



The official newspaper
of Big Bend National Park &
Rio Grande Wild & Scenic River
Volume 24, No. 2 Spring 2003

G. Fox

Prickly pear cactus in bloom

Desert Beauty

Welcome to Big Bend National Park and the Rio Grande Wild & Scenic River! Big Bend is one of the largest and least visited of America's national parks. Over 800,000 acres await your exploration and enjoyment. From an elevation of less than 2,000 feet along the Rio Grande to nearly 8,000 feet in the Chisos Mountains, Big Bend includes massive canyons, vast desert expanses, and the entire Chisos Mountain range. Here, you can explore one of the last remaining wild corners of the United States, and experience unmatched sights, sounds, and solitude.

Visitors are often surprised to learn that Big Bend is world renowned as a botanical wonderland. Well over 1,200 species of plants thrive here. To understand why, think about the park's location. Situated more or less in the center of the North American continent, Big Bend is the meeting place where plants from the Rocky Mountains, the Chihuahuan Desert, the Mexican Plateau, and the Sierra Madre converge.

You must also think vertically, since Big Bend is hardly a flat place. From the top of the Chisos Mountains at 7,800' to the banks of the meandering Rio Grande at 1,800', you will find over a vertical mile of elevational relief. High ridges coax moisture from passing clouds. The result is the relatively cool and moist "sky island" of the Chisos that supports forests and woodlands surrounded by hot, desert lowlands. Remember also, that a river runs through it. The Rio Grande floodplain provides a ribbon of lush riparian vegetation that stands in vivid contrast to the stark desert that begins only a few yards from its muddy banks.



In this issue of the *Big Bend Paisano*, we explore the rich tapestry of Big Bend's plant life. In these pages you'll become familiar with common plants, blossoms, and habitats. You'll also discover how park staff are battling the disruptive effects of exotic plants, and human impacts to assure the diverse future of this botanical wonderland.

7 Desert Plants



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8 Touring Guide



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9 Big Bend Trails



R. Leisure

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IN CASE OF EMERGENCY

Park Rangers are available to provide assistance. Dial 911 or (432) 477-2251

Phones are located at:
visitor centers,
campgrounds,
Camper Stores, and the
Chisos Mountains Lodge.





The Paisano, Spanish for roadrunner, is published by the National Park Service and the Big Bend National History Association for the orientation and education of visitors to Big Bend National Park.

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The National Park Service was established on August 25, 1916. . . "to conserve the scenery and the natural and historic objects and the wild-life. . . and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations." As conservation educators, the Division of Interpretation provides guided walks, talks, evening slide programs, workshops, and other educational activities as well as written materials such as this newspaper.



The Big Bend Natural History Association, established in 1956 as a private, non-profit organization, champions the mission of the National Park Service in facilitating popular interpretation of the scenic, scientific, and historic values of Big Bend and encourages research related to those values. The Association conducts seminars and publishes, prints, or otherwise provides books, maps, and interpretive materials on the Big Bend region. Proceeds fund exhibits, films, interpretive programs, seminars, museum activities, and research.

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Superintendent's Welcome

Welcome

Welcome to Big Bend National Park and the Rio Grande Wild and Scenic River, two unique areas of the U.S. National Park System in the state of Texas. At over 800,000 acres, Big Bend National Park encompasses the largest protected area of the Chihuahuan Desert in the United States. The Chihuahuan Desert is the largest on the North American continent, extending from Old Mexico to New Mexico. The Rio Grande is the major lifeline in this desert and for 1,250 miles along the southern boundary of Texas, it forms the international boundary between the United States and Mexico. One hundred ninety-six miles of this section of the Rio Grande have been designated as the Rio Grande Wild & Scenic River.

Of the many wonders of this desert park, the one most appreciated each spring is the incredible diversity of plant life. Some wildflower years are better than others, and several late -winter rains have set the stage for a promising bloom outlook this year. While enjoying the myriad of colors, shapes, and life strategies of these hardy plants, try to appreciate the fact that anything can grow here at all. In this edition we focus on this rich diversity of plants, the factors that determine what can grow and where, and spotlight on some of the resource challenges we face daily in preserving this fragile botanical wonderland for park visitors of today and tomorrow.

Experience your America!

Frank J. Deckert
Frank J. Deckert, Superintendent

Bienvenidos

Bienvenidos al Parque Nacional Big Bend y el Silvestre y Escénico Río Grande, dos áreas únicas del sistema estadounidense de parques nacionales dentro del estado de Texas. Con un tamaño de más de 800,000 acres, el Parque Nacional Big Bend encuadra el área protegida más grande del desierto Chihuahuense dentro de los Estados Unidos. El desierto Chihuahuense es el más grande de Norte América, extendiendo de México a Nuevo México. El Río Grande es la fuente de vida de este desierto, y sobre 1250 millas sirve como la frontera internacional entre los Estados Unidos y México. Ciento noventa y seis millas de este río son designados el Silvestre y Escénico Río Grande.

De las muchas maravillas de este parque desértico aquella mas conocida es la tremenda diversidad de flora durante de la primavera. Algunos años son mejores que otros con respecto a las flores silvestres y este año ya cuenta con buenas lluvias invernales

que pudieran prometer un florecimiento muy bueno. Mientras que se le goce de la multitud de colores, formas y estrategias de estas plantas robustas, hay que dar en cuenta que es una sorpresa que cualquiera planta pueda sobrevivir aquí. Con este numero enfocamos en esta tremenda diversidad de plantas, los factores que determinan a donde y cuando se les puedan crecer, y algunos de los retos que enfrentamos diariamente para preservar esta frágil maravilla botánica para los visitantes de hoy y mañana.

¡Conoce su América!

Frank J. Deckert
Frank J. Deckert, Superintendente

Volunteer Honor Roll



Each year, volunteers contribute thousands of hours to the National Park Service. A vital supplement to paid staff, volunteers bring special skills, dedication, and fresh approaches to our work in interpretation, visitor protection, maintenance, administration, and resource management.

Join us in thanking the following individuals and organizations who have recently donated 100 or more hours in volunteer service to Big Bend:

- | | | |
|-------------------------|----------------------|---------------------|
| Barbara & Bill Baldwin | Ginny & Jim Herrick | Steve McAllister |
| Norma & Lloyd Burgi | Fran & Bernie Heyman | Dana & Les Over |
| Suzanne Cable | Whit Hibbard | Casey Parks |
| Linda & Steve Dettinger | Carol L Hines | Becky Reiger |
| Erv & Sam Drabek | Carol & Bob Huber | Camilla Rondina |
| Jennifer Dyer | Katrina Jensen | Samantha Schroeder |
| Barbara & Richard Engle | Gail & John Kamaras | Adessa Schwartz |
| Bud Frankenberger | Mark Kirtley | Jessica Sherwood |
| Kay & Richard Gordon | Joan & Jack Lamkin | Wayne Strelvel |
| Steve Harper | Maria Lavender | Bob & Scarlett Wirt |



Did You Know...

Park animals are wild. Do not feed or approach any of Big Bend's wild-life. Enjoy animals at a safe distance and allow them to find their own natural sources of food.

Do not remove any natural objects from the park, including rocks, cactus, reptiles, and fossils. Collecting specimens of any kind or defacing park features deprives other visitors. Leave everything as you found it for others to enjoy. If you must collect something, pick up litter!

All bicycles, including mountain bikes, must remain on paved or unpaved roads. They are not allowed on hiking trails or off-road.

Motor vehicles must be licensed and street-legal. All motor vehicles must stay on established roadways open to public travel. Vehicles are not permitted off-road.

It's Up to You...

National parks have been described as the crown jewels of the United States. While enjoying the beauty of Big Bend National Park, please remember that few other nations have parks that can compare to those of the United States. They are something to be proud of. They are something to preserve.

Over 300,000 people come to experience Big Bend's deserts, mountains, and canyons each year. The protection of Big Bend National Park is ultimately in the hands of the people who visit it. Your cooperation with park rules is one way to help ensure the park's survival.

Please, treat **your** park with care.



Happy Volunteers staying afloat in Mariscal Canyon



J. Willis

The Big Bend Natural History Association is a non-profit organization established to support the park's educational and scientific programs. BBNHA also publishes and distributes books, maps, guides, newspapers and other materials designed to enhance visitors' enjoyment and understanding of Big Bend National Park.

After two planning sessions with a professional facilitator, Big Bend Natural History Association has come up with ambitious plans for the next few years. On the top of our list is an effort to enlarge and modernize the existing visitor center at Panther Junction in partnership with the National Park Service and the Friends of Big Bend National Park. Though still in the planning stages, the project has momentum and may come to fruition in the next few years. BBNHA also recently purchased ten acres of land in Study Butte, and we are planning to build housing for our employees on

it. We have held talks with both the National Park Service and the Big Bend concessionaire, Forever Resorts, to see if we could do a joint project that would supply much-needed housing for all three on that tract. Stayed tuned for more exciting developments as these project develop, and, as always, your financial support is welcomed and appreciated

Mike Boren
Mike Boren, Executive Director

Seminars

Discover desert birds, blooms, bats, and big cats with our Natural History Seminars Program. Now in its 15th year, the immensely popular program sponsored by BBNHA continues to grow and improve.

Spring 2003 Seminar Schedule

April 5	Wildflowers #1
<i>John Mac Carpenter</i>	
April 6	Wildflowers #2
<i>John Mac Carpenter</i>	
April 12	Cactus & Succulents
<i>Jim Weedon</i>	
April 13	Big Cats
<i>Robert Guzman</i>	
April 26	Reptiles!
<i>Alan Tennant</i>	
May 2-4	Birds of Big Bend
<i>Mark Adams</i>	
May 10-11	Birding in Big Bend
<i>Kelly Bryan</i>	
May 17	Bats
<i>Meg Goodman</i>	
July 4-6	Butterflies
<i>Roland Wauer</i>	

Average cost for a seminar is \$50 per day with most seminars running 1-2 days. Class size is limited to 15 participants to ensure individualized instruction. Seminar participants may also take advantage of free camping in one of Big Bend's group campgrounds.

To register for a seminar or to receive a complete catalog, contact us at PO Box 196, Big Bend National Park, TX, 79834 or call 432-477-2236. You may also e-mail us at bibe_bbnha@nps.gov



BBNHA Birding Seminar

Featured Publications

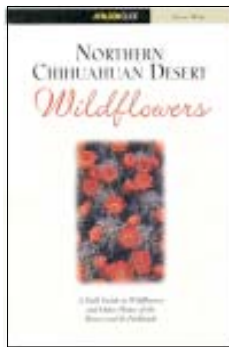
Have a hunger for the desert? Take a bite out of our great selection of books and publications. Our bookstores offer a wealth of books, maps, checklists, and field guides carefully selected to help you enjoy your visit to Big Bend National Park.

