

Forbes State Forest Resource Management Plan



Forbes Forest District 4

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Preface

The state forest system of Pennsylvania, approximately 2.2 million acres of forest land, comprise 13 percent of the forested area in the Commonwealth. The Bureau of Forestry is the steward and trustee of this land. Part of the bureau's mission is to manage state forests under sound ecosystem management, to retain their wild character, and maintain biological diversity, while providing pure water, opportunities for low-density recreation, habitats for forest plants and animals, sustained yields of quality timber, and environmentally sound utilization of mineral resources. Article 1, Section 27 of the Pennsylvania Constitution provides that, "Pennsylvania's public natural resources are the common property of all the people, including generations yet to come," and it sets forth that the Commonwealth has trustee responsibility for these resources. The bureau carries out this constitutional mandate by implementing it in both its long-term planning and every-day actions. To carry out its stewardship and trustee responsibilities for state forest lands, the bureau develops and implements planning documents that assure that the overarching goal of state forest management – ensuring sustainability – is achieved for the benefit of all the people. In 2016, the bureau revised its State Forest Resource Management Plan (SFRMP), which is the primary instrument that the bureau uses to plan, coordinate, and communicate its management of the state forest system. The SFRMP sets forth broad policies, as well as more focused goals and objectives, about state forest uses, resources, and values.

State forest management is a coordinated effort involving central office program areas and field staff in 20 forest districts located throughout Pennsylvania. Each district is responsible for managing wildland fire, destructive insects, and plant diseases on all lands throughout the district – public and private. The district staff promote wild plant conservation and private forest land conservation and stewardship. The staff also provides for the administration, protection, conservation, and management of state forest lands within the district.

Building upon the 2016 state-wide SFRMP, the bureau has developed District State Forest Resource Management Plans to provide district-level resource information and district- and landscape-level management priorities. This Forbes State Forest Resource Management Plan provides an overview of the district and its operations on state forest land and sets forth a framework for future management of Forbes State Forest. The planning horizon for this District SFRMP is approximately 5-10 years, after which time it will be revised to reflect changing conditions and priorities.

The bureau also creates District Activity Plans that describe the management activities the bureau will take within each district that may affect the public's use of state forest land. These are implementation plans that address how goals and objectives in the SFRMP and District SFRMPs are being achieved. The District Activity Plans are written at the start of each calendar year and revised mid-way through the year. They are posted on District webpages so that the public may review and comment upon them.

This Forbes SFRMP is comprised of a District Overview, a listing of District Priority Goals, and a collection of landscape management unit (LMU) plans, which are described further below.

Executive Summary

The Forbes State Forest Resource Management Plan provides an overview of the district and its operations on state forest land and sets forth priorities for future management of Forbes State Forest within the broad framework of the 2016 statewide State Forest Resource Management Plan (SFRMP). The statewide SFRMP is the primary instrument that the Bureau of Forestry uses to plan, coordinate, and communicate its management of the entire state forest system. This District-level SFRMP for Forbes State Forest focuses on local resources, opportunities, and areas of emphasis for management. The planning horizon for this District SFRMP is approximately 5-10 years, after which time it will be revised to reflect changing conditions and priorities.

The Forbes State Forest is comprised of over 60,000 acres located in southwestern Pennsylvania in Fayette, Somerset, and Westmoreland Counties along Laurel Hill, Chestnut Ridge, and Mt. Davis. The Forbes State Forest is a mosaic of land parcels, in proximity to private and public lands scattered throughout the Allegheny Mountain Ecoregion of the Appalachian Plateau Province, known locally as the Laurel Highlands. The topography within the district is rugged and irregular in pattern. It has been developed almost solely by stream erosion. As the original plateau-like surface was eroded and the streams branched out into more complex dendritic patterns, the topography gradually and progressively became more rugged. The highest point in Pennsylvania is in the Forbes State Forest in Somerset County at Mt. Davis, elevation 3,213 feet.

The virgin forest in the Forbes Forest District of American chestnut, mixed oak, and white pine-hemlock was harvested for charcoal, homes, mines, and farmland from the mid 1800's to early 1900's. The Chestnut blight hit in the early 1900's and eliminated the American Chestnut from the forest. Fires also burned cutover areas in the early 1900's. Several gypsy moth defoliations killed many acres of oaks from the mid 1980's to early 1990's. Decent annual precipitation and snowfall, acid deposition from industrialized areas in Pittsburgh and Ohio, historical high deer numbers, and infusion of several invasive plant species have contributed to the current day forest types found on the Forbes State Forest.

The Forbes State Forest is dominated by the red oak-mixed hardwood forest community type. Most of the red oak dominated stands are of medium to high quality. There are also forest stands dominated by other oaks like white oak and chestnut oak. Northern hardwood stands with red maple, American beech, and sugar maple, along with Allegheny hardwood stands with black cherry add species diversity to the Forbes State Forest. Some hollows and side slopes are dominated by tulip poplar, basswood, and cucumber-trees. There is very little conifer cover on the Forbes State Forest.

Forest health issues affecting the Forbes State Forest range from damaging insects and diseases to invasive plants. The Forbes Forest District has taken a proactive approach to control and reduce invasive plants on the Forbes State Forest by monitoring the state forest land constantly for invasive species of concern, then killing the invasive plants, and document the occurrences. We work together with our Division of Forest Health and other agencies to reduce the effect of insects and diseases.

This district's average annual timber harvest goal for the current allocation period is 285 acres of overstory removal, and 200 acres of shelterwood treatments. This goal is part of a long-term, systematic plan to provide benefit for the ecosystem and to bring a continuous supply of high-quality timber to Pennsylvania's economy.

The Forbes Forest District actively manages the forest for a diversity of wildlife species through various management techniques. Some of these techniques are species specific while others are designed to improve habitats for numerous wildlife species.

Economic gas production has been obtained from the deep Devonian age Oriskany Sandstone and overlying fractured Onondaga Chert in several gas fields from state owned land in the Forbes State Forest. The state forest land has produced gas from wells in the Seven Springs gas field along Laurel Ridge in Somerset and Westmoreland Counties, and from wells in the North Summit gas field along Chestnut Ridge in Fayette County. In addition, small parcels of state-

owned land, unitized with producing wells on private property, have produced gas from the Oriskany and Onondaga formations.

Numerous cultural and historical resources can be found throughout Forbes State Forest. Many of these features can be traced back to Pennsylvania's early industrial era. Some of these historical resources can be visited today, while others are interpreted through educational programs, publications, or waysides.

To facilitate land management objectives and meet public use demands, the district manages an array of infrastructure, including but not limited to: 44 miles of public use roads, 86 miles of administrative roads, and numerous parking lots, bridges, culverts, trails, and boundary line. The district is divided into 3 maintenance divisions that serve as bases for work crews and equipment. Maintenance is an ongoing and important operation.

Each staff member in the Forbes Forest District has a role in wildfire suppression. The primary fire staff are one Forest Fire Specialist Supervisor and one Fire Forester who conduct investigations, initial attack and extended attack operations in the six counties that comprise the Forbes Forest District. Both have national qualifications. They are supported by the District Incident Management Team (IMT). The District IMT's primary Incident Command System (ICS) positions are filled by staff with extensive wildfire experience. Not all team members are nationally qualified in their assigned ICS positions, but have been trained in the fundamentals of their respective positions.

The Forbes is the largest public land base in the Laurel Highlands. It is uniquely positioned to provide opportunities for low-density outdoor recreation and provide continuity to other private and public partners. The proximity to several metropolitan areas such as Pittsburgh, Morgantown, Uniontown, Greensburg, Cumberland, MD, Baltimore, MD, and Washington DC bring large numbers of recreationists year-round to the Forbes State Forest. Hiking, backpacking, biking, and horseback riding on the many miles of hiking trails draw seemingly endless users to the forest in summer. Annual snowfall on Laurel Ridge ranks among the highest in the state, accounting for a very high level of winter recreation to include cross-country skiing, snowshoeing, snowmobiling, dog-sledding, and other uses. Trails and roads form the basis of most recreational pursuits in the state forest. The Forbes State Forest features over 100 trails and roads, totaling over 350 miles. Large inter-connecting trail systems can be found in the Laurel Highlands Trail System, Roaring Run Natural Area, and Quebec Run Wild Area.

Public education and outreach is an essential component of the bureau's mission. The Forbes Forest District participates in numerous educational opportunities with stakeholders from Envirothons, to fire prevention and Smokey programs, to forest resource programming with schools. The district provides interpretive wayside panels located at various locations including trailhead parking areas, along trails, at the district office, and other areas of high use by the public. The district also provides programs designed to teach the public about the value of natural, cultural and historic resources – as well as programs to encourage participation in recreation within the state forest.

To facilitate consistent, structured, and integrated resource management and planning across large landscapes, state forest lands and adjoining lands are organized by *Landscape Management Unit (LMU)*. LMUs are the "building blocks" of the Forbes SFRMP, as targeted plans for each individual LMU comprise the bulk of the district plan. Each LMU plan contains an overview narrative of the LMU features, a profile that summarizes relevant data about the LMU, and a list of priority goals for which that LMU is well-suited. There are 8 LMUs in the Forbes Forest District.

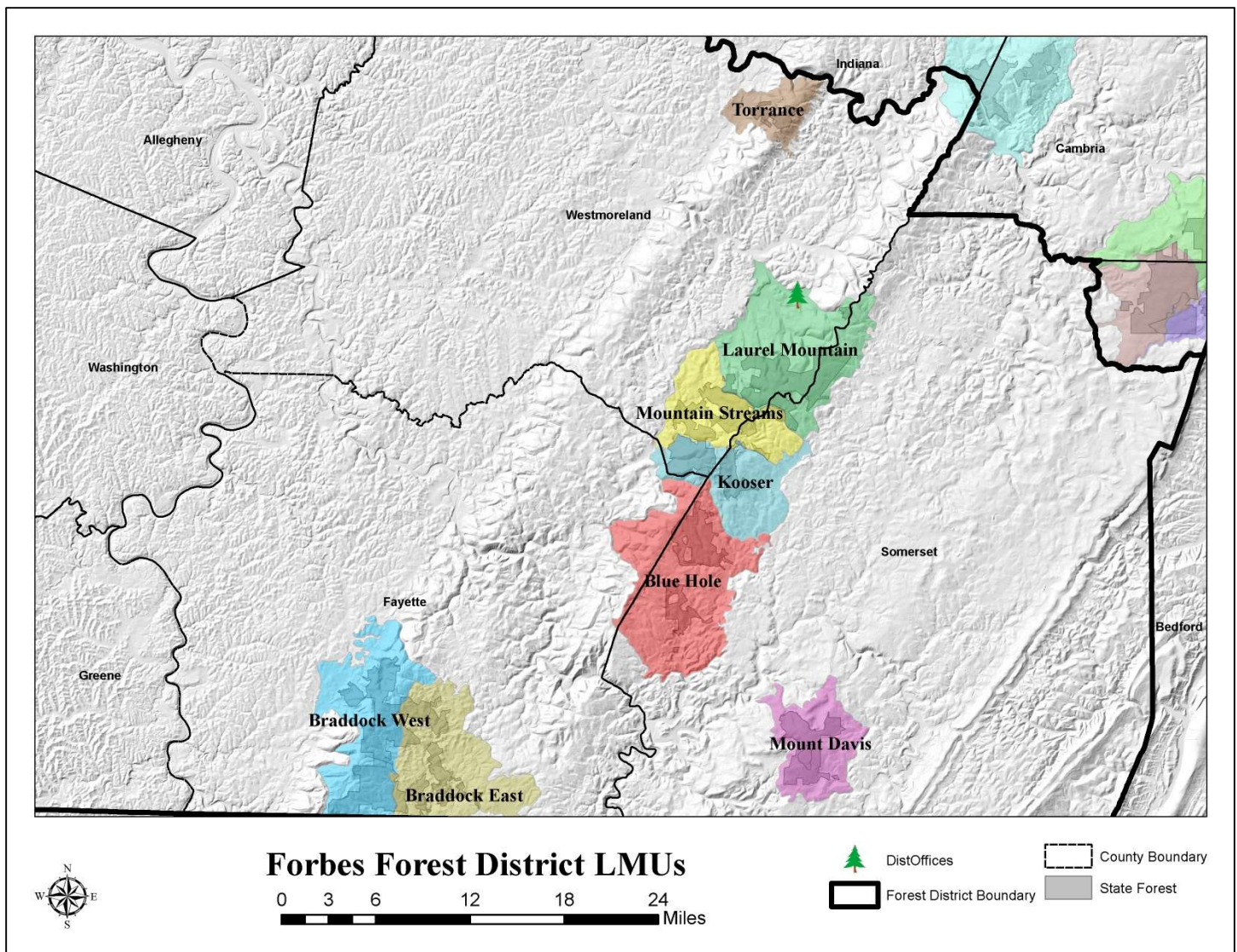


Figure i: LMUs for the Forbes Forest District

List of Landscape Management Unit (LMU's) in Forbes State Forest

- Laurel Mountain
- Kooser
- Mountain Streams
- Torrance
- Blue Hole
- Mount Davis
- Braddock West
- Braddock East

District Priority Goals

The 2016 SFRMP sets forth Principles, Goals, and Objectives that focus on the variety of resources, uses, and values of state forest land. These Principles, Goals, and Objectives were organized around 12 Resource Chapters:

- Communications
- Timber and Forest Products
- Native Wild Plants
- Wildlife
- Water Resources
- Soils
- Geologic Resources
- Wildland Fire
- Forest Health
- Recreation
- Infrastructure
- Cultural Resources

The Principles, Goals, and Objectives in the SFRMP apply universally across all of state forest land. Due to their broad application, they were written in relatively general terms. This District SFRMP provides an opportunity to prioritize goals that are more specifically applicable at the district level. The District Priority Goals that follow provide points of emphasis for state forest land management within Forbes State Forest over the next 5-10-year planning horizon.

Wildland Fire

- Forbes Forest District currently only has one RXB2 (Burn Boss Type 2) to direct prescribed fire operations on low and moderate complexity burns. Our goal is to train another staff member as RXB2 for continuity of operations.
- In recent years Forbes Forest District has made strides in outfitting personnel for wildland fires, but equipment is lacking. Our goal is to acquire a Type 7 Engine and updated slip-on units for use on wildland and prescribed fires.

Recreation

- The initial classification of state forest into ROS zones is complete. Our goal is to develop management objectives for each ROS unit, to provide continuity between managers and staff, continuity of operations as new employees are hired, and to aid in decision making for the many requests for new trails and infrastructure from recreational groups.
- Currently, trails are maintained by district maintenance personnel, volunteer groups, youth groups, and individuals. Our goal is to develop and implement a systematic trail assessment program so that trail needs will be current, and we can appropriately use the different groups to accomplish this huge task.
- Many of the trails on the state forest were not built in a sustainable manner or were built on soils that cannot handle the huge amount of traffic received. Current trail restoration of eroded sections causes consternation with some user groups. Our goal is to research innovative trail restoration practices that would meet the needs of multiple user groups yet be practical with the means at our disposal.

Communications

- Reaching the myriad of state forest users and forest district landowners is a daunting task. Our goal is to improve communication of key messages to the public through interpretive panels and programs, recreation

programming, forest demonstration sites, and education. This involves many staff including ‘Service’ Foresters, ‘Management’ Foresters, Environmental Education Specialist, Rangers, and Managers.

- The Forbes State Forest is a key component of the area known as the Laurel Highlands. The Laurel Highlands is a premier outdoor recreation and heritage tourism destination. Our goal is to establish and maintain relationships with key partners within this conservation landscape so that we can lend our expertise to maintain the integrity of the area.

Timber and Forest Products

- A primary part of our mission is to provide sustained yields of quality timber. Our goal is to continue to achieve our Harvest Allocation Model acreage goals, while using the most up to date science and research and innovative techniques from our staff, to ensure quality regeneration of the site.

Forest Health

- Many invasive plant species endeavor to take root in the Forbes State Forest. Our goal is to eradicate invasive plants to the best of our ability, training, and equipment. We will use our staff, volunteers, and other means available to us, such as our Bureau’s newly developed Early Detection Rapid Response (EDRR) program.

Cultural and Historic

- The Forbes State Forest is home to many historical features including CCC camp remnants, historic railroads, old homesteads, the Wharton Iron Furnace, and many more features. Our goal is to protect and interpret historic areas of interest.

Native Wild Plants

- The Forbes State Forest is home to several rare and endangered wild plant species due to unique habitats that only occur in southwestern Pennsylvania. We will consult our Bureau’s Ecological Resources Section for the best ways to sustain, protect, manage, and enhance these rare and endangered plant species and their habitats on the Forbes State Forest.

District Overview

1) Location and Description

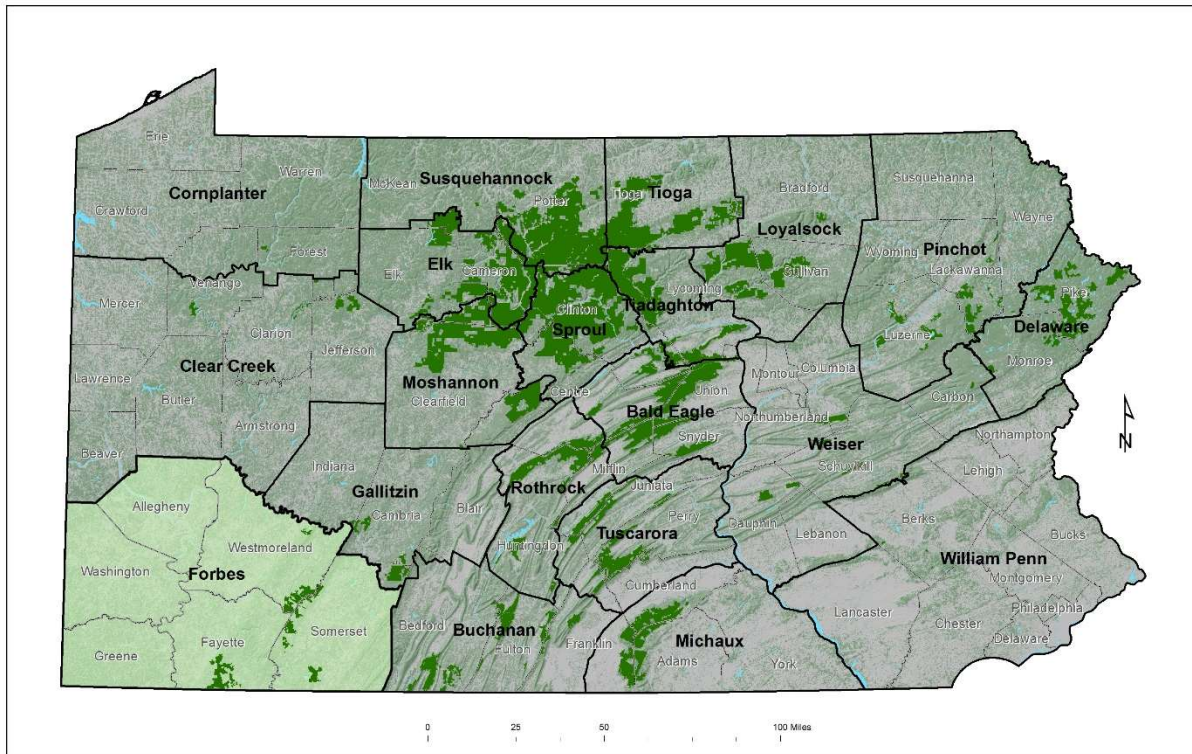


Figure 1-1. Location of Forbes Forest District with state forest land (dark green).

The Forbes State Forest is comprised of over 60,000 acres located in southwestern Pennsylvania in Fayette, Somerset, and Westmoreland Counties along Laurel Hill, Chestnut Ridge, and Mt. Davis. The Forbes State Forest is named in honor of Brigadier General John Forbes, who commanded the successful British expedition against the French and Indians at Fort Duquesne in 1758 during the French and Indian War. The Forbes State Forest is a mosaic of land parcels, in proximity to a few state game lands and several state parks, scattered throughout the Allegheny Mountain Ecoregion of the Appalachian Plateau Province, known locally as the Laurel Highlands.

This area includes, among many other attractions, the 70-mile National Scenic Laurel Highlands Hiking Trail, Ohiopyle State Park which is the largest state park in the Commonwealth, two private ski resorts with a third on state park land, and elevations ranging up to 3,213 feet at Mount Davis — the highest point in Pennsylvania. All water from the Forbes State Forest eventually finds its way to the Ohio River.

The proximity to several metropolitan areas such as Pittsburgh, Morgantown, Uniontown, Greensburg, Cumberland MD, and Baltimore MD, and Washington DC brings large numbers of recreationists year-round to the Forbes State Forest. Just about any type of outdoor recreation can be found on the Forbes. Hiking, biking, and horseback riding on the many miles of hiking trails draw seemingly endless users to the forest in summer. Annual snowfall on Laurel Ridge ranks among the highest in the state, accounting for a very high level of winter recreation. Winter recreation is open to cross-country skiing, snowshoeing, snowmobiling, dog-sledding, and other uses.

The virgin forest in the Forbes Forest District of American chestnut, mixed oak, and white pine-hemlock was harvested for charcoal, homes, mines, and farmland from the mid 1800's to early 1900's. The Chestnut blight hit in the early 1900's and eliminated the American Chestnut from the forest. Fires also burned cutover areas in the early 1900's. Several gypsy moth defoliations killed many acres of oaks from the mid 1980's to early 1990's. Decent annual

precipitation and snowfall, acid deposition from industrialized areas in Pittsburgh and Ohio, historical high deer numbers, and infusion of several invasive plant species have contributed to the current day forest types found on the Forbes State Forest. At the higher elevations, there are oak dominated forests with red oak, chestnut oak, and white oak; northern hardwood forests with red maple, white ash, sugar maple, red oak, and American beech; and Allegheny hardwood forests dominated by black cherry. On the side slopes, there are tulip poplar-beech-maple forests dominated by tulip poplar, red maple, American beech, and cucumber-tree. In the bottomlands, there are scattered eastern hemlock found along streams and ravines.

The Forbes Forest District is comprised of approximately 3,234,560 acres of which approximately 1,846,336 acres or 57% are forested.

