

The Big Bend Paisano



A Visitor's Guide to Big Bend National Park
and Rio Grande Wild & Scenic River



VOL. XXIII No.1

SPRING 2002

FREE

Nature's Last Resort

A Refuge for Species of Concern



photo by Joe Espinosa

Big Bend National Park is much more than just precipitous canyons, spectacular mountains, and rugged vistas. It is also more than merely a destination for camping and hiking. For many life forms, Big Bend National Park means life itself. Protected within park boundaries, some of these rare species find their last resort for survival.

In this issue of the Big Bend Paisano, we get to know a few of these special species, and along the way, reaffirm the priceless importance of our National Parks.



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Please accept our
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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.

- 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 programs

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- A 15% discount on items sold by BBNHA
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- Opportunity to support scientific, educational, and historical programs in Big Bend

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The Big Bend PAISANO



Orienting and Educating Visitors to Big Bend National Park and the Rio Grande Wild & Scenic River

"Spanish for Roadrunner"



VOL. XXIII No. 1

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A Fool's Tale



Using over morning coffee as another day begins, I look out the window into the back yard and silently greet each bird that comes in for a drink of water and a morning bath. Shy Pyrrhuloxia, bold cactus wren, darting canyon towhee, furtive scaled quail, all year-round residents, all well-known neighbors. Now a yellow-rumped warbler, a nervous ruby-crowned kinglet, several pale Brewer's sparrows, a herd of bossy white-crowned sparrows, birds of winter and harbingers of the coming spring. Soon the migrants will grace the trees and bushes busily fueling up for the next jump to the north. With them will come the birds of summer, the travelers whose journey north ends in Big Bend, who will nest and produce another generation before they head south again. I feel fortunate. To live in an area where natural cycles are preserved, to be witness to the yearly movement of birds is a definite bonus of my job.

For those who observe and research birds, the value of a protected area like Big Bend National Park is profound. Currently the park's checklist of birds stands at 445 species, testimony to the park's location along a major migration route and to the diversity of habitat types protected here.

For birders, Big Bend offers the opportunity to see more kinds of birds than any other na-

tional park, including Mexican species seldom seen anywhere else in the United States. For researchers, the park offers a natural laboratory in which to study the intricate relationships between the birds and their environment. For birds, the park offers refuge and shelter in a world where large tracts of unaltered habitat are rapidly disappearing.

...some threads of the tapestry that is Big Bend can, and do, break.

In recognition of the park's diversity of bird species, and its opportunities for education and conservation through research, the American Bird Conservancy last year named Big Bend as a **Globally Important Bird Area**.

An important aspect of the IBA program is that it helps emphasize conservation issues specific to each site. In the Big Bend region, air pollution, degraded water quality and quantity in the Rio Grande, and the invasion of exotic plant and animal species have direct impacts on wildlife populations. With its overlay of important designations, National Park, Biosphere Reserve, and now Globally Important Bird Area, Big Bend National Park is able to muster support and funding for research, monitoring, and protection of the resources in its charge.

It would do us well to remember though, that even this effort is not always enough, that some threads of the tapestry that is Big Bend can, and do, break.

In 1901 in the Chisos Mountains, the great wildlife artist Louis Agassiz Fuertes, painted a portrait of a singular little quail endemic to the desert southwest. Known variously as Mearn's quail,

Montezuma quail, or "Fool" quail, it had already disappeared from the El Paso region by 1883. By 1901, it was fading from Central Texas. By the 1930s the "Fool" quail was already rare in the Chisos Mountains. By the 1960s, in spite of almost 20 years of "protection" in a national park, it was apparently gone from the Big Bend and confined to the Davis Mountains of Jeff Davis County, and the Glass and Del Norte Mountains of northern Brewster County. In the early 1970's, ornithologist Harry Oberholser was moved to write, "In Texas, the Harlequin quail has almost reached that great destination of all earthly life: extinction."

The reasons for the quail's disappearance have been debated over the years, but most certainly habitat change from human disturbance is at the root. The

quail requires open juniper/oak woodlands and a ground cover of tall bunchgrasses. Unlike other quail, the Montezuma digs for tubers and bulbs in deep, dry soil, and seldom flies or runs when threatened. Instead it relies on its cryptic coloration to hide, crouching silently until the last second, then exploding from the ground in a flurry of wings. Of all the quail species, the Montezuma is the most intolerant of habitat alteration.

In the 1970s, staff at Big Bend National Park made an assessment that some areas of the Chisos Mountains had recovered sufficiently to provide habitat for the quail again. In 1973, 26 quail from the Santa Rita Mountains in Arizona were released in Pine Canyon. Hopes were high. Surveys in the years following the release located small numbers of the quail but by 1979, none were found. The last accepted sighting was in 1983. In the ensuing nearly twenty years, Montezuma quail have

been conspicuously absent from the Chisos Mountains.

Lingering over the last few sips of coffee, reluctant to leave the parade of birds appearing in the yard, I spy one, then two, then more scaled quail. One lone bird makes a tentative approach to water, the rest waiting under cover. Finally, all make the break and come to drink. Watching from the window, for a moment I see not the little "cotton-tops," but rather the boldly patterned Harlequin. But in a blink, they are gone. Just as surely gone as the Mexican gray wolf, the desert bighorn sheep, the aplomado falcon, and others unknown. A grim thought, but... Mexican gray wolves are being returned to New Mexico, aplomado falcons fly again over the Texas coastal plain, and bighorns are settling in next door at the state Black Gap wildlife area. Perhaps one day the little "Fool" quail will again haunt the dry hillsides of the Chisos Mountains.

by Park Ranger Mark Flippo



"Important Bird Areas are places of international significance for the conservation of birds at the global, regional or sub-regional level. IBAs are a practical tool for conservation. Sites must, wherever possible, be amenable to being conserved and to being delimited from surrounding areas, and be large enough to support viable populations of the species for which they are important."



The Big Bend PAISANO

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The Big Bend Paisano, is published by the National Park Service and the Big Bend Natural 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 wildlife. . . 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.

On matters relating to this publication write:

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Welcome



Bienvenidos

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.

Spring in Big Bend is always a flurry of activity. Plants are blooming, birds are migrating, and park visitors are streaming in from every state. During your explorations, remember that Big Bend National Park is much more than merely campgrounds and hiking trails. For many species, it is a vital sanctuary where they are making a last stand at survival. In this issue we explore some of these special life forms that make Big Bend one of the most diverse and fascinating of our National Parks.

Frank J. Deckert

Park Superintendent



Superintendent Deckert

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 como el Silvestre y Escénico Río Grande.

El verano en Big Bend siempre es un tiempo muy atareado. Las plantas florecen, las aves migran, y los visitantes al parque vienen de todos estados. Durante sus exploraciones, recuerden que el parque nacional Big Bend es mucho más que campamentos y senderos. Para muchas especies, es un santuario vital donde se mantienen en una lucha para sobrevivir. Con este número enfocamos en algunas de éstas especies que se hace a Big Bend uno de los parques mas diversos y interesantes.

Frank J. Deckert

Superintendente



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:

AmeriCorps-NCCC
Henry & Patty Banks
Bill & Barbara Baldwin
Richard & Penny Barker
Jim Bogue
Will Bradley
Royce & Royann Brockett
Charles & Sue Cottingham
Erwin & Sharon Drabek
Jennifer Dyer
George & Harriet Eggleston

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*Big Bend's 2002
AMERICORPS-NCCC Crew
"Earth 5"*



Big Bend Natural History Association

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 America was attacked on September 11, 2001, many people involved with tourism feared that the public would not travel and revenues would suffer. Here in Big Bend National Park we didn't know what to think. Would people travel less, or would people travel more domestically? Would our visitation be hurt or would it increase? Would there be security fears because we share a border with Mexico?