Stop by any visitor center, or order these online at www.bigbendbookstore.org



Northern Chihuahuan Desert Wildflowers

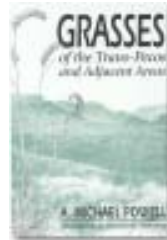
Probably the best available book on Big Bend flowering plants, this Falcon Guide by Steve West is an indispensable field guide for this part of the Chihuahuan Desert. Concise and pithy descriptions and range information accompany one or two well-composed photos of each plant per page. There are more than 270 of these color photos with descriptions of 261 species. \$24.95



Land of Contrasts

New Big Bend National Park Video!

A brand new video about Big Bend, the first in almost 15 years, is now available. With stunning photography and insights from park rangers, renowned filmmaker Carl Crum distills the essence of the park experience. See mountain vistas, river journeys, wildlife and cactus in bloom. A must-have for Big Bend lovers. 38 minutes. \$19.95



Grasses of the Trans-Pecos

Most of Big Bend is a grassland, though a dry one. Grasses have always been important to wildlife, and ranchers' livestock and livelihood. Dr. Michael Powell's authoritative volume presents 268 species with botanical descriptions, keys, and drawings for identification. A worthy companion to his *Trees and Shrubs of the Trans-Pecos*. A handy reference for visitors and botanists alike. \$27.95

Legends & Lore of Texas Wildflowers

Native Americans treated rheumatism with paintbrush tea. Violets have been used to treat cancer, and buttercups are said to work on leprosy, plague, and insanity. And then, of course, there is the tale of the little Native American girl whose unselfish gift appeased the Great Spirit and covered the land with bluebonnets. A rare combination of science and storytelling. \$16.95

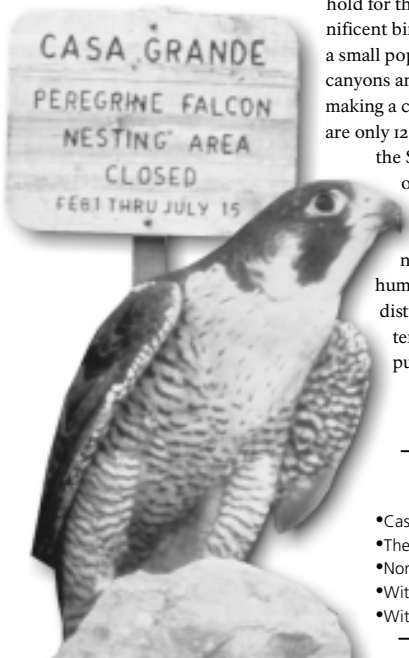


Medicinal Plants of the Desert & Canyon West



The American Southwest is a rich source of medicinal plants and knowledge about their uses. Indian, Mexican, and European peoples all have their traditions of herbal remedies using what the land provides. Michael Moore's volumes on herbal remedies draw on his extensive background and present a learned, practical, highly readable, and always fascinating guide to the preparation and use of medicinal plants. \$13.95.

Quiet Time for Falcons



Big Bend National Park has always been a stronghold for the peregrine falcon. While these magnificent birds of prey were once facing extinction, a small population lingered among the remote canyons and mountains of Big Bend. Although making a comeback in many areas, in Texas there are only 12 nesting pairs, and the birds remain on the State's endangered species list. Last year, only six young fledged from park nests.

Falcons are known to abandon active nests at even the smallest amounts of human disturbance. To ensure quiet and disturbance-free nesting, the park has temporarily closed certain areas to all public entry. Help us protect your falcons!

Falcon Nesting Zones February 1 - July 15

The following areas are closed to all entry:

- Casa Grande above 6,600'
- The Southeast Rim Trail
- Northeast Rim Trail to campsite NE-4
- Within 1/4 mile of the Santa Elena Canyon Rim
- Within 1/4 mile of the Mariscal Canyon Rim

Park Increases Fees

In February, Big Bend National Park increased both entrance and user fees. Private vehicle entrance fees increased to \$15 per week, campground fees increased to \$10.00 per site per night and group campground fees increased to \$3.00 per person per night.

The park entrance fee was last increased in 1997 when the price changed from \$5.00 to \$10.00. Park camping fees were last increased in 1998 from \$7.00 to \$8.00. In order to change camping and entrance fees, national parks must perform comparability studies to determine fair and comparable rates to be administered at parks. Big Bend National Park conducted a comparability study of parks and campgrounds across the state of Texas in October 2002. Approval of the study was granted by both the National Park Service Regional Office in Denver and in Washington, DC, in January of this year.

Upcoming Projects:

- Reconstruct Rio Grande Village Nature Trail Boardwalk
- Construct vault toilet at Hot Springs
- Rehab. Persimmon Gap Visitor Center
- Rehab. comfort station at Castolon

Big Bend National Park participates in the National Park Service Recreation Fee Demonstration Program. Eighty percent of the fee revenue collected returns to the park and is used to fund backlogged maintenance projects that provide direct benefit to park visitors.

Past fee demonstration projects include the renovation of restrooms for accessibility in the Chisos Basin and Rio Grande Village campgrounds and the rehabilitation of the Chisos Basin and Cottonwood amphitheaters.

Superintendent Frank Deckert stated "We are aware that any increase in

fees is most often met initially with some dismay. The fact that eighty percent of the money comes back to fund worthwhile projects, things that might otherwise go by the wayside, justifies the increase and helps us to better serve our visitors."



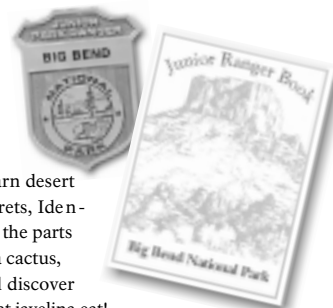
Border Crossings Remain Closed

A reminder that entering the U.S. at other than an authorized border crossing point is illegal. There are NO authorized crossings in Big Bend NP. Crossing at Boquillas, Santa Elena, or other locations along the Rio Grande is prohibited. The closest legal ports of entry are at Del Rio and Presidio, Texas.

The U.S. Attorney's Office has indicated that it will prosecute any criminal violations regarding these illegal crossings. If you re-enter the United States at any point within Big Bend National Park, you may be liable for a fine of not more than \$5,000 or imprisonment for up to one year, or both.

Please consult Park Rangers for the latest updates on this situation.

WANTED: Junior Rangers!



Learn desert secrets, identify the parts of a cactus, and discover what javelina eat!

The Big Bend Junior Ranger program is designed for kids of all ages. Through activities, games, and puzzles, kids can have fun as they

learn about the park. They can also earn stickers, badges, patches, and an official Junior Ranger certificate.

The Junior Ranger Activity Book costs \$1.00 and is available at any park visitor center.

Big Bend Live!

Magnificent sunsets, fiery sunrises, and the continuously changing play of light on the Deadhorse Mountains are now visible from your home computer! Log onto the official Big Bend National Park Website and you can see what park employees get to see everyday...the view looking southeast from park headquarters, updated every 15 minutes.

View the Sierra del Carmen and the Basin Window...

LIVE!

Although great for bringing Big Bend's scenery into your home, the purpose of this webcam goes beyond providing just pretty pictures. There are great concerns over Big Bend's deteriorating air quality. This webcam is one of many instruments now continuously monitoring visibility in the park. Site visitors can now access real-time readings on visibility, ozone levels, and even archived images of each day.

Click over to www.nps.gov/bibe and check it out!

Soon, website visitors will also be able to enjoy a continuously updating view through the Chisos Basin Window!

Surf Big Bend

Official N.P.S. Website



- Live Web-cam
- Daily Weather
- River Levels
- Campgrounds Research
- Backcountry Park Maps
- Press Releases
- Road Conditions
- Ranger Programs
- What's Blooming?
- Bird Sightings
- Photo Gallery

...and more!

www.nps.gov/bibe

Grasslands, Not Badlands

Big Bend is the best protected example of Chihuahuan Desert in the United States. Although world renowned for a rich and diverse assemblage of desert plant communities (see page 6), Big Bend National Park also contains examples of overused and damaged habitats. You don't have to look very hard to see the poor ecological condition of the North Rosillos area of the Park. Years of grazing by goats, sheep, and cattle, combined with drought and alteration of the natural drainage systems have created this problem. The deep, silty soils in the north part of the park once supported widespread desert grasslands. Although nearly 100,000 acres of these soils have been degraded, Big Bend National Park is attempting to restore some of these areas to their historic ecological condition. Various called the "Nine Point Draw" or "Grasslands not Badlands," project, it is an attempt to use the most practical methods to restore the area to a healthy vegetative state.

Big Bend consulted members of the NPS Geological and Water Resources Divisions to determine the best approach. They concluded that a phased tactic would bring the most promising results. Phase 1, done in 2001, involved mapping the North Rosillos, especially the man-made tanks and diversions.

Phase 2, in progress now, is an effort to determine the best methods of returning the soil and grassland to a natural state. We are running experiments at four sites, using several techniques. These include ways to help water penetrate the soil surface, and to slow runoff during rainstorms. Native grasses, shrubs, and seeds are being used in revegetation trials. Also during Phase 2, the rest of the Park will be assessed to prioritize restoration needs. Funding is being sought for Phase 3, which will use the most promising techniques learned in Phase 2 to start large-scale restoration.

Ecologist
Kat Crumpton

Consultants from the Jornada Agricultural Resource Station, Texas Tech, Texas A&M, the Natural Resource Conservation Service, and the National Park Service are all lending their time and expertise to ensure a successful return of the grassland that once was.



Top: Extreme erosion has occurred following overuse, drought, and drainage alterations. Bottom: Park employees run experiments at hundreds of study plots throughout the north Rosillos area of the park. The results obtained will guide future revegetation efforts.

Desert Invaders Plants That Don't Belong

by Park Botanist Joe Sirotnak



From baked creosote flats to cool montane forests, Big Bend boasts over 1,200 plant species, but not all of them were here when Euro-Americans first passed through this country. Many of the plants that are so common in the Chihuahuan Desert and along the Rio Grande are recent immigrants from Europe, Africa, and Asia. For example, the tamarisk, also known as saltcedar, was brought to North America from eastern Asia and the Mediterranean for ornamental and streambank stabilization use. Frequently, these exotic plants are unwelcome additions to our fragile desert ecosystems. The ecological problems associated with the spread of tamarisk include dropping water tables, drying of seeps and springs, reduction in native riparian plants like willow and cottonwood, and degradation of wildlife habitat. In recent years, Big Bend National Park has been actively seeking -and -destroying tamarisk at desert springs throughout the park.

