



# NATIONAL WILDFLOWER RESEARCH CENTER

# wildflower

September/October 1995

Volume 12, Number 5

## Center Waters Wildflowers With Unwasted Water

J. C. Blumenfeld  
Editor/Writer

Visitors to the Center are often surprised to see volunteers and staff watering the plants, trees, and buffalograss. If native plants are adapted to the water regimes of the areas to which they are native, why water?

While it is true that native plants generally do not need supplemental watering once established, the key phrase is *once established*. When first installed in a garden and until they take root, many native plants need the same amount of water and close attention as nonnative species. After the first year, though, native plants in a low maintenance garden use far less water, a significant savings to both the homeowner and the natural community. And saving water is important!

Water conservation has always been a critical component of the Wildflower Center's mission, and a simple rooftop rainwater harvesting system was in place at the Center's old site. With the opening of the Wildflower Center's new facility, an advanced rainwater harvesting system was in order. When fully operational, this system will fulfill all the Center's irrigation and non-consumptive water needs.

Most rainwater from all major building roofs drains into one of three large cisterns: the Entry Cistern (3,000 gallons) collects water from the Auditorium roof; the Children's Little House Cistern (2,500 gallons) collects water from the Little House roof; and the Observation Tower Cistern (5,000 gallons) collects water from the roofs of the Visitors Gallery, Cafe, and Auditorium. The Entry Cistern will be connected to the drip-irrigation

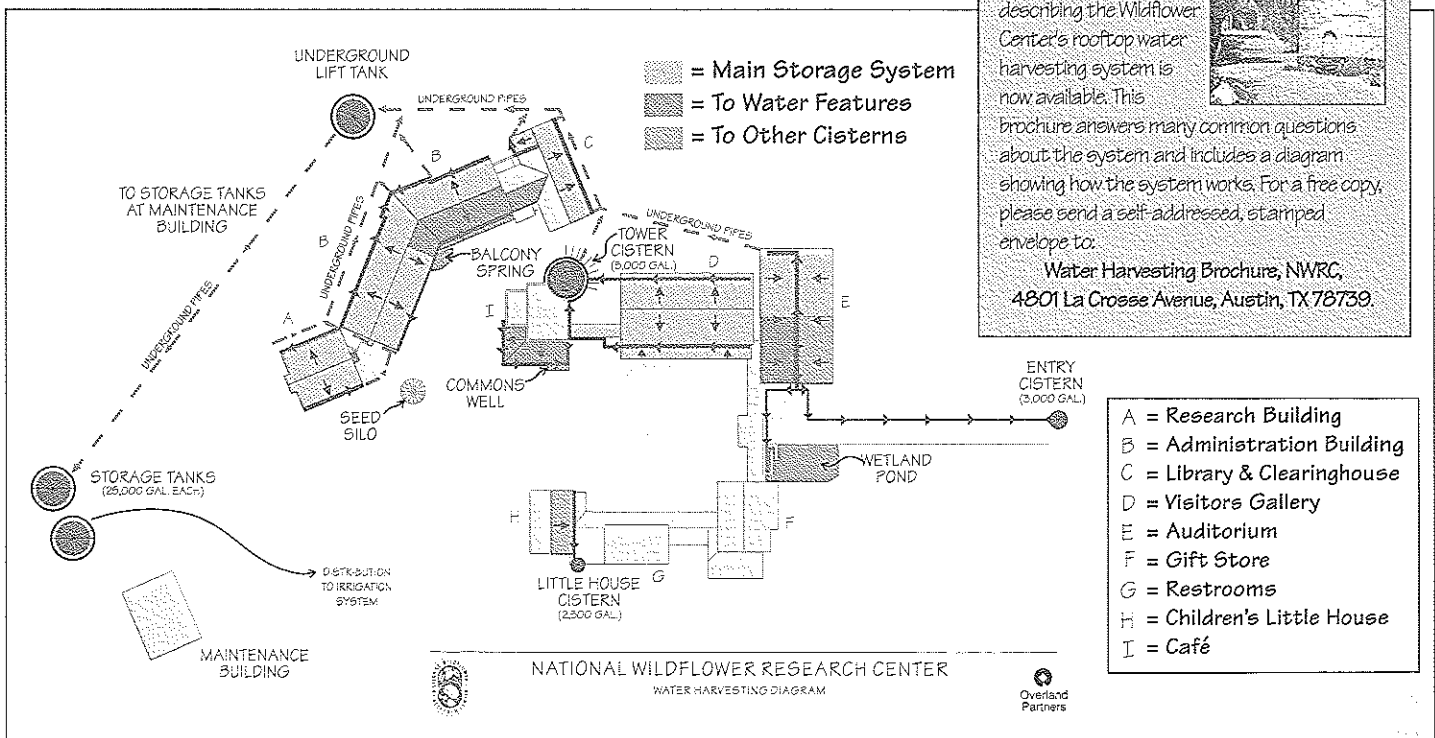
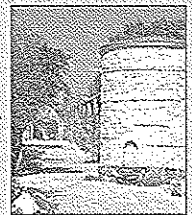
system and water the gardens around the visitor drop-off area, while water in the Little House Cistern is drawn directly from a spigot at its base for children's planting projects. Water in the Observation Tower Cistern drains into a small holding tank under the Administration Building where it is pumped into two 25,000 gallon storage tanks behind the Display Gardens. From there, the water goes into the Center's irrigation system.

