

Discover Rocks, Ridges, and Ravines Scenic Driving Tour



Planning For Your Trip:

Before you venture out on a driving tour:

- Check the Laurel Highlands Visitor Bureau website at: www.golaurelhighlands.com and the state parks and forests (DCNR) website at: www.dcnr.pa.gov for maps and updated information.
- Check hours of operation for Fallingwater at www.fallingwater.org and call ahead for required tour reservations at: 724-329-8501.
- Call or check websites for hours of operation. for Laurel Caverns at <http://laurelcaverns.com>, 800-515-4150 and Christian Klay Winery at www.cwklaywinery.com, 724-439-3424.
- Dress for the weather and activities. The Laurel Highlands can be eight to ten degrees cooler than other areas.
- Check the events listing in this tour for dates of local events.
- Note: there is limited cell service in some areas.
- Caution: some GPS programs are not accurate in this area.
- Bring maps of the driving tour, the local towns, and the Laurel Highlands area.
- Bring a camera.
- Bring a flashlight with new batteries and a lightweight jacket or fleece if touring Laurel Caverns.

Experience Pennsylvania's geologic extremes and discover what makes the Laurel Highlands a place unlike anywhere else. Visit Pennsylvania's deepest gorge, longest cave, highest point, and some of the hardest rocks while you visit our state's highest vineyard, one of its most famous houses, and the largest state park in Pennsylvania. The best time for your geologic journey is May through October. This two-day tour gives you time to see it all. The rocks aren't going anywhere except at the Jim Mountain Quarry where the rocks are used to build roadways like those you will drive on the tour. Enjoy your visit with the rocks and the natural beauty they helped form in this region.

Suggested **two-day driving tour schedule** (four to five hours each day):

Day One - Stops one through four (34 miles)

Day Two - Stops five through ten (83 miles)

Directions to first stop:

- Begin at Donegal (Exit 91 of the Pennsylvania Turnpike) and drive 2.2 miles on PA 31 East
- Turn right onto PA 711 south/PA 381 south (Laurel Highlands Scenic Byway). Drive 9.6 miles to Normalville

Point of Interest – Stone Houses

As you travel through the Laurel Highlands look closely at the stone used for houses, churches, fireplace chimneys, and walls. Much of this stone was quarried locally from the 300-million-year-old Allegheny Formation which can be seen outcropping along PA 381. What is unique is the stonework design. The stone is dry stacked horizontally with some flat stones laid vertically to expose the entire surface of the stone. In some cases, grinding stones from gristmills are used in the design. How many examples of this unique stonework can you find?



Laurel Highlands stonework design

Directions to first stop continued:

- Turn left in Normalville to continue on PA 381 south. Note the views of Chestnut Ridge on the right and Laurel Ridge on the left.
- Drive seven miles and turn right into the entrance of Fallingwater.



Vertical joints in rocks at Fallingwater

Gas, ATMs and restrooms

available in Donegal, Normalville, Farmington, Confluence, and New Centerville. ATMs and restrooms available in Ohiopyle but no gas.

Information on **dining and lodging options** available at Donegal, Chalk Hill, Uniontown, Ohiopyle, Confluence, and Somerset can be found at:

www.golaurelhighlands.com

www.mlchamber.com

www.somersetcountychamber.com

www.fayettechamber.com

www.visitconfluence.info

Information on **camping** in Ohiopyle State Park and Forbes State Forest can be found at:

<http://www.dcnr.pa.gov/StateParks/FindAPark/OhiopyleStatePark/Pages/Stay.aspx>

<http://www.dcnr.pa.gov/StateForest/FindAForest/Forbes/Pages/Camping.aspx>



Ohiopyle Falls

Stop One – Fallingwater (Western Pennsylvania Conservancy)

Note: Fallingwater is not open for tours on Wednesdays

Frank Lloyd Wright explained to Edgar J. Kaufman: “I want you to live with the waterfall (and rocks) not just view it.” To accomplish the idea of living harmoniously with nature, he designed a house that is an extension of the landscape.

