



Lingua Botanica

The National Newsletter for FS Botanists & Plant Ecologists



I've been spending a lot of time in my yard this spring doing the usual things; mowing grass, whacking weeds, smelling flowers. This year however, I've also been propagating copies of some of my favorite plants. Making new plants from cuttings is little miracle. Snip snip. Add a little rooting hormone and some water and pretty soon you have a new rose, a new beautyberry, or a new *Sedum*. It's so cool. You sure can't make new puppies or gerbils that way! So anyway, I have all these new plants sitting around, many more than I could ever use for myself. And now the real fun begins; now I get to share little bits of my garden with my friends. My current garden started as a blank canvas of suburban lawn. Early on I had to make some big decisions about where to cut out lawn for flowerbeds and where to plant trees. That was hard enough, but then I had to choose the palette of plants I wanted to use: size, colors, texture. As we all know, the choices are embarrassingly plentiful; from *Amorphophallus* to *Mirabilis* to *Zinnia*; annuals, perennials; prickly foliage or soft, natives both delicate and rank, exotic tropicals, old-fashioned plants, and froo-froo cultivars. It's too bad the yard will only hold a few hundred species... It's only taken a few short years (and some tender loving BST) to get to where I have lots of little presents for my friends. From the moment my trusty old shovel first cleaved my Bermuda grass sod I've been on a path of a thousand decisions toward a green nirvana. It started with a goal, and I worked a weekend at a time toward it. Overall, I'm happy with the decisions I've made. I've benefited hugely from the generosity of friends, mistakes (sometimes big ones) were made, and the path has sometimes been obscure; but good or bad, clear or confused, each turn eventually led me to where I hoped to go. What I've built is exceptionally rewarding, but the bigger joy comes from sharing the fruits of my labors. - the editor.

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Useful URLs

Pacific Forestry Centre's Mushrooms of the Pacific Northwest: A really useful resource! This page is an "expert-system" type key to the macrofungi of the PNW that is pretty easy to use, even for non-mycosheads.

http://www.pfc.forestry.ca/biodiversity/matchmaker/index_e.html

ShrubCam!: If you enjoyed last year's CornCam or SoybeanCam, you're going to love the Superfluous Shrubbery Cam. While you're there, be sure to visit the guest shrubs.

<http://www.sudftw.com/shrubcam.htm>

Mary Austin's *Land of Little Rain*: The work that made Mary Austin famous in 1903 is available in its entirety via the web. If you've not experienced the Land of Little Rain, make some time for classic prose about desert botany.

<http://sunsite.berkeley.edu/Literature/Austin/LandOfLittleRain/>

...and learn more about Mary Austin at

<http://www2.tcu.edu/depts/prs/amwest/html/wl0359.html>

2002 is the International Year of the Mountain: State agencies and private organizations in the U.S. are participating in the commemoration of the Year of Mountains with special festivals or symposia. The U.S. is proud of its mountain communities and their efforts to maintain mountain biodiversity and promote economic security and a healthy environment.

<http://mt2002.er.usgs.gov/>

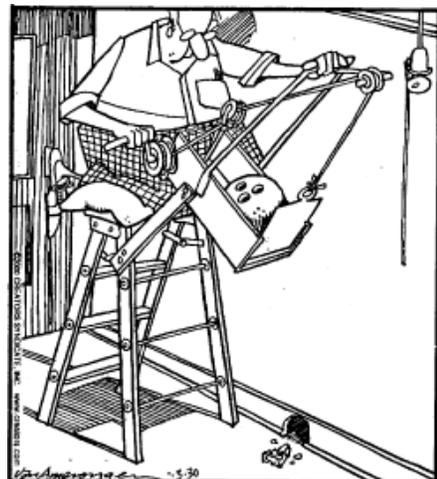
<http://www.mountains2002.org/home.html>

U.K. Big Trees: Although some of this site is membership-protected, you can still view some pretty amazing images of monster hardwoods from the British Isles.

<http://www.tree-register.org/>

New National Botany and Rare Plant Leader Named

Wayne Owen, the Southern Region's Plant Ecologist, has been named the Forest Service's National Botany and Rare Plant Program Leader. Wayne has a Ph.D. in Plant Ecology from the University of California, Davis. Wayne began his Forest Service career as the Forest Botanist on the Boise National Forest, served several years on the Interior Columbia Basin Ecosystem Management Project Science Team, and was the Forest Botanist and Range Program Manager on the Ouachita National Forest before moving to the Regional Office in Atlanta.



Wayne doesn't have near enough to do in the evenings.

News From the FWS National Conservation Training Center.

Hi! I am Larry Stritch. I serve as the Forest Service's liaison at the Fish and Wildlife Service's National Conservation Training (NCTC), located in West Virginia's eastern panhandle in the community of Shepherdstown. We are located approximately 70 miles north of Washington, DC and are considered a part of the Baltimore Washington metropolitan area. In my capacity as FS Liaison at NCTC I make FS employees aware of training opportunities that are not available through our WFWARP Continuing Education Program, <http://www.fs.fed.us/biology/education/index.html>. The NCTC offers courses in a variety of disciplines including wildlife, fish, and plants, from conservation genetics to conservation biology. Additionally, training opportunities can be had in:

Aquatic Resources	Interpersonal Skills
Biodiversity	Interpretation
Biotelemetry	Introduction/US Fish & Wildlife Service Programs
Budgeting	Land Acquisition
Change	Law
Communications/Speaking/Writing	Law Enforcement
Computer Technology	Leadership
Congress	Mapping
Consensus/Negotiations/Conflict	Media
Conservation Biology	NEPA
Conservation Leadership	Orientation
Contaminants	Partnerships
Cultural Resources	Permits
Distance Learning	Planning
Diversity	Problem Solving
Ecological Services	Programs, U.S. Fish & Wildlife Service
Ecosystem Conservation	Realty
Education/Outreach	Refuge Management
Endangered Species	Restoration
Environment	Rights-of-Way
Environmental Education	Safety
Federal Aid	Secretarial/Clerical/Adminstrative
Financial Skills	Statistics
Fisheries Management	Supervision, Management and Leadership
Fish Culture	Team Building
Fish Health	Training/Instruction/Facilitation/Presentation Skills
Fisheries Techniques	Vegetation
Geogranhic Information Svstems (GIS)	Waste Management

Global Positioning Systems (GPS)	Water Rights
Habitat Conservation	Water Quality
Habitat Evaluation	Wetlands
Hazardous Materials	Wilderness Management
Human Resources Management	Wildlife
Internet	Invasive Species
Motorboat Operator and Instructor courses	

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[NCTC Home Page](#)

By clicking on any of the underlined subject areas you will be directed to the web page where the courses for that subject area are listed. Additionally, you do not necessarily have to come to NCTC to take one of their courses; some courses are taken to the field on a regular basis. Also if your Forest or Region would like to have NCTC bring a course to your area that can be arranged. Usually, it will mean scheduling the course a year out. Tuition for FS employees generally runs \$650.00 for a weeklong course, less if the course is of a shorter duration. Lodging and meals are provided on site and are within per diem limits. For students, especially single parents an on-site day care facility is available. Please visit <http://training.fws.gov/campus.html> for further information.