Although possibly the most obvious, the tamarisk problem is not the only exotic plant issue that park managers face. A new wave of plant invaders, mostly African grasses like buffelgrass, Lehman's lovegrass, and King Ranch bluestem, threatens the integrity of Chihuahuan Desert ecosystems. These new threats are not so obvious, and in fact may seem quite harmless at first. How dangerous can a grass be, after all? The answer is that they can be plenty dangerous. For example, African buffelgrass (not to be confused with the native shortgrass prairie species known as buffalo grass) is famous in Arizona and Sonora for crowding out native desert plants, reducing wildflower abundance and diversity, fueling

frequent wildfires, and causing dramatic decreases in wildlife. Buffelgrass was brought here from Africa in the 1950s to improve livestock forage in Texas and the southwest. For many years it was called a "wonder-grass" because of its ability to survive drought and produce forage in hot and arid environments. Unfortunately, buffelgrass does not stay where it is planted and has taken over millions of acres of our native deserts and thorn-scrub habitats. Buffelgrass appeared in the park several decades ago and has become a dominant plant in several places, particularly on sandy soils at low elevations. It establishes first on roadsides, probably from seeds carried on and in vehicles, then spreads up and down arroyos, and finally into undisturbed desert shrublands. Buffelgrass is currently invading the core habitats of several very rare cactus species in Big Bend.

It may seem ironic that in this issue of the *Paisano*, we have included articles about both restoring grasslands and removing grasses from desert habitats. Why are grasses "good" in one habitat and "bad" in another? The answer is that we are trying to foster and maintain self-regulating ecosystems within their historic range of variability. This means keeping invasive exotic grasses out of historic desert shrublands while helping native grasses re-establish former grasslands in the north part of the park. Ecosystems with structural and functional components that are within the range of natural variability are highly diverse, are resistant to degradation, and tend to maintain themselves.



A new wave of exotic grasses threaten native desert plants. Over three tons of buffelgrass have been removed using the "shovel and elbow grease method"

What are we doing about these desert space invaders? Big Bend National Park, along with cooperating partners and volunteers, is actively removing buffelgrass from roadsides and critical habitats and is planting native species to restore these degraded sites. We are also studying the ecology of invasive exotic plants to assess the best methods of prevention, control, and restoration of exotic plant-infested habitats. It is hard work, but all of us working together are beginning to make a difference in maintaining our beautiful and diverse Chihuahuan Desert ecosystem. Ask any ranger how you can help.

Prickly Pears to Pines

Ranger Tom Vandenberg

Driving park roads for the first time, much of the plant life may seem to blend into one greenish-brown blur. Look closer! You will soon discover that the park's vegetation is abundant, colorful, and wildly diverse. Amazingly, Big Bend is NOT all desert, and visiting different locations will introduce you to many fascinating plant communities, each brimming with plants fiercely adapted to that specific piece of real estate. As the land gradually rises from the river to the mountains, rainfall amounts and temperatures change as well. Along the Rio Grande, average annual rainfall is around 10 inches. By contrast, in the Chisos Basin, at 5,400 feet above sea level, the average is closer to 18 inches. Temperatures cool as elevations rise, too: on a blistering 115 F day at Castolon, it may be only 90 degrees F in the Chisos. These changes result in an endless chain of slightly different environments, from desert to forest, from prickly pear to pines.



Although only a small part of the park's land mass, the moist banks of the Rio Grande are a major source of the park's plant diversity. How many deserts can boast the thick jungle of vegetation that grows here? Only a few yards wide, but winding for 127 miles through the park, the Rio Grande floodplain is a sinuous bonanza for plants that must keep their feet wet to survive. River cane and cottonwoods



Tree tobacco flowers are a favorite of hummingbirds.

are not particularly stingy in their use of water and depend on high rates of evaporation to keep their large leaves cool. Although found throughout the desert too, the largest mesquite trees grow along the river. The majority of a mesquite's biomass may be hidden underground in the form of large roots that can draw water from over 75 feet

down. Many of the large cottonwoods and mesquites that once lined the river banks were harvested during the mercury mining era and used to fuel the giant ore-processing furnace at the Mariscal Mine.



Cottonwood trees were once more abundant.



Many Winter and Spring visitors are curious as to why Big Bend roads cross so many bridges, culverts, and low water crossings. Summer visitors know why. From mid-July through September, it rains somewhere in the park almost every day. Localized and intense thunderstorms over a rocky landscape result in extreme erosion and runoff. A dry sandy wash may become a

raging torrent in minutes, only to be dry the next day. These "rivers-in-waiting" support different vegetation than surrounding



Littleleaf leadtree thrives in sandy washes

desert landscapes. Plants in desert washes must be resistant to both enduring drought and the raw power of scouring floods. Desert willow, mesquite, persimmon, acacia, leadtree, Mexican buckeye, and purple ceniza thrive in these dynamic habitats.



Covering 49% of the park's area, the shrub desert is the kingdom of the sun. Much of the surface is just gravel and rock. Only the hardiest of plants can endure the brutal heat and dryness that persists at these low elevations. To survive, plants here have developed many intriguing strategies. Individuals are widely spaced to share meager rainfall. Even leaves can be a liability here, losing enough moisture to kill. Lotebush, creosotebush, tarbush, and althorn

produce only tiny leaves that reduce surface area to the sun and wind. Cactus have done away with leaves altogether, instead, multipurpose spines protect moisture reserves and also provide a small amount of shade and wind protection. Ocotillo and leatherstem take the best of both worlds by only producing their tiny leaves for a short period immediately



Cactus have many survival strategies.

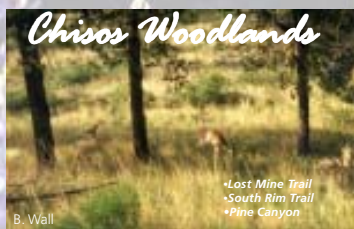
after rainfall. One of the most successful plants here is the lechuguilla. Looking like a bunch of spiny green bananas, lechuguilla sometimes forms vast thickets that are the bane of many backcountry hikers. Look for the six-foot tall flower stalks that are produced only once in the plant's lifespan.



Continuing upward in elevation, the shrub desert gradually receives enough moisture to support abundant grasses. Above 3,500 feet, the surface of the ground may be hard to see. A rich carpet of black, chino, and side oats grama grass cover the hills, gullies, and surround yuccas and succulents such as century plants, giant dagger, and sotol. Desert grasses are perennial, which means that they live long lives. During the summer rains, desert grasses green up and grow quickly. During the drought

of winter and spring, they dry out and hillsides become brown, yet the grasses live on through their dormant roots. Look for the clusters of long, narrow, toothed leaves that make up sotol. A vital food to prehistoric desert people,

the sotol heart was baked in pits and eaten like a giant artichoke. Unlike the century plant that blooms only once, a healthy sotol may produce a tall flower stalk every year.



where else in Texas. The distinctive foliage of the drooping juniper is found nowhere else in the United States. Others, like the Chisos Oak are found nowhere else on the planet.

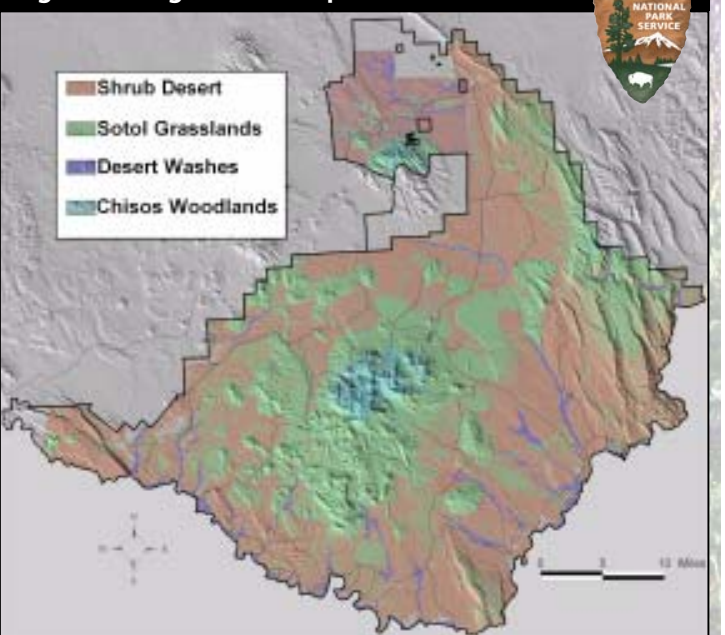


Tall Arizona Pines grow in the moist canyons of the high Chisos.

Driving into the Chisos Basin, motorists are greeted by the red-barked Texas madrone. As striking as the smooth bark is, it pales in comparison to the vivid red berries produced each Fall.

A rare commodity in the desert, this tiny woodland is vital to a wide range of wildlife, from acorn woodpeckers and Colima warblers to white-tailed deer and Mexican black bears.

Big Bend Vegetation Map



Mountain Lion Country

If Big Bend had a symbol, it might well be the mountain lion - - the embodiment of freedom and wildness. Solitary and secretive, this mighty creature is the unquestioned lord of its natural world. As one of Big Bend's top predators, *Felis concolor*—"cat all of one color"—is vital in maintaining the park's biological diversity. Within the delicate habitats of the Chihuahuan Desert, mountain lions help balance herbivores (animals that eat plants) and vegetation. Research shows that cats help keep deer and javelina within the limits of their food resources. Without lions, the complex network of life in Big Bend would certainly be changed.

Encountering a mountain lion, however, can lead to conflicts in maintaining the balance between natural processes and visitor enjoyment and safety. Since the 1950s, there have been more than 800 sightings of mountain lions by visitors. While over 90 percent of these sightings were along park roadways, encounters along trails have also occurred. Since 1984, three lion and human encounters have resulted in attacks on people. In all cases, those attacked recovered from their injuries and the aggressive lions were killed, preventing them from playing out their important natural roles. The more we know about lions, and the less we seek an encounter, the better able we will be to make life easier for them and for us.

How much do you really know about this powerful and wild cat? Mountain lions live throughout the park, including the Chisos Mountains where they prefer to use trails. Your chances of encountering an aggressive lion are remote. What can you do to minimize the consequences of an encounter? Avoid hiking alone or at dusk or dawn. Watch children closely; never let them run ahead of you.



NEVER RUN FROM A LION!

Do not crouch down; the lion has seen you long before you saw it.

