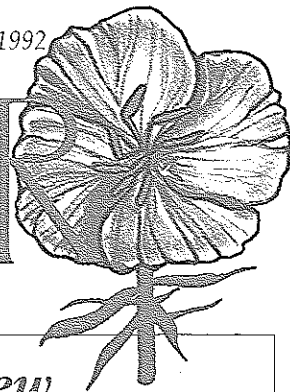


WILDFLOWER



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

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

A species' seed biology and general life history are the keys to understanding why it has become endangered — and for developing a plan to stabilize the population so it no longer is endangered.

The Texas Parks and Wildlife Department gave a grant to the Wildflower Center to study the federally listed endangered species *Thymophylla tephroleuca* (ashy dogweed), which is native to Zapata and Starr counties in far south Texas along the Mexican border. It exists only in three distinct populations on a private ranch. The plant, a member of the Asteraceae family, is a small semi-woody perennial with bright yellow flowers and aromatic foliage. It grows in a desert environment, along with cacti and other scrub vegetation, and blooms occasionally throughout the year, depending on rainfall.

For our seed biology research, we collected seeds from the site several times throughout a two-year period, taking care to keep seeds from the sites separate. We used tetrazolium (TZ) tests to determine whether the seeds were still alive, and we conducted germination tests to examine whether pretreatment was needed to break dormancy before germination. We chose heat-stratification as a pretreatment because ashy dogweed is native to an area where the average summer temperature hits well above 100 degrees F in the summer and falls to an average low of 60 degrees F in the winter.

High summer temperatures act as a pretreatment, preventing germination before summer. In our study, germination was higher after a heat pretreatment. Seeds with no pretreatment germinated at an average of 23 percent, but heat-stratified seeds germinated at 49 percent.

Although species must be examined individually, this successful study may provide important information about species with similar habitats.

Elinor Crank
Research Horticulturist
National Wildflower Research Center

Do-it-yourself sod offers new method of creating a native lawn

Grass sod: just put it down, water it, and create an instant lawn that out-competes most weeds. This convenience prompts many homeowners to buy expensive grass sod instead of using grass seeds to create landscapes.

Now that more people are choosing to have lawns of native grasses, sod availability is a problem: most native grass species aren't sold as sod. But you can make your own!

I had read in *American Horticulturist* (Nov. 1989) that researchers were growing typical lawn-grass sod in a layer of sewage sludge compost on top of sheets of polyethylene plastic. I made my own native grass sod using that method. It worked for me, and it might work for you, using short grass species native to your region.

Many regional native grasses are suitable for a lawn. I happened to choose Texas grama (*Bouteloua rigidisetata*), a short bunch grass, and buffalograss (*Buchloe dactyloides*), a grass that grows underground by stolons and forms a dense carpet. Both species are warm-season, native grasses; buffalograss is found throughout the midwestern plains and Texas grama is native to Oklahoma, Texas, and northern Mexico. Though buffalograss seeds are available commercially, Texas grama is not. It was wild-collected in the fall.

I planted in late March, past the average last freeze date for Central Texas. (Follow a planting schedule that considers your climate.) To plant the seeds, I rolled out strips of four-foot-wide, heavy duty black polyethylene plastic, and shoveled a one- to two-inch layer of "Dillo Dirt" — the finished product of the City of Austin's sewage sludge composting project — onto the plastic. Then I sprinkled the seeds on top. The seeds I used were large, so I could see that the area was covered with seeds about two inches apart — a heavy seeding rate. Finally, I covered the seeds with a thin layer of compost.

Over the next few months, I



The finished product can be rolled up and moved to a different location.

watered the sod beds regularly; by July the roots of the grasses had formed a dense mat. As the article in *American Horticulturist* had said, the whole strip could be rolled up, moved with machinery, and rolled out on the site. Obviously, this isn't practical for homeowners. So, for ease of handling without machinery, I cut the sod into two-foot squares and planted them. I watered the newly planted sod every other day for a week. It took hold and is still thriving.

