



FRIENDS OF CITY OF ROCKS NEWSLETTER
(Vol. 4, No. 1, Feb. 2020)
MISSION STATEMENT

The purpose of the Friends of City of Rocks State Park, Inc. (website: <http://www.friendsofcityofrocks.org>; e-mail address: friends@friendsofcityofrocks.org) is to help support the New Mexico State Parks in the enrichment of the park area. Specifically, the Friends aim to enhance, preserve and promote park use, to participate in nature as responsible stewards of the earth, to create an awareness of the wonder, fragility and importance of the park, to develop and improve existing education/interpretive programs, to develop and improve public awareness of the park, and to encourage public participation and/or membership in the Friends group.

BECOME A MEMBER OF THE FRIENDS!

Interested in helping out City of Rocks State Park? Consider joining the Friends. Typical Friends activities include highway cleanup, cutting and splitting firewood for sale to park campers, operation of a gift shop in the park Visitor Center, fund-raising, etc. To join, a) complete and send in the membership application form at the end of this newsletter, OR b) download, complete and submit a membership application from the Friends website (see above). NOTE: If you are already a member of the Friends, it is time to renew your membership! You can do so using the same form mentioned above.

FIREWOOD NEEDED!

Have a pile of logs you'd like to donate to the Friends to be cut, bundled and sold as firewood? This is one of our biggest moneymakers with all proceeds used to support park operations. Contact us at norrisw@wnmu.edu for more information.



UPCOMING EVENTS

[Day Use Fees Apply to All Events
Scheduled Inside the Park]

***PROTOCOL FOR ALL STAR**

PARTIES: Meet at the Gene and Elizabeth Simon Observatory in the Orion Group Area. Please arrive before sunset so you can familiarize yourself with the area.

Please watch for people walking down the road to the Star Party. If you have a flashlight, please make sure you have red cellophane or a red light on it. It helps with the light pollution. Parking is across the road at the vault toilet.

Note: All Star Parties are “Weather Permitting

Saturday, Feb. 15 2020. Field Trip: Bird Hike along Cienaga Trail (8:00 AM – 10 AM). Come hike the Cienaga Trail to look for quail, roadrunners, owls, hawks, wrens, thrashers, towhees and more. Hiking distance is approximately 2 miles along moderate, sloping terrain. Meet at the Cienaga Trailhead at 8:00 AM. Leaders: Karen Beckenbach & William (Bill) Norris.

Saturday, Feb. 22 2020. Star Party. Sunset is 6:03 PM, Program starts at 7:00 PM. Charles Turner is presenting.

Saturday, Feb. 29 2020. Field Trip: Winter Birds of City of Rocks State Park (9:00 AM – 11 AM). Event associated with the 8th Natural History of the Gila Symposium. Come hike the Cienaga Trail to look for quail, roadrunners, owls, hawks, wrens, thrashers, towhees and more. Hiking distance is approximately 2

miles along moderate, sloping terrain. Meet at the Cienaga Trailhead at 9:00 AM. Leaders: Karen Beckenbach and William (Bill) Norris.

Saturday, Mar. 21 2020. Star Party. Sunset is 7:23 PM, Program starts at 8:30 PM. Bill Nigg is presenting.

Saturday, Mar. 28 2020. Field Trip: Spring Flora of City of Rocks State Park (9:00 AM - noon). Co-leaders: Richard Felger and William (Bill) Norris. Meet at the Park Visitor's Center at 9:00 AM. Field trip co-sponsored by Friends of City of Rocks and the New Mexico Native Plant Society (Gila Chapter).

Friday, Apr. 10 2020. Friends Meeting, 7:00-8:30 PM on the Western New Mexico University campus (Harlan Hall, Rm 111). Program: “Moths of the Southwest” by Mr. Ron Parry. Refreshments will follow.

Friday, May 8 2020. Friends Meeting, 7:00-8:30 PM on the Western New Mexico University campus (Harlan Hall, Rm 111). Program: “Lichens of the Southwest” by Russ Kleinman. Refreshments will follow.

