

Issue 6 November 2014

*Working Together We Can
Make a Difference.*



Jawbone of new
reptile from the
Dying Grounds.

Summer of Science

Science is ongoing at Petrified Forest National Park. Every year, seasonal employees, researchers, and summer interns swell the park's science staff, go into the field, and make new discoveries in paleontology, archaeology, and ecology.

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Special Message from Brad

Traver, Superintendent

Paleontology

Not far from the Dying Grounds, an area frequented by paleontologists since Charles Camp of the University of California made important discoveries in the early 1920's, this summer's paleontological crew located an animal new to park records. Unearthed from a layer dated at 220 million years old, the animal was once thought to be a type of dinosaur (from partial remains found elsewhere) but is now believed to be an ancestor of both crocodiles and dinosaurs. About 500 bones of at least 6 different individuals of different sizes were found at the site. The adult was not large – about 6 ft long, standing about 3 ft off the ground. Similar animals have recently been found at sites in Texas and Madagascar. All the scientists involved are collaborating on a paper for peer review and publication. In the lab, the bones are being carefully removed from the dirt and rock that has encased them for so many years. Work at the site will continue next summer.

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1. Excavation in the Dying Grounds.
2. Fossil jacket full of bones ready for transfer from a new site.
3. Reptile tracks.

Summer of Science

Continued from page 1

Last summer, crews identified what they are calling the pond site and found fossil bones of several relatively large amphibians. This year, the focus was to look at the site at its smallest scale. The crew excavated promising chunks of the pond bottom and brought them to the lab. Under a microscope, fossil bones, teeth, and fish scales the size of sand grains were found. An estimated 80 different animals may be represented by these fossils, including small fish, reptiles, and amphibians, and will take months to identify. The Triassic pond site yielded some data last year, more and different data this year, and is expected to yield data for some time to come. As with all science, these different data points will be built into a larger story over time that could help better explain what this environment was like during the Late Triassic.

A new partial survey for fossil tracks revealed evidence of Triassic Period horseshoe crabs in 5 different places with trackways up to 4 ft long, and a few reptile footprints, about 1" in size. All the tracks are in the same sandstone layer, about 223 million years old. More track survey work is anticipated next year.

Park partners at Yale University returned to a site they have been studying for several years in the northeastern corner of the park and found another micro-invertebrate fossil locality. Partners at Virginia Tech also returned to the area this summer but worked a site outside the park, with park assistance.

The Burke Museum (associated with the University of Washington) conducted field research in an area south of the pond site in the expansion lands and found another animal new to the park's records. In the first day's excavation, they identified at least 14 individuals of this animal in a trove of bones.

Paleontologist and program contact – Dr. William Parker (928) 524-6228 x262. Summer Interns: Adam Marsh, Ben Kligman, and Shelby Matsuoka.

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Archaeological survey southeast boundary.



Archaeology crew at work.



Archaeology crew survey transect.



Archaeology interns at work.



Petrified wood projectile point.

Summer of Science

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Archaeology

This summer was the second of a 3-year project to identify and record archaeology on the park's expansion lands. On about 2,000 acres in block and linear configurations, this summer's crews identified over 80 new sites and returned to 24 to update records for modern mapping, including habitation sites and areas where stone tools were produced from local petrified wood.

The high density of sites encountered last summer continued in this year's work. Archaeologists expect high site density to continue in all areas where the landscape is suitable for human use in the expansion lands.

Sites ranging from early Archaic (BC 7000–1500) to Pueblo IV (AD 1350–1500) were found this summer, consistent with the range of time periods found elsewhere in the park. Within the Pueblo II and Pueblo III periods, both jacal (a wall construction style of sticks and mud) and masonry building techniques were used to build above ground structures.

A story of habitation site selection may be emerging. Basketmaker pithouse villages (BC 1500–AD 750), common in the park, appear to move from lower dune ridges close to washes in early occupation periods to higher sites, including mesa tops, in later periods. Basketmaker is unique as it represents the first time groups of people settle into villages together.

A rock art project to evaluate recording techniques was undertaken by intern Nicole Lohman. Techniques ranged from digital recording on iPads to hand drawing of glyphs. Complete recordings of two important rock art sites were made. Drawing on acetate sheets overlaying photographs of each glyph panel was determined to be the most effective recording technique.

Independent research projects were conducted by all of the interns this summer, using Petrified Forest as a teaching laboratory. These projects were presented at the 2014 Pecos Conference and a portion of this research will be included at an invited poster session at the 2015 Society for American Archaeology meetings.

Lead Archaeologist and program contact – Mr. William Reitze (928) 524-6228 x268. Archaeologists: Iva Lee Lemkuhl, Amy Schott. Seasonal archaeologists: Gregory Luna Golya, Erina Gruner, Robert Sinesky. Interns: Nicole Lohman, Nicole Kulaga, Caitlin Ainsworth, Carlyn Stewart, Kathryn Turney.

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Summer of Science

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Ecology

Over Labor Day weekend, Petrified Forest held a small bio-blitz, in which crews of citizen scientists record all species of plants and animals they encounter within a 24-hour period. Over 50 volunteers donated over 800 hours. Results indicate 287 species of plants and animals were recorded on the park's expansion lands. Results of the bio-blitz will be vitally important as a baseline dataset of species diversity and geographic distribution on these lands.

