



# NATIONAL WILDFLOWER RESEARCH CENTER

# wildflower

May/June 1995

Volume 12, Number 3

## EXPLORE THE BIG BEND WITH THE WILDFLOWER CENTER



Journey with the National Wildflower Research Center on a fun-filled, educational adventure into the heart of the pristine West Texas wilderness. Our journey takes us to the Big Bend area of the Rio Grande River, where breathtaking canyons, sweeping grasslands, and majestic vistas punctuate the harsh grandeur of the great Chihuahuan Desert. A naturalist guide will escort our group, and there will be many opportunities to discover the diverse and interesting plant life with regional specialists at selected preserves. Our itinerary also emphasizes the history, culture, and astronomy of the region with visits to old forts, enchanting ghost towns, and a mountaintop observatory. A highlight of our tour will be an all-day rafting trip down the spectacular Colorado Canyon. Our journey will conclude on the sandy shores of the Rio Grande with a Texas-style barbecue and margarita party complete with an authentic cowboy singer.

*Please join us for this very special trip!*

DATE: SEPTEMBER 12-17, 1995 COST: \$1,235 (DOUBLE OCCUPANCY)

SIZE LIMIT: 36 PARTICIPANTS

### ITINERARY

**Day 1:** We'll meet at the El Paso airport where we will be greeted by our tour director and National Wildflower Research Center representative for the 3:00 p.m. transfer by private tour bus to historic Fort Davis. We'll relax with fellow tour members at dinner along the way and check into the Hotel Limpia, an impeccably restored turn-of-the-century building in the heart of the spectacular Davis Mountains. (D)

**Day 2:** After breakfast and an orientation with our naturalist guide, we'll tour the ruins of Fort Davis, regarded by many historians as the most important example of a Southwestern frontier military post. This evening, a festive welcome dinner will be held at the Hotel Limpia and from there we will proceed to the McDonald Observatory to attend a private Star-Gazing Party. (B,L,D)

**Day 3:** Today we'll explore the spectacular Big Bend. We will visit the Barton Warnock Environmental Education Center and, by special arrangement, the Center's naturalist will meet with us for a private lecture about the area plant life. We'll continue to the ghost town of Terlingua for a sunset stroll and dinner at the historic Starlight Cafe. Our accommodations for the next three nights will be at the Lajitas Badlands Hotel located on the Rio Grande River banks. (B,L,D)

**Day 4:** The entire day will be spent exploring the natural wonders of Big Bend National Park. Our guide's superb knowledge of the native plants and geology will greatly enhance today's tour through the park's incredible terrain and delicate ecosystems. We'll enjoy a leisurely picnic surrounded by desert wildflowers and cacti. Dinner will be at the Terlingua Cafe. (B,L,D)

**Day 5:** Our exploration of the Big Bend wilderness continues with an all-day rafting trip down the Colorado Canyon. Its broad, sandy beaches and breathtaking vistas make it one of the most pleasurable experiences in the park. We'll be greeted on the river bank with ice cold margaritas and a Texas-style barbecue, complete with a cowboy singer. (B,L,D)

**Day 6:** This morning we say goodbye to the spectacular Big Bend country and head for El Paso and home. (B)

**Reservation Form  
on Page 6**

**HOW TO MAKE RESERVATIONS:** Reservations are accepted on a first come, first served basis and space is limited to 36 participants. A \$400 deposit will confirm your reservation. Please mail and make check payable to: **Far Horizons Archaeological and Cultural Trips, Inc.**, P.O. Box 91900, Albuquerque, NM 87119-1900. **Final payment is due 7/14/95.**

**CANCELLATIONS AND REFUNDS:** Cancellations received in writing at least 60 days prior to departure will result in a fee of \$150. Cancellations received less than 60 days prior to departure will not receive a refund. If you are unable to complete the trip, Far Horizons will not reimburse any fees. **We strongly recommend travel/cancellation insurance.**

For more information, call Rene Hamilton at Far Horizons, (800) 552-4575, or Flo Oxley at the Wildflower Center, (512) 292-4200 ext. 116.

