



# Friends of Ironwood Forest

Spring/Summer 2011

Friends of Ironwood Forest is a local non-profit organization that works for the permanent protection of the biological, geological, archaeological, and historical resources and values for which the Ironwood Forest National Monument was established. The Friends provide critical volunteer labor for projects on the Monument, working with the Bureau of Land Management and many other partners, and to increase community awareness through education, public outreach, and advocacy.

## Desert Tortoise (*Gopherus agassizii*)

By Royce Ballinger, Ph.D. *Photos courtesy Young Cage.*

Apart from the unique Bighorn Sheep, the Desert Tortoise is perhaps the most iconic animal in the Ironwood Forest National Monument (IFNM). These are long lived critters, so that some you see may be as old as you are. Large adults in the wild may be 40-50 years old, but captive individuals have been observed to reach 70-80 years and older.

The Desert Tortoise occurs from extreme southwestern Utah across southern Nevada and southeastern California to southern Arizona and southward into Mexico. Of the 50 species of tortoises in the world, three species occur in the United States, one each in south Texas and the southeastern U.S. from Louisiana to South Carolina and Florida in addition to the Desert Tortoise of the southwestern U.S. Another North American species occurs in Northern Mexico.

Studies by Roy and Annalaura Averill-Murray (2005) on IFNM indicated that Desert Tortoises occur in all areas of the monument but are most common on rocky slopes and in washes. Fewer tortoises were found in the valleys

between the mountains but within 1.7 kilometers of boulder areas. Tortoises were more commonly encountered during the monsoon season (July to October) and they are more active in the morning and late evening.

During warmer parts of the day they retreat to underground burrows to avoid overheating and loss of water. Barrett (1990) documented Desert Tortoises in the Picacho Mountains, north of IFNM, to move up steeper slopes in winter months. Similar movements have been seen in IFNM and the Tortolita Mountains. The Averill-Murrays estimated density of tortoises in



IFNM to be 0.23 individuals per hectare but 0.53 per hectare on boulder strewn slopes. This equates to about one tortoise per 2-4 football fields on average.

Tortoise activity tends to center around one or more dens. Barrett (1990), using radio tracking techniques, found an average of 8 dens in the home range. In her study, home range varied from 3 to 53 hectares compared to 3-26 hectares in IFNM (Averill-Murray and Averill-

*continued on page 6*



# Wildlife Don't Vote

*Dear Friends,*

*Did you ever wonder why conservation of natural resources involves considerable effort in persuading the general public, media, and elected officials? It's because wildlife don't vote. Decision makers pay attention to what matters to the people they represent.*

## ***Thank you for your donations:***

Jay & Mary Lou Adler	Kathi LaTourrette
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*Wildlife don't vote, but you do! **You** are the important connection between policies and actions that protect wildlife and the places they call home.*

*Did you know that in the last few months, bills have been introduced in the U.S. House of Representatives that would eliminate all funding for National Monuments like Ironwood Forest National Monument?*

*Legislation has also been introduced in the House to prevent the use of the Antiquities Act. The very act used to protect America's natural treasures for over 100 years. From the Grand Canyon to Ironwood Forest National Monument, irreplaceable biological, geological, historical, scientific, and recreational places and values have been protected by the use of the Antiquities Act.*

*What might seem like political banter or bureaucratic hyperbole, far removed from our day-to-day lives, can actually have immediate implications and long-term consequences. For example, had the funding been eliminated for National Monuments like Ironwood Forest, they would have likely been closed to the public.*

*This is one of the reasons your support of the Friends of Ironwood Forest is so important. Your support enables us to advocate on your behalf for policies and funding that protect the natural treasures in our backyard and across the country. Your support also makes a difference to decision makers who understand the Friends represent the concerns of citizens who care and who vote — because wildlife can't vote.*

*Lahsha Brown*  
Executive Director



**Ragged Top** by Michael McNulty (black and white, 19 x 9.6 plus mat)

**Friends of Ironwood Forest is raffling these gorgeous photos  
at this year's Ironwood Festival, Saturday, May 14, 2011**

*These beautiful photos are matted and ready for you to frame to match your décor.*

**Tickets \$2 each OR 3 for \$5 (three chances to win per ticket).**

Drawing to be held at the Ironwood Festival. You need not be present to win.