Well, the answer is in, and the news is encouraging. Big Bend Natural History Association operates the bookstores in all the visitor centers at Big Bend National Park and Amistad National Recreation Area, and our sales are up! Revenues increased almost 35% in the first quarter of our fiscal year (October through December) and both January and February sales are also up over the same months last year.

What a wonderfully diverse and resilient country we live in! In a country wise enough to set aside natural wonderlands such as these for the enjoyment of future generations, we now see a whole range of behaviors expressing optimism, not fear, and hope, not despair. Beginning even as soon as

October, visitors flocked to Big Bend, perhaps as a place to collect their thoughts and ponder what had happened.

Big Bend Natural History Association applauds the American public and the heroes who have risen from their ranks to meet this challenge: the policemen, firefighters, rescue workers, military personnel, Border Patrol agents, National Park Rangers, politicians, and, yes, even the visitors to our parks. Our visitors are more than our lifeblood; they are our friends and neighbors and fellow citizens. Their refusal to be cowed by mad threats of violence tells me we are as good as we ever were and answers once and for all any questions that may have lingered about the strength of diversity.

In this place, one need look no farther than the desert which surrounds us to see that a diverse community is a strong and resilient community. In this nation one need look no farther than one's neighbors to see that strength on display



Thanks for your generous support,
Mike Boren
Executive Director

Featured Publications



Surround yourself with the abundant and diverse natural and human history of Big Bend. 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

The Earth Speaks

Its voice is in the shape of a new leaf, the feel of a water-worn stone, the color of the evening sky. That voice is captured here in the words and images of those who have listened with their hearts, including Henry David Thoreau, John Muir, Rachel Carson, Edward Abbey, Aldo Leopold, and many others. \$12.95



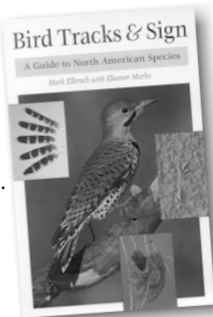
Desert Ecology

Explore the life cycle of the yucca and creosote bush, trace the wanderings of the tenebrionid beetle, and breathe in the rhythms of the desert at night. This book explores how desert plants and animals live where they do—the physiologic and behavioral adaptations that enable plants and animals to survive in such inhospitable places. Written not for the specialist but for everyone. \$17.95



Bird Tracks & Sign

This richly-illustrated full-color guide—the first of its kind for North American birds—offers thorough and straightforward instructions for identifying bird families or species by examination of the unique signs they leave in the wild. Includes tracks and trails, nests, feathers, pellets, skull, and more. \$34.95

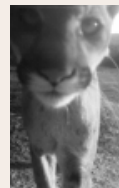
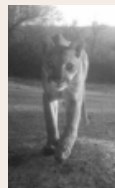


Butterflies of West Texas Parks and Preserves

New from former Big Bend Chief Naturalist Roland Wauer, this book describes and illustrates the 50 most common butterflies of the region with glorious photographs, along with 11 "specialties" unique to the region. Includes a checklist. 78 pages \$17.95

Big Bend Seminars

Take A Closer Look!



2002 Seminar Schedule

Geology, Birding, Snakes, Wildflowers, and Lions are some of the highlights of the 2002 Big Bend Seminars Program. Now in its 14th year, the immensely popular program conducted by BBNHA continues to grow and improve. This year, a total of 21 seminars in Big Bend National Park, and 2 at Amistad National Recreation Area will be presented by experts in a variety of fields.

Big Bend National Park

April 5	Colors of Big Bend Dana Schoppa
April 6	Wildflowers John Mac Carpenter
April 7	Big Cats in Big Bend Gilbert Guzman
April 14	Wildflowers John Mac Carpenter
April 20	Trans-Pecos Reptiles Alan Tennant
April 26-28	Desert Birds Roland Wauer
April 30-31	Cacti of Big Bend Roland Wauer
May 3-5	Desert Butterflies Roland Wauer
May 11-12	Birding Big Bend Kelly Bryan
May 18	Big Bend Bats Jana Higgenbotham
May 26	Desert Survival TBA
Sept. 28-29	Birding Big Bend Kelly Bryan
October 12	Big Bend 101 Sam Richardson
November 9	Black Bears Raymond Skiles
November 10	Tracking in the Desert Billy Pat McKinney
November 16	Geology Jeep Tour Bill Bourbon
November 17	Dinosaurs! Anthony Fiorillo

Amistad National Recreation Area

March 23-24	Archeology Joe Labadie
May 4-5	Living off the Land Dr. Phil Dering

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 BBNHA at PO Box 196, Big Bend National Park, TX, 79834 or call 915-477-2236. You may also e-mail us at bbnha@nps.gov



National Park News

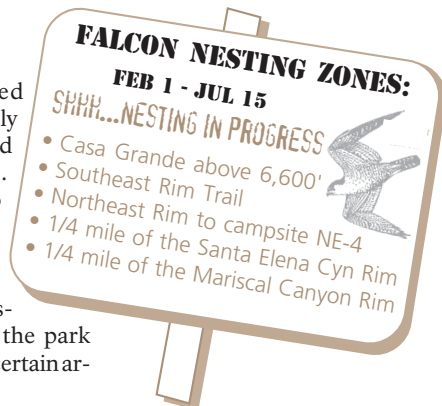


Peregrine

Help Us To Protect Your Falcons

The jet-fighter of the bird world, a peregrine falcon wheels through the sky at speeds approaching 200 miles per hour and many park visitors hope for even a glimpse of this majestic aerialist. Once at the brink of extinction, falcons are staging a comeback in many areas. In Texas, however, there are less than twelve nesting pairs, and the birds remain on

the state's endangered species list. Last year, only seven young fledged from Big Bend nests. Falcons are known to abandon active nests at even the smallest amount of human disturbance. To ensure disturbance-free nesting, the park has temporarily closed certain areas to all public entry.



Black Bear Genetics

A Family Affair

When black bears naturally returned to Big Bend from Mexico in the late 1980s, there were many unanswered questions that arose. Which Mexican mountains did they come from? What population size could the park hold? Were they all related? Was there enough genetic diversity to ensure their longterm survival? For the last four years, researchers from the National Park Service, US Geological Survey, and Oklahoma State University have delved into the secrets of this remote population of bears. Upon carefully trapping, radio-collaring, tracking, and conducting genetic tests, many of these questions are finally being answered.



The analysis of mitochondrial DNA is now complete. This genetic "fingerprint" is passed on from mother to cubs and has allowed researchers to recreate a family tree for park bears. The study determined the number of *haplotypes*. Haplotypes are DNA indicators of relatedness. The more haplotypes in a population, the more genetically diverse it is. Tissue samples were taken from 144 bears in seven different populations from the Chisos and nearby mountain ranges in Mexico.

Of all bears studied, five haplotypes were identified. Big Bend bears included representatives of only two types. Interestingly, all Big Bend females and their offspring were of only one type. This indicates the Big Bend population could be descended from as few as one or two females. The same type was found only in bears from the Serranias del Burro Mountains, in Coahuila, Mexico. This confirms that the female founder(s) came from Northern Coahuila. The second lineage identified in Big Bend

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Official NPS Website



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was found only in adult males that were not offspring of resident females and were probably migrants born elsewhere.

Big Bend bears in the study were highly related. In fact, the northern Tex/Mex population includes fewer haplotypes than reported in any other regional black bear population. This may not necessarily be a cause for alarm. Park bears appear to be relatively mobile. During last year's drought conditions, the majority of park bears migrated back to Mexico and later returned after the rains came. This migration to and from Mexican mountains, if uninterrupted in the future, should ensure the genetic health of the park population.