Hold your ground, wave your hands, shout! If the lion behaves aggressively, throw stones.

Convince the lion that you are not prey and that you may be dangerous yourself.

If you have small children with you, pick them up and do all you can to appear large.

Report all lion sightings to a park ranger.

The lion's role is a part of the health and welfare of the entire ecosystem. Research and further human understanding of the cat's habits pave the way for conservation efforts in its behalf. As we discover more about the lion, we fear it less and appreciate it more. For many visitors, just seeing a track, or just knowing lions are out there, will be reward enough.

Black Bears

The return of black bears to Big Bend National Park is a success story for both the bears and the park. Native to the Chisos Mountains, bears disappeared from this area during the pre-park settlement era. After an absence of several decades, bears began returning to the park from Mexico in the early 1990s.

Today, wildlife biologists estimate that up to 12 black bears may live in the park.

Though they prefer the wooded Chisos Mountains, bears also range along the Rio Grande and through - out the desert, particularly when drought dries up their regular water sources in the mountains.

Black bears are omnivorous. They eat large amounts of nuts, fruits, sotol and yucca hearts, insects, and smaller quantities of eggs, small mammals, reptiles, amphibians, honey, and carrion. Their strong sense of smell also leads them to human foods, and they can quickly open coolers, backpacks, and trash cans when enticed by food odors.

Bears normally avoid humans, but bears that learn to get food from human sources often become aggressive in their attempts to get more "people" food. When humans disobey the rules of both the park and nature by feeding bears, it is the bears that end up paying the ultimate price. Rangers may have to kill bears that lose their fear of people and

endanger humans in their attempts to get our food. Fortunately, Big Bend has not had to kill any bears, but some national parks destroy several bears each season; we hope that through educating visitors about proper

behavior in bear country, we can avoid this tragic outcome.

Big Bend has made it easy to keep edible items away from bears. Campers at the Chisos Basin Campground, at High Chisos backpacking sites, and at some primitive roadside campsites will find bearproof storage lockers for storing all edibles. Hard-sided vehicles are also suitable for storing edible items. All dumpsters in the Chisos Mountains developed areas are bearproof, as well. And remember, a bear's definition of an "edible" is far broader than ours; lock up sunscreen, skin

lotion, toothpaste, soap, and other toiletries whose odors might attract wildlife.

There really are no problem bears - only problem people. Carelessness can kill. Don't be responsible for the death of a bear. Follow the guidelines below. Pay close attention to the food storage rules posted in the Basin campground and on your backpacking permit. Your actions affect both Big Bend's wildlife and future park visitors.

With your help, bears and humans CAN live safely together in Big Bend National Park.



D. Onorato

A small population of black bears lives here. Please help us keep them wild by storing all food items properly.

Don't Call Me Pig!

For many visitors to Big Bend National Park, seeing a javelina (hav-uh-LEE-nuh) is a new experience.

These curious creatures, also known as collared peccaries, are only found in the United States in Texas, New Mexico, and Arizona. They are covered with black, bristly hairs and generally weigh between 40 and 60 pounds. They usually travel in groups called bands that consist of 10-25 individuals. Peccaries have a highly developed sense of smell, but very poor vision.

Physically, javelinas resemble pigs, but in reality, they are not closely related to pigs at all and have been genetically distinct from them for millions of years. A closer look reveals several major differences between the two animals. Javelinas have 38 teeth; domestic pigs and wild boars have 44. The canine teeth of the javelina are short and straight, while those of pigs are longer and curved. Javelinas have a



R. Leasure

Collared peccaries live throughout Big Bend

scent gland that they use to mark their territory that pigs do not have. Pigs sweat to keep themselves cool, but javelinas must instead cool themselves in available water sources or by staying in the shade.

A javelina's diet includes prickly pear cactus, grasses, mesquite beans, pinyon pine nuts, fruits, berries, and seeds. Unfortunately however, many javelinas now include human food as part of their diet. Every year we are seeing more and more campsites in the park raided by javelina. Although normally not aggressive, they can be when food is involved. Protect yourselves and our javelinas by properly storing all your food inside a vehicle or in the food storage lockers provided in the campgrounds. Do not leave coolers or food boxes unattended on picnic tables or in a tent. Flatten tents when you are away from your campsite. It is important that

javelinas and all park animals eat their natural food sources to stay healthy and safe. With your help, these unique animals can continue to thrive and thrill park visitors for years to come.

Keep ALL Wildlife WILD

In the Basin Campground

- Store food, beverages, trash, toiletries, pet food, and dishes in the bearproof storage locker provided at your site.
- Keep your campsite clean. Take trash and food scraps to a dumpster.
- Dump liquids in restroom utility sinks, not on the ground.
- Ice chests and coolers are not bear-proof; store them in your vehicle.

Cyclists

- Use food storage lockers where provided.

At the lodge

- Leave nothing outside your room, on the balcony, or on the porch.

When hiking

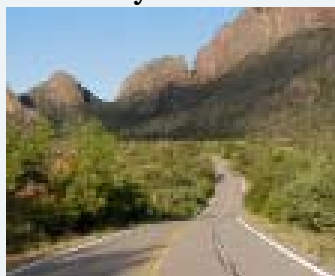
- Never leave packs or food unattended.
- Avoid carrying odoriferous food and toiletries.
- Leave excess food and beverages in your trunk or food storage box
- Carry out all trash, including orange peels, cigarette butts, and left-over food.

Now That You're Here, What Can You Do?

You've driven many miles to get here, and have finally arrived at your destination: Big Bend National Park. But now what? Now that you're here, how do you spend your time? Where should you go? What should you explore? The park is big, and often visitors have a limited amount of time to explore.

S. Harmon

One Day



K. Beckwith

If time allows, drive to the **Chisos Mountains** to take in the spectacular mountain views. Walk the 0.3-mile self-guiding Window View Trail to get a feel for the mountain scenery.

A trip along the **Ross Maxwell Scenic Drive** will give you a taste of the Chihuahuan Desert and will lead you to the Rio Grande. There are scenic overlooks and exhibits along the way. Sotol Vista, Mule Ears Overlook and Tuff Canyon are all worthwhile stops. The short walks to the Sam Nail (Old) Ranch and Homer Wilson (Blue Creek) Ranch and a visit to the Castolon Historic District will give you a glimpse into Big Bend's past.

A highlight is the short (1.6-mile round trip) walk into **Santa Elena Canyon**—one of Big Bend's most scenic spots. Drive to the end of the Ross Maxwell Scenic Drive to access the trailhead. You may return to the main road by returning on the Ross Maxwell Drive or on the **Maverick Road**, a 13-mile gravel road linking the Ross Maxwell Drive to the Maverick (west) Entrance. Always check on road conditions first.

Three Days



J. Blaylock

With three days to spend in the park, you can explore the major roads more thoroughly and still have time for hiking. In the Basin area, consider hiking the **Window Trail** (5 miles round trip) or the **Lost Mine Trail** (4.8 miles round trip); consult the *Hiker's Guide to Trails of Big Bend National Park*, for sale in park visitor centers, for trail descriptions.

In addition to the Basin and Ross Maxwell Scenic Drive (see suggestions for "one day") you can drive to **Rio Grande Village**, perhaps stopping at Dugout Wells along the way to walk the short Chihuahuan Desert Nature Trail. The Rio Grande Village Visitor Center offers a brief introductory slide program. Walk the **Rio Grande Village Nature Trail** which begins near site #18 in the campground. The bluff overlooking the Rio Grande at the end of the nature trail is a particularly beautiful spot at sunset.

Boquillas Canyon road will take you to several overlooks of the Rio Grande and the small village of Boquillas, Mexico. At the end of the road is the **Boquillas Canyon Trail**, which takes you to the entrance of this spectacular canyon.

One Week



S. Harmon

With a week or more to spend in Big Bend, endless possibilities are open to you. You'll have plenty of time to explore the roads mentioned in the previous sections, and will also have time to hike or to drive some of the "unimproved" dirt roads. For these, you'll need a high clearance or four-wheel drive vehicle; don't forget to check at visitor centers for current road conditions. The River Road, Glenn Springs Road and Old Ore Road are some of the more popular backcountry routes. A visit to Ernst Tinaja near the south end of the Old Ore Road is a Big Bend highlight.

If you don't have high clearance or four-wheel drive, gravel roads such as Dagger Flat, Grapevine Hills and Maverick will get you "off the beaten path." Hike the Chimneys Trail, Mule Ears Trail, or Grapevine Hills Trail for a closer look at the desert environment. If you'd like to explore the Chisos Mountains, trails to Boot Canyon, Emory Peak and the South Rim offer good views of the park and take you into another world which seems far removed from the desert. There are plenty of opportunities for overnight backpacking along these trails. A free backcountry use permit is required and can be obtained at park visitor centers.

Float The Rio Grande



M. Libby

If you have the time and a spirit of adventure, you may want to consider a river trip. Seeing the park's canyons from the middle of the Rio Grande is both fascinating and gratifying. There are many possibilities, from half-day floats to extended seven-day excursions. Park Rangers can recommend a trip that meets your abilities and interests. Rafting and equipment rental companies are listed on page 14.

See "Backcountry Planning" on page 13 for additional information on Big Bend river trips.

Enjoying Your Visit

No matter how limited your time in Big Bend, remember that you will enjoy the park more if you **stop your car and explore on foot**. That doesn't mean that you have to hike miles on steep grades; there are many short, easy walks and roadside exhibits where you can stretch your legs and enjoy the sights, smells and sounds of the Chihuahuan Desert.

Hiker's guides and road guides are available at book sales areas throughout the park, and they

offer more detailed information about Big Bend's trails and roads. Attending **ranger-led activities** and evening programs are also good ways to learn more about Big Bend; check at the visitor centers and park bulletin boards for current activities.

Remember, you will NOT be able to see everything on this trip. You will probably enjoy the park more if you choose a few spots and explore them thoroughly to get a taste of what Big Bend has to offer. Then, come back

again sometime to see the rest!



Big Bend Trails



From the 7,825 foot summit of Emory Peak, to the banks of the meandering Rio Grande, visitors will find over 200 miles of hiking trails in Big Bend National Park. Trails range from strenuous primitive routes through rugged desert backcountry to short handicapped-accessible pathways.

Below are descriptions of many of the most popular easy and moderate hiking trails. Most of these trails are perfect for shorter day hikes of up to several hours. For information on longer, more difficult routes, or to plan an extended backpacking trip, stop by any park visitor center. A large selection of maps and trail guides are available and park rangers can assist you in trip preparations and backcountry permits.