Purchase tickets at the Ironwood Festival before the drawing (Thornydale and Hardy, SW corner) or prior to the event from Lahsha Brown at Friends office (628-2092) or Royce Ballinger, Heritage Highlands resident (572-5973).



above

**Bobcat on Saguaro** by Young Cage  
(full color, 14x11 plus mat)

left

**Owl and the Moon** by Young Cage  
(full color, 14x11 plus mat)



# IRONWOOD FESTIVAL 2011

Saturday, May 14 • 8 AM–1 PM

Tucson Audubon's Mason Center  
SW corner, Thornydale and Hardy Rd

- 8:30** Natural History of Ironwood National Monument | Young Cage, Friends of Ironwood Forest
- 9:30** Archeology and the cultures of Arizona | Allen Dart, Old Pueblo Archaeology Center
- 10:30** Migratory birds of the Ironwood forest | Paul Green, Tucson Audubon
- 11:30** Conserving the legacy of the Sonoran Desert and Arizona | Carolyn Campbell, Coalition for Sonoran Desert Protection
- 12:30** Monsters, vipers, and toads | Ed Moll, Tucson Herpetological Society

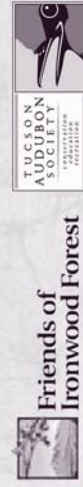
**7:00 & 9:00 BIRD WALKS**  
**8:30–1:30 PRESENTATIONS**  
**9:00–1:00 KIDS' ACTIVITIES**  
 Birds Migration Game Story  
 Telling Live Critters  
 Pantomime Theater  
**DEMOS** Composting Solar  
 Cooking Energy Bicycle  
 Native Plants **NATURE SHOP**  
 Book Sale Educational Toys  
**FOOD** Organic Local

**PARTICIPANTS** ARIZONA NATIVE PLANT SOCIETY • BEAN TREE FARM • BUREAU OF LAND MANAGEMENT—IRONWOOD FOREST NATIONAL MONUMENT • CITIZENS FOR SOLAR • COALITION FOR SONORAN DESERT PROTECTION • DESERT DWELLERS • DESERT HARVESTERS • FRIENDS OF IRONWOOD FOREST • ENVIRONMENTAL EDUCATION EXCHANGE (E<sup>3</sup>) • IMAGINE GREATER TUCSON • OLD PUEBLO ARCHAEOLOGY CENTER / ARIZONA HUMANITIES COUNCIL • PIMA COUNTY PARKS AND REC • SONORAN ARTHROPODS STUDIES INSTITUTE (SASI) • SUNNYSIDE AUDUBON STUDENT URBAN NATURALISTS (SASUN) • SUSTAINABLE TUCSON • TEP • THE LOCAL TRUST • TREES PLEASE! • TOHONO CHUL'S DESERT PLAYERS • TUCSON AUDUBON NATURE SHOPS • TUCSON HERPETOLOGICAL SOCIETY • TUCSON ORGANIC GARDENERS • TUCSON WATER • WATERSHED MANAGEMENT GROUP • WILDLIFE REHABILITATION IN NW TUCSON



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# What in the World is Cochineal?

By Young Cage, *Friends of Ironwood Forest Board of Directors*

What in the world is Cochineal?

Have you ever noticed fuzzy or cottony looking material around the spines of some of our prickly pear cactus?

Well, it turns out that that the material you were looking at covers and protects an amazing and quite useful scale insect, which produces a product that you are likely using everyday. “What?” you ask “A bug product I use every day?

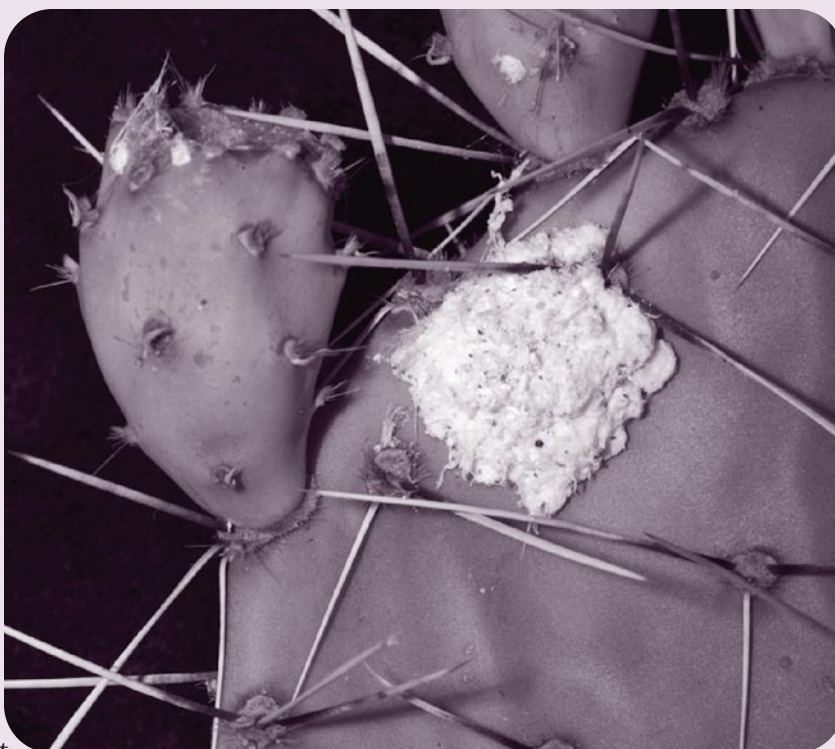
The insect is called a Cochineal.