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Interesting Botany Books Linnaeus: Nature and Nation

Lisbet Koerner, 320p., from Harvard University Press, 2001.

Review by Book News, Inc.

Rejecting the focus of earlier studies on how modern Linnaeus (1707-78) was, Koerner (history of science, Harvard University) examines his actual thought processes and aspirations as revealed in letters, poems, notebooks, and secret diaries. Of particular interest to her is his desire to teach tropical plants to live in the north and to domesticate wild animals to provide his native Sweden with the same degree of economy as empires with colonies.

Toward the Managed Forest – Going Places We’ve Never Been.

From: Jack Ward Thomas 1985 Wildlife Society Bulletin 13: 197-201.

Originally presented as an after-dinner address to the Canadian Forestry and Wildlife Management Symposium in 1984, this (in)famous speech about dysfunctional relationships between ‘ologists and silvi’s seems as relevant today as it was then.

I wish that every biologist and every forester in the agency would periodically read this article and reflect on the interactions they have with their management partners. We should always be thinking about our role in the Forest Service. What are we here for? What will our legacy be? Although the original piece is presented in the context of wildlife biologists, the games apply equally well to any ‘ologist and in the summary table below, I’ve tried to generalize the games for all biologists.

The single most important message in the original paper is “So long as wildlife considerations operate in the management arena as constraints, there will be conflict. Wildlife must be considered as a desired product, not as a constraint, if wildlife is to receive adequate attention.” The second most important message is that the more we play these games, the more the resources, our own credibility, and the trust that is essential to good working and public relations suffers.

Jack does not suggest that we, the biologists, simply roll over for those regressives (within and outside the agency) that see the forest as simply a source of products such as boards and fiber. Our responsibility is to tell the truth, obey the law, stay engaged, stand by your ethics, and be professional. Repent if you need to, receive your absolution, then go forth and do good things.

Games that Foresters Play	Games that Biologists Play
<p>Loophole: When playing loophole, the constrainee attempts to outwit the constrainer by finding a hole in the constraint big enough to drive a logging truck through. If called to task, the constrainee quickly blames the constrainer for having written a confusing constraint. The operative question for a loophole player is not “is it right?” Rather, the query becomes “is it legal?”</p>	<p>Stand Clear and Throw Rocks (aka Ain’t it Awful): In this game, the biologist essentially refuses to have anything to do with forest management while reserving the right to criticize and ridicule. The exercise is rewarding to the souls of the sanctimonious, but does little for the resource.</p>
<p>Prove It: In this game the constrainee essentially says “I don’t believe that the constrainer is correct and I will not be constrained until somebody proves it.” A good prove-it player tries to retain the right to make all final decisions as to when something is indeed proven. Some scholars believe this game is related to the game of Catch 22.</p>	<p>Obstacle: It has been observed that even the most competent biologist can serve faithfully as an obstacle to any land management scheme by pointing out that any alteration to the <i>staus quo</i> will be harmful to some species. The only difference between stand clear and throw rocks and obstacles is that in order to play obstacle one must actually enter the fray rather than remain aloof.</p>
<p>Redefinition: In redefinition, the constrainee, upon finding that a constraint is difficult or impossible to meet while accomplishing some other prime objective, responds by causing the constraint to be redefined to make it less constraining.</p>	<p>Hogtied (aka I’ve Got You now You Son of a...): Hogtied is usually employed by those who, down deep, wish to thwart forestry operations to the extent possible. This is usually accomplished by choosing a highly visible (in the political sense) species for emphasis. A threatened or endangered species will do nicely. Or, second best, is a valued game species. Then, the worst possible scenario is developed in order to demonstrate that catastrophe is imminent. Alternative, more positive approaches</p>

	receive little consideration.
Whoops!: Astute whoops players outmaneuver constrainters by ignoring or only partially meeting the constraints. When caught short, the constrainees exclaims, “whoops” while exhibiting surprise and chagrin at the failure to perform as expected. Really astute players take on an aura of contriteness and promise better performance in the future.	We Don’t Know Enough: If we don’t know enough, the biologist refuses to be contaminated by participating in anything grubby as forest management while pretending to take part. Pretense takes the form of responding to all queries for knowledge by emphasizing how little is really know about species/forestry relationships while ignoring the considerable amount that is known. Some students of game playing believe this game is nothing more than a variation of the old generalized standby – “Stop the world I want to get off.”
Predecessor: When playing predecessor, the constrainees attributes all past actions, all current actions, and all planned actions to his predecessor in the position. Predecessor loses effectiveness gradually, usually becoming ineffective some 3 to 5 years after the incumbent’s appointment.	Precision: Precision is a game whereby the appearance of ignorance is greatly enhanced by insisting on high levels of precision in inherently nebulous estimates. At the same time, steadfast opposition is maintained to suing, in the absence of better information, principles and general relationships. One observer noted that a good precision player can unabashedly stand quietly in the midst of a dozen D-8 Caterpillar tractors busily engaged in rearranging the world and take measurements in milli-microns.
We Don’t Do That Anymore: This is a variation of predecessor in which the constrainees explains noncompliance by admitting that the situation is bad, but assuring everyone concerned that “we don’t do that anymore.” This deflects impending criticism by tacitly admitting the constraint was not met but that such actions are a thing of the past and, hence, not worth further comment. We don’t do that anymore is particularly useful in dealing with constrainters that are meek, dull, or unreasonably optimistic. If the constrainees sees that the constringer is not buying we don’t do it anymore, a quick shift to predecessor sometimes allows escape from the noose.	Lying Down in Front of the Bulldozer: Lying down in front of the bulldozer is the physical equivalent of the more cerebral game of obstacle. The tactic is to be willing to sacrifice everything in an all out effort to stop the activity. In some versions the biologist charges full tilt at the specter of the managed forest – usually splintering his lance in the process. The literary among us will relate to this game by its European title of “Don Quixote.” Oriental scholars prefer the more ancient designation of “Kamikaze.”
Teamplayer: This blatant game is usually employed only when some less intense game has failed to yield the desired result. Teamplayer is most effective when used on a constringer by a superior in the bureaucracy. It usually takes a form of something like this” “We have a job to do. Your constraints have turned out to be something of a bother. If you were a bit more understanding and flexible the job would get done and we will all look good. If not, we will <i>all</i> look bad and it will be <i>your</i> fault.” Only the nerviest, most steadfast constringer can handle several consecutive games of teamplayer without cracking under the strain.	



Doing for Native Blooms What Johnny Did for Apples

Ken Druse, NY Times, 29 May 2002

RAMINGHAM, Mass. - Ask William Cullina about the future of gardening, and he will give a one-word answer, "natives," the way the word "plastics" was delivered in "The Graduate." Native plants have given him a career, and the subject of his two books. They have also been the focus of Garden in the Woods, a public garden here that displays the largest landscaped collection of native plants in the Northeast. It is here that Mr. Cullina now works.

Twice a year I make a pilgrimage to this garden to see the woodland wildflowers, especially in spring, when the leafless landscape makes these curious jewels of the forest floor glow. Scattered around are rhododendrons and mature native azaleas with pink flowers fluttering like butterflies. The densely planted understory includes blue star, Solomon's seal, wild bleeding heart, wild sweet William, wild ginger and scores of white, yellow, bronze and red trillium species. It is common to turn a corner and find not just the typical mature gardener but people in their 20's bowing down to a lady-slipper orchid. Some lady-slippers are, in fact, available in the retail area of the garden.

