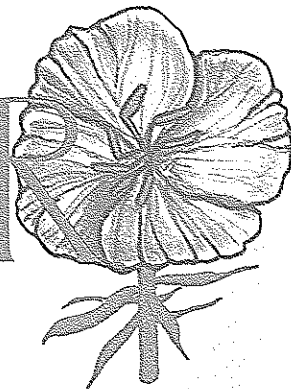


WILDFLOWER



A nonprofit organization dedicated to researching and promoting wildflowers to further their economic, environmental, and aesthetic use.

Pressing the Issue

Is Wildflower Collecting a Good School Activity?

As spring breezes freshen the air, coaxing the first wildflowers to bloom, the annual hunting season — for wildflowers — begins. Each year, thousands of wildflowers fall prey to eager students busily picking and pressing in hopes of high grades. Once completed and graded, those collections often lie unused and forgotten, collecting dust on a shelf or permanently filed in the trash.

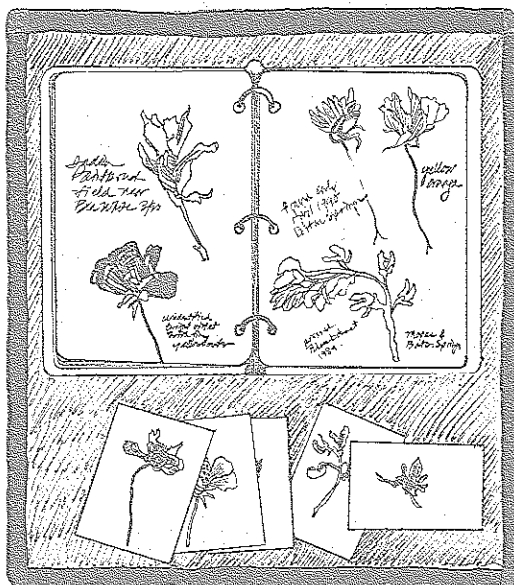
How useful are wildflower collections as school projects? Do students actually attain a better understanding of plants through collecting wildflowers? Are there alternatives to collecting that would be more beneficial to the student and less destructive to the environment?

The most important aspect of wildflower collection is the opportunity for students to get outside and see plants growing in their natural habitats, interacting with the surrounding components (other plants, insects, soil microorganisms, etc.). Too often,

natural sciences curricula neglect the study of whole organisms in order to focus on their structural aspects. Yet the goal of assigned collections usually tends to emphasize quantity over any other factors. In the rush to overwhelm teachers with sheer numbers of specimens, students learn little about more important concepts such as the ecology of plants, characteristics of plant families, or even plant names.

How can wildflower collecting or alternative projects instill a longer lasting impression on students? Below are a few suggestions or alternatives for plant collections.

- Emphasize the process and value of collections, rather than quantity. Detailed notes on location, habitat, collector, etc., are just as important as the plant itself. You may want to start a mini-herbarium (plant library) as a class or school project that classes can add to in subsequent
- (read on, back page)*



class or school project that classes can add to in subsequent

Castilleja Loves Company, Center's Study Finding

Preliminary results from the Wildflower Center's two-year study of the Indian paintbrush annual species *Castilleja indivisa* show the plant is a parasite that draws water and possibly nutrients from the plants around it.

In the past, little was known about the best ways to propagate and harvest seed, so seed sources were limited — pushing Indian paintbrush seed prices up to an average of \$500 per pound.



Preliminary study results indicate that seed producers would produce larger plants with more seed and that gardeners would grow healthier plants if they sow the seed with another plant. The study planted Indian paintbrush and Texas bluebonnets (*Lupinus texensis*) together. The Indian paintbrush planted with bluebonnets grew better than those planted alone.

Although several perennial species of Indian paintbrush have

been studied and found to be parasitic, the Wildflower Center study is one of only a few conducted on this annual.