RECENT FRIENDS ACTIVITY

- Those of us who attended Vandy Starkweather’s fascinating presentation on “Light Pollution” at the Jan. 10 2020 meeting of the Friends were reminded how precious those clear skies are during monthly Star Parties. Please read her article on this topic later in this newsletter.

- Twelve people enjoyed a “Winter Botany” hike in the park, led by Drs. Richard Felger and Russ Kleinman, on Saturday, Jan. 18 2020.



Richard Felger and Russ Kleinman lead a Winter Botany hike at City of Rocks State Park on Sat., Jan. 18 2020. Photo by Susan Moseley.



Parry's Agave (*Agave parryi*), seen on winter botany hike at City of Rocks State Park (Jan. 18 2020). Photo by Susan Moseley.

- Six Friends (Rachelle Bergman, Susan Moseley, Steve Collie, Tim Geddes, Tony Mendoza, and William (Bill) Norris) worked at the park for several hours on Sunday, Jan. 19 2020 to wrap and deliver exactly 100 bundles of wood for sale in the Friends store.



Winter Botany hike at City of Rocks State Park on Saturday, Jan. 18 2020. Photo by Susan Moseley.



**NEW MEXICO'S DARK SKIES NEED
OUR PROTECTION**
by Vandy Starkweather

New Mexico has some of the darkest skies in the US. That darkness draws eco-tourism, promotes human and wildlife health, stimulates interest in astronomy, outer space and therefore science, and is

thus beneficial to the general population. Lack of awareness of the benefits of our dark sky threatens to degrade it through light pollution. If our dark sky is lost, it would be difficult to recover it, so raising public awareness is crucial to the dark sky's preservation.

New Mexico has a Night Sky Protection Act that requires all outdoor lights to be shielded to focus all light toward the ground, and prevent light from radiating upward toward the sky. However, this law is rarely enforced, and seems to be largely unknown. Businesses with bright glaring lights have often answered, "I didn't know there was such a law," and point to the permit that was granted by local government for those non-compliant lights. Raising public awareness will probably be more helpful toward keeping our skies dark than attempts to force businesses and homeowners to change their lights.

There are lots of reasons to encourage responsible lighting. When safety is a concern, such as lighting around homes and businesses intended to deter burglary, shielded lighting reduces glare and improves visibility. Have you had the experience where a bright light blinded you with its glare? It's harder to see if the light is too bright! Burglars can hide in the shadows created by harsh lights, but they are easier to see if the light is diffuse and covers the whole ground. Lights that are too bright along a highway cause glare and impair the vision

of drivers. Lights mounted horizontally on a business make it harder to see the actual building. Unshielded yard lights shine in to neighbors' houses, intruding on their lives, and they add to the sky glow. Sky glow obscures the stars, making the sky a gray haze instead of a glittering heaven. People who live in cities with light polluted skies never see the Milky Way, meteor showers or the constellations. So let's keep the sky dark! There are many fixtures available that will light a property in such a way that it can all be seen, but without invading the neighbors' homes or blinding passing drivers.

Thinking about human health, studies have shown that artificial light at night, shining into bedroom windows, for example, can disrupt circadian rhythms in people, resulting in drowsiness during the day, impaired driving, below standard work performance, debilitated social activities, and has been shown to weaken the immune system and has even been linked to some cancers.

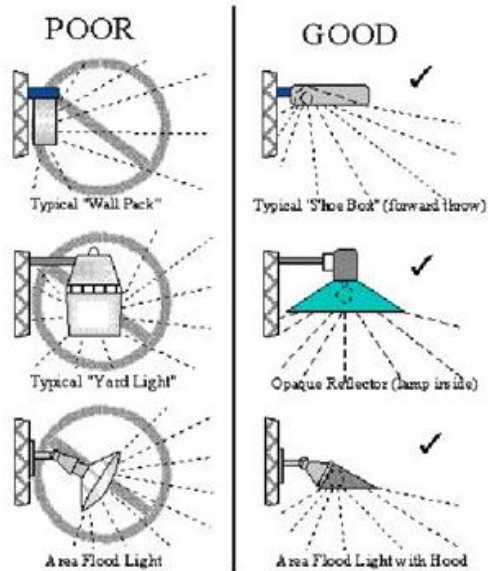
There is also a financial incentive. It has been estimated that 30% of outside light at night is wasted, either aiming at the sky or aiming horizontally where it is not needed, and being too bright. This is burning money, and benefits no one. Governments and private citizens can all save money by using light efficiently and economically.