Table 1-1. Acres of forested land statistics acquired from United States Census Bureau

County	Acres of Forested Land	Acres of All Land	Percent Forested
Allegheny	168,731	467,200	36
Fayette	319,127	505,600	63
Greene	249,028	368,640	68
Somerset	433,684	687,360	63
Washington	274,496	548,480	50
Westmoreland	401,270	657,280	61
Totals	1,846,336	3,234,560	57

2) District Organization and Human Resources

The Forbes Forest District is one of the 20 state forest districts administered by the Pennsylvania Department of Conservation and Natural Resources, Bureau of Forestry. It comprises about 3% of the 2.2 million-acre state forest system. Within the bureau, the administrative responsibility of the Forbes Forest District is delegated to the District Forester, whose office is located at 1291 Route 30, Laughlintown, Pennsylvania 15655. The District Forester is responsible for executing all the sections of the SFRMP on state forest land. Two assistants help accomplish this mission. One assistant manages primarily the foresters in conducting resource management activities including timber sales, landscape planning, wildlife projects, wildland fire suppression, oil and gas management, rights-of-way, and prescribed fire. The other assistant manages primarily maintenance staff and rangers in conducting forest operations including roads, trails, bridges, infrastructure, boundary lines, recreation and law enforcement. The Forbes State Forest is divided into three maintenance headquarters covering five divisions: Laurel Mountain Headquarters (Laurel Mountain/Kooser Divisions), Mt. Davis Headquarters (Mt. Davis/Blue Hole Divisions), and Braddock Headquarters (Braddock Division). Following is an organizational chart of the Forbes Forest District staff:

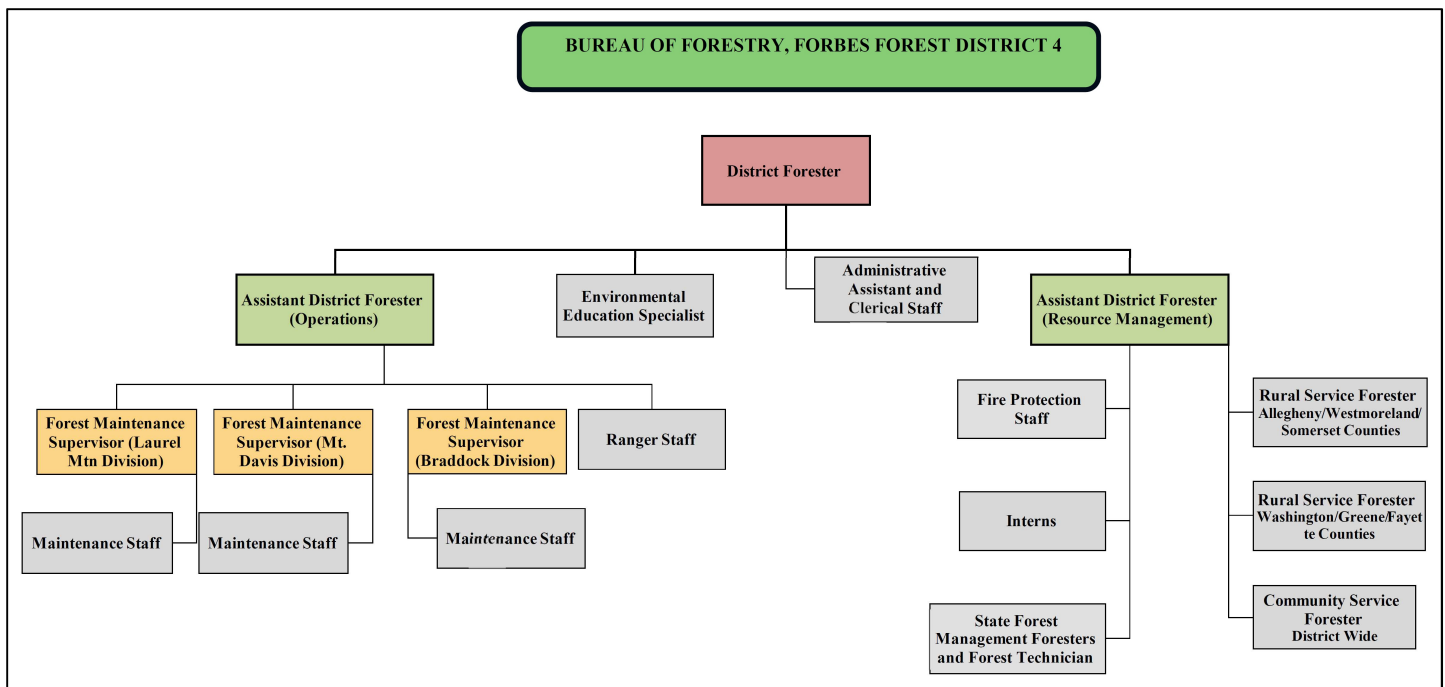


Figure 2-1. Forbes Forest District organization chart.

3) Historical Land Use and Disturbance

Many factors have influenced the Forbes State Forest over the last 150 years, including timber harvesting, fire, wind and ice storms, insects, diseases, white-tailed deer browsing, and drought. These factors have shaped what we know today as the Forbes State Forest.

Early Timber Harvesting

The first European settlers who traveled to the Forbes Forest District found dense virgin forests of American chestnut, mixed oak, and white pine-hemlock. From the mid 1800's to early 1900's, these forests were virtually all harvested and cleared for charcoal for the iron and steel industries, ties for railroads, mine timbers, fuel wood and chemical distillation wood, farmland, as well as lumber for homes, buildings, furniture, and barrels.

Large-scale logging activity appeared in the Mt. Davis area in the 1890's. Timber companies used narrow-gauge logging railroads and the famous geared Climax Type A locomotives to work their way up the mountainsides. In the Kooser area, there is no evidence of any large-scale logging operations until around 1875 when railroads became the primary means to extract timber from rough, remote mountainous areas. It is speculated that lumber from the Kooser area was used to rebuild the Borough of Somerset, which burned to the ground in the years 1833, 1872, and 1876.

The major factor that influenced the present forest composition of the Laurel Mountain Division was the logging operation completed in 1908. On September 1, 1909 forester J. R. Williams described the condition of the Laurel Mountain Division as follows:

The Westmoreland-Somerset reserve was purchased from the Byers, Allen Lumber Company, who finished their lumbering operations in 1908. The timber consisted of such hardwoods as, oak, chestnut, maple, tulip, locust, hickory, and beech, and hemlock. Almost everything merchantable was removed. Trees too small for lumber were cut into pit posts, for which any species of tree can be used. The small amount of timber left standing is either scattered or else in places so rough as to be almost inaccessible for lumbering. There is such a tract of hardwoods, consisting of some good red oak left standing back of Grove Hollow; but it is a question whether it

would pay to build a road and take it out. Along the streams is found an occasional beech or sycamore of good size, with here and there a hemlock. Of the large stand (about 1,000-acres), of almost pure hemlock that stood upon the swampy area called "Spruce Flat" on the Summit of Laurel Hill, there is today not a tree to be found. Hemlock regeneration is entirely absent there. The "flat" since the fires, presents a desolate appearance, a waste covered by nothing but ferns and an occasional cherry or sassafras. Scrub oak and small pitch pines cover a large flat lying east of "Spruce Flat". The growth is so dense as to make it almost impossible to travel through. Another flat lying west of "Spruce Flat" is covered with scrub oak, but in mixture with chestnut and white oak, which in time will choke out the scrub oak. Of course, after the lumbering, with the woods left full of "slashings," the land was visited by repeated and severe fires. I should say that fully three-fifths of the reserve has been burned over since the lumbering was done. The fires did great damage to the young growth. A vigorous young growth followed the cutting, and where it escaped the fires is today growing rapidly; but in the "burned area," some places are covered with nothing but ferns and blackberry bushes, while others support a growth of such species as fire cherry and sassafras. This is better than nothing for they will make excellent nurse trees for more desirable species. Black locust does well here, attaining splendid growth and being remarkably free from the pests, which usually attack it. Young growth of locust is coming up all over the reserve, and especially has it taken possession of the hill tops.

It is interesting to note Forester Williams' description of the vegetative cover on areas that had been logged and repeatedly burned. He notes that large areas were covered with nothing but fern, blackberry, fire cherry, and black locust. While we have no way of determining which areas Forester Williams was referring to, we do know that no area today is in this condition.

The Forbes State Forest today consists of, at the higher elevations, high quality oak-dominated forests, with red oak, chestnut oak, and white oak; Northern hardwood forests with red maple, white ash, sugar maple, and red oak; and Allegheny hardwood forests dominated by black cherry. Side slopes and hollows are dominated by tulip poplar, red maple, American beech, basswood, and cucumber-tree. In the bottomlands, there are scattered Eastern hemlock found along streams.

Wildfires

Logging, railroad use, charcoal, and iron production by the settlers created a rise in large, catastrophic wildfires in Pennsylvania, especially from 1880 to about 1930. In most cases across the state, and in the Forbes Forest District, fire frequency and severity dramatically increased during this period, creating many of the even-aged, oak-dominated forests the Bureau of Forestry now manages. In 1913, the average size of a wildfire in Pennsylvania burned 412 acres. All wildfires that year consumed a total of 386,267 acres. The public perception around these large, intense fires contributed to a national effort of fire suppression. Since the early 1900's, several Pennsylvania laws prohibited forest burning, making it illegal for anyone to purposefully start wildfires. In 1901, the Pennsylvania State Department of Forestry (now the Bureau of Forestry) was given responsibility to address wildfires through detection, suppression, and prevention.

Around 29 fire towers were built throughout the Forbes Forest District between 1913 and 1953, some on state forest land and others on private lands. Hundreds of fire wardens and crew members were trained in suppression tactics to curtail ravaging forest fires. Today, six fire towers remain standing with 83 Forest Fire Wardens and 487 volunteer fire departments (VFD's) helping prevent and suppress wildfires in the Forbes Forest District. There has been a dramatic decrease in the acres and size of wildfires since the early 1900's due to full suppression activities. From 2008 to 2017, the Forbes Forest District staff and Fire Wardens acted on a yearly average of 51 forest fires covering 232 acres within the District. Today, we see the ecosystem changing in part due to the lack of fire on the landscape. Our quick response to wildfires and attempts to limit fire spread are favoring fire intolerant species like red maple and birch.

Insects and Diseases

Chestnut blight disease was first observed in the New York Zoological Park in 1904. The fungus is native to Asia and was probably introduced into the United States on nursery stock. The disease spread quickly with deadly results. By 1915, most American chestnut throughout its entire natural range in the Appalachian Mountain region were dead.

The American chestnut occupied a unique position among hardwoods. There were few native trees that could compare with its vigor of sprouting, rapidity of growth, and yield of a great variety of useful products, such as high-grade lumber, poles, ties, slack cooperage, paper and fiber board, tannin extract from bark and wood, and a highly-sought after edible fruit.

The American chestnut occurred throughout the Forbes State Forest in the mixed oak types at higher elevations. Following the death of the chestnut, the oak stands were left grossly under stocked. Chestnut sprouts can be found throughout the mixed-oak type today, with a select few old enough to bear fruit although the nuts are almost always shriveled and never develop properly. However, they usually die when the sprouts grow to around three inches in diameter. Some sprouts have been found to be six to eight inches in diameter before being re-infected by the disease.

Today the American Chestnut Foundation and other organizations, including DCNR are working to reintroduce the American Chestnut to the forest through various process. We are committed to the reintroduction of the American chestnut tree.

Gypsy moth was introduced into the United States in 1869 and first discovered in Pennsylvania in 1932. Since the 1970's, gypsy moth defoliations have killed hundreds of acres of oaks in the Forbes State Forest, peaking in the late 1980's and early 1990's. Most of the oak killed by the gypsy moth has since been salvaged through timber sales. Since the 1990's, gypsy moth outbreaks have not been as severe due to the resurgence of the gypsy moth fungus, *Entomophaga maimaiga*. This fungus was introduced into the United States near Boston, MA from Japan in 1910-11 to try and combat the gypsy moth biologically. It was perceived as a scientific failure until the fungus was observed on dead gypsy moth caterpillars in several northern eastern states in 1989, including Pennsylvania. The fungus' presence in Pennsylvania has helped keep gypsy moth populations in check. From the 2000's to current day, there have been a few spikes in the gypsy moth population causing some local tree mortality but nothing to the degree it was like in the late 1980's and early 1990's.

White-tailed Deer

Prior to lumbering in this area in the early 1900's, deer were relatively scarce. In 1912, published articles stated a large crowd gathered at the Ligonier train station to witness 21 deer from Michigan were released on a game preserve on Laurel Mountain above Ligonier to supplement game on the mountain. The deer herd, statewide and in the Forbes Forest District, began its buildup in 1915 after the original virgin timber had been harvested and burned and the cutover areas started to develop into hardwood stands. Severe winters and heavy winter mortality in the late 1970's reduced the deer herd temporarily, but populations rebounded quickly in the 1980's and remained high through the early 2000's leading to deer over-browsing desirable tree and plant species. Starting in 1999, the Forbes Forest District erected several deer fence enclosures to keep deer out of timber sale areas to temporarily protect young desirable tree seedlings from deer browse until they get out of the reach from deer.

The historic over-browsing of tree seedlings by deer has been a major problem in the Forbes State Forest. Heavy browsing before and after regeneration timber harvests delays the establishment of the new hardwood stands. Over browsing caused many areas to become open areas of grasses and ferns. The survival of tree reproduction on regeneration cuts is related to the number of deer per unit area. The heavy browsing in regeneration cuts reduces both the height and density of commercial reproduction. Browsing adds years to the rotation period, and the longer the delay in regenerating a stand the greater the risk of further reduction in the density of stems and diversity of species. Quality of the reproduction is also affected. Repeated browsing on the commercial tree growth has resulted in multiple sprouting from the root collar. Deer ignoring non-desirable species like beech, birch, and striped maple has encouraged

these species to occupy the area formerly occupied by more valuable cherries and oaks. These impacts play heavily on the health, compositions, and stocking of forest stands for decades to come and have led to the whole sale loss of native herbaceous and shrub communities throughout much of the forest, as well as the seed source for these populations to become re-established naturally.

However, since the early 2010's, deer numbers have slowly dropped back to somewhat manageable levels and there has been an observed reduction in deer browse on desirable tree seedlings on the Forbes State Forest. Many deer fence enclosures have been taken down, but some still remain to help secure successful regeneration.

Weather Events

Ice storms occur periodically from time to time at the highest elevations of the Forbes State Forest. On October 30, 2002, a severe ice storm hit the Forbes Forest District and affected all trees above 2,200 ft. elevation. The one-inch thick ice remained on the trees for about three days. The late leaf fall in 2002, giving the ice more surface area to accumulate, compounded the severity of the damage. Most trees sustained some crown damage, some trees completely uprooted, and trees at the highest elevations sustained severe crown damage.

In the Braddock Division, a tornado touched down in July 1971, cutting an intermittent swath across Chestnut Ridge from Haydentown to Gibbons Glade. Compartments 40 and 41 in the Quebec Run Wild Area suffered considerable timber damage from this tornado, along with a small site in Compartment 38 and another in Compartment 39 just south of Gibbon Glade. Another tornado in 1998 followed nearly the same path, damaging a small amount of red pine in Compartment 38, about six acres of hardwoods in Compartment 37 just west of the Silbaugh farm, and hitting the same site in Compartment 39 along with additional acreage.

In the Mt. Davis Division, two tornadoes touched down, one on May 31, 1998 and the other on June 2, 1998. The May 31st tornado affected about 54 acres in compartment 19 along the south side of South Wolf Rock Road. The June 2nd tornado affected about 360 acres in compartment 17 along the east side of Vought Rock Road. The timber was salvaged in 1999 and 2000.

Civilian Conservation Corps (CCC)

The 1930's saw the arrival of the Civilian Conservation Corps (CCC) to the Forest. Three CCC camps were located on the Forbes State Forest, Negro Mountain Camp (S-97) located in the Mount Davis Division, Blue Hole Camp (S-98) located in the Blue Hole Division, and Kooser Camp (S-99) located at what is now Kooser State Park. The CCC constructed roads, bridges, trails, dams, buildings, parks, picnic areas, planted trees, suppressed wildfires, and improved forest stands. This was a period of intense activity in the forest and a lot of our permanent improvements were made in this era. With the entry of this country into World War II in December 1941 the CCC camps terminated their activities.

Forest Management Activities

Professionally trained foresters have been managing the natural resources on state forest lands from the very beginning of the state forest system in Pennsylvania in 1895. The first forest management plan went into effect in January 1955, thus signaling the beginning of a new era in Pennsylvania forestry, an era of providing high-quality forest products compatible with the total resources of the forest. In 1965, the department switched from an uneven-age to an even-age system of management. Since that time, overstory removals and clearcuts have been implemented every year on the forest as well as intermediate improvement cuts and two-aged cuts in aesthetic and riparian buffers. The basic objectives of state forest management have changed from those of previous periods. The periods of "protection", limited cutting, and strictly timber management have been replaced by one of multiple resource use, in which the sustained yield of high-quality forest products, environmental and ecological considerations, and recreational use are desired. Today, on state forest lands, timber is not managed to the exclusion of other forest resources, but all resources - water, fauna, flora, timber, minerals, and recreation—are managed together on an ecosystem-based approach.

The Forbes Forest District has three management foresters and one forest technician specifically dedicated to managing the 60,000 plus acres that make up the Forbes State Forest. Of those 60,000 acres, roughly 27,000 acres are zoned

multiple resource, commercial with the potential for sustainable forest management practices using commercial timber sales. The virgin trees on the Forbes State Forest were harvested from the mid 1800's to early 1900's and resulted in areas of high quality, oak-dominated second growth timber on the Forbes State Forest today. Most of the maturing forest stands in the Laurel Mountain, Kooser, Blue Hole, and Mt. Davis Divisions are 90-110 years old and 80-90 years old in the Braddock Division. In the 1970's and 1980's the foresters concentrated on, and implemented, clearcuts in the higher quality timber stands in the Laurel Mountain, Kooser, and Blue Hole Divisions. A lot of these stands regenerated heavy to black birch, black cherry, and red maple with little oak. The Braddock Division mostly saw light intermediate cuttings to improve the younger timber along with some gypsy moth salvage in the late 1980's and early 1990's. The Forbes State Forest's yearly timber harvesting goal was 625 acres a year during this period.

There was a shift from clearcutting in the 2000's to utilizing more of a shelterwood cutting technique to help regenerate oak from harvesting. Prescribed fire was also introduced to help regenerate oaks during this time with successful results. Prescribed fire reduces undesirable, less-tolerant species in the understory and allows the more fire-tolerant oak species to excel. Also, road buffers treated with single-tree selection cuttings in the past are now being treated with two-age cuttings and group selection management to regenerate these areas without compromising the aesthetic characteristics of these stands.

In 2004, the bureau created a harvest allocation model that set timber harvest schedules for state forest land in each district. The Forbes State Forest's annual timber harvest goal fell from 625 acres per year to 470 acres per year in the first 10 year cutting period (2004 – 2013). During this time, the foresters tried to strike a balance between implementing both shelterwood and overstory removal harvests with the use of prescribe fire to help regenerate a more diverse species mix with a concentration on oak species. With the onset of the harvest allocation model second 10 year cutting period (2014-2023), the Forbes State Forest's annual timber harvest goal rose from 470 acres a year to 555 acres a year. The foresters continue to implement overstory removals to recruit the next generation of trees for future management. However, high quality timber in easily accessible areas is getting harder and harder to find causing the foresters to get more creative to get timber out to market. The foresters are also focusing on lower timber quality sites that are more difficult to sell and require more time, effort, and money to regenerate adequately.

4) Acquisition History

Prior to Europeans settling Pennsylvania, dense forests nearly covered the entire state, except for a few natural meadows in the lowlands and scattered rocky areas in the highlands. These seemingly inexhaustible timber tracts provided the early settlers with raw materials to produce charcoal for the iron and steel industries, ties for railroads, fuel wood and chemical distillation wood, as well as lumber for homes, buildings, furniture, barrels and boxes. The settlers never envisioned that such forests could ever disappear. However, as Pennsylvania's increasing population turned forest land into farms and cities, and as expanding industries consumed more and more wood, the amount of standing timber grew smaller. Then, in the late 1800s, awareness began to grow that the forests were not inexhaustible. Large tracts of land once covered with virgin forests had been cutover and abandoned by the owners. Forest fires burned uncontrolled throughout much of the cutover area. Between 1860 (when Pennsylvania led the nation in lumber production) and 1900, (when it had to import lumber to fill its needs) various efforts were made to halt the depletion of the forests. The future wood supply and the restoration of once-forested areas greatly concerned conservation-minded citizens.

In 1887, the Pennsylvania General Assembly authorized the governor to appoint a committee to examine and consider the subject of forestry in Pennsylvania and report its findings at the next regular session of the legislature. In 1888 a Governor's Commission was appointed to study the forest situation. Authorized by the legislature once again, the governor appointed a second commission in 1893. Because of these studies, in 1895, Dr. J. T. Rothrock was appointed Commissioner of Forestry in the newly created Division of Forestry in the Pennsylvania Department of Agriculture.

In 1897 the legislature passed an act authorizing the purchase of unseated lands for forest reservations, thus marking the beginning of the Pennsylvania State Forest System. This act provided for the acquisition of not less than 40,000 acres in the headwaters of each of the main rivers of Pennsylvania, mainly the Delaware, Susquehanna, and Ohio, providing the land selected shall be of a character better suited to the growth of trees than to mining or agriculture, and that 50% of the area have an elevation of not less than 600 feet above sea level. In 1898, 7,500 acres of land in Clinton County became the first land purchased under this new act.

The Forestry Commission eventually assumed forest fire control responsibilities for the entire state, and in 1916 the Commonwealth was divided into 21 fire districts. Of the six counties in the present-day Forbes Forest District 4, Westmoreland, Somerset and Fayette counties were originally designated as District 5. Greene, Washington and Allegheny counties were part of District 2. A reorganization in 1921 under Gifford Pinchot resulted in the present six counties being designated as Forest District 22 and the state-owned land named the Forbes State Forest. For a short period, from 1946 to 1953, this area was divided into two forest districts, with the counties of Fayette, Greene and Washington being District 25, and administered from Uniontown. In 1953, the six counties were again combined as they are today and designated as Forbes Forest District 4.