Day-after-day Cochineal insects go about their lives under their cottony tent. The females are quite small at about 5 mm. and are oval and wingless. The males are even smaller, have wings, and have very short life spans. The female gives birth to nymphs, both male and female.

The cochineal insect feeds by sticking its long proboscis (probe) into the cactus and sucking out nutrients. This remarkable insect produces a waxy white substance (not unlike when a spider produces a web) that results in the fuzzy cottony material that you see on the cactus.

The insects disperse by having the nymph’s spin a bit of that cotton like material, and letting the wind carry it and the nymph away to colonize a new cactus

How does this little insect relate to you? Well, the Cochineal’s claim to fame is that within its body it



Cochineal on a prickly pear pad. *Photo courtesy author.*

produces quantities of something called carminic acid. From this acid comes one of the world’s greatest dyes.

Time now for a little history:

When the Spaniards arrived in the New World they were surprised and pleased to find a deep crimson and purple dye being used by the indigenous peoples (Aztec, Mayans, and others). These dyes were brighter and longer lasting than anything available in Europe and the Old World. Indians were creating this dye from harvested Cochineal insects, in a process that concentrated the very colorful carminic acid.

The Spanish, using the Indian’s knowledge and expertise, exported enormous quantities of the dye to Europe and the rest of the world, and for over 200 years maintained a monopoly on the crimson and purple dye industry.

Spain prospered as the dye quickly became the second most important export from Latin America to Europe (second only to gold).

*continued on page 7*





left: Young Desert Tortoise, which accounts for its lighter color. right: Male chasing female Desert Tortoise in courtship ©Young Cage

## Desert Tortoise *continued from page 1*

Murray, 2005). In other words, each tortoise requires an area about the size of 7-63 football fields (1 hectare = 10,000 square meters; one football field is about 4,410 square meters or 91 meters by 45.5 meters). In spite of this large size, tortoises are known to be intimately familiar with their home area and thus vulnerable to being artificially moved from this area. If you encounter a tortoise, give it a wide berth. If the individual appears to be in immediate danger, such as crossing a road, try to redirect traffic, but if you must move it to a safe place use rubber gloves to avoid transmitting bacteria and foreign chemicals. Tortoises use chemical cues to assess resources, neighbors, and their location during normal daily activities.

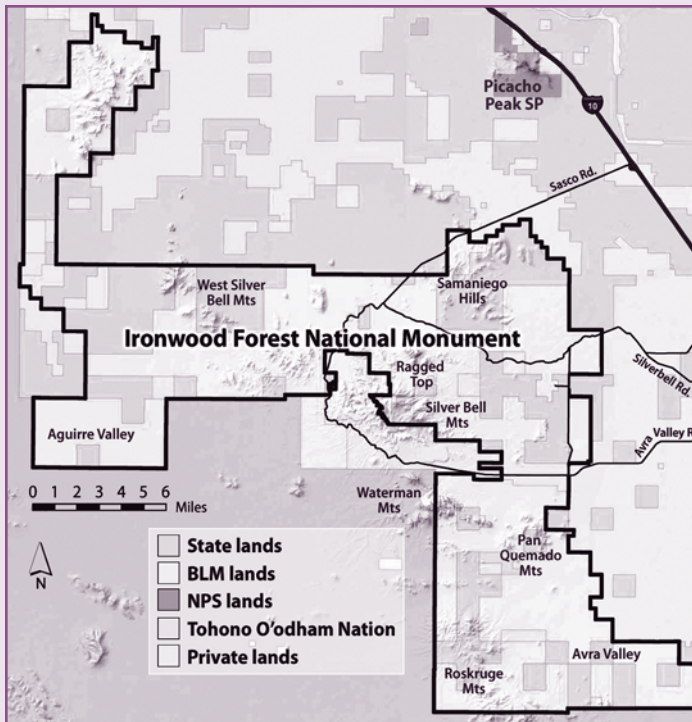
But perhaps the most important reason for not picking up a tortoise in the wild is to prevent disrupting its water balance. Desert Tortoises store water in their bladder for use during long periods of dry weather. When they are picked up, they frequently discharge their bladder water as a defensive response. Loss of this water greatly jeopardizes their survival over the following weeks and months.

