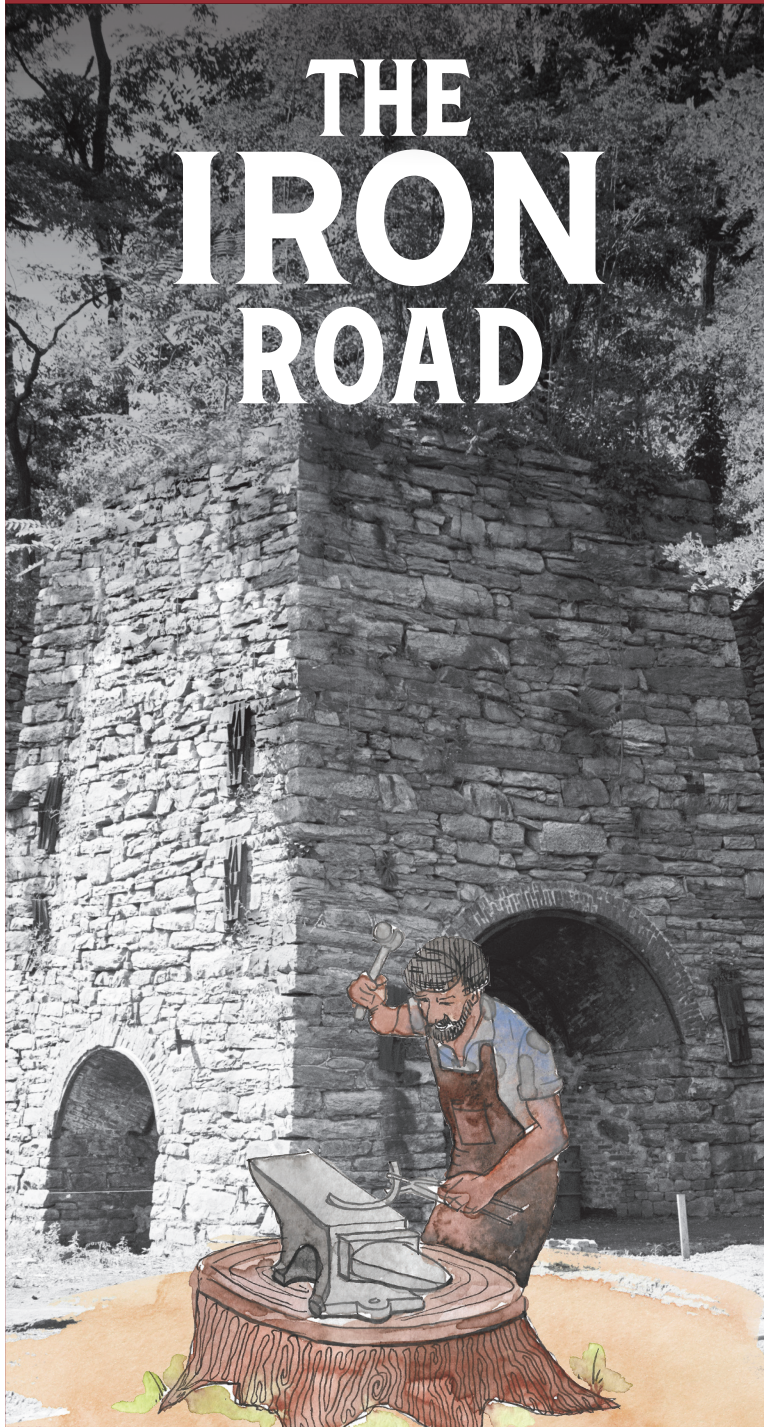


DRIVING TOUR

THE IRON ROAD



Explore small museums, iron smelting furnaces, industrial revolution-era villages, cemeteries, and more located along country roads in the beautiful states of Maryland and Pennsylvania.

HISTORY OF IRONWORKING

Of all the factors that contributed to the industrial might of 20th century America, none was more important than the development of a flourishing iron industry.

