

# Friends of Petrified Forest National Park

Working together we can make a difference!



Digging for fossils in the Blue Forest with the Holbrook Girl Scouts where first occurrence of an animal called *Shuvosaurus* was found.

## Core Drilling Begins!

Starting November 7, a core drilling project began at Chinde Point, funded by the National Science Foundation. The project will extract a core from top to bottom of the Chinle Formation, which covers approximately 20 million years of the late Triassic Period. This core will be studied in a variety of ways, eventually providing more specificity to dates and ages of the rock layers exposed. The project will then move to other areas of the Colorado Plateau.

For more information follow the coring project on Facebook: Colorado Plateau Coring Project.

The Arizona Daily Sun had a great article recently about the project, "Petrified Forest: A fossil every 4 inches."

## Donations Accepted

The Friends of Petrified Forest National Park, as a non-profit, partner organization, plays many roles in its support of the park.

From hands-on labor and scientific expertise, Friends have made substantial contributions to the park over the past two years.

Monetary donations helped pay for interns who made incredible scientific discoveries this summer.

Donations and fund-raiser ideas are welcome at any time. Please contact [Brad\\_Traver@nps.gov](mailto:Brad_Traver@nps.gov) with contributions or ideas for generating money.

Thank you for your support!

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Masonry stabilization at the Depot Tank stage stop in the expansion lands.



*Right:* Summer interns Sarah Tulga and Zach Morris uncover the bones of a giant amphibian in Billings Gap.  
*Below:* The jacketed amphibian bones.



*Left:* Phytosaur skull under excavation in Billings Gap.  
*Below:* The jacketed phytosaur skull being prepared.



## Summer of Science

*Thank you Friends for your generous donations, making this work possible through the hiring of summer science interns!*



### Paleontology

Paleontology work was focused in two areas. The first was recovering fossils from a known fossil-producing locality on lands recently acquired by The Conservation Fund. The second area of focus was beginning an "histology" project. Histology is the study of the cellular structure of fossilized animal bone sliced so thin light passes through it.

The fossil-producing site has had bones eroding from its surface for years. If allowed to weather, they are lost to science. The first fossil found was the skull of a phytosaur. Phytosaurs are the distant ancestors of modern crocodiles and were common in the river systems that existed in the area 220 million years ago. The skulls often detach from the skeleton and are more difficult to locate. The skull found is approximately 2' long and very well preserved, especially the palate. The second find from the site was *Doswellia*, a close-relative of the phytosaurs, and a new find for Petrified Forest National Park. Scientists have known that these animals should exist in the ecosystem and time period represented at the park but had never found one, until this summer. The species of *Doswellia* found, *D. kaltenbachii*, is the first record of this species in the western United States. Lastly, aetosaur neck plates from the species *Desmotosuchus spurensis* were found and immediately used in a public display at Rainbow Forest Museum. *Desmotosuchus* bones are very rare in the park.

This site is important for another reason. Fossils excavated so far indicate the area was the bottom

of an ancient pond. Numerous bones of fish, amphibians, and reptiles have been found. Continuing to excavate this layer may result in an ecosystem description of the pond - what animals were living there and, if plant fossils are found, what was growing there. In addition to large animals, fossils of small creatures add to the story. These are especially important as smaller animals are only preserved under special circumstances and are rare in the fossil record.

Beyond the fossil bones, a new rich layer of fossil material was identified a few inches lower (and thus older) than the layer above. Further research will await an opportunity to get back to the site.

The histology project may better define ancient ecosystems in the park. The cellular structure of fossil bones can tell scientists the age of the animal, how fast it grew, and possibly whether it was male or female. A productive fossil site in the Painted Desert provides bones of diverse groups such as amphibians, crocodile ancestors and early dinosaurs. Using histology to study these different animals from the same time and the same environment, allows scientists to see if these factors affected growth rates and styles for the different animal groups. No other fossil site in the world has this much potential for detailed definition. With 11 individuals of the same species excavated from the *Revueltosaurus* quarry last year, (this alone is unique in the world), histology allows the examination of the same bone from each animal, providing age and potentially gender for each individual. This may explain why they



## Public Lands Day Success

September 28 found a dozen volunteers working to clean up a future caretaker residence and identify a new trail into the Wilderness Area. It was a perfect fall day and both objectives were accomplished.

