



Michigan Archaeology 2018

EZHIBIIGAADEK ASIN

KNOWLEDGE WRITTEN ON STONE

Shooting the arrow of knowledge into the future with digital preservation

Sanilac Petroglyphs Historic State Park

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Knowledge Written on Stone



These carvings in stone, or petroglyphs, represent the collective memory of the Great Lakes Anishinabek (Original People) ancestors. Certain areas were used for ceremony throughout the Anishinabek aboriginal territory—places selected for their spiritual power and significance. Ceremonies and teachings were conducted at these sacred sites, and many ceremonies still take place at the Sanilac Petroglyphs today.

In the Thumb region of Michigan, more than 100 petroglyphs carved into a large sandstone outcrop contain valuable lessons and reflect Anishinabek oral history. Some of the carvings are said to contain significant information, such as Creation and Prophecy Stories—stories that have been handed down through generations. Other carvings depict daily life and history, such as animal clans and celestial or seasonal events. These teachings help the 21st century Anishinabek understand their past, present and future.

Chief Little Elk believed the petroglyphs—ezhibiigaadek asin—were carved by Nanabush (Nanaboozhoo), the Spirit Uncle to all Anishinabek. Nanabush walked the earth before the existence of humankind and was tasked with giving names to all living things. He is believed to have taught the ancestors how to live in balance with Creation.

“Those rocks are natural like that. No one carved them. That one up on the Cass River, we call that the Nanabush Rock. The ol’ timers said that’s the Indian Creation. That’s natural . . . no one carved it. But that rock used to be bigger, it’s going down. It’s sinkin’. They used to have ceremonies there once a year. No one goes now, that’s why it’s sinkin’. We should have a ceremony there. No one carved that stone . . . no one . . . ‘cept maybe . . . Nanabush.”

Chief Eli “Little Elk” Thomas, Saginaw Chippewa (1898-1990)

SANILAC PETROGLYPHS HISTORIC STATE PARK



Located on the floodplain of the Cass River, this site was rediscovered following massive forest fires that swept the region more than 100 years ago. Archaeologists have studied these petroglyphs since the 1920s and recorded them through drawings, photographs, molds and casts, and excavations

surrounding the rock outcrop. Stone tools and pottery found during excavations show that Native peoples occupied the area intermittently over approximately the last 8,000 years and help date the creation of the petroglyphs to within the last 1,400 years. A prominent carving featuring an archer also suggests this time frame, following the introduction of bow and arrow technology to this region. This is by far the largest known grouping of petroglyphs in Michigan.

The Michigan Archaeological Society purchased the petroglyphs and the surrounding land and deeded these to the State of Michigan in 1971. Now the 240-acre Sanilac Petroglyphs Historic State Park is preserved to teach us about our cultural and natural heritage and our continuing relationship with the environment. The petroglyphs are listed in the National Register of Historic Places.

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They Work with Each Other



The fragile carvings in sandstone are easily affected by natural and cultural forces. Many faded naturally throughout the centuries, but some have been vandalized or even chipped away and stolen. Tribal and state partners are working more closely than ever to care for and manage this site, and recently began an ambitious digital preservation effort using terrestrial LiDAR and close-range photogrammetric reconstruction.



Simply put, LiDAR uses pulses of light (harmless lasers) to detect and measure the three-dimensional (3D) world. LiDAR instruments can be mounted on a tripod, on a vehicle, or on a manned aircraft or unmanned drone. LiDAR

creates a detailed model by collecting a 3D point from every location that reflects the laser. For this project, specialists with the Michigan Department of Transportation used roughly a dozen tripod positions to accurately record all aspects of the site to within about a millimeter of accuracy. Including surrounding features, they captured almost 3 billion points—about 1 billion of these on the rock outcrop itself! In addition to using LiDAR, specialists also performed a photogrammetric reconstruction of the petroglyphs using 155 overlapping photos. Software can use these to create a second type of 3D model of the petroglyphs. These processes will be repeated every five years for the next 15 years in a longitudinal study of site preservation and technological innovation. Add to this the additional LiDAR scanning of the molds and casts made in the 1940s and we will witness the changes in the carvings across nearly a century.



EBMODAAKOWET

The Archer



Ebmodaaakowet represents Anishinabek ancestors shooting an arrow of knowledge into the future so that later generations connect to and learn from this sacred place. Today, through respectful collaboration and modern technology, a tribal and state partnership is dedicated to preserving ezhibiigaadek asin for the next Seven Generations.



FRONT: A dense LiDAR point cloud made of millions of 3D points, colorized by intensity (reflectivity), shows minute details of the petroglyphs. **LEFT:** Tribal partners led MDOT specialists in blessing the LiDAR units with sage smoke and a smudging ceremony to begin the fieldwork in a respectful way. **ABOVE:** Triangulated mesh model of the Ebmodaaakowet carving created using photogrammetry.