The Forbes State Forest, named in honor of Brigadier General John Forbes, who commanded the successful expedition against Fort Duquesne in 1758 during the French and Indian War, is divided into five divisions in three counties. The Laurel Mountain, Blue Hole, and Mt Davis Divisions were named after major geographic features. The Kooser Division was named for an early settler and the previous landowner, while the Braddock Division is named after Major General Edward Braddock, a casualty of the French and Indian War who was buried in the road that later became the first National Road, US Route 40.

Laurel Mountain Division

The Commonwealth of Pennsylvania purchased the major portion of the Laurel Mountain Division from the Byers and Allen Lumber Company on April 23, 1909, for \$42,662.81. This purchase, which contained an easement to the Pittsburgh, Westmoreland and Somerset Railroad, was obtained for \$5.00 per acre, which in retrospect would indicate that the Commonwealth acquired a considerable bargain at the time. However, Byers and Allen had purchased the same tract in the late 1890s complete with the virgin timber for the sum of \$50,000. The 8,532-acre Somerset-Westmoreland State Forest Reserve, as it was called in 1909, was the first large purchase in the Ohio River watershed.

A 31.50-acre tract of land along U.S. Route 30 near the village of Laughlintown was added to the division in 1978. This tract was purchased from the Western Pennsylvania Conservancy for \$12,750.00 and is the site of the district office.

The Torrance Tract, which is part of the Laurel Mt Division, is located about 15 miles north of the main block of state forest land in the Laurel Mt Division. The original 1,165-acre Torrance Tract was originally acquired by the state in 1921 for use by the Torrance State Hospital. The property was transferred to the Bureau of Forestry on May 4, 1982. In 2003, an additional 389.5 acres was purchased from the Western Pennsylvania Conservancy.

Kooser Division

The original lands comprising the Kooser Division were acquired in two separate purchases and one land exchange. The first and largest purchase was made on July 5, 1922, from the United Lumber Company, a West Virginia-based corporation. The Commonwealth paid \$12,286.84 for 2,730 acres of land in three separate blocks. The second purchase of 244 acres from O. E. and Bessie Shaffer occurred on June 23, 1931, for the sum of \$976.25. A land exchange with the Somerset Limestone Company brought six additional acres of land to the Kooser Division. In this exchange, the Commonwealth traded two pieces of land, 36 acres and 33 acres in size, for one 75-acre piece that was adjacent to state forest land.

Mt Davis Division

The Mt Davis Division of the Forbes State Forest comprises one large and one small tract of land totaling approximately 5,526 acres. The major 4,651.33 parcel was purchased in 1929 from Ann Elmira Humes for \$14,091.62, with smaller

acquisitions occurring in 1942 from John N. Davis Estate Heirs for 422.50 acres and in 1979 from Willard Rockwell, Jr. for 499.29 acres. One land exchange in 1967 added 50.64 acres.

Blue Hole

The Commonwealth of Pennsylvania purchased most of the Blue Hole Division on September 8, 1931. Joseph Levy and Charles Snowden, United Lumber Company of West Virginia, previously owned this land. This land grant consisted of 3,656 acres and 133 perches for a sum of \$10,970.49, hand paid. Two additional tracts of land were purchased in 1983: 1,545-acres purchased from Enertel Corporation for \$1,092,315.00 and 76.8-acres purchased from Paul Bell for \$46,965.00. The 2,363-acre Barron Tract was acquired from the Western PA Conservancy in 2008 and was added to the Blue Hole Division. The timber rights on the Barron Tract are vested in the Ruffed Grouse Society for a period of 15 years from the date of deed recording on January 31, 2008. The Blue Hole Division now totals 7,471 acres.

Braddock Division

Two major purchases by the Commonwealth from Indian Creek Coal & Coke Company provided the bulk of the original ownership. A purchase of 2,351-acres was made December 30, 1950 for a price of \$23,512.60. Another purchase of 8,991-acres was made June 6, 1951 at a cost of \$76,981.60. Smaller purchases such as the Birkett & Ritchey purchase in 1949 made up the balance of the original 15,095 acres of state-owned land in the Braddock Division. A 1981 purchase of 92 acres from Bertha Franks and seven additional tracts totaling 3,244 acres were purchased from the Western Pennsylvania Conservancy in 1994. More recent acquisitions include the 875-acre Ruane Tract, 256-acre Morrow Jones Tract, and the 977-acre Fort Necessity Connector which bring the total state forest land in the Braddock Division to its current total of 19,527 acres.

5) Cultural and Historic Resources

Numerous cultural and historical resources can be found throughout Forbes State Forest. Many of these features can be traced back to Pennsylvania's early industrial era. Some of these historical resources can be visited today, while others are interpreted through educational programs, publications, or waysides. Additional historical resource information can be obtained from the Landscape Management Unit (LMU) sections or the District Interpretive Plan in the Appendix. Forbes State Forest historic sites include:

Civilian Conservation Corps (CCC) Camps

Negro Mountain Camp (S-97)

The remnants are in the Mount Davis LMU. Two cabins remain and are currently being renovated. Some stonework and minor remnants of other structures remain. Interpretive panels are installed, other panels are in planning.

Kooser Camp (S-99)

Located at present day Kooser State Park, formerly part of the Forbes State Forest.

Blue Hole Camp (S-98)

The remnants located in the Blue Hole LMU, including one remaining cabin, stonework and minor remnants of structures. Interpretive panels have been installed.

Fort Necessity (SP-12-PA)

Located at present day Fort Necessity National Battlefield, formerly part of the Forbes State Forest.

Industry

PW&S railroad – Logging railroad original construction began 1899-1900, addition was completed in 1906. Railroad operations ceased in 1916. Remnants are in the Laurel Mountain LMU, road and some trails developed on original mainline and logging spurs.

Indian Creek Valley railroad – Built in 1902 for Laurel Hill timbering operations, railroad abandoned in 1969. Located in the Mountain Streams LMU.

Blair Brothers railroad – Built in 1908 for timber transport. Located in the Mountain Streams LMU, trail developed on portion of the original railroad grade.

Wharton Furnace – Iron furnace that produced pig iron during 1839-1856. Furnace is on the National Register of Historic Places. Interpretive panels have been installed. Located in the Braddock East LMU.

DuPont Powdermill – Powder mill produced gunpowder during both WWI and WWII. Remnants in the Braddock West LMU.

Grist mill – One of the oldest grist mills in the Fayette county, located along Mill Run in the Quebec Run Wild Area. Records indicate the mill was constructed in the 1790s; stone remnants located in the Braddock West LMU.

Fire Towers (still standing in 2019)

Pondfield Fire Tower – Still standing in the Braddock West LMU, discontinued use for spotting wildfires in mid-1900s, 80-foot tower built in 1935.

Kooser Fire Tower – Still standing in the Kooser LMU, managed by the Laurel Hill State Park Complex, built in 1934.

Bear Cave Fire Tower – Still standing on private property on Derry Ridge in Derry Township, Westmoreland County, built in 1923.

Hays Mills Fire Tower – Still standing on private property in Brothers Valley Township, Somerset County, built in 1922.

Rolling Rock Fire Tower – Still standing on private property on Laurel Hill Mountain in Ligonier Township, Westmoreland County, believed to have been built in 1919.

Springfield Fire Tower – Still standing on private property on Chestnut Ridge in Connellsville Township, Fayette County, built in 1953.

Other

High Point Monument and Observation Tower – Located in the Mount Davis LMU, an observation tower built in 1935 stands over 50-feet tall, located near the USGS designated 'high point' bench mark monument of Pennsylvania (3,213 feet).

Patterson Spring – Built by the CCC, rehabbed by the POC in 2018. Located in the Blue Hole LMU.

Airglow Observatory – Built on leased property in 1965, observatory owned by the University of Pittsburgh, located in the Laurel Mountain LMU.

Jones Cabin – Built in late 1700s, structure is still standing. Located in the Braddock East LMU.

Marymount – Retreat constructed in early 1920s, managed by Sisters of Charity in 1950s-80s. Stone and wood buildings are still standing. Located in the Braddock West LMU.

Cemeteries - Five cemeteries remain within state forest boundaries; including Anna Bookman's Gravesite.

6) Ecoregions, Physiography, and Land Cover

Ecoregions

The Forbes State Forest lies in the Appalachian Mountain Physiographic Province and the Allegheny Mountain Eco-region. The Bureau of Topographic and Geologic Survey defines the Allegheny Mountain Eco-region consisting of broad, rounded ridges separated by broad valleys. The ridges decrease in elevation from south to north and the ridges have no topographic expression at the north end of the section. The ridges occur on the crests of anticlines that have been eroded enough to expose the very resistant rocks that form the crests of the ridges. However, not enough erosion has occurred to breach the anticlines and create parallel ridges such as occur in the Appalachian Mountain Section. The southern parts of these ridges form the highest mountains in Pennsylvania. The valleys are broad, undulating surfaces with shallow to deep stream incision. Relief between the ridge crests and the adjacent valley lowland can be greater than 1,000 feet. Local relief on the broad, valley lowland is generally less than 500 feet. Elevations in the Section range from 775 to 3,210 feet, the highest elevation in Pennsylvania at Mt. Davis. The Section occurs in southwestern Pennsylvania and includes all of Somerset County, about half of Fayette and Cambria Counties, and parts of Westmoreland, Indiana, Blair, and Bedford Counties.

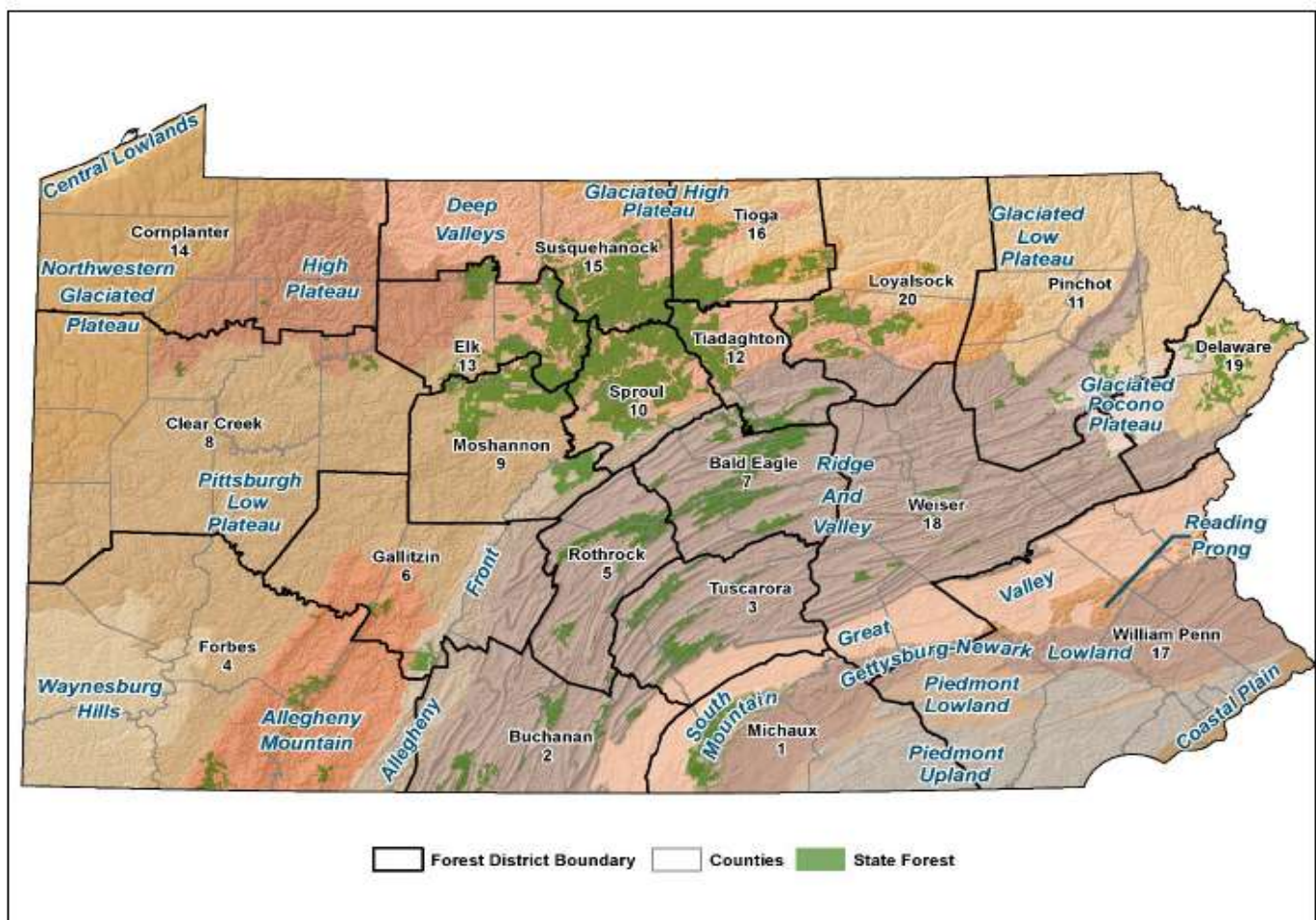


Figure 6-1. Ecoregions of Pennsylvania.

Physiography

The Forbes Forest District lies completely within the large physiographic province known as the Appalachian Plateaus Province, which covers all north central and western Pennsylvania and parts of adjoining states. The topography within the district is typical of this province in that it is rugged and irregular in pattern. It has been developed almost solely by stream erosion and dissection of a former flat or almost flat, featureless surface underlain by nearly horizontal and broadly folded strata. As the original plateau-like surface was eroded and the streams branched out into more complex dendritic patterns, digging deeper into the soil, the topography gradually and progressively became more rugged. It is the present complex dendritic pattern of the streams, which is largely responsible for the rugged, irregular appearance of the area's topography today.

The process of erosion and dissection of the land by streams has been slow and relatively undisturbed for millions of years. It has taken approximately ten million years, since the late Tertiary period in geologic time, to etch the land into its present topographic form. There has been no glacial activity and no significant local structural activity such as the uplifting, faulting or folding of the land, to markedly influence the topography or disturb the long stream erosion and dissection process in progress – with the noteworthy exception of the geologic folds that form Chestnut and Laurel Ridges (Allegheny Mountain Section of the Province) where the Forbes State Forest is found. This process is ongoing.

The state forest land within the district is in western and southwestern Somerset County, south-central Fayette County, and eastern Westmoreland County. In this three-county area the topography is typically dissected, rugged and irregular and is dominated by several conspicuously long and parallel northeast-trending ridges, which add a measure of regularity to the otherwise irregular landscape. These ridges include the Chestnut, Laurel, Negro, Allegheny, Savage, and Little Allegheny Mountains.

The outcrop of the upturned edges of resistant sandstone beds determines the location of the ridges. The Pennsylvanian Age Pottsville Sandstones form the backbone of Laurel, Negro and Allegheny Mountains, while the Mississippian Pocono Sandstone forms Chestnut Ridge. Along all these ridges sandstone rubble is common. In numerous places blocks of sandstone weighing many tons have moved down slope from their original outcrop position. These ridges are generally forested. Their slopes are too steep and the soil too thin and rocky for prosperous farming.

The highest point in Pennsylvania is in the Forbes State Forest in Somerset County at Mt. Davis, elevation 3,213 feet. This high point is located on a slight rise above the general summit level of Negro Mountain, four miles north of the Pennsylvania-Maryland border. In the immediate vicinity of the high point the ground contains interesting "stone patterns" of stripes, nets and polygons believed to have been formed by intense frost action sometime in the geologic past, possibly during the Ice Age (Late Pleistocene time).

Local topographic relief near the high ridges is approximately 1,000 feet. The total relief of the whole Somerset-Fayette-Westmoreland County area east of Chestnut Ridge is about 2,363 feet from the Mt. Davis high point of 3,213 feet in southern Somerset County to a low point of 850 feet where the Youghiogheny River cuts through Chestnut Ridge at Connellsville in central Fayette County.

All drainage from the Forbes State Forest land is generally westward into the Ohio River and ultimately into the Mississippi River and the Gulf of Mexico. State forest land in south central Fayette County is in the Monongahela River watershed and is drained by the tributaries of Sandy Creek from which water flows into the Cheat and Monongahela Rivers on its way to the Ohio River. State forest land elsewhere in the three-county area is in the Allegheny River watershed. Land in southern Somerset County, south of the Jefferson-Lincoln township line and the Pennsylvania Turnpike, and in northeastern Fayette County is drained by Indian Creek, Laurel Hill Creek and the Casselman River from which water flows into the Youghiogheny River and subsequently into the Allegheny River. State forest land in eastern Westmoreland County is drained by tributaries of the Loyalhanna Creek, which drains into the Kiskiminetas River and then ultimately into the Allegheny River.

Geology

Surface Stratigraphy - The oldest rocks exposed at the surface on Forbes State Forest land are the predominantly red sandstones and shales of the Catskill Formation of Upper Devonian Age which outcrop on the crest of Chestnut Ridge at the summit on U.S. Route 40 and in other places in stream cuts on the flanks of Chestnut Ridge in south central Fayette County. There are many successively younger rocks which outcrop in or near the state forest land. The youngest rocks exposed on Forbes State Forest are those of the Conemaugh Formation of Pennsylvanian Age. These Conemaugh rocks outcrop in the relatively broad areas between the Chestnut Ridge and Laurel Hill in eastern Fayette County and between Laurel Hill and Negro Mountain in Somerset County.

Subsurface Stratigraphy - Hidden beneath the surface in the Forbes State Forest are many older rock formations which predate in age the oldest Devonian Catskill beds exposed at the surface. Subsurface Structure in the Forbes State Forest area is characterized by a general regional dip or tilt of the beds to the southeast toward the center of the old Appalachian depositional basin, at less than one degree from the horizontal, with interruption in this slight basin ward dip afforded by a series of northeast trending broad anticlinal and synclinal folds in which the beds dip more steeply, generally between five and ten degrees. The fold's increase in size and complexity due to faulting toward the southeast. Strata on the east flanks of both the Chestnut Hill and Laurel Hill anticlines dip to the southeast at an average rate of approximately 4 degrees; both anticlines have a maximum east flank structural relief of about 1,900 feet. Farther to the southeast the Negro Mountain anticline has average east flank dips of 60 or more and maximum structural relief of about 2,600 feet. The structure of all the major anticlines is complicated by faulting and fracturing; the degree of this fault-fracture complexity increases toward the southeast.

Landcover

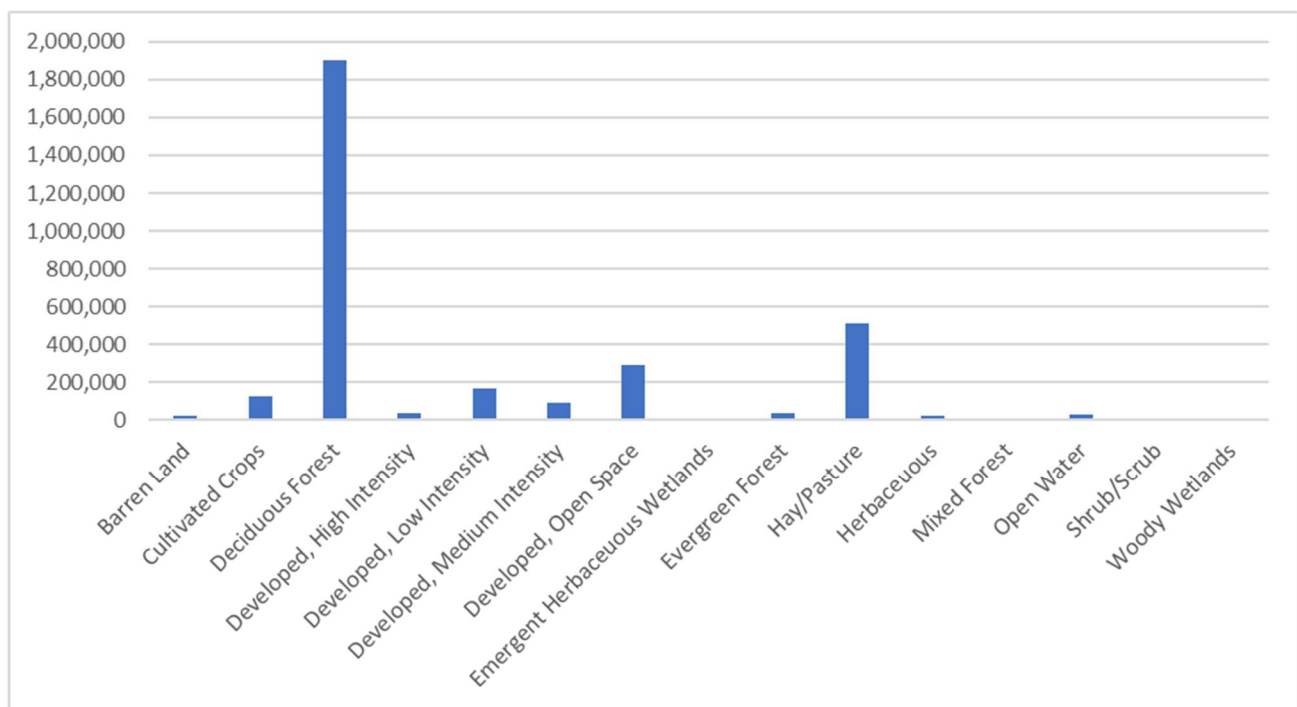


Figure 6-2. Acres of land cover types from National Land Cover Database for Forbes Forest District.

Within the Forbes Forest District, the largest landcover type is by far deciduous forest. However, the Forbes Forest District is unique due to the many differing land cover types and elevations within the district. These cover types range from extremely flat, developed urban areas around Pittsburgh to large undeveloped, uninterrupted tracts of deciduous forests at higher elevations on Laurel and Chestnut Ridges. In between, there are fragmented, small woodlots interspersed with fields, mostly pasture with some cultivated crops, in and around small rural communities.