# How the Growing is Going

Since last fall, greenhouse volunteers and staff have propagated more than 75,000 plants representing 85 species of wildflowers (annuals and perennials) and grasses. Various propagation techniques were used, including growing plugs from seeds, taking leaf cuttings, and dividing plants from the original Wildflower Center site. Many of these species are not commercially available; thousands of dollars were saved by growing these plants at the Center.

The majority were planted in the Wildflower Meadow behind the Visitors Gallery, in the scar left by the installation of the utilities, and in the Seed Court gardens. We should see a wonderful bloom of annuals this year,

while the perennials will take longer to establish because of the energy they expend the first year developing extensive root systems.

Note! These tens of thousands of seedlings did not plant themselves. An incredibly dedicated corps of volunteers helped the Center horticultural staff install each seedling by hand. The results of this tedious task will be evident next spring, when these annual and perennial species fill the Wildflower Center grounds with bands of flowing color.

Center volunteers and staff have learned a great deal this past year, with most of this learning taking place in one of the best classrooms in North America: the gardens and grounds of

the Wildflower Center. While most of the 75,000 seedlings are in the fertile ground of the Wildflower Center, the knowledge gained through this experience has also been planted in another fertile medium — the collective expertise of our volunteers and staff. Overall, the Center is definitely growing in the right direction.



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

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

Founder  
**Lady Bird Johnson**

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

Editor  
**Joshua C. Blumenfeld**

Designer  
**Elaine Brown**

Copy Editors  
**Joseph Hammer, F. M. Oxley**

Contributing Authors  
**Marcia Hermann, Kym Tsai**

Illustrations  
**Ann Ducote, Michael Wall**

*Wildflower* (ISSN 0898-8803). Published bi-monthly. A portion of your \$25 membership dues pays for your annual subscription to *Wildflower*, National Wildflower Research Center, 4801 La Crosse Ave., Austin, TX 78739. Phone: (512) 292-4200. Material may be reprinted only with permission of the editor. Second class postage paid at Austin, TX.

POSTMASTER: Send address changes to: *Wildflower*, NWRC, 4801 La Crosse Ave., Austin, TX 78739. (512) 292-4200.

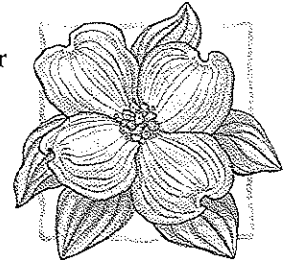
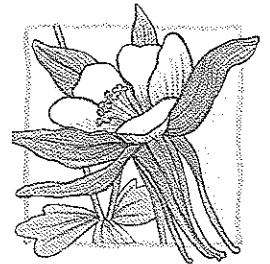
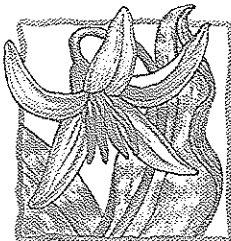
© 1995

Printed on recycled paper.

## Your Wildflower Center Membership Card:

### Don't Leave Home Without It!

Wildflower Center membership includes many valuable benefits: free admission to the gardens and grounds of the new Center, the newsletter, discounts on Clearinghouse and gift store products, and advance notice of classes, programs, and conferences. One benefit that is often overlooked is the reciprocal benefits privilege at more than 100 botanical gardens and arboreta across North America (and in Israel, if your travels take you that far). This reciprocity usually entitles a Wildflower Center member to free admission, and many participating organizations also give parking and gift store discounts.



A list of all the reciprocal gardens and arboreta is included in your Wildflower Center membership packet; however, if you have misplaced this or if you have been a member for a few years, an updated list is available through the Wildflower Center Membership Office, (512) 292-4200, or through the American Horticultural Society, (800) 777-7931. Special restrictions may apply at certain times of the year, so be sure to call the participating garden or arboretum before you visit. Also, carry your Wildflower Center membership card — this is your entry ticket.

From Honolulu, Hawaii, to St. Croix, U.S. Virgin Islands, some benefits of Wildflower Center membership are just around the corner.

# The Secret Life of Deserts

Angela Barton

Clearinghouse Coordinator/Resource Botanist

What would you think if asked to describe a desert? For many of us, visions of *Lawrence of Arabia* probably come to mind complete with images of blowing sands, statuesque cacti, and an unfortunate soul crawling on hands and knees in search of water.

