptable creatures capable of living in habitats ranging from deserts to swamps to forests. These animals have the broadest geographic distribution of any terrestrial mammal in North America, excluding humans. However, in the past century mountain lions were eliminated from the Eastern U.S. due to exhaustive hunting, habitat loss, and declining prey populations. Today, despite the rebound of prey populations, the status of this apex predator in the East is precarious: the Eastern

Cougar (*Puma concolor cougar*) is deemed extinct in the wild and the Florida Panther (*Puma concolor coryi*) has been reduced to a population of approximately 50 individuals in south Florida.

In contrast, mountain lion sightings, like those on the Plateau, have increased all over the East and Midwest. Though many wildlife managers claim that these reported mountain lions are escaped captives or released pets, the origin of these individuals has yet to be confirmed.

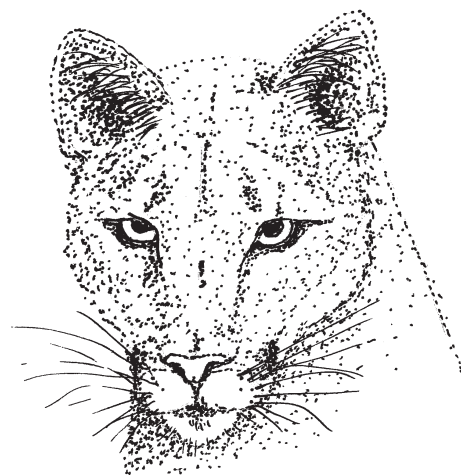
To date, we have mapped seven unconfirmed sightings from six separate sources using the ArcGIS 9 computer program. Because of the word of mouth method of collecting these sightings data, the sightings are mostly localized around the Sewanee / Monteagle area. Local naturalist Jean Yeatman has mentioned a number of sightings in the Lost Cove area and was kind enough to show me a plaster cast of a large feline footprint that she collected several years ago. In 1997 a Tennessee Wildlife Resources Agency wildlife officer found what were presumed to be mountain lion prints in southern Marion County near Sand Mountain, and in 1971 a local hunter killed a 150-pound mountain lion in Pikeville, TN, approximately 70 miles from Sewanee.

A photograph is necessary to verify the presence of mountain lions on the Plateau, and we have experimented with different types of remote game cameras in an attempt to capture an image. These tree-mounted cameras are active 24 hours a day and are equipped with an infrared sensor that triggers a camera in response to movement. So far no mountain lions have shown up to our cameras, but pictures of deer and surprised hikers have kept us amused in the meantime. The Landscape Analysis Lab has recently purchased a new digital remote

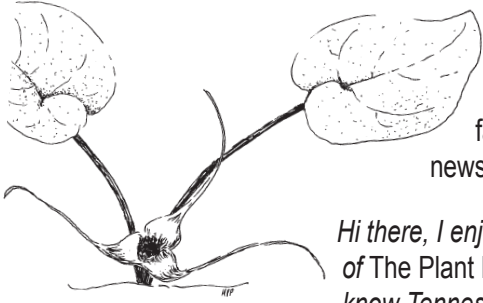
camera and has several more in the budget. Eric Keen (C'08) intends to continue working with the cameras in the future. If we are lucky enough to get a picture of a mountain lion, the next step is DNA analysis to identify the subspecies. A scat or hair sample would determine whether the cat is from one of the native subspecies—the Florida Panther or the presumed extinct Eastern Cougar—or whether it is a western subspecies of mountain lion, which would likely mean the animal is a released captive.

The habitat suitability model that I built using ArcGIS takes into account road density, land cover type, the contiguity of land cover types and the density of native forest patches, and other habitat characteristics that affect the quality of mountain lion habitat. The entire 7000 km² southern Cumberland Plateau study area was broken into 10 habitat suitability classes, with class 1 representing poor habitat and class 10 representing the best habitat. Approximately 1043 km² of the study area is in class 10, and most of these suitable habitat patches lie in four

(continued on p. 4)



Wild Ginger



The e-mail from Jim Scheller arrived shortly after we put the fall '05 issue of this newsletter into the mail:

Hi there, I enjoyed this issue of The Plant Press. . . . I didn't know Tennessee had wild ginger!