Successfully making iron in the early United States required access to raw materials (iron ore, charcoal or coal, and limestone), a source of power (water, and later steam) and transportation (ox carts and roads), as well as skilled labor. Many furnaces employed both African Americans and European immigrants as part of a diverse and skilled workforce. Some furnaces depended on enslaved Africans, some of whom may have brought ironworking skills with them from Africa where the trade is an ancient and revered profession.

The diagram in the next panel illustrates the operation of a furnace typically constructed of local field stone with the chimney or "bosh" lined with firebrick. Once a fire was lit and up to temperature (3000° F) raw materials were fed through an opening called the charging arch at the top of the furnace in layers, first charcoal, then iron ore, then limestone flux. The job of a filler was one of the hardest and hottest furnace jobs. Heat was regulated and enhanced by air injected into the furnace stack via nozzles called tuyeres. Intense heat from the burning charcoal separated the iron from the ore. The limestone flux would bind with the waste or slag from the ore. The molten iron would sink to the bottom, puddling at the lowest level in the crucible. Molten slag floated in a layer above the molten iron.



FILLERS

Raw materials are fed in by fillers through the charging arch at the top of the furnace.



FOUNDERS

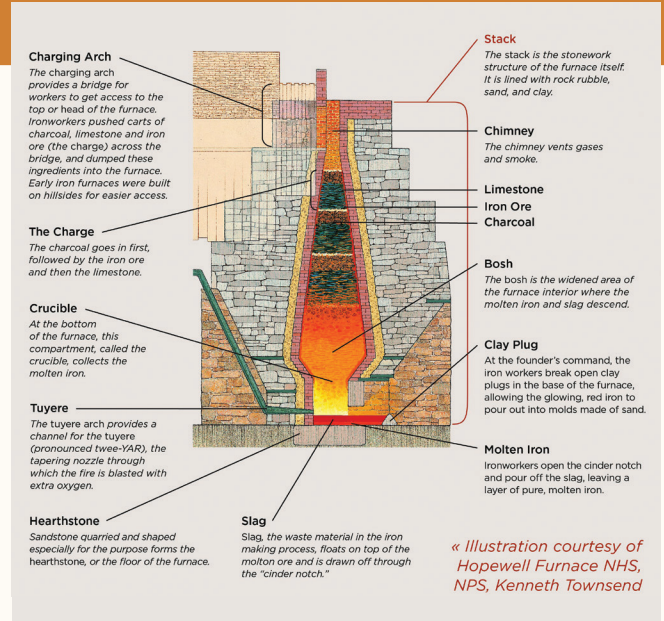
The founder decided when the iron was ready to pour.



THE WAY WE MADE IRON



Furnace Diagram



Once the ironmaster decides it is time, the foundryman knocks out the clay plug at the bottom of the crucible and molten iron flows into troughs on the sand floor of the casting shed.

Guttermen, having already prepared the sand bed, guide the molten iron into branch-shaped troughs to cool.

Once cooled, the iron pigs are loaded into carts and transported to the next stop in the process, either to be remelted and cast by moulders or refined and forged by blacksmiths. Some iron was used on the spot to cast household implements such as kettles, frying pans, and ten plate stoves. After refining, other iron was formed into products such as wagon tire rims, spoons, axes, hooks, hinges, shutter dogs, musket barrels, and munitions.



Moving iron ore and finished products to market evolved over time. Mule or horse carts and canal boats were used first, followed in the 1830s by railroads.



GUTTERMEN

With the sand bed prepared, the gutterman guides the molten iron in the troughs to cool.





CATOCTIN FURNACE

12698 Catoctin Furnace Road, Thurmont, MD 21788
443-463-6437 • catoctinfurnace.org

Completed in 1775, Catoctin Furnace was in blast in time to provide ammunition to General George Washington and his army. At least 271 enslaved people of African ancestry made up the bulk of Catoctin Furnace's earliest workers, some of whom may have been brought directly from Africa for their valuable ironworking skills. The operation of the furnace depended heavily on the labor of enslaved and freed African Americans until the middle of the nineteenth century, when their labor was replaced by that of European immigrants.