Indian paintbrush, which are native to the western United States, are often seen in nature growing with other wildflowers and grasses.

A more detailed article about the *Castilleja* study appears in the *Wildflower Journal* spring issue.

CATALOG INSIDE!

Changing the Earth, One Person at a Time

The 1990s are already being described as the "Decade of the Environment." In the most basic analysis, all environmental stability depends on our native flora, which in turn supports the animal life, stabilizes the soil, and buffers the atmosphere, water, and other climatic and ecological features of planet Earth. Decreasing plant species diversity, the replacement by introduced exotics, and the removal of our native wildflowers, grasses, shrubs, vines, and trees, therefore, becomes of paramount importance in our environmental concerns. Correcting all other environmental problems depends on our efforts to first protect and re-establish our native flora.

A primary goal of the National Wildflower Research Center is to involve everyone in this process of environmental repair at the regional flora level. No longer can we only

pay our annual dues and let others lobby for regulations, campaign for clean-ups, and enforce environmental ordinances. Nor can we simply return damaged and modified land to nature to let "nature takes its course" to return that land to an ecologically balanced natural plant community. There has been too much change over too many millions of acres for this policy of benign neglect to work. We must all take an active role in the process...and we can!

On a large scale, restoring our roadsides and selected park and other public lands to natural plant communities is a process in which many of us can become involved. Using locally indigenous native trees and shrubs in our home, school, and business landscapes, planting a native wildflower meadow in appropriate planned landscapes, and even planting native wildflowers in our

annual and perennial gardens, all result in a cumulative effect, adding millions of native plants to our immediate environment.

Let's start repairing our environment one person and one plant at a time. It is *our* environment that we have all innocently had a part in damaging, and it is up to all of us to be part of the solution. Join the National Wildflower Research Center in our efforts to preserve and re-establish our beautiful and diverse native flora. This is the one thing we can all do to be *a part of* our natural environment, not continue to be *apart from it*.



David K. Northington, Ph.D., is Executive Director of the National Wildflower Research Center.

Wildflower

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WILDFLOWER CENTER NEWS

Wildflower Center founder Lady Bird Johnson addressed members of The Bohemian Club in California in February on the importance of re-introducing wildflowers and other native plants into the environment.

All the native plants on the Center grounds survived December's extreme cold snap. Temperatures in Austin dropped to four degrees above zero, the coldest temperature in the area for many years. Heavy spring rains helped create a bumper crop of wildflowers on the Center property. Many visitors came to the Center to enjoy the bounty.

The Center recently distributed 430 copies of its educational poster, enough for every fourth- and fifth-grade classroom, to the Austin Independent School District. The Center is hoping to get funding to distribute the colorful poster to all fourth- and fifth-grade classrooms in the country.

Staff Research Horticulturist Elinor Crank will present a paper titled "The Benefits of Mycorrhizae Inoculant" at the June meeting of the American Association of Botanical Gardens and Arboreta in Seattle.

The second Center-sponsored tour of Costa Rica was a great success. More than 30 travelers spent a week in March amid the country's rainforests and volcanoes, learning about its wildflowers, orchids, and wildlife.

In April, more than 60 participants went on the Center's Big Bend National Park tour in West Texas. The educational trip included visits to the Chihuahuan Desert Research Center, Fort Davis National Historical Site, and river rafting on the Rio Grande.

A record number of Center trustees are expected to attend the annual trustee meeting in mid-May in Austin, Texas.

Take a Walk on the Wild Side

The National Wildflower Research Center welcomes visitors to its Austin, Texas, headquarters. Located on the banks of the Colorado River, the Wildflower Center has 60 acres of land, including several acres of wildflower and native grass plantings available for viewing.

Inside the Wildflower Center, visitors can watch a brief videotape that discusses the importance of our native flora, as well as the Center's history and purpose. For a closer look at the research in progress, visitors may stroll the grounds using a self-guided walking tour.