More than anything else, these results prove the importance of each isolated "island" population to the future of the Tex/Mex bear population. To maintain the small, isolated populations in Big Bend and Mexico, protection is required and bear movements must not be impeded by human activity and development. Results from this study will help Big Bend National Park successfully provide a home for bears long into the future.

Live Park Webcam

A new view every 15 minutes!

Magnificent sunsets, fiery sunrises, and the continuously changing play of light on the Dead Horse 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.

Although invaluable in bringing Big Bend's scenery into your home, the purpose of this

webcam goes way beyond just providing 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.

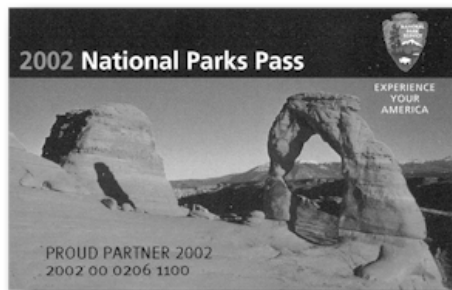
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365 DAYS - 385 WAYS

The National Parks Pass costs just \$50 and covers entrance fees into all National Park Service areas for 12 months from the date of purchase.



Get Your Passports Here...

Already paid \$10 to enter Big Bend NP? You may exchange your current valid entrance receipt for a variety of passports:

All U.S. citizens aged 62 or older are eligible for the **Golden Age Passport** which costs \$10 and allows free entry into all National Park Service areas and 1/2 price camping.

If you visit Big Bend several times each year, you may want to consider purchasing a **\$20 Big Bend Annual Pass** which covers all entrance fees to Big Bend National Park for 12 full months.



Back From the Brink

Wetland Project Restoring Vital Habitat



Park elementary school students planting native grasses at the restoration site

The Big Bend mosquitofish (*Gambusia gaigei*) is not a particularly impressive fish at first glance. This small, minnow-sized creature seems rather ordinary. Nothing could be further from the truth, however. The mosquitofish is actually an endangered species whose only habitat in the wild is a few warm-water springs at Rio Grande Village in Big Bend National Park. No where else in the world is this animal found naturally.

So precarious is its existence, that at one point the entire mosquitofish population was down to just three individuals. The fight to save this special fish has been going on for decades, culminating in a current habitat restoration project that will hopefully increase its chances for survival.

The decline of the mosquitofish can be attributed to both natural and human-caused factors. Scientists think the fish thrived long ago when Big Bend had a much wetter climate. As this area dried out over time, its habitat was severely limited. Early farming efforts before the park was established also contributed to the decline. Crop fields, irrigation ditches, and roads eliminated the wetland habitat. Even early Park Service practices hurt the situation with the development of paved roads, a picnic area, and a maintenance yard in prime mosquitofish habitat. It wasn't until the 1960's that the Park Service realized that the mosquitofish was on the verge of extinction and began efforts to save it.

Today, a 10-acre wetland area containing two springs, runoff

channels, a beaver pond, and two constructed ponds constitutes the core mosquitofish habitat. The fragile fish are highly adapted to warm water spring conditions not found in other water sources of the region. It is essential to restore and enhance as much available habitat as possible. To that end, in 1999 Big Bend began a wetland restoration project funded by the

National Park Service Water Resources Division. The primary goal of the project is to increase surface spring water to provide additional mosquitofish habitat. To do that, the park began by removing an asphalt road and picnic area and recontouring the soil to better retain water. A water pipeline, power line, and a maintenance facility were

also relocated out of the wetland area. Aerial photos, detailed topographic mapping, and soil analysis were key to understanding the former extent of the wetlands and determining the scope of the current project.

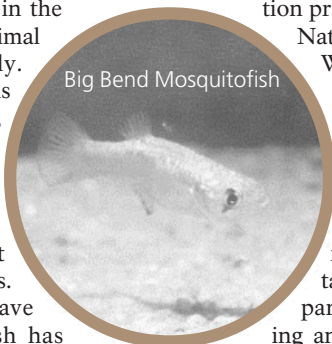
The next phase in the habitat restoration is revegetation. This includes transplanting plants from nearby areas and also growing new plants from seed. The park elementary school operates a greenhouse to propagate native plants for restoration projects and has played an integral role in the wetland revegetation effort. For this project, transplants include wetland grasses, cottonwoods, willows, baccharis, and cattails. In addition to replanting, non-native plant species like tamarisk, palm trees, buffelgrass, and rabbit's-foot grass must be removed to avoid over-running the native species. Dense thickets of

thorny mesquite bushes, another result of pre-park agricultural practices, are being thinned through active removal and prescribed burning to allow the re-establishment of wetland grasses.

Thus far, the wetland resto-

ration project has been very successful and the park has great hope for expanding the mosquitofish habitat in the future. Threats to the fish still abound, however, and constant vigilance is required to keep them safe. Because the population is so small and clustered, a seemingly minor environmental change could exterminate the species from the wild. Because of its highly endangered status, the park must continue to be actively involved with the Big Bend mosquitofish. Habitat restoration is an important part of providing sanctuary for the continued recovery of a species that is trying to return from the very brink of extinction.

by Park Ranger
Gail Fox



Big Bend Mosquitofish

...at one point the entire mosquitofish population was down to just three individuals.

The Chisos Chirper

Following an afternoon rain, the thunder rolls away and the warm Big Bend night fills with a symphony of chirping sounds.

In the Chisos Mountains, this chirping noise may not only be the sound of insects, but may also be the territorial and mating call of the elusive spotted chirping frog, *Syrrophus guttillatus*.

This small frog spends most of its life nestled deep inside rock crevices where it finds pockets of moisture. With a somewhat flattened head and body, this frog can really squeeze deep into remote cracks and out of the hot sun. Unique among park amphibians, this frog develops from tadpole to adulthood within the protection and moisture of its egg membrane. This direct development allows the frog to be independent of water sources. It is an ideal adaptation for the dry conditions of Big Bend National Park.

Although this spotted chirping frog has historically been considered a relict species, recent research may prove otherwise. A relict species is one that once had a larger distribution due to a past climate that was quite different than the present one. Eight thousand years ago, the climate of Big Bend was wetter and cooler than it is today. As the area gradually warmed, plants and animals that were better adapted to the cooler conditions were restricted to higher elevations. The spotted chirping frog, the quaking aspen, the Douglas fir, and the Carmen Mountain white-tail deer are examples of relict species found in the Chisos Mountains.

Since the spotted chirping frog is also found in the mountains of Durango, Mexico, it is thought that the distribution of the spotted chirping frog once extended to the lower elevations that joined these two mountain ranges. However, there has been recent speculation that the frogs in the Chisos may not be *Syrrophus guttillatus*, but actually the mottled cliff chirping frog, *Syrrophus marnockii*, commonly found throughout the Texas hill country. At the moment, researchers are looking at the similarity of the calls, the genetic makeup, and the morphology of the animals to consider the relationship of the frog to either species.

Regardless of the name, this chirping frog is one of many reasons why the Chisos, a mountain island in a desert sea, is a valuable outdoor laboratory for further research, and a valuable refuge for relict species.

by Park Ranger
Angelina Yost



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. If you encounter a lion, we suggest:

DON'T RUN!

- 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 sightings to a park ranger.



Like all predators, 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.



Big Bend Bears

Living Safely with 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 throughout 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. Park staff 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 other national parks destroy several bears each season; we hope that through educating park 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 at left in the "Living With Bears" box. 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.

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Living With Bears

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 odorous food and toiletries.
- Leave excess food and beverages in your trunk or food storage box if not taking them with you.
- Carry out all trash, including orange peels, cigarette butts, and left-over food.