The next time you visit the Center and enjoy all the beautiful native plants, remember, they are not the only important resource the Center conserves.

### Water Harvesting Brochure Available

A brochure describing the Wildflower Center's rooftop water harvesting system is now available. This brochure answers many common questions about the system and includes a diagram showing how the system works. For a free copy, please send a self-addressed, stamped envelope to:

Water Harvesting Brochure, NWRC,  
4801 La Crosse Avenue, Austin, TX 78739.



NATIONAL WILDFLOWER RESEARCH CENTER  
WATER HARVESTING DIAGRAM



## Conserving Water, Using Native Plants, and All That Other Good Stuff

Most of the Earth's surface is covered by water, however, only about two percent of this is fresh and available for use. The remaining water is either saltwater or frozen in glaciers and polar ice caps and not economical to process for use. How do we use this remaining two percent?

We use water for a variety of purposes. For example, washing a full load of clothes uses 35 to 50 gallons, while shaving with the tap running uses 5 to 15 gallons. By far, the greatest amount of water is used to maintain lawns and gardens. Watering an average lawn for only five minutes requires 170 gallons daily, or 1,200 gallons every week. In 10 weeks, this would fill up an average-size swimming pool! It's estimated half of all suburban water used during the summer months is used for landscaping purposes. The water you put on your lawn and garden costs money, it is treated drinking water.

Native plants are well-adapted to the envi-

ronmental conditions that exist in their regions and, once established, seldom require supplemental watering. For instance, native trees have evolved to become remarkably water efficient.

In addition, many native shrubs and low-growing native plants are perfect for garden and landscape use. Native ferns, grasses, annuals, and perennials of all colors, textures, and sizes abound. Check your state's species list (available from the Clearinghouse) for species native to your area.

Of course, there will be times when you do need to water your garden or landscape. Remember, water early in the morning or late in the evening and build basins around large plants and trees to reduce runoff. Mulch will help reduce evaporation and inhibit water-guzzling weeds. In addition, use a sprinkler that sprays large drops of water close to the ground rather than one that sprays a fine mist into the air.

Above all, CONSERVE! The giant underground lakes and rivers (called *aquifers*) that supply irrigation and drinking water for much of the country are rapidly being depleted, nature cannot keep up with our demands. Remember, we have the same amount of water we did when the Earth was formed and we will not be getting any more...ever! By using native plants in our gardens and landscapes, we are using this precious natural resource wisely, saving money, and helping repair the environment.



Julie Barrett-Heffington is the Education Director of the National Wildflower Research Center.

*The National Wildflower Research Center is a nonprofit research and educational organization committed to the preservation and reestablishment of native wildflowers, grasses, shrubs, and trees.*

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## WILDFLOWER CENTER NEWS! NEWS! NEWS!

Media coverage of the Wildflower Center is still strong following the Grand Opening celebrations. If you have not visited the new facility, stop by your local library or bookstore and take a look at the July issue of *Architecture* magazine, which not only features the Center's buildings on its cover, but has a great article about the new facility with plenty of pictures. An upcoming issue of *House Beautiful* (possibly December or February) will focus on the Center's gardens.

