

## Can you find the charcoal hearths?

This map was made using **LiDAR**, *Light Detection And Ranging* by laser. An airplane flew in a grid pattern over Pennsylvania and shot a laser beam toward the ground, repeatedly taking distance measurements and combining them with very accurate GPS readings.

The data were adjusted in a computer to make this map. The computer picked out flat round locations of a certain size, and a researcher put a yellow dot on each one.

The larger red dots, added later, show the location of Pine Grove Furnace and other South Mountain blast furnaces where pig iron was made from the late 18<sup>th</sup> century through the 19<sup>th</sup> century. Not all furnaces lasted as long as Pine Grove Furnace (in operation from roughly 1770 to April 1895) -- but while in operation, each of them required many acres of forest to supply fuel.

The purpose of this map is to reveal old **charcoal hearths**, 30 to 60 feet across, scattered all through the South Mountain landscape. They are remnants of the annual effort to turn hundreds of acres of trees into charcoal fuel for the iron furnaces. This highly skilled labor was performed by workers called *colliers*.

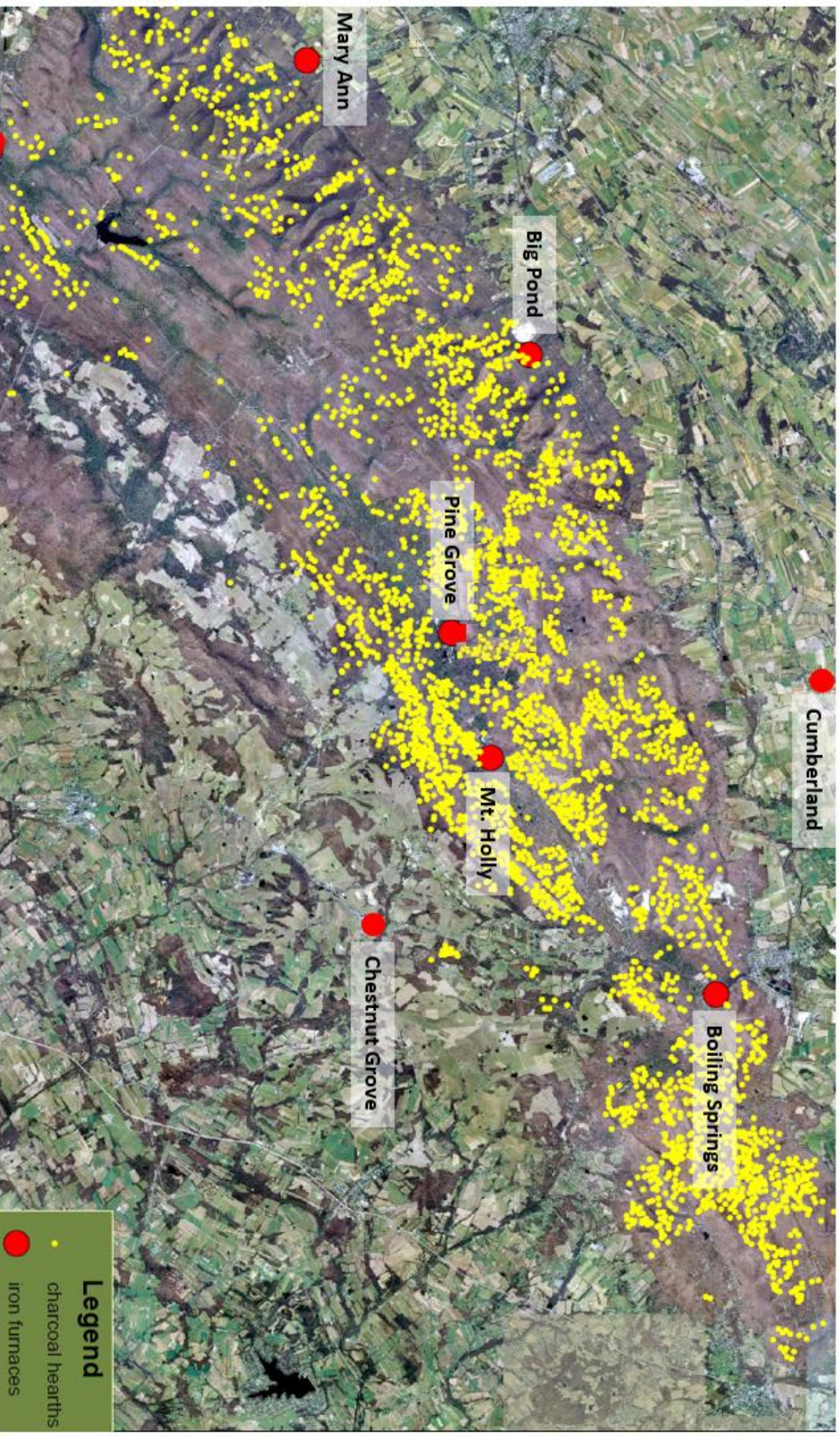
Colliers made a charcoal hearth by clearing all vegetation and carefully leveling and smoothing the ground, 30 feet across. Then, an above-ground mound of wood (called a “pit”) 10 to 14 feet high was built in the center of the hearth. The wood was covered with dirt and leaves and burned in low-oxygen conditions for 1 to 2 weeks. On average, 24 hours of iron smelting at a furnace required all the trees from one acre of forest, made into 800 to 1000 bushels of charcoal in a single pit.

After the land was clear-cut, trees were allowed to grow back for 20 to 25 years, then again cut and made into charcoal. Colliers preferred to use the same hearths over and over again through the decades. Thus, many of the hearths around Pine Grove Furnace might have been used several times during the roughly 125 years of iron production here.

Between the town of Dillsburg (18 miles northeast of Pine Grove Furnace) and Caledonia State Park (13 miles southwest) the LiDAR mapping technique reveals at least **3000 charcoal hearths** supplying the several iron operations near the South Mountains! Other researchers using LiDAR and field studies think the true number is **over 7000**.

Today, it is still possible to see the old hearths as you hike in the Michaux State Forest. Watch for perfectly round and perfectly flat areas, often with slightly different vegetation than the surrounding woods. The easiest place to spot a hearth is on sloping terrain: the round area flattened by the colliers stands out against the slope. Sometimes campsites and hiking trails are built directly atop or through these convenient “holes in the forest”; for example, the popular Pole Steeple hiking trail passes directly through one of the hearths, and others are visible as you walk up the trail.

# Charcoal Hearths



LIDAR map courtesy of Noel Potter and Helen Delano