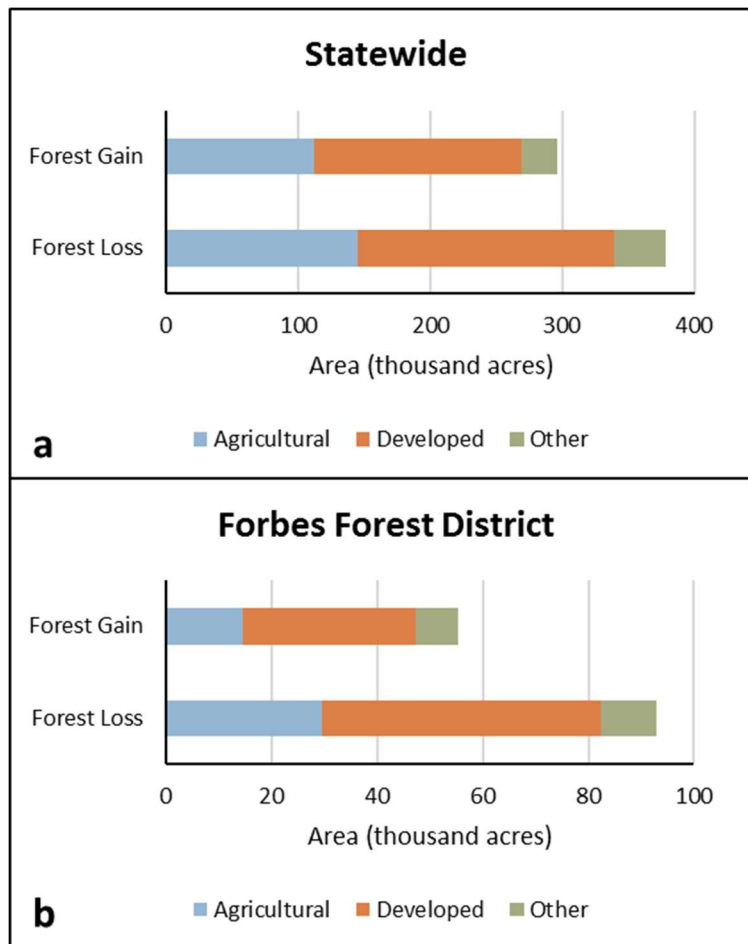


Figure 6-3. Gross forest loss and forest gain 2011-2016 (based on US Forest Service FIA plot data: <https://www.fia.fs.fed.us/>) by land-use categories for (a) the entire state; and (b) within Forbes Forest District. The colors in *forest gain* represent the type of land cover FROM WHICH the forestland came (e.g. agricultural could be an old farm field that gained enough tree cover in that period to now be classified as forest). Similarly, colors in *forest loss* represent the categories TO WHICH forestland was converted (e.g. agricultural could be a forest that was cut and converted to pasture).

For the most part, the forest land gain and loss in the Forbes Forest District mimics the statewide trend of gaining forest land mostly from abandoned agricultural lands and losing forest land to urban development. Within the district, the losses in forest land are out pacing the gains in forest land, placing an even higher importance to conserving the forested public lands in the district.

7) Vegetation Communities and Native Flora

On state forest land, more than 50 typed plant communities have been identified in accordance with the bureau's typing manual. The bureau recognizes seven aggregated forest types on state forest land, and each forest type includes one or several dominant plant communities (see Table 7-1). For definitions and characteristics of each plant community, see <http://www.naturalheritage.state.pa.us/communities.aspx>.

Table 7-1. Dominant plant communities of each aggregated forest type.

Aggregated Forest Type	Dominant Plant Communities
Allegheny hardwoods	Black cherry-northern hardwood forest
Northern hardwoods	Northern hardwood forest Sugar maple-basswood forest
Red oak	Red oak-mixed hardwood forest
Other oak	Mixed oak — mixed hardwood forest Dry oak — heath forest
Red maple	Red maple forest
Conifers	Dry white pine (hemlock) — oak forest Hemlock (white pine) — northern hardwood forest Hemlock (white pine) — red oak — mixed hardwood forest Red pine — mixed hardwood forest Spruce plantation
Other	Aspen-Grey (paper) birch forest Pitch pine-mixed oak forest Tuliptree-maple forest Black gum ridgetop forest

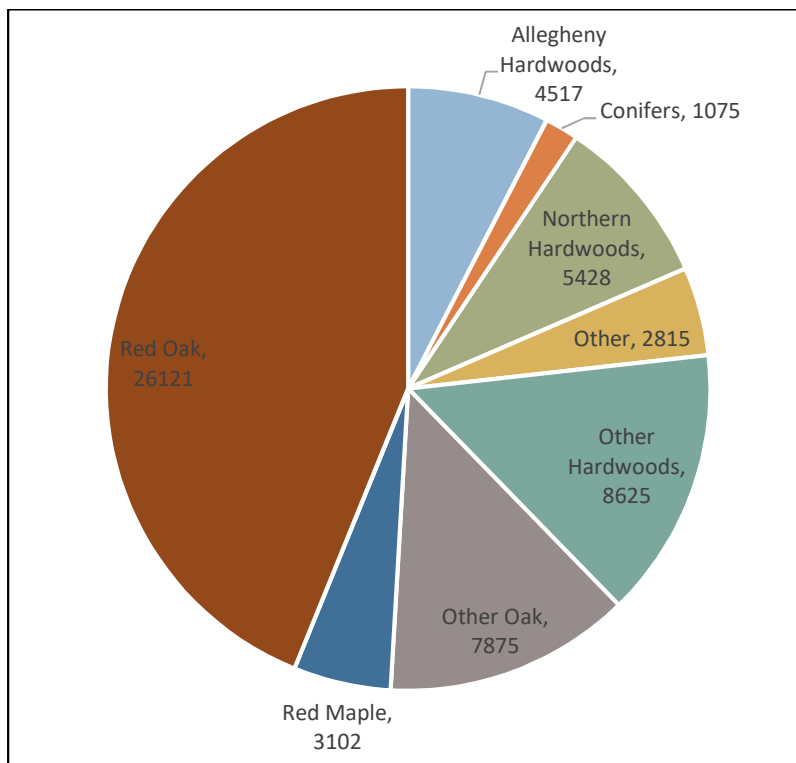


Figure 7-1. Acreage of state forest land in this district by aggregated forest type. The forest types are described on p. 108 of the 2016 SFRMP.

The Forbes State Forest is dominated by the red oak-mixed hardwood forest community type. Most of the red oak dominated stands are of medium to high quality. There are also forest stands dominated by other oaks like white oak and chestnut oaks but of lesser timber quality in general. Northern hardwood with red maple, American beech, and sugar maple, along with Allegheny hardwood stands with black cherry add species diversity to the Forbes State Forest. Some hollows and side slopes in the Forbes State Forest are dominated by tulip poplars, basswood, and cucumber-trees. There is very little conifer cover on the Forbes State Forest, with small patches of pitch pine along the ridge tops, Eastern hemlock along the streams, and a few small pine plantations planted by the CCC. All these forest types are important to wildlife, as well as to the forest products industry that relies on the timber removed from these forests.

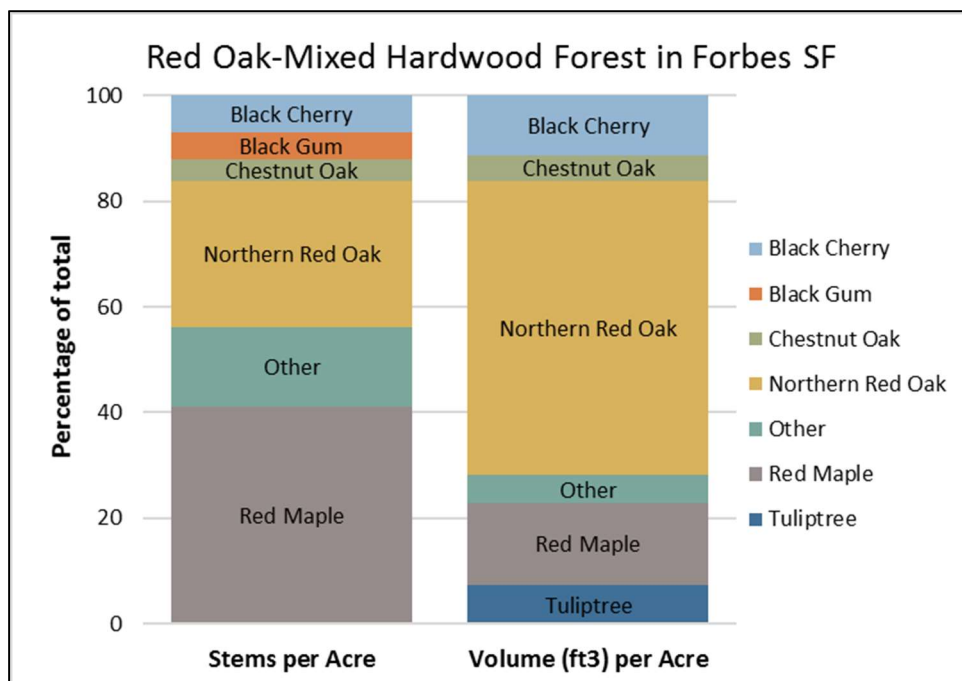


Figure 7-2. Species composition (top 5 species) of all stems over 4.5 inches DBH in the forest communities that have over 15 Continuous Forest Inventory (CFI) plots in a district. For more information and summaries of the Bureau's CFI data, see the online interactive tool here: https://pa-forestry.shinyapps.io/cfi_explorer/

Forbes State Forest has over 26,000 acres of red oak-mixed hardwood forest, which comprises about 44% of total state forest acreage in this district. As seen in Figure 7-2 above, red oaks represent a large portion of the volume of wood per acre but are not as well represented in the number of stems per acre. Most of the red oak on the Forbes State Forest are large, dominant trees of relatively the same age that took advantage of past harvesting practices and after uncontrolled wildfires now occupy the forest canopy. Red maples are becoming more abundant in the forest understory and in many newly harvested areas due to its ability to grow in varying conditions and soils. The Figure 7-2 reflects that many red maples are taking hold in the Forbes State Forest but are still relatively small to medium sized trees. Red maple and sweet birch becoming more numerous than oak species in future stands on the Forbes State Forest is a concern due to the value of oaks for timber and wildlife.

Common Communities in Forbes State Forest

AR Red Oak - Mixed Hardwood Forest: This forest type is common in much of Pennsylvania. It occurs on fairly mesic sites and is quite variable in composition. northern red oak (*Quercus rubra*) is the dominant overstory species in these stands with greater than 40% of the total basal area. Associated tree species typically include red maple (*Acer rubrum*), Chestnut oak (*Quercus montana*), black oak (*Quercus velutina*), white oak (*Quercus alba*), mockernut hickory (*Carya tomentosa*), shagbark hickory (*Carya ovata*), sweet birch (*Betula lenta*), yellow birch (*Betula alleghaniensis*), white ash (*Fraxinus americana*), American beech (*Fagus grandifolia*), and/or tuliptree (*Liriodendron tulipifera*). The shrub layer often includes northern arrow-wood (*Viburnum recognitum*), maple-leaved viburnum (*Viburnum acerifolium*), smooth serviceberry (*Amelanchier laevis*), shadbush (*Amelanchier arborea*), striped maple (*Acer pensylvanica*), hornbeam (*Carpinus caroliniana*), hop-hornbeam (*Ostrya virginiana*), witch hazel (*Hamamelis virginiana*), and spicebush (*Lindera benzoin*). Ericaceous shrubs such as mountain laurel (*Kalmia latifolia*), low sweet blueberry (*Vaccinium angustifolium*) and lowbush blueberry (*Vaccinium pallidum*) may also be present but are not abundant. The herbaceous layer is highly variable. Representative species may include sessile-leaved bellwort (*Uvularia sessilifolia*), false Solomon's-seal (*Maianthemum racemosa*), may-apple (*Podophyllum peltatum*), pipissewa (*Chimaphila maculata*), teaberry (*Gaultheria procumbens*), partridge berry (*Mitchella repens*), white wood aster (*Eurybia divaricata*), Indian cucumber-root (*Medeola*

virginiana), squaw-root (*Conopholis americana*), wood ferns (*Dryopteris* spp.), and hay-scented fern (*Dennstaedtia punctilobula*).

TM Tuliptree - Beech - Maple Forest: These woods occur on fairly deep, not strongly acidic soils, at a mid- to lower-slope position. This often very mixed type has greater than 40% of the overstory basal area in tuliptree (*Liriodendron tulipifera*) with red maple (*Acer rubrum*) as a commonly associated species. American beech (*Fagus grandifolia*) is often present and, when present, is often codominant. In successional, lower slope situations, tuliptree (*Liriodendron tulipifera*) may occur in nearly pure stands. The long list of possible associates includes various oaks, mostly northern red oak (*Quercus rubra*), as well as black gum (*Nyssa sylvatica*), sugar maple (*Acer saccharum*), American beech (*Fagus grandifolia*), mockernut hickory (*Carya tomentosa*), shagbark hickory (*Carya ovata*), sweet birch (*Betula lenta*), eastern hemlock (*Tsuga canadensis*) and, in western Pennsylvania, cucumber-tree (*Magnolia acuminata*). Total conifer cover does not exceed 25% of the overstory. Common shrubs and mid-story trees may include various viburnums, hornbeam (*Carpinus caroliniana*), flowering dogwood (*Cornus florida*), hop-hornbeam (*Ostrya virginiana*), witch hazel (*Hamamelis virginiana*), and spicebush (*Lindera benzoin*). There may be a rich herbaceous layer, especially in the ephemeral, spring flora. On richer sites that are not over-browsed, this may include species like may-apple (*Podophyllum peltatum*), bloodroot (*Sanguinaria canadensis*), rattlesnake fern (*Botrychium virginianum*), dutchman's-breeches (*Dicentra cucullaria*), squirrel corn (*Dicentra canadensis*), wild leek (*Allium tricoccum*), and spring-beauty (*Claytonia virginica*).

Unique Plants and Plant Communities

Some unique plant communities can be found situated on the high elevation Chestnut Ridge area of Forbes state forest. This area is considered a highly disturbed dry white pine and hemlock oak forest on the ridgetop. This community type occurs on fairly dry sites with a rocky ground, boulders and/or exposed bedrock. The canopy may be somewhat open and tree growth somewhat suppressed dominated by eastern white pine, occasionally eastern hemlock and a mixture of dry-site hardwoods, predominantly oaks. This natural community harbors several species of concern and sensitive threatened or endangered species. The outcrops on the ridgetop provide habitat for thick-leaved meadow-rue (*Thalictrum coriaceum*) while the small semi-forested wetland to the south of the ridgetop is used by fall dropseed muhly (*Muhlenbergia uniflora*), both special concern species.

The Roaring Run area of Forbes state forest is characterized by a red oak-mixed hardwood forest community, which harbors three plant species of concern. There are many golden saxifrage-Pennsylvania bitter-cress spring runs provide habitat for rare plants. Some of the associated vegetation associated with these communities includes a dense growth of mosses (bryophytes), golden saxifrage (*Chrysplenium americanum*), grasses, sedges (*Carex* spp.), and numerous herbs including turtlehead (*Chelone glabra*), bugleweed (*Lycopus* spp.), and common wood sorrel (*Oxalis montana*), as well as a variety of aquatic invertebrates and amphibians. Springs and the associated spring run communities are numerous along the entire Roaring Run valley. These areas are significant in that they are generally the source of high quality water that serves to recharge the stream system.

Flora Inventory

The Pennsylvania Natural Diversity Inventory (PNDI) maintains locational and biological information on vascular plant species listed as Pennsylvania Extirpated, Pennsylvania Endangered, Pennsylvania Threatened, Pennsylvania Rare, and Tentatively Undetermined. The Pennsylvania Flora Project at the Morris Arboretum, University of Pennsylvania has prepared dot maps from herbarium specimens of the vascular flora the database can be searched geographically or taxonomically. This information contains confirmed and historic locational information. The Bureau's Resource Inventory and Analysis Section has recorded vascular plant species on the inventory plots. Species lists exist for all forest districts from these inventories on state forest lands that can be specialized for either Districts or Ecoregions. Inventories for plants classified as Pennsylvania Vulnerable (Ginseng, *Panax quinquefolius*, and Golden-Seal, *Hydrastis canadensis*) need to be conducted to identify populations that can be managed for sustainable harvest.

Wild Plant Habitat Projects and Species of Concern Focus

The following list showcases projects on the Forbes State Forest that enhance wild plant habitats:

- Construct fences around three populations of two globally rare plants to protect them from deer browsing.
- Plant native pollinator plant mixes in several openings throughout the Forbes State Forest to help bees, butterflies, and other pollinator species
- Move towards more native seed mixes for Forbes State Forest timber sale reclamation and infrastructure rehabilitation
- Time mowing alongside state forest roads to lessen impact on plant species of special concern that grow in these habitats

8) Forest Health

Protecting forest ecosystem health is critical to the Bureau of Forestry's ecosystem management efforts. It is the mission of the Bureau of Forestry to "ensure the long-term health, viability and productivity of the commonwealth's forests...." There are many forest health issues affecting the Forbes State Forest from damaging insects and diseases to invasive plants. Foresters work with the Bureau of Forestry's Forest Health Section to identify, monitor, document, manage, and treat insects and diseases on state forest land and with our Ecological Services Section to identify and control invasive plants.

Insects and Disease

Forest insects and diseases are serious threats to the health and sustainability of the forest ecosystem. As trees age or are stressed by external factors, they become less able to fight off insects and disease-causing pathogens, eventually succumbing to insect infestations and diseases that help finish off the declining tree. External factors that can stress trees include drought, excessive precipitation, abnormal temperatures, and wind. Some insects and diseases are native to our area but there are several insect and diseases that were introduced into our area and into the United States from foreign countries. The non-native, invasive pests are usually much more destructive to our forest ecosystem since there are no natural biological controls in place.

Native Pests

Many native insects feed on our native tree species and normally do not cause widespread harm. However, sometimes extreme outbreaks of these pests do occur and have a substantial effect on the health of certain tree species. The Forbes Forest District saw some Red Oak Sawfly defoliation in 1965-67 on the Forbes State Forest. In the summers of 1970-71, the Cherry Scallop-Shell Moth completely defoliated the black cherry in extensive areas along the Laurel Ridge. Since defoliation from this insect occurs late in the summer, it is not considered a serious forest pest. The Forest Tent Caterpillar defoliated several hundred acres in 1971-72 as well as the Fall Cankerworm in 1973-74. The Fall Cankerworm returned to mostly the Laurel Mt Division in 2008-10 completely defoliating some areas of the Forbes State Forest before the population collapsed. In 2015, the yellow-poplar weevil caused some concern throughout Greene, Washington, Fayette, and some portions of Westmoreland and Somerset Counties, including state forest land, but this threat subsided with very little damage. Black Knot is found on many black cherry throughout the Forbes State Forest. This disease usually does not kill black cherry trees, but the cankers degrade timber quality, weaken tree vigor, and cause breakage in wind events.

Non-native, Invasive Pests

Many non-native, invasive insects and diseases have found their way into the Forbes Forest District. The chestnut blight and Dutch elm disease were introduced into the United States and changed the makeup of the forests during the early part of the last century. The gypsy moth was introduced from Europe and became a major threat to the forest

ecosystem in the late 1980's and early 1990's. Thousands of acres of trees were defoliated, and countless trees died. The most prevalent introduced pests and diseases that have more recently affected the Forbes State Forest and surrounding areas are gypsy moth, emerald ash borer, and hemlock wooly adelgid. Spotted Lanternfly has not yet taken hold in the Forbes Forest District.

Gypsy Moth:

Gypsy moth was introduced into the United States in 1869 and first discovered in Pennsylvania in 1932. Since the 1970's defoliations by the gypsy moth, have killed millions of oak trees across Pennsylvania. These defoliations led to an aggressive pesticide aerial spray program to try and curtail damage caused by this introduced exotic insect pest. White, chestnut, black and red oak are preferred by the gypsy moth caterpillars. Gypsy moths usually avoid ash, butternut, black walnut, locust, sycamore, and tuliptree (yellow poplar). Although it usually takes more than one year of defoliation before trees die, conifers that are defoliated may be killed after a single season of defoliation. Several gypsy moth defoliations have killed hundreds of acres of oaks in the Forbes State Forest, peaking in the late 1980's and early 1990's. Most of the oak killed by the gypsy moth has since been salvaged through timber sales. The Forbes State Forest more recently experienced high populations of this insect in 2006, 2007, and 2008, mainly on the Mt. Davis Division and some areas of the Laurel Mt Division. Hundreds of acres were defoliated causing mortality of hundreds of acres of mainly oak trees. This resulted in management activities being focused in these areas to salvage the dead trees. Small populations of gypsy moth have since occurred across the entire Forbes State Forest but a virus, gypsy moth nucleopolyhedrosis virus (NPV) and a fungus *Entomophaga maimaiga* have kept the populations in check. The Bureau of Forestry will continue to suppress gypsy moth populations in oak stands in forest districts and state parks.

Emerald Ash Borer:

The emerald ash borer is a half-inch long metallic green beetle. Larvae of this beetle feed under the bark of ash trees and eventually girdle and kill the entire tree. Emerald ash borer was first identified in North America in southeastern Michigan in 2002. Emerald ash borer feeds exclusively on ash trees in North America. Tens of millions of ash trees have been lost to this pest, which usually kills ash trees within 3-4 years of infestation. EAB was first detected in Pennsylvania in 2007 on the northern edge of the Forbes Forest District. As of 2019, EAB has spread rapidly and most of the ash trees in the Forbes State Forest and statewide are dead or are currently showing the last signs of life. In 2015, 135 ash trees were located on five different sites on the Forbes State Forest treated with a systemic insecticide according to the Bureau's Ash Management Plan to preserve a future ash seed source. The trees will be treated on a three-year rotation. Districts will also work with the Division of Forest Health to identify lingering ash. A lingering ash is defined as an ash tree that is still alive after 95% ash mortality has been present for at least two years. Locations will be georeferenced, and samples of the lingering ash will be collected by Division of Forest Health staff for study by the USDA Forest Service Northern Research Station.

Hemlock wooly adelgid:

The hemlock wooly adelgid, is a serious pest of Eastern hemlock in the northeastern states. This insect was first reported in southeastern Pennsylvania in the late 1960's. The hemlock wooly adelgid sucks sap from the young branches which results in premature needle drop, branch dieback, and eventual tree death. Hemlock line some of the mountain streams that flow through the Forbes State Forest. This insect has the potential to affect the stream quality and negatively impact the ecosystem of the streams lined with hemlocks. High value hemlock sites will be identified and protected using systemic insecticides and predatory beetle releases. Districts will work with the Division of Forest Health to conduct the suppression and biocontrol programs. Openings in the hemlock canopy will be examined to determine the amount of hemlock regeneration. If needed, hemlock will be planted to keep the site as hemlock habitat. Restoration research is being conducted by USDA Forest Service Research. In addition, silvicultural practices are also being studied by the USDA Forest Service. The Division of

Forest Health will work with the Districts and USDA Forest Service Research to identify potential treatment sites. In 2013, small populations of this insect were discovered on the Forbes State Forest, including several sites in the Braddock Division and on the Torrance Tract. The trees were not showing any signs of dieback. During the winters of 2013 and 2014, subzero temps for a few weeks were enough to kill of the small populations of the insect. The sites have been examined since but there haven't been any detections of populations of the insect. Neighboring Ohiopyle State Park has done some treatments of insecticide to preserve some high priority hemlocks. In 2015, the Forbes Forest District treated a small 9-acre hemlock stand by soil chemical injection to preserve a shaded riparian habitat along Shirey Run on the Torrance Tract.

