Massive 60-Million-Year-Old Tree Stump and other Geological Exhibits Featured at the New Long X Trading Post in Watford City

By John W. Hoganson

The grand opening and ribbon cutting ceremony for the Long X Trading Post in Watford City occurred on Saturday afternoon, April 16, 2005 with about 300 people in attendance. Gene Veeder, Executive Director of the McKenzie County Job Development Authority, and Sue Johnsrud, Assistant Director of the McKenzie County Tourism Bureau, presided over the event. Veeder was Master of Ceremonies. Bill Goetz, Governor Hoeven's Chief of Staff, Sara Otte-Coleman, North Dakota Tourism Director, Gerard Baker, Superintendent of Mount Rushmore National Memorial Park, Dale Patten, Chairman of McKenzie County Commissioners, and Dennis Bingeman, Mayor of Watford City, gave addresses during the outdoor ceremony. Lee Peterson, Commissioner for the Department of Commerce, was also a special guest. The presentations were followed by a public open house. Several hundred people, mostly school children, visited the center during the first week that it was open. The Long X Trading Post, named after the oldest and one of the most historic cattle ranches in McKenzie County, Long X Ranch, houses a visitors' center with exhibits, a pioneer museum, and a bottle shop. It is the place to stop to obtain information about Watford City and McKenzie County's cultural, historical, and geological attractions. A massive 60-million-year-old petrified tree stump, a cast of a *Bison latifrons* skull, and a petroleum industry display are among the many exhibits in the visitors' center that interpret the prehistory and history of McKenzie County.

Ribbon cutting ceremony during grand opening of the Long X Trading Post. L. to r., Gerard Baker, Dale Patten, Dennis Bingeman, Lee Peterson (partially obscured), Sara Otte-Coleman, Bill Goetz, Sue Johnsrud, and Gene Veeder.

In 1996, Mike Matozevich of the U.S. Forest Service (USFS) discovered crocodile bones weathering out of a Sentinel Butte Formation outcrop in the badlands near Lone Butte in McKenzie County, about 30 air miles southeast of Watford City. While excavating the crocodile remains we discovered a huge, beautifully preserved petrified tree stump still in growth position. The stump was completely entombed in the small butte where the crocodile bones were weathering out, and we did not know that it was there before the excavation was well underway. It was discovered when we commissioned a backhoe from Trotter Construction in Grassy Butte to remove the 8 feet of rock resting on top of the crocodile bone bed. As Ron Heiser, the backhoe operator, was removing the rock he encountered the top of the stump. I told him to remove it from the site so that we would have access to the bones. But as work proceeded the stump "grew" larger, ultimately too large to remove with the backhoe. After the rock was removed from around the stump it was determined to be 9 feet in diameter at the base and 8 feet tall – the largest petrified tree stump that I have seen in North Dakota. The fossil site is located on United States Forest Service-Dakota Prairie Grasslands administered land and the excavation was funded by the Forest Service. The crocodile bone excavation was a cooperative project between the NDGS and USFS. Several USFS personnel were involved including Barb Beasley, paleontologist from Chadron, Nebraska, Larry Melvin, Minerals Program Manager for Dakota Prairie Grasslands from Bismarck, and Marvin Giese and David Valenzuela, District Minerals and Land Program Managers from Watford City. J. Mark Erickson and geology students from St. Lawrence University, Canton, New York, and many volunteers assisted with the excavation.

The base of the stump was embedded in a one foot thick bed of lignite indicating that the tree was growing in a swamp about 60 million years ago. The roots radiating from the stump were carbonized and turned into lignite whereas the stump was petrified with most of the wood replaced by silica. The stump is probably bald cypress (*Taxodium*) suggested by the nature of the bark, configuration of the roots, associated leaf fossils found at the site, and because it was growing in a swamp. Other petrified tree stumps, also probably cypress, dot the landscape around the excavated stump. North Dakota was hot and humid 60 million years ago, similar to south Florida today, and in western North Dakota forests were growing in a swampland. The swamps were inhabited by crocodiles. After death and decomposition of the carcasses, the crocodile bones washed into and were trapped by the root system of this huge tree. Other creatures lived in the swamp, including mammals, indicated by other fossils found at the site.

Gene Veeder and others asked if the stump could be displayed at the new Long X Trading Post visitors' center that was being planned at that time. Frank Guzman, USFS McKenzie District Ranger, organized a meeting in Watford City, which included officials from the Forest Service, Marvin Giese, David Valenzuela, and Larry Melvin; Gene Veeder, Watford City Engineer Dave Johnson, and myself. Even though we knew that it would be a difficult engineering task, the decision was made to move the stump to Watford City for exhibition in the new visitors' center.

Long X Trading Post at Watford City.

Because of the large mass of the stump, a crane would be required at the site to lift the fossil onto a truck for transport to Watford City. The fossil site is about 2 miles from the nearest oil well road, and the trail to the site had to be improved before the crane could be transported to the site. This was accomplished by the McKenzie County Road Department. The spring morning of the move was beautiful, but the weather turned nasty later in the day. Earlier, we had excavated around the stump to make sure that all of the crocodile bones had been removed. The trench extended to a depth of about 1 foot below the base of the stump. The well thought out plan and procedures for removal of the stump were devised primarily by Rick Jore, Watford City's Administrator/Engineer, and Dale Karpyak, owner of Iron Horse Machine of Watford City. Tunnels were burrowed beneath the stump so that 6 inch wide straps could be placed under the stump for lifting. The stump was shrink wrapped. Jore and Karpyak designed a metal frame to place around the stump and a spreader bar system at the top to prevent damage during lifting and transport. A crowd of about 30 people came to this remote locality by four wheel drive truck and horse to witness the event. And it was a sight to behold. The crane slowly lifted the stump and suddenly sediment from inside the stump flushed out from the bottom. We knew the stump was hollow but did not know it was hollow all the way through. We were not sure if the hollow stump would be able to withstand the stress of the lift. But it did and it was lifted into the back of an end-dump gravel truck, containing a bed of sand, and strapped down for transport.