Finally, New Mexico tourism brought in 7 billion dollars last year, which is very beneficial to our economy, providing jobs. Tourism guides emphasize New Mexico's beautiful night skies. For example, Lonely Planet says, "With the vast Gila National Forest, birthplace of Geronimo and a wonderland for wilderness backpackers on its doorstep, Silver City is once again firmly on the map." Wilderness needs a dark sky, and New Mexico tourism benefits from a dark sky.

So let's keep those skies dark! Please consider installing shielded lights on your own property, and encourage our local businesses to do the same.

Lamps

EXAMPLES OF SOME COMMON LIGHTING FIXTURES



IDA in Partnership with NOAO, NSF and IYA
Dark Skies Awareness

Reprinted with permission

CREOSOTEBUSH IS THE DESERT!

by Richard Felger. Herbarium, University of Arizona. DesertFoodPlants.org

Larrea is a genus of five species of shrubs, four in South America and one in North America. It was named in 1800 by Antonio José Cavanilles in honor of Juan Antonio Hernández Pérez de Larrea (1731–1803), bishop of Valladolid, botanist, and director of the Sociedad Económica de los Amigos del País. *Larrea* is a member of the caltrop family (Zygophyllaceae).



Larrea tridentata, growth form, photo by Russ Kleinman with Richard Felger, Burro Mtns., Engineer Canyon, Dec. 29 2008

The North American species is *Larrea tridentata*, creosotebush. Common names in Spanish include *hediondilla*, because the plants are smelly (*hedionda*), like a little stinker, and *gobernadora*, for governor. *Larrea* is South American in origin and two of them, *L. divaricata* in South America and the similar appearing *L. tridentata* in North America, are the most characteristic plants of the North and South American deserts.

These shrubs are highly aromatic and long-lived, multiple-stemmed, and trunkless with very hard, brittle wood. The slender stems have swollen nodes marked by dark rings or bands formed of resin secreted by stipules. (Stipules are moderately expanded, small structures derived from the leaf bases.) Young stems and leaves produce small white hairs that become submerged in gummy, varnish-like glandular exudate, the exudate especially thick and viscid during dry seasons.

Differences in leaflet shape and pubescence for North and South American populations have been reported, but the variation seems influenced at least in part by environmental conditions. Variation in stipule shape is a feature by which the North and South American populations can be distinguished. These resin-producing structures are evolutionary important in arid lands where there is intense herbivore pressure.



Larrea tridentata, 2x macro triangular stipules, photo by Russ Kleinman with Richard Felger, Burro Mtns., Engineer Canyon, Dec. 29, 2008

There has been controversy over the taxonomic rank of the North American *Larrea*. Most botanists confine *Larrea divaricata* to South America and call the North American plants *Larrea tridentata*. Morphological and molecular data confirm that they are closely related. Because of their similarities, Felger treated the North American population as *L. divaricata* subsp. *tridentata*. A case could be made for recognizing the *tridentata* taxon either as a subspecies or distinct species, although current consensus recognizes the two as separate species.

The leaves are opposite, often about one centimeter long, stalkless, and with a pair of leaflets united at their broad bases, which might be mistaken as a simple leaf. Stipules, structures 1–2 mm long at the leaf bases, are of evolutionary significance. The stipules are triangular and stuck to the stem by sticky glandular exudate and remain after the leaves fall. Young stipules at the stem tips enclose next emerging leaf and stem bud, providing protection from desiccation and herbivores (primarily insects).