Spotted Lanternfly:

A recent arrival on to Pennsylvania is the Asian native spotted lanternfly (SLF). It was discovered in Berks County in September 2014 and was almost immediately placed under quarantine. This invasive planthopper is a sap sucking insect that greatly weakens the host to other stressors though it generally does not kill the host outright, but the resulting excrement covers the lower limbs and ground with honeydew. This honeydew and fungal growth, known as sooty mold, reduces salability of fruits. This species is spreading despite the quarantine and affects over 70 plant species that occur in Pennsylvania, including grapes, hops, fruit trees, conifers and hardwood species. The current strategy for SLF management is to slow the spread. Because the Spotted Lanternfly is a poor flyer, the main method of movement over long distance is from human transportation making it critical to not move firewood and inspect vehicles and recreational aids.

Invasive Plants

Invasive plants are defined as a species that is non-native (or alien) to the ecosystem under consideration and whose introduction causes or is likely to cause economic or environmental harm or harm to human health. Invasive plants usually become a weed pest, a plant that grows aggressively, spreads, and displaces other plants. Invasive plants tend to appear on disturbed ground, and the most aggressive can invade existing ecosystems. Invasive plants are generally undesirable because they are difficult to control, can escape from cultivation, and can dominate whole areas. In short, invasive plant infestations can be extremely expensive to control, as well as environmentally destructive. Invasive plants are brought into areas by accident or purposefully. These plants are often referred to as exotic, non-native, or introduced. In their natural range, these plants are limited by factors that keep them in balance including pests, herbivores, or diseases. However, when introduced into an area where these limitations are absent, some species can become invasive. Invasive plants reduce habitat for native wildlife. Invasive plants often out-compete natives and growing space for native vegetation and often emerge earlier in the spring and push natives out through fast reproduction. This limits habitat available for native wildlife and disrupts the food chain.

Invasive plants are noted for their ability to grow and spread aggressively. Invasive plants can be trees, shrubs, vines, grasses, or flowers, and they can reproduce by roots, shoots, seeds, or all three. Invasive plants tend to be not native to North America, spread and reproduce by seeds, roots, or shoots, mature quickly, produce numerous seeds that disperse and sprout easily, be generalists that can grow in many different conditions, and be exploiters and colonizers of disturbed ground.

The following invasive plants can be found on the Forbes State Forest and have the greatest potential to negatively impact the forest ecosystem:

- Mile-a-minute
- Japanese stilt grass
- Ailanthus
- Japanese barberry
- Bush honeysuckle
- Multi-flora rose

- Autumn olive
- Garlic mustard
- Oriental bittersweet
- Japanese Knotweed
- Poison Hemlock

The Forbes Forest District has taken a proactive approach to control and reduce invasive plants on the Forbes State Forest. We monitor the state forest land constantly for invasive species of concern, move quickly to treat and kill the invasive plants, and document the occurrences.

The Forbes Forest District has adopted a management approach for invasive species called “Early Detection and Rapid Response” or EDRR for short. This method is adapted from the U.S. Forest Service, to quickly assess an area and treat prioritized species. Smaller populations of high priority species are given treatment. This saves time and money in treatment later. We have identified the following seven EDRR invasive plants which pose the most threat to the health of Forbes State Forest and will be a priority for treatment. Four of these species are currently located on the Forbes State Forest with three others denoted with an (*) that have the potential to move onto the Forbes State Forest.

- Mile-a-minute
- Ailanthus
- Autumn Olive
- Oriental Bittersweet
- Poison Hemlock*
- Wavyleaf Basketgrass*
- Japanese Angelica Tree*

Information on invasive species across Pennsylvania can be found at the following link:

[Invasive Plant Factsheets](#)

9) Timber Management and Forest Regeneration

The bureau created a harvest allocation model that sets timber harvest schedules for state forest land in each district. The goals of the model are to promote and maintain desired landscape conditions, create a diversity of successional stages and native forest communities, balance the age class distribution, and provide a sustained yield of quality timber. The model uses the bureau’s forest inventory data, economic information, bureau policies, and desired ending target forest conditions to develop timber harvest schedules that best meet the bureau’s silvicultural and timber management goals. A detailed discussion of the harvest allocation model can be found in the 2016 SFRMP, beginning on page 93. The harvest allocation model is broken into 14 ten year cutting periods within a 140-year planning horizon. The Forbes Forest District started using and tracking acres and volumes from the harvest allocation model in 2004. The following charts and tables reflect the accomplishments of the harvest allocation model on the Forbes State Forest for the first cutting period (2004 – 2013).

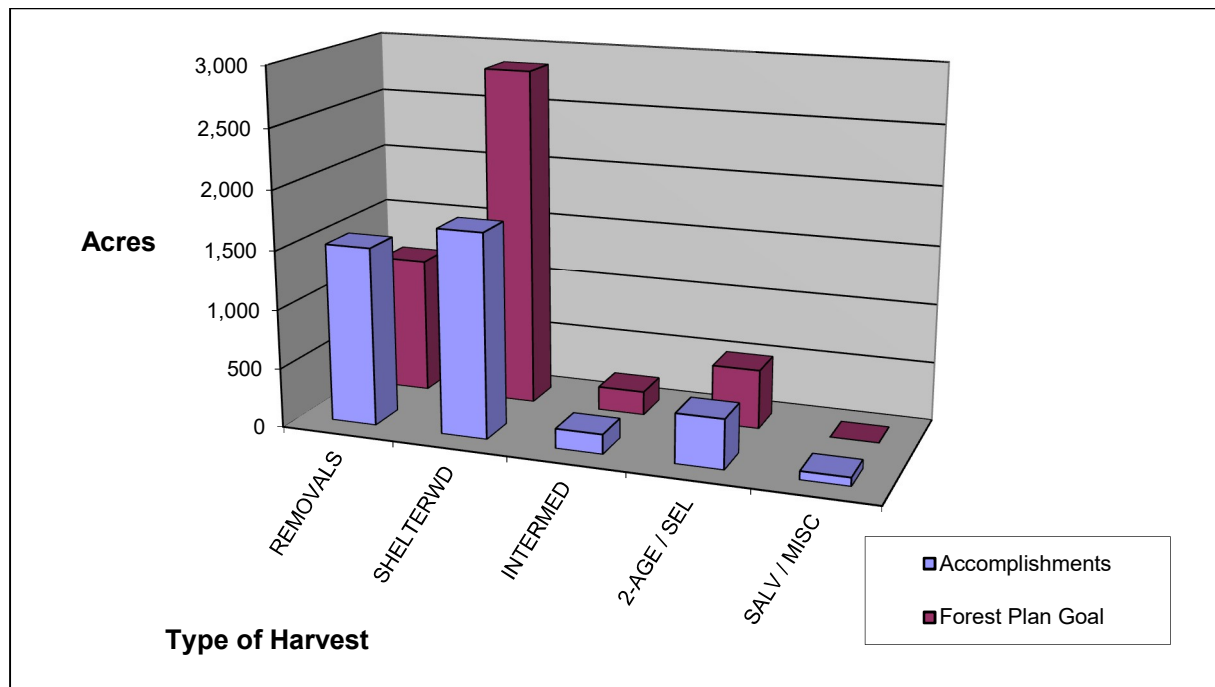


Figure 9-1. Chart of comparison between actual harvest acreage accomplishments and harvest allocation model goals from the first decade (2004 – 2013) of implementation of the harvest allocation model on the Forbes State Forest. Rows from left to right represent: Overstory Removals (even-aged), Shelterwoods (even-aged), Intermediate Treatments (even-aged), Two-age and Uneven-age Buffer Treatments, and Salvage/Miscellaneous.

Table 9-1. Comparison between actual harvest accomplishments and harvest allocation model goals from the first decade (2004 – 2013) of implementation of the harvest allocation model on the Forbes State Forest.

HARVESTED AREA (ACREAGE)							
	All Planned Forest Treatments					Salvage/ Misc.	All Harvests
	Removals (Even-aged)	Shelterwood (Even-aged)	Intermediate (Even-aged)	Two-Age & Uneven-Age Buffer Treatments	Total		
Executed Contracts '04-'13	1,514	1,729	166	417	3,826	72	3,898
Forest Plan Goal '04-'13	1,155	2,851	200	500	4,706	0	
% of Plan Goal Achieved	131%	61%	83%	83%	81%		

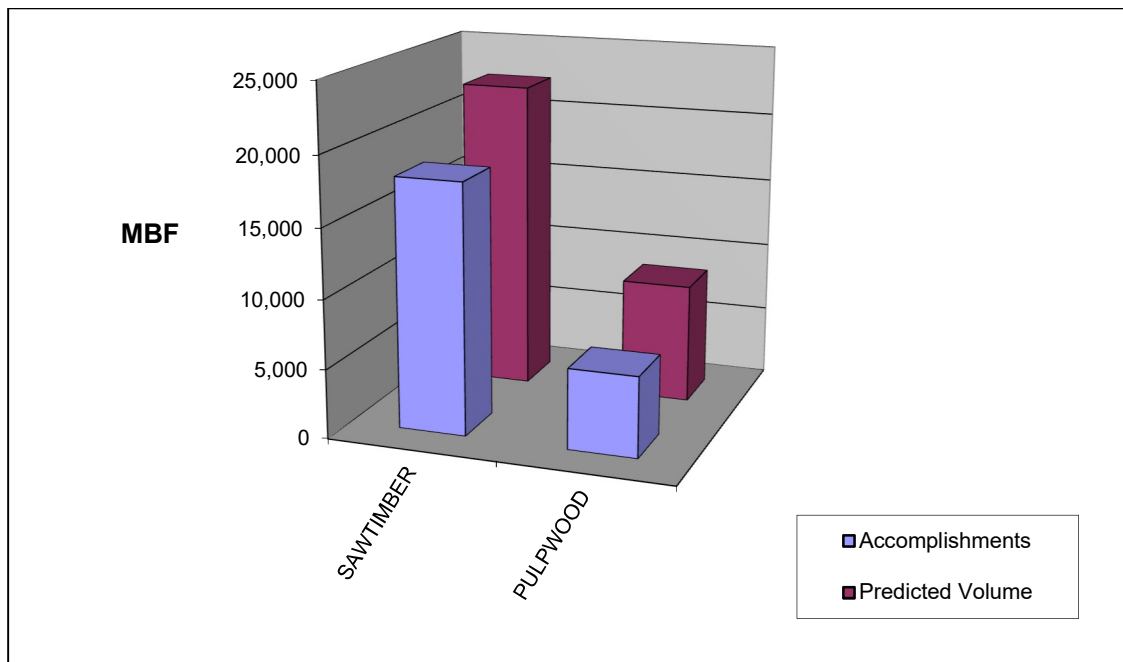


Figure 9-2. Chart of comparison between actual harvest volume (thousand board feet - MBF) accomplishments and harvest allocation model goals from the first decade (2004 – 2013) of implementation of the harvest allocation model for sawtimber and pulpwood on the Forbes State Forest.

Table 9-2. Comparison between actual harvest volume (thousand board feet - MBF) accomplishments and harvest allocation model goals from the first decade (2004 – 2013) of implementation of the harvest allocation model for sawtimber and pulpwood on the Forbes State Forest.

TIMBER VOLUMES (MBF OR MBF EQUIVALENT)									
	All Planned Forest Treatments			Salvage/Misc.			All Harvests		
	Sawtimber	Pulpwood	Total	Sawtimber	Pulpwood	Total	Sawtimber	Pulpwood	Total
Executed Contracts '04-'13	18,043	5,800	23,843	312	94	406	18,355	5,894	24,249
Forest Plan Goal '04-'13	22,399	8,591	30,990	0	0	0			
% of Plan Goal Achieved	81%	68%	77%						

Timber harvesting treatments on the Forbes State Forest varied from the timber model allocation goals established for the first decade of implementation (2004 – 2013). Overstory removals were slightly over the goal because we needed to salvage unexpected gypsy moth killed timber. Shelterwood harvests were well under the goal due to the time dedicated to the overstory removals and needing to capitalize on adequate regeneration in other areas on the Forbes State Forest. Intermediate, or thinning, harvests were also well below the goal due to the age of our forest, intermediate treatments

are normally ineffective and non-commercial. This acreage goal will most likely be lowered when the District reviews the timber harvest allocation model. Two-age and buffer treatments were at the goal level set by the model.

The bureau is presently in the second decade of the harvest allocation model (2014 – 2023) and the Forbes State Forest goals for this period are listed in the following table.

Table 9-3. Target shelterwood (Shelt), overstory removal (OR), intermediate (Int), and buffer treatment acreages for the second decade of the timber harvest schedule, aggregated by forest type, site class, and treatment. Additional shelterwood treatments for 3 or more stage shelterwoods are not represented in these targets.

Aggregated Forest Community Type	Site 1		Site 2		Site 3		Totals			
	Shelt	OR	Shelt	OR	Shelt	OR	Shelt	OR	Int	Buffer
Northern Hardwoods	0	0	38	48	0	0	38	48	200	500
Allegheny Hardwoods	0	61	0	27	0	1	0	88		
Red Oak	239	325	1,463	1,734	0	0	1,702	2,059		
Other Oaks	0	0	72	131	76	51	148	181		
Red Maple	0	0	0	0	0	0	0	0		
Other Hardwoods	19	475	89	0	0	0	108	475		
Conifers	0	0	0	0	0	0	0	0		
Totals	258	860	1,662	1,940	76	51	1,996	2,851	200	500

Forest Regeneration

Without successful regeneration of forest trees, no silvicultural system is possible. Past and current managers of the Forbes State Forest must consider a range of challenges to the regeneration of healthy forest stands during silvicultural treatments. The following lists both historic and currently emerging challenges to successful regeneration.

- White-tailed Deer: Deer populations vary across the Forbes Forest District. Some areas seem to be low enough to allow oak regeneration to become established while other areas need to be fenced to keep deer from eating desirable regeneration. These fences allow the natural regeneration to grow out of the reach of deer browsing impacts. Once this goal is met the fence is removed.
- Competing vegetation (woody and herbaceous):
 - Striped Maple: This native understory tree, is a problem on some sites in the Forbes. Cutting in these areas tends to greatly increase the problem, as the dense, low level shade of the “released” stripe maple layer makes it virtually impossible for other forms of desirable vegetation, including seedlings of desirable tree species to become established.
 - Undesirable Tree Competition: Low value tree species such as black birch, red maple, fire cherry, and some black gum often out compete the more valuable oak, poplar, and sugar maple on the Forbes.
 - Ferns: Hay-scented fern can become a problem in some stands on the Forbes. After timber sales, the fern can form dense mats on the forest floor due to the increased sunlight and block forest regeneration from growing.
 - Greenbrier: This species causes issues where it exists in thick patches. It is difficult to kill or even walk through in some areas. Forest regeneration has a tough time trying to grow through thick greenbrier.
 - Other competition: Species such as mile-a-minute, bush honeysuckle, oriental bittersweet, autumn olive, Japanese barberry, multiflora rose, Japanese stiltgrass, and tree-of-heaven all are creating impacts

on regeneration at various locations in the district. Many areas have been treated with herbicide to control the effects of these species at least long enough to get regeneration established.

- Other factors affecting regeneration: These include frost, drought, excessive moisture, remnant effects of acidic deposition, and a variety of forest pests and diseases that limit host seed availability and viability.

Forbes State Forest 10-year (2008-2017) Forest Management Activities:

Forbes State Forest - Timber Sales Sold

- 37 sales on 2,915 acres for \$4,372,266 revenue
- 18,197,000 board feet and 600,700 cubic feet harvested

Forbes State Forest - Salvage Permits Sold

- 88,502 board feet and 51,841 cubic feet harvested
- \$21,904 in revenue

Forbes State Forest - Other Forest Products Sold

- Cut Fern - 2 bushels
- Loose Stone – 113.5 tons
- Fence Posts and Rails (8 foot sections) – 11,172
- Firewood – 2,795 cords

Forbes State Forest - Regeneration Projects (to stimulate and promote new desirable tree seedlings growth)

- Tree Planting 42 projects covering 1,647 acres with 165,173 conifers and 124,950 hardwoods
- Deer Fence Installations 6 fences covering 166 acres and 6.3 miles of fencing
- Deer Fence Dismantles 47 fences covering 1,317 acres and 45 miles of fencing
- Deer Fences Present 31 fences covering 841 acres and 29.2 miles of fencing
- Herbicide Mist 38 projects to kill fern, striped maple, and invasives on 1,768 acres
- Low Shade Removal 1 project on 97 acres
- Prescribed Burns 10 burns to enhance oak seedling growth on 432 acres
- Mowing 1 project to reduce mountain laurel shading tree seedlings on 22 acres

10) Wildlife

Forbes Forest District supports the state wildlife action plan and diverse and robust wildlife populations. The Forbes State Forest has many diverse forest types, high quality growing sites, exceptional quality trout streams, and an active timber management program. These factors, amongst others, provide the potential for a diversity in wildlife species and resources to improve wildlife habitats throughout the district. The timber management program has the largest impact

on wildlife populations in the district and strives to balance forest age classes across the Forbes State Forest. Annually, approximately 550 acres of state forest land is commercially harvested and sold which creates early successional habitats in various age classes. White-tailed deer, ruffed grouse, woodcock, eastern cottontail, black bear, and numerous song birds thrive in these early successional habitats.

The Forbes Forest District actively manages forest and wildlife habitats for a diversity of wildlife species through various other management techniques. Some of these techniques are species specific while others are designed to improve habitats for numerous wildlife species. Some of these management techniques include aquatic habitat enhancement through large woody material (LWM) projects, woodcock and grouse management areas, erecting bat boxes, daylighting timber rattlesnake basking areas, conducting timber stand improvements, enhancing wildlife openings, apple tree maintenance, annual conifer plantings, pollinator habitat creation, gating caves to protect bats, and conducting prescribed burns.

Wildlife Habitat Projects and Species of Concern Focus

In addition to timber sales, the following list showcases other projects on the Forbes State Forest that enhance wildlife habitats:

- Our 240-acre Mountain Streams woodcock habitat project is creating unique early successional bottomland, brushy habitat for woodcock, ruffed grouse, songbirds, black bear, and white-tailed deer. This project is a collaboration of the Bureau of Forestry, PA Game Commission (PGC), Wildlife Management Institute, California University of Pennsylvania, U.S. Fish and Wildlife Service, and the R. K. Mellon Foundation. We have created over 150 acres of early successional habitat and plan to expand this project for years to come.
- The Ruffed Grouse Society (RGS) currently holds a timber lease on the Barron Tract of the Forbes State Forest and is creating early successional habitat for ruffed grouse through timber harvesting.
- The timber rattlesnake is one of three venomous snakes found in Pennsylvania. Due to the high elevations and rugged terrain of Forbes State Forest, rattlesnakes thrive in this district. Our staff works with the Pennsylvania Fish and Boat Commission to daylight timber rattlesnake gestation sites on state forest land where pregnant female timber rattlesnakes bask in the sun to give birth to healthy young rattlesnakes.
- Continue to protect critical habitat for a globally rare amphibian on the Forbes State Forest and look to enhance this habitat in the future.
- The Youth Conservation Corps (YCC) since 1972 has installed approximately 18 stream control devices to improve Jones Mill Run and other streams for trout fishing.
- Maintain and prune apple trees around wildlife openings and other selected areas for wildlife.
- Continue to plant thousands of conifers at scattered locations throughout the state forest land to increase conifer cover and enhance wildlife habitat.
- Plan to conduct in-stream habitat improvement projects on selected streams in the Forbes State Forest by carefully felling trees (large woody material) into streams in selected areas to create pools and places for fish to hide, breed and stay cool.
- Continue to conduct prescribe burns on state forest land to create early successional habitat with more desirable species diversity which benefits wildlife.
- Continue to conduct timber stand improvements (TSI) in selected previously harvested 20-25-year-old state forest stands. We pick out the best quality highly desirable young trees we want to form the next mature diverse forest and cut the lesser quality trees around these desirable trees to give them more room and sunlight to grow.

- Continue to monitor the 2014 American chestnut planting in the Laurel Mt. Division for resistance to the Chestnut Blight. We planted and fenced one acre of the newest American Chestnut hybrids provided by the American Chestnut Foundation.
- During the summer months, our staff work to enhance old well openings and timber sale landings for white-tailed deer, wild turkey, and ruffed grouse by testing soil, liming, fertilizing and planting seed mixes.
- Plan to help the PGC enhance Allegheny Woodrat habitat on the Forbes State Forest in select locations.
- Continue to manage herbaceous openings throughout the Forbes State Forest to enhance wildlife foraging habitat.
- Continue to assist Trout Unlimited with Linn Run to improve the stream quality for aquatic species.
- Continue to enhance wildlife habitat when reclaiming oil and gas reclamation projects
- Continue to gate every winter the entrances to Barton Cave, Lemon Hole Cave, and Coon Cave on state forest land to prevent visitors from disturbing hibernating bats and protect them from the spread of white-nose syndrome. We also maintain four bat boxes on state forest land to provide brooding areas for bats.

Reptile and Amphibian Protection Areas

In cooperation with the Pennsylvania Fish Commission, certain Natural Areas have been designated as amphibian and reptile protection areas. The taking, catching, killing, and possession of any species of amphibian and reptile within the designated Natural Area boundary is prohibited. The Roaring Run Natural Area has been given this designation.