The foundation of this landscape on which the house and waterfalls sit is made up of a 310-million-year-old rock formation known as Pottsville Sandstone. This sandstone, mainly composed of the mineral quartz, was a most fortuitous choice by Mr. Wright since it is the hardest, most resistant rock found outcropping in southwestern Pennsylvania.

The rock for the house was quarried from a slightly younger formation of rocks known as the Allegheny. An easily seen feature is the vertical joints in the rocks resulting in rectangular patterns on the bedding surfaces. Look along the rock path just before it reaches the stream and you can see this pattern exposed. The joints are running northeast in one direction and at nearly right angles northwest in the other direction. If you look at the sides of the large boulders you will see flattened surfaces in line with these directions. The rocks quarried for the house therefore naturally broke out in rectangular shapes which made them easier to use, especially when constructing a rectangular house!

The rocks at Fallingwater are on the west flank of the Laurel Hill anticline and dip to the northwest toward the Youghiogheny River. The rock layers located in the road behind the house show this slight dip to the west.

Directions to next stop:

- Turn right out of Fallingwater to continue south on PA 381
- Continue for 3.6 miles to Ohiopyle State Park
- Turn right into the Falls Area parking lot.

Stop Two – Ohiopyle Falls (Ohiopyle State Park)

You have traveled from a spot of quiet serenity to one where the conflict between rock and water is obvious.

While you stand on the observation decks overlooking Ohiopyle Falls and the Ferncliff Peninsula across the river, notice the striking power of the Youghiogheny River coupled with the strength of the Pottsville Sandstone’s unrelenting resistance to being washed away.

Regardless of the river’s level, the Youghiogheny River is a very steep, fast flowing, influential river, fueled by countless mountain streams and runs that enhance its scouring power. But the Pottsville Sandstone is a worthy adversary. The cement that binds the particles of sand together is steadfastly strong. At this site, the sandstone is winning the battle on two fronts. First, a ledge of Pottsville Sandstone creates the spectacular Ohiopyle Falls. While the Ferncliff Peninsula, which is directly across the river from the observation decks, is essentially also a 100-acre tongue of mostly Pottsville Sandstone. The river would not take this serpentine path around the peninsula but because the rock is so strong, the water must take a circuitous route.

Geology-Related Events:

Buckwheat is a short season crop adapted to growing in many soils including the high elevations of the Laurel Highlands.

Buckwheat Suppers

Ohiopyle-Stewart Community Center and Fire Company
Information and scheduled dates at www.ohiopyle-stewart.org

Buckwheat Cake Suppers

New Centerville and Rural Volunteer Fire Company
Information and scheduled dates at www.ncrvfc.com

Celebrate the heritage of the local coal miner.

Miners Memorial Day

Windber
www.echf.org

Celebrate the history of the life of rural southwestern Pennsylvania farmers.

Mountain Craft Days

Somerset
www.somersethistoricalcenter.org

Flax is a cool season crop grown here by early American farmers prior to the 1800s for its fibers that can be spun into linen.

Flax Scutching Festival

Stahlstown
www.flaxscutching.org

These turns caused American Indians to call the river “Youghiogheny,” meaning “river that runs a roundabout course.” The distinct environment of the river’s edge coupled with the steep walls of the Youghiogheny River Gorge provides a unique microclimate that provides a home for many uncommon plant species.

Naturally occurring plants are not the only ones that benefit from life in the Laurel Highlands. Our next stop at the Christian Klay Winery will focus on some very special high-altitude cultivars.

Directions to next stop:

- Turn right out of parking area to continue south on PA 381
- Drive 6.2 miles to intersection with PA 40
- Turn right onto PA 40 west (National Road).

Note that you pass the winery’s retail store located on the left as you continue on your way to the winery.