Splitting into two crews, one worked on the former Suglia house. Tumbleweeds blown up around the property structures, creating a significant fire hazard, were tackled mercilessly. A wire pen away from the buildings was built and filled with the weeds.

The other crew staked out a 1.5 mile hiking trail between Lithodendron Wash and the park's northern Wilderness Area. This trail will provide access to the southern edge of the northern wilderness, an area called the Devil's Playground. Access to the expansion area through which this trail passes will require a permit. Kachina Point is currently the only access point into the northern Wilderness Area, but it requires an overnight hike to get into the Devil's Playground area. Using the new trail from the former Suglia property will allow a resident caretaker to monitor use and will give visitors access to potable water.

Thanks to Friends and other volunteers for helping making Public Lands Day a success!



Clean up at the former Suglia property.



Staking out a new trail into the Wilderness Area.

### Summer of Science (continued)

were all living together in the same place at the same time.

*Paleontology program contact: Bill Parker 928-524-6228 x262. Interns: Sarah Tulga, Adam Marsh, Zachary Morris, and Kelsey Hornung.*

#### Archaeology

Archaeological work began with a systematic identification and recording of sites on ranch lands acquired in 2011 within the expanded boundary of Petrified Forest National Park. Starting with areas close to roads, two crews: the red team and the

gold team, explored their assigned areas and made important discoveries.

The red team explored about 160 acres, finding and recording 15 archaeological sites, ranging from small one-room field houses to slightly larger multi-room pueblos from the Pueblo II and Pueblo III period (800-1000 years ago). The density of sites was higher than expected and, should it be representative, would reveal an exceptionally dense use of the area.

One of the field houses held a cache of 7 stone axe heads. Since each axe head represents a great deal

## Summer of Science (continued)

of effort, a collection of them is a rare find. The raw material may have come from New Mexico and working of the stone took many hours of grinding and polishing. A wide variety of pottery types were represented in pottery sherds found. Thin sectioning the sherds (cutting very thin slices to examine under a microscope) will help scientists identify materials used in manufacture. When examined against local materials, the question of whether all the pottery came from other areas of the region or whether some was locally made and decorated to mimic designs from elsewhere may be better addressed.

The gold team identified a large Basketmaker site from about 1300 years ago. Features of the site include pit houses, storage cists, and flaking stations (for making stone tools and weapons). This Basketmaker site also has later occupations represented by Puebloan field houses. Incredibly, a second, even larger Basketmaker site was found nearby that also had evidence of Archaic occupation. Together these two sites represent occupation of the area from about 5000BCE to about 1350CE – a span of over 6000 years!

At the second Basketmaker site, archaeologists recorded 42 features including living quarters, storage areas, flaking stations, and a water control feature. Most exciting was a site used to manufacture shell ornaments. Shell blanks, finished ornaments, and specialized tools were all found at

the site. All together, the gold team found these two Basketmaker sites, as well as another 10 sites on about 90 acres. Once again the density of sites was higher than expected. The Basketmaker sites are particularly important due to their large size, the relative scarcity of undisturbed sites in our region, and most importantly, the landscape (grassland dune ridge) they were found in. The park currently has sites on high mesas or on ridge crests but, until now, lower landscape positions like these dune ridges were unknown. These are important additions to our knowledge of the Basketmaker period in our area.