My next project is short grass sod interspersed with wildflowers. If you try this method or another to make sod, I'd like to know your results!

Marcia Hermann
Research Assistant
National Wildflower Research Center



Visit a natural area at least once a month for at least one year—Enjoy!

Director's Report

Wildflower Center research touches endangered species

The public has demonstrated a strong concern about the fate of rare and endangered plants, which we at the Wildflower Center share. Although the Center is not dedicated exclusively, or even primarily, to protecting or preserving endangered plant species, organizations that focus on this cause already exist and fill the niche.

Our mission is to preserve and reestablish *all* native plant species and communities, including those threatened with extinction. Endangered species play an unusually important role in achieving this goal because they often indicate severely altered, disturbed, or damaged habitats. Although biological or ecological factors may greatly limit the existence of some of these species, they also may be threatened by human activities such as agriculture, ranching, urban sprawl, and transportation. The reduction, alteration, or removal of a species' natural habitat (its place to live) often is compounded by the presence of exotic plants that escaped from cultivation or were introduced intentionally to roadside or pasture sites. Once these aggressive exotics are established in damaged habitats, reintroducing once-indigenous native species is even more difficult.

The Wildflower Center works with endangered species in two ways: developing propagation techniques for native plants and reestablishing wild populations. Over the past three years,

we have learned to germinate, container-grow, and plant-out two endangered plant species: *Salvia penstemonoides* and *Thymophylla tephroleuca* (*Dyssodia tephroleuca*). Working with these species helped us determine whether reproduction could be a major factor in their near-disappearance from the wild, and increased our understanding of their growth patterns — an important factor in reestablishing wild populations.

Our studies of reestablishment of wild populations are supported by the American Conservation Association. The ACA gave us a grant that allows us to support collaborative research on endangered species reestablishment at the University of California at Berkeley; the Desert Botanical Garden in Phoenix; the University of New Mexico; Sul Ross State University in Alpine, Texas; and the San Antonio Botanical Garden. The goal of this research is to set guidelines for plant reestablishment efforts, while learning how to reintroduce endangered species into appropriate natural habitats.

A plant species in danger of extinction is normally one that does not have an appropriate set of natural conditions in which to grow, reproduce, and interact with the flora and fauna of its normal

habitat. Successful reestablishment of any plant species hinges on a stable habitat that allows the flora and fauna to work interdependently. So, an endangered species is an important tool in assessing its habitat; successfully reintroducing an endangered species may indicate that the habitat is once again healthy and functional.

Our reestablishment studies are exciting, because we are learning how to reconstruct or repair damaged habitats, which contain other plant species that could become threatened with extinction if the habitat is not improved. In focusing on this research, we hope we can reconstitute some of the nation's endangered habitats — and not just learn to propagate endangered species or protect the few remaining natural populations where they still occur.



David K. Northington, Ph.D., is executive director of the National Wildflower Research Center.

WILDFLOWER CENTER NEWS

The Wildflower Center's Midwest Regional Office presented a conference in October on landscaping with native plants. The conference, which was attended by 130 people from six states and one Canadian province, marked the office's first anniversary. In November, the Midwest Office and the City of Bloomington co-sponsored a lawn ordinance workshop for municipal planners and other city leaders in the Minneapolis-St. Paul area. Bonnie Harper-Lore spoke at the Natural Areas Association conference in Estes Park, Colo., in October.

The Wildflower Center's traveling display was shown at the annual meeting of the American Society of Landscape Architects in Kansas City, Mo., in October. The ASLA donated the booth space.

The Center's Wildflower Days Festival will be held April 11-12 from 10 a.m. to 4 p.m. Admission is free for the event. Wildflower walks, a native plant gardening information booth, wildflower gift shopping, children's activities, live music, and refreshments are among the activities planned.

Wildflower

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Executive Director: David K. Northington, Ph.D.

Editor: Tela Goodwin Mange

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U.S. Postal Service Statement of Ownership, Management and Circulation

On Sept. 11, 1991, *Wildflower* (0898-8803), a bimonthly publication printed six times per year, with an annual subscription price of \$25, filed its statement with the U.S. Postal Service, as required by law.

