



Cliff Notes

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Tonto Takes “Vital Signs”

In 1916, the Organic Act established the National Park Service, charging it to maintain the resources under its stewardship “unimpaired for the enjoyment of future generations.” In order to fulfill this mission, managers need to have scientific information about those resources. The NPS Inventory and Monitoring Program was initiated a few years ago to gather such data for analysis and creation of a scientific foundation upon which resource decisions can be made. Nationally, there are 32 ecological networks in the program. Tonto National Monument is one of 11 parks in the Sonoran Desert Network. A small staff of scientists based in Tucson coordinates the inventory and monitoring of 25 “vital signs” in those 11 parks.

Vital signs are key species that indicate the health of an ecosystem when monitored over time. Other indicators include things like water and air quality. Systems with ecological integrity are resilient to environmental disturbance within a natural range of variability. Monitored vital signs allow managers to determine appropriate restoration or maintenance interventions when needed in order to sustain normal functions. For example, non-native species can be eliminated or contained when their nature and extent are identified in a timely manner. Park managers need to understand what the baseline conditions are within their parks and what the normal degree of variability of those conditions are in order to better fulfill their stewardship mission.

Story Continues on Pg. 2



Park Ranger Eddie Colyott

Reptile Research Continues at Tonto



Erika Nowak handles a Western Diamondback at Montezuma Castle National Monument .

As people encroach on their habitat, encounters between humans and rattlesnakes are increasing. Should the snakes be relocated to areas further away from people, or should people just learn to live with the snakes? With funding provided by the Western National Parks Association, the United States Geological Survey, and the National Park Service, wildlife biologist Erika Nowak has been studying rattlesnakes for ten years. Here at Tonto National Monument, she has been conducting a nuisance rattlesnake study for 3 years. We have at least three different species of rattlesnakes in the park: the Western Diamondback, the Arizona Black and the Blacktail rattlesnake. You might be asking, “What the heck is a nuisance rattlesnake study?” Nuisance rattlesnakes are snakes that occur in places where people don’t want them. Here at the Monument, that means that they seem to prefer the areas also frequented by people, like the Visitor Center and park housing. In a recent television program aired on the National Geographic channel, Erika described these reptiles as being territorial. She said, “they’re not territorial in the sense that they defend their territories, but that they have a home range that they live in year after year.” **Cont’d. on Pg. 2**

What are Vital Signs?

The concept of ecosystem health is similar to that for individual health. A healthy individual’s vital signs remain within a normal dynamic range and return to a nominal level quickly after disturbance. Just as early physicians discovered the value of body temperature, respiratory rate, and blood pressure in assessing patient health by measuring them in many patients, today’s park managers are measuring dynamic ecosystem parameters to identify environmental ‘vital signs’ for parks and to establish their normal variation. Monitoring of these environmental vital signs provides a means of sustaining the health of park resources, diagnosing threats to their well being, and mitigating those threats.

Vital Signs (cont'd.)



Young Black Bear in the riparian area.

The small riparian area at Tonto National Monument is perhaps the most important biological resource in the park. Riparian plant communities in the southwestern United States account for less than 1% of the landscape, yet it is estimated that greater than 50% of southwestern bird species and up to 80% of all wildlife species in the southwest are dependent on riparian areas. Riparian areas in arid regions supply insects for foraging and large trees for nesting as well as water.

From 2001 to 2003, surveys of the vascular plants and vertebrates (amphibians, reptiles, birds, and mammals) were conducted in the monument. These surveys have recorded at least

90% of the species that regularly occur in the monument.

Of the 369 species recorded in the monument, 149 were found in the riparian area. Four of the bird species (Bell's vireo, yellow warbler, summer tanager, and Abert's towhee) were found only in the riparian area.

Because of the importance of the spring to the large concentration of wildlife there, and the need to reduce human/wildlife interactions, we will continue to limit access to this area. The presence of humans in these areas can alter the activity and feeding patterns of large mammals, lead some birds to abandon their nests, and damage stream banks and fragile vegetation.

Feeding wild animals creates an unnatural dependence on humans for food and can interrupt migration patterns. Human foodstuffs can also cause illness or death.

