

Regional Research Crew Survey...

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The Lubbock Lake Landmark regional research crew undertook surveys at three different locations over the winter and early spring. In December, initial survey began at a new research location on a private ranch near Stanton. An extensive, intact rim site (now rare for the region) overlooked Mustang Draw. A number of hearths had just begun to be exposed in the dirt ranch roads and inside a horse arena (hence the name Arena site). From the December survey and a further visit in January, 47 hearth features were recorded and almost 400 associated artifacts mapped and collected. The artifacts, predominantly lithics, included projectile points, bifaces and unifaces, a core, and part of a metate (grinding stone). This material demonstrated occupations from the Paleoindian to aboriginal Historic periods. Truly astounding as few rim sites had such time depth and the potential is high for the site being a persistent place and yielding important and new information about regional hunter-gatherer camping activities and land use through time. As one of the larger salinas on the

Llano Estacado, Tahoka Lake has been the focus of a number of occupations, both prehistoric and historic. Previous work at Tahoka Lake by the regional research crew has recorded a number of archaeological areas within the overall extensive site around the lake. In January as part of education programming, staff and students from Tahoka Middle School joined the crew and were introduced to survey and mapping. The students first heard a talk about the importance of Tahoka Lake, then divided into groups to learn about artifacts and



The field crew being inspected during survey.

pedestrian survey, the Total Station and its use in survey, and the GPS base station. Together, they identified, recorded, mapped, and collected a number of lithic tools and debitage from one of the identified areas of the site.

Adair-Steadman, a well known Folsom base camp originally was excavated in the 1970s by staff of the Texas Historical Commission. Now part of the Landmark's regional research program, survey at the site in April was part of an annual visit made to document the surface artifacts and condition of the site. Almost 50 lithic artifacts were mapped, recorded, and collected during the one-day on visit. All were made from the local Edwards Formation chert.

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Tues—Saturday 9am—5 pm
Sunday 1—5 pm

Sophie Butler, Field Technician

Dragonflies of the Lubbock Lake Landmark: Nature's Winged Wonders Abound on the Refuge

The Lubbock Lake Landmark is not only a hot-spot for archaeological discovery and nature pursuits such as birding, butterflying, and the search for wildflowers, it is also a natural environment that plays host to more than a dozen dragonflies. Over the past four seasons, I have combed the trails of the Landmark in search of these fine critters and have observed and/or photographed nearly 20 species from four different families. To date, only one species of damselfly, the Familiar Bluet (*Engallagma civile*) has been observed and photographed on the refuge. However, it is likely that more await discovery. This bright blue (gray in females and young males) smallish damselfly is quite noticeable with its bold coloration. This damselfly has been observed and photographed along the trails in several locations on the Landmark.



Checkered Setwing

Perhaps the most interesting species on the Landmark are the Checkered Setwing and Roseate Skimmer. The former is characterized by a pronounced checkered pattern on the abdomen (tail) in the female especially and has a brilliant cherry-red face in mature males! The latter is characterized in mature males by a stunning pinkish abdomen and lavender thorax! Nearly all the species noted can be observed on the refuge from June to October. The Variegated Meadowhawk is the exception as it may be seen as early as March and as late as November. It is one of the most common western species on the Southern High Plains and, in extremely wet years, its population can become quite numerous at times.

The refuge's dragonfly (*Anisoptera*) presence is well represented and numbers 18 species, and more to come is certain. Just last season alone produced a surprising new record with the photographing of a young male Bleached Skimmer (*Libellula composita*) whose presence in the region is most uncommon.

The 19 species identified on the Landmark are listed by family, common name (followed by the respective scientific name in parentheses), and in alphabetical order. They are as follows:



Roseate Skimmer

Bluets

Familiar Bluet (*Engallagma civile*)

Darners

Blue-eyed Darner (*Rhionaeschna multicolor*)

Common Green Darner (*Anax junius*)*

Clubtails

Flag-tailed Spinyleg (*Dromogomphus spoliatus*)*

Skimmers

Variegated Meadowhawk (*Sympetrum corruptum*)

Wandering Glider (*Pantala flavescens*)

Widow Skimmer (*Libellula luctuosa*)

Black Saddlebags (*Tamea lacerata*)

Bleached Skimmer (*Libellula composita*)

Checkered Setwing (*Dythemis fugax*)

Flame Skimmer (*Libellula saturata*)*

Continue on page 3

Dragonflies ...