Regulations are strictly enforced!



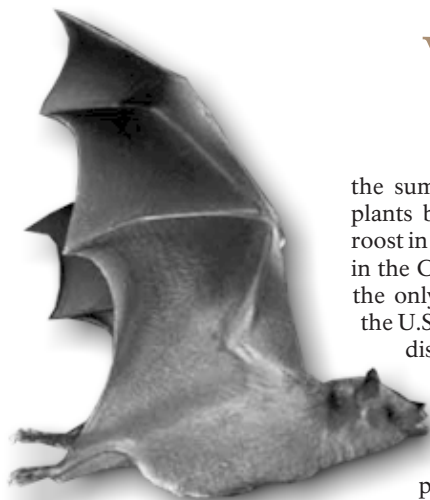
If you see a bear...

- Keep a safe distance.
- Do not approach, follow, or feed a bear.
- If a bear approaches, scare it away by shouting, waving arms, or throwing objects.
- Look for cubs. If present, back away slowly.
- Report all bear sightings and incidents to a Ranger.



Wings in the NIGHT

Rare bats depend on Big Bend NP



Big Bend National Park is home to more species of bats than any other national park. In fact, almost half of the 45 species of bats found in the U.S. can be found here. Many are fairly numerous, easily seen and sometimes even heard as they fly on warm nights. Of the twenty species of bats found in Big Bend National Park, three are of special concern to researchers. Park staff and bat biologists pay close attention to Mexican long-nosed bats, Townsend's big-eared bats, and western yellow bats.

Nectar Lovers

Mexican long-nosed bats (*Leptonycteris nivalis*) are federally listed as an endangered species because of the threats they face in Mexico, where people often disturb or even destroy their roosting caves in misguided attempts to eradicate vampire bats. Confusing these harmless nectar-feeding bats with vampires, people there often kill these bats and other beneficial bats. Loss of food sources also imperils the long-nosed bats, as people harvest century plants, the bats' primary nectar source, for human and livestock consumption.

Mexican long-nosed bats are the only nectar-feeding bats found in Big Bend National Park. They are the primary pollinators of the park's century plants, since they carry pollen from flower to flower as they feed on the rich nectar. Researchers estimate that without these bats, century plant reproduction in the park might drop to 1/300 of what it is today. Century plants play important roles in the high desert ecosystem; in addition to providing food for the bats, they also provide food and shelter for numerous species of insects and birds. None of these things would be possible without the nectar-feeding bats and their pollination services.

Long-nosed bats visit Big Bend National Park only during

the summer, when the century plants bloom. While here, they roost in a single large crevice high in the Chisos Mountains. This is the only known roosting site in the U.S. Protecting this site from disturbance is vitally important to the survival of the bats, the century plants, and everything else that depends on the century plants for survival. Park staff monitor both the bats and the century plants each summer, trying to estimate the status of the bats and the food available to them.



Bat Gate over a deep shaft at Mariscal Mine

A Maternity Ward

Townsend's big-eared bats (*Corynorhinus townsendii*) are found throughout Big Bend National Park. These bats are highly sensitive to disturbance. If awakened during their hibernation, they will use up vital body fat necessary to their winter survival and may starve to death before spring. Any disruptions to maternity colonies may even cause females to abandon their offspring.

One of the largest maternity colonies in the entire U.S. exists deep within the shafts and tunnels of the Mariscal Mine. In the late 1970s, park staff began to close many of the mine entrances with fencing to protect adventurous park visitors from unstable walls, deep pits, and mercury dust, but little thought was given to the bats that relied on the mines for roosting. Poorly designed closures made it difficult for bats to enter and exit their roosting sites.

Bat Gates

In the early 1990s, park management recognized the need to change the closures on the mine shafts to improve both visitor safety and bat access. Park staff worked with bat biologists to de-

sign and install "bat gates" across the multiple entrances of this mine. These gates prevent humans from entering, but allow the bats to fly in and out relatively unimpeded. These were among the first bat gates installed in any national park, and they serve as an excellent example of both visitor and resource protection.

A New Arrival

The **western yellow bat** (*Lasiurus xanthinus*) has only recently been found here. Its traditional range is in western Mexico and southern parts of Arizona and

Western yellow bats, however, prefer to roost under the dead hanging branches of palm trees. Here in Big Bend National Park, these bats have switched to roosting under the dead hanging leaves of yuccas. These bats seem to have adapted quite well to using yuccas in place of palm trees.

The presence of this new bat species in the park leads researchers and park staff to wonder what prompted these animals to expand their range into this area. Perhaps their numbers have increased beyond what their traditional habitat can support, so they are searching for new suitable habitat. Perhaps their habitat is declining due to development, prompting them to flee that area and resettle into marginal areas in west Texas. It has even been suggested that global warming will cause an increase in the number of tree-roosting bats moving into west Texas.

There is still much that we don't know about some of these rare bats. Their nocturnal activity, their hidden roosting sites, their migratory habits, and the challenging terrain in which they often live make them difficult to study. Here in Big Bend National Park, all three of these bat species can find the necessary food, shelter, and other habitat components that they need to survive. Outside the park, where they may be subject to disturbance and loss of habitat, they face a more uncertain future.



by Park Ranger

Mary Kay Manning

with special thanks to Mike Dixon, Loren Ammerman, and Brian Keeley

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
yearly average:	79/47	15.34"

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



Seeing The Park

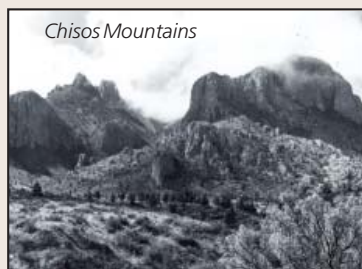
Now That You're Here, What Can You Do?

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.

Here are some suggestions for seeing the park if you have only a limited amount of time to enjoy Big Bend.

One Day

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.



Chisos Mountains

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

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 pro-



Rio Grande Village

gram. 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 an overlook of the small village of Boquillas, Mexico, and to the border crossing. At the end of the road is the **Boquillas Canyon Trail**, which takes you to the entrance of this spectacular canyon.

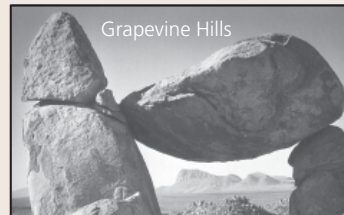
One Week

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 the 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.



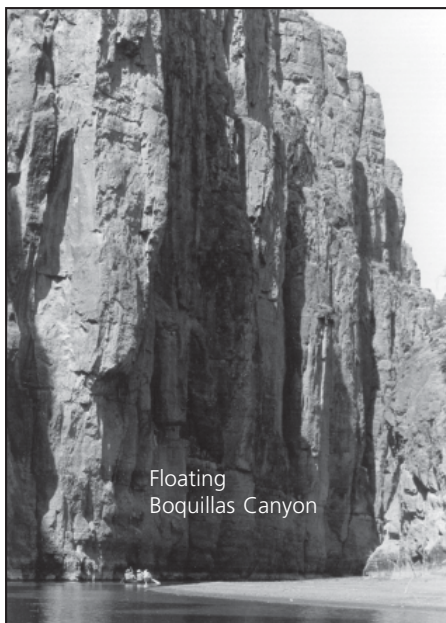
Grapevine Hills

Float the Rio Grande

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 ex-



tended seven-day excursions. Park Rangers can recommend a trip that meets your abilities and interests. Rafting and equipment rental companies are listed on page 15. See "Backcountry Planning" on page 13 for additional information on river trips.



Floating Boquillas Canyon

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 is also a good way to learn more about Big Bend; check at the visitor centers and park bulletin boards for current activities.