Visitors see the original Isabella stack (pictured here), built in 1857. The restored casting shed (where the molten iron was cast into pig iron) is a replica, reconstructed for the Bicentennial.

The nearby Catoctin Furnace African American Cemetery represents what is thought to be the most complete African American cemetery connected with early industry in the United States. The labor pool, enslaved and free, included skilled artisans such as forge workers, colliers, masons, and carpenters. The Catoctin Furnace Historical Society is committed to increasing public awareness of the role African Americans played in the iron industry at Catoctin Furnace and elsewhere and to highlight the impact of African Americans on the industrial history of the United States.



LONA CONING FURNACE

Main Street, Lonaconing, MD 21539
301-463-6266 • townoflonaconing.org

On May 17, 1839, the iron outlet plug was removed and the first pour of molten iron ran out of the furnace, the first commercial run in the U.S. to use bituminous coal. Perhaps the first run in the world to use the basic coal-fired “pig-iron” production method still in use today. Other furnaces went into operation at roughly the same time — no secret process could stay secret for very long.

Chartered as the George’s Creek Coal and Iron Company in 1834, the foundation was laid three years later. By 1838, construction progressed with the assembly of the steam engines which would power the air-blast compressors. Next, the furnaces that heat the blast-air stream were tested and the chamber was filled with coal. When set afire, the burning coal set the masonry work inside the furnace chamber.

Visitors to Lonaconing can also see an ore cart on the Furnace Park grounds. It is likely that the cart’s wheels and other cast parts were cast in a local shop with iron from this furnace.



NASSAWANGO

Furnace Town, 3816 Old Furnace Road,
Snow Hill, MD 21863
410-632-2032 • furnacetown.org

The only furnace in Maryland ever to make extensive use of bog ore, Nassawango operated only until 1849 and was reported to be in a dilapidated condition as early as 1859.

Erected in 1830 by the Maryland Iron Company and named for the creek upon which it sits, the Nassawango furnace smelted iron from the abundant bog ore formations nearby. While the furnace produced about 700 tons of iron per year, the quality and distribution of the bog ore may have caused several financial failures during the operation of the ironworks.

Nassawango made use of hot blast techniques only a few years after the idea was developed in England. If, as some have suggested, Nassawango Furnace was built with the hot blast gear installed from the beginning, it would be one of the first hot blast furnaces in the United States.

Today, Furnace Town Historic Site provides visitors an opportunity to stroll the picturesque 25-acre 19th-century village containing many historic structures, including the furnace, blacksmith shop, church, carpenter shop, printers shop, and more.



PINE GROVE FURNACE

1100 Pine Grove Road, Gardners, PA 17324

717-486-7174 • dcnr.pa.gov/stateparks/findapark/pinegrovefurnacestatepark/pages

Visitors to Pine Grove Iron Works (now Pine Grove Furnace State Park) can explore the furnace stack (built ca. 1771) and many related structures including the mule barn (now the General Store), grist mill (now the Appalachian Trail Museum), chapel, water races, and ore pits including Fuller Lake.

A museum in the visitor's center contains displays about the industry and visitors can spend the night in the Paymaster's office or the stately Ironmaster's Mansion. Surrounded by breathtaking mountain views, the English Tudor-style mansion, which was originally built in 1829, is a popular overnight stop for hikers on the Appalachian trail.

Nearby Laurel Forge, built in 1830, has vanished although its power supply remains as the park's Laurel Lake. The works owned 27,000 acres for charcoal fuel, today comprising a large portion of the surrounding Michaux State Forest. For over half a century the works were owned by the prominent abolitionist Ege family, local ironmasters who also owned Carlisle Iron Works. Pine Grove castings included ten-plate stoves, firebacks, boiler plates, and wheels for the Baldwin Locomotive Works. While Pine Grove's final blast occurred in 1895, brickmaking and natural ice harvesting continued into the 20th century.