"*Cypripedium kentuckiense* is the largest of the lady-slippers," said Mr. Cullina, whose book "Native Trees, Shrubs and Vines" is being published this week by Houghton Mifflin. "It grows to two feet tall and has a pouch as big as a hen's egg. I'm not saying you should buy it < it's just really, really cool." His offhand pitch was appealing, but the \$100 price tag was a little off-putting. Instead I went for a less expensive showy lady-slipper (*Cypripedium reginae*), a plant I had seen for sale only one time before, also at Garden in the Woods.

There is a national trend toward growing native plants, and it is not because of post-September patriotism. It is because people believe that these plants will get along on their own and be care-free in the garden.

"That's not always true," said Mr. Cullina, who is chief propagator and nursery manager at the garden. "For one thing, the plants may get eaten by bugs, and people don't like that."

But that, he said, shows that they are integral links in the food chain, which ultimately leads to you and me. "One ecological argument is that no plant is an island, that organisms evolve with other organisms and develop relationships and also antagonisms in this web of life," he said.

Once native plants are established, they will probably do better in times of stress (subnormal temperatures, heat or drought) than exotic plants from other climates. Considering the heat wave that plagued much of the country in April and the recent cold snaps, it is asking a lot of a plant to fare well. In my northern New Jersey garden, most of the native deciduous trees don't leaf out until late May, so they were spared damage this year. I can't say the same for the exotics, many of which, like the Japanese weeping Katsura, have leafed out and lost three sets of leaves this spring.

But there is also an aesthetic reason to grow natives: a desire to overcome habits that make it hard to know where you are in this country unless you look at your plane ticket. "In this age of homogenization, native plants help provide regional context," Mr. Cullina said. "When you think of sugar maples, you think of New England. When you see palmetto palm, you imagine South Carolina. If you picture the Joshua tree, you know

it's the California desert. It is the same with the tall grasses of the Midwest prairies." Planting such things is an act of restoration, not decoration.

Mr. Cullina grew up in West Hartford, Conn., where his family had a vegetable garden. His grandmother was a horticulturist, and at 7 Mr. Cullina was routinely mounting pressed flowers and leaves from the woods behind his family's home. He learned about plant science and propagation in a Saturday school science class he was chosen to attend in fifth grade.

"I wanted to study biology in college, but hated the chemistry and memorizing statistics," he said. He graduated from Hobart and William Smith Colleges with a degree in psychology, but returned to school to study horticulture and landscape architecture and received a Bachelor of Science degree from the University of Connecticut. "I started growing tropical orchids under fluorescent lights in college," he said, "and by the time I went back to school, I had filled the spare room and moved on to the basement with banks of metal halide lights."

After a divorce, he scaled down his collection to fit a small apartment and discovered the miniature orchids that have fascinated him ever since. "I love plants < how they look, what they do," he said. Growing exotic orchids indoors complements growing local plants outdoors. (Mr. Cullina is building a new house with his wife, Melissa, that will have greenhouses for orchids and propagation; his next book will be on growing orchids.)

In 1995, he answered an advertisement for the position he now holds at Garden in the Woods, which was begun in 1931 by Will C. Curtis, a graduate of the landscape architecture program at Cornell University, on 30 eccentric acres of glacial ravine in Framingham, a quiet town about 20 miles southwest of Boston. Two years later Howard Stiles joined him. In 1965, pressed by finances, age and developers, Mr. Curtis and Mr. Stiles gave Garden in the Woods to the New England Wild Flower Society, which raised an endowment to maintain it. Garden in the Woods has now been expanded to 45 acres < 32 in natural woodlands and 13 in gardens.

Since 1980, Garden in the Woods has had a retail area to promote one of its missions, conservation through propagation. If more people grow wildflowers and learn to propagate them, some of the genetic cache will be saved, even as the habitat of wildflowers is lost to development.

The year Mr. Cullina arrived, retail nursery sales were \$70,000; last year the nursery grossed \$271,000. The success is due in part to the growing interest in native plants, and also to Mr. Cullina's increased efficiency in propagation. Today, plants like his own selection of *Phlox divaricata*, which he called Blue Moon, or the native *Iris fulva*, with five fans of growth, are available in two-quart pots for \$6 or \$7 each; they are rarely available through any other retail outlet.

"A lot of what I do is to adapt things that I've picked up from other people, and sometimes I figure things out by accident," Mr. Cullina said. For example, he harvested some blue cohosh seeds before they were fully ripe one year, only to discover that they germinated faster < in two years, versus three. He cleans seeds from berries in a commercial milkshake blender and seems to know intuitively what a plant that isn't performing might need.

The holy grail of wildflower production has always been the native lady-slipper orchid. The pink lady-slipper is still rare and often too difficult to grow at home. (It is

nearly impossible to transplant species collected from the wild, because of their extremely fragile root system and soil requirements.) But yellow, white and showy lady-slippers are less difficult and more readily available, being propagated successfully from seed and by plant division.

Orchid seed is as fine as dust and must be sown on a sterilized nutrient medium in flasks. "We don't have laboratory space here," Mr. Cullina said. "But we collect seed for a few growers and get plants back in return."

Many of the lady-slippers available in the nursery are propagated by dividing clumps. Sown from seed, orchids take up to seven years to bloom. Plants from divided clumps might bloom in a year or two.

"A happy yellow lady-slipper orchid clump will double its number of shoots and flowers each year," he said. "Once a colony is well established, you can divide them every other year."

"Barring unforeseen disasters, these herbaceous plants could live forever," he said. "We're dividing healthy orchids that are over 60 years old."

Mr. Cullina will not stop propagating and propagandizing native plants until people consider restoration simply as another way of gardening. "If everybody appreciated and grew native plants, that would help to bring back the wildlife that is associated with them," he said.

One person may not make a difference, but if it's 10 people, 100 people, 1,000 people. . . . If neighbors could get together to create less manicured plantings along their common borders, perhaps someday, following Mr. Cullina's example, there could be flyways and wildlife corridors that could bring new life to the botanically barren suburban landscape.

A Sapling With Lofty Ambitions

David Cho, Washington Post, 27 April 2002



A generational passing 460 years in the making was celebrated at Mount Vernon yesterday when an infant white oak, its bottom wrapped in wet paper towels, was presented to the public and then plopped into a hole in a grove of trees on George Washington's great estate.

Though hardly more than a twig in the ground, this was no ordinary sapling. No, this unassuming little stick is a clone of the granddaddy of trees, the famous Wye Oak of Talbot County, Md. -- the largest white oak in the nation and considered by many arborists to be the most impressive tree on the East Coast.

Yesterday's coming-out party at Mount Vernon represented the first outdoor planting of a clone of the gigantic tree. The Wye Oak -- 79 feet high, half an acre across at its crown and more than 31 feet in girth -- has survived wars, pollution, gypsy moths and even the ax in its nearly 500 years on Earth.

During Colonial times, it was ignobly reduced to a hitch for horses and endured the constant trampling of hooves on its roots. But in 1939, the Wye Oak hit it big,

literally, when its lordly stature prompted Maryland officials to give it its own state park on 27 acres of Eastern Shore real estate.