Bat Study

Dr. Yar Petryszyn and Melanie Bucci, a graduate student from the University of Arizona conducted a bat study from 2001 -2003 at Tonto National Monument. This was the first inventory of bats done here. By using multiple techniques, they were able to identify 14 species of bats in the park. One of the goals of the study was to evaluate the use of new technologies to identify bat species. Only 1 bat species was identified by the capture, or netting only method. An additional 5 species were identified by recording echolocation calls. By combining both acoustical monitoring and netting techniques, they were able to identify 8 more bat species.

Riparian areas typically have more bat activity because of the higher concentration of insects there. Desert areas were also found to be important environments for bats because many of the larger bats are unable to maneuver in the more forested, or riparian areas.

This long-nosed bat is obtaining nectar and pollen from the flowers on a saguaro cactus plant.



Justin Schofer uses tracking equipment to locate rattlesnakes and gila monsters embedded with transmitters.

Reptile Research (cont'd.)

The Rattlesnake Research Project started in 2002 and also includes Saguaro National Park, Montezuma Castle and Tuzigoot National Monuments, and Walnut Canyon National Monument. It started out as a nuisance rattlesnake study but now includes a small mammal prey base study, an Arizona Black rattlesnake study and a Gila Monster study. Animals for the study are weighed, measured, sexed and either implanted with passive integrated transponder (PIT) tags that can be scanned to identify individuals, or transmitters (each transmitter has a different frequency) so that they can be tracked.

Study animals are tracked once or twice weekly during the active season (April-October).

During the hibernation season, they are tracked once or twice a month. Their locations are recorded using a GPS unit. Activity ranges and hibernation sites are then mapped.

Researchers tracking the gila monsters quickly learned that they can cover large distances over rough terrain in a short amount of time. During the capture process, gila monsters are also photographed. Their beaded patterns are similar to the human fingerprint in that the patterns are unique to each individual. Two photos of captured gila monsters, one from 1994 and one from 2003 match. This indicates that this particular gila monster has lived in the Park for at least eleven years!

2005- 2006 Calendar of Special Tours & Events

October

Sat. 8th 8 am Early Bird Upper Cliff Dwelling Tour
Sat. 15th 8 am Early Bird Upper Cliff Dwelling Tour
Sat. 22nd 8 am Early Bird Upper Cliff Dwelling Tour
Sat. 29th 8 am Early Bird Upper Cliff Dwelling Tour

November

Sat.-Sun. 5-6th OPEN HOUSE
Sat. 12th 2 pm Off-Site Tour
Wed. 16th 5 pm Upper Cliff Dwelling Full Moon Hike
Fri. 25th 1:30 pm Ranger Talk
Sat. 26th 2 pm Besh Ba Gowah Tour

December

Sat. 3rd 2 pm Off-Site Tour
Sat. 10th 2 pm Off-Site Tour
Sun. 11th 2 pm Living History Program
Fri. 16th 5 pm Upper Cliff Dwelling Full Moon Hike
Sat. 17th 2 pm Besh Ba Gowah Tour
Mon. 19th Park Anniversary Fee Free Day
Wed. 28th 1:30 pm Ranger Talk

January

Sat. 7th 2 pm Off-Site Tour
Sat. 14th 5:15 pm Upper Cliff Dwelling Full Moon Hike
Sun. 15th 1:30 pm Ranger Talk
Sat. 21st 2 pm Besh Ba Gowah Tour

February

Sat. 4th 2 pm Off-Site Tour
Sun. 12th 5:30 pm Upper Cliff Dwelling Full Moon Hike
Sat. 18th 2 pm Besh Ba Gowah Tour
Mon. 20th 1:30 pm Ranger Talk

March

Sat. 4th 2 pm Off-Site Tour
Sat. 11th 2 pm Besh Ba Gowah Tour
Sat.-Sun. 18-19th OPEN HOUSE
Sat. 25th 1:30 pm Ranger Talk

April

Sat. 1st 11 am Off-Site Tour
Sat. 22nd 11 am Besh Ba Gowah Tour

May

Sat. 6th 8 am Early Bird Upper Cliff Dwelling Tour
Sat. 13th 8 am Early Bird Upper Cliff Dwelling Tour
Sat. 20th 8 am Early Bird Upper Cliff Dwelling Tour
Sat. 27th 8 am Early Bird Upper Cliff Dwelling Tour

Reservations are required for all special tours. When you make your reservation, we will send you a map with directions to the sites. Call the Monument to make reservations (928) 467-2241.