- Drive 3.8 miles to Chalk Hill, turn left at the top of the hill onto Fayette Springs Road. (Look for signs for the Fayette Springs Farm Vineyard and Orchards)
- Turn left into the winery parking area to the left of the barn

Stop Three – Christian Klay Winery

After descending from the Laurel Ridge, the area begins to flatten out as you reach an offset of the Chestnut Ridge. The Chestnut Ridge is the westernmost ridge in the Laurel Highlands.

The 215-acre Fayette Springs Farm is home to Christian Klay Winery. Located at an elevation of over 2,100 feet, this 14,000-vine vineyard with its 100 varieties of grapes is one of the highest elevation vineyards east of the Rockies.

This vineyard’s underlying soils (known as Wharton Soils) are comprised of shale, siltstone, and sandstone from the 305-million-year-old Pennsylvanian Glenshaw formation. Beneath these deep soils is a layer of clay above the bedrock. These soils, clay, and rock form what is known as a fragipan which restricts the flow of water downward. The resulting perched water table is within three feet of the surface. The type of soil and the supply of water to the grapevine are the primary factors that influence the characteristics of the wine. The concept that wine (and food) from a specific area has characteristics of the environment where it is grown is known as terroir (pronounced “tare-WAHR”).

Place-based wines and foods reflect the soil and climate as well as the culture of the region – literally the local flavor! Even the names of the wines reflect the local history. Check out the views of three states from this location as you enjoy a taste of the region.

Directions to next stop:

- Exit the winery and turn right onto Fayette Springs Road to return to PA 40
- Turn left onto PA 40 (National Road) and follow for two miles
- Turn left onto Skyline Drive, use caution when making this turn. Watch for Laurel Caverns and Summit Inn signs
- Drive 4.7 miles to Laurel Caverns and turn right
- Travel approximately one-half mile to the visitor center

Stop Four – Laurel Caverns Geological Park/Seven-County View

Laurel Caverns is the largest and longest cave in Pennsylvania. This may seem unlikely since the first thing you notice when you arrive at Laurel Caverns is that you are on top of a mountain.

People associate caverns with lower elevations since they often depend on a generous supply of flowing ground water to dissolve and remove rock to create an empty space. The existence of Laurel Caverns is due to a 50-foot-thick layer of Loyalhanna Limestone, plenty of precipitation due to its location on Chestnut Ridge, abundant groundwater, thick forest soils above that increase the acidity of water that soaks through it, joints in the rocks that create pathways for water to travel, and erosion resistant rock to hold up the surface above it.

Acidic water dissolves the calcium carbonate in the limestone, leaving sand grains behind. Water carries this sand to lowest part of the cave which fills in as new openings are created. As long as there is a place for sand to go, more open “cave” space will be created. The sand on the floor and along the sides of the cave is evidence of this ongoing process. Notice the fairly consistent temperature of 52 degrees. Even though you are descending several hundred feet in the cave, it does not get warmer since you remain about the same distance from the surface while underground. As you walk down through the cave you are also walking down the mountain.

Above ground, notice the spectacular scenic view to the west. From here you will not encounter another mountain range until you reach the Rocky Mountains in Colorado. On a clear day, the UPMC building is visible approximately 50 miles away in Pittsburgh.

Directions to next stop:

- Turn left out of parking area road onto Skyline Drive to return to PA 40
- Turn right onto PA 40 (National Road) and drive 1.9 miles
- Turn left at the light onto Chalk Hill-Ohiopyle Road
- Drive 6.7 miles and turn right onto Kentuck Knob Road
Note view of gap in Laurel Ridge and view of Sugarloaf Knob to the right after 6.4 miles
- Drive 1.4 miles down steep grade to intersection of PA 381
- Go straight across intersection into parking area

Stop Five - Natural Waterslides at Meadow Run (Ohiopyle State Park)

Note: Use caution when walking in this area. Rocks are slippery when wet.

This natural mill race, once harnessed for a sawmill, is popular for anglers and thrill seekers alike: one finding serenity in the rugged beauty of Meadow Run’s waters, the other immersing oneself into the raging torrent for the ride of a lifetime.