Larrea tridentata, 1x macro of bifoliate compound leaf with two small pubescent leaflets fused at the base, photo by Russ Kleinman.

The flowers are bright yellow, 2.5–3 cm wide, and have 5 sepals and 5 petals. The petals are held perpendicular like propeller blades. The 10 stamens at first hang down and soon stand up, each with a prominent scale or appendage, which forms a cup holding nectar. The nectar is the reward for insects providing pollination services.



Photo of *Larrea tridentata* by Sue Carnahan, taken in Guaymas, Sonora, on 21 Jan 2020

The fruits, covered with silky white hairs, appear as fuzzy white balls with five one-seeded parts (mericarps), each less than one cm long, which separate at maturity. The seeds are 3.5–5 mm long and not sticky.



Larrea tridentata, closeup of fruit, photo by Russ Kleinman with Richard Felger, Burro Mtns., Engineer Canyon, Dec. 29, 2008.

To germinate the seeds, soak them within the mericarps in water for one or two days, changing the water several times. Rootlets (radicals) emerge in about a day. Seedling die-off is a common problem.



Larrea tridentata, 2x macro of single mericarp, photo by Russ Kleinman with Richard Felger, Burro Mtns., Engineer Canyon, Dec. 29 2008.

Symbiotic soil fungi, the mycorrhizal association, are important, so you should use at least some native soil from around wild plants. When taking them out of nursery pots, make sure the root ball does not fall apart; if the root ball collapses the plant would surely die. Every lowland desert home should include creosotebush.

The highly aromatic herbage is the drugstore of the desert and gives the desert its characteristic aroma, especially after a rain. The herbage has been used in many remedies to treat a wide range of conditions, including childbirth, congestion, sore eyes, snake and spider bites, and scorpion stings. Creosotebush is sometimes taken as a tea and in other preparations, but may be harmful if ingested, especially in larger doses.



Larrea tridentata, photo by Russ Kleinman with William (Bill) Norris, Burro Mtns., Engineer Canyon, Apr. 21 2007.

The wood is extremely hard and uses include arrow shafts and fire-hardened arrow points, basketry awls, crosspieces for saguaro and organpipe fruit-gathering poles, drills for the fire-drill, rope twisters, and tool handles. The leafy branches were used for roofing and to cover the sides of some traditional native houses and ramadas. A dark reddish lac, from a scale insect (*Tachardiella larreae*) is sometimes found on the stems. This lac is plastic when heated and served as an all-purpose sealant for pottery vessels for food storage and hafting arrows, as well as for medicinal purposes.

Some wonder how *Larrea* got from South America to North America, but this intercontinental disjunction is no more amazing than for various other plants. Although many the North and South American intercontinental disjuncts are small, sticky-seeded herbaceous plants, others have larger, non-sticky seeds comparable in size to those of *Larrea*.

South American creosotebushes are diploid ($2n = 26$; two sets of chromosomes). North American creosotebushes include three chromosome races: diploid, $2n = 26$ in the Chihuahuan Desert; tetraploid, $2n = 52$ in the Sonoran Desert; and hexaploid, $2n = 78$ in the Mojave Desert. Among the North American chromosome races there is no discernable differences apart from size of the stomates (breathing pores) and their guard cells, which correlated with ploidy (chromosome number).

Creosotebush evolved in South America and immigrated to the Chihuahuan Desert (the diploid race, the oldest of the three). The earliest known creosotebush in North America is from 18,700 years ago, dated from a packrat midden in the Tinajas Altas Mountains, east of Yuma, Arizona. *Larrea* in this ancient midden was already the modern Sonoran Desert race, as indicated by the stomates and guard cells. So, the Chihuahuan Desert diploid race must have arrived in North America at a much earlier time.

The earliest known Mohave Desert hexaploids are from a packrat midden dated 8420 years before present. A unique creosotebush ring-shaped colony, known as the King Clone in the Mohave Desert, is about 14 meters across. It is reported to be 11,700 years old, based on extrapolated growth rates. However, the oldest Mohave Desert packrat middens (in a nearby valley) are not older than 5880 years. The King Clone thus seems to be younger than popular belief.