The self-guided walking tour is a good way to see native plants in a variety of settings. The Center provides a "Guide to the Grounds," containing a map of the grounds, names and descriptions of landscape plants, and an explanation of the research at the Wildflower Center.

The most eye-catching area on the self-guided tour is the reconstructed prairie area in front of the Wildflower Center. The reconstructed prairie is an example of the Blackland Prairie — the southernmost extension of the tallgrass prairie of the Great Plains — that formerly covered 12 million acres

in Texas. Prairie species from a nearby prairie remnant undergoing development were transplanted to the Center's reconstructed prairie area.

Because the Wildflower Center's prairie area contains a large diversity of wildflowers and species of native grasses, the prairie constantly changes in color and texture during the year. It's possible to visit the area several times a year and see something different each time. The prairie area, which was created in the fall of 1988, will take three to five more years before it is well established.

As part of the Wildflower Center's ongoing research, the staff burned a section of the prairie during the winter of 1990 to study the use of fire as a prairie management technique. (Please see related story in next column.) The results of the burn can be seen on the walking tour.

The landscaped beds on the grounds illustrate how native plants and grasses can be easily substituted for non-native plants. All of the plants used in these beds are commercially available in the Central Texas area.

(read on, page 5)

RESEARCH U.P.D.A.T.E

Wildflower Center researchers are conducting experiments to determine the effects of fire as a management tool for prairies and grasslands. Information gathered will help aid those interested in re-establishing and maintaining North American prairies and grasslands.

Once covering 250 million acres and representing the largest ecosystem in the United States, only 1 million acres of the original tallgrass prairie remain in North America.

In a prairie conservation effort, Center staff and volunteers transplanted more than 90 individual native grass and wildflower species to the Center grounds from an area in Central Texas that was scheduled for development.

Fire historically has been a component of the prairie life cycle, clearing away dead plant material, returning nutrients to the soil, stimulating the growth of new plants, and triggering the germination of some dormant seeds.

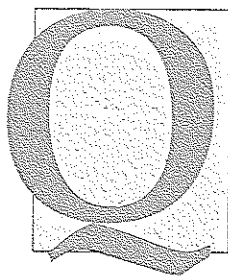
In the first phase of the Wildflower Center project, researchers recorded the individual plant species that were present on a two-acre site at the Center. Then, in January, researchers burned the area to simulate a naturally occurring prairie fire.

In February, the area was seeded with about 20 native grasses and forbs, including sideoats grama, big and little bluestem, Indian grass and switchgrass. The new vegetation that appears in the burned area will be recorded, and the results will tell Wildflower Center botanists how the fire helped or hindered the growth of new and previously existing plants.

The information gained by the Center's researchers will be passed on to interested parties throughout the Midwest, to help them reclaim this rich heritage of the Plains and re-establish prairies where they have been replaced by land development and non-native species.



Much of the Center's research takes place in the greenhouse. Several species of wildflowers also grow in beds outside of the greenhouse.



I am looking for a source of nursery-propagated *Trillium grandiflorum*. Do you know of one?
— D. Wallace, Neshannock, Pa.

The propagation of *Trillium* spp. is slow and, consequently, the plants are expensive. *T. grandiflorum* requires five to seven years to reach flowering size when grown from seed; when propagated by division, it usually yields one new plant division per plant each year. Tissue culture propagation of this species is in the experimental stage, and at this time, commercial propagation on a large scale is not feasible.

Production of this species by division requires maintenance of permanent stock plants. No known nursery maintains thousands of these plants in beds as permanent stock plants for division. Therefore, any nursery selling large quantities of this species must be obtaining these plants from the wild. Plants are usually dug from the wild, placed in nursery beds in

the fall or spring, and then sold as soon as possible. As consumers, we need to be informed and avoid purchasing wild-collected plants.

Q: How can I attract butterflies to my yard? — P. Johnson, Tucson, Ariz.