You are standing on what was once a solid outcropping of sandstone. Upstream, Meadow Run gains water and speed culminating here where it is funneled into a small, steep corridor. Rain water and snow melt combine with rock and soil particles to create a torrent of scouring power at the heart of Meadow Run.

The Meadow Run Slides is a “knick point” or sharp break in stream gradient. In a distance of 250 feet, the stream drops 20 vertical feet, four times greater than its average gradient. Here, Meadow Run is trying to erode a 310-million-year-old Pottsville Sandstone ledge down to its lowest point where it meets the Youghiogheny River. The larger, more powerful Youghiogheny River has eroded through rock strata at a faster rate than Meadow Run and therefore sits at a lower elevation.



Laurel Caverns



Meadow Run Waterslides



Baughman Rock



Aerial view of Turkeyfoot



1940s excavation of Fort Hill with Casselman Gorge in background

The resulting steeper grade and faster water in Meadow Run along with abrasive rock fragments and some less resistant rock in the stream bed have worn a distinct channel. Look for flat vertical surfaces on the rock paralleling the stream.

In geology, occurrences on a small scale, like erosion at Meadow Run, often mimic what is happening on a large scale. Our next stop shows erosion on a grand scale.

Directions to next stop:

- Turn right out of parking area onto PA 381 north
- Drive 0.3 miles and turn right onto Sugarloaf Road
- Drive two miles and turn left into parking area for the scenic overlook - Baughman Rock

Stop Six – Baughman Rock (Ohiopyle State Park)

You are looking at a spectacular example of how water and weather impact the landscape on a majestic scale. Perched atop Baughman Rock, half way up the side of the Youghiogheny River Gorge, you see a 1,700-foot difference in elevation from ridge top to river's surface.

By the time the Youghiogheny River exits the gorge downstream at Connellsville, it will have cut into the earth another 300 feet making the total relief over 2,000 feet, deeper than any other gorge in Pennsylvania. Across from you is the Laurel Ridge and the highest point in Ohiopyle State Park at 2,934 feet.

The Youghiogheny River started flowing around the same time as the mountains were forming. As mountains rose, the river cut through rock layers forming a steep and narrow gorge. The once flat landscape folded upwards creating a series of synclines and anticlines (imagine the area like corrugated cardboard). As the strata was elevated through folding, an estimated two miles was removed through chemical and physical weathering resulting in the landscape before you. Because of the cutting through and leveling off of folded layers, the same rock layer is exposed at different locations. The rock under your feet is Pottsville Sandstone, which also outcrops at Ohiopyle Falls and on Laurel Ridge. This sandstone is resistant to weathering and remains solid rock where it reaches the surface while less resistant rocks have eroded and weathered back exposing fantastic rock faces.

While you continue to your next stop, look for the large streams and rivers that combine to create the scouring force of the Youghiogheny River.

Directions to next stop:

- Turn left out of parking area to continue on Sugar Loaf Road for 5.6 miles
- Turn left where Sugar Loaf Road ends onto PA 281 north
- Follow Route 281 north for 2.4 miles into Confluence crossing over the Youghiogheny River and Casselman River

Point of Interest – **Confluence/Turkey Foot**

As you enter Confluence, you will cross bridges over the Youghiogheny River and the Casselman River. As you leave Confluence, you will cross under a railroad bridge and over the Laurel Hill Creek. The Youghiogheny River originates in West Virginia, flows north and cuts a gorge through the Laurel Ridge. The Casselman River originates in Maryland at the Eastern Continental Divide flowing west. The Laurel Hill Creek flows southwest, draining the east slope of the Laurel Ridge. These three waterways meet in this valley to form an area historically known as Turkey Foot. Native Americans and early settlers named this area because of the resemblance of the confluence of the waterways to the three toes of a turkey's foot. The first written reference for Turkey Foot was in George Washington's journals of 1754.