The secret to its beauty and longevity? Scientists believe it's all in the genes.

That's why cloning the Wye -- a feat that took 30 years in itself -- is so significant, researchers say. The clones -- there are 30, with more to come -- could one day be a boon for the multibillion-dollar nursery industry, which already generates several times more in revenue each year than U.S. tobacco and sugar crops combined, according to the U.S. Department of Agriculture.

Imagine, if you will, a Wye oak for sale at every garden store in the country. That's what nursery owners are dreaming of, and they're not stopping there. The nonprofit Champion Tree Project, founded in Michigan in 1996, is partnering with nurseries across the country to identify and clone the biggest and best beauties of all 826 tree species in the United States. Their next project: a 3,600-year-old bald cypress in Florida.

The Wye project had priority because the venerable tree is succumbing to old age. Its trunk is already hollow enough for "four men to sit in there and play cards," said Frank Gouin, a retired horticulture professor at the University of Maryland who cracked the genetic code on the Wye Oak three years ago.

The Wye clones are considered valuable because the original has never suffered from a prevalent fungus disease known as oak wilt, which is particularly damaging to white oaks. In addition, its leaves seemed to repel gypsy moths naturally.

"It's a mystery why. It has to be something in the genes," Gouin said.

Oaks are popular among landscapers and homeowners, said Nancy Buley of the American Nursery & Landscape Association. "There's a mystique around oaks, especially a tree like the Wye Oak."

The Champion Tree Project's founder and president, David Milarch, said that what interests him is what has allowed the giant white oak to stay so well for so long. "Was it luck or did it just miss the ax? Or was there something going on genetically in its immune system? We will never know if we lose that tree."

Milarch also held out the possibility of medical advances and cures as future generations of scientists study the Wye's genes. The bark of the Pacific Yew, for instance, was found to have cancer-fighting properties.

Equally important to Milarch is restoring U.S. forests to their former glory. "The Wye Oak is what trees on the Eastern Seaboard are supposed to look like. That's what made up the forest two, three hundred years ago," he said.

Yesterday's tree-planting was part of an effort by the Champion Tree Project to replenish Mount Vernon's forests with 1,000 trees in the next decade. In recent years, the majority of the riverfront estate's saplings have been eaten by deer forced off nearby land by encroaching development in southeastern Fairfax County.

With that in mind, a wire fence has been installed around the Wye clone to fend off hungry visitors, and arborists vowed to keep close tabs on the sapling.

Champion Tree has most of its cloning done at private nurseries and receives \$1 for each cloned tree that is sold. In return, the businesses get to use the Champion Tree label. Because some trees, including white oaks, are extremely difficult to clone, nurseries guard their techniques like state secrets, Milarch said.

Agricultural cloning is not a new science. Fruit farmers have been doing it since Plato's time, Gouin said; in fact, the ancient philosopher wrote about grafting, a form of

cloning. Gouin's success involved grafting a bud from the Wye Oak to a seedling from one of its acorns and wrapping the graft in wax to prevent moisture from leaking.

While they can't be sure, Gouin and Milarch believe that clones will grow to the same height as the originals; natural offspring, by contrast, have only 50 percent of a parent's genetic makeup. But the pair conceded that it might take some time -- say a few centuries -- before that theory can be proved.

In the meantime, Mount Vernon's newly cloned infant can enjoy the estate's fertile soil and the protection of its corps of gardeners. During yesterday's ceremony, a small photo of the original Wye Oak was left on the ground next to its clone -- a reminder of Granddad and an acorn that fell in a place far away.

LB EXTRA: The Wye Oak was felled by a storm on the evening of 6 June 2002. For a full report on the sad event, point your browser to <http://www.washingtonpost.com/wp-dyn/articles/A8861-2002Jun6.html> or <http://www.cnn.com/2002/US/06/17/fallen.oak.ap/index.html>

Botany

By Berton Braley (<http://mac.edu/~ckasper/indexbot.htm>)

There should be no monotony
In studying your botany;
It helps to train
And spur the brain --
Unless you haven't gotany.
It teaches you, does Botany,
To know the plants and spotany,
And learn just why
They live or die --
In case you plant or potany.
You learn, from reading Botany,
Of woolly plants and cottony
That grow on earth,
And what they're worth,
An why some spots have notany.
You sketch the plants in Botany,
You learn to chart and plotany
Like corn or oats --
You jot down notes,
If you know how to jotany.
Your time, if you'll allotany,
Will teach you how and whatany
Old plant or tree
Can do or be --
And that's the use of Botany!



When Plants Migrate

James Trefil, Smithsonian Magazine

The Paleobots say we've got it all wrong you know. Over the past several decades the scientists who study the history of plant life, known as paleobotanists, or paleobots for short, have been building up a picture of how ecosystems evolve that may change how we think about the multibillion-dollar business of conservation.

Back in 1889 a young explorer and biologist named C. Hart Merriam climbed 12,633-foot Humphreys Peak in the San Francisco Peaks in Arizona. He noted what many mountaineers had noted before: that as he climbed, the plant life changed radically. Starting among the cacti of the Sonoran Desert, he climbed into a pine forest at 7,000 feet and a treeless alpine tundra at the summit. It seemed to him that the plants at a given altitude were associated in what came to be called "communities," groupings of interacting species. The idea was that over the course of time, plants that require particular climate and soils conditions come to live in the same places, and hence are frequently to be found together. An oak-hickory forest might be one such community, a spruce-fir forest another. What the paleobots are asking is whether these associations, real in the present, are permanent.

A great natural experiment took place on this planet between 15,000 and 10,000 years ago, when small changes in the Earth's orbit and axis of rotation caused great sheets of ice to spread from the poles. These glaciers covered much of North America and Europe to depths of up to two miles, and then, as the climate warmed, they retreated. During this retreat, they left behind newly uncovered land for living things to colonize, and as those living things moved in they laid down a record we can read now. Today the study of tree migration is a growth industry, in the past couple of years workshops on the subject have been held in California and Australia.

Think about a lake in New England, a few miles south of the retreating ice. As plants started to grow nearby, they would release pollen into the air. Some of these grains would fall into the lake, sink to the bottom and be incorporated into the sediments. As the climate warmed and the ice sheet moved farther north, different plants would grow near the lake and their pollen grains would land in new layers of sediment. Today, scientists can drill into the lake bottom, bring up a core and read the record of nearby plant life from the first colonizers at the bottom to the current tenants at the top.

If communities are defined as associations of plants that migrate together as well as simply live together, you would expect to see ecosystems marching north in lockstep. The fossil record seems clear, however; there is little or no evidence that entire groups of plants moved north together. Things that lived together in the past don't live together in the present. Instead of stable collections of plants and animals following the glaciers north, we find each individual organism moving at its own pace. At any given time during the migration, particular organisms happen to be grouped together, but those groupings are just snapshots of a continuously changing reality.

What does this lack of community during migrations say about the webs of interaction we see in current ecosystems? And what does it tell us about how we should act to conserve the natural world? In an Italian restaurant near the University of Chicago, I raised these questions with two old friends, David Jablonski and Sue Kidwell, husband and wife paleontologists who, although they normally work in different areas, have come

to remarkably similar conclusions on the subject of communities. Kidwell notes that “the fossil record really makes you question how much glue there is holding communities together. The plants and animals don’t seem to care who they’re living with, and all the different combinations seem to work equally well.” To which Jablonski adds: “There seems to be something like a backlash developing against the idea of communities. There’s a lot more interchangeability among members of an ecosystem than people thought.”