The Center is delighted to have Cathy Nordstrom join the staff as Registrar/Education Assistant. Her responsibilities include scheduling participants for all education programs, professional conferences and symposia, and tours of the Center. She also manages the Speakers Bureau and assists with all Education Department programs.

The City of Austin awarded the Center one of five 1995 Environmental Awareness Awards in recognition of the Center's outstanding achievements in environmental protection. These awards are sponsored by the City of Austin Environmental Board, Resource Management Commission, and Solid Waste Advisory Commission.

The Center's new promotional brochure is finally complete. If you have wanted to tell your friends or relatives about the Wildflower Center, send them this very colorful and informative brochure. It will be available through the Center, the Austin Convention and Visitors Bureau, and all 13 Travel Information Centers in Texas.

The Education Department will bring in the experts September 14 for a botanical drawing class. Participants will learn to create botanically correct plant portraits. To register, contact Cathy Nordstrom at (512) 292-4200.

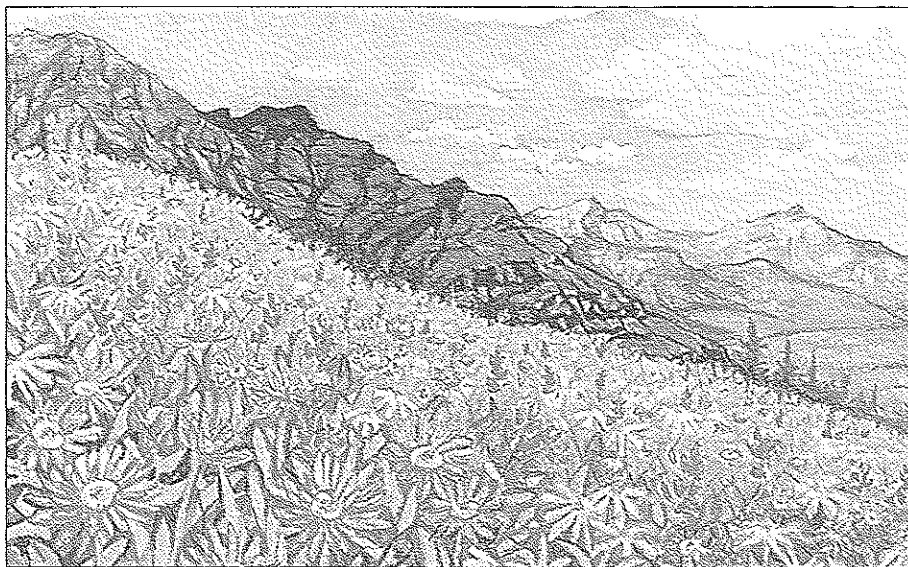
**WILD IDEAS.** A Holiday Shopping Event will be held December 1, 2, and 3 this year. Look for more information about this annual holiday extravaganza in the November/December issue of *Wildflower*.

# Mountains of the Moon

J. C. Blumensfeld  
Editor/Writer

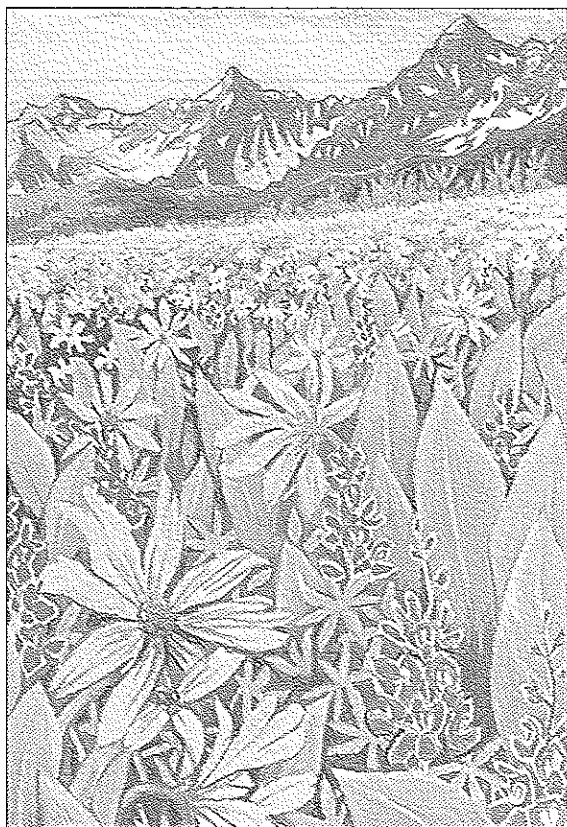
Imagine a mountainous environment where there are no trees. Where winds of more than 100 miles per hour whip through jagged rock and across talus slopes. Where the thin atmosphere cannot block ultraviolet radiation (that is, when it is not snowing) and temperatures plunge to the bottom of the thermometer during the long winter.