The biology and natural history of the Desert Tortoise has been summarized by Ernst, et al.

(1994) and Van Devender (2002). Desert Tortoises are mostly herbivorous, eating grasses, cacti, and flowers of desert plants. Perhaps their most important foods are the blossoms and leaves of annual plants that appear abundantly after winter and monsoon rains. However, they likely take small animals because bird feathers, mammal hair, lizard and snake skin, and arthropod parts have been found in fecal scats. Like many vertebrate herbivores, tortoises lack the ability to produce enzymes necessary to digest cellulose obtained in their plant food. These enzymes are produced by microorganisms in their gut which are obtained early in life by young tortoises eating fecal pellets of adults.

Reproductive maturity requires 15-20 years. Mating occurs from late spring through the summer. In Arizona, females lay 1 clutch of 2-12 eggs (usually 5-6) in late June just before the monsoon rains. Larger females produce more eggs than smaller females. The eggs hatch in late September and the carapace (top "shell") of hatchlings is relatively soft and remains so for up to 5 years after hatching; thus young hatchlings are more susceptible to predators. Only a few hatchlings from each clutch survive their first year.

*continued next page*



The Monument is managed by the Bureau of Land Management (BLM) and is part of the National Landscape Conservation System (NLCS). With over 28 million acres of nationally significant landscapes, the NLCS joins the existing National Parks and National Wildlife Refuges as another way to protect and enjoy areas with outstanding cultural, ecological and scientific importance. Map courtesy BLM.

## What in the World is Cochineal? *continued from page 5*

Carminic acid's primary function in the Cochineal seems to be to protect the insect from ants and other predators.

In the 1870s, artificial dyes were developed (from coal tar) and in a very short time the Cochineal business virtually died. Use of Cochineal dye became largely restricted to Indian folk art and cultural products.

Things eventually turned once again, as the artificial dyes were discovered to have problems (remember the carcinogen scare with red dye #2?). The search for a dye replacement landed squarely back on the Cochineal.

So once again Cochineal returned to popular use under the trade names of carmine, carminic acid, E120, and Coccus Cacti. Cochineal products have very few side effects and are now found in food, drinks, cosmetics and pharmaceuticals. You likely use at least one of these products every day.

There are varying opinions as to the damage Cochineal populations can do to a cactus. If the damage to the prickly pears appears minimal (normally the case), it's best to leave the cactus and the Cochineal alone. However, now you can enjoy their history and share this little known knowledge with other desert dwellers!

## Desert Tortoise *continued from page 6*

Desert Tortoises are protected in Arizona and considered "threatened" under the federal Endangered Species Act in areas west of the Colorado River. So if you are fortunate enough to see one of these fascinating animals, take its picture but give it plenty of space.

### References

Averill-Murray, R. and A. Averill-Murray. 2005. Regional scale estimation of density and habitat use of the Desert Tortoise (*Gopherus agassizii*) in Arizona. *J. Herpetology* 39:65-72.

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Ernst, C.H., R.W. Barbour, and J.E. Lovich. 1994. *Turtles of the United States and Canada*. Smithsonian Institution Press, Washington, D.C. 578 pages.

Van Devender, T.R. (ed.). 2002. *The Sonoran Desert Tortoise: Natural history, biology and conservation*. University of Arizona Press, Tucson, 389 pages.





# Friends of Ironwood Forest

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# IRONWOOD FESTIVAL 2011

**7:00 & 9:00 BIRD WALKS**

**8:30–1:30 PRESENTATIONS**

**9:00–1:00 KIDS' ACTIVITIES**

Birds Migration Game Story Telling

Live Critters Pantomime Theater

**DEMOS** Composting Solar Cooking

Energy Bicycle Native Plants

**NATURE SHOP** Book Sale

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