Although barren areas do exist, they represent only a portion of the entire desert habitat. Found within its boundaries may be grasslands, temporary lakes, and even snow. A wide variety of life thrives in deserts, each adapting to survive the arid environment.

Three major factors define a desert: geographic location, precipitation and evaporation, and soil type.

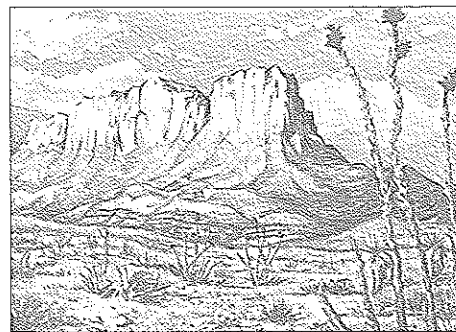
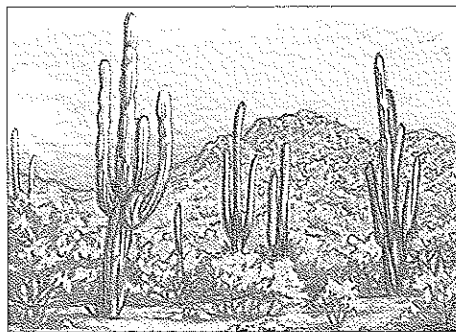
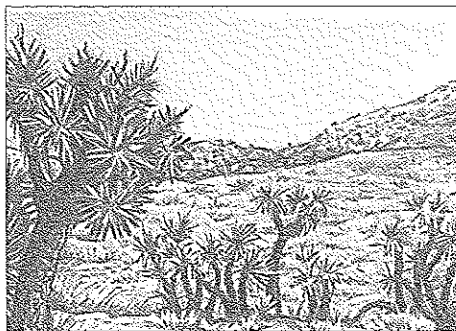
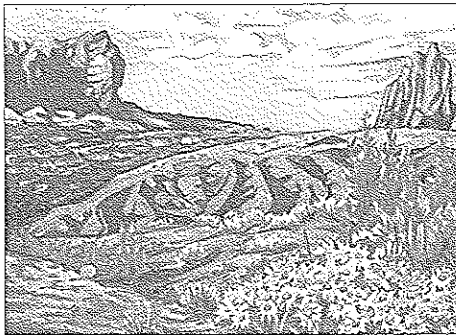
Geographically, most deserts are located between 35 degrees north and 35 degrees south latitude — a band where permanent high atmospheric pressure excludes most storm systems and clouds. With no clouds to block the sun's rays, heat builds up during the day and escapes back into the atmosphere at night, causing cold temperatures after sunset.

Mountain ranges are also involved in desert development. In North America, precipitation from the west is forced to rise over the mountains. This air cools as it rises until it cannot hold moisture any longer. Rains occur along the windward side of the mountain, emptying the air of moisture. Dry air continues over the mountaintop and down the leeward side. With no moisture, the leeward side remains dry and a *rainshadow* develops.

Two types of deserts are formed as a result of geographic location: cold and hot deserts. A cold desert occurs in northern regions, has low annual temperatures, and receives more than half its annual precipitation in the form of snow. A North American example is the Great Basin Desert.

Hot deserts, such as the North American Mojave, Sonoran, and Chihuahuan Deserts, receive precipitation in the form of rain during summer, winter, or both times of the year. Winter rains tend to be low intensity, cover large areas, and continue for long periods of time, whereas summer rains are short, intense bursts covering smaller areas.

However, the amount of precipitation is only part of the equation. Evaporation, caused by high winds and temperatures, is



also a major consideration in arid regions. A desert typically receives 25 cm (10 in) of rain or less a year while evaporation removes 25 cm (10 in) or more, producing

*continued on page 5*

## NORTH AMERICAN DESERTS

Four desert regions are located between the Rocky Mountains and the Sierra Nevadas.