Directions to next stop continued:

- Continue on PA 281 north through Confluence
- Turn left at stop sign onto Oden Street (PA 281 north)
- Turn right at next stop sign onto Logan Street (PA 281 north)
- Cross under the railroad bridge, over Laurel Hill Creek, and follow PA 281 north out of Confluence to Fort Hill
- Drive 4.1 miles to Fort Hill and turn right into the parking area at Shepard's Farm Restaurant and Ice Cream

Stop Seven – Fort Hill

Note: The best view is from the parking lot. This is private property and can only be entered when the restaurant is open between Memorial Day weekend and Labor Day. A partial view of Fort Hill can be seen from the pull off near the blue and gold historical marker located 50 feet prior to the restaurant.

Rare throughout Laurel Highlands topography are small, flat-topped hills. The most notable in the region is the 60-foot-high Fort Hill.

Located along the Casselman River, Fort Hill sits on top of resistant layers of Buffalo Sandstone. The hill is capped with coarse sediments that hold the hill up by protecting the underlying, lesser resistant rock from further erosion. The weaker less well cemented rocks underneath the cap rock weather back faster to form the steep-sided slopes.

Fort Hill was occupied by the Monongahela People between 1275 and 1300 BCE. The Monongahela People were farmers who occupied the rich fertile floodplains along the rivers of this region. They built wooden palisades (fences or walls), buttressed with mounds of earth around their villages. When the Europeans saw these villages, they mistakenly referred to them as forts. Archaeological excavations of the area resulted in evidence of houses, burial remains, and pottery and flint chips.

As you continue to your next stop, notice how you will drive uphill and gain another 1,000 feet in elevation.

Directions to next stop:

- From Fort Hill, turn right onto PA 281 north for 1.1 mile
- Turn right onto Fort Hill Road (past bright red house)
- Follow for approximately 3.5 miles. You will drive through a one-lane tunnel, cross Casselman River, and cross over the Great Allegheny Passage Rail-Trail, making a sharp curve to left as you drive this portion of road
- Turn left onto High Point Road and follow for four miles (approximately two miles is gravel road)
Note the view of High Point Lake on left along this road
- At stop sign, bear left onto Mount Davis Road for 3.7 miles
- At sign for Mount Davis State Forest Monument, turn right onto South Wolf Rock Road for approximately one mile
- Turn left into entrance road for parking area

Stop Eight - Mount Davis High Point (Forbes State Forest)

The high folds (anticlines) of the Laurel Highlands were gradually eroded by the actions of wind, water, and weather over a period of 200 million years or more. Along the 30-mile long ridge is Mount Davis.

Mount Davis is unique for its central feature: a rock 3,213 feet above sea level. This rock, the highest point in Pennsylvania, was probably part of a Pottsville Sandstone ledge that separated and fell to one side. Had it fallen in another direction, the honor of highest point might be elsewhere.

One of the most striking geologic features around the high point is the interesting sorted, patterned loose rocks on the surface of the ground formed during the Pleistocene Age. At Mount Davis, sandstone boulders four feet in diameter have been moved into geometric patterns that consist of slanted, partially embedded sandstone slabs in circular arrangements. Several of these patterns, 25 to 30 feet in diameter, can be seen from the observation tower. The phenomenon is caused by freezing and thawing action that most often occurs on high, bald mountains where bedrock is exposed without a soil covering to provide insulation from the cold.

Approximately 50 million years of geologic history can be seen in the rock layers. On the southwest edge of the ridge outcrops one of the oldest geological rock formations in southwestern Pennsylvania, the Upper Devonian Catskill Formation. Rocks exposed here at the surface of the Mount Davis High Point Area are from the Lower Pennsylvanian Pottsville Formation.

Directions to next stop:

- Turn right out of entrance road onto South Wolf Rock Road for approximately one mile
- Turn right onto Mount Davis Road for 0.1 miles
- Turn left into Baughman Rocks Parking Area

Stop Nine – Baughman Rocks (Forbes State Forest)

This isolated outcropping of Pottsville Sandstone forms a ledge resembling a puzzle with all of the pieces slightly pulled apart.

