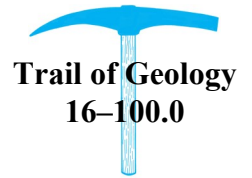


OUTSTANDING GEOLOGIC FEATURE OF PENNSYLVANIA

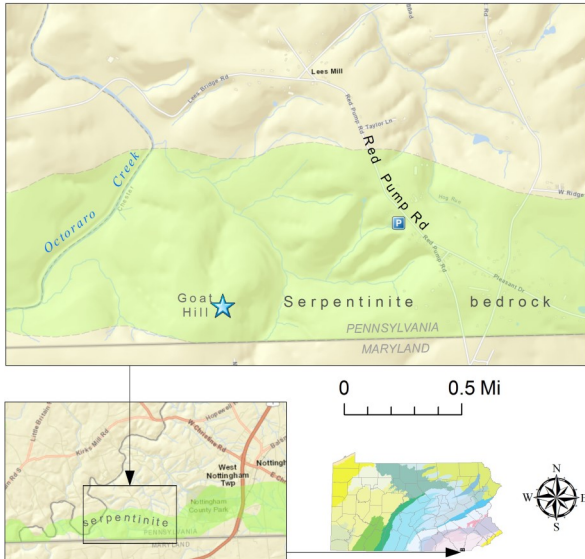
GOAT HILL SERPENTINE BARRENS, CHESTER COUNTY



Stuart O. Reese, 2016

Location

Goat Hill Serpentine Barrens, Red Pump Rd., Chester Co., West Nottingham Twp., lat: 39.72898, lon: -76.07278 (parking); Rising Sun 7.5-minute quadrangle



Geology

The “serpentine barrens” of Goat Hill in southern Chester County is a distinctive terrain underlain by the rock serpentine. Serpentinities are largely composed of magnesia and silica with trace (but relatively elevated) amounts of toxic nickel and chromium. Because of this unusual chemistry, serpentinities form very thin, infertile soils that stunt the growth of typical plant species. Instead, a specialized group of plants (flora) tends to dominate the serpentine regions. These barren areas are characterized by sparse, grassy vegetation with scattered trees, in contrast to the large trees and forests of most of Pennsylvania. The barrens also contain many species that are uncommon in Pennsylvania, such as long-hairy field chickweed, prairie grasses, and the rare serpentine aster. The more wooded areas have the quite common and hearty greenbrier. The result is an exceptional landscape for Pennsylvania.

The geologic history of these rocks is complex. The large masses of serpentine originally formed as layers of olivine-rich rocks in large igneous intrusions associated with volcanic arcs in the early stages of the Appalachian Mountains. These rocks then underwent multiple periods of mountain building and metamorphism over tens of millions of years, which altered the olivine-rich rocks to serpentine. Later, after millions of years of uplift and erosion, the rocks were uncovered and exposed at the surface.

The serpentinities are also well known for their mining history. In the early- to mid-nineteenth century, the Pennsylvania-Maryland State Line serpentine district was the top producer of chromite in the world, and Goat Hill was known for the production of magnesite ($MgCO_3$).

Top left: The barrens in early fall at Goat Hill, Chester County. Note the grassy undergrowth of the hilly terrain and scattered pitch pines. The Goat Hill area is a public wild-plant sanctuary managed by the William Penn Forest District.

Bottom left: Rock showing the common scaly texture and greenish color of serpentine. Photographs by Steve Shank, Pennsylvania Geological Survey.

Recommended Reading

[State-Line Serpentine Barrens](#) web page of The Nature Conservancy website.

[Nottingham County Park](#) web page of the Chester County website.

[William Penn State Forest](#) web page of DCNR.

[Friends of the State Line Serpentine Barrens](#) website.

Published by the [Pennsylvania Geological Survey](#).