Hard, harsh, and deadly are all words that correctly describe this type of environment. Alpine is another, more accurate word to describe the rugged ecosystems which exist above the tree-line on the highest mountains in North America. While these areas may appear inhospitable to life, they are home to a variety of plants that have adapted to make the best of some of the most extreme conditions on Earth.



## LOCATION & ENVIRONMENT

With the exception of isolated mountain summits such as Mt. Washington and Mt. Katahdin in the Eastern United States, the Long Range of Newfoundland, and the Torngat Mountains of Labrador, North American alpine vegetation exists only on high mountains in the western third of the continent. Beginning above the Arctic Circle



in the Brooks Range in Alaska, alpine vegetation spreads southeast to the Alaska Range, splitting into two forks: one following the Alaska Range to the Sierra Nevadas and the other stretching across the Rocky Mountains from the Brooks Range south to the higher peaks in Arizona and New Mexico.

While the lack of trees defines the alpine habitat, it is the many physical aspects of the bare mountain peaks that shape the vegetation:

low temperatures, intense solar radiation, high wind, blowing snow, and thin atmosphere. Because these physical factors are constantly changing, so, too, is the alpine environment.

Alpine temperatures hover around freezing most of the year, and winter temperatures have been reported as low as  $-40^{\circ}\text{F}$  on Mt. Washington in New Hampshire. Summer temperatures are a bit warmer, and temperatures occasionally climb above  $80^{\circ}\text{F}$ .

Wind plays an important role in modifying the alpine environment. Mt. Washington holds the record for the highest wind speed ever recorded: 231 miles per hour on April 12, 1934, near the summit. Besides moving water, the wind keeps alpine temperatures low during the day and warms the chill at night. With few natural windbreaks, save boulders and loose rocks, the wind hammers the alpine vegetation.

## ALPINE PLANT ADAPTATIONS

The characteristic alpine plant is a short perennial herb or dwarf deciduous or evergreen shrub with a well-developed root and rhizome system. Annual species are rare and comprise only one to two percent of the alpine flora. Energy directed toward individual survival and nutrient gathering takes precedence over energy directed toward reproduction, hence many perennial species.

Alpine vascular plants are numerous, and the Rocky Mountains are home to more than 5,000 species. Taking into account the species in Alaska and the Eastern United States and Canada, the number easily tops 7,000.

Many vascular plants in alpine environments share a number of similar adaptations, most of which are geared to take advantage of the very short alpine blooming season and to survive the long, severe winters. Most alpine vascular plants have very large, rather showy flowers relative to their vegetative parts, which are often low and scrubby. When these plants bloom, they tend to bloom at the same time in an explosion of color.

Alpine environments include a high concentration of *bryophytes* and *lichens*. Bryophytes are photosynthetic plants lacking a vascular system, and the most common alpine bryophytes are mosses. Many of these simple plants are extremely resistant to low temperatures and have adapted to withstand

*continued on page 5*

# Wildflowers

## NOTEBOOK



W. D. Bransford  
Campbell and Lynn Loughmiller

**Botanical Name:** *Erythronium grandiflorum*

**Pronunciation:** Air-i-THROW-nee-um  
grand-i-FLOOR-um

**Common Name:** Snow Lily, Dogtooth Violet, Glacier Lily

**Family Name:** Liliaceae (Lily Family)

**Range:** Montana to British Columbia, south to California and Colorado

**Habitat:** Subalpine and lower alpine snowbed areas to 3,636 m (12,000 ft)

**Bloom Period:** Flowers open in April at low elevations, July or August at higher elevations, and last roughly one month

The delicate beauty of the snow lily follows the retreating snowline of the Western mountain slopes in the spring and summer, blooming as high as 3,636 m (12,000 ft). Two

large (10-20 cm [4-8 in]), shiny oblong

basal leaves surround the long, 15-30 cm (6-12 in), usually naked stem, which holds 1-5 nodding yellow flowers.

