Shooting the arrow of knowledge into the future with digital preservation
Sanilac Petroglyphs Historic State Park

EZHIBIIGAADEK ASIN
KNOWLEDGE WRITTEN ON STONE
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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.

“They 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 PETROGLYPHHS 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.

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.

WIIDANOKINDIWAG
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.

EBMODAAKOWET
The Archer

Ebmodaakowet 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.