Panther Junction - Rio Grande Village Area

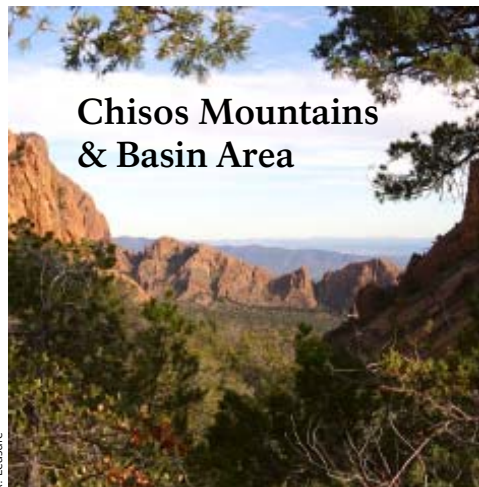
Between Panther Junction and Rio Grande Village lies a vast sweep of scrub desert, rocky ridges, and river floodplain. Sprinkled through this massive area are trails that

highlight the fascinating natural and human history of Big Bend. Discover Indian mortar holes in Boquillas Canyon and the early pioneer settlements of Dugout Wells and Hot Springs. Enjoy the diverse birdlife along the Rio Grande and the rich geology at Grapevine Hills.

One of the more popular areas in Big Bend's east

side, is the Hot Springs Historic District. Drift back in time and imagine what life was like during the early 1900s when J.O. Langford developed this natural hot spring into a tiny health resort. A one-mile loop takes you past the old motel, post office, homestead, and foundation of the hot spring bathhouse.

Trail	Roundtrip Length	Comments	Trailhead Location
Grapevine Hills	2.2 miles	Follows a sandy wash through boulder field. A short climb at the end takes you to a large balanced rock archway	Grapevine Hills Road mile 6
 Chihuahuan Desert Nature Trail	0.5 miles	A flat desert path near a cottonwood oasis. Signs interpret Chihuahuan Desert plant life.	Dugout Wells Picnic Area
 Hot Springs	0.75 miles	Walk past historic buildings to the riverside hot springs. 105°F water. <i>Take a bathing suit and soak a while.</i>	End of Hot Springs Road (unpaved)
 Rio Grande Village Nature Trail	0.75 miles	Cross a boardwalk and climb 125 feet to a great panoramic view of the river floodplain and distant mountains. Good birding and sunrise/sunset views.	Rio Grande Village Campground (site 18)
Boquillas Canyon	1.4 miles	Begins with a short climb, then descends via a sandy path to the river. Ends near a huge sand "slide."	End of Boquillas Canyon Road





Chisos Mountains & Basin Area

The Chisos Mountains form the rugged heart of Big Bend National Park. High ridges and summits coax moisture from passing clouds. The result is a forested mountain "island" surrounded by a desert sea.

When the lower desert trails become uncomfortably hot, enjoy the shady, pine-scented trails of the Chisos Mountains. All Chisos trails begin from the Basin area

which is located in the center of the park.

For a good introduction to the scenery and wildlife of the Chisos, hike the **Window Trail**. From the Basin Campground, this trail winds two miles through colorful Oak Creek Canyon to the top of the Window pouroff. Wildlife is abundant along this trail. Look and listen for javelina, white-tailed deer, and Mexican jays.


Trail	Roundtrip Length	Comments	Trailhead Location
 Window View	0.3 mile	Level, paved, handicapped accessible. Great sunsets and mountain views.	Chisos Basin Trailhead (near the Basin Store)
Basin Loop	1.6 miles	Connects the Laguna Meadow and Pinnacles Trails. Climbs 350 feet through pine/oak woodland. Nice views of the Basin area.	Chisos Basin Trailhead (near the Basin Store)
The Window	5.6 miles	Descends to the top of the Window pouroff. Great scenery and wildlife viewing. Climbs 800 feet on return.	Chisos Basin Trailhead or Basin Campground
 Lost Mine	4.8 miles	This magnificent hike climbs 1,100 feet to excellent mountain and desert views.	Basin Road mile 5 (at Panther Pass)

Ross Maxwell Scenic Drive

The Ross Maxwell Scenic Drive skirts the rocky ramparts of the Chisos Mountains and descends through the spectacular west side of Big Bend National Park. Many of the park's best views and desert hikes are found here.

The Ross Maxwell Drive ends at the trailhead to **Santa Elena Canyon**. There is no better trail to experience the sights and sounds of the Rio Grande. From the parking area, the giant chasm is in full view before you. Hike to the

river's edge and follow it upstream into a world of superlative cliffs and dense thickets of riverside vegetation. Enjoy the sounds of moving water and the descending song of the canyon wren.

Trail	Roundtrip Length	Comments	Trailhead Location
Burro Mesa Pouroff	1.0 mile	A flat, sandy trail up a canyon to the base of a dry pouroff. Interesting geology and desert plants.	Ross Maxwell Dr. mile 11
The Chimneys	4.8 miles	Flat desert trail to prominent rock formations. Look for rock art. No shade.	Ross Maxwell Dr. mile 13
Mule Ears Spring	3.8 miles	A beautiful desert hike to a small spring. Spectacular geology and mountain/desert views.	Ross Maxwell Dr. mile 15
Tuff Canyon	0.75 miles	Balconies overlook this scenic canyon. A short trail leads into and through the narrow gorge carved out of soft volcanic tuff.	Ross Maxwell Dr. mile 20
 Santa Elena Canyon	1.6 miles	Crosses creekbed, climbs stairs, then follows the river upstream into the mouth of a magnificent 1,500 foot deep limestone canyon.	8 miles west of Castolon



Roadside Colors



Prickly Pear



Cane Cholla



Skeleton-leaf Goldeneye



Big Bend Silverleaf or Ceniza



Strawberry Pitaya Cactus



Rainbow Cactus



Yellow Trumpetflower



Ocotillo



Desert Willow



Lechuguilla



Yucca

Wildflowers "Spring"-ing to Life

Deserts by nature are harsh environments in which to live. Only the

strongest can survive the lack of moisture and the temperature extremes. Many of the plants growing in Big Bend National Park have impressive adaptations in order to cope with these environmental challenges. When spring finally arrives, the desert comes alive with incredible displays of natural beauty. In the best of years, the desert floor is covered with thousands of brilliantly colored flowers for as far as the eye can see. Seeing the magnificent colors, smelling the intoxicating fragrances, and hearing the buzzing insects that swarm to the flowers is a sensory experience that few others can match.

Predicting the extent of each year's bloom is difficult. Some years are good, some disappointing, some unforgettable. Precipitation levels and temperature seem to be the most important factors in determining blooming patterns. A delicate balance must be struck in order to achieve ideal conditions. A spectacular spring bloom is dependent on rainfall during the previous fall and winter. If the soil is too dry, some plants will not bloom. If the soil is moist, but the winter too cold or too warm, some plants will not

bloom. Some years the conditions are just right for certain plants, but not for others. Some years a certain area will have a magnificent bloom while the surrounding landscape is barren. But when moisture and temperature conditions are just right for the majority of species, the desert springs to life.

Because of Big Bend's varying elevations and the blooming requirements of different plants, our spring bloom begins in February and continues through the summer. Early spring is the domain of the wildflowers, with bicolored mustards, bluebonnets, verbena, desert marigolds, and many others taking center stage. As time passes and temperatures rise, cactuses and other desert plants start to show their colors. From March to May, look for the blooms of things like prickly pear cactus, claret cup cactus, strawberry pitaya, ocotillo, yucca, lechuguilla, acacias, and desert willows. Finally, the heat of summer does not discourage plants like the eagle's claw cactus and century plants from blooming. They, along with wildflowers that bloom after any seasonal rain, provide a colorful show during our warmest months.



Ranger Gail Fox

This time of year, there is always something blooming in Big Bend. Take the time to discover this natural phenomenon and celebrate the renewal of spring.



Century Plant



Ranger Manning's "TOP 10" Desert Plant Questions

1. Why are some of the cactus purple? Are they dying?

There are approximately a dozen species of prickly pear cactus that grow here. The purple-pink one is called purple-tinged prickly pear. During the dry season it becomes dormant and doesn't produce as much green chlorophyll. During the summer rains this prickly pear is much greener, yet always shows a purple "tinge" along its pads.

2. When is the best time of year to see the flowers blooming?

Big Bend has 2 bloom seasons. The desert wildflowers bloom in the spring, while the wildflowers in the Chisos Mountains bloom primarily in late summer and early fall.

If rainfall the previous summer and fall has been sufficient, the Big Bend bluebonnets, bicolored mustard, purple nama, and woolly paperflower begin blooming in mid February. The first two weeks of April are the best time to see cacti, yuccas, and ocotillo in bloom. If you visit the park anytime from mid February to mid April, you are sure to see something blooming.

Summer rains bring out the blooms in the Chisos Mountains. Hike the trails from late August through mid-October to see mountain sage, blue sage, Mexican catch-fly, scarlet bouvardia, heliopsis, and many other colorful flowers.



Century Plants (*Agave havardiana*) produce a spectacular blooming stalk and then die.

3. What's that tall spiky cactus with the red flowers on the tips of each stem?

Ocotillo looks like a cactus, but it is actually a woody plant in the sandalwood family. It drops its leaves during dry times to conserve water, so it may appear to be dead much of the year. Watch for hummingbirds feeding from the flowers.

4. Do century plants really live for 100 years?

No. The plant's leaves grow in a rosette form for 25 to 50 years as it stores nutrients. It sends up its growth stalk in just a few weeks, produces beautiful clusters of yellow flowers, and then dies in the same season. It was probably named by people who grew tired of watching and waiting for the plant to bloom.

5. What are the little yellow flowers?

Good question! Most of the plants with small yellow flowers are in the sunflower family. The taxonomic term for this group is Compositae, so all of these yellow flowers are generally called "composites". There are many species of yellow composites in Big Bend, and they can be very difficult to tell apart.

6. What's that tree with the smooth pink bark that peels off?

That's the Texas madrone. Its smooth bark may be white or peach-colored, and the old bark peels off each year. It lives only in mountainous areas, and in Big Bend is found only in the Chisos Mountains.

7. Where can I get some of these plants to take home for my yard?

It is illegal to take plants from a national park, but there are nurseries in Alpine and Fort Davis that have many of the plants you see here. Check the One-Way Nursery in Alpine or High Country Nursery in Fort Davis. The Chihuahuan Desert Research Institute, located between Alpine and Fort Davis, has a native plant sale each year in April.

8. Where are all the saguaros?

Many people associate deserts with saguaro cactus, but these giant cacti are native only to the Sonoran Desert. Go to Tucson, Arizona, and you will see lots of them. Some have been transplanted to west Texas, but they are not native here.