The two are quick to point out that as with most rules relating to living systems, there are exceptions to this one. Biologists can sometimes identify a so-called keystone species – a pollinating insect, for example – that plays such a crucial role that is removed can result in the upheaval of the entire ecosystem. Nevertheless, interchangeability over geologic time seems to be much more the rule than the exception.

If the relationship between members of an ecosystem are indeed as malleable as this story suggests, then the lack of community in the northward movement of life after the glaciers is easy to understand. As each new association is formed, an essential role that had been played by one species would be taken over by another. “Ecosystem can stand a little loss and invasion,” says Jablonski. “Some give and take need not be fatal; in fact, it’s natural.”

To nail down the past, paleontologists are compiling databases of everything they have on past ecosystems. The palynologists, who study pollen, are key players, as are their colleagues who study phytoliths, microscopic glass-like secretions of plants long gone. The work involves more than academic curiosity. Policymakers have to take the best information that scientists can come up with and make difficult decisions.

As a people, we Americans have decided that we want to preserve at least a part of our natural environment. We can’t preserve everything however, and that means we have to have some way of choosing between competing conservation strategies. This choice depends, in turn, on what we think it is important to conserve. When we thought the most important thing to do was to save a species. Today conservationists are more likely to talk about preserving entire ecosystems: the Greater Yellowstone Region, for example, or the Everglades.

It may be time, however, to focus on a different goal. We should concentrate on preserving the ability of plants and animals to respond to environmental changes. “We should be thinking about establishing reserves that cross environmental gradients,” argues Jablonski. “We should think of ecosystems as sets of living organisms that need to expand and contract to shift around.”

Such shifting already occurs in nature, of course. The Hawaiian Islands have been created by progressively newer volcanoes rising above the sea surface. As the older islands slowly sink again, the corals that are able to migrate move upward so that they remain at the same depth. Not all of them move fast enough. (Other organisms, for various reasons, have had an even harder time: Hawaii has probably lost a greater percentage of its flora and fauna than any other place in the United States.)

The fossil record seems to be telling us that we should be thinking about preserving species by giving them room to maneuver. Jablonski suggests, for example, that if we make an environmental preserve in the Amazon, we should include some foothills of the Andes to protect this kind of flexibility. That philosophy could guide the creation of new parks and preserves in other parts of the world, too.

In the United States, unfortunately, our parks and preserves are often surrounded by expensive development. It is very difficult to change boundaries that have existed for decades, even when we find out we should have done things differently. Had we known a century ago what we know now, we might, for example, have extended the boundaries of places like Yellowstone park to include greater ranges of elevation. We might have bought more inland acres when establishing coastal preserves, to maintain the ability of coastal ecosystems to migrate landward if sea levels rise in the next century. Even if our current choices are limited, I expect that these new ideas will have an impact on how we spend our conservation dollars in the future.

The implications go farther. If the climate does warm, natural ecosystems are not the only ones that will be moving northward: those associated with agriculture will be doing the same. We normally think of an Iowa cornfield as a monoculture, but as every farmer knows, all sorts of varmints, weeds, and insects live in even that simplified system. If the Corn Belt moves north of Minnesota, the paleobots are telling us, the rest of the "community" may not move with it like one big unhappy family. Knowing what will happen in advance could be worth billions of dollars to American agriculture.

As I left restaurant and walked out into the cold Chicago night, I felt strangely elated. For one thing, it seemed to me that this new understanding could move the entire environmental debate to a new and more realistic level. Perhaps even more important, though, it confirmed my belief in the value of basic research, which is sometimes portrayed as the pursuit of useless knowledge. We have much to learn from something as seemingly "useless" as ancient pollen grains in the mud at the bottom of an ordinary lake.

Fossilized Chinese plant may have been the first flower

Paul Recer, Associated Press

WASHINGTON — The ancestor of all the grains, fruits, and blossoms of the modern world may have been a fragile water plant that lived in a Chinese lake 125 million years ago.

The plant, called *Archaeofructus sinensis* for "ancient fruit from China," is of a species never before seen and carries the clear characteristics of the most primitive of flowering plants, said David Dilcher of the Florida Museum of Natural History and the University of Florida.

"It is like the mother of all flowering plants," said Dilcher, coauthor of a study appearing Friday in the journal *Science*. "It changes our whole impression of what is the oldest of all flowering plants."

Botanists had long considered a woody plant from New Caledonia as the most ancient of flowering plants. Dilcher said the new discovery precedes that magnolia-like species.

The discovery also suggests that flowering plants got their start as herbs growing in shallow pools and were able to reproduce quickly, a distinct advantage for survival, said Dilcher. *Archaeofructus* "was not a flashy flower," he said. The plant's flowering part had no real petals but acted only as a reproductive unit.



"The reason we can say it is a flowering plant is that the seed is enclosed inside of carpels of the fruit," said Dilcher. "That is primary key." A carpel is the female part of a flower.

It is believed that flowering plants later developed colored petals and fragrance and tasty fruits to help in reproduction. The showy, good-smelling flowers attract insects to help in pollination, and animals eat the fleshy fruit of plants and help spread the seeds.

Dilcher said that *Archaeofructus* apparently lived in clear, shallow pools, with its flowers and seeds extending above the water surface. Its leaves probably were submerged, he said, and the limbs were partially supported by the water. The plant rooted in the floor of the lake.

The best evidence of its waterlogged lifestyle is that fossils of nine fish were found among the branches of the plant in the slab of stone dug from the ancient lake, he said. "The closest modern relative is probably the water lily," said Dilcher.

At the time the plant thrived, 125 million to 144 million years ago, dinosaurs roamed the Earth and the early ancestors of mammals were tiny creatures skittering among the rocks.

Dilcher said the lake where the plant lived was near erupting volcanoes. The plant was buried and preserved by a heavy fall of volcanic ash.

Finding the most ancient of flowering plants also sheds light on the evolution of humans, Dilcher said. "We co-evolved with flowering plants," he said. "We depend today on flowering plants for our survival, for food and fiber and building materials. The wheat, rice, corn, and all of the fruits that we enjoy are all flowering plants" that may have evolved from *Archaeofructus*, Dilcher said.

Other experts in *Science* said it will require more examination of *Archaeofructus* before it is generally accepted as the most ancient of flowering plants. But Peter Raven of the Missouri Botanical Garden in St. Louis said it "may be the most significant flowering plant ever found."

The Remarkable Sky Islands of Southeastern Arizona

Excerpted from *Wild Orchids Across North America: A Botanical Travelogue*

Philip E. Keenan, Timber Press, 1998

See images of some of these orchids at <http://plants.usda.gov/plants/>

Sky Island! The perfect metaphor for a region of the country unsurpassed for its rich biodiversity, and as biologically grand for its richness of species as the grand Canyon is for its scenic grandeur and geology. In this vast corner of southeastern Arizona, four great biomes (biogeographic regions) meet: the Rocky Mountains from the north, the Sierra Madres from Mexico, the Sonoran Desert in the west, and the Chiricahuan Desert to the east-southeast. The major sky islands rise boldly from the deserts and are represented by the Santa Rita, Huachuca (pronounced war-CHEW-cah), and the Chiricahua Mountains, among others, trending more or less north to south.