White-tailed Deer

White-tailed deer are an important part of the history of Pennsylvania's forest. The recovery of deer populations from near extinction in the late 1800's to their present abundance provides opportunities for hunting and recreation. However, it has been well documented that deer can cause damage to tree seedlings and plants. Deer can also cause regeneration failure requiring expensive fencing around recently harvested areas, and dramatically reduce habitat for other wildlife. When the white-tailed deer population is out of balance with habitat, it impacts state forests and parks by browsing tree seedlings, shrubs, and wildflowers beyond their capacity to reproduce, impacting the ability to sustain a healthy, fully functioning forest. Excessive browsing of early forest regeneration can suppress certain tree species and promote the expansion of unpalatable or resilient species, further slowing the regeneration process. By exhausting their major food source and obstructing forest regrowth, deer in high numbers can cause a forest's ability to support future deer populations to decline.

Establishing young forests enhances the mix of forest habitat and is good for other wildlife and overall forest health. Out-of-balance deer populations impact other wildlife and frustrate efforts to establish healthy, young forests. The Bureau of Forestry recognizes the ecological importance and considerable influence of white-tailed deer on commonwealth forests and is dedicated to maintaining a healthy forest plant community in balance with a healthy deer population. To accomplish its mission of conserving Pennsylvania's forests, DCNR manages deer on its lands and promotes sustainable deer management on all commonwealth forest lands.

The Deer Management Assistance Program (DMAP), established by the PGC, gives DCNR an additional tool to promote forest regeneration by focusing hunters on specific areas of state forestland impacted by deer. These areas provide hunters with additional harvest opportunities for antlerless deer which helps to promote a sustainable forest and diverse wild plant community. The Forbes State Forest established two DMAP areas on state forest land in the Laurel Mt Division and Mt Davis Division.

The Bureau of Forestry is currently partnering in two research projects looking at deer impacts to forest regeneration and habitat. One project is in cooperation with the US Forest Service and is looking at better ways to measure deer impact in the forests with the hope of improving the SILVAH program and forest management success. The other is a

landscape level study called the Deer/Forest Study. The bureau is cooperating with the PGC, Penn State, and the US Geologic Survey on this study. It is looking at deer impacts to regeneration and herbaceous plants, looking at the effectiveness of DMAP, and GPS collaring deer to study their movement/behavior.

Chronic Wasting Disease (CWD)

Chronic wasting disease (CWD) is a contagious, progressive neurological disease that affects, and always proves fatal to members of the deer family (cervidae). In Forbes Forest District, this disease would impact white-tailed deer. CWD was first recognized as a syndrome in captive mule deer held in wildlife research facilities in Colorado in the late 1960's, but was not identified until the 1970's. The cause of CWD is believed to be a prion, an abnormal form of cellular protein that is most commonly found in the central nervous system and in lymphoid tissue. CWD causes a characteristic spongy degeneration of the brains of infected animals resulting in emaciation, abnormal behavior, loss of bodily functions, and death.

CWD is transmitted both directly through animal to animal contact and indirectly through food and soil contaminated with bodily excretions including feces, urine and saliva. The minimal incubation period between infection and development of clinical disease appears to be approximately 12 months. CWD infectious agents are extremely resistant in the environment and can persist for decades.

CWD was first detected in Pennsylvania on a captive deer farm in Adams County in 2012. Unfortunately, multiple free-ranging deer in Bedford, Blair, Cambria, Fulton and Clearfield counties have tested positive from 2012-2019. Also, during this time additional captive deer farms tested positive in Jefferson, Bedford, Franklin and Fulton counties. Following these detections, the Pennsylvania Game Commission established Deer Management Areas (DMA's) to reduce the risk of spreading CWD to other parts of the state. Three DMA's currently exist in Pennsylvania, with boundaries that get reviewed and altered yearly based on newly confirmed cases. A small portion of Forbes State Forest falls within DMA #2 in Westmoreland County starting in 2019.

The Forbes Forest District will support the Department of Agriculture, Department of Health, Department of Environmental Protection, US Department of Agriculture, and Pennsylvania Game Commission in the prevention, surveillance, and response designed to manage CWD.

Hunters who harvest deer within in a DMA should be aware that special [rules and regulations](#) apply and should have their deer tested for the disease. Additional information on Chronic Wasting Disease, testing, and [approved processors](#) can be found on the [Pennsylvania Game Commission website](#)

Wildlife Areas of Emphasis

Roaring Run Natural Area – 3,593 acres (Reptile and Amphibian Protection Area)

Mount Davis Natural Area – 581 acres

Quebec Run Wild Area – 6,094 acres

Spruce Flats Special Management Area – 322 acres

Christner Bog Special Management Area – 15 acres

State Wildlife Action Plan

Management of the state forest system is guided by the State Forest Resource Management Plan, which includes wildlife management goals to provide habitats for a wide variety of wildlife. These wildlife include Species of Greatest Conservation Need (SGCN) identified in the Pennsylvania Wildlife Action Plan, which is administered by the Pennsylvania Game Commission and Pennsylvania Fish and Boat Commission.

For planning purposes, the Pennsylvania Wildlife Action Plan has been used by the DCNR Bureau of Forestry to:

- inform an implementation document for each forest district containing:
 - o High priority SGCN known to occur in each forest district.
 - o High priority SGCN that could potentially be found in each forest district.
 - o Specific habitat types and characteristics where each species might be found.
 - o General habitats management recommendations to support each species.
- draft strategies for each forest district to protect, maintain, or enhance wildlife habitat features during forestry management activities.

Advancing from planning to implementation, these forest district documents are guiding management for SGCN. Thus, strategically associating the State Forest Resource Management Plan and Pennsylvania Wildlife Action Plan fosters coordinated resource management planning and implementation to benefit Pennsylvania's SGCN and state forest habitats.

11) Water

Water is one of the most valuable resources on the Forbes State Forest. Water, like timber, is a renewable resource when properly managed. Through careful planning and management, forests can produce clean water while at the same time providing many other resources.

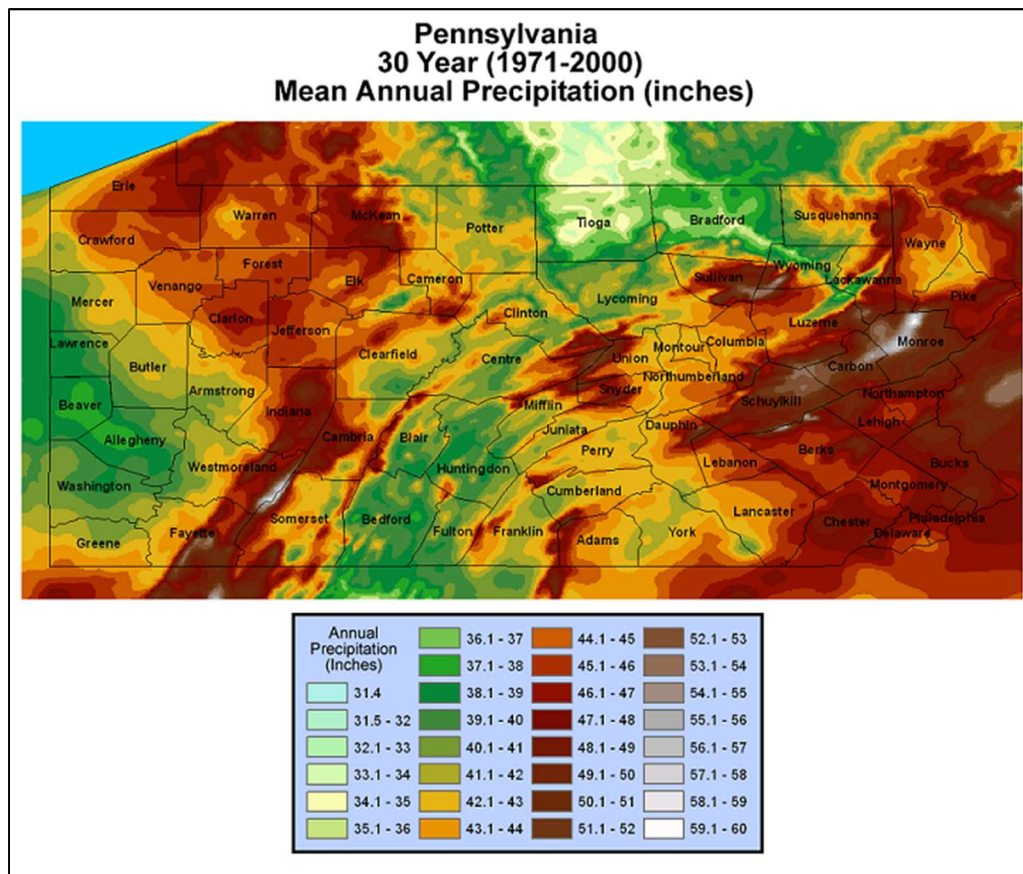


Figure 11-1. PA Precipitation Data Map – US Dept of Commerce, NOAA, NWS, State College, PA

Major Watersheds

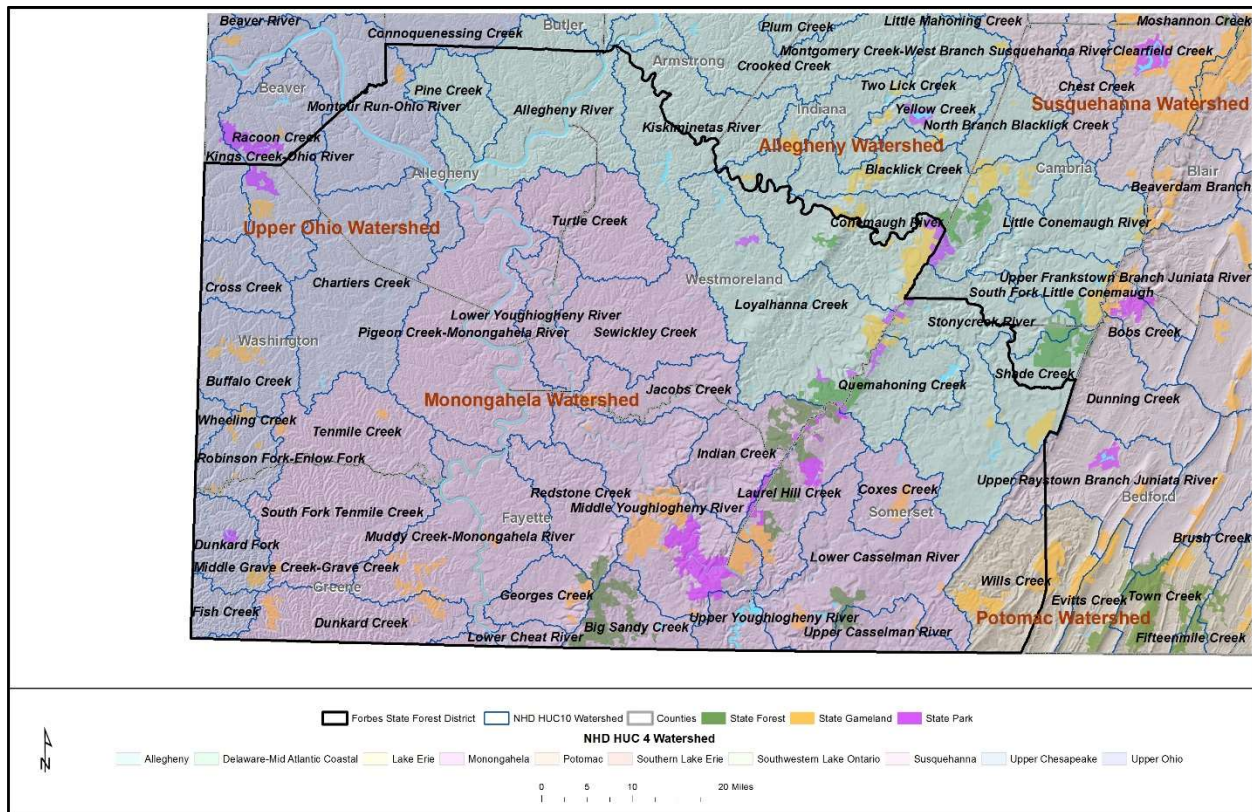


Figure 11-2. Map of major (Hydrologic Unit Code 4) and minor (Hydrologic Unit Code 8) watersheds within entire district.

Four major watersheds encompass the Forbes Forest District. Land in the Forbes State Forest is located within two of them: the Monongahela Watershed and the Allegheny Watershed. Water drains from the Forbes State Forest into the Monongahela River after flowing through the Casselman River, Cheat River, Georges Creek, Big Sandy Creek, Redstone Creek, Laurel Hill Creek, and Indian Creek watersheds. Water from the Forbes State Forest drains into the Allegheny River from the Loyalhanna Creek, Quemahoning Creek, and the Conemaugh River watersheds. Water from both the Monongahela and Allegheny Watersheds will ultimately flow into the Ohio River Basin.

Major Municipal Supplies

There are no public water impoundments located on the Forbes State Forest. However, the Forbes State Forest is within several watersheds that contribute to public water supplies. Most public water systems near the Forbes State Forest source water from groundwater wells, though a few suppliers do utilize surface water and spring water sources.

Fish and Boat Commission Stream Habitat Prioritization

Wildlife and fish habitat work is most efficient if it is prioritized to get the most benefit for the effort. To help the Bureau of Forestry effectively manage for fish habitat, the Pennsylvania Fish and Boat Commission (PFBC) has shared their Stream Priorities for Habitat Improvement tool. Prioritization in this tool is based primarily on trout biomass, Class A designation, and high angler use. Priority 1 streams are highest priority for habitat projects. The PFBC prioritization tool includes spatial data for use in GIS along with a spreadsheet of priority streams within the districts. This tool assists the decision-making process when determining what streams to emphasize for improvement. The highest priority streams should be emphasized for habitat work within a district. Priority 1 streams should be addressed first, then priority 2 streams. This tool can also aid in prioritizing Dirt and Gravel Roads projects within districts to provide increased benefit to the aquatic resources.

Table 11-1. Priority 1 streams in this district from the PA Fish and Boat Commission's Stream Priorities for Habitat Improvement tool. All three streams are in the Laurel Mountain LMU.

Stream Name	County
Camp Run	Westmoreland
Linn Run	Westmoreland
Rock Run	Westmoreland

In-stream habitat improvement projects to introduce large woody material (LWM) are planned for Camp Run and Jones Mill Run in 2020.

Acid Mine Drainage

Acid mine drainage (AMD) has contaminated many streams throughout the Forbes Forest District. On Forbes State Forest, two abatement projects were implemented. An abatement pond was constructed on Laurel Run, along Felgar Road in the Laurel Mountain LMU, in 1997. Also, in the 1990's, a series of five AMD mitigation ponds were constructed in the Mt. Davis LMU to improve the quality of Elk Lick Run. Section 305(d) of the Clean Water Act currently lists no streams as impaired because of AMD on the Forbes State Forest.

Acid Precipitation

Several streams in the Forbes State Forest have above normal acidic pH levels due to legacy acid precipitation. Weather patterns west of the Forbes State Forest over industrialized central OH and SW Pennsylvania pick up pollutants that are squeezed out and fall as acid precipitation as air rises over the Laurel Highlands. Over many, many years this turns streams more and more acidic. Note the abundance of precipitation falling in the Laurel Highlands as rain or snow in the above 30 year mean annual precipitation map.

Center for Dirt and Gravel Roads at Penn State

The Bureau of Forestry was an active participant in the Dirt & Gravel Task Force in the mid 1990's, which led to the establishment of the Dirt and Gravel Road Maintenance Program in 1997. Forestry has been a long-standing partner in the development of the Environmentally Sensitive Road Maintenance practices used in the Program. As a cooperating agency with the State Conservation Commission (SCC) and local County Conservation Districts, Forestry continues to work to implement pollution prevention procedures and road maintenance practices on their roads. Forestry allocates \$7 Million annually through the Dirt and Gravel Road Maintenance Program to reduce sediment pollution from unpaved roads by funding road improvement projects and providing Environmentally Sensitive Maintenance (ESM) education. The Bureau dedicates this money to road projects on its 2,000+ mile network of roads that are open to public travel. Forestry staff is properly trained under the same 5 year ESM training renewal format utilized by the SCC program.

State Forest Public Use Roads (Class Z1), comprised of improved dirt and gravel surfaced roads that receive routine maintenance and are open year-round for travel by licensed motor vehicles, are considered for Dirt & Gravel Funding. The road must also be within a High Quality and Exceptional Value watershed, as identified in Chapter 93, Water Quality Standards, and have a direct impact to waters through runoff or dust. In addition, the aggregate purchased for the road must be paver placed DSA. Roads outside of protected watersheds, drivable trails, and administrative roads are not eligible.

Other Significant Water Resources

The Forbes State Forest is home to plentiful springs and is the headwaters to many waterways. Other unique water resources in the Forbes State Forest include:

- Spruce Flats Bog – adjacent to Laurel Summit State Park, Spruce Flats bog is a 28-acre high-elevation bog. The bog is home to unique plants not found in surrounding area or seen in this locality since last ice age.

- Blue Hole – a deep pool of water in the stream, Blue Hole is located on Blue Hole Creek near the mouth of Gary Run in the Blue Hole LMU.
- Cole Run Falls – located a few yards west of Cole Run Road in the Blue Hole LMU.
- Patterson Spring – located along Glade Road, spring runs most of the year
- Wildcat Spring – located along Shelter Rock Road, spring bubbles up into a shallow pool
- Christner Bog – classified as a non-glacial upland bog along east side of Christner Road in the Mt. Davis LMU. The bog is an acidic seepage area with 3 to 4 seeps feeding the area from the west.
- Cooperative trout nursery – man-made pond next to Mt. Davis Forest Headquarters
- Roaring Run – designated as a Wilderness Trout Stream and Exceptional Value Stream with its watershed completely protected within the Roaring Run Natural Area.
- Camp Run – designated as a Wild Brook Trout Enhancement Area and Exceptional Value Stream passes through the Mt. Streams area of the Forbes State Forest.
- Hunt Springs - located off Sky Road in Somerset County
- Beck Springs – located along Jones Mill Run Road, used to supply water for Laurel Hill State Park
- Groundwater Intakes – On the Torrance Tract, rights-of-way exist to Torrance State Hospital for the water intake on Shirey Run and to Blairsville for the water well on Bear Cave Run.

12) Oil, Gas, and Mineral Resources

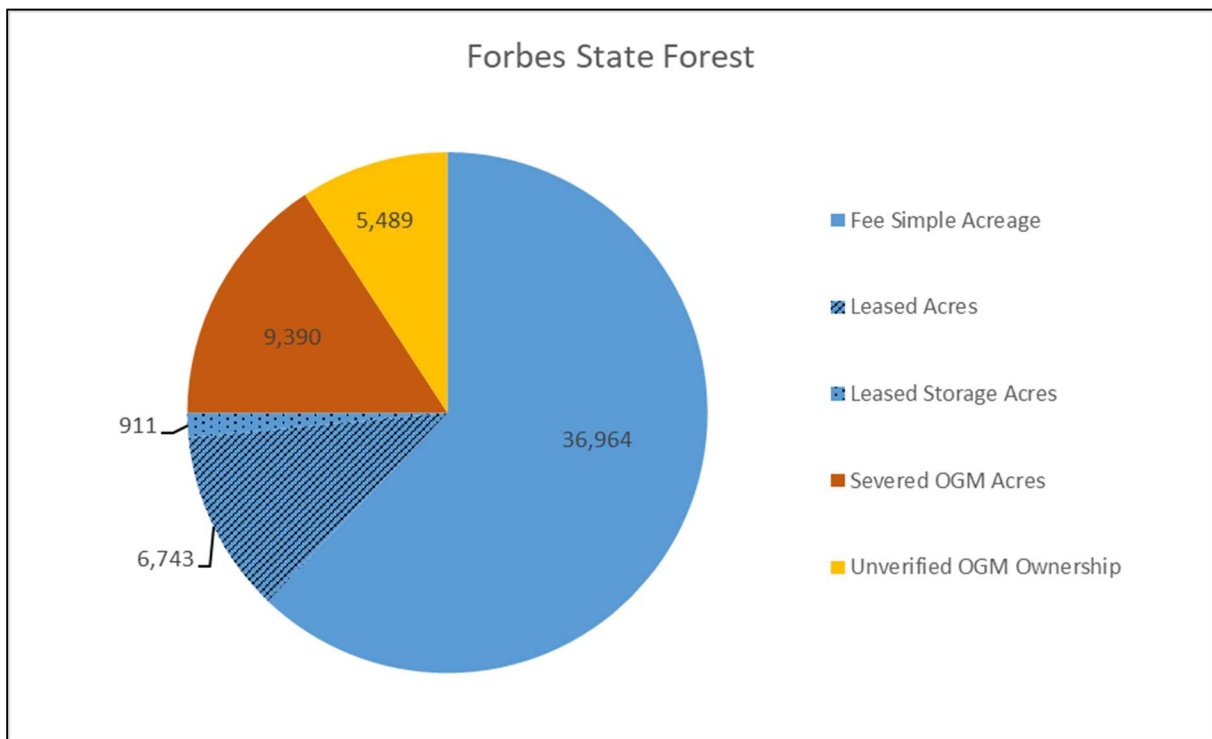


Figure 12-1. Acres of subsurface ownership/status on state forest land within the district. Acreage figures are derived from bureau GIS data, not acreages specified in lease or subsurface agreements. Severed Gas Rights Acres include only severed rights lands where the subsurface ownership has been verified. Partially severed areas that have been leased are counted as DCNR Issued Lease Acres, as opposed to Severed Gas Rights Acres.

The DCNR Bureau of Forestry's mission statement clearly identifies the environmentally sound utilization of mineral resources, which includes oil, gas, coal, and hard minerals as a key component of state forest management. Subsurface geological resources and unique geologic features on state forest lands are managed to provide long-term benefit to the citizens of the commonwealth while adhering to the principles of ecosystem management. Decisions regarding management of the subsurface estate must be based on the mission and both state-wide and district-level management plans. Oil and natural gas development is one of the management activities that historically has occurred on state forest land. The activity contributes significantly to Pennsylvania's economy and provides a source of domestic energy. Natural gas development, however, especially at the scale seen in the modern shale-gas era, can affect a variety of forest resources, uses, and values, such as:

- recreational opportunities,
- the forest's wild character and scenic beauty, and
- plant and wildlife habitat.