In a partnership with the Arizona Game and Fish Department, known prairie dog colonies in the core park were mapped and an extensive survey of the expansion lands was performed to identify colonies for future mapping.

Although sightings have been reported, the Milksnake captured and marked this year was the first since 2007. Milksnakes are uncommon, nocturnal, and live underground.

Javelina and ringtail were found for the first time at Petrified Forest this year, probably as a result of climate change.

The summer crew continued the park's long-standing monitoring of small animals in the park using the following techniques:

- *Visual Encounter Surveys.* Using a set of randomly generated points in all habitat types, a systematic search for all taxa surrounding those points was conducted.
- *Nighttime Road Surveys.* Completed 23 surveys over 15 weeks. Found 367 animals including 59 snakes of 8 species and amphibians of 6 species (at least one individual of the 8 known snake and 7 known amphibian species in the park).
- *Active Reptile Trapping.* Trapped 25 days at 7 permanent sites yielding 376 animals, mostly lizards, but also snakes, amphibians, and small mammals. Seventy-five were recaptures from previous years meaning 80% of the captures were new animals added to the study.
- *Incidental Captures.* Captured 105 animals. Fourteen were recaptures from previous years meaning 87% of the captures were new animals added to the study.

Biologist, ecology lead, organizer of the Bio-blitz, and program contact: Mr. Andy Bridges, (928) 524-6228 x267. Biological Technician: Clinton Helms. Summer Intern: Alex Lim.



Greater Short-horned Lizard.



Milksnake.



Hera Buckmoth.



Pallid Bat in net.



National Public Lands Day fence removal project and some of the participants.

September 26, 2014 First Annual Friends Day

On Friday, September 26, Petrified Forest held its first annual Friends Day. Participants were provided a behind-the-scenes look at what's going on in the park in areas not generally visible to the public.

Tours of archaeological and paleontological sites with park scientists and an opportunity to check the reptile traps with the park biologist were offered in the morning. An open house of information on a variety of topics was available in the afternoon. This included a look under a microscope to see how bones are separated from the dirt and rock they are found in, as well as a chance to tour the museum collections.

In the evening, everyone gathered at Agate Mesa and enjoyed dinner while overlooking the Rio Puerco Basin at sunset. It was a great opportunity to gather with Friends and enjoy an evening of food and discussion in a place that everyone has fallen in love with.

Petrified Forest National Park is already looking forward to next year's Friends Day!

September 27, 2014 National Public Lands Day

On Saturday, September 27, a group of 21 volunteers and 4 park staff gathered to continue work on a fence removal project started in April of this year. Long sections of internal fence on expansion lands are no longer needed for cattle control. They also impede wildlife movement and need to be removed.

In the Billings Gap area, the work group removed a 0.75 mile stretch of mesh fence and nearly 1.75 miles of barbed wire fence in about 6 hours. The posts were left standing but will be removed at a later date.

Many thanks to Dave Dorum for the crew and equipment he brought from the Arizona Game and Fish Department. Thanks also to Kevin Dahl of the National Parks Conservation Association and Friends of Petrified Forest National Park, as well as Sandy Bahr of the Sierra Club, who each spread the word in their respective organizations and made the day a success as a result.

Join us for next year's Public Lands Day project!

Future Projects

A Special Note from Brad Traver, Superintendent, Petrified Forest National Park

Thanks to the Friends for your financial support of the 2014 summer interns and the wayside exhibit project. Thanks also for two especially generous donations specifically targeted for trail construction between the Painted Desert Visitor Center and Tawa Point and to improve lab equipment. We continue to appreciate the generous support of our Friends!

Here are some projects you can help us with in the coming year:

- Support of 2015 interns - \$1500 each for a 10 week period, in paleontology, archeology, and ecology. The \$3700 donated by Friends for the 2014 season helped make the discoveries detailed in this newsletter possible.
- Travel grants are always appreciated. They help area schools pay for bus transportation to bring kids to the park. In the 2013/2014 school year, Friends donated \$2000 toward these grants, bringing hundreds of school kids to the park for field trips.
- More exhibit panels will be produced in 2015, including a series telling the park's

archaeological story in the recently restored stone building at Puerco Pueblo. Waysides will also be replaced from Crystal Forest south to Rainbow Forest. These will include images from our re-photography efforts: historic and modern images showing petrified wood still in place after 100 years. Panels average \$400 apiece to produce, with design done by park staff.

- New discoveries from the summer require radiocarbon dates for archaeological sites. Each carbon date costs approximately \$550. Top priorities include the two new Basketmaker villages discovered on the expansion lands. Dating will tell us if they were occupied at the same time and how they fit with other Basketmaker villages in the area. We know from artifacts at one of the sites that it was occupied between 200 and 700 AD. Radiocarbon dating will provide a more precise date.

Thank you for your continuing interest in the support of Petrified Forest National Park!

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

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

Brad_Traver@nps.gov

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

www.nps.gov/pefo/



Horseshoe Crab Tracks.