To attract the greatest number of butterflies, establish plants that serve the needs of all of the insect's life-stages. Butterflies need places to lay eggs, plants the caterpillars can eat, sites where chrysalises can form, and nectar sources for the adult butterflies. Adult butterflies are attracted to red, yellow, orange, pink, or purple blossoms that are flat-topped or clustered and have short flower tubes that allow the butterflies to reach the nectar. Plants should be grown in sunny areas, as adult butterflies rarely feed on plants in the shade.

If you have a question about native plants, write to the Clearinghouse at the Wildflower Center (address on back page). Free wildflower information is a benefit of membership in the Center. Non-members need to enclose \$1 and a self-addressed label or a 3-by-5-inch card.

From the Field

Wintergreen Spring Wildflower Symposium May 18-20, Wintergreen, Va. Weekend conference consists of hikes, slide presentations, lectures, workshops, and field trips. **Contact:** Mike Caouette, 1-800-325-2200, ext. 391.

Wildflower Conference May 13-16, Cashiers, N.C. Conference features walks, field trips, and discussions of mountain flowers, trees, and shrubs, with Dr. Ritchie Bell. **Contact:** Agnes Crips, High Hampton Inn, 446 Hampton Road, Cashiers, N.C. 28717, (303) 929-0513.

Wildflower Photography Workshops Brush up on photography methods and composition in lectures and/or workshops sponsored by the Wildflower Center and Eastman Kodak and taught by nationally recognized wildflower photographer John D. Smithers. Workshops scheduled *May 10, 12, 13* at the National Arboretum, Washington, D.C., (202) 475-4815; *May 17, 19, 20* at The Holden Arboretum, Mentor, Ohio, (216) 946-4400; *May 25, 26, 27* at the Royal Botanical Gardens, Hamilton, Ontario, (416) 527-1158; *June 2* at the Vermont Institute of Natural Science, (802) 457-2279; *June 7, 9, 10* at the Shelburne Farms & Vermont Wildflower Farm, Shelburne, Vt., (802) 985-8686; *June 15, 16, 17* at Le Jardin Botanique de Montreal, Quebec, (514) 252-3036; *June 22, 23, 24* and *June 29, 30, July 1* at the Bowman Hill Wildflower Preserve, Washington Crossing, Penn., (215) 862-2924.

Twelfth North American Prairie Conference, Aug. 5-9, Cedar Falls, Iowa. Presentations center around the conference theme "Recapturing a Vanishing Heritage." **Contact:** Daryl D. Smith, 2759 McCollum Science Hall, University of Northern Iowa, Cedar Falls, Iowa 50614, (319) 273-2238.

Eastern Native Plant Alliance Annual Meeting Aug. 17-19 The Holden Arboretum, Mentor, Ohio **Contact:** Mary Pockman, 7301 Hooking Road, McLean, Va. 22101.

WILDFLOWER OUTLOOK

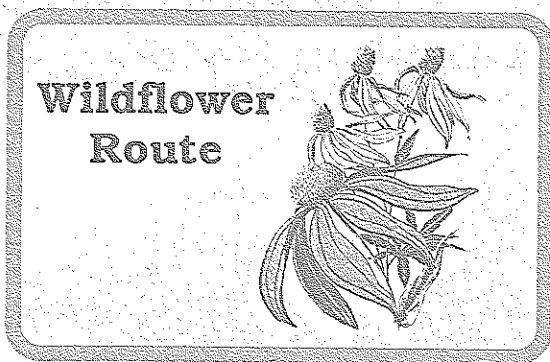
Travelers seeking wildflowers in Minnesota need only follow the signs. The state's Dept. of Transportation and Dept. of Natural Resources are establishing several wildflower routes along state highways, marked with brightly colored signs (shown at right). The designation is given to high-quality corridors of native woodland, wetland, prairie wildflowers, or grasses. State highway officials say State Highway 65, the first route to receive the designation, offers a glimpse into the state's prairie past.