Given the host of potential impacts of shale-gas development to the state forest resources, uses, and values, the Bureau has established a Shale-Gas Monitoring Program to track, detect, and report on the beneficial and adverse impacts of the activity. The program aims to provide objective and credible information to the public and inform and improve shale-gas management efforts. An essential function of the Shale-Gas Monitoring Program is to regularly compile and analyze its data and findings. The Program has produced two reports on its monitoring efforts. Information on the Shale-Gas Monitoring Program can be found here:

<https://www.dcnr.pa.gov/Conservation/ForestsAndTrees/NaturalGasDrillingImpact/ShaleGasMonitoring/Pages/default.aspx>

To assist the Bureau with managing oil and gas development in concert with other forest resources, uses, and values, the Bureau has created the Guidelines for Administering Oil and Gas Activity on State Forest Lands. The objective of this document is to communicate a set of "guidelines" and Best Management Practices (BMPs) that provide consistent, reasonable, and appropriate direction for managing oil and gas activity on state forest lands in accordance with the Bureau's mission. The Guidelines can be found here:

http://www.docs.dcnr.pa.gov/cs/groups/public/documents/document/dcnr_20032134.pdf

Gas Development

The Forbes State Forest is situated solely within the Appalachian Plateau Province in an area which is generally characterized as having a gently dipping and uniform layering of formations which have been deformed (i.e., folded and faulted) much less than in the steeply dipping and intensely folded and thrust faulted rocks of the Ridge and Valley Province to the east. The State Forest lands are located on three major northeast-southwest trending folds which are both structurally high (anticlines) and topographically high (mountains); i.e., the Chestnut Ridge, Laurel Ridge and Negro Mountain "highs". The "high" folds are faulted and fractured, in some places extensively. The Oriskany-Onondaga gas is found in both the intergranular and fracture porosity of the reservoir in the structurally highest portions of the fault blocks; the gas occurrences are largely determined by structural conditions and hence can be located by seismic surveying.

The shallow Upper Devonian oil and gas, on the other hand, is generally unrelated to the structure of the rocks; it is found in sand buildups (stratigraphic traps) in both structurally high and low locations, where the sand has developed sufficient reservoir characteristics, i.e., porosity (largely intergranular), permeability, thickness and oil and gas saturation, to be economically productive.

Economic gas production has been obtained from the deep Devonian age Oriskany Sandstone and overlying fractured Onondaga Chert in several gas fields from state owned land in the Forbes State Forest. The state forest land has

produced Oriskany-Onondaga gas from wells in the Clarke, Kooser, Blair and Tunnel gas pools of the Seven Springs gas field along Laurel Ridge in Somerset and Westmoreland Counties, where the gas is owned by the state and production royalty is received by the state (Tracts 75, 98, 228), and from wells in the North Summit gas pool of the Summit gas field along Chestnut Ridge in Fayette County where the state does not own the gas and hence does not receive production royalty income from it. In addition, small parcels of state owned land, unitized with producing wells on private property, have produced gas from the Oriskany and Onondaga formations, and hence gas royalty income to the state; i.e.: Oriskany gas in the Rockwood gas field from unitized state owned "river bottom land" along the Casselman River near Rockwood in Somerset County (Tract 305), and Onondaga gas in the Quebec Run gas field from unitized state owned forest land in extreme southern Fayette County (Tract 234). All these gas productive Oriskany and Onondaga reservoirs are between 1 ¼ to 1 ¾ miles below the surface.

In the Braddock Division, a small (2 ½ miles long by 2400 feet wide) pool of natural gas under the crest of Chestnut Ridge was discovered in 1936 with the drilling of the Snee No. 1 well. Though gas had been produced in Fayette County since 1884, most of the wells were shallow, low volume and located in the "low lands" of the western half of the county. The Summit pool was a high volume, high-pressure pool, much of which is located under lands that are now within the Braddock Division of the Forbes State Forest. Under a 1982 proposal by Consolidated Gas Supply Corporation (now Dominion Energy Transmission, Inc.) the Summit gas field was converted to the North Summit gas storage field in the 1990's. A gas storage lease agreement between the gas storage lessee and the state covering state owned lands in the field includes provisions for a gas storage rental payment to the state and for environmental protection of the state-owned waters and lands in the field. In 2011, two injection gas wells, UW-209 and UW-210, were drilled into the North Summit gas storage field to bring the storage field up to full FERC storage capacity.

Small amounts of shallow Upper Devonian oil and gas have also been produced from wells on state forest land, and from wells unitized with state forest land, in the Sandy Creek oil and gas field in southern Fayette County (Tract 234). This shallow oil and gas production is from the Speechley sand at approximately 3,000 feet in depth in wells operated by Zenith Exploration Company.

The deepest well drilled on Forbes State Forest, the Phillips Petroleum Company #2 Tract 98 well, now plugged and abandoned, was drilled in 1962 on Laurel Ridge in Somerset County into the Oriskany sandstone at a total depth of 9,259 feet. The deepest well drilled on private land in the Forbes Forest District, the Amoco #1 Svetz dry hole, was drilled in 1974 on Laurel Ridge in Somerset County offsetting Forbes State Forest land (Tract 601) to the Cambrian age Gatesburg Formation at a total depth of 21,460 feet. At one point in time, this was the deepest well in the Appalachian Basin.

Future gas production from formations below 10,000 feet on Forbes State Forest land appears possible since gas was produced from the Silurian age Tuscarora sandstone at a depth of approximately 11,318 feet in the Snee #1 Heyn gas discovery well in the North Summit gas field, offsetting state forest land near the Summit Hotel on U. S. Route 40 on Chestnut Ridge in Fayette County.

Almost all of Forbes State Forest land has been leased for oil and gas exploration and development, either through leases granted by the state where it owns the oil and gas, or through leases granted by private oil and gas owners where the state does not own the oil and gas but does own the surface. Most of the state-owned oil and gas rights on the Forbes State Forest land are presently under lease from the Department to a variety of oil and gas lessees; i.e. Amoco, Ashtola, Patric Petroleum, Peoples Natural Gas, CNG Producing Company, Kaiser Energy, Inc. (Tracts 228, 280, 299, 301, 307, 348 354, 384, 424, 475, 540, 541, 601). In the summer of 2002, DCNR conducted an auction for sub-surface gas and oil rights on Department-managed lands. One of the leases pertained to the Braddock Division, where a well was drilled on private land in the Braddock division, with a non-development clause for state forest land. The 2,363-acre Barron Tract was acquired from the Western PA Conservancy in 2008 and was added to the Blue Hole Division. The Barron Tract's oil and gas mineral rights are vested 50% in Lyme Timber and 50% in Western PA Conservancy. The Bureau of Forestry maintains zero control of the subsurface on the Barron Tract.

Coal Development

The most important hard mineral commodity in the Forbes Forest District is coal. There is no coal mining activity on the Forbes State Forest at the present time. However, the state forest land may contain recoverable coal reserves in excess of 29 million tons. For the most part, these coal lands were once owned by Indian Creek Coal and Coke Company.

Much of the early optimism by Indian Creek Coal and Coke was based on a six-foot seam locally known as the Carrol Seam found in the Carrol Custom Bank mine on Stoney Fork near Elliottsville, Fayette County. This seam was mistakenly called the Upper Freeport, but a core drilling project conducted by the Minerals Section in conjunction with the Pennsylvania Geological Survey during the summers of 1980 and 1981 proved that it was the Upper Kittanning Coal. The recoverable Upper Kittanning deep mineable reserves in the Elliottsville area are approximately eight million tons.

Pipelines

There are several smaller natural gas pipelines that bisect the Forbes State Forest which pipeline owners have right-of-way Agreements with the district. One major gas pipeline right-of-way, Texas Eastern Pipeline, managed by Spectra Energy passes through the Barron Tract of the Forbes State Forest transporting natural gas from Texas to the northeastern U.S. population centers.

Limestone

In 2013, the Commonwealth made an agreement with Hanson Aggregates to allow them to mine about 700 acres of limestone under the Torrance Tract of the Forbes State Forest, with no surface impact, in exchange for adding 825 acres of forest land to the Pinchot State Forest in Lackawanna County.

13) Wildland Fire

Wildfire Suppression

The Division of Forestry was created in 1895 in response to unregulated logging, widespread deforestation, devastating wildfires, and flooding. Spurred by unquestionable environmental damage in the late 1800s and early 1900s, visionary leaders such as Gifford Pinchot and Dr. Joseph Rothrock lobbied for laws to protect our streams, forests, and communities. In 1915, legislation was passed to create a system of Forest Fire Wardens, who have specifically legislated powers and duties and are officially recognized agents of the Commonwealth.

These laws established a system comprised of three types of Wardens: Local Forest Fire Wardens, District Forest Fire Wardens (District Forest Manager), and a Chief Forest Fire Warden (Chief of the Division of Forest Fire Protection-DFFP). All appointed Wardens have some level of responsibility and preform the following duties under the direction of a District Warden, on all lands, public and private:

- Detecting, extinguishing, reporting and investigating wildfires.
- Assembling, leading, and training a crew of wildland firefighters.
- Promoting and conducting wildfire prevention programs.
- Attending and assisting with the training as needed.

The Local Wardens preform these duties and report to the District Warden. The District Warden collects reports such as investigations and billing, approves/confirms accuracy and forwards the information collected, to the Chief Forest Fire Warden. The Chief Forest Fire Warden collects the information, develops reliable filing systems, pays bills and develops a budget to ensure adequate funding to keep the system functioning for each Forest District, as well as developing and implementing policy.

Part of the Bureau of Forestry's Mission is to: "Protect Forestlands, public and private, from damage and or destruction from Fire". The Forbes Forest District is mandated through state law to respond to, extinguish, and investigate wildfires.

The district forester serves as the District Fire Warden. All staff working in the Forbes Forest District are trained in wildfire response to varying degrees, and most participate in direct attack when necessary. The Bureau of Forestry utilizes the Incident Command System (ICS) which is the standard system used by emergency responders nationwide on all types of emergency incidents. Most wildfire activity in Pennsylvania occurs in the spring after winter snows melt and before trees leaf-out and vegetation greens up.

Each staff member in Forbes Forest District has a role in wildfire suppression. The primary fire staff in one Forest Fire Specialist Supervisor's (FFSS) and one Fire Forester (FF) who each conduct initial attack and extended attack operations in three counties. Both have national qualifications, which include but are not limited to, Incident Commander Type 4, Prescribed Fire Burn Boss (Type 2), Firing Boss, Wildland Fire Investigator, and Firefighter (Type 1). The FFSS and FF are supported by the District Incident Management Team (IMT). The District IMT's primary Incident Command System (ICS) positions are filled by staff with extensive wildfire experience. Not all team members are nationally qualified in their assigned ICS positions, but have been trained in the fundamentals of their respective positions. Seven members have out-of-state wildfire experience on Type 1 and Type 2 incidents. One team member is currently working on their national task book for the Geographic Information System Specialist (GISS) position and serves that role on one of the State Incident Management Teams. Three team members are nationally qualified as Firing Bosses in addition to the FFSS and FF. The staff members not assigned to a specific primary team position support the district's wildfire operations in the following roles as the needs of the incident dictates: Office Dispatcher, Division/Group Supervisor, Crew Boss, Strike Team Leader (Engine), Staging Area Manager, Heavy Equipment Boss, Firing Boss, Firefighter (Type 1) and Firefighter (Type 2).

As of January 2018, Forbes Forest District has 83 trained volunteer forest fire wardens with crews and equipment and 22 district employee forest fire wardens who help suppress wildfires. Forest Fire Wardens have been engaged in forest fire protection work in Pennsylvania for over 100 years. Their authority and responsibility is established by legislative mandate and their work guided by policy and practice. The Forest Fire Warden organization is defined in Act 18 of 1995 (71 P.S. § 1340.302). This is the legislation which also created the Department of Conservation and Natural Resources (DCNR). Primarily, the Chief Forest Fire Warden is charged to *"take such measures for the prevention, control and extinction of forest fires as will assure a reasonable protection from fire to woodlots, forest, and wild land, within this Commonwealth."* District Forest Fire Wardens act as the field representative of the Chief Forest Fire Warden. Local Forest Fire Wardens are appointed to suppress and investigate wildfires and to engage in wildfire prevention activities.

Forbes Forest District also has 487 volunteer fire departments (VFD) which is hundreds more than most other Forest Districts. VFD's serve as the primary initial attack resources on wildfires in Forbes Forest District. These resources are very responsive and effective where access to wildfires is relatively easy. With that in mind, Forbes Forest District focuses on wildfire suppression equipment to support operations in remote locations which are inaccessible to Type 6 and Type 7 engines. The Forbes Forest District has two Wick 375 portable pumps which is the standard in the national system for extended hose lays in mountainous terrain, thousands of feet of one inch forestry hose, thousands of feet of ¾ inch hose, numerous appliances that support extended hose lays, numerous drip torches, NATO 20-liter jerry cans, flare pistol, chainsaws, leaf blowers, numerous hand tools, and slip-on units (Type 7) that are mounted on pick-up trucks during fire season. ATV's and John Deere gators are used primarily for scouting and transporting personnel/equipment/food.

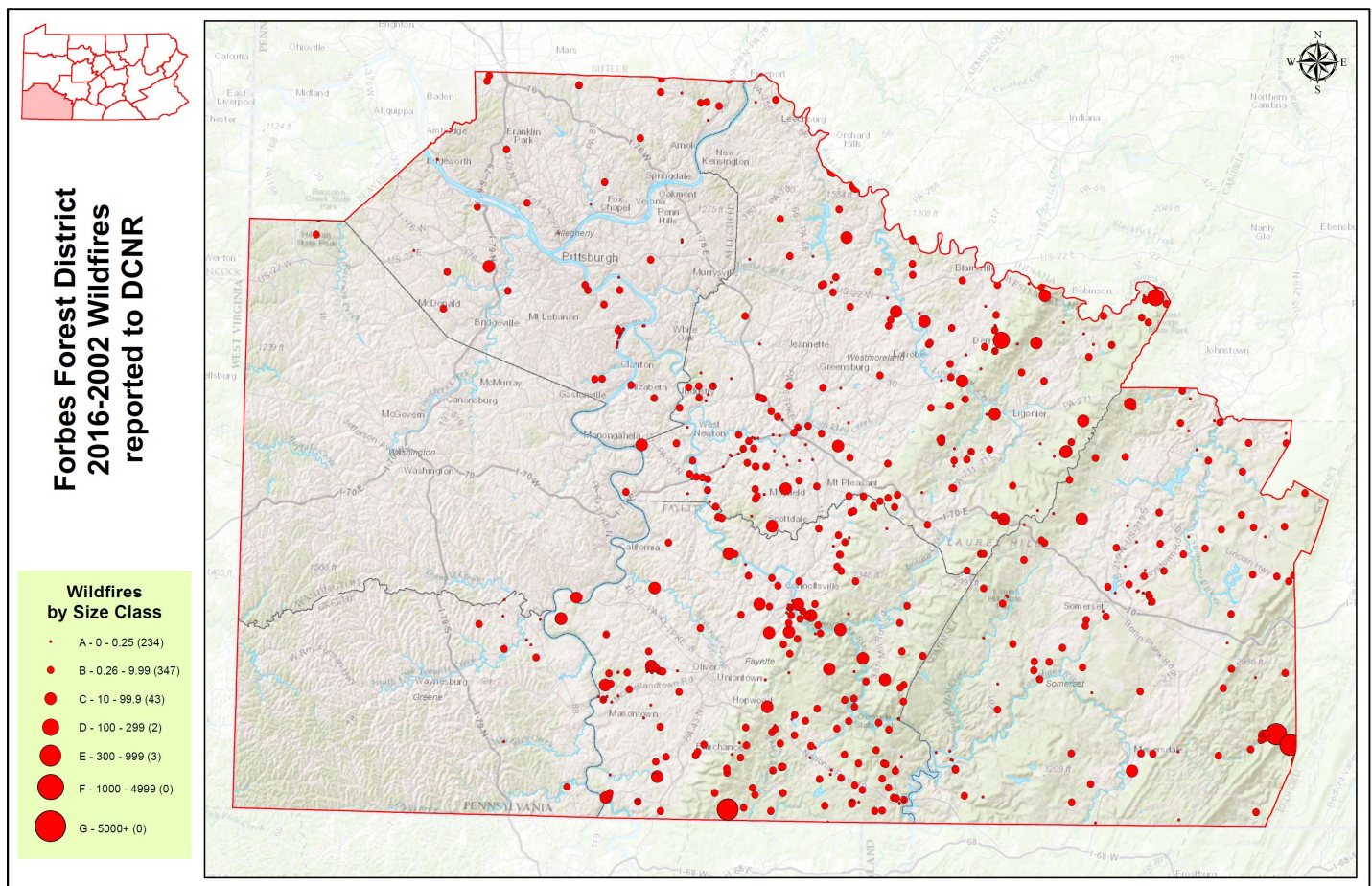


Figure 13-1. Recent Fire History. Above is a map showing the number and size of wildfires in the Forbes Forest District from 2002-2016 that the Bureau of Forestry and/or Forest Fire Wardens took some form of action on or were reported to the Bureau of Forestry. This is not a total representation of every wildfire that occurred in the Forbes Forest District as indicated by the lack of wildfires in Greene and Washington Counties.

Table 13-1. Large wildfires over the past 10 years in the Forbes Forest District

<u>Fire Name</u>	<u>Date</u>	<u>County</u>	<u>Size</u>	<u>Cause</u>
Fairhope	April 2008	Somerset	480	Railroad
Fairhope	Nov 2010	Somerset	700	Railroad
St. Clair	April 2016	Westmoreland	190	Incendiary
Quebec Run WA	April 2016	Fayette	388	Smoking
Millwood Rd	Nov 2016	Westmoreland	173	Incendiary

Prescribed Burning

On July 17, 2009, the PRESCRIBED BURNING PRACTICES ACT, P.L. 76, No. 17 became law. This law allows state government agencies and private landowners to use fire as a silvicultural tool and for control of invasive and understory competing vegetation. The Forbes Forest District uses prescribed fire on state forest land to help manage the ecosystem by enhancing oak seedling growth, controlling competing vegetation, preparing sites, reducing the duff layer, creating wildlife habitat, and reducing fuel loading. Prior to ignition, foresters invest months and even years to determine if

prescribed fire is the best management practice for a site. And, the right weather and site conditions must line up, which is very difficult to achieve, for prescribed burns to be successful. Prescribed burning also provides an opportunity for district staff, fire wardens, and volunteer fire department personnel to gain knowledge and experience on fire behavior and tactics in a more controlled setting. Forbes Forest District has one nationally qualified Burn Boss (RXB2) and five nationally qualified Firing Bosses (FIRB).

Table 13-2. Prescribed fires conducted on the Forbes State Forest.

YEAR	NAME	ACRES
1999	King Burn 1	6
2000	King Burn 2	12
2001	King Burn 3	6
2004	Grindle Ridge Switchgrass	3
2005	Clear Run 1	16
2006	Clear Run 2	20
2006	Grindle Ridge Switchgrass	3
2007	Borderline	17
2007	Cole Run	34
2009	Grindle Ridge Switchgrass	3
2010	Pritts Distillery	29
2010	Hickory Flats 2	47
2012	American Toad	50
2012	Wharton Furnace	91
2013	Blockhead	34
2013	Hairpin	54
2014	Grindle Ridge Switchgrass	3
2015	Airglow	15
2015	Bear's Den	53
2016	Eco Res Black Line 1	15
2017	Eco Res Black Line 2	20
2018	Potter School	44

575 Ac TOTAL

14) Infrastructure and Maintenance

Infrastructure refers to buildings, equipment, roads, and other capital assets, tools, and resources used to meet an organization's goals and objectives. Successful accomplishment of the bureau's mission cannot happen without proper inventory, planning, and administration of these assets. The bureau uses infrastructure to perform management activities and to provide for state forest use by others, including private industry and the general public. This requires accurate inventories, acquisitions, management, evaluation, maintenance, and retirement of infrastructure, as well as adequate funding to make all these tasks possible.

Bureau staff manage the following infrastructure on approximately 60,000 acres of the Forbes State Forest. These lands are spread out over portions of three Pennsylvania Counties: Westmoreland, Somerset and Fayette. There are three Forest Maintenance Divisions established to maintain the infrastructure of those lands.

The Laurel Mountain Division takes care of the Lands generally situated on Laurel Ridge, along the Westmoreland/Somerset County line, south to County Line Road. This Division sees the highest rate of recreational use within the District. This Division is home to the Roaring Run Natural Area.

The Mount Davis Division takes care of those lands surrounding Pennsylvania's High Point at Mount Davis and those to the south of the borough of Seven Springs in Somerset County.

The Braddock Division takes care of those lands along Chestnut Ridge in Fayette County, and is home to the Quebec Run Wild Area.

Buildings

The Forbes Forest District has a current inventory of 28 buildings. These buildings include the District Office, Maintenance Supervisors Headquarters, pole buildings, Old CCC cabins, an historical cabin, Winter Recreational Warming Huts, latrines, and even a small Chapel (complete with stained glass windows). There are current plans to add new office space at the Mount Davis Forest Maintenance Headquarters and a new pole building, to be located at Laurel Ridge State Park.

State Forest Picnic Areas

There are two State Forest Picnic Areas on the Forbes State Forest. These sites contain numerous picnic tables, a pavilion, latrines and both modern and stone grills. The Mount Davis State Forest Picnic Area is located along Mount Davis Road (State Route 2004) in southern Somerset County, very near Pennsylvania's High Point. This Picnic Area is open to the public year-round. The Lick Hollow State Forest Picnic Area is located just off US Route 40, southeast of Uniontown; in Fayette County. The gate and latrines are open during the height of the summer season (Memorial Day weekend through Labor Day), but Visitors are welcome to visit this beautiful area any time of the year.

Roads

The Bureau of Forestry classifies their roads into three categories: Public Use Roads, Drivable Trails and Administrative (Gated) Roads. Some roads (or portions thereof) are further designated as "Joint-Use" roads that are open to vehicular traffic as well as snowmobiles, during the official Snowmobile Season. The Forbes State Forest has approximately 44 miles of public use roads and about 86 miles of gated administrative roads. There are no designated "Drivable Trails" on the Forbes State Forest. The overwhelming majority of our roads are gravel roads. We do have two small sections of paved roadway in the Laurel Mountain Division: Linn Run Road and a portion of Laurel Summit Road.