It is in these three mountain ranges in particular that the Mexican element of orchid and bird species contributes so many remarkable new species to one's life list. Six new species of orchids (Arizona has a total of approximately 25 species) and two dozen new birds (including the gorgeous red-faced warbler, the flamboyant painted redstart, and te elegant trogon which some people consider the most beautiful bird in the world), all

from Mexico, a mere 50 miles (80 km) or so to the south, were some of the results of our three-week stay in this memorable region. *Malaxis corymbosa*, *M. porphyrea* (formerly *M. ehrenbergii*), *M. soulei*, *M. tenuis*, *Plantanthera limosa*, and *Hexalectris warnockii* were all in bloom on the weekend of 15-18 August during the second annual meeting of the North American Native Orchid Alliance, which highlighted these “Mexican” species on three field trips.

Incidentally, we can thank the Gadsden Purchase of 1853 for adding 55,000 square miles (256 ha) to southern Arizona and New Mexico including these magnificent sky islands of southeastern Arizona. This purchase proved to be the last in U.S. history and it was made primarily for the construction of a southern transcontinental railroad, still in use today, paralleling Interstate 10.

Ron Coleman’s trusty old blazer negotiates the final two miles (3 km) through one of the Sky Islands. The “road” here is nothing but a rocky outcropping on the edge of a steep mountain in the famed Chiricahuas, the final stronghold of the Apache chiefs Cochise and Geronimo. Joseph Welch, now retired in Tucson, is the fellow birder on this trip. Ron is the orchid expert, with the go-anywhere four-wheel drive. One could not ask for a more knowledgeable and complementary pair.

We find three *Malaxis* species growing in protected mountain meadows, in damper mossy spots in the forest, and near small streams. We are now in the Canadian life zone of ponderosa pine (*Pinus ponderosa*), Douglas-fir (*Pseudotsuga menziesii*), and the southernmost station for Engelmann spruce (*Picea engelmannii*). A meadow of sunflower, delphinium, beebalms, and many other wildflowers is beginning to bloom behind us. These high meadows are famous for their hummingbirds.

Malaxis porphyrea is my favorite among the malaxis because of the deep ruby or red-purple color. The stature of the plant is surprising tall --nearly 18 inches (4 cm) in some cases – considering how tiny the individual flowers are – the lip is 3 mm X 2 mm approximately. On one 14 inch (35 cm) plant, there are 95 flowers, of which 75 are open and 20 are in tight bud. The flowers are beautifully balanced and almost perfectly spaced along a 6-inch (15 cm) flowering stem, which slightly arcs as it matures (i.e., when most of the flowers are open). A purplish haze in microcosm. Other than the color difference, *M. porphyrea* is almost identical to *M. brachypoda*. Both are easily overlooked in the landscape, as are all the *Malaxis* species, because of their diminutive size, although the single leaves are not small and remind me of the leaf of Canada mayflower (*Maianthemum canadense*), so abundant back home. This is why a hand lens is an essential part of the orchidist’s equipment. With it, one sees the pulled back (recurved), filiform lateral petals and the delightful deeper purple edges on the lip, which is lowermost (resupinate) in this species. Even better than a hand lens is a stereo microscope.

In terms of size, *Malaxis tenuis*, the so-called bottlebrush adder’s mouth orchid is also diminutive, but the inflorescence often appears bedraggled because the individual flowers project horizontally on rather longish pedicels. This creates a narrow, one-plane effect, which is quite different from anything else I can recall. The Latin name *tenuis* refers to this strange shape. The uppermost (non-resupinate) pale green lip is not only edged with deeper green but also graced with two additional dark green stripes down the middle of the approximately 3 X 2 mm triangular lip.

Malaxis soulei, the well-named rat-tail or mountain malaxis complete the trio we find here in this spot. It reminds me at once of our lawn weed back home, the common plantain (*Plantago major*), with its tightly packed spike of tiny flowers. It is unmistakable. The greenish yellow uppermost, notched lips with basal “ears” hug the stem and on close examination reveal two darker stripes of green down the middle. This species is perhaps the more common of the four “Mexicans” that immigrated to these sky islands.

The temperature, a delightful 70 degrees F. (21 C) up here at 9000 feet (2700 m) is flirting with 100 degrees F down among the cacti, where just about every living thing has taken cover under the blistering noontime sun. For every 1000 feet (300 m) we climb in altitude, the temperature drops about four degrees. By the same token, the vegetation change is equivalent to driving 300 miles (480 km) north for each 1000 feet (300 m), effectively putting us in the boreal forest of Canada.

We find our fourth adder’s-mouth, *Malaxis corymbosa*, on another day and another mountain -- the eastern slope of the Huachucas – in Miller Canyon, just above the Upper Sonoran life zone, which is distinguished by the unique chocolate-colored stems of the manzanita (*Arctostaphylos pungens*) and the alligator-checked trunk of the alligator juniper (*Juniperus deppeana*). Superficially resembling *M. unifolia* of US. eastern woodlands, the headed or corymbed malaxis has a more compact, flat-topped inflorescence than the former and the flowers are comparatively larger. The ovate lateral sepals on *M. corymbosa* closely flank the lip, making the lip appear larger than it actually is. Because of the neat look (the sunburst effect noted by Luer) of the corymb, the inflorescence photographs well.

The only real disappointment of my orchid hunting involved *Hexalectris warnockii*. We finally caught it in bloom on the seventeenth of August in the Chiricahua National Monument, in very dry oak woods beside an equally dried up creek bed, after an agonizing two-week wait for the traditional monsoon rains to stimulate its opening. Some authors describe the flower as spectacular. The ones we saw could hardly be called that. Deep maroon-purple spreading sepals and petals contrast with the three-lobed lip petal, the two lateral lobes incurving and pinkish, and the floor of the lip whitish and purple, with three raised yellow crests. Only one flower was open on each of the two blooming plants we saw this day instead of the usual three or four. It would be a safe assumption, then, that this is not a good year for them. *Hexalectris warnockii*, incidentally, was not described until 1943 from a collection made in the Chiso Mountains of extreme southwestern Texas.

The so-called monsoonal rains occur during July and August, providing a welcome relief and inspiration to the southwest’s vegetation, as well as its people population. Thunderstorms, many severe enough to cause rapid flooding and washouts, pop up almost every late afternoon or early evening. Because of the sudden and unexpected nature of the dark clouds and curtains of rain, these storms are dubbed popcorn storms. Drivers sometimes must wait hours for these “washes” to subside before crossing the otherwise dry dips in the road. Every year, an impatient one will chance it too soon and either lose his or her vehicle – or life.