Larrea tridentata contains numerous bioactive toxic compounds. These substances provide chemical deterrence for would-be herbivores. However, some insects have evolved the ability to eat creosotebush. Creosote Gall Midges, the *Asphondylia auripila* group, are a remarkable species complex of tiny gall-inducing flies. Each of 15 closely related species of these flies has specialized to eat a specific part of the plant: leaves, stems, buds, or flowers. Each species induces a unique gall. The different fly species are similar and difficult to distinguish one from the other. The female deposits an egg and a fungus spore into the specific plant part. The fungus grows inside of the gall and the larvae eat the fungus. Adults emerge with rain. The dry galls may remain on the plant long after the flies leave.

Larrea is the larval host for Geometrid moths (*Digrammia colorata* and *Synglochis perumbraria*), a bagworm moth (*Thyridopteryx meadii*), and clasping leaf gall midge (*Contarinia* sp.). The creosote bush lac scale (*Tachardiella larrae*) eats creosote bush and excretes lac, which is extensively used by people for sealing pottery vessels and other object, and as glue. The cryptic creosotebush walking-stick (*Diapheromera covilleae*) hangs upside down on the stems. They are seen at night during the summer monsoon season waving long antennae.

The Desert Clicker is a small grasshopper that is well-camouflaged, together with the creosotebush tree hopper (*Multareoides bifurcates*). The creosote bush grasshopper (*Boottettix argentatus*)

eats only on *Larrea*. There are over 8,000 species of grasshoppers, and *B. argentatus* is the only one known to feed on just a single species. Larvae of the Silver Twig Weevil feed inside roots and stems. This little weevil has an immensely elongated snout with strong mandibles to cut through the hard wood of creosote bush.

Looking like what you eat has adaptive advantage. Old, fallen yellow or brown creosotebush leaves lose much of their toxins and become food for certain detritus-feeding insects, such as larvae of the *Pachybrachis mellitus* beetle, which are the same color of their food. The adults eat the yellow flower petals.

About 150 species of bees visit *Larrea* flowers. Among these, more than 22 species of bees in 9 genera in the American Southwest feed exclusively on creosotebush flowers. The plants need them for pollination and the bees need the flowers for nectar.

The Creosote Bush Plant Bug is cryptically green and hides in creosotebush. When that fails, swift legs and a pair of wings help it escape quick, sharp-eyed verdins and gnatcatchers. The seeds are eaten by various desert denizens. After falling to the ground, the seeds are carried away by seed-eating ants.

The Desert Cottontail deals with the toxic herbage by eating small amounts at a time, and then only the youngest, least defended twigs. Evidence of its selective eating habits can be found during drought periods as sprigs of dry, brown creosote leaves deposited around the

periphery of shrubs after the edible twig portions have been eaten. Jackrabbits are one of the few mammals that regularly eat the leaves, which are very bitter and are only eaten when there is no other food source. Some desert packrats (*Neotoma*) and kangaroo rats (*Dipodomys*) include creosote seeds in their diet.

The Western Camel (*Camelops hesternus*), the only large camel in the Southwest during the latest Pleistocene was contemporaneous with early Amerindians and became extinct by 11,000 years ago. (There was also the llama, *Hemiauchenia*.) Because the introduced, Old World camel (*Camelus*) ate *Larrea*, it is assumed that *Camelops* could too, but there is no direct evidence. Noted paleontologist Jim Mead says some other artiodactyls in the Southwest may have occasionally ate *Larrea*, but little is known about this. Shasta Ground Sloths did eat creosotebush, as evidenced in some Rampart Cave cookies, the dried Ice Age dung also from about the time of the first people in the Southwest.

Creosotebush is a beautiful and remarkable plant deserving high honor from desert dwellers.