HISTORIC JOANNA FURNACE

Located 3 miles North of Morgantown, PA 19543 on Route 10. Turn at Furnace Road.

610-286-0388 • haycreek.org

Nestled in an area rich with iron ore, abundant woodland for charcoal, limestone, and waterways to provide power lies Joanna Furnace, a historic remnant of Berks County's thriving early iron industry. Joanna Furnace was started in 1791 by Samuel Potts, Thomas Rutter III, Thomas May, and Thomas Bull. The furnace was named in honor of Pott's wife, Joanna Holland Potts. Joanna's later owners included John Smith, Thomas Bull Smith, Levi Bull Smith, William Darling, and L. Heber Smith. The furnace blew out in 1898, after L. Heber Smith's death.

Joanna was a cold-blast, single-stack, charcoal iron furnace most of her life. Water-powered until the mid-1850s, Joanna used steam power after that. Under the guidance of the ironmaster and founder or keeper (or manager), guttermen, fillers, and potters worked in twelve-hour shifts, tapping the iron twice daily. The average blast was one year, but some blasts lasted two or three years. A major technological change occurred in 1889. At this time, fifteen feet were added to the furnace stack height. A Weimer blowing engine, downcomer pipe, blowout door, and bell and hopper were installed. In order to facilitate getting the iron ore, limestone and charcoal to the top of the stack, a water hoist was installed on the outside of the stack between the Bridgehouse and Furnace Stack.



CORNWALL IRON FURNACE

94 Rexmont Road, Cornwall, PA 17016

717-272-9711 • cornwallironfurnace.org

Cornwall Iron Furnace is the only surviving furnace of its kind in the Western Hemisphere. A National Historic Landmark and a Landmark of the American Society of Mechanical Engineers, Cornwall's picturesque Gothic Revival buildings stand near the remarkable world-class ore mine that operated from the 1730s until 1973. Extant workers' villages, shops, schools, churches, and the ironmaster's mansion bear witness to the once-thriving iron plantation.

Cornwall is typical of the charcoal, cold-blast iron furnaces that dotted the Pennsylvania landscape in the eighteenth and nineteenth centuries. As with other furnaces, all the iron ore, wood for charcoal, limestone, and waterpower necessary for smelting iron were on hand in a favorable setting.

Visitors explore the five-acre site which includes remnants of the original eighteenth-century industry incorporated into the nineteenth-century furnace building. Other historic structures include a wagon shop and blacksmith shop, abattoir, and charcoal barn now refitted as a visitor center. In close proximity but not part of the site is the ironmaster's mansion, several workers' villages, and the Cornwall Iron Ore Mine. The site is administered by the Pennsylvania Historical & Museum Commission and is supported by the Cornwall Iron Furnace Associates.



HOPEWELL FURNACE

2 Mark Bird Lane, Elverson, PA 19520

610-582-8773 • nps.gov/hofu

In 1938, the Secretary of the Interior designated Hopewell Furnace as part of the National Park Service. While it is neither the oldest, the biggest, nor the last charcoal iron furnace in blast in the United States, Hopewell's showcases a nearly complete early American industrial village and landscape. For more than a century, from its beginnings in 1771 to its final blast in 1883, Hopewell exemplified the technological growing pains of a Nation destined to become an industrial giant.

There are many remarkable buildings within the cultural landscape of Hopewell including a working 22-foot diameter "breast" water wheel, cast house, blast machinery, working blacksmith shop, the restored Ironmaster's Mansion, and the Bethesda Church.

The idyllic scene today is only a pale reminder of the historical community that flourished in the 1830s and 40s when Hopewell was a busy industrial complex of 19th century manufacturing. Visitors may explore the National Historic Site's 848 acres and historic structures which illustrate the business, technology, and lifestyle of our growing nation.