Remember, you don't have to see everything 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 to see the rest!



Take A Hike!



Big Bend Trails

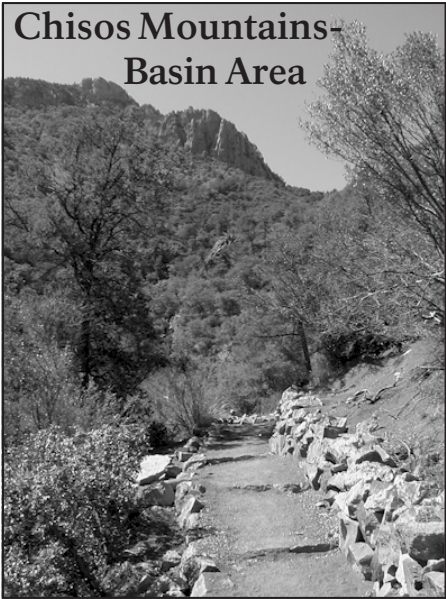
Experience Your America!

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. Whatever your style of hiking, you can find it in abundance in Big Bend.



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.



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 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. On the return trip, hike .25 mile along the Oak Spring Trail for one of the park's best views.




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)

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. Take a bathing suit and soak a while.	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

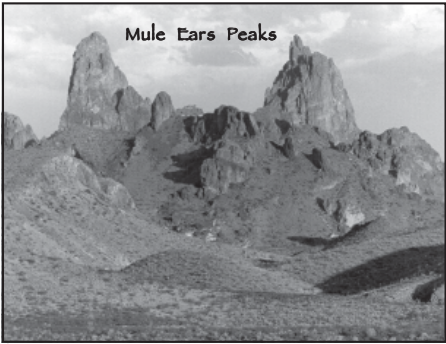



Ross Maxwell Scenic Dr. - Castolon Area

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 viewpoints and desert hikes are along this road.

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 (at Burro Mesa Road)
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 descends along the river into a magnificent 1,500 foot deep limestone canyon.	8 miles west of Castolon

Conservation Alert

Look... But Don't Touch

Disappearing Cactus

With a plethora of user-unfriendly characteristics, logic would lead us to believe that cacti would be pretty low on the popularity scale. However, come spring, even the homeliest cacti undergo a sensational transformation, making even the most botanically apathetic visitor stop and take notice. . . they flower! Exquisite blossoms attract not only pollinators, but also visitors from every state. Park visitation increases drastically during the March and April flowering season, stretching ranger resources to the limit. Unfortunately, many of the park's cactus species are vanishing. Why?

Many reasons contribute to disappearing cactus. Encroachment by exotic plants minimizes the amount of space cacti have within their ideal habitat. Trespass livestock can trample and destroy the delicate soils, sometimes leaving entire areas barren. Desert organisms are particularly sensitive to changing environmental conditions. When external factors stress an already restrictive habitat (try surviving on ten inches of rain a year or less), the "fabric" that holds the system starts to unravel and the ecosystem deteriorates. Plants vanish. Animals perish. The desert, as we know it, dies.

The main threat faced by some of Big Bend's cactus species is poaching. Cacti are more vulnerable to theft than other plant species because whole individuals are easily transported

from the ground into backpacks, boxes, or bags. Removed from their desert environment, all dug up cactus will eventually die. Big Bend's rare cacti are highly prized by collectors, not just for their aesthetic value, but also *because of*

that they are likely to suffer the danger of imminent extinction within the foreseeable future. The rarest cactus in Big Bend is the **Chisos Mountain Hedgehog**. Found nowhere else in the world

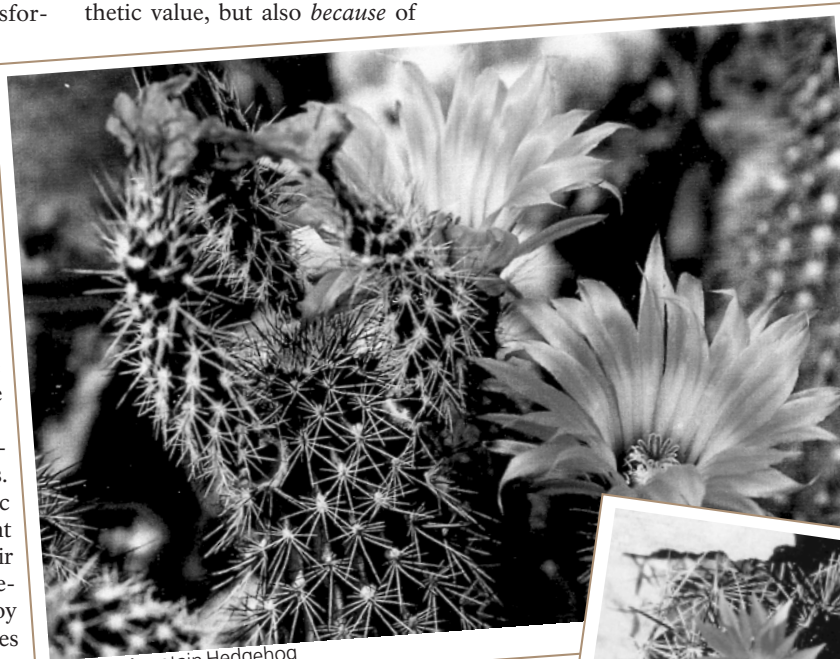
times, and the impact becomes monumental.

What does the park do to control cactus poachers? Big Bend is 1,252 square miles of some of the most remote and rugged land in the U.S.. We do our part by preserving and protecting the fragile desert habitats in which rare cacti species live. We also expect visitors to share the responsibility of maintaining the integrity of *their* national park by reporting suspicious activity, and by not taking part of the park home with them.

Preservation of natural habitat is the best way to protect threatened and endangered species; but what if these species continue to disappear? National Parks have become

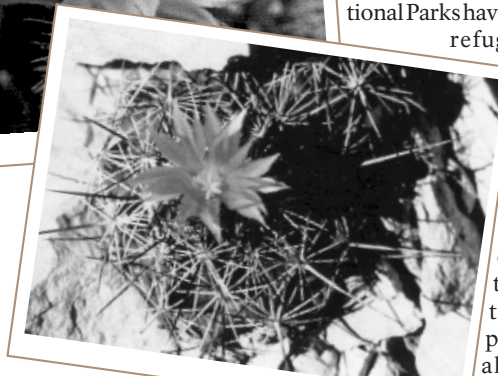
refuges for

many organisms living on the brink of extinction. National parks have also become living laboratories



Chisos Mountain Hedgehog

For every individual cactus taken out of the park, we get a little closer to losing that species forever.



Bunched Cory

their rarity. The rarer the cactus, the higher the price. Unfortunately, rarity is also associated with the danger of extinction. During the 1970s and 80s, widescale, systematic collecting on private ranchlands denuded many areas of cactus. Freshly dug piles of cactus representing every species within 100 miles were a frequent sight along local roadsides. Individuals sold for .10 cents and wholesale prices were listed per thousand. Today, with increased awareness and protection, the cactus harvest is not as blatant-but still continues.

Within Big Bend National Park there are three species of cactus listed as *threatened* under the endangered species act. This means

but for a few locations in the park, this species usually grows under creosote bush and is hard to find. This natural camouflage vanishes when the magnificent pink blossoms appear-usually during spring break-the *busiest time of the year*. Every year, a few more Chisos Hedgehogs end up in the clutches of cactus poachers.

Two other threatened cacti, **Lloyd's Mariposa Cactus** and **Bunched Cory Cactus**, are also targeted by cactus hobbyists. Both were once very common throughout the Big Bend country on limestone soil. Today, rampant overcollecting has reduced their populations to protected lands within Big Bend National Park and the Black Gap Wildlife Management Area.