Cautiously looking over the ledge, you see large blocks scattered below that separated from the ledge 10,000 to 20,000 years ago. The blocks broke loose during intense freezing and thawing of the region. As the surrounding bare soil thawed, gravity helped slide the blocks to their current location. The trees and other plants keep them in place today.

One of the most noticeable features of Baughman Rocks is the shallow depressions produced by weathering of the rock known as *opferkessels*. Initially, the roots of moss, lichen, or algae create cracks in the surface weakening the rock. Water gets into the cracks where it freezes and expands to break up the rock. At the same time, the water dissolves minerals within the rock. The remaining loosened sand grains are removed by wind or water. The result is a depression or hole. Leaves often collect in these holes, further acidifying the water which speeds up this weathering process.



Mount Davis High Point and Tower



Boulders in geometric patterns at Mount Davis



Baughman Rocks—Forbes State Forest



Opferkessel at Baughman Rocks

This outcrop's sandstone layers contain primarily quartz and clay and are the result of sediments that were deposited along ancient stream channels over 300 million years ago.

Directions to next stop:

- Turn left out of parking lot onto Mount Davis Road for 0.1 miles
- Just past Mount Davis Picnic Area on the right, turn left on North Wolf Rock Road (gravel road just before the cell tower)
- At 1.1 miles, turn right onto Vought Rock Road (no sign) and follow for 3.6 miles – most of this road is gravel.
Note the deer enclosure on right side of road – near tornado damage area.
- Turn left onto Old Mule Trail Road -TR827 (no sign) and follow for 2.3 miles. Notice the views of the Casselman Wind Power Project turbines.
- Turn left onto Rockdale Road and follow for 4.4 miles into Rockwood

Point of Interest – Casselman Wind Power/Wind Turbines

The turbines can be viewed up close at the entrance to the wind farm located on the left, approximately one mile from the turn onto Rockdale Road. Please respect the property owner's privacy by not entering the property or blocking the gates.

The formation of the Laurel Highlands and the resulting ridges provides an area rich in wind resources. These resources are harnessed by Iberdrola Renewables at this wind farm located partially on a reclaimed coal strip mine. Each turbine is 389 feet tall (the height of a 30-story building) and weighs 235 tons. The rotor blades are 253 feet long (greater than the wingspan of a Boeing 747 jet). The 23, 1.5 megawatt turbines produce enough electricity to power 10,000 homes annually.

Directions to next stop continued:

- Cross the river and go uphill; at stop sign, continue straight onto PA 653 west and drive for 2.6 miles to New Centerville
- Turn left to continue on PA 653 west for 7.1 miles
- Turn right into Jim Mountain Quarry overlook parking area

Stop Ten - Jim Mountain Quarry

The Jim Mountain Quarry, located on Laurel Ridge, is owned and operated by Amerikohl Aggregates, Inc. This sixty-foot seam of Loyalhanna Limestone contains approximately 45% calcium carbonate the remaining 55% is mostly silica resulting in very hard and extremely resistant stone.

The Loyalhanna Limestone is named for exposures along Loyalhanna Creek in Westmoreland County. It consists of 50% or more medium sized, well rounded sand grains deposited by underwater, near shore currents 328 million years ago.

The rock layers in the quarry face consist of red, clayey siltstones; olive grey sandstones; and the limestone that forms the base of the 300-foot-thick Mauch Chunk Formation in southwestern Pennsylvania. These layers dip slightly to the northwest then dip abruptly so that by the time they reach the middle of the valley below they are nearly 1000 feet underneath the surface. Continuing further in the same direction, these layers rise up to be exposed again near the top of Chestnut Ridge (visible on the horizon, nine miles to the northwest). The festoon (scoop-like) cross-bedding pattern on the limestone is striking and can be seen on boulders of Loyalhanna Limestone taken from the quarry and placed around the edges of the parking area.

Through a combination of blasting and crushing, limestone is extracted and separated into aggregate and crushed limestone. Aggregate is used for road base, anti-skid, stone for paving, and parking lots. Crushed limestone is used in agriculture to “sweeten the soil,” making soil less acidic, and in environmental operations such as reclamation of abandoned mine drainage sites.