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Skimmers

Halloween Pennant (*Celithemis eponina*)

Roseate Skimmer (*Orthemis ferruginea*)*

Twelve-spotted Skimmer (*Libellula pulchella*)

Eastern Amberwing (*Perithemis tenera*)

Red Saddlebags (*Trapeza onusta*)

Spot-winged Glider (*Pantala hymenaea*)

Common Pondhawk (*Erythemis simplicicollis*)

Great Pondhawk (*Erythemis vesiculosa*)

So, what are you waiting for? Armed with binocular and camera in hand, head out to the Lubbock Lake Landmark in search of these scintillating little winged wonders!

*not photographed by author

Jerry K. Hatfield, enthusiast

The Great Camel Discovery

A mandible (lower jaw) of a giant camel was discovered this spring in Ogallala deposits (Pliocene) on the ranch near Post during reconnaissance survey. Although way beyond the timeframe of the Landmark's regional research program, it was a rare find too important to be passed by. The camel family (Camelidae) originated in North America in the Eocene (55-33 million years ago) and thrived throughout the continent before emigrating to South America and Asia and Africa where today they are represented by wild llamas and camels. Camels became extinct in North America at the end of the Pleistocene approximately 11,000 years ago (camel was one of the game animals of Clovis peoples at the Landmark). During their evolution in North America, camels diversified into a wide range of forms, including small, gracile forms, giant forms, and everything in between, and inhabited plains and mixed savanna-woodland environments.

Several genera of camels were present in North America during this time. The type of giant camel represented by the partial mandible was among the largest camels ever to exist. Maximum height of these animals would have ranged from 10-14 feet and a complete mandible averages over two feet in length. The mandible had begun to erode out of a cut-bank in a small, intermittent drainage and part of it remained in place. This situation was very fortunate as the location of the bone in the wall provided stratigraphic and chronological information. The mandible was exposed at the base of the Ogallala Formation, providing an approximate age of 6-8 million years ago.

The mandible, recovered in many segments, requires conservation before analysis can begin. Currently, the mandible has been cleaned and stabilized. The mandible will need to be reconstructed before an identification can be made. Initial observations suggest this specimen may represent the genus *Gigantocamelus*. This designation, however, may change after further examination and research. Finds of giant camels occur only rarely in the region and this specimen is an important and exciting find that will contribute to the understanding of ancient animals and regional environments.

John Moretti, Field Technician

Archaeology In Action

Here's your chance to see "archaeology in action" as you interact with the excavators and lab crew. View what is being unearthed and learn how environmental and cultural clues fit into the picture of the culture and time period under investigation.

**Saturday, July 11, 2009
10:00a.m. - 4:00p.m.**

A Mammoth of a Good Time ...

The first hunter-gatherer groups to enter North America at the end of last Ice Age encountered an array of large mammals that are now extinct. Species that became extinct include horses, camels, ground sloths, and mammoths. On the Southern High Plains, evidence of people hunting and/or butchering Columbian mammoth (*Mammuthus columbi*) came from the Clovis site (near Portales), the Miami playa site (Roberts County), and here at the Lubbock Lake Landmark in Yellowhouse draw. The Columbian mammoth grazed on grasses on the southern parts of North America and was larger than its cousin the Woolly mammoth that was adapted to the colder climates of northern North America.

The activities of the first hunter-gatherer groups to enter North America for which definitive evidence exists date between 11,500 to 10,900 years ago, a time known as the Clovis period. Clovis sites are rare in North America, but these people were mobile hunter-gatherer groups that carried with them a highly sophisticated stone tool kit designed

for hunting and butchering a variety of game animals, mammoth being only one of them. This spring, additional Columbian mammoth remains were located at a playa near Brownfield and at two other localities near the escarpment edge on a ranch near Post. At Brownfield, test excavations around a mammoth leg bone in playa sediments did not uncover any additional mammoth remains or stone tools.