Tela Goodwin Mange, editor, is an employee of the publisher and owner, the National Wildflower Research Center. Both may be reached at the organization's headquarters, 2600 FM 973 North, Austin, TX 78725-4201.

The organization's function, purpose, and tax-exempt status have not changed in the preceding 12 months.

Average number of copies printed during the preceding 12 months: 16,186. Average number of mail subscriptions during the preceding 12 months: 14,860. Average number (total) of paid and/or requested circulation during the preceding 12 months: 14,860. Average number of

free distribution during the preceding 12 months: 422. Average total distribution during the preceding 12 months: 15,282. Average number of copies not distributed: 904. Average total: 16,186.

Average number of copies printed nearest to filing date: 13,200. Average number of mail subscriptions nearest to filing date: 11,226. Average number (total) of paid and/or requested circulation nearest to filing date: 11,226. Average number of free distribution nearest to filing date: 200. Average total distribution nearest to filing date: 11,426. Average number of copies not distributed: 1,774. Average total: 13,200.

Tela Goodwin Mange certifies that these statements are correct and true.

What makes plants rare or common?



Something about rarity catches our attention. Who does not experience a particular thrill when first seeing, or even hearing about, something rare? It could be an antique, a coin, a stamp, or any number of other objects. Botanists also experience that thrill when viewing a rare plant from this perspective and from that of a scientist. In addition to the pleasure rare species provide us as novelties, they represent exceptional opportunities to learn more about the relative adaptive abilities of organisms in nature.

At the Wildflower Center, for the past several years we have been working with a rare plant that has only two or three existing populations, depending on what one defines as a population (please see page 1). The plants grow easily in cultivation, seed set is high, and germination is high. When I explain this to visitors to the Center, they almost invariably ask, "Then why is it rare?" That, to me, is one of the really interesting questions related to endangered species. Having some insight into what causes a plant's rareness may be critical if we hope to decrease the probability of its extinction.

Early in this century, two general and opposing theories emerged regarding rare plants. One was that the species were old, maladapted to present environments, and on their way out naturally. The other was that they were young and had not filled the niche to which they were adapted. I still hear these arguments, even from botanists, and, certainly, relic species do exist, as do newly derived species. However, numerous examples exist of rare species that are neither old nor young. That is, these

examples are of intermediate age in the evolutionary process.

Another widely held truism is that rare plants are poor competitors. But studies specifically related to competition suggest that certain sparse prairie grasses are evenly matched or competitively superior to widespread, common species. Other commonly held theories have conflicting data. For example, rare species may be genetically uniform or highly variable. Seed set may be high or low and the resulting seeds may exhibit high, intermediate, or low germination rates.



Humans are the greatest cause for extinction of species, primarily by the destruction of habitats.

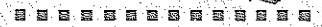


Suffice it to say that the causes for rarity (or commonness) may be as individual as the species involved and no common pattern will emerge — except, perhaps for one. All are highly vulnerable to extinction. Up to this point, I have not mentioned human impact. With few exceptions, for example some hunting (animals) or collecting (plants), humans have not caused species to be rare. Humans are, however, the greatest cause for extinction, primarily by the destruction of habitats.

Rare species are highly interesting to us for both aesthetic and biological reasons. Many widely varying ideas and theories exist regarding the reasons for rarity, but for most — although such information is important to increase our understanding of natural systems and to preserve rare species — there are little hard data. There are many reasons for wishing to preserve these species, but for me, these alone would be enough.

Dr. John E. Averett
Research Director
National Wildflower Research Center

A RARITY QUIZ



In the proceedings *The Biological Aspects of Rare Plant Conservation*, John Harper, a noted biologist from the United Kingdom, suggested that when biologists become interested in rare organisms, it almost inevitably is the rarity of the species that is their concern. The discussion centered on the meanings of rarity but Harper also pointed out that controlling the abundance of a species may sometimes be possible, making some species more common.