A few references:

Felger, R.S., T.R. Van Devender, B. Broyles, and J. Malusa. 2012. Flora of Tinajas Altas, Arizona—A Century of Botanical Forays and Forty Thousand Years of *Neotoma* Chronicles. *Journal of the Botanical Research Institute of Texas* 6 (1): 157–257.

Gagne, R.J, and G. Waring. 1990. The *Asphondylia* (Cecidomyiidae: Diptera) of creosote bush (*Larrea tridentata*) in North America. *Proceedings of the Entomological Society of Washington* 92: 649–671.

Hurd, Paul David. 1975. The principal *Larrea* bees of the southwestern United States (Hymenoptera, Apoidea). *Smithsonian Contributions to Zoology*, no. 193.

Mabry, T.J., J.H. Hunziker, and D.R. DiFeo, Jr., editors. 1977. *Creosote Bush, Biology and Chemistry of Larrea in New World Deserts*. Dowden Hutchinsonson & Ross, Stroudsburg.

Schulz, S.C., D. Otte, and F. Enders. 1977. *Larrea* as a habitat component of desert arthropods, pages 176–208, in Mabry et al.

--*Larrea tridentata* (Sesse & Mocino ex de Candolle) Coville Creosote bush. Host for Geometrid moth, *Digrammia colorata* (Lepidoptera: Geometridae); Geometrid moth, *Synglochis perumbraria* (Lepidoptera: Geometridae); Bagworm moth, *Thyridopteryx meadii* (Lepidoptera: Psychidae).

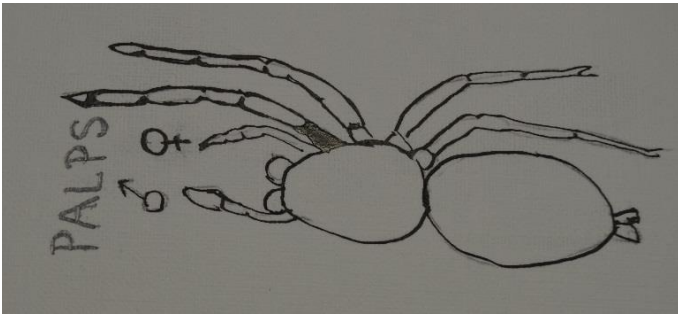
DESERT ARACHNIDS

Article, Photos and Illustrations by Tim Geddes

The Class Arachnida includes several groups of segmented invertebrates that are adapted to desert life. A waxy exoskeleton prevents water loss and because these arthropods are small, they can escape the sun by retreating

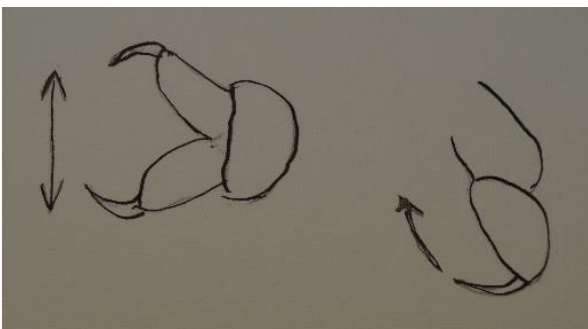
underground or by confining their activities to the hours of darkness.

Spiders have two body segments while insects have three body regions. Spiders have four pairs of legs and insects have three. Spiders have six or eight eyes while insects have two large compound eyes and some have a few simple eyes as well. No spider has antennae.



Spider Parts.

Tarantulas, trapdoor spiders, and others in the Suborder Mygalomorphae are considered primitive spiders and their jaws work in an up and down motion. Other spiders, Suborder Araneomorphae have jaws that open and close from side to side.



Spider Jaws.

Because Arthropods have an exoskeleton they need to molt as they grow. Long lived female tarantulas molt several times in their twenty-year life span.



Tarantula.