ANTIETAM IRON WORKS

3912 Harper's Ferry Rd, Sharpsburg, MD
canaltrust.org/pyv/antietam-ironworks

First known as Frederick Forge, the furnace on Antietam Creek was founded by John Semple and later acquired by John McPherson and by John Brien. Brien, also associated with Catoctin Furnace, operated Antietam with at least 250 workers, of which 60 were enslaved. Documentary and genealogical research demonstrates that many of the enslaved workers at Antietam Iron Works were forcibly moved there in the 1830s following Brien's bankruptcy at Catoctin Furnace.

Owned by Samuel Hughes during the Revolutionary War, workers at Antietam Iron Works cast, bored, and proved 9, 12, and 18 pounder cannons for the Baltimore Town Committee of Correspondence, for the Continental Marine Committee, and for the Continental Army (four of the first 5 cannons produced blew up during the proving process.) In 1831, a nail factory and 2 rolling mills were added. Multiple waterwheels of different sizes drove the bellows for the furnaces, a 21-ton forge hammer, nail factory, sawmill, rolling mill, and grist mill. While the works suffered damage during the Civil War, they were rebuilt and operated until 1881 by the Ahl family of Carlisle, PA (associated with the furnaces at Boiling Springs and Pine Grove.) Today, remnants of the ironworks include a dam and race, a possible wheel pit or building foundation, the furnace stacks (all on private property), and a picturesque four-arch stone bridge. Built by John Weaver in 1832, the bridge is still in use.



MUSSELMAN-VESTA IRON FURNACE CENTER

Furnace Road, Marietta, PA
 717-314-4060 • rivertownes.org/iron-furnaces

Found in the Chickies National Historic District in a restored two-story building, the furnace office building is the last vestige of the Lancaster County iron industry that flourished along the Susquehanna. The furnace, the last of eight anthracite hot-blast iron furnaces, was built in 1867 by Henry Watts and Henry Musselman, ironmasters who saw the potential of producing pig iron using the new hot-blast process. The furnace changed hands many times over the 64 years of its existence. The last owners, the E.J. Lavino Company, smelted ferromanganese ore and scrap metal to produce the iron used to support the need for ferromanganese steel. Besides the office building, the furnace complex has the concrete supports for the overhead rail spur that brought materials to the furnace, brick workers houses, the original building used as a stable for the mules and horses that brought iron ore and limestone to the furnace, and the homes of ironmasters Henry Watts and Henry Musselman (both privately owned). The furnace complex is along the Northwest River Trail, which passes by the remains of the other seven furnaces. The center houses many images, displays and articles about the iron industry, a diorama of the furnace complex, information on the PA Canal System (used to transport anthracite coal from the Northeast coal region of PA), and the history of the rafting/timber industry of Marietta. The Center is open April to November, Sunday afternoons and by appointment for individuals and other community and school groups.

MUSEUM OF THE IRONWORKER

12610 Catoctin Furnace Road, Thurmont, MD 21788
240-288-7396 • catoctinfurnace.org

Located in a restored ca. 1820 worker's house in the Catoctin Furnace village, the Museum of the Ironworker contains exhibits about the history of the furnace, details regarding the craft of ironmaking, and daily life in the village. A highlight of the museum are two forensic facial reconstructions of enslaved ironworkers. In the 1970s, a highway expansion project resulted in the excavation of thirty-five graves at Catoctin Furnace. Left out of the written record in name and deed, the individuals are revealed within the archaeological record. Now, the art and science of forensic facial reconstruction allow you to meet them. Other exhibits include Catoctin Furnace-made stoves, cannonballs, and other more utilitarian objects.



Two interpretive trails, the African American Cemetery Trail and the Iron Trail, provide informative walks through the historic village and industrial landscape as well as a window into the lives of the people who lived and labored here. The Catoctin Furnace Blacksmith Shop provides a glimpse into the art and artistry of blacksmithing as it was practiced during the nineteenth century utilizing historic tools and restored bellows.

Nearby are Catoctin Mountain Park (U.S. National Park Service) and Cunningham Falls State Park, in which there are trails and other sites of interest, such as "the Charcoal Trail" and a blacksmith shop.