For every individual cactus taken out of the park, we get a little closer to losing that species forever. Perhaps it seems like the loss of one or two won't do irreparable damage to the desert ecosystem. However, in nature, nothing stands alone. By removing *one* cactus plant, we delete: one source of food, one source of shade, one source of moisture, one habitat for small organisms, one topsoil stabilizer, and one intrinsic part of the desert ecosystem. Multiply this a thousand

ries for the study of endangered species. However, simply creating protected areas does not guarantee survival for the organisms that live within. Through interpretive programs and park literature, we are attempting to instill a sense of urgency in our visitors: extinction is *now* and extinction is *forever*.

Please help us maintain our fragile Chihuahuan desert ecosystem by not removing any of the plants and animals that live within, and by taking the time to teach your children, and your children's children, that life is irreplaceable. So look, but don't touch, and with your help we can preserve Big Bend National Park's uniqueness in its original state, one spiny, flowering cactus at a time.

by Park Ranger
Sharon Collyer

WANTED



CACTUS RUSTLERS!

EACH YEAR, LARGE NUMBERS OF CACTUS AND OTHER PLANTS ARE

STOLEN

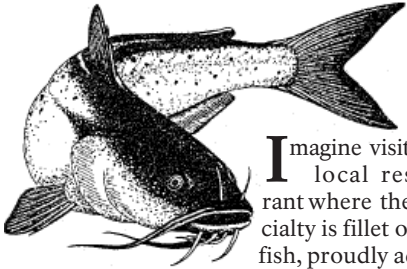
FROM BIG BEND NATIONAL PARK. HELP US STOP THE LOSS OF IRREPLACEABLE DESERT PLANTS...

REPORT CACTUS THIEVES TO A PARK RANGER AT ONCE!

Local nurseries sell native desert plants. If you would like to legally acquire desert plants, ask at a visitor center for more information.



River Ecosystems



Imagine visiting a local restaurant where the specialty is fillet of catfish, proudly advertised as, "Local fare, straight out of the Rio Grande!" Would you be inspired to order? Not many people get excited about eating anything that comes out of this river, much less jumping in for a swim. Are these fears really grounded in fact? According to the data, the Rio Grande has been on a downslide for decades.

During bygone days, the Rio was a dynamic river, experiencing high floods during the rainy season. This created fertile bottomlands and diverse riverside habitats. Beginning in the 1950s, large dams were built to satisfy irrigation and human consumption demands. These blockades reduced the wide range of flows and nutrients, altering the conditions that native species had adapted to. Consumption demands have only increased, turning the Rio Grande into more of an irrigation canal than a natural free-flowing river.

Beginning in 1994, the watchgroup American Rivers officially began rating the Rio Grande as an endangered river, citing several threats: land development, excessive diversion and overuse of water, agricultural runoff, mine waste, and industrial pollution. Today, the only water that flows downstream of El Paso is irrigation runoff and discharges from city wastewater treatment plants. This water, though wet, is not necessarily helpful; it is highly concentrated with chlorides and other salts.

Sometimes the river below El Paso is nothing more than a dry wash. Where does the water come from that flows through the park? It is mostly from the Rio Conchos which originates in the mountains of Chihuahua, Mexico, and enters the channel of the Rio Grande near Presidio, Texas. This river has also been reduced due to growing agricultural and municipal use in Mexico. Where does that leave the quality of our National Park waters? Believe it or not, this is the light at the end of the gloomy tunnel.

Anyone who is familiar with the Rio Grande will tell you that the stretch between Presidio and Langtry (*through the park*) is the healthiest part. The Rio Conchos, although far from pristine, provides dilution for the concentrated trickle out of El Paso and points north, and numerous fresh water springs in the Lower Canyons of the Rio Grande Wild

and Scenic River contribute even more. The isolation and remoteness from pollution sources contributes to better water quality. Part of that remoteness comes from having such a large area of land protected under state and federal law.

The National Park Service mission is to preserve and protect resources undisturbed for future generations. This ensures that the river here will ideally be protected from future human-induced degradation. This doesn't mean that everything is perfect here—there are several fish, mussel, reptile, and amphibian species federally listed as threatened, en-

dangered, or are under review for these designations. There are even extirpated species, or ones that once lived in these waters but are now only found elsewhere.

Protecting

what river habitat is left can provide species with some stable foundation. The Blue Sucker, *Cyprinostomus elongatus*, for many years was considered a species of concern and probably headed for the endangered species list. Recent studies, however, discovered abundant populations of this fish in the Lower Canyons, more than anyone would have imagined. This provides hope that not all is lost and more may be surviving than we have research dollars to discover.

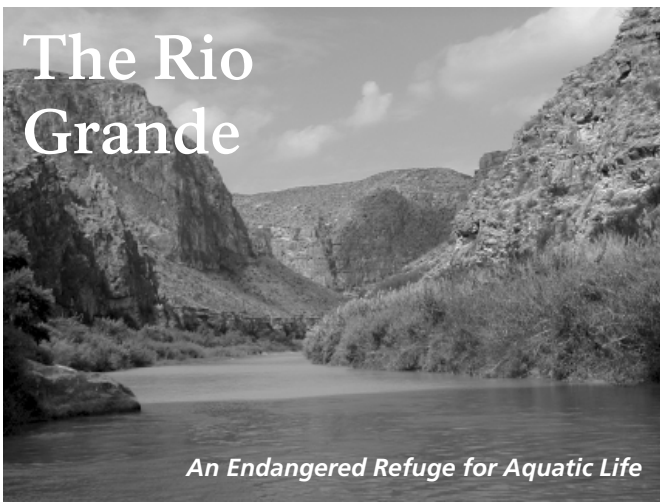
This protected stretch of river also provides hope for extirpated species. Just as the Mexican Black Bear recolonized Big Bend's mountains, the river habitat within the park may provide other once-resident species with a future home. The Silvery Minnow, *Hybognathus amarus*, was last seen here in the 1960s. Today, the only known population is in New Mexico. This population is currently being temporarily removed from the river when water levels become too low to support the fish. Big Bend may be an ideal spot to reestablish this species.

With ever-increasing competition between humans and our wild counterparts, maintaining suitable habitat for all is becoming more difficult. As systems like the Rio Grande become more and more degraded we need to act. If maintaining a functioning ecosystem is a priority, we should identify appropriate sites where not only endangered species can recover but where all natural inhabitants can find their niche and thrive. National and State protected lands may be the best hope for conserving suitable habitats. We can all take part in protecting and conserving our future by understanding and supporting our land management agencies in these efforts.



by Park Ranger
Joselyn Fenstermacher

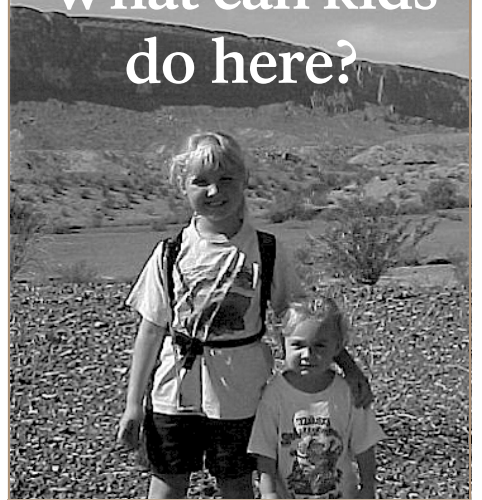
The Rio Grande



An Endangered Refuge for Aquatic Life

Kids

What can kids do here?



Become a Junior Ranger!

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 certificates.

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

Hike a Trail!