**GREAT BASIN DESERT** **Location:** Nevada and parts of Utah, Oregon, and Idaho **Type:** Cold desert; winter rainy season **Dominant Vegetation:** Small to medium-sized shrubs such as sagebrush (*Artemisia* spp.) and saltbush (*Atriplex* spp.). Grasses, such as bottlebrush squirreltail (*Sitanion hystrix*) and wildrye (*Elymus cinereus*), dominate cool, moist areas in the north. Wildflower species include sego lilies (*Calochortus* spp.), paintbrushes (*Castilleja* spp.), and lupines (*Lupinus* spp.).

**MOJAVE DESERT** **Location:** Southern Nevada and southeastern California **Type:** Hot desert; winter rainy season. The Mojave Desert is known for the lowest elevation in the United States (85.5 m (282 ft) below sea level) and the highest temperatures (up to 88°C (190°F)). Annual rainfall averages less than 15 cm (6 in). **Dominant Vegetation:** The Joshua tree (*Yucca brevifolia*) is the symbol of this desert. The creosote bush (*Larrea tridentata*) can dominate up to 70 percent of the land surface.

**SONORAN DESERT** **Location:** Northern Mexico, southern California and Arizona **Type:** Subtropical desert; winter and summer rainy seasons. **Dominant Vegetation:** Two of the seven Sonoran Desert subdivisions fall within the United States. The Lower Colorado River Valley is the largest of these two and home to creosote bush (*Larrea tridentata*), white bur sage (*Ambrosia dumosa*), and indigo bush (*Psoralea schottii*).

The second subdivision, the Arizona Upland Division, forms the eastern edge of the desert in Arizona. Cacti, including the Sonoran trademark saguaro (*Carnegiea gigantea*), are abundant in this area. Other plants include jumping cholla (*Opuntia fulgida*), the night blooming cereus (*Cereus greggii*), and fairy dusters (*Calliandra eriophylla*).

**CHIHUAHUAN DESERT** **Location:** Northern Mexico, southern New Mexico, and the Trans-Pecos region of west Texas **Type:** Hot desert; summer rainy season. **Dominant Vegetation:** Common lowland plants include creosote bush (*Larrea tridentata*) and tarbush (*Flourensia cernua*). Cacti are abundant, with more than 65 species known in the Texas region and more than 130 species found in the Mexican region. Desert marigold (*Baileya multiradiata*), and desert zinnia (*Zinnia acerosa*) are also common.

# Wildflower

## NOTEBOOK



W.D. Bransford.

**Botanical Name:** *Calochortus nuttallii*

**Pronunciation:** Ka-lo-KOR-tus  
nut-TAL-ee-eye

**Common Name:** Sego lily

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

**Range:** Across Utah and western Colorado to northern Arizona and northwestern New Mexico

**Habitat:** Dry soil on plains

**Bloom Period:** May through July

flowers are 2.5-5 cm (1-2 in) wide and range in color from white to lavender. At the base of each petal are dark spots (glands) sometimes covered with delicate hairs.

This western lily prefers sandy, dry soil and is found on plains, among sagebrush, and in pinyon-juniper and other open pine forests of arid regions. Scarce in developed areas, the sego lily is still common in protected lands, threatened only by "enthusiastic wildflower collectors or an occasional hungry cow."

The sego lily is one of the most beautiful flowers in the Great Basin Desert. Erect, 15-45 cm (6-18 in) unbranched stems are surrounded by narrow leaves 5-10 cm (2-4 in) long. The three petaled

The bulb is quite tasty, and can be eaten cooked, raw, or ground into a meal. During the Utah famine of 1848-49, pioneers survived on the bulbs and honored the plant by making it the state flower of Utah.

**Botanical Name:** *Baileya multiradiata*

**Pronunciation:** BAY-lee-ya mul-tih-ray-dee-AH-tah

**Common Name:** Desert marigold, paper-daisy

**Family Name:** Asteraceae  
(Sunflower Family)

**Range:** Southeastern California to southern Utah, western Texas to northern Mexico

**Habitat:** Sandy desert soils

**Bloom Period:** March through October; can be year round

This southern beauty often borders hundreds of miles of dusty roadsides, creating solid bands of brilliant yellow. Depending on weather conditions, *Baileya multiradiata* is either a sprawling annual or weak perennial herb averaging approximately 30-38 cm (12-15 in) tall. The stems have a soft, wooly,

gray-green coat and are sparsely leaved along the lower half. The solitary golden flower heads have numerous, 3-toothed ray flowers circling lemon-colored disk flowers. The desert marigold forms a dense golden orb of crowded flowerheads.