Want to see more than 150 living, blooming wildflowers? The Connecticut State Museum of Natural History presents the fifth annual Wildflower Festival June 10 from 1 to 5 p.m. at Jorgensen Auditorium on the campus of the University of Connecticut in Storrs. For more information, call (203) 486-4460.

For up-to-the-minute tips on where to see the best wildflower displays throughout Utah, call the Wildflower Hotline. The five-minute recorded message, sponsored by the Red Butte Gardens, can be heard through October; call (801) 581-4969.

The Colorado Native Plant Society has published "Rare Plants of Colorado." The soft-cover guide is the product of three years of research into the state's rare and endangered plants. For more information, call the Rocky Mountain Nature Association, at (303) 586-2371.

Bethel College in North Newton, Kan., is offering a prairie ecology workshop, June 4-22, for elementary school teachers. Participants will earn three hours of graduate credit. For information, write: Prairie Ecology Workshop, Bethel College, 300 E. 27th, North Newton, Kan., 67117.



Being Responsible in Your Landscape

Is it possible to have a great garden and be environmentally responsible at the same time? Do you often feel as if you have only two alternatives: bugs or beauty? These suggestions can help homeowners keep their little corner of the world a little safer.



- Fight insects by using natural predators. This method of pest management, called biological control, uses pests' natural enemies, such as lacewings, ladybugs, and praying mantises. Include nesting boxes and bird feeders to attract insect-eating birds such as purple martens, house wrens, brown thrashers, and chickadees. Toads, most lizards, and many snakes are also harmless and very helpful in keeping insects and other pests in control in your garden.

- Native plants attract native pests, but those native pests have native predators that will keep the pest problem under control. Many pest problems in the landscape are caused by the introduction of exotic

species. These plants often carry natural pests, but not the natural predators.

- Use non-toxic sprays and dusts. A good spraying of cold water every day for a week can rid plants of mealy bugs or spider mites. When water is not enough, concoctions of water, soap, and certain plant substances are often highly effective. Soap sprays work to repel soft-bodied insects; use 2 to 4 tablespoons liquid soap per gallon of water. Effective plant juice sprays can be made from one part chopped leaves of pine, poplar, or edible herbs, one part water.

- If you must apply a chemical pesticide, don't apply the pesticide when it is windy or raining. Drifts of herbicide spray may harm desirable plants and if the soil is saturated, it is likely the pesticide will run off, and eventually pollute our water system.

- A yard or garden containing only one species is an easy target for

insects and fungal pests. Variety, in this case, is more than just the spice of life — it can dramatically decrease the potential for pest damage.

- To maintain healthy garden soil, organic matter must be added each year. Renew your soil by working under old plant growth rather than removing and disposing of it. Add compost, which is commercially available or easily made from decomposed plant material.

- Water during the early morning or evening hours; evaporation losses will be up to 60 percent higher during the day. Better yet, use native plants, which require much less water than other plants.

- Do not put leaves, grass clippings or any other "trash" into the storm sewer or drainage ditches. The decomposition of grass, clippings, leaves, and other plant and animal matter removes valuable oxygen from the water, reducing what is available to sustain the natural habitat.

Walking Tour, continued from page 3

Several research plantings can be seen during the walking tour, including those of the *Castilleja* (Indian paintbrush) project, wildflower seed mix plots, and the study of mycorrhizal relationships.

Another enjoyable area of the Center's grounds is the pollinator garden, which contains various plants to attract pollinators such as bees, moths, butterflies, and hummingbirds. Benches have been set up so visitors can rest while enjoying the flowers and observing the pollinators they attract. The garden is at its most colorful during the summer and early fall.

The Wildflower Center's research greenhouses are not open to the public. Because the greenhouses contain regulated plants being used in experiments, large numbers of visitors could alter research results and expose plants to pests.