ADDITIONAL IRON FURNACE SITES

The following sites are interesting to visit but may not have extant furnaces or extensive explanatory signage. You may wish to verify site opening hours before visiting.

THADDEUS STEVENS BLACKSMITH SHOP & CALEDONIA FURNACE

Caledonia State Park, 101 Pine Grove Road, Fayetteville, PA 17222

717-352-2161 • dcnr.pa.gov/stateparks/findapark/caledoniastatepark/pages/default.aspx

Thaddeus Stevens entered the iron business with the opening of Maria Furnace in Fairfield, Adams County. In 1837, finding better iron ore in Franklin County, Stevens built Caledonia Iron Works of which the blacksmith shop remains. This blacksmith shop represents the consumer end of the extensive iron industry along this early road to the West. Thaddeus Stevens, a member of the US House of Representatives, was an opponent of the slavery of African Americans. In June 1863, troops under the command Jubal Early, on their way to Gettysburg Campaign, destroyed the ironworks.

↓ Thaddeus Stevens
Blacksmith Shop



Carlisle Iron
Works Furnace ↑

CARLISLE IRON WORKS FURNACE

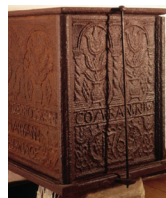
109 Bucher Hill Road, Boiling Springs, PA 17007
visitcumberlandvalley.com/listing/carlisle-iron-works-furnace/1145

The Carlisle Iron Works Furnace in Boiling Springs was built in 1760 and remains in excellent condition. This is one of the earliest blast furnaces and was founded by John Rigbie & Co. It was operated by Michael Ege, a well-known iron master, after 1781. Ege is also associated with Pine Grove Furnace and Catoctin Furnace. The Carlisle Iron Works produced stove plates, firebacks and ironware, and during the Revolutionary War, munitions.

MARY ANN FURNACE

Codorus State Park, 2600 Smith Station Road, Hanover, PA 17331

717-637-2816 • dcnr.pa.gov/stateparks/findapark/codorusstatepark/pages/default.aspx



Built in 1762, Mary Ann Furnace is believed to be the first charcoal furnace built on the western side of the Susquehanna River. The furnace supplied cannon balls and grapeshot for the Continental Army and employed Hessian prisoners of war to run the ironworks while many of the available workforce were off fighting the British. Mark Bird, one of the original founders was the son of ironmaster William Bird of Hopewell Furnace. He used his own product in the Revolutionary War but was never repaid. Nothing remains of the ironworks except memories, but artifacts of the furnace operations can be seen at the Codorus State Park visitor center complex.

HAMPTON NATIONAL HISTORIC SITE

535 Hampton Lane, Towson, MD 21286

410-823-1309 • nps.gov/hamp

At first a tobacco plantation, in 1761, Col. Charles Ridgely and his two sons established the Northampton Ironworks, which eventually provided much needed material for the American Revolution. This wartime industry created mass wealth for the Ridgelys on the labor of the enslaved, indentured servants, and British prisoners of war. The ironworks, once located about a mile north of Hampton Mansion, continued to be the principal basis of the family's wealth until c. 1830. The Hampton estate grew to be a very large, Southern-style plantation having planted fields of grains, orchards, and herds of livestock, along with the ironworks, mining, marble and limestone quarries, mills, and mercantile interests. Visitors can tour reconstructed slave quarters, outbuildings, and the Georgian manor house with its extensive collection of art and original artifacts.

MONT ALTO CHARCOAL IRON FURNACE

PA 233, One mile east of Mont Alto, PA 17237

717-352-2161 • dcnr.pa.gov/stateparks/findapark/montaltostatepark/pages/default.aspx

The Mont Alto Charcoal Iron Furnace was built during 1807 by Colonel Daniel Hughes and his two sons, Samuel and Daniel and later sold to Colonel George B. Weistling of Harrisburg. Weistling built the Mont Alto Railroad to facilitate getting his iron to market and to help make the railroad profitable built a summer resort on Antietam creek. The mansion house still exists on the grounds of the Mont Alto Penn State campus as the Weistling House. The iron roof of a carousel built by the Iron Works now covers a gazebo at the Mont Alto State Park.