Once the seeds have set, the ray flowers remain on the stems, becoming dry and papery, giving rise to its other common name: paper-daisy. The tissue paper flowers are temporary; the plant soon blooms again.

The name marigold, attributed to several species of the sunflower family, is reported to be a tribute to the Virgin Mary because the flowers are known as "Mary's Gold."



Patsy Chaney. Inset: Norman Flaigg.



# The Power of TEAMWORK

David K. Northington, Ph.D.  
Executive Director

The power of a good team is often overlooked. When you visit the Wildflower Center, the gardens and buildings may appear to have existed for decades. It is difficult to believe that this 42-acre site was once heavily degraded ranch land. The transformation of this site into the Wildflower Center's new home is the result of a great team effort, an effort which fully incorporated the Wildflower Center's mission of native plant preservation and reestablishment and made maximum use of environmentally conscious construction techniques.

The talented members of the Wildflower Center design and construction team brought a wide range of expertise with them. Ecological site planner Darrel Morrison supervised the initial site inventory and placement of the buildings to keep disturbance to a minimum while landscape architects J. Robert Anderson and Eleanor McKinney oversaw the installation of the acres of gardens. The architectural firm of Overland Partners and the construction firm of Bartlett Cocke/Austin Commercial, J. V., were responsible for building design and construction, and were given the mission of creating structures that were ecologically sensitive as well as cost effective — a difficult task that was accomplished admirably. These individuals and firms worked closely with Wildflower Center staff to ensure that the design and construction supported the mission of the Center by being sensitive to the land.

After five years, the result is a complex of buildings that appear as natural as the land on which they are situated and that were constructed without harming the biodiversity of the site. This objective required a great deal of preplanning, cooperation, and flexibility. However, as you will see when you visit the Center, the ends are a wonderful justification of the means.

That's the power of a good team.

## Life of Deserts

from page 3

a very dry environment. Desert soils, the third defining factor, are not always sand. In semiarid or arid areas, characteristic soils are called *aridisols*. These soils have an upper surface layer with very little organic matter, while lower layers are composed of clay, salts, and very fine materials made of gypsum or calcium deposits. These layers are cemented together to form *hardpans*, which restrict water permeation and plant establishment. Calcium hardpans, known as *caliche*, are typical of many desert regions.

For vegetation to survive in a desert, it must be adapted to dry conditions. There are three basic categories of arid region plants: succulents, low-growing shrubs, and desert annuals.

Succulents store water in thickened stems or leaves. Most cacti are stem succulents, and have either jointed pads, such as *Opuntia* spp., or single, thickened stems, such as barrel cacti. Leaf succulents, such as *Agave* spp. and *Yucca* spp., store water in thick, waxy leaves which have serrated edges to protect against evaporation and herbivores. Sharp spines, which are simply modified leaves, are common among succulents.

Typically small to reduce surface area and prevent evaporation and light colored to reflect sunlight, these spines also provide protection against herbivores.

Desert shrubs are usually low-growing, with small leaves, sharp branches, and spines. Water is conserved in woody stems and evaporation is reduced by small leaf surfaces. To protect against predators, many shrubs, such as creosote bush and tarbush, produce foul-tasting compounds.

Desert annuals, also called *ephemerals*, have developed heat and drought resistant seeds. With sufficient precipitation, water washes off chemicals produced by the seeds which prohibit germination. The seeds must then germinate, mature, flower, reproduce, and set seed before the water supply is gone, usually from several days to a few weeks.

While deserts are created by the same variables of geography, precipitation, evaporation, and soils, they all have their own unique character. Within these arid regions live a variety of plants and animals, each adapted to their particular habitats. In other words, don't believe everything you see in the movies.

## F I E L D

### Northeast

**Brooklyn, NY:** *Native Plants: Toward a 21st-Century Garden*, June 1, **Contact:** Brooklyn Botanic Garden, 1000 Washington Ave., Brooklyn, NY 11225, (718) 622-4433.