Many park trails are suitable for families. Consult the "Easy and Moderate Hikes" chart on page 9. For children in strollers, consider the Window View Trail, a paved ¼-mile loop trail that begins at the Chisos Basin trailhead.

Big Bend is a special place! We hope you enjoy Big Bend National Park and that you learn to value its resources. If you have any questions, ask a park ranger for help.

Safety Concerns for Parents

Mountain Lions

Because Big Bend is mountain lion country, it's important for parents to keep close watch over their children. Lions are most common in the Chisos Mountains, but have been sighted at all elevations and could appear anywhere. While lions are rarely a threat to adults, young children who are unaccompanied by adults could be in danger.

Require your children to walk with adults, rather than by themselves. If you see a lion, pick up your smallest child. Keep all your children with you and stand as a group. **DON'T RUN!** Shout and wave your arms above your head. Mountain lion sightings are unusual and exciting, and most people see lions while travelling in their cars. However, be sure you talk to your children about safe behavior before you begin hiking or exploring the park.

Swimming

The Rio Grande is a surprisingly strong river with unseen undertows and debris on the bottom. Swimming is not recommended. Stay with your children as they explore the river shore, make them keep their shoes on, and don't let them drink the river water.

Please see page 14 for additional safety information.



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.

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. Small bills are also advised if you plan to travel to the nearby Mexican villages.

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 \$8.00 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.

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

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



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, full-hookup campground 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 are taken.

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.

Bird Watching

With its proximity to Mexico, diversity of habitat types, location on a major migration path, 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 the last two weeks of April and the first week of May. In this rush of birds

are many 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 migrants come the occasional rare and accidental species who have wandered, or are pushing the extreme edge of their normal range. To observe the many 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.

The park bird checklist is a valuable tool in figuring out where to look. 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 the Chisos Basin*) is another productive habitat, particularly for acorn woodpecker, Mexican jay, and tufted 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.

While you are enjoying the birds, keep in mind that many of the migrants you may observe are members of populations in decline. Beset by habitat destruction on both the wintering and breeding grounds, and critical stopover areas along the migratory path, these birds that bring us so much pleasure could soon fade from our skies. You can help: tread softly and don't damage water sources; don't disturb nesting birds with noise or intrusive attempts at photography. Share your observations with us, particularly of rare or accidental species. Your detailed reports become part of the record and may aid researchers. Enjoy the birds of spring, and help us ensure their return next year.



Cottonwood Campground

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.

Park Campgrounds

	Elevation	# of Sites	Cost Per Night	Facilities	Registration
Chisos Basin	5,401 ft	65	\$8.00*	Flush Toilets, Dump Station	Self-pay station
Cottonwood	2,169 ft	35	\$8.00*	Pit Toilets, No Generators	Self-pay station
Rio Grande Village	1,850 ft	100	\$8.00*	Flush Toilets, Dump Station	Self-pay station
Rio Grande Village RV	1,850 ft	25	\$14.50	Full Hookups	Inquire at RGV Camper's Store

* 50% discount 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, Southwest 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 (915) 477-1158.

Hiking and 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.

You may purchase maps and hiker's guides at park visitor centers, or you may order them in advance from the Big Bend Natural History Association by calling (915) 477-2236.



Pets are not allowed on trails or in backcountry 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 10.

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.

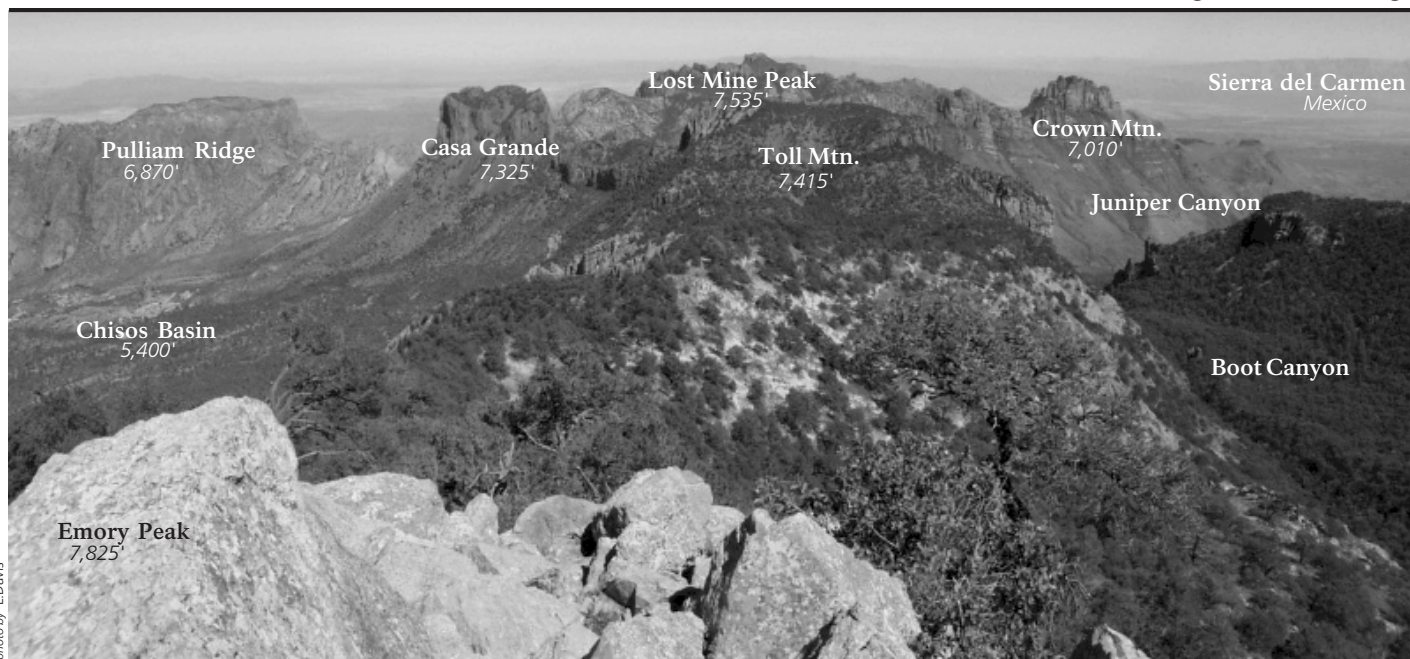
If you plan to take a river trip in Big Bend National Park, you may bring your own equipment, or you can hire a guide service. Four local companies (see page 15 for telephone listings) provide guide service in the park—you may reserve a trip by contacting them directly.



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 (915) 477-2236 or visit the ir online internet bookstore at www.bigbendbookstore.org



Top of the World: View from the summit of Emory Peak

photo by L.Davis



Safety Tips

Reading This Could Save Your Life!

Safety is the Starting Point for a Great Visit

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.

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.

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.

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.

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.

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.

Big Bend truly is wild country. In fact, many people visit Big Bend precisely because it is 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!

National Park Service
U.S. Department of the Interior
Big Bend National Park



Javelina are wild and can be dangerous...

Never Feed A Javelina!



Regulations are strictly enforced!

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.