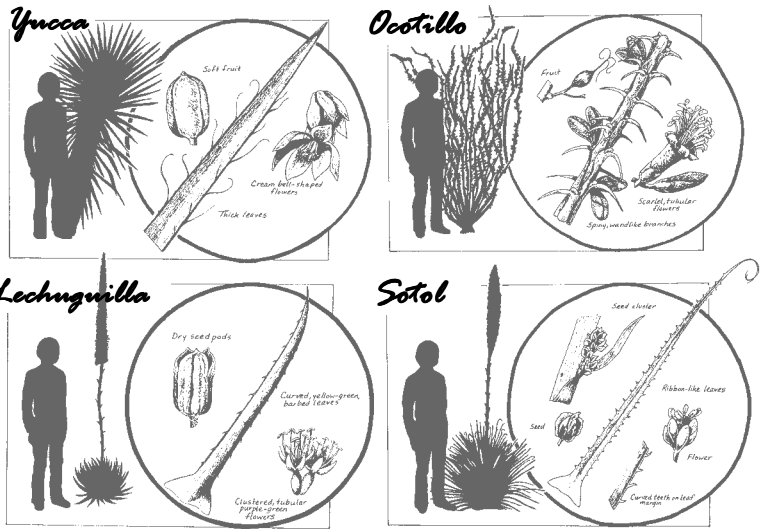
9. What makes those nests in the cactus?

You may see lots of large, football-shaped nests built several feet above the ground in the cacti and yuccas. These are built mostly by cactus wrens, the largest member of the wren family. Having a nest deep within spiky plants protects the offspring from predators. Thrashers and verdin also build nests like this.

10. What eats the cactus? The cactus have lots of bite marks in them.

Javelina eat a lot of prickly pear cactus. Their mouths are seemingly impervious to the sharp cactus spines. Smaller animals like rabbits and rodents will carefully take small bites in the cactus pads between the spines. Cactus are a good source of moisture, fiber, and nutrients, so animals will risk a few pricks to get these rewards.

Name That Plant!

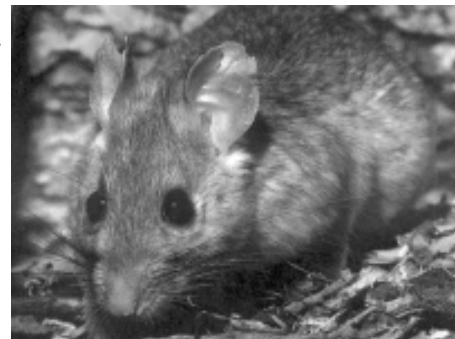


Windows To The Past

Packrat Middens

While enjoying Big Bend's rich assemblage of unique desert plants, it may be easy to assume that the park has always been a dry desert...but a small, industrious rodent tells us a far different story. The white-throated packrat (*Neotoma albigula*) lives throughout the west, and is as common today as it was during the Pleistocene. The curious lifestyle of this creature has left us with highly detailed window into the vegetative history of the last 40,000 years, and surprisingly, today's desert appears to be only 9,000 years old!

Packrats seek out rocky areas for nesting sites. Once they find a suitable crevice they begin to form a nest out of vegetation. Modern day



Botanical studies of packrat nests (middens) tell us that Big Bend has only recently become a desert.

packrats continue in the tradition of their ancestors as inveterate collectors of anything they can scurry away with. Every loose twig, leaf, nut, seed, bone, bottle cap, and feather within 100 feet is soon assimilated into the messy nest pile of vegetation. Once a packrat settles in, countless descendents will continue to use and improve the same nest. These nests soon become so large that they are known as middens (*trash heaps*). Some massive nests appear to have been continuously occupied for well over 40,000 years. Cemented together into an odorous concretion of plant material and rat urine, these middens are a goldmine for botanists and ecologists. Just like excavating into an Egyptian tomb, botanists can delve into the time capsule of a packrat midden and reveal what

Ranger Don Akin


types of plants once grew in the immediate vicinity.

In Big Bend National Park, middens have been radiocarbon dated as far back as 45,000 years and paint a much different picture than we see today. On the rocky hillside near the Rio Grande Village tunnel, packrat nests are currently made of creosote, prickly pear, and lechuguilla, but excavations

in the older layers show that 9,000 years ago those same nests were being constructed of piñon pine needles, oak leaves, and juniper twigs. This indicates that today's dusty deserts were once the same fragrant woodlands we now see in the Chisos Mountains. As the climate dried, woodland plants slowly disappeared and were replaced by cactus and other hardy desert survivors.


In the past, distributions of plants and animals have shifted dramatically in response to changes in climate. Several atmospheric models predict that over the next 50 to 200 years, climates may change as radically as they did at the end of the Ice Ages. Will our climate continue to warm, or revert to cooler conditions? The clues we receive from packrats of Big Bend show responses of the past and can help us predict responses to future climate change. Only time will tell us what future pack rats will be storing in their middens.

Ranger Programs

 Join a park ranger for a guided hike, evening slide show, talk, or workshop on Big Bend's natural and cultural history. These free programs are offered daily. Consult the Interpretive Activities Schedule posted on visitor center and campground bulletin boards for more information.

Camping


Tent Camping

 Camping in Big Bend National Park is on a first-come, first-served basis with **no advance reservations taken**. The National Park Service operates campgrounds at Rio Grande Village, the Chisos Basin, and Castolon. The cost is \$10.00 per night for a site.

Camping is also available at **primitive backcountry campsites** in the Chisos Mountains and along backcountry roads. High-clearance or 4-wheel drive vehicles are necessary to reach most road sites. Backcountry permits are required and can be obtained in person at park visitor centers up to 24 hours in advance.

Groups of 10 or more are eligible to reserve a spot in one of the park's **group campsites**. Reservations may be arranged up to 90 days in advance by calling (915) 477-2251.


Camping areas are often full during the Thanksgiving and Christmas holidays, as well as during spring break in March or April.

 The only showers and laundry facilities in the park are located at the Rio Grande Village store.




Rio Grande Village campsite


Lodging

 The Chisos Mountains Lodge, operated by Forever Resorts Inc., is located in the Chisos Basin at 5,400 feet elevation. The lodge offers a variety of rooms and cottages, plus a gift shop and dining room. For reservations, please call (915) 477-2291 or 2292.

Banking

 There are **NO** banking facilities in Big Bend National Park. The nearest banking/ATM services are located in Study Butte, 26 miles west of park headquarters. Most stores accept major credit cards; however, camping fees must be paid in cash. It is advisable to have small bills (\$1, \$5, \$10, \$20) since larger bills are often difficult to change.

Birdwatching


 Enjoying birds is one of Big Bend's most popular visitor activities. In a recent survey of birders, Big Bend National Park ranked among the top fifteen birding sites in North America. With its proximity to Mexico, diverse habitats, location on a major flyway, and checklist of almost 450 species, Big Bend has much to offer to those who plan their vacations around the potential for viewing birds.

The spring migration begins in late February or early March. Through March and April the number of migrants increases steadily until peaking in the last two weeks of April and the first week of May. In this rush of birds are many neotropical migrants returning from wintering ranges in Latin America on their way to northern nesting grounds. Most pass through, but some remain through the summer to nest and raise their young. Among the expected passage migrants come the occasional rare and accidental species that have wandered off their normal course or are pushing the extreme edge of their normal range. Last spring, a **short-tailed hawk** was well documented in April flying over the Chisos, providing a first park record, and a **flame-colored tanager** was video-taped in Boot Canyon, providing a third park record. For the birder who wishes to observe the many expected migrant and resident species, and perhaps have the chance to find that once-in-a-lifetime rarity, patience and knowing where to look are the keys.

Nearly 75% of all the listed species have been observed in riparian areas, including the corridor of the Rio Grande and desert springs (Sam Nail Ranch, Dugout Wells). The pinyon-oak-juniper belt (Upper Green Gulch, Lost Mine Trail, and around the Chisos Basin) is another productive habitat, particularly for acorn woodpecker, Mexican jay, and black-crested titmouse. If Colima warbler is a goal, then hikes to the moist woodland canyons of the high Chisos (Pine and Boot Canyons) are necessary. The grassland/shrub community along the lower slopes of the Chisos, and the lower desert areas can yield many species, including Lucifer hummingbird, once yuccas, sotol and agaves bloom.

Keep in mind that many of the migrant species you may observe are members of populations in decline. Beset by habitat destruction on both the wintering and breeding grounds, and critical resting areas along the migratory path, these birds could soon fade from our skies. You can help: tread softly in fragile habitats; don't disturb nesting birds with excessive noise or intrusive photography. Please share your observations of rare species. Your detailed report becomes part of the record and can be an aid to researchers. Enjoy the birds of spring, and do all you can to ensure their return next year.

Trailers & RV's

 All park campgrounds can accommodate trailers and RVs, but vehicle lengths have a great deal to do with safely reaching the campground and finding a suitable space.

The only hookups available in Big Bend National Park are at Rio Grande Village in the 25-site, **Rio Grande Village RV Park** operated by Big Bend Resorts, Inc. Although there is no size restriction, your vehicle must be equipped with water and electrical hookups as well as a three-inch sewer connection. Register at the store. No advance reservations.



Chisos Basin Campground

Near the RV park is the 100-site **Rio Grande Village Campground** operated by the National Park Service. Although there are no hookups, water, flush toilets, and a dump station are available. Set in a large grove of cottonwoods, the campground is adjacent to the Rio Grande. Many of the sites are pull-throughs. **Generator use is limited: from 8:00 am to 8:00 pm daily.** A no-generator use area is also designated.

The 65-site **Chisos Basin Campground** is rugged and hilly. The sites are small and most are not suited to recreational vehicles or trailers. The road to the Basin is steep and curvy, especially at Panther Pass—the road's highest point. The road into the campground is a 15 percent grade. Trailers longer than 20 feet and RVs longer than 24 feet are not recommended.

Cottonwood Campground, near Castolon, offers pit toilets and potable water, but no hookups or dump station. **Cottonwood is a NO-generator campground.**

Big Bend's unpaved roads are generally unsuitable for RV's and trailers. Overnight camping in any primitive site requires a backcountry permit, obtained in person at park visitor centers up to 24 hours in advance.