During the talk, he asked the audience how many would wish to see rare species made more common or if they would wish to see a more common species made rare. The audience clearly indicated that, except perhaps for a few noxious species, they wished to see no change. That is, the flora of 1980 was just right and the task of the conservationists was to maintain that condition.

The late Deborah Rabinowitz, an ecologist at Cornell University, asked audiences of professional biologists to list the traits, attributes, or characteristics of rare species before she spoke (*Plant Science Bulletin*, Dec. 1985.)

From audiences totaling 50 individuals, some 20 characteristics were listed, such as highly specific ecological requirements, low reproductive potential, and adaptation to past environments. Narrow ecological zones and low reproductive rates were most frequently mentioned. Responses to the remaining 18 characteristics were less frequent and approximately equally distributed.

In both instances, the questions relate to our attitudes toward and understanding of rarity and rare species. Think about your own response to the questions below and, if you are inclined, send them to me at the address listed on the back page. I will tabulate the results for a future issue of the *Wildflower* newsletter if a sufficient number are received.

- Are you interested in the species or in the cause for its rarity?
- If you could change the relative abundance of a species, would you?
- What are three characteristics or traits of a rare species?

— J.A.

FROM THE
F.I.E.L.D.

Eco-Fair Texas 1992, Jan. 24-25, Austin.
Contact: EFT, P.O. Box 1991, Austin,
Texas 78767-1991, (512) 478-4060.

Wildflower Cultivation: A Partnership with Nature, Jan. 28-Feb. 1, Bronx, N.Y. Contact: Susan Greenstein, (212) 220-8666.

Society for Range Management Annual Meeting, Feb. 9-14, Spokane, Wash. Contact: SRM, 1839 York St., Denver, Colo. 80206, (303) 355-7070.

Urbanization and the Environment, March 5-7, Houston. Contact: Elizabeth Nelson, Harris County Flood Control District, 9900 Northwest Freeway, Suite 220, Houston, Texas 77092, (713) 684-4037.

Rancho Santa Ana Botanic Garden Wildflower Walks, weekends from March 7 to May 31, Claremont, Calif. Contact: RSABG, 1500 North College Ave., Claremont, Calif. 91711-3157, (714) 625-8767.

Rhode Island Wild Plant Society Annual Meeting, March 14, Rhode Island. Contact: RIWPS, 12 Sanderson Rd., Smithfield, R.I. 02917-2606, (401) 949-0195.

Wildflowers and the Natural Landscape, March 19-21, Casper, Wyo. Contact: Casper College—School of Outreach, Wildflowers for Wyoming, 125 College Dr., Casper, Wyo. 82601.

WILDFLOWER OUTLOOK

The Iowa Prairie Network, a grassroots organization created to increase the exchange of information about Iowa's prairies and other natural areas, has established the **Iowa Prairie Network Hotline**. The hotline is continually updated with information about scheduled natural areas conferences, field days, work days, and seminars throughout the state. Midwest and national events are included when applicable to Iowa's natural areas. The hotline also discusses current native plant issues.

All events and issues are fed into the hotline through a network of volunteers across the state. You can reach the hotline at (402) 572-3080.

The Rhode Island Wild Plant Society newsletter reports that **sea lavender** (*Limonium carolinianum*) has been added to the Rhode Island "Christmas greens" law, which makes it illegal to gather certain plants without the permission of the property owner.

Sea lavender is among several native plants that have become popular in flower arrangements and holiday decorations, the RIWPS newsletter reports, and large quantities of the plant have been removed from coastal marshes. Other plants protected by the "Christmas greens" law include clubmosses (*Lycopodium* sp.), flowering dogwood (*Cornus florida*), trailing arbutus (*Epigaea repens*), great rhododendron (*Rhododendron maximum*), mountain laurel (*Kalmia latifolia*), winterberry (*Ilex verticillata*),

holly (*Ilex opaca*), inkberry (*Ilex glabra*), and various conifers.

Sea lavender is also protected in Massachusetts, Connecticut, Maryland, and Virginia.