### Mid-Atlantic

**Washington Crossing, PA:** *Growing Native Plants: Propagation From Cuttings*, July 8, **Contact:** Bowman's Hill Wildflower Preserve Association, P.O. Box 103, Washington Crossing, PA 18977, (215) 862-2924.

### Southeast

**Athens, GA:** *Butterfly Gardening*, June 8, **Contact:** The State Botanical Garden of Georgia, 2450 S. Milledge Ave., Athens, GA 30605-1624, (706) 542-1244.

**Cullowhee, NC:** *Landscaping With Native Plants*, July 18-22, **Contact:** 440 H.F. Robinson Bldg., Western Carolina University, Cullowhee, NC 28723, (704) 227-7397.

### Oklahoma/Texas

**Austin, TX:** *Designed Gardens as Plant Communities*, June 2-4, **Contact:** New Directions in the American Landscape, 804 Bethlehem Pike, Erdenheim, PA 19038, (800) 274-3478.

**Denton, TX:** *Ecological Restoration in Texas*, August 19-20, **Contact:** Environmental Restoration Conference, Institute of Applied Sciences, P.O. Box 13078-UNT, Denton, TX 76203, (817) 565-2694.

### Southwest

**Albuquerque, NM:** *Operation Wildflower Workshop*, May 24-25, **Contact:** Albuquerque Garden Center, 10120 Lomas Blvd., N.E., Albuquerque, NM 87112, (505) 296-6020.

### Rocky Mountains

**Salt Lake City, UT:** *5th International Rangeland Congress: Rangelands in a Sustainable Biosphere*, July 23-28, **Contact:** General Secretary, 5th IRC, P.O. Box 11637, Salt Lake City, UT 84147, (801) 524-5054.

## Reservation Form — Big Bend Trip

**SIGN ME UP FOR ADVENTURE!** Return this completed form with your deposit (\$400 per person) payable to **Far Horizons** to: Far Horizons Archaeological and Cultural Trips, Inc., P.O. Box 91900, Albuquerque, NM 87199-1900.

Name \_\_\_\_\_

Address \_\_\_\_\_

City/State \_\_\_\_\_ ZIP \_\_\_\_\_

Phone (Day) \_\_\_\_\_ (Evening) \_\_\_\_\_

Amount Enclosed \$ \_\_\_\_\_ Check/Money Order (Payable to **Far Horizons**)

MC/VISA # \_\_\_\_\_ Exp. \_\_\_\_\_

### YOUR TOUR INCLUDES:

- ❖ Roundtrip transportation by private motorcoach from El Paso to El Paso
- ❖ All accommodations and taxes
- ❖ All meals: 5 breakfasts, 4 lunches, 5 dinners
- ❖ Baggage handling and gratuities for one piece of luggage
- ❖ Star-Gazing Party at the McDonald Observatory
- ❖ Tour of the Barton Warnock Environmental Education Center
- ❖ Tour of Big Bend National Park
- ❖ Tour of historic Fort Davis
- ❖ All-day river rafting tour with Texas-style barbecue, margarita party, and cowboy singer
- ❖ Services of a professional Tour Director

## *The Benefits Keep Growing: 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 new gardens and grounds
- ❖ The bi-monthly 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
- ❖ Membership card

**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:

Name: \_\_\_\_\_

Address: \_\_\_\_\_

City/State/ZIP: \_\_\_\_\_

Phone: \_\_\_\_\_

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

Donor Name: \_\_\_\_\_

Address: \_\_\_\_\_

City/State/ZIP: \_\_\_\_\_

Phone: \_\_\_\_\_

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

12/3



NATIONAL WILDFLOWER RESEARCH CENTER  
 4801 LA CROSSE AVENUE, AUSTIN, TEXAS 78739

Second Class  
 Postage Paid at  
 Austin, Texas

- ❖ Big Bend Trip, page 1
- ❖ Reciprocal Benefits, page 2
- ❖ The Secret Life of Deserts, page 3

\*\*\*\*\*CAR-RT-SORT\*\*C-064

MS. CATHY NORDSTORM  
 6311 MAURY HOLW  
 AUSTIN TX 78750-8257

## *Wildflowers Work!*

Volume 12, Number 3 May/June 1995



Printed on recycled paper.