Like many alpine species, the flower of the snow lily is rather large and very showy. The petals and sepals curve back behind the base of the flower while the 6 stamens protrude through the center, making the flower look as though it had exploded into bloom.

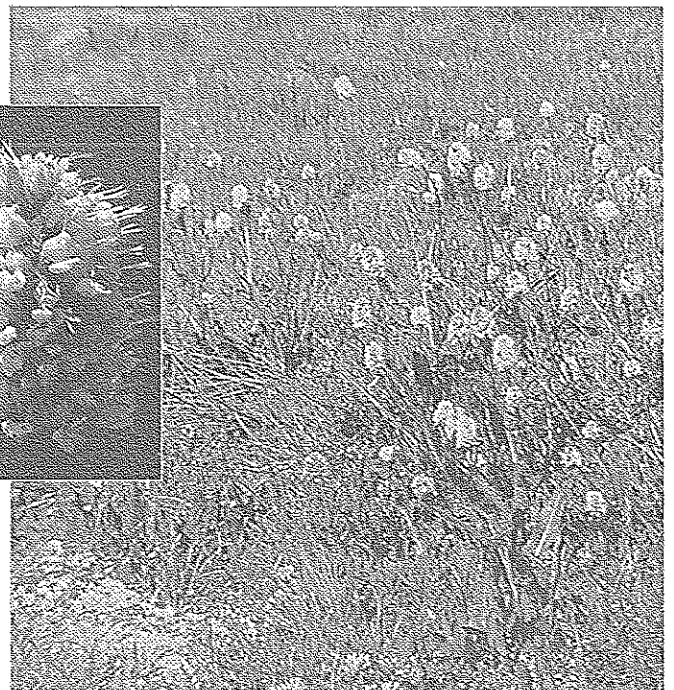
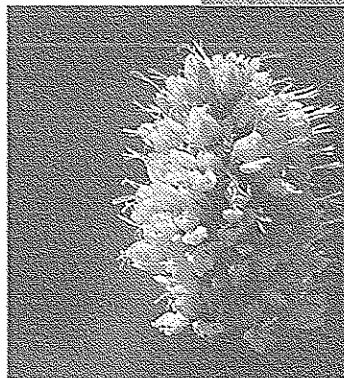
Although the snow lily is now protected by law, many parts are edible, especially the large bulb, which can be boiled or dried then eaten whole. Native Americans used the leaves for greens and boiled the fresh green seed pods (which reportedly taste like string beans). Black bears, grizzly bears, elk, deer, and many rodents find the snow lily a tasty delicacy, and partake of the plant without fear of legal repercussions.

**Botanical Name:** *Polygonum bistortoides*  
**Pronunciation:** Po-LI-go-num  
bis-tor-TOY-dees  
**Common Name:** Western bistort, smoke-weed, American bistort, snakeweed, knotweed  
**Family Name:** Polygonaceae (Buckwheat Family)  
**Range:** Western Canada to southern California, Arizona, and New Mexico  
**Habitat:** Moist or wet mountain meadows and along streams and swamps at high elevations  
**Bloom Period:** May through August

A perennial, Western bistort produces dense flower clusters at the tops of slender, erect, unbranched stems which can grow to a height of 70 cm (28 in). This alpine beauty blooms in such profusion it often covers mountain

meadows with thousands of white to pinkish flowers. The flowers, which can be up to 5 cm (2 in) long, resemble cotton tufts from a distance. Swollen stem nodes, said to look like "knees," give rise to the botanical name, *Polygonum*, the Greek word for knees.

The thick, twisted, snake-like root was used in soups and stews and as an emergency food source by Native Americans and early settlers. Western bistort also provides food for wildlife, including black bears, grizzly bears, and rodents which feast on the roots and deer and elk which browse the foliage.