Upper Cliff Dwelling Tours

- Tours of the Upper Cliff Dwellings are offered every Saturday and Sunday from November through April. Mondays and Fridays are added as the season progresses to accommodate demand. See page 4 for more details.
- Early Bird tours of the Upper Cliff Dwelling are offered on Saturdays at 8 am in October and May.
- Full moon evening hikes to the Upper Cliff Dwelling will be offered once a month from November through February. They are similar to the daytime hike, but are shorter in length because of the darkness. Hikers must be fit to do this tour because of the quicker pace.

Open House

- Twice a year, the Upper Cliff Dwelling is open to visitors without a guide for an entire weekend. Uphill travel on the trail is between the hours of 9 am and 2 pm. Regular fees will be charged both days during Open House weekends. There is no fee if you have a National Park pass.
- Twice a year, all fees are waived: September 24th for Public Lands Day and December 19th, the anniversary of the establishment of the Monument.

Ranger Talks and Living History

- Scheduled ranger talks will include a variety of subjects such as making twine out of native plants, rattlesnakes, Southwestern farming practices, gila monsters, and medicinal and edible uses for native plants.
- The living history program will reenact the story of Angeline Brown, a school teacher in Tonto Basin who took her young students on a field trip to the cliff dwellings 125 years ago.

Off-Site Tours

- Off-site tours are offered through an agreement with Tonto National Forest and Besh Ba Gowah Archeological Park.
- The **Schoolhouse Platform Mound** site is unique in that it was built after neighboring villages were abandoned. It was occupied for over 100 years while other settlements in the basin were smaller and were occupied only briefly. Why?
 - The **Cline Terrace Platform Mound** site is similar to other sites along the Salt River but it also has several distinct characteristics. There is a massive compound wall around the complex, and many of the walls are constructed of white gypsum. The site must have been quite impressive in the moonlight.
 - **Besh Ba Gowah** is a reconstructed ruin located in the city of Globe. You can walk in the rooms, climb recreated ladders, and enter a typical living area. There is also a museum and ethnobotanical garden at Besh Ba Gowah. The site is on flat ground. There is a \$2.00 per person entry fee at Besh Ba Gowah.



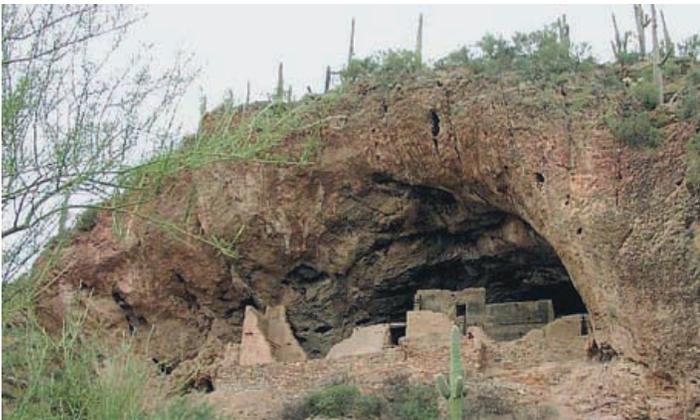
Visitors enjoy a tour of Besh Ba Gowah with Park Ranger Eddie Colyott.

Plan Your Visit

Tonto National Monument is located 30 miles northwest of Globe on Highway 188. Driving time from Phoenix, Scottsdale or Mesa is approximately 2 to 2 1/2 hours; from Tucson or Flagstaff 3 to 3 1/2 hours.