*Our wild ginger here is a wonderful plant and quite "shy". It is *Asarum caudatum* and likes shade and damp. It has dark rose-colored flowers which "hide" under the leaf. They are cup-shaped with three lobes, each of which has a long, tapering tip, a most unusual flower. What kind of flower does your wild ginger have?*

*I don't know if you have tasted the root or stem of your ginger plant. Our ginger is quite strong and the natives used it to treat toothaches. The Chinese use *A. caudatum* (xi xin) to treat tightness in the chest—heart-shaped leaves, hmmm, "The Law of Signatures", perhaps?*

At a psychic level, I've been told the plant is a "relationship" plant. Look at the way the root system is inter-twined and again the heart-shaped leaves. If your ginger is a different species, and more than likely it is, I'll send you some samples of ours next spring when the flowers come out. . . . Jim

When spring rolled around, a manila envelope arrived from the west coast, bearing a pressed and dried specimen of the long-tailed wild ginger. It is unmistakably close kin to our plant. The only obvious morphological difference between this and our eastern species (*A. canadense*) is the extended tips on the lobes of the western flower.

Wild ginger is a secretive little flower, if there ever was one. While trillium, geranium, and larkspur are fairly flaunting their blossoms to attract bees and butterflies, wild ginger's flowers lay low. The observant hiker must gently brush aside the plant's twin leaves to see the single maroon flower right at ground level.

That ground-hugging nature is for good reason. These blooms are engineered to get the attention of flies and gnats that are out early in the spring in search of rotting animals on which to lay their eggs. Although possibly disappointed to discover that these flowers are not corpses at all, the little insects can still snack on pollen and heedlessly transport more of it to the next flower (or dead body).

When the fruits of wild ginger mature, they pop open to expose seeds to which each has a yummy tidbit called an elaiosome attached. "Yummy to you!" you might say. Actually, they are so tiny that no one much larger than an ant would even bother with them. But ants love them! They raid the fruits and carry off the

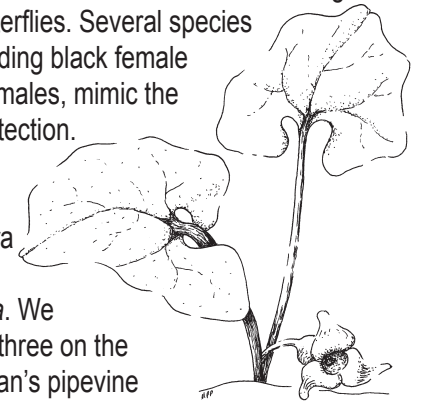
seeds to share the elaisomes with their nestmates before casting off (i.e. planting) the seeds in their burrows.

No, I have never tasted our *Asarum*, although I have rubbed the leaves and sniffed the ginger fragrance on my fingers. I have nibbled on the leaves of our much more common relative of wild ginger, the little-brown-jugs (*Hexastylis arifolia*), and found them to be spicy, somewhat peppery. American Indians and early colonists used both *Asarum* and *Hexastylis* for seasoning and they are advocated by wild food enthusiasts. Neither of these plants is actually kin to the ginger whose root you can purchase in the grocery store. That plant, *Zingiber officinale*, is tropical, an export of Jamaica and Indonesia.

Wild ginger root, boiled in sugar water, apparently makes a wonderful sweet treat. Indians also used it to cure a variety of ailments, from indigestion to coughs, colds, and heart problems. In recent years, this plant, along with the other members of the Birthwort Family (Aristolochiaceae), has been found to contain the anti-tumor compound aristolochic acid, which paradoxically may also cause cancer and kidney disease.

The chemicals in members of the Birthwort Family are also poisonous to several animals. But these plants are host to the pipevine swallowtail butterfly, which lays its eggs on the undersides of pipevine and wild ginger leaves. As they graze on the leaves, the emerging caterpillars ingest the chemicals and incorporate them in their bodies. Birds learn to avoid eating both the caterpillars and the butterflies. Several species of edible swallowtails, including black female Eastern tiger swallowtail females, mimic the pipevine swallowtail for protection.