George Bruso

intense ultraviolet light. Mosses absorb nutrients directly through their cells and grow over the surface of rocks and the thin alpine soil. Some moss species can survive after losing almost all their stored water and are able to absorb and retain large quantities of moisture when it again becomes available.

Lichens, on the other hand, are simple plants composed of a fungus and an alga growing together in a spongy body (*thallus*) and depend on one another for survival. The alga supplies food while the fungus provides protection for the organism and absorbs and stores water. Lichens grow extremely slowly and, if undisturbed, can live for more than 4,500 years. Like mosses, they are adapted to the severe alpine conditions and most can withstand losing more than 98 percent of their stored water.

## SUCCESSION & HUMAN IMPACT

Mosses and lichens are important early colonizers of bare alpine rock, and acids in their cells break down rock while the small leafy stems of mosses (*gametophores*) trap dust and blowing debris. Over thousands of years, a thin soil forms that, eventually, is colonized by more advanced plants.

The harshness of the alpine environment belies the fragile nature of these ecosystems, and what may take thousands of years to establish can be destroyed in minutes. By far, human impact is the biggest threat, especially mining and uncontrolled grazing in alpine meadows. While these activities are now restricted in many alpine areas, tourist use is rapidly becoming the newest scourge.

## CAN ALPINE ECOSYSTEMS SURVIVE?

Today, the fear of alpine areas has diminished to the point where a visit to the top of a Rocky Mountain peak often receives the same consideration as a visit to a public lake, often with deadly consequences for those caught unprepared. Gradually, respect for the alpine ecosystem is returning, and greater safeguards -- from tightly controlled access to total bans on visitation -- are having their desired positive effects.

And the alpine environment survives. These seemingly barren "moonscapes" of wind and ultraviolet radiation remain as enticing and inhospitable as always -- the realm of the true survivors in the plant world.

# Ms For National

Just as the Wildflower Center gardens are growing by leaps and bounds, so, too, is our membership. In fact, more than 6,000 new memberships have been received since January of this year. Wildflower Center members reside in all

>400 Members (Red): California, Illinois, New York, Ohio, Pennsylvania, Texas.

200-399 Members (Yellow): Colorado, Florida, Georgia, Indiana, Maryland, Massachusetts, Michigan, New Jersey, North Carolina, Virginia, Washington, Wisconsin.

100-199 Members (Blue): Alabama, Arizona, Connecticut, Iowa, Kansas, Louisiana, Minnesota, Missouri, Oklahoma, Oregon, South Carolina, Tennessee.

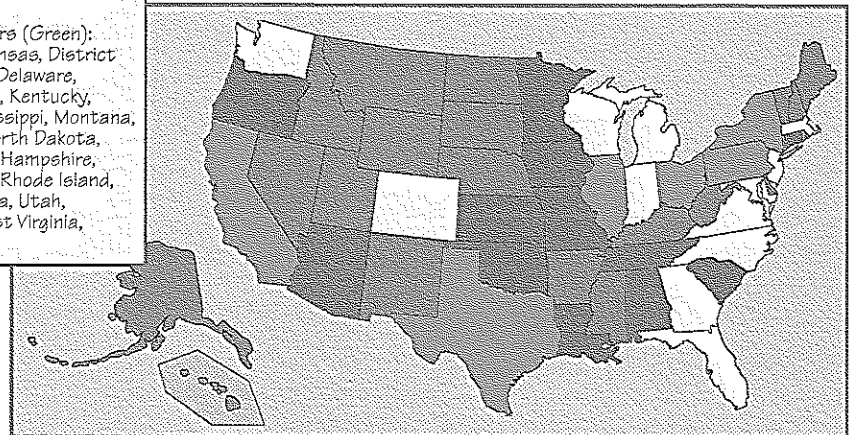
<100 Members (Green): Alaska, Arkansas, District of Columbia, Delaware, Hawaii, Idaho, Kentucky, Maine, Mississippi, Montana, Nebraska, North Dakota, Nevada, New Hampshire, New Mexico, Rhode Island, South Dakota, Utah, Vermont, West Virginia, Wyoming.

50 of the United States (including the District of Columbia), and members in Argentina, Australia, Canada, England, Germany, Japan, New Zealand, Portugal, and other countries spread the

message of the Wildflower Center's mission to a world-wide audience.