Park Campgrounds

	Elevation	Sites	Nightly Fees:	Facilities	Registration	Comments
Chisos Basin	5,401 ft	65	\$10.00*	Flush Toilets, Dump Station	Self-pay station	Surrounded by rocky cliffs. Many hiking trails nearby.
Cottonwood	2,169 ft	35	\$10.00*	Pit Toilets, No Generators	Self-pay station	In a cottonwood grove along the river. Grassy sites. Good birding.
Rio Grande Village	1,850 ft	100	\$10.00*	Flush Toilets, Dump Station	Self-pay station	Largest campground. Shady sites. Laundromat and showers nearby.
Rio Grande Village RV	1,850 ft	25	\$18.00	Full Hookups	Inquire at RGV Camper's Store	Concession-operated. Adjacent to RGV store.

* \$5.00 with Golden Age or Golden Access Passport

Horses

Visitors are welcome to bring and use their horses in the park. A free stock-use permit is required and may be obtained in person at any of the park's visitor centers up to 24 hours in advance of the trip.



While horses are not permitted on paved roads or road shoulders, all gravel roads are open to horses. Cross-country travel is permitted in the park, except in the Chisos Mountains where horse use

is limited to the Laguna Meadow, South-west Rim, and Blue Creek trails. Horses are not permitted on nature trails, the Santa Elena and Boquillas Canyon Trails, or the Pine Canyon Trail, nor are they permitted in picnic areas.

Grazing within the park is not permitted, so you must bring your own feed. Stock may be watered in the Rio Grande and at springs that are not used for domestic water supply. Be prepared to haul water for your stock as springs are unreliable, especially during winter months. Check current spring conditions at a visitor center when you arrive. All horse manure must be removed from the park, or deposited at a designated location near the NPS horse corral at Panther Junction (ask a ranger for directions).

You may camp with your horses at many of the park's primitive road campsites. These are available on a first-come, first-served basis through a free backcountry use permit available at park visitor centers. These campsites are especially difficult to obtain during holiday periods, especially spring break.


Camping with horses is not permitted in any of the park's developed campgrounds. Government Springs campsite, located 3½ miles from Panther Junction, is a primitive campsite with a corral large enough for 4-8 horses. If you plan to bring horses to the park, you may reserve this campsite up to 10 weeks in advance by calling (432) 477-1158.

Hiking & Backpacking

Big Bend National Park offers over 100 miles of hiking trails. A free permit is required for all overnight trips, and can be obtained in person only up to 24 hours in advance of the trip. Because of the unreliability of desert springs, it is difficult to plan an extended backpacking trip prior to your arrival in the park. Decide how much distance you want to cover and how much time you have. Park staff can assist you with trip planning based on your needs and current trail conditions. The Panther Junction Visitor Center is open daily from 8:00 a.m. to 6:00 p.m.

Backpacking sites in the Chisos Mountains are difficult to obtain during the Thanksgiving and Christmas holidays, and during spring break in March and early April.

Maps and hiker's guides are available for purchase at park visitor centers. If you would like to order them in advance of your trip, call the Big Bend Natural History Association at (432) 477-2236 or visit their online internet bookstore at www.bigbendbookstore.org

 **Pets are not allowed on trails or in back-country areas. Please leave pets at home if you plan to hike.**

The Southeast Rim of the Chisos Mountains, Mariscal Rim, and Casa Grande are closed during the peregrine falcon nesting season (February 1 - July 15).

Weather

Elevational differences in Big Bend mean that temperatures can be vastly different in different areas of the park. The lower areas along the Rio Grande are very hot during the summer months, while the Chisos Mountains are considerably cooler. Winter weather generally occurs between November and February, with temperatures dropping dramatically as cold fronts move through the area. Between June and October thunderstorms and flash floods may occur. Bring clothing for both warm and cool weather, as well as rain gear, when visiting Big Bend any time of the year. See "how hot?" on page 15.

Floating the Rio Grande

The Rio Grande follows the southern boundary of Big Bend National Park for 118 miles. In this distance it has carved three major canyons, Santa Elena, Mariscal, and Boquillas, which have rapids varying in difficulty from Class I to Class IV. Between the canyons, the river is generally slower-paced. The Rio Grande Wild and Scenic River extends downstream beyond the park boundary for an additional 127 miles.

If you plan to take a river trip in Big Bend National Park, you may bring your own equipment, or you can hire a guide service. Four local companies (see page 14 for telephone listings) provide guide service in the park—you may reserve a trip by contacting them directly.



If you plan to use your own equipment, you must obtain a free permit at a park visitor center. Permits are issued up to 24 hours in advance of your trip, in person only. Stop by the Panther Junction Visitor Center for your permit and for current river condition information prior to your trip.

Permits for the Lower Canyons of the Rio Grande Wild and Scenic River may be obtained at the Persimmon Gap Visitor Center, when open; a self-permitting station is also located at Stillwell Store, 5 miles south on FM2627 on the way to La Linda, Mexico. Permits for floating Santa Elena Canyon may be obtained at the Barton Warnock Center in Lajitas. Only permits for Santa Elena Canyon may be written there. However, we encourage all parties to get their permits at a park visitor center when possible, to obtain the most up-to-date river information and conditions.

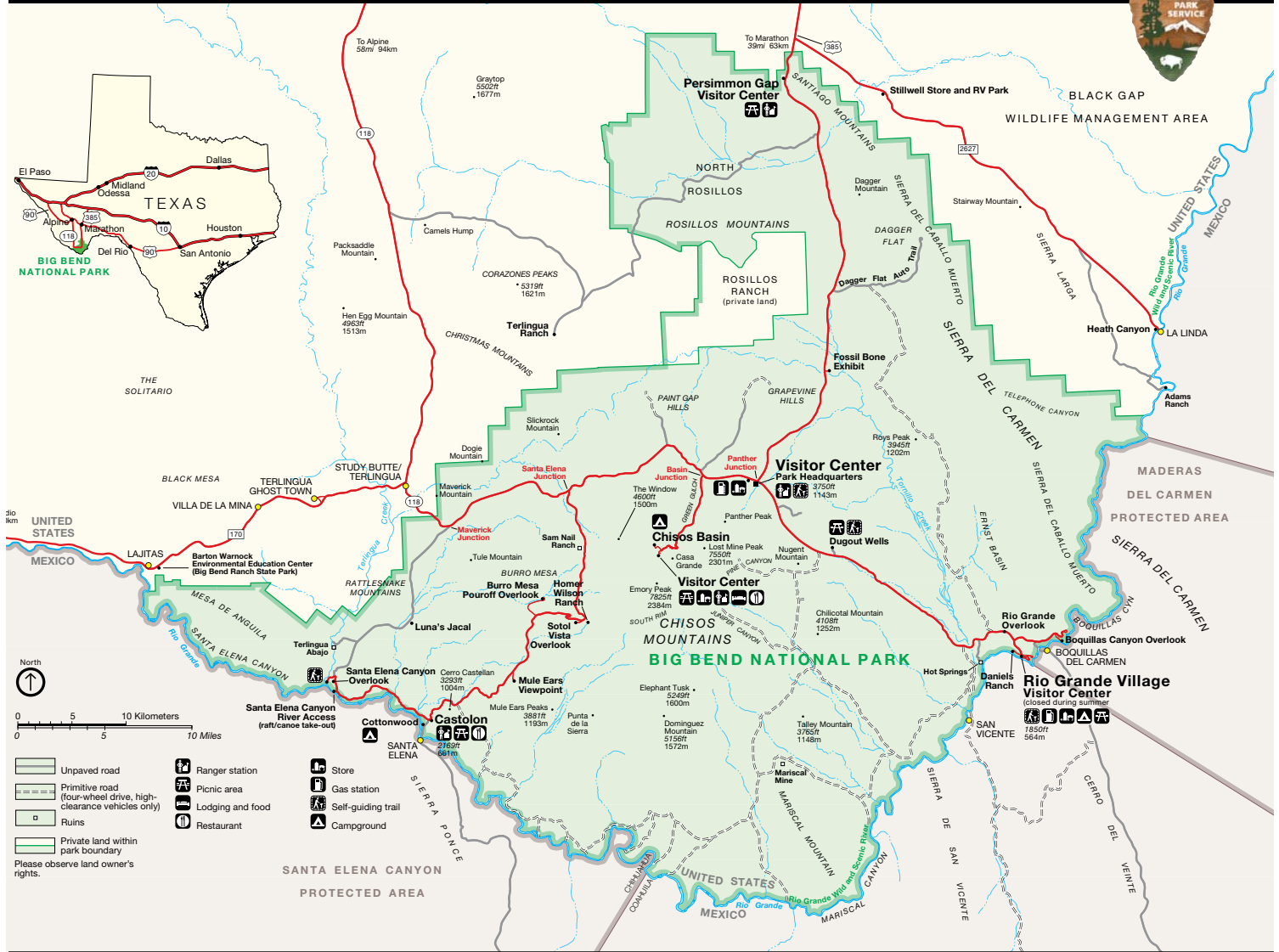
River guide booklets are available for purchase at park visitor centers. If you would like to order them in advance of your trip, call the Big Bend Natural History Association at (432) 477-2236 or visit their online internet bookstore at www.bigbendbookstore.org



Keep Big Bend Beautiful

For your convenience, barrels for recycling cans, glass, and plastic bottles are located at the entrances of park campgrounds.