Wind Turbines



Rock layers at Jim Mountain Quarry



Kittanning coal seam

For more information on the geology of Pennsylvania visit the DCNR Bureau of Topographic and Geologic Survey website at:
<http://www.dcnr.state.pa.us/topogeo/field/index.htm>

Directions to return to Donegal:

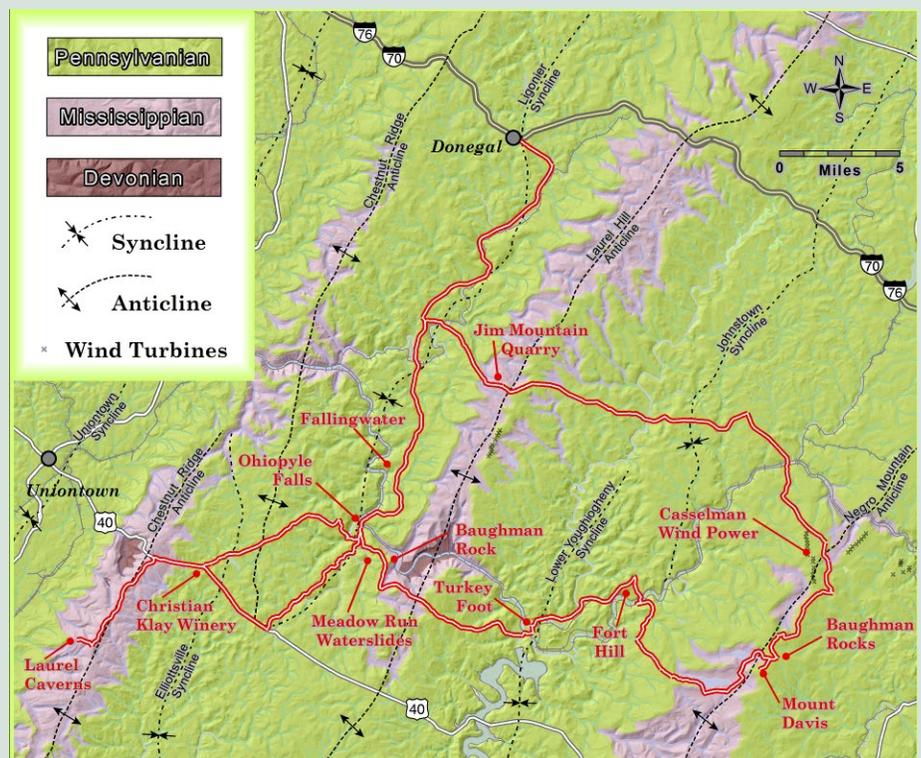
- Continue on PA 653 west for 4.4 miles
Note the view of Chestnut Ridge straight ahead
- Turn right onto PA 381 north
- Turn right at blinker light in Normalville to continue on PA 381/711 north
- Travel approximately 5 miles on PA 381/711 north to Melcroft

Point of Interest – Coal Patch Towns

During the early 1900s, Pennsylvania had more coal patch towns than any other state. As you drive through Indianhead and Melcroft, look to your right for houses once part of coal patch towns. Built by coal companies, each house looks the same as the one next door, providing efficient and cheap housing for coal miners and their families. The mines were operated by different coal companies, mining the same seam of coal. Look to your left as you head downhill past Melcroft for the Middle Kittanning coal seam which is 44 inches thick on average. Behind the houses are the remediation ponds built in 2007 to capture and treat acidic water draining from the now closed mines. As the mines closed, many coal patch towns were torn down with only a few houses remaining like the ones here.

Directions to return to Donegal continued:

- Continue on PA 381/711 north for 4.5 miles
- Turn left onto PA 711/31 west for two miles to Donegal



Join us on Facebook at: <https://www.facebook.com/visitPAparks> or at: <https://www.facebook.com/PAForests> and post photos and comments about your experiences on the tour!