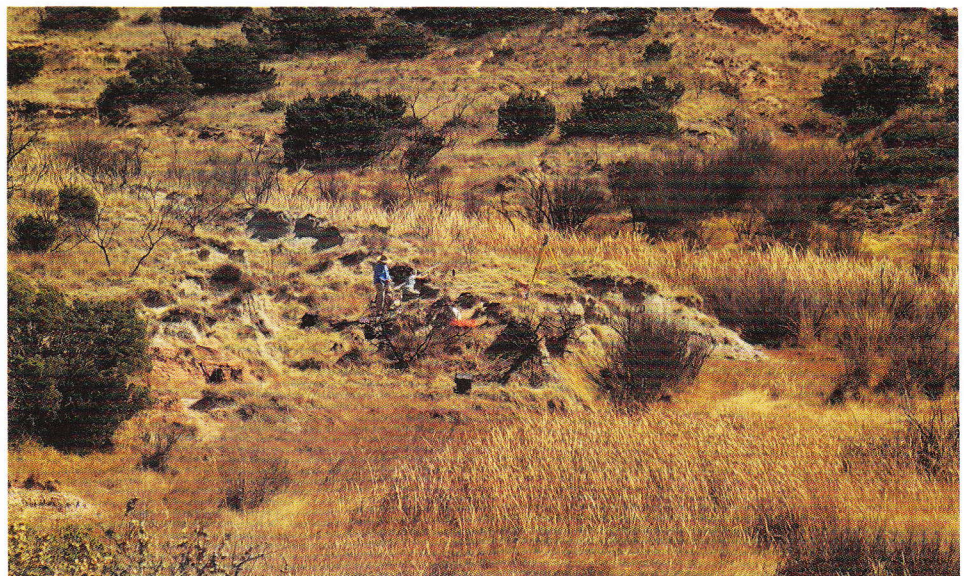
At Post, Edwards Formation chert tools have been discovered near mammoth remains at two different localities. The Edwards Formation is an important source of raw material for the manufacture of stone tools that is located in central Texas. The discovery of Edwards Formation chert stone artifacts indicates these tools were part

of a hunter-gatherer toolkit that was transported for use at these localities. At the first site, a biface tool was found on the surface near a fragmented mammoth tusk. A biface tool is a piece of stone that has been worked on both sides. Several test units have been placed to ascertain whether or not the stone tool was in fact associated with mammoth. The testing has yielded another Edwards Formation biface tool in proximity of the mammoth tusk. Both biface tools are located near the mammoth tusk, but are not in direct association with the mammoth in the same layer of sediment.

At the other Post locality, an Edwards Formation chert uniface tool has been found on the surface close to fragmented mammoth bone. A uniface tool is a stone tool that has been worked only on one side. The presence of another stone tool near mammoth remains suggests another possible site with an association of early people with extinct mammoth. Additional excavation at both sites is planned for the coming summer.



Lubbock Lake Landmark crew excavating mammoth remains in a playa near Brownfield.



Excavation of mammoth remains in lake sediments near Post, Texas.

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Mammoth...

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The stone tools are being prepared to be sent off to the Lab of Archaeology at California State for blood residue analysis. The stone tools will be tested to determine if they are positive for mammoth as well as other extinct Pleistocene fauna such as horse and camel. A positive test for any of these species would provide an important clue that these artifacts are associated with the mammoth remains at the two sites and were left behind by the first hunter-gatherer groups on the Southern High Plains.

*Dr. Stance Hurst,
Lubbock Lake Landmark Regional Field Manager*

Research continues at Roland Springs

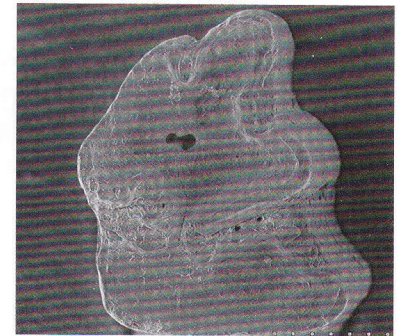
Investigations at the Roland Springs Ranch Locality 1 (RSR-1) has produced a large and varied collection of animals from the early Pleistocene (about 1.8 -2 million years ago). Research during the fall and winter primarily has involved comparing RSR-1 material with that in the related late Pliocene (ca. 3-3.5 million years ago; also known as the Blancan land mammal age) Beck Ranch collection. The focus of this research has been on rabbit and tortoise remains, both important components of the RSR-1 fauna.