BIG POND FURNACE

Lat: 40.053512°, Long: -77.404612°

Furnace Hollow Road, South of intersection with Hogshead Road, Cumberland County, PA

Big Pond was built in 1836. Later owners, the prominent Ahl family, refurbished the operation but before it restarted in 1880, a fire in freshly made charcoal stored at the charcoal house permanently destroyed the operation. The stack, neglected in private ownership, partly collapsed in 2011 exposing interesting features including the unused firebrick lining. A head race can be followed through the adjoining Michaux State Forest. Big Pond was recently purchased by The Archeological Conservancy to preserve the ruins from development.

ELKRIDGE FURNACE

Intersection of Furnace Avenue and Race Road, Elkridge Landing, MD 21075

howardcountymd.gov/planning-zoning/elkridge-furnace-inn-story

In 1719 the Maryland Assembly passed the Maryland Ironworks Act permitting the construction of iron furnaces. In 1755, A. Lawson, E. Dorsey and C. Dorsey built Elkridge Furnace a bit down river of Elkridge Landing producing pig iron. The pigs were shipped downriver and often used as ballast in ships sailing back to England where finished goods using the pigs were done and the goods shipped back to the colonies. In the second half of the 18th century an industry producing finished iron goods built up around the forge. Elkridge produced cannons and cannon balls during the revolution. By the end of the century the iron industry here was in decline, possibly due to a shortage of wood to make charcoal and the silting up of the Patapsco River. In 1873 a flood caused an explosion in the furnace destroying the operation which was not restored. Still standing, at the intersection of Furnace Avenue and Race Road, are the ironmasters mansion, the company store building and tavern, now the Elkridge Furnace Inn, and ruins of the furnace.