We found *Platanthera limosa*, the so-called Thurber’s bog orchid, on 10,000-foot (3000 m) Mount Lemmon just east of Tucson in the Santa Catalina Mountains. Yet another Mexican immigrant in the Southwest, it looks at first glance much like the

ubiquitous tall leafy green orchid, *P. hyperborean*, of the far north (barely reaching northern Arizona). *Platanthera limosa* has a much longer and whitish spur and a yellowish green lip that contrasts noticeably with the gray-green sepals and lateral petals. Mount Lemmon is a great ride but only on a weekday. The weekends are much too crowded and the traffic becomes hazardous, particularly on the drive down after an afternoon of partying, high above the desert heat. Despite these “hazards,” Arizona is the second fastest growing state in the United States. It is easy to understand why.

American Plants Banned to Protect British Oaks

Environmental News Service, 7 May 2002

LONDON, United Kingdom - The UK government has placed a ban on imports of plants from parts of the United States and added controls on wood to protect native trees and shrubs from an American plant disease that has not become established in the British Isles.

Phytophthora ramorum, a fungus which causes a bark canker disease known as sudden oak death, is killing native oak trees and other plants in California and Oregon. Once diseased, plants can die within a few months.

A statement from No. 10 Downing St. today said plant health and seeds inspectors have found evidence of the disease in viburnum plants at a small number of nurseries. The fungus' identity was determined at the Central Science Laboratory and confirmed by Forestry Commission experts.

The infected plants were destroyed. An investigation is underway to determine whether there has been any spread and whether there are any links to imported plants.

A ban is now in effect on the import of rhododendron, viburnum, vaccinium and oak planting material from areas of the United States where the disease is known to occur.

In the United States, *P. ramorum* has been found in an area running along the Pacific Coast from Big Sur, California, to Brookings, Oregon. Presently, sudden oak death occurs in areas dominated by a maritime climate zone, close to the coast with a strong summer fog influence and moderate summer temperatures.

Sudden oak death was first verified in 1995 on tanoaks near Mill Valley, California. Since then, it has been found in 10 counties in the San Francisco Bay area. It affects coastal and interior live oak, black oak, arbutus, bay laurel, rhododendrons, and viburnum.

According to the Oregon Association of Nurserymen, in August 2001 the disease was reported for the first time in Oregon, near the city of Brookings on the southwestern coast. Sudden oak death in Oregon is limited to nine individual sites in a small portion of Curry County from less than one acre to about 15 acres. Less than 40 acres in all are affected, and the land has been clearcut and burned.

To keep the fungus from attacking British oaks, the UK Department for Environment, Food & Rural Affairs (DEFRA) has imposed an extension of current controls on imported oak wood to include wood derived from all host trees originating in the affected areas of the United States.

Imports of oak wood from North America are already subject to measures such as removal of bark to reduce other risks.

Scientists at the University of California's Marin County Extension explain that there are two categories of hosts for *Phytophthora ramorum* - bark canker hosts and foliar hosts. The bark canker hosts are tanoaks and oaks that become infected on the trunks.

Foliar hosts are bays, rhododendrons, bigleaf maple, arbutus, bay laurel, rhododendrons, honeysuckle, huckleberry, and viburnum that become infected on the leaves and small branches. While the bark cankers often lead to mortality in tanoaks and oaks, foliar hosts only occasionally die from the *P. ramorum* infection.

UK government officials have urged the European Commission to require Member States to carry out surveys of potential host material this summer and to report their findings later this year.

The fungus has been found infecting rhododendrons and viburnums in the Netherlands and Germany, DEFRA said today. As of April, it has been found in a number of new locations in both countries.

European species of oak may be more resistant to the fungus than North American species, preliminary Forestry Commission research suggests.

In the UK, and elsewhere across Europe, there is already widespread oak mortality and dieback of complex cause known as oak decline. In some cases, the Forestry Commission says, the decline is associated with infection by other Phytophthoras, but these are mainly root infecting species whereas *P. ramorum* causes stem cankers.

Oak decline also involves recurrent episodes of drought, other root infecting fungi, repeated insect defoliation and scale insect attack.

This combination of decline factors complicates surveying to detect sudden oak death on trees in the UK, scientists say. UK Forest Research carried out investigations over summer 2001 and "no evidence of its presence was found," after surveys of susceptible areas close to major rhododendron nurseries, sites with understory rhododendron, and sites where oak decline is prevalent. Government researchers will continue with surveys in 2002.

There is now a requirement to notify DEFRA of commercial deliveries of host plants, of any origin, into and within England and Wales.

Life on Mars Hopes Raised

Dr. David Whitehouse, BBC Online science editor

Read the original presentation abstract at: <http://www.astrobiology.com/asc2002/abstract.html?ascid=371>

Scientists have found "intriguing" new evidence that may indicate there is life on Mars.

An analysis of data obtained by the Pathfinder mission to the Red Planet in 1997 suggests there could be chlorophyll - the molecule used by plants and other organisms on Earth to extract energy from sunlight - in the soil close to the landing site.

Researchers stress their work is in a very preliminary state and they are far from making definite claims.

Even so, the work is attracting much attention in the scientific community and will come under intense scrutiny when it is presented to an astrobiology conference in the US next week.

Dr Carol Stoker, from the American space agency's (NASA) Ames Research Center, confirmed the findings to BBC News Online but cautioned that they were "not ready for the big time".

Early data - Mars Pathfinder mission touched down in the Ares Vallis region of Mars in July 1997. It took many images of the surrounding area and released a small rover to sample rocks.

A detailed analysis of the images of the landing site now reveals two areas close to Pathfinder that have the spectral signature of chlorophyll.

According to experts it might be highly significant - or could be just a patch of coloured soil.

Dr Stoker's team scrutinised the so-called Superpan, which is a high-resolution, highly processed series of superimposed images produced by Pathfinder's camera.

It is a multispectral panorama of the landing site recorded in 15 regions of the spectrum, and contains a wealth of information about rock types, colours and textures.

Knowing the spectral signature of chlorophyll, the researchers wrote a computer program that systematically scanned the Superpan for any pixels of interest.

Specifically, the program looked for the spectral signature associated with red light absorption by chlorophyll.

Previous searches for evidence of chlorophyll in Pathfinder's pictures were carried out shortly after it landed.

Some tentative indications were seen but they were later dismissed as "possible image misregistration".

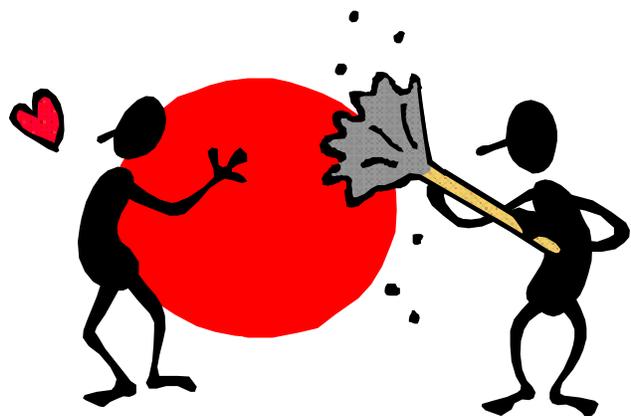
Two patches - In Dr Stoker's study six regions of the Superpan matched positive for the chlorophyll signature.

For each of the regions, a full spectrum was plotted out and their exact position in the Superpan was then carefully examined.

All of the detections occurred close to the camera. This is to be expected say the researchers, as these are the areas where the camera has the highest sensitivity and resolution.

Close examination revealed that four of the cases occurred on the Pathfinder spacecraft itself. But two regions showed a chlorophyll signature in the soil around Pathfinder.