Park Map



Legend

- Unpaved road
- Primitive road (four-wheel drive, high-clearance vehicles only)
- Ruins
- Private land within park boundary
- Please observe land owner's rights.
- Ranger station
- Store
- Gas station
- Self-guiding trail
- Campground
- Picnic area
- Lodging and food
- Restaurant

Local Services

No Cell Phone Service in Big Bend

Inside The Park (432)

EMERGENCY	911
National Park Service	
General Information	477-2251
Big Bend Natural History Association	
Booksales & Seminars	477-2236
Visitor Centers & Ranger Stations	
Castolon Ranger Station	477-2225
Chisos Basin Visitor Center	477-2264
Panther Junction Visitor Center	477-1158
Persimmon Gap Visitor Center	477-2393
Rio Grande Village Visitor Center	477-2271
Lodging	
Chisos Mountains Lodge	477-2291
Chisos Mountains Lodge	477-2292
Restaurants	
Chisos Mountains Lodge	477-2291
Park Gasoline Service	
Panther Junction (also diesel)	477-2294
Rio Grande Village	477-2293
Campground Stores	
Rio Grande Village	477-2293
Chisos Basin	477-2291
Castolon	477-2222

Outside The Park (432)

Lodging		
Badlands Motel, Lajitas	424-3471	
Big Bend Motor Inn, Study Butte	800-848-BEND	
Easter Egg Valley Motel, Study Butte	371-2254	
El Dorado Motel, Terlingua	371-2111	
Gage Hotel, Marathon	386-4205	
Heath Canyon Ranch Inn, FM 2627	376-2235	
Longhorn Ranch Hotel, Hwy. 118	371-2541	
Marathon Motel, Marathon	386-4241	
Terlingua Ranch Resort	371-2416	
Camping		
Big Bend Motor Inn, Study Butte	800-848-BEND	
Big Bend Ranch State Park, Lajitas	424-3327	
Big Bend Travel Park, Study Butte	371-2250	
Lajitas on the Rio Grande	424-3471	
Longhorn Ranch, Study Butte	371-2541	
Ocotillo Mesa RV Park, Study Butte	800-729-1406	
Stillwell's Trailer Camp, FM 2627	376-2244	
Study Butte RV Park	371-2468	
Terlingua Ranch Resort	371-2416	
Gas Stations & Grocery Stores		
Big Bend Motor Inn (gas, diesel)	800-848-BEND	
Lajitas Trading Post (gas, supplies)	424-3234	
Study Butte Store (gas/diesel/groceries)	371-2231	
Stillwell Store & Station (gas)	376-2244	

Medical Services		
Terlingua Medics	371-2222	
Lajitas Infirmary	424-3536	
Big Bend Regional Medical Center, Alpine	837-3447	
Banks		
Quicksilver Bank & ATM, Study Butte	371-2211	
Kennels		
Terlingua Creek Kennels, (Oct-Apr)	371-2348	
Guide Services		
Big Bend Touring Society, Terlingua	371-2548	
Texas Jeep Expeditions	877-839-JEEP	
Rio Grande Float Trip Outfitters/Rentals		
Big Bend River Tours, Study Butte	800-545-4240	
Desert Sports, Terlingua	888-989-6900	
Far Flung Adventures, Study Butte	800-359-4138	
Rio Grande Adventures, Study Butte	800-343-1640	
TX River Expeditions, Study Butte	800-839-7238	
Horseback Riding		
Big Bend Stables, Study Butte	800-887-4331	
Lajitas Stables, Lajitas	424-3238	
Spring Creek Remuda, 23 mi. south of Marathon	376-2260	
Ben's Hole Creek Ranch, Terlingua	371-2954	

Let Safety Be Your Constant Companion

Big Bend is unfamiliar country to most visitors yet it need not be dangerous. Whether hiking the highcountry, rafting the Rio Grande, observing wildlife, or simply driving the scenic roads of this wilderness park, let safety be your constant companion. Spend a moment reviewing these common safety concerns so that you may have an enjoyable visit.

Driving

Many accidental deaths in Big Bend result from car accidents. While driving is a great way to see the park, it can also be dangerous, particularly if you are tired or are going too fast. Drive within the speed limit, 45 mph maximum in the park, and watch for javelina, deer, and rabbits grazing along road shoulders, especially at night. Seat belts are required at all times. Remember, too, that you share the road with bicyclists and pedestrians. Some park roads, such as the road into the Chisos Mountains Basin, are steep and winding and require extra caution. The Basin Road is not recommended for RVs over 24 feet or trailers over 20 feet. Finally, always select a designated driver before drinking alcoholic beverages.

Heat

Desert heat can kill you. Carry plenty of water (at least one gallon per person, per day) and wear a hat, long pants, long-sleeved shirt, and sun screen when hiking. Springs are unreliable and often dry up for a portion of the year, despite what maps indicate. Avoid hiking during mid-day in summer; travel as wild animals do, in the early morning or late evening hours rather than during the heat of the day.

Mountain Lions

Big Bend is mountain lion country, especially the Chisos Mountains. While lion attacks are rare, three have occurred in the last 10 years. Should you encounter an aggressive mountain lion, hold your ground, wave your arms, throw stones, and shout. Never run. Keep groups together and consider hiking elsewhere with young children if you come across a special mountain lion warning sign posted at a trailhead.

Desert Wildlife

Black bears, javelinas, skunks, coyotes, and raccoons frequent Big Bend's campgrounds. Although they sometimes appear tame, all of the animals in the park are wild, and could pose a threat to your health and safety if you attempt to approach or feed them. Never feed any of Big Bend's wildlife.

To prevent these creatures from becoming habituated to people, store all food, coolers, cooking utensils, and toiletries in a hard-sided vehicle, preferably in the trunk of your car. Food storage lockers are available for hikers and campers in the Chisos Mountains. Dispose of garbage properly. At the Chisos Basin Campground, throw away garbage in the special bear-proof dumpsters and trash cans provided. Remember to report all bear or lion sightings to a ranger.

Hiking

Exploring this desert and mountain country on foot requires both mental and physical preparation. Trails vary from well maintained in the Chisos to primitive and barely visible in the desert. Plan hikes within your ability. Take along a map and compass and know how to use them. Flash floods may occur following thunderstorms so avoid narrow canyons or dry washes. Stay low and avoid ridges during thunderstorms. Carry a flashlight and a first aid kit. Let someone know where you're going and when you expect to return. If you get hurt or lost, stay in one place to conserve water and energy. Signal for help; three blasts on a whistle is a well-recognized distress call. In remote areas, a large "X" marked on the ground by any means visible from the air will signify that help is needed. Carry a signal mirror. Remember to obtain a free backcountry use permit before heading out overnight.

Fire

Fire danger is always an important safety consideration in Big Bend. Wood or ground fires are not permitted in the park, and you must exercise caution in the use of gas stoves, charcoal grills, and cigarettes. Big Bend has experienced drought conditions in the past several years and some restrictions may apply to the use of these heat sources. Check with a ranger for the latest information about fire safety in the park.

Swimming

Hot weather makes the muddy Rio Grande look very inviting, but swimming is not recommended.

Water borne micro-organisms and other waste materials can occur in the river and cause serious illness. The river can be hazardous, even in calm-looking water. Strong undercurrents, deep holes, and shallow areas with sharp rocks and large tree limbs are common and make the Rio Grande unsafe for swimming. If you do choose to swim, wear a life jacket and avoid alcohol.

Poisonous Animals

Venomous snakes, scorpions, spiders, and centipedes are all active during the warmer months. Inspect shoes and sleeping bags or bedding before use and always carry a flashlight at night. While snake bites are rare, they usually occur below the knee or elbow. Pay attention to where you walk and place your hands.

Big Bend truly is wild country. In fact, many people visit precisely because it is so remote and rugged. But remember, as you enjoy the splendor of this great wilderness area, to make safety a priority. By giving forethought to your actions you can have a safe, exciting, and rewarding vacation in Big Bend National Park.

Keep The Wild in Wildlife!

Javelina are wild and can be dangerous...



Never Feed Javelina!

Regulations are strictly enforced!



How Hot?

PANTHER JUNCTION
elevation 3,750 feet

	Avg.High/Low	Avg.Rainfall"
January	61/35	.46
February	66/34	.34
March	77/45	.31
April	81/52	.70
May	88/59	1.50
June	94/66	1.93
July	93/68	2.09
August	91/66	2.35
September	86/62	2.12
October	79/53	2.27
November	66/42	.70
December	62/36	.57
<i>yearly average:</i>	79/47	15.34"

Temperatures in the Chisos Basin vary 5-10 degrees below these readings, while daytime temperatures along the Rio Grande average 5-10 degrees warmer.

Pet Owners



Keep your pet on a leash (or in a cage) at all times. Pets are not allowed on park trails, or anywhere off established roadways. Pets may not be left unattended in the park.

A National Park is a refuge for the animals and plants living within it. Even if your pet doesn't chase animals, dogs present the image and scent of a historical predator. The result is stress on native wildlife...in a refuge, remember.

Predators such as owls, coyotes, javelina, and lions CAN and DO kill pets here. Even large dogs cannot defend themselves against such predators.

Remember, desert heat is **deadly**. Do NOT leave your pet alone in a vehicle. Pets are not allowed on trails, off roads, or on the river. The nearest kennel service is in Terlingua, 30 miles away.



National Park Service
U.S. Department of the Interior

Big Bend National Park
PO Box 129
Big Bend, TX 79834
www.nps.gov/bibe



Big Bend Natural History Association
PO Box 196
Big Bend National Park, TX 79834
www.bigbendbookstore.org

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EXPERIENCE YOUR AMERICA...

Buy a

National Parks Pass



With the establishment of Yellowstone National Park in 1872, the United States created the world's first national park. Today, nearly 400 National Park Service sites celebrate our nation's natural and cultural heritage. From mountains to mangroves, from seashores to cliff-dwellings, the National Park Service is the steward of our resources and teller of our stories.

The **National Parks Pass** costs just \$50, and covers entrance fees at all National Park Service sites for 12 months from date of purchase.

U.S. citizens aged 62 and over are eligible for the **Golden Age Passport**. A \$10 fee will provide a lifetime of free entry into all national parks and 1/2 price camping.

Already paid your park entrance fee? You may exchange your current, valid entry receipt and apply it towards the purchase of these pass options.

EXPERIENCE YOUR AMERICA

Join Our Family



Please accept our invitation to join the Big Bend Natural History Association

The Association's goal is to educate the public and increase their understanding and appreciation of the Big Bend Area and what it represents in terms of our historical and natural heritage. You can be an important part of this effort when you become a member.

BBNHA was founded in 1956 to aid educational, historical, and scientific programs for the benefit of Big Bend and its visitors.

Your Benefits as a Member

- A 15% discount on items sold by BBNHA
- A 10% discount on most seminars
- A subscription to *The Big Bend Paisano*
- Current Big Bend calendar
- Discounts at many other association bookstores in visitor centers at other national park sites
- Opportunity to support scientific, educational, and historical programs in Big Bend

Past and present projects include:

- Operate book sales outlets in Big Bend National Park and Amistad National Recreation Area
- Publish trail guides and brochures and assist with the publication of *The Big Bend Paisano*
- Sponsor an on-going Seminar program
- Provide annual grants for research projects and administer grants and gifts received for the park
- Support the park's volunteer, Junior Ranger, and educational outreach.

Yes!

Please enroll me as a member of BBNHA

ANNUAL DUES

Individual (\$25) Associate (\$50)

Corporate (\$100)

LIFE MEMBERSHIP

Individual or Family (\$250)

Corporate (\$500)

Benefactor (\$1,000)

New Member Renewal

Mr./Ms./Mrs. _____

Address _____

City _____ State/ZIP _____

Make check payable to BBNHA or charge to:

Visa Mastercard Discover

Card No. _____ Exp. Date _____

Signature _____

DETACH AND MAIL TO:

BBNHA, P.O. Box 196

Big Bend National Park, Texas 79834

Telephone: (915) 477-2236

e-mail: bibe_bbnha@nps.gov



S. Little