Spider courtship typically begins with arm and body movements of the male to entice the female. The female black widow doesn't always eat the male. The male deposits a sperm packet on silk and sucks the sperm up with its pedipalps. A pedipalp is inserted into the female to fertilize the eggs. Female wolf spiders carry the silken egg sac on her back until the spiders hatch. Silk, a protein called fibroin has many uses in a spider's life including wrapping prey, drag lines and in ballooning. Pseudoscorpions, centipedes, and some insects also use silk.

Scorpions have pinchers (pedipalps) and a long tail with a stinger on the end. In courtship the pair perform a dance with the pedipalps grasping each other. The male deposits a sperm packet and pulls the female over it. She picks it up with her genital orifice and her eggs are fertilized.

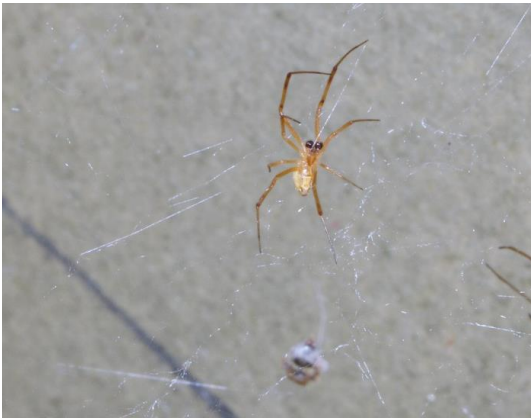
In the U.S. the black widow and the brown recluse have venoms that can be a threat to humans. Spider bites are rare and most "spider bites" are probably bacterial skin infections. Black widow venom is a neurotoxin called alpha-latrotoxin and antivenom is available. Brown recluse bites cause local cell death

and can lead to serious problems. There are over twenty species of scorpions in the western U.S. and they have a venomous sting. The bark scorpion is potentially fatal to humans, especially for children. Symptoms include convulsions, respiratory paralysis, fever, numbness.



A Whip Scorpion (also called a Vinegaroon).

Arachnophobia is based on ignorance. If one takes the time to understand arachnids they will find that they are interesting animals and fascination will take the place of fear.



Black Widow Spider, Male.



Orb Weaver.



Black Widow Spider (Female) with Web and Eggs.

Several kinds of ferocious looking arachnids are in fact harmless to man including whipscorpions, windscorpions, and pseudoscorpions. They are all non-venomous or are such a small size that they pose no danger to humans.

Membership Application

Friends of City of Rocks State Park, Inc. (FCR)

FCR is a non-profit 501(c) organization dedicated to enhance, preserve and promote park use. Your contribution and membership will give you the satisfaction of helping preserve and protect one of the most beautiful places on the planet.

_____ New _____ Renewal

Name(s) _____

Address _____

City, State, Zip _____

Phone _____ E-Mail _____

Yes, I want to support FCR. Enclosed are my annual membership dues. Dues and donations are tax deductible.

***ACTIVE MEMBER: (Voting)**

SPONSOR (Non-Voting)

_____ \$15 Individual

_____ \$25 Friend

_____ \$20 Family

_____ \$50 Good Friend

_____ \$10 Senior (single or couple)

_____ \$75 Very Good Friend

_____ \$500 Lifetime

_____ \$100 Best Friend

_____ \$500 Special Best Friend

In addition to my dues, I enclose \$ _____ as a donation (optional)

*Active dues paying members are those individuals who are entitled to vote at annual meetings and MUST participate in at least one of the following. Please check at least one of the following:

_____ Hospitality _____ Newsletter _____ Programs _____ Membership _____ Publicity

_____ Garden Care _____ Fund-Raising _____ Events _____ Scrapbook _____ Officer

Active Members receive free day admittance to City of Rocks State park

Thank you for your support and interest. Together we can create an awareness of the wonder, fragility, and importance of City of Rocks State Park.

Please send your check to: Friends of City of Rocks State Park, Inc., PO Box 74, Hurley, NM, 88043

Upon receipt of our completed membership application, you will receive a welcome letter, receipt, and membership card. For further information or questions, please call 1-228-363-1403.

Official use only

Date Received: _____ Ck#: _____ Cash: _____ Membership Card: _____