Trails

The Forbes provides many miles of maintained trails for a wide variety of dispersed, low-density outdoor recreation activities. Trails vary from narrow, rocky, and winding single-tracks to wider trail corridors with smoother tread surface, to even wider and gated administrative roads. The Forbes State Forest features over 100 trails and roads, totaling over 321 miles, open to many forms of recreation. This includes, 176 miles of District Local Use (Shared-Use) trails, 44 miles of public use roads, 86 miles of gated administrative roads, and 15 miles of the Laurel Highlands Hiking Trail (LHHT) which is part of the Potomac Heritage National Scenic Trail and is administered by the Bureau of State Parks. See Recreation Section for more detail.

Hiking - 277 miles of trails, which includes 15 miles of the LHHT on the Forbes State Forest, and gated roads

Mountain Biking - 152 miles of trails and 86 miles of gated roads

Horse Riding - 152 miles of trails and 86 miles of gated roads

Snowmobiling – Forbes State Forest grooms 115 miles which includes 40 miles of state forest trails, 38 miles of joint-use roads, and 37 miles of trails on Laurel Ridge State Park.

Cross-Country Skiing - 191 miles of trails available but specifically maintain 32 miles specifically for this purpose.

Bridges

There are 14 vehicular bridge structures on the Forbes State Forest Road system, with four more planned for the future. There are numerous pedestrian bridges throughout the trail system.

Culverts Under Road and Trail Stream Crossings

Forbes State Forest contains an estimated 95 culverts determined from GIS data. The Bureau of Forestry conducts stream culvert assessments using the North Atlantic Aquatic Connectivity Collaborative (NAACC) protocol. Assessed culverts yield data on the condition of stream crossings on state forest land regarding aquatic organism passage. The data is used to determine if the crossing is a barrier to organism passage, and if so, to what extent. This information assists the bureau prioritize culverts for replacement or repair.

Gates

There are 120 steel gates on the Forbes State Forest blocking public access to certain state forest roads and trails in order to protect various natural resources.

State Forest Boundary Line

There are approximately 300 miles of boundary line around the various tracts that comprise the Forbes State Forest. We have a five-year rotation on boundary line maintenance, which means that we maintain about 60 miles of boundary line every year.

Historical Structures

Wharton Furnace is one of the few remaining iron furnaces in southwestern Pennsylvania. It is located along Wharton Furnace Road near the village of Chalk Hill, in Fayette County. Carroll Cabin is a nineteenth century log cabin located in the Braddock Division, Fayette County. There are three CCC-era cabins in the Mt. Davis Division, Somerset County.

Radio System

There is a total of 45 portable radios and 33 mobile radios assigned to this District.

Vehicles

The Forbes State Forest staff maintains an extensive fleet of 27 four-wheel drive pickups and SUV's.

Heavy Equipment

The Bureau of Forestry utilizes different types of heavy equipment to perform our duties. These include two road graders, seven dump trucks, three backhoes, three material loaders, ten farm tractors, two fork lifts and a skid steer.

Specialty Equipment

This District owns several different types of specialty equipment. These include five rigs designed to groom snowmobile trails, one articulated brush mower, numerous brush hogs, one tracked trail dumper, ten ATV/UTV's, and five snowmobiles.

Fire Tower and Observation Tower

There are currently two towers which the Bureau of Forestry owns on the Forbes State Forest. One is an Observation Tower located at Mt. Davis. It is open to the public during daylight hours. The other tower is a Fire Tower located in the Braddock Division along Skyline Drive in Fayette County. This tower is not open to the public.

15) Special Designations

Conservation Landscapes

Driven by the values of conservation, sustainability, and community revitalization, conservation landscapes are built on several ingredients:

- **Presence of DCNR-owned lands** -- Large blocks of state parks and forests provide the foundation for the landscape and a staffing presence

- **Sense of place** -- Regions with a sense of place and identity in many cases are based on shared landscape not political boundaries
- **Readiness** -- Often driven by opportunity or threats such as changes in the economic base, depopulation, or sprawl
- **Engagement** -- Civic engagement process that brings people of the region together to identify common values and concerns
- **Strategic investments** -- State agencies with regional and statewide partners provide high-level leadership, financial support, and technical assistance to build better communities, to conserve identified values and to invest in “sustainable” economic development

Throughout Pennsylvania, seven large regions are working together to drive strategic investment and actions around sustainability, conservation, community revitalization, and recreational projects. Known as conservation landscapes (Figure 7-1), these collaborations are found in regions where there are strong natural assets, local readiness and buy-in, and state-level investment and support. Founded on the regions’ sense of place and resource values, conservation landscapes motivate citizens and elected officials to take on the challenge of effective land use planning, investment, civic engagement, and revitalization.

There are currently seven conservation landscape partnerships within Pennsylvania. The Forbes State Forest lies within the Laurel Highlands Conservation Landscape which exists to conserve and promote the recreational and cultural aspects in an area in southwestern Pennsylvania defined by three Allegheny Plateau ridges and portions of several watersheds.

The Laurel Highlands is one of Pennsylvania’s most notable and breathtaking natural treasures. Interspersed with small, historic communities, the region features magnificent mountains, rushing streams with breathtaking waterfalls, and rolling hillsides with picturesque farmlands.

Located an hour east of Pittsburgh, the Laurel Highlands Conservation Landscape spans five counties -- Somerset, Westmoreland, Fayette, and portions of Cambria and Bedford. It is defined by three Allegheny Plateau ridges -- the Chestnut, Laurel, and Allegheny.

The Laurel Highlands is a traditional vacation and tourism area for Pittsburgh and Johnstown and has growing appeal to a broader array of cultural and recreational visitors.

The region is rich in natural resources including the Youghiogheny, Casselman, Stonycreek, and Conemaugh rivers, which offer abundant natural and recreational assets.

Central to the Laurel Highlands is the 70-mile long Laurel Ridge, a high plateau region with deep cut hollows covering over 200,000 acres rich in amphibian, avian, and plant biodiversity.

The partners, including the Forbes Forest District, in the Laurel Highlands Conservation Landscape are working to protect the unique character of the region by creating a model of sustainable development tied to the natural and cultural assets of the region.

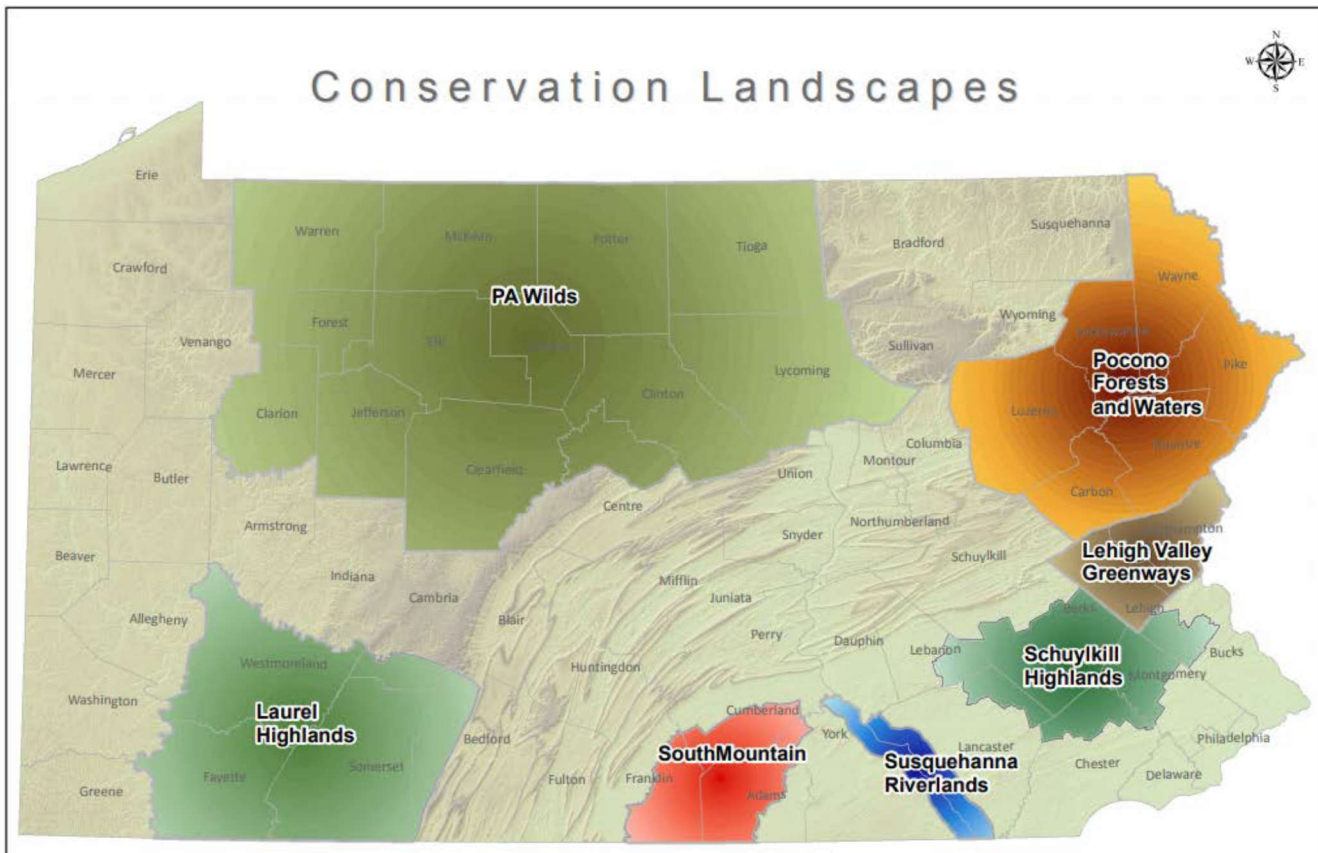


Figure 15-1. The seven Conservation Landscapes in Pennsylvania. The Laurel Highlands is situated in the southwestern part of the state.

Public Wild Plant Sanctuaries

The Wild Resource Conservation Act also provides that the department may protect wild plant species that are in jeopardy of population decline by acquiring or designating areas previously acquired as public wild plant sanctuaries. Any area of publicly owned land that supports a viable population of native plant species of special concern, or contains suitable habitat for viable growth of native plant species of special concern and is known to have historically supported such species, or the areas contains suitable habitat for viable growth and reproduction of native plant species of special concern which may be transplanted or the area supports an exemplary Pennsylvania native wild plant community may be nominated as a public wild plant sanctuary. These sites receive various active management to benefit the plant species of concern found there, including invasive removal and reducing competition. There are five Public Wild Plant Sanctuaries on the Forbes State Forest.

Wild and Natural Areas

The bureau has long recognized the value and need for setting aside unusual or interesting areas of state forest land. The Conservation and Natural Resources Act, Act 18 of 1995, state that “The department is authorized to set aside, within the state forests, unusual or historic groves of trees, or natural features, especially worthy of permanent preservation, to make the same accessible and convenient for public use and to dedicate the in perpetuity to the people of the state for their recreation and enjoyment.” To this end the bureau designates Wild and Natural Areas.

The objective of a **natural area** is to protect areas of scenic, historic, geologic or ecological significance, which will remain in an undisturbed state, with development and maintenance being limited to that required for health and safety. Natural areas are set aside to provide locations for scientific observation of natural systems, to protect examples of typical and unique plant and animal communities, and to protect outstanding examples of natural interest and beauty. Natural areas are maintained in a natural condition by allowing physical and biological processes to operate, usually

without direct human intervention. Any unique or unusual biologic, geologic or historic areas can be considered for designation as natural areas. In addition to the 'unique' or 'unusual,' representative examples of all major forest types occurring in this Commonwealth were also included in the proposed natural area system. The size of these areas is generally small but may be as large as several thousand acres.

The objective of **wild areas** is to set aside certain areas of land where development or disturbance of permanent nature will be prohibited, thereby preserving the wild character of the area. In Pennsylvania's state forest system, certain areas that retain an undeveloped, wild character are designated as Wild Areas to assure that this primitive character is perpetuated. A wild area is defined as an extensive area which the general public will be permitted to see, use and enjoy for such activities as hiking, hunting, fishing, and the pursuit of peace and solitude. Development of a permanent nature will not be permitted so as to retain the undeveloped character of the area. Because of the restrictions imposed on wild areas, careful consideration must be given to alternative uses before additional areas are so designated. The size of the area should be no less than 3,000 acres and seldom more than 15,000 acres. They should be located where there are few public roads or other human-made developments such as campsites, rights-of-way, etc. Only areas where the department owns sufficient subsurface rights to preclude development will be considered.

More information on Wild and Natural Areas on state forest land is found beginning on page 56 of the SFRMP.

Table 15-1. Total acreage of Wild and Natural Areas on state forest land within Forbes State Forest.

Forbes	Name	Acreage
Natural Areas	Mt Davis Natural Area	598.7
	Roaring Run Natural Area	3,531.7
	Natural Area Total	4,130.4
Wild Areas	Quebec Run Wild Area	6,094.1
	Quebec Run Wild Area - Proposed	1,345.9
	Wild Area Total	7,439.9
Total		11,570.3

The Mt Davis Natural Area includes the highest elevation in Pennsylvania at 3,213 ft. An access road off South Wolf Rock Road leads to a parking area and from there visitors can take a short hike to the highpoint observation tower. The observation tower is one of the most popular locations for visitors in the Forbes State Forest.

The Roaring Run Natural Area is unique in that it encompasses the entire, mostly forested, watershed of Roaring Run, a high quality, wilderness trout stream. Roaring Run Natural Area has been designated as a Reptile and Amphibian Protection Area by the Pennsylvania Fish and Boat Commission.

The Quebec Run Wild Area receives its name from Quebec Run, a small tributary of Mill Run that drains the northwest section of the wild area. Quebec Run harbors native brook trout. Quebec Run Road is an administrative road that bisects the wild area from north to south and is gated at both ends. Much of the trail system in this wild area follows remnants of old logging roads, skid trails, and even portions of narrow-gauge railroad constructed to remove forest products.

The Roaring Run Natural Area and the Quebec Run Wild Area contain some of the larger contiguous tracts of semi-primitive, non-motorized zoned lands in Forbes State Forest. This makes these two areas excellent destinations for visitors seeking independence, isolation, and a more challenging experience.

High Conservation Value Forests

Pennsylvania state forests are certified under the Forest Stewardship Council (FSC) standards. FSC certification prioritizes the protection of particularly valuable forest characteristics by requiring certified landowners to identify high conservation value forests (HCVFs) on their land and plan for sustainable management and monitoring of these areas. FSC recognizes six types of HCVFs:

- HCV 1: HCV forest areas that contain globally, regionally, or nationally significant concentrations of biodiversity values (protected areas, rare or threatened species, endemic species, and seasonal concentrations of species)
- HCV 2: Globally, regionally, or nationally significant large landscape-level forests
- HCV 3: Forest areas that are in or contain rare, threatened, or endangered ecosystems
- HCV 4: Forest areas that provide basic services of nature in critical situations (protection of watersheds and protection against erosion and destructive fire)
- HCV 5: Forest areas fundamental to meeting basic needs of local communities
- HCV 6: Forest areas critical to local communities' traditional cultural identity

In 2011, the bureau followed FSC's HCVF guidance to identify, designate, and manage for areas of high conservation value. The areas which have been identified as HCVFs are managed in a manner that will maintain and/or enhance the values for which they have been designated and conversion of forest land to a "non-forested use" is prohibited.

Sub-categories of HCVFs occurring on state forest land are as follows:

- **1.1:** areas legally protected or managed primarily for concentrations of biodiversity values that are significant at the ecoregion or larger scale
- **1.2:** areas with significant concentrations of rare, threatened or endangered species or rare ecological communities, endemic
- **2.1:** significant large landscape-scale forest where viable populations of most if not all naturally occurring species exist in natural patterns of distribution and abundance
- **2.2:** areas significant to biodiversity conservation at the ecoregion scale because it contains landscape-scale biodiversity values that are not present on other forests due to landscape-scale habitat modifications on surrounding lands
- **3.1:** old growth stands
- **3.2:** roadless area >500 acres in size or that has unique roadless area characteristics
- **3.3:** rare, threatened, or endangered ecosystem
- **4.1:** areas providing a source of community drinking water
- **4.2:** areas protecting community drinking water supplies
- **4.3:** extensive floodplain or wetland forests that are critical to mediating flooding or in controlling stream flow regulation and water quality
- **6.2:** areas with cultural features created intentionally by humans

More information about HCVFs can be found in the LMU descriptions of this plan and in the SFRMP, p. 64.

Table 15-2. Acres of High Conservation Value Forest by category on the Forbes State Forest. To comply with Principle 9 of the FSC U.S. Forest Management Standards, the bureau evaluated and assessed areas for inclusion as HCVFs. While the BOF believes that all state forest lands are of highest conservation value, areas not designated as such are still of equal importance and are protected through law and best management practices. The areas which have been identified as HCVFs are mapped and managed in a manner that will maintain and/or enhance the values for which they have been designated. More information about HCVFs can be found in the SFRMP, p. 64.

HCVF Category	Acres
1.1, areas legally protected or managed primarily for concentrations of biodiversity values that are significant at the ecoregion or larger scale	572
1.2, areas with significant concentrations of rare, threatened or endangered species or rare ecological communities, endemic	2,715
2.1, significant large landscape-scale forest where viable populations of most if not all naturally occurring species exist in natural patterns of distribution and abundance?	10,398
2.2, areas significant to biodiversity conservation at the ecoregion scale because it contains landscape-scale biodiversity values that are not present on other forests due to landscape-scale habitat modifications on surrounding lands	10,398
4.1, areas providing a source of community drinking water	164
6.2, areas with cultural features created intentionally by humans	54

Land and Water Conservation Fund

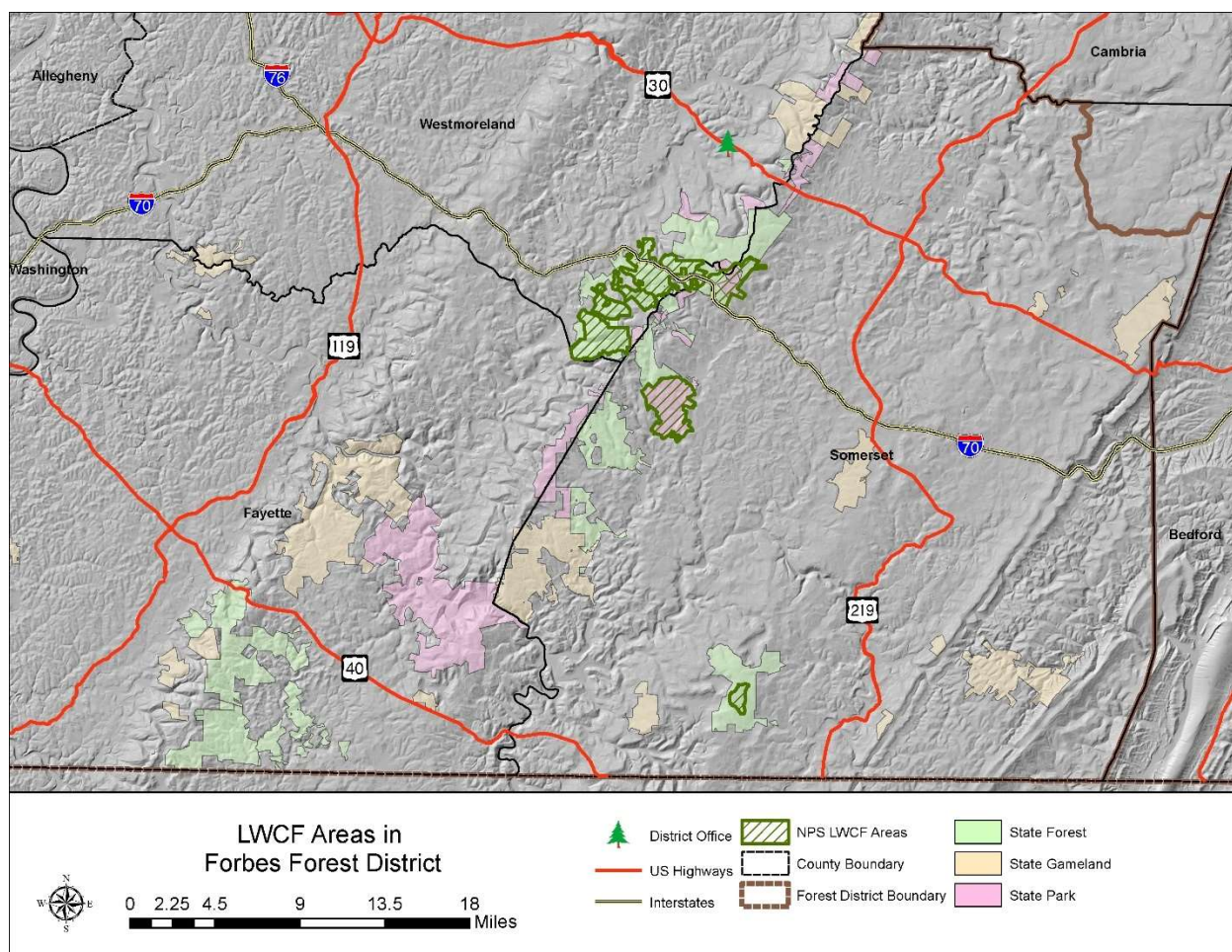


Figure 15-2: Land and Water Conservation Fund protected lands.

Created by Congress in 1964, the Land and Water Conservation Fund (LWCF) was a bipartisan commitment to safeguard natural areas, water resources and our cultural heritage, and to provide recreation opportunities to all Americans. The idea behind the fund was to use revenues from the depletion of one natural resource - offshore oil and gas - to support the conservation of another precious resource - land and water. The Act states unequivocally that grant-assisted areas are to remain forever available for "public outdoor recreation use," or be replaced by lands of equal market value and recreation usefulness. The LWCF Manual indicates property acquired or developed with LWCF assistance shall be operated and maintained to appear attractive and inviting to the public; to maintain sanitary facilities in accordance with applicable health standards; properties shall be kept reasonably open, accessible, and safe for public use; fire prevention, lifeguard, and similar activities shall be maintained for proper public safety; buildings, roads, trails, and other structures and improvements shall be kept in reasonable repair throughout their estimated lifetime to prevent undue deterioration and to encourage public use; the properties and facilities shall be kept open for public use at reasonable hours and times of the year, according to the type of area or facility; a posted LWCF acknowledgement sign shall remain displayed at the project site. The Forbes State Forest has a significant portion of land covered by LWCF. In addition to following state guidance for maintaining recreation opportunities and access, we also