The Nature Conservancy has been working with the U.S. Dept. of Defense to restore the 101-acre **Huffman Prairie**, which is located inside Wright-Patterson Air Force Base near Dayton, Ohio.

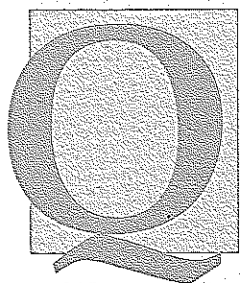
Nature Conservancy magazine calls the prairie Ohio's largest remnant of native tallgrass prairie. The prairie has been damaged by artificial drainage, grazing, and fire suppression.

Civilians and military personnel will work on the long-term project, the magazine reports. The DOD is funding the project through its Legacy Program, which finances efforts to restore cultural, historic, and natural resources on DOD holdings.

American Horticulturist reports that the Minneapolis Parks and Recreation Dept. has almost completed the restoration of a native **acid bog**.

The bog, in Theodore Wirth Park, had been overtaken by the exotic glossy blackthorn. Restoration efforts began in 1986.

Know of a special project in your area that would interest our members? Please send news clippings or releases about the project to the Editor.



Questions, questions, questions! The Clearinghouse at the National Wildflower Research Center answers thousands of questions a year

on wildflowers and native plants and how to grow them. Clearinghouse Q & A features some of those questions and the botanists' answers.

Q: ...When does a wildflower become a cultivated native plant? This question intrigues me because I have been pruning, tending, and spraying "wild" berries and flowering plants that were present

on my lot for the past 12 years. I never planted them, but I utilize them in my landscaping and gardening. I usually call them "wild," but is this appropriate?
— P. Schenone, Henryville, Pa.

A: In our general literature, the Wildflower Center often uses "wildflower" to mean "wildflower species." This definition of the term "wildflower" allows us to distinguish one kind of plant species from another, or to distinguish native and naturalized species from introduced species that require care other than Mother Nature's to survive and reproduce over the long term.

A native plant living in its natural state on its natural site is surely called

a wildflower. If we change its environment — add a little moisture, or nutrients, or disturb its microclimate — it's still the same plant, but is it still wild? Would you consider this plant to be more wild than a native plant propagated in a nursery and introduced to a site where its parents did not live? Degree of wildness may be a matter of perspective. I offer no guidelines, no test or standard, for this begs the question of the philosopher in us all. I can only refer you to the inspiration of Henry David Thoreau, who wrote that "in wilderness lies the preservation of the world."

— Bonnie Crozier
Resource Botanist

Planned giving helps the Wildflower Center and you!

It's hard to believe 1992 is already here and tax season is just around the corner! Although there have been many changes in the U.S. Tax Code, charitable gifts are still one of the few legitimate methods Uncle Sam allows to encourage support for non-profit organizations such as the Wildflower Center. With careful planning, a gift will benefit the Center, and help you use your assets to your best advantage.

The most common type of gift to the Center — cash or check — is fully tax-deductible if the total of all your charitable gifts for the year does not exceed 50 percent of your adjusted gross income.

"Planned gifts" include gifts of stock, bonds, property and other non-cash goods, and gifts through estate settlements, all of which can provide increased tax benefits.

Estate settlements, or *gifts by will*, are the most common form of planned gift. In this case, a bequest (or gift) of personal or real property is given to the Center through your will in one of three ways.

Specific bequests give a stated amount of money, piece of property, or percentage of your estate to the Wildflower Center. *Residuary bequests* give the Wildflower Center the remainder of your estate once all specific bequests have been satisfied. *Contingent bequests* name the Wildflower Center as beneficiary of your estate if you outlive one or more of your other beneficiaries.

Gifts by will can reduce your estate taxes, funeral costs, legal fees, and other related costs, depending on the type of bequest you choose.