While at the Wildflower Center, visitors are encouraged to pick up fact sheets with details about wildflowers and other native plants, as well as information on where to buy seed or how to plant wildflowers. Information on the Texas area is available in the lobby. For fact sheets on other states, please ask for additional assistance.

Once the walking tour is complete, visitors often enjoy visiting the Wildflower Center's gift shop. It offers many books on wildflower identification and landscaping throughout the country. The gift shop also features many other unique items, including several pieces crafted exclusively for the Wildflower Center and available nowhere else.

The Wildflower Center's visiting hours are Monday through Friday, 9 a.m. to 4 p.m. Hope to see you soon!

Bluebonnet print now available

Noted naturalist, artist and Wildflower Center trustee Jean Andrews has graciously made her lovely botanical limited edition print of the Texas bluebonnet *Lupinus texensis* available exclusively through the Wildflower Center for a limited time.

The 16-inch by 20-inch print, one of a limited edition of 250, is printed on archival paper and depicts the life cycle of the bluebonnet. The print is taken from Andrews' book, *The Texas Bluebonnet*, which also is available through the Wildflower Center for \$9.95. Each print is identified and signed by the artist.

Orders for this special print may be placed by phone, (512) 929-3600, weekdays from 9 a.m. to 4 p.m. Central Time, or by mail (2600 FM 973 North, Austin, Texas 78725) for \$75 plus \$5 shipping and handling.

Pressing the Issue, continued from page 1

years. Collect flowers as a group instead of individually.

• Wildflower flash cards — made by taping pressed specimens onto index cards, with their names written on the back — may be a more useful way to learn how to identify wildflowers.

The cards can be filed in a box in the classroom for future reference.

• Photographing wildflowers, although expensive, is another option, especially for older students.

• Photocopies of wildflowers provide enough detail for recall, and are an easy way to make a simple identification booklet that can be reused.

• A wildflower planting on the school grounds provides an excellent opportunity both to learn about plants and to study them over time. Caring for their own wildflowers will instill in students a greater appreciation for plants in the wild.

With a little creative thinking, teachers can help reduce the frenzied collecting of wildflowers, and still give students a glimpse of the intricate plant kingdom.

Beth Anderson
Wildflower Center Resource Botanist

New Tours Added!

The Wildflower Center and SelecTours have added several Wildflower and Naturalist Tours to the 1990 slate, including Sonoma, Calif., in September, and Hawaii in October. Other tours include:

Vancouver, B.C.
June 23-July 1, 1990

Hawaii
October 1990

New Zealand
November 1990

For more information, or to sign up for one of the tours, call SelecTours at 1-800-759-7727.

Get Involved! Join the National Wildflower Research Center!

Members of the National Wildflower Research Center support wildflower work across the nation. Benefits include *Wildflower*, the newsletter and *Wildflower*, the journal; 10% discount on unique Center products such as wildflower books, calendars, and T-shirts; special advance notice on tours and discounts to Center seminars; free wildflower information from the Center's Clearinghouse; a membership card; and other benefits.

- \$25 Supporting Member. All benefits listed above.
- \$50 Sustaining Member. All the above plus a set of specially commissioned wildflower note cards.
- \$100 Key Member. All the above plus wildflower garden apron and invitations to special events.
- \$250 Center Sponsor. All the above plus wildflower poster.
- \$500 Trust Member and \$1000 Benefactor. All the above plus special privileges.

• Thank you! Your contribution is partially tax deductible. Contact the Development Office for detailed information on tax-deductibility.

Please enter a membership in the category checked at left:

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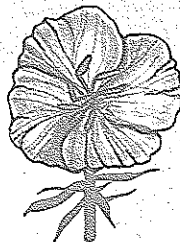
- Make your check payable to: NWRC
- Mail to: Membership, National Wildflower Research Center, 2600 FM 973 NORTH, AUSTIN, TX 78725-4201 7/3

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