The Birthworts form a relatively small family, containing only three genera in North America: *Asarum*, *Hexastylis*, and *Aristolochia*. We have representatives of all three on the Sewanee Domain: Dutchman's pipevine (*Aristolochia macrophylla*) was recently discovered on the Shakerag Hollow addition; colonies of wild ginger grow in Shakerag and in Dick Cove; and little-brown-jugs and Virginia snakeroot (*Aristolochia serpentaria*) are scattered throughout the forest. Each is a pleasure to discover in its woodland habitat.



—Mary Priestley

Sewanee grad Jim Scheller (C'62) is a physician and flower essence practitioner in Larkspur, California. A longtime Friend of the Herbarium, he sent us several books on the medicinal uses of plants and flower essence therapy when we first organized the Friends of the Herbarium.

Summer Calendar of Events

Know Sewanee's Trees: the Campus

Wed., June 21, 4 PM, Karen Kuers

Dr. Kuers, an urban forester, will lead a stroll among the trees of the Sewanee campus, giving tips on identification and tales about outstanding individuals, such as the "Moon Tree". She will also include information on "Taking Care of Your Trees" in an urban setting. Meet in front of All Saints' Chapel for this easy one-hour walk.

Know Sewanee's Trees: the Cross

Wed., July 5, 4 PM, George Ramseur

Join retired botany professor Dr. Ramseur for an easy walk among the trees of the Domain. Sometimes "we can't see the trees for the woods" but he will help us become familiar with the species that make up Sewanee's forest communities. Meet at the Cross for this one-hour walk.

Watercolor Workshop: Painting Tree Shapes in the Landscape

Sat., July 8, 9 AM-12 NOON, Bob Askew

Local watercolor artist Bob Askew will conduct this workshop in which students will learn to see trees as masses, and will receive a step-by-step lesson on how to effectively incorporate these shapes into their picture. One preliminary pencil sketch will be created as a dress rehearsal for a finished watercolor painting to be completed by each student. Other techniques to be covered: scaled drawing, paper stretching, transparent washes, wet in wet painting, masking shapes.

Students are encouraged to bring their own supplies and lightweight portable seats if they choose. However, basic materials will be supplied compliments of the Herbarium. Dress comfortably, and it is always good to be prepared with a cap, sunscreen, and bug spray.

This workshop is limited to 10 participants. Call Yolande Gottfried at 931.598.3346 to register (no cost) or for more details, call Bob Askew at 931.598.5311.

Meet Bob at the stone bench at the Quad adjacent to All Saints' Chapel on the Sewanee campus.

Late Summer Wildflowers: No Trees!

Sat., August 26, 8:30 AM, Mary Priestley

The Meadow Trail at the Visitors' Center at South Cumberland State Park is managed to keep out the woody growth and permit a flower-studded grassy meadow to flourish. 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.

THE SEWANEE PLANT PRESS

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Drawings, by Mary Priestley, are of little-brown-jugs (Hexastylis arifolia), western wild ginger (Asarum caudatum), eastern wild ginger (Asarum canadense), Dutchman's pipe (Aristolochia macrophylla), mountain lion, and mountain lion paw prints.

For more information on these events contact Yolande Gottfried at the Herbarium (931.598.3346) during regular business hours or by e-mail at ygottfri@sewanee.edu.

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

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c/o Mary Priestley
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Co-sponsored by the Friends of South Cumberland State Park
www.cumberlandwild.org

Mountain Lion, continued from page 1

contiguous counties surrounding Sewanee: southern Franklin and Marion counties of TN and northern Jackson and Marshal counties of Alabama. This amount of habitat could hypothetically support anywhere from 24 to 50 mountain lions. However, as scientists learned from experimental mountain lion reintroductions in North Florida, even if a landscape is physically capable of supporting a mountain lion population, ultimate success or failure of the population is dependent on the attitudes of local residents.

I presented this research in March at the annual meeting of the Association of Southeastern Biologists. This is, however, an ongoing project. Anyone who believes they have seen a mountain lion or evidence of one on the Plateau is urged to contact me at moye_vp0@sewanee.edu. Residents of the Mountain can take pride in knowing that our home is one of the last remaining pockets of wilderness in the East still capable of supporting a mountain lion population. Lets keep it that way!

—Valerie Moye C'07

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