Many people believe most of the Center's members live in Texas. In fact, the opposite is true. While Texas is home to many of the Center's more than 20,000 members, California, New York, Pennsylvania, Illinois, and Ohio are home to more than 400 members each. Even Alaska and Hawaii have more than a dozen members each.

And there is always room for more. As the only national nonprofit organization dedicated to the preservation and reestablishment of native plants, the Wildflower Center is delighted to provide information and services to an audience that is growing not only larger, but more diverse by the month.



# F From the FIELD

### New England

**Concord, MA:** *Floodplain Ecology*, **September 16**, **Contact:** New England Wild Flower Society, 180 Hemenway Road, Framingham, MA 01701, (508) 877-7630.

### Mid-Atlantic

**Boyce, VA:** *In the Public Eye: Transforming the Urban Landscape*, **September 21-22**, **Contact:** State Arboretum of Virginia, P.O. Box 175, Boyce, VA 22620, (703) 837-1758.

### Southeast

**Atlanta, GA:** *Fall Gardening Festival*, **October 7**, **Contact:** Atlanta Botanical Garden, 1345 Piedmont Road, Atlanta, GA 30309, (404) 876-5859.

**Athens, GA:** *Designing Your Home Landscape*, **November 11**, **Contact:** The State Botanical Garden of Georgia, 2450 S. Milledge Ave., Athens, GA 30605, (706) 542-1244.

### Oklahoma/Texas

**Waco, TX:** *Native Plant Society of Texas, Fifth Annual Symposium*, **October 13-15**, **Contact:** Native Plant Society of Texas, P.O. Box 891, Georgetown, TX 78627, (512) 863-9685.

### Southwest

**Flagstaff, AZ:** *Second Southwestern Rare and Endangered Plant Conference*, **September 11-14**, **Contact:** The Arboretum at Flagstaff, P.O. Box 670, Flagstaff, AZ 86002, (602) 774-1441.

### Midwest

**Chanhassen, MN:** *Arboretum Flower & Garden Show*, **September 16-17**, **Contact:** Minnesota Landscape Arboretum, 3675 Arboretum Drive, P.O. Box 39, Chanhassen, MN 55317, (612) 443-2460.



## Enjoy Southern Hospitality With the Dixie Chicks, the Wildflower Associates, and More Wildflowers Than You Can Count!

The Wildflower Associates invite you to savor Southern hospitality, dance to the music of the Dixie Chicks, and, of course, support the educational programs of the Wildflower Center at the third annual Night of the Wildflowers: A Country Garden Gala, Saturday, September 30.

Join more than 500 guests at the Wildflower Center for an outstanding evening of entertainment, the always exciting silent auction, and a casual country supper followed by dancing and starlit strolls through the gardens. Individual tickets to this gala event are only \$50, and underwriting opportunities (which range from \$250 to \$5,000 and include reserved seating and other amenities) are available.

For more information about tickets and underwriting opportunities, please contact Brenda Cardenas, Development Assistant, at (512) 292-4200.



### Make Every Day A Wildflower Celebration: Join the National Wildflower Research Center!

Members of the National Wildflower Research Center support wildflower and other native plant work across the nation.

Benefits include:

- ✿ Free admission for you and your immediate family to the Wildflower Center's gardens and grounds
- ✿ The bimonthly newsletter, *Wildflower*
- ✿ A 10% discount on unique Center products such as wildflower books, calendars, and T-shirts
- ✿ Advance notice of tours and Center seminars and classes
- ✿ Discounts for information from the Center's Clearinghouse
- ✿ Reciprocal privileges at more than 100 gardens and arboreta

**YES!** Please enroll me as a Supporting Member of the National Wildflower Research Center.

- \$25 Supporting Member.  
My check for \$25.00 is enclosed.

Please enter a Supporting Membership for:

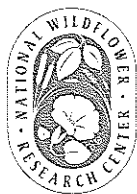
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Gift Membership: If you are giving this membership as a gift, please enter your name and address below.

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- Make your check payable to: NWRC
- Mail to: Membership, National Wildflower Research Center,  
P. O. Box 550, Austin, TX 78767-9778

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## Wildflowers Work!

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