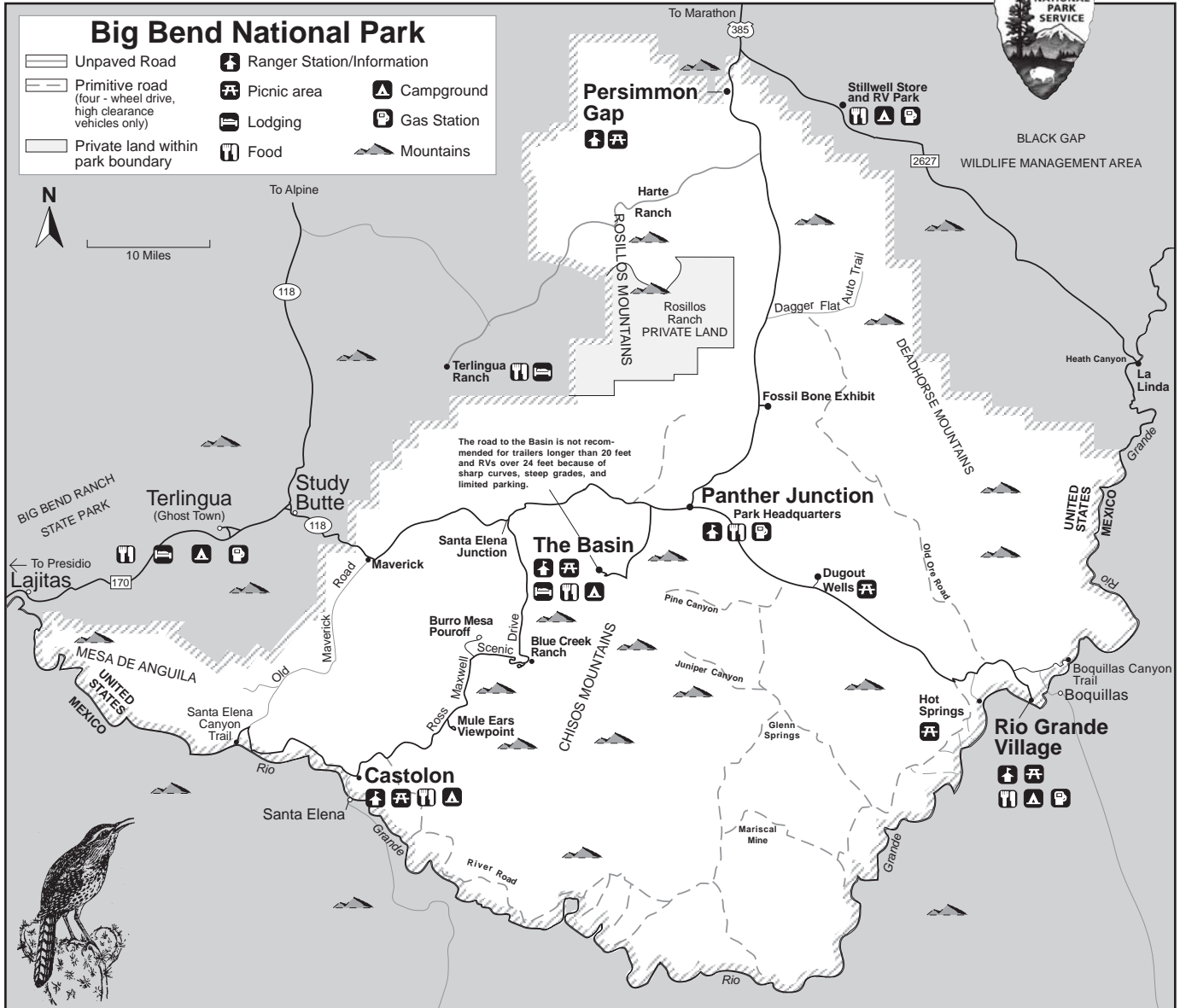


Pet Owners:

Keep your pet on a leash (or in a cage) at all times. Never leave them unattended at any time. **Predators such as owls, coyotes, javelinas, and lions CAN and DO kill pets here.** Even large dogs cannot defend themselves against 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.



Local Facilities & Services



Inside the Park (Area Code 915)

Reporting Emergencies Parkwide Call 477-2251.

After the automated system answers, press 9.

If no answer, please hang up and call 911.

National Park Service

General Information 477-2251

Big Bend Natural History Association

Seminar programs and book sales 477-2236

Visitor Centers and Ranger Stations

Castolon Ranger Station 477-2225

Chisos Basin Visitor Center 477-2264 or 477-2392

Panther Junction Visitor Center 477-1158

Persimmon Gap Visitor Center 477-2393

Rio Grande Village Visitor Center 477-2271 or 477-2356

Lodging

Chisos Mountains Lodge (Chisos Basin) 477-2291

Campgrounds

Rio Grande Village, Basin, and Cottonwood (NPS operated)

Rio Grande Village RV Park (full hookups required) ... (concession operated)

..... All are operated on a first come, first served basis

Restaurants

Chisos Mountains Lodge (Chisos Basin) 477-2291

Park Gasoline Service

Panther Junction (also diesel) 477-2294

Rio Grande Village (also propane) 477-2293

Tow Service 477-2291

Campground Stores

Rio Grande Village 477-2293

Chisos Basin 477-2291

Castolon 477-2222

Medical Services (outside the park)

Terlingua Medics (business #) 371-2536

Big Bend Family Health Center (Study Butte) 371-2661

Big Bend Regional Medical Center (Alpine) 837-3447

Banking Services (outside the park)

Quicksilver Branch Bank & ATM, Terlingua 371-2211

Kennel Service (outside the park)

Terlingua Creek Kennels 371-2348

Guide Services (outside the park)

Big Bend Touring Society, Terlingua 371-2548

Texas Jeep® Expeditions 371-2633 or 1-800-839-7238

Texas Jeep® Rentals, Terlingua 877-839-JEEP

Outside the Park (Area Code 915)

Lodging (Call ahead for reservations)

Badlands Hotel, Lajitas 424-3471

Big Bend Motor Inn, Study Butte 371-2218 or 800-848-BEND

Easter Egg Valley Motel, Study Butte 371-2254

Gage Hotel, Marathon 386-4205

Heath Canyon Ranch, FM 2627 376-2235

Longhorn Ranch Motel, Hwy 118 371-2541

Marathon Motel, Marathon 386-4241

Terlingua Ranch Resort 371-2416

Camping

Big Bend Ranch State Park, Lajitas 424-3327

Big Bend Travel Park, Study Butte 371-2250

Bj's RV Park, Terlingua 371-2259

Easter Egg Valley Motel 371-2254

Heath Canyon Ranch, FM 2627 376-2235

Lajitas on the Rio Grande 424-3471

Ocotillo Mesa Scenic RV Park, Study Butte 800-729-1406

Stillwell Trailer Park, FM 2627 376-2244

Study Butte RV Park 371-2468

Terlingua Oasis RV Park (tents & cabins) 371-2218 or 800-848-BEND

Terlingua Ranch Resort 371-2416

Service Stations and Grocery Stores

Big Bend Motor Inn, Study Butte (gas & diesel) .. 371-2483 or 800-848-BEND

Lajitas Trading Post (gas) 424-3234

Stillwell Trailer Park, FM 2627 (gas) 376-2244

Study Butte Store and Station (gas, diesel & propane) 371-2231

Terlingua Auto Service, Study Butte (towing & repair) 371-2223

Rio Grande Float Trip Outfitters

Big Bend River Tours, Study Butte 371-3033 or 800-545-4240

Desert Sports, Terlingua 371-2727 or 888-989-6900

Rio Grande Adventures, Study Butte 371-2490 or 800-343-1640

TX River Expeditions/Far Flung, Study Butte ... 371-2633 or 800-839-7238

Equipment Rentals

Desert Sports, Terlingua 371-2727 or 888-989-6900

Rio Grande Adventures, Study Butte 371-2490 or 800-343-1640

Big Bend River Tours, Study Butte 371-3033 or 800-545-4240

Horseback Riding

Lajitas Stables, Lajitas 424-3238

Big Bend Stables, Study Butte 371-2212 or 800-887-4331

Spring Creek Remuda, 23 mi. south of Marathon 376-2260

Ben's Hole Creek Ranch, Terlingua 371-2954

(Calls to 371, 424, and 837 prefixes are long-distance)