Outright gifts of appreciated stock or securities are fully deductible at their current *fair market value* at the time the donation is made, and may help you avoid capital gains taxes. For example, the XYZ stock you purchased ten years ago

for \$1,000 now has a current fair market value of \$10,000. If you donate the stock to the Wildflower Center, you are allowed a tax deduction of \$10,000 and are not taxed on the \$9,000 gain.

Many other planned giving options exist for making your charitable contributions, including trusts, gift annuities, and life insurance policies.

It should be noted, however, that planned giving is a complex field. If you wish to make a gift of stock or securities, please have your stock broker contact the Wildflower Center Development Office to

ensure that the transfer provides you with the maximum return on your gift and is handled according to IRS regulations.

If you are interested in learning more about planned giving and how it can best suit your needs while benefitting your favorite non-profit organization, detailed information is available from your attorney, tax specialist, or the Wildflower Center's Development Office.

Margaret A. Johnson
Development Associate
National Wildflower Research Center

West-coast books give hours of enjoyment

California! The Golden West! The Pacific Northwest! The Western states bordering the Pacific Ocean have diverse climates, and terrains, as well as wildflowers and native plants...and a variety of natural beauty. As in the rest of the country, ecological challenges have underscored the importance of saving or reintroducing this region's native plants. The Center offers a selection of books on this vast region:

- *Complete Gardening Guide to the Native Perennials of California*. Glenn Keator. 500 species. More than 40 line drawings. Includes landscaping suggestions, methods of conserving water and preserving soil moisture. 228 pages. Paperback. \$14.95.

- *Gardening with Native Plants of the Pacific Northwest*. Arthur R. Kruckeberg. Well-organized, well-written guidebook for all who garden with Northwest natives. 264 pages. Paperback. \$24.95.

- *A Field Guide to Pacific States Wildflowers*. Edited by Roger Tory

Peterson. From British Columbia to Baja California, from the Rockies to the Pacific — 1,492 species described and illustrated. Paperback. \$14.95.

- *Shore Wildflowers of California, Oregon and Washington*. Philip A. Munz. 122 pages. Paperback. \$10.95.

- *Growing California Native Plants*. Marjorie G. Schmidt. How to identify, evaluate, propagate more than 350 California species: annuals, perennials, shrubs, trees. 366 pages. Paperback. \$9.95.

- *California Spring Wildflowers*. Philip A. Munz. From the base of the Sierra Nevada and Southern Mountains to the sea. 122 pages. Paperback. \$8.95.

- *California Desert Wildflowers*. Philip A. Munz. 122 pages. Paperback. \$8.95.

- *California Mountain Wildflowers*. Philip A. Munz. 122 pages. Paperback. \$8.95.

To order, please use the form below (or a photocopy). Please allow 10-15 business days for delivery.

Southwest landscaping publication available

In 1991, the Wildflower Center and the Desert Botanical Garden co-sponsored the conference "Landscaping with Wildflowers and Native Plants."

The conference's 24 papers have been collected into a 126-page special edition of *Wildflower Journal*. Copies can be obtained — while supplies last — for \$8 per copy, including postage and handling. Texas residents add \$0.31 sales tax.

Please send checks (made out to NWRC) to the address listed on the back page, attention: Proceedings.

Enjoy a warm winter with west-coast books

Use this form (or a copy!) to order any of the books above. Make check payable to NWRC and mail with form to: NWRC BOOK ORDERS, 2600 FM 973 NORTH, AUSTIN, TX 78725-4201. Or call (512) 929-3600, from 9 a.m. to 4 p.m. Central Time weekdays, for credit card orders only.

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PLEASE HELP US GROW!

Do you have friends, relatives, or neighbors you believe would like to join the National Wildflower Research Center?

If so, we're asking you to please take a moment to share their names and addresses with us. Adding new members is vitally important for support of our research and development work. We will send them information on the Center and how to join our growing wildflower family. Your cooperation in helping us GROW is most appreciated.

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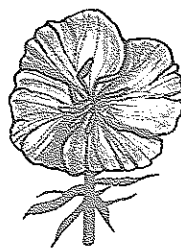
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Volume 9, Number 1 January/February 1992



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