Given the controversial nature of their findings and the early stage of the research, the scientists want to hold back any claims about what they may have found until they have done more work and prepared a detailed paper for submission in a scientific journal.



Federal Botany Jobs

Check for these and other jobs of interest to botanists at <http://usajobs.opm.gov/>.
Remember, botanists make excellent rangers, planners, staff officers, and Forest Supervisors.
There are currently (20 June 2002) fifteen open Forest Service line officer positions

All these positions are open to everyone. All these positions are Full Time, Permanent						
POSITION	SALARY	GRADE/SERIES	APPLY BY	ANNOUNCEMENT #	LOCATION	AGENCY
BOTANIST	\$45,285 - 58,867	GS-0430-11/11	May 26, 2003	SW-INV-0430	Southwestern States, US; Western & Pacific States, US	Navy Field Offices
BOTANIST	\$37,428 - 58,867	GS-0430-09/11	June 24, 2002	PGSO-02-139-DEU	Pinnacles NM, CA	INTERIOR, National Park Service
BOTANIST (SUPERVISORY)	\$56,179 - 73,030	GS-0430-12/12	July 1, 2002	140746	Homestead, FL	INTERIOR, National Park Service
BOTANIST SUPERVISORY	\$78,946 - 102,627	GS-0430-14/14	July 16, 2002	142184	Homestead, FL	INTERIOR, National Park Service
BOTANY	\$16,025 - 103,623	GS-0430-02/15	Dec 31, 2002	WCPOC-0400	Throughout the U.S.	Fld Operating Ofc of Ofc of Sec of Army
BOTANIST	\$24,701 - 30,597	GS-0430-05/07	Sep 27, 2002	NC-DEU-02-373	WORLDWIDE	US Army Corps of Engineers
BOTANIST	\$24,701 - 30,597	GS-0430-05/07	Sep 27, 2002	NC-DEU-02-374	WORLDWIDE	US Army Corps of Engineers

Banner Plant: *Carex decomposita*

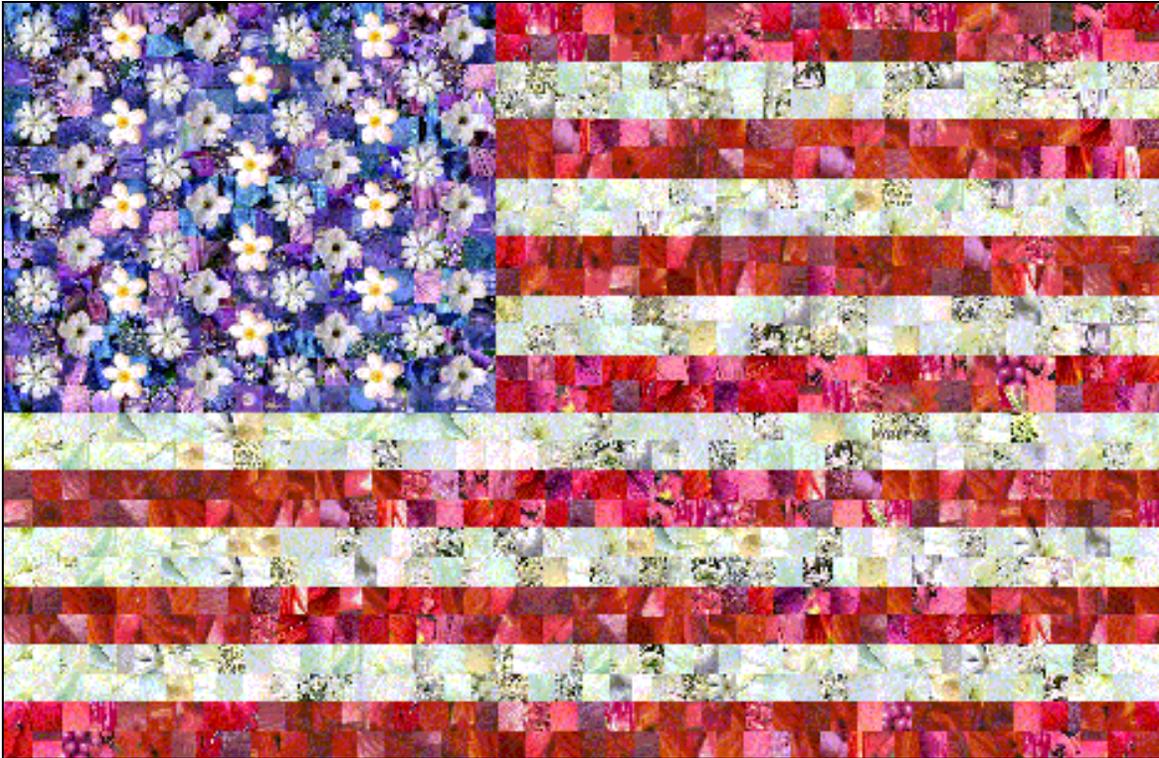
Each month, a different plant graces the banner of *Lingua Botanica*.
This month's image and natural history are courtesy of Phil Hyatt, Kisatchie National Forest.

Carex! Or, to most people, *Carex*? You walk over them, wondering who would ever have the time to identify them. You've tried the keys and fought with characters like "styles and stigmas 2 or 3", "leaves sheathed or sheathless", and "nerves of perigynia raised or sunken". Most likely you've thrown up your hands on a *Carex* specimen somewhere along the line. The characteristics and terminology confound. Who can figure out what they mean by ventral side of the perigynia, distichous spikelet (or what's a spikelet, for that matter?), knobby achenes? Where does the beak of a perigynium begin and the body end?

Carex decomposita surprises us by giving us a *Carex* that's not only rare, but also easy to identify. First, it's called "Cypress Stump Sedge" or "Epiphytic Sedge". If you're in a swampy area, and the *Carex* you find is growing on the base of a tree or stump, you may have found *Carex decomposita*. Look at the inflorescence! Its distinctive. See the branched spikelet (in the sense of entire inflorescence), with groups of perigynia sticking out at the base in clumps or "spikelets" (in the sense of a portion of the inflorescence)? That's another sign you have *Carex decomposita*. Combine the habitat and branched spikelet and you're almost there! Break off a few "seeds" (perigynia are modified leaves covering the achene, if you want to get technical). The roundish, small perigynia can be seen to have a plump or "bulging" characteristic. This and their dark color firmly nail the identification of this one!

Carex can be difficult to identify, but if you start tackling an easy species or three, from time to time, eventually you'll learn the common ones in your area. *Carex decomposita* is listed as G3; it is either SU, SH, S?, or mostly S1 or S2 in states from Texas and the coastline to New York, inland to Oklahoma, Missouri, Michigan, and Ohio. It is missing in West Virginia.

Afterword: Celebrate America's Wildflowers!



The opinions expressed in *Lingua Botanica* are not necessarily those of the USDA Forest Service or the editor. The USDA prohibits discrimination in all its programs and activities. Pass your copy of *Lingua Botanica* around to all your friends. Contributing submissions are always welcome.

If you're not on the edge, you're taking up too much space – Wayne Robbie
To subscribe to the *Lingua Botanica*, just send an email to Wayne Owen at <wowen@fs.fed.us>.