AVALON NAIL AND IRON WORKS

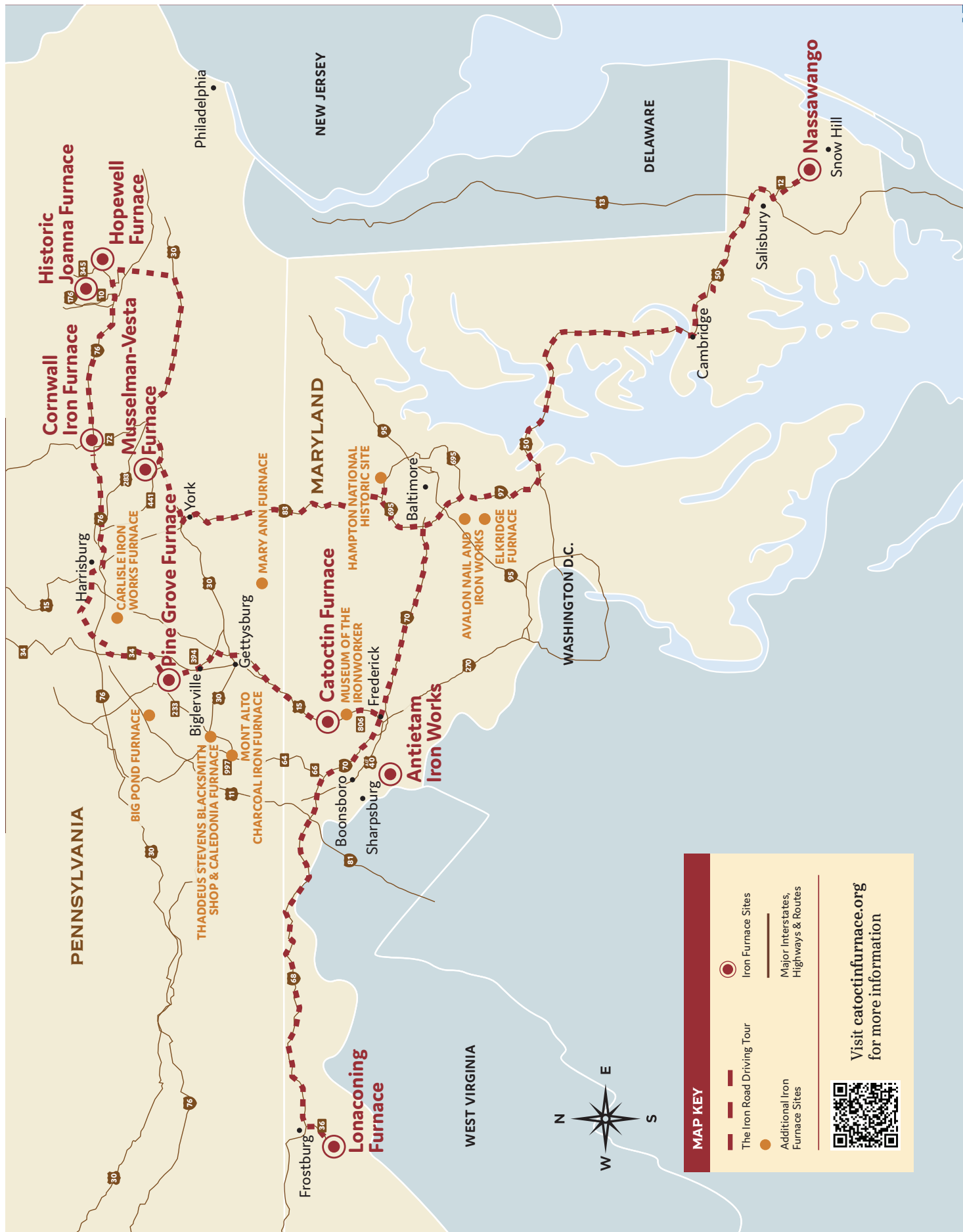
Intersection of Glen Artney Rd and Gun Rd, Patapsco Valley State Park, 5120 South Street, Halethorpe MD
dnr.maryland.gov/publiclands/pages/central/patapscovalley/avalon/historic-sites.aspx

The Patapsco River Valley is the site of one of the first industrial sites in Maryland. In 1761 Caleb Dorsey built his ironworks on what is now part of Patapsco State Park. During the Revolutionary War, Dorsey's Ironworks produced musket parts for the American Militia. In 1815 the Dorseys sold the works to James Ellicott. The Ellicotts renamed the works to Avalon Nail and Iron Works, ended the practice of enslaved labor, expanded the works with a large nail factory, and eventually a rolling mill producing rails for the B&O railway. A small town built around the ironworks. The Great Flood of 1868 washed away much of the town and the ironworks complex. The history center is one of two surviving buildings. Nearby, the Thomas Viaduct, built for the B&O Railroad, is one of the first stone-arched railroad bridges built in the United States.

↓ Elkridge Furnace



Avalon Nail and Iron Works ↑



THE IRON ROAD



Further details are available at catoctinfurnace.org/ironroad. Follow the link to uncover more information about each site, plan your “Iron Road” trip and discover links to hotels and restaurants near the “Iron Road.”

This brochure was made possible by a grant from the Tourism Council of Frederick County Tourism Reinvestment in Promotion and Product (TRIPP) program and funding from donors to the Catoctin Furnace Historical Society.

The Catoctin Furnace Historical Society, Inc., in partnership with the “Iron Road” furnaces, studies, commemorates, interprets, and preserves the rich industrial history of early American ironmaking villages, including the architecture, cultural landscapes, lifeways, and foodways of the diverse workers.

VISIT
Frederick
CITY & COUNTY

Catoctin Furnace Historical Society, Inc.
12610 Catoctin Furnace Road, Thurmont, MD 21788
240-288-7396 • info@catoctinfurnace.org

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Cover watercolor art courtesy of Lucy Irwin, 2020