Extinct tortoise remains of the genus *Geochelone* spp. comprise the majority of specimens recovered from RSR-1 excavations. Therefore, knowledge of Blancan tortoises is a necessity in developing a detailed understanding of the RSR-1 fauna. As a

part of this effort, Beck Ranch tortoise material has been analyzed to help identify the species represented in the RSR-1

collection. An important discovery resulting from examination of shell segments in the Beck Ranch collection is that nine separate segments refit to form a partial shell representing a *Geochelone rexroadensis* individual. *Geochelone rexroadensis* is a large, thick, and smooth-shelled tortoise. The importance of the identification of this specimen lies in the fact that it is a previously undescribed specimen for which no reference is made in any of the Beck Ranch publications.

Scanning electron microscope (SEM) images were obtained for Beck Ranch extinct rabbit *Nekrolagus* lower 3rd premolars (p3). Fourteen



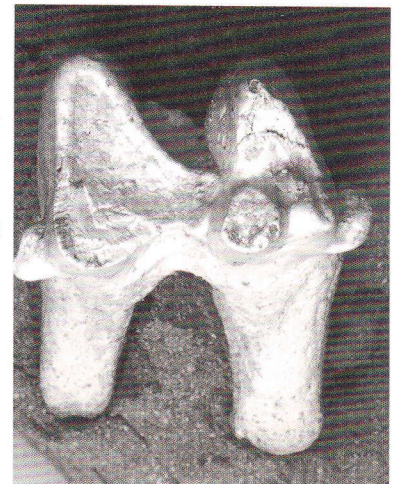
Extinct rabbit tooth.



Reconstructed partial shell of Geochelone rexroadensis.

RSR-1 rabbit (Leporinae) p3's also were examined under the SEM and imaged. Two forms occur in the RSR-1 fauna based on size and morphological traits that also separated them from the Beck Ranch *Nekrolagus* specimens. *Nekrolagus*, considered ancestral to and a key form in the evolution of the modern rabbits *Lepus* (jackrabbit) and *Sylvilagus* (cottontail), was a Blancan form, and the transition to *Lepus/Sylvilagus* may have been completed by the earliest Pleistocene. The lack of *Nekrolagus* in the RSR-1 fauna, although common in the Beck Ranch fauna, underscored the probable early Pleistocene age for the RSR-1 fauna. The two RSR-1 forms, however, were not modern rabbits. Much more research needs to be done before identifications can be made.

SEM images also have been taken of two bat molars of what appears to be an extinct vespertilionid bat (evening bats). The molars are heavily buttressed on both anterior and posterior sides and each of these is a different shape. The buttressing is a way of protecting teeth and the bat probably was eating hard substances. No modern evening bat has teeth exhibiting this trait.



Extinct bat tooth with distinct buttressing.

John Moretti, Field Technician

Texas Master Naturalists ask: What Are These Interesting Plants??

Ever wonder what plants are growing in the Xeriscape bed northeast of the Landmark's Interpretive Center? Recently, the South Plains Chapter of the Texas Master Naturalists has developed a guide to the plants. Many of these plants are native to the Landmark and have been planted in this bed to show the beauty of the regional plants. Look for descriptions and illustrations, drawn by Master Naturalist Barbara Teel, of each plant in this guide. This bed, prepared for the Landmark about two years ago, gradually has seen more and more plants added to create an interesting mix.



A variety of wildflowers

The sippers (supplied by stored rainwater) that were built by the chapter about a year ago have been fairly successful and can be seen along the nature trail. The sippers were designed to provide rainwater to the smaller animals that call the Landmark home. However, due to the lack of rain, the little animals chewed through the plastic tubing. These tubes have been repaired by members and, hopefully, they can provide water for the small wildlife at the Landmark. Thank goodness for the rain.

Earlier this spring, the Landmark hosted the chapter for a Project Wild training led by Vicki Sybert, Wildlife Biologist for the Texas Parks and Wildlife. This training is a comprehensive set of hands-on activities designed for all ages, a fun way to learn about the ecology and biology of wildlife. My favorite activity was when we all got in a circle and sat in each others lap. When one person leaves the circle falls down. We actually experienced how a habitat can collapse when something changes. These active learning activities will be very valuable at the Landmark for future educational programs.

Meeting at Lubbock Lake Landmark is such a great experience, because it is natural environment and the area is surrounded by the natural and cultural heritage the Southern High Plains. The mission of the Texas Master Naturalist Program is to develop well-informed volunteers to provide education, outreach, and service dedicated to the beneficial management of natural resources and natural areas within the community and the state of Texas. As we move forward into the future our volunteers will assist in landscaping, wildlife support, and educational programs. The Texas Master Naturalists are sponsored by the Texas Agri-Life Extension Service and the Texas Parks and Wildlife Department. Lubbock Lake Landmark has graciously become an active partner with the Texas Master Naturalists. Contact the Lubbock Lake Landmark for more information about becoming a Texas Master Naturalist.

Jackie Driskill, Texas Master Naturalist

How do you utilize the Landmark?

We want to know how our visitors take advantage of the Landmark. If you are interested in sharing your experience, contact Susan in the Education Office. Your story could be published in the next edition of

Notes from the Field.



Mary Wilber, Stacy Esquel, Instructor Vicki Sybert, Barbara Teel & Education Intern Leigh Anne Stone participate in Project WILD

From Ancient Bones to Historic Metal

Conservation efforts play a vital role in maintaining the integrity of the objects recovered in the regional research program. Currently, measures are being taken to refine the techniques by researching the latest strategies and products for conservation in order to build upon an already successful methodology. Environmental controls are



Immersing fragile bone in a stabilizing solution.

monitored extensively using data loggers to record the temperature, relative humidity, and light intensity to which objects are exposed. Two new data loggers have been added recently in order to help evaluate the interior environment of the QRC. Bone brought into the QRC lab undergoes a detailed conservation process. To begin with, the bone is cleaned thoroughly, at times using simply a wooden pick and a brush. In certain cases, chemicals may be applied in order to remove as much dirt as possible. The bone then goes through a series of immersions in a reversible conservation-grade chemical solution in order to stabilize and strengthen the bone. Conjoining may be practiced to refit broken bones. This process involves refitting broken bones back together using a reversible conservation-grade adhesive. An interesting bone recently conjoined is a mammoth rib found at the Landmark in Area 6 during last year's excavation season. The bison skull brought in from the Post research continues to undergo stabilization treatments. Most of the sediments now are gone, the mandible has been detached, and the inner portions of the skull are being stabilized.

Excavation does not just occur in the field. When unstable bone is discovered in the field, a protective bandage (either a cast or pedestal) is applied in order to remove the bone safely and work on it in the lab. As the cast or pedestal is excavated, treatments are applied that result in the ability to handle the bone safely. A cast brought in from the Post research contained two metapodials exposed in the field but what was found was both surprising and exciting. Upon excavation, not only has a metacarpal been found but all the carpals as well. And, the carpals are all still in place. Underneath the carpals, the radius with part of the ulna are still in place. Quite exciting to bring a piece of the field into the lab for discovery.

Conservation efforts are not limited to just bone. Currently, historic metal objects from the Post research are being stabilized. This material includes cans, bullet casings, and a trap. In order to preserve these objects, they are first being cleaned using a brush. Those objects considered to be fragile will be recessed. What recessing means is that these objects will receive their own customized tray with a foam cut out covered in unbleached muslin into which they will be placed. This arrangement prevents the object from moving around too much to prevent further damage. One object in particular shows signs of oxidation and is undergoing a process to remove as much of the build-up as possible in order to prevent even more damage to the object. The removal of this build-up also will help to prevent an infestation that could spread to other objects in the collection. The object will be isolated and evaluated periodically to monitor its progress.



Excavation and cleaning a bison skull from the Post research recovered in a plaster jacket.

Lubbock Lake Landmark: an archaeological and natural history preserve

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www.museum.ttu.edu/LLL

*Dedicated to the conservation and stewardship
of cultural and natural resources*



Lubbock Lake Landmark



Sights of the Landmark in Spring....



The Hoodenpyle family of Lubbock enjoys a picnic lunch and a beautiful spring day.

**Contributors to this issue of Notes
from the Field:**

- Sophie Butler
- Jackie Driskill
- Jerry K. Hatfield
- Dr. Stance Hurst
- John Moretti
- Cynthia Lopez

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Museum of Texas Tech University



*Students from Post learn about fire ecology during
Environmental Awareness Week.*



*Celeste Devilliers & Sara Farnsley creating
Tie-Dye t-shirts during Springbreak Fest.*