Self-Guided Lower Cliff Dwelling Trail

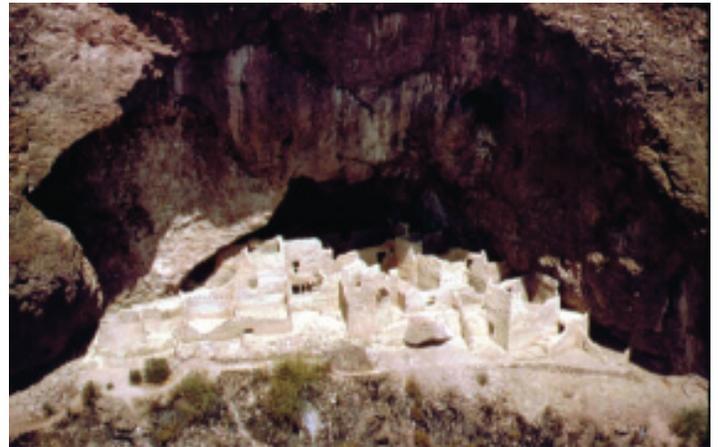
A paved trail winds its way through the Sonoran desert to the Lower Cliff Dwelling. You gain 350 vertical feet, so be prepared for a steep climb. Signs along the trail provide information about desert plants, the geology of the area, and the lives of the ancient Salado. There are several benches on the path. Sit and enjoy the beautiful view of Roosevelt Lake. Once you arrive at the dwelling, enjoy walking through homes that were occupied 700 years ago. The Cactus Patch Trail branches off the main trail and ends in the parking lot. Learn how desert plants have adapted to desert conditions and how the Salado used these plants to provide food, shelter, and clothing. Bring water, sunscreen and a hat with you. The one mile roundtrip walk takes about an hour to complete so plan to arrive at the park no later than 4 pm. Allow extra time to visit the museum.



Lower Cliff Dwelling

The Visitor Center offers a small museum, bookstore, viewing deck, and an 18 minute orientation video. It is open daily (except Christmas Day) from 8 am to 5 pm. There is also a picnic area with restrooms near the Visitor Center for your enjoyment.

Upper Cliff Dwelling Tours



Upper Cliff Dwelling

During the winter season (November through April), rangers give guided tours to the Upper Cliff Dwelling. Tours are offered every weekend. Additional weekday tours are added as visitation increases. This 3 mile roundtrip hiking trail travels in a creekbed through a riparian area, then gains 600 feet in elevation by way of switchbacks. The tour lasts 3-4 hours and reservations are required. There is no extra fee for the tour. Full moon tours to the Upper Cliff Dwelling are offered November through March, also by reservation.

FOR RESERVATIONS OR INFORMATION CALL THE MONUMENT AT (928) 467-2241.

See page 3 for a Schedule of Special Events & Tours.

Volunteers-In-Parks

Volunteers-In-Parks are Very Important People (VIPs)! If you've ever wanted to lend your efforts directly to the stewardship of America's heritage, you have that chance at Tonto National Monument. The Monument is seeking volunteer assistance at the information desk and in the Lower Cliff Dwelling. Volunteers may also have the opportunity to help our biologist remove invasive plants, assist our archeologist with field work and archival research, or help with trail maintenance and other projects. During spring, summer and fall, you may assist in the field with ongoing reptile research.

We would welcome an occasional day or a more generous slice of your time. You will be helping preserve some of our nation's most important archeological resources while giving others a better chance to learn about them. You might even learn something yourself and have fun doing it!

If you are interested in any of these opportunities, please contact our volunteer coordinator Susan Hughes, Chief Ranger at (928) 467-2241.

Volunteers Roger Repp and Jon Davis (holding the Gila monster) weigh, measure and photograph a gila monster.



Western National Parks Bookstore

The bookstore carries a variety of books, tapes, posters, and gift items. Most pertain to the prehistoric cultures represented at Tonto National Monument, the plants and animals of the Sonoran desert, and the geology and history of Arizona. There is also a children's section. The association (WNPA) donates a portion of its profits back to the park to support educational activities such as the Junior Ranger Program.



Open daily 8 am to 5 pm (except Christmas Day)
WNPA members receive a 15-20% discount
Qualified teachers receive a 20% discount.

Visit the online bookstore at www.wnpa.org

Printing of this newsletter is made possible by the Western National Parks Association.