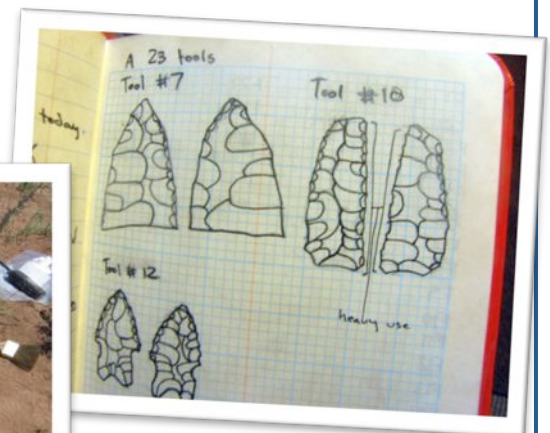
After being chased out of the lowlands by monsoon season, crews began recording in other areas. Two Pueblo II period sites of 12-20 rooms were mapped. These sites had interesting features such as raised platforms which may indicate affiliation with Chacoan culture. Recording was also started on another pit house village from the early Pueblo period of about 20 rooms. The season ended before the record was completed, though work will continue on a smaller scale.

*Archaeology program contact: Bill Reitze 928-524-6228 x268. Archaeologist: Iva Lee Lemkuhl. Seasonal archeologists: Gregory Luna Golya, Erina Gruner, Robert Sinesky, Kathleen McConnell. Interns: Crystal Simms, Emmy Kvamme, Stephanie Mack, Samantha Linford.*



Recording proto-historic structures.

Excavating an ax cache.



Field sketches of lithic tools.



## New Outdoor Orientation Site at the Visitor Center

For the last 50 years, the secondary plaza at the Painted Desert Visitor Center has been left an unfinished part of the architect's plan. Originally envisioned as a grassy area with planted islands for relaxation, the reality has been nicknamed the "dirt pile" by park staff.

The Painted Desert Visitor Center was located outside the park entrance fee booth in order to introduce travelers, especially those traveling east to west, to all National Park Service sites in Arizona. Visitors could then decide to explore Petrified Forest National Park or continue their journey elsewhere. It was designed to be a secondary Welcome Center for travelers on the I-40 corridor.

Although the Visitor Center continues to offer this function, the park recognizes the need to introduce visitors to the diversity of resources within Petrified Forest National Park itself, enticing them to go beyond the interstate and explore the scenic, historic, and geologic treasures the park protects.

The new outdoor orientation site is located between the Fred Harvey building and park housing. It will have five exhibit stations along an accessible loop trail. Each exhibit panel will introduce a primary park resource and explain where its features are found in the park. Exhibits and shade shelters will be added in 2014. Native landscaping will follow.

Another feature accessible from the orientation site will be a 1.5 mile trail connecting the Painted Desert Visitor Center to Tawa Point and the existing Rim Trail. The Youth Conservation Corps began trail work over the summer. Work will continue next year.

True to the original architect's vision, the outdoor orientation site will offer shade and relaxation within the oasis of the Painted Desert Visitor Center. But it will expand the opportunity to introduce the diversity of stories at Petrified Forest National Park to all travelers, encouraging them to explore and support their national park.



## Other News...

### Opening of New Lands

Twenty-one years after the park's General Management Plan first proposed the idea of expansion and 10 years after the Petrified Forest Expansion Act was signed into law, Petrified Forest National Park expects to open newly acquired lands to public use in 2014. The spring newsletter will have more on this – stay tuned.



### Newsletter Timing

Besides the government shutdown, our fall newsletter is later than we would have liked because our friend and colleague, Patricia Thompson, Chief of Resources Management, was badly injured in a car accident on Labor Day weekend. She continues her recovery in a physical therapy facility that specializes in spinal cord injuries. Our hopes and prayers are with her every day as she strives to get back to work.

Recording a ridge top site in the expansion lands during summer archaeological work.

## Join the Friends Group today!

You can be a member of the Friends of Petrified Forest National Park! Contact Kevin Dahl for more details.

[kdahl@npca.org](mailto:kdahl@npca.org)

For specific information about park projects, contact the park superintendent, Brad Traver.

[Brad\\_Traver@nps.gov](mailto:Brad_Traver@nps.gov)

Visit the park's official website to learn more about the park and its resources.

[www.nps.gov/pefo/](http://www.nps.gov/pefo/)



Total station mapping on expansion lands during summer archaeological work.



Historic artifact inventory during summer archaeological work.