Petrified tree stump being excavated with a backhoe.

Removal of crocodile remains from the base of the petrified tree stump.

Preparing petrified tree stump for removal. Note shrink wrap, strapping, and straps for lifting placed in tunnels under the stump.

Preparing petrified tree stump for removal. Note spreader bar above stump.

Lifting petrified tree stump into truck.

The trip from the fossil site to Watford City was uneventful, again as a result of the collective engineering genius of Jore and Karpyak. By the time we arrived in Watford City snow was falling. The crane in Watford City to be used to lift the stump from the truck and through the roof of the trading post appeared too small for the task. The stump was taken to the grain elevator to be weighed, and it was determined that a larger crane would be needed to lift the 16,000 pound stump. The crowd of spectators and reporters had to wait another two hours for the large crane to arrive from Borsheim Builders Crane Service, Inc., of Williston. It was a remarkable sight to see the stump lifted and lowered through a hole in the roof of the two story building. The crane operators were masters and gently placed the stump on the preconstructed platform in the visitors' center. The easy part was providing the interpreted text and photographs to finish the exhibit. The project was truly a cooperative effort between the city of Watford City, McKenzie County, USDA Forest Service-Dakota Prairie Grasslands, and the North Dakota Geological Survey.

Transporting petrified tree stump across badlands terrain.

Lifting petrified tree stump through roof of Long X Trading Post.

Placing petrified tree stump on base in Long X Trading Post.

Petrified tree stump exhibit in Long X Trading Post.

Petrified tree stump exhibit and *Bison latifrons* skull exhibit in Long X Trading Post.

Several years ago, Kent Pelton, a teacher at Watford City High School, discovered a skull of the giant Ice Age bison, *Bison latifrons*, along the shore of Lake Sakakawea while fishing (see my 2003 NDGS Newsletter volume 29, no. 2 article). The original skull, with a horn core span of 7 feet, is exhibited at the North Dakota Heritage Center in Bismarck. The United States Army Corps of Engineers provided funds to make a cast of the skull to be displayed in Watford City. The cast in the visitors' center is accompanied by a skull of a modern day bison for comparison.

The Industrial Commission, Oil and Gas Division and the ND Geological Survey collaborated on establishing the first comprehensive petroleum industry exhibit in North Dakota at the Long X Trading Post. An entire room is dedicated to this exhibit, which illustrates the importance of the oil and gas industry to McKenzie County and the State of North Dakota. The exhibit includes three interactive displays. One display explains how seismic exploration is used to determine rock types and configuration of the rocks beneath the surface. This information aids geologists and engineers in locating the highest potential areas to drill for oil and gas. Visitors can trigger a blaster's switch which activates the display. A simulated explosion occurs and seismic waves are seen traveling through the rocks in the model while a narration explaining the process is provided.

Petroleum industry exhibit in Long X Trading Post. Seismic exhibit on the left and core and crude oil exhibit on the right.

Petroleum industry exhibit in Long X Trading Post. Note picture of Benhomer Risser #1 well on the wall and interactive computer.

Along another wall in the petroleum room are stratigraphic columns of North Dakota showing the rock formations, and depths below the surface of the rock formations, that produce oil and gas in McKenzie County. Oil well cores and crude oil samples from 12 producing rock units are exhibited. A light is activated in each of the cubicles containing the core and oil samples by pressing a button adjacent to the rock formation on the stratigraphic column. The visitor gains an appreciation for the different rock types and the several varieties of crude oil that are recovered from the different producing horizons, which generate oil and gas in McKenzie County.

The third display in the petroleum room is an interactive computer that utilizes video clips and power point presentations to provide the visitor an insight into the history of oil and gas development in McKenzie County and North Dakota.

The visitors' center also has a temporary exhibit gallery. That gallery contains a geology of the Lewis and Clark trail exhibit that Ed Murphy and I designed. It is a 16 foot long map of the Missouri River corridor in North Dakota from the South Dakota border to the Montana border. This map includes the Missouri River channel as mapped during the Lewis and Clark expedition in 1804-1806 and the present position of the Missouri River channel, which is mostly occupied now by Lake Sakakawea and Lake Oahe. The map also includes the location of Lewis and Clark campsites and places where Lewis and Clark and other members of the Corps of Discovery made geological observations. Photographs of the geological features that the Corps of Discovery wrote about are also included on the map. Tables in front of the map contain rock, fossil, and mineral specimens that the Corps journalists wrote about, which the visitor can hold and examine. Across the room from our Lewis and Clark exhibit are Eloise Ogden's (Minot photographer) beautiful photographs taken along the Lewis and Clark trail.

There are many other displays in the Long X Trading Post, primarily of historic artifacts from pioneer days in McKenzie County and development of the cattle industry. A visit to the Long X Trading Post should be in everyone's travel plans.

Geology of the Lewis and Clark Trail exhibit in the Long X Trading Post.