

The Monahan Outdoor Education Center

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Description

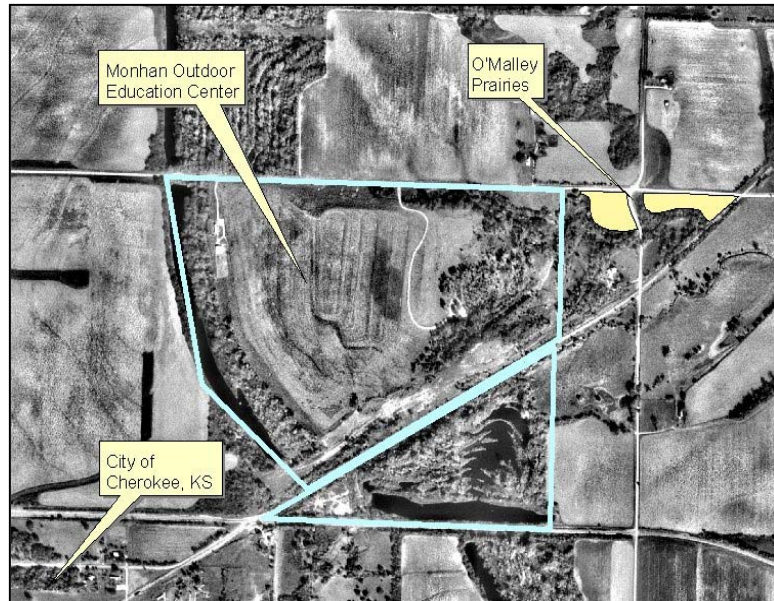
The Monahan Outdoor Education Center is a 153 acre (62 ha) partially reclaimed abandoned coal mine. The major feature is an 80 acre (32.3 ha) restored grassland atop what was a “gob” pile – a large pile of abandoned coal refuse. To the east of the grassland is the remnant of an erosion control dam built during the reclamation project. It forms a rough semi-circular border between the grassland and the naturally re-vegetated oak woodland growing on the mine spoils. The dam has created two small wetlands and has a hiking trail on it that also moves through the woodland and over two small streams. There is a gathering pavilion and restroom facility at the edge and at the end of the gravel road onto the property from the north border.

To the west of the prairie is a barn (for equipment storage) and trailer home (for graduate students), then a large bordering strip-mine lake. To the south is small drainage (from the strip-mine lake eastward) and wetland that flow to join a similar drainage way from the north border and then leave the property to the east. South of this drainage is a railroad track and a large un-reclaimed area with poorly vegetated mine spoils and strip pits.

Acquisition, reclamation, and development

In 1988, Dr. and Mrs. William J. Reals of Wichita donated the land to the PSU Biology Department in memory of Mrs. Reals father, the late Francis A. Monahan. Monahan was the son of a mining engineer from Scotland and he used the valuable skills he learned from his father in the coal fields in Cherokee and Crawford Counties. The site was dedicated on November 6, 1988.

In the early 1950s, Monahan bought the 156 acre tract of land from the Commercial Fuel Company because he knew there was still a lot coal there and a lot of coal dust in the washings and thought



some of it might be salvaged. Monahan was also interested in seeing the land restored. He was always concerned about the impact mining had on the land. He was even appointed by the governor to serve on a state commission that studied the environmental impact of strip mining.

Reclamation of the site began in 1984 and ended eight months later. The reclamation included three phases: (1) stabilization and clean up – built an erosion control dam and cleared mining debris; (2) site preparation – de-water small pits, reshape surface including lowering of gob pile; (3) restoration – addition of topsoil (mine spoils were used) and limestone, construction of tile drainage system to divert surface infiltration, discing, fertilizing and planting of an oats cover crop. In Spring 1985, trees, shrubs and grass were planted. The grasses planted were a mixture of native species including Little bluestem, Big bluestem, Sideoats grama, Wheatgrass, Switchgrass, Buffalograss, Prairie coneflower, Purple prairie clover, and Prairie sunflowers.

The initial development of the Monahan Outdoor Education Center included a barn and caretakers quarters (mobile home). The barn houses maintenance equipment and supplies including a tractor and implements, fire-fighting equipment, and related materials for managing the site. Rural water was provided later. In 2001, the Reals

Pavilion was completed as a shelter for visitors. The Coal Creek Nature Trail system was also developed on the east side of the property.

Currently, a modern pit toilet is being constructed adjacent to the pavilion by the PSU College of Technology and a wetland area is being constructed south of the grassed mound (with funding from the Natural Resource Conservation Service).

Usage

The site has been used for several theses and research projects. The vegetation was first surveyed in 1987-1988 by Vickers (1989) and in 1994 by Yates (1996). Imhoff (1994) performed the first post-reclamation water quality survey. Various undergraduate students have also conducted short-term water quality studies on the site, most recently in the period 2000-2002 by Tommy Wells, Brandon Dunham, and Kip Sagehorn. The Kansas Dept. of Health and Environment funded a \$30,000 study of surface and groundwater to assist in planning a remediation project for controlling seepage along the north side of the mound. The study was conducted by Dr. Joe Arruda and employed several graduate (Scott Benard, Josh Jagels) and undergraduate (Lynsey Earl, Sarah Smith, James Daniel, John Imhof, Glenn Reed Selby, and Deep Bhari) students.

Many classes, including Stream Ecology, Terrestrial Field Ecology, Wetland Ecology, Ornithology, Mammalogy, and Wildlife Management have used the area. "Soils", a requirement for all field biology students, uses the Monahan for soil analysis. Travis Robb completed an undergraduate research project on the Monahan and presented a paper titled "A comparison of organic soil carbon at a native grassland and a reclaimed strip mine site in southeast Kansas" at the Biology Undergraduate Research Colloquium. He was sponsored by Dr. Dixie Smith.

The Coal Creek Nature Trail was developed with student help. The large strip-pit lake to the west is used by the public for fishing.

Management

The large central restored grassland is mowed or burned, usually in the spring but at times in the fall. The focus of recent management has been to control the seepage of acid mine drainage from the

north slope. To that end, a water quality study (surface and ground water) was conducted and a new wetland constructed. In the future, it is hoped that funds will be secured for more extensive reclamation effort.

The remaining areas are not actively manipulated. The area to the east of the grassland has re-vegetated on its own post-mining. It is dominated by some hardwood species (oaks) and has a heavy understory of brush. The triangular-shaped portion of the property south of the railroad tracks has not been reclaimed and serves as a contrast for the restored part.

Theses

- 1996. The Evaluation of Two Types of Multivariate Analyses Applied to Grassland Vegetation Data from a Reclaimed Coal Mine Area in Southeast Kansas, USA. Yates, Karen F. (Advisor: Dr. Joe Arruda)
- 1996. Land Use and Anuran Biodiversity in Southeast Kansas. Anderson, Lewis Ray. (Advisor: Dr. Joe Arruda) [used MOEC as one location]
- 1994. A Post-Reclamation Water Quality Assessment of the Monahan Outdoor Education Center. Imhof, Sally A. (Advisor: Dr. Joe Arruda)
- 1989. Vegetative Analysis of the Monahan Reclaimed Mined Land Area. Vickers, Jeff L. (Advisor: Dr. Ralph Kelting)

Publications

- 2006. Anderson, L. and J.A. Arruda. The relationship between land use and amphibian biodiversity in southeast Kansas. Amphibian and Reptile Conservation. In Press.
- 1992. Imhoff, Sally. Reclamation of the Monahan Site. Francis A. Monahan Outdoor Education Center. pp. 19-28 *in*: J. Arruda (ed), Kansas Academy of Science Multidisciplinary Guidebook 6. Fall Field Trip to the Natural Areas of Southeast Kansas. Kansas Geological Survey Open-File Report 92-22. 91 pp.
- 1992. Ford, Steven. Francis A. Monahan Outdoor Education Center. pp. 13-18 *in*: J. Arruda (ed), Kansas Academy of Science Multidisciplinary Guidebook 6. Fall Field Trip to the Natural Areas of Southeast Kansas. Kansas Geological Survey Open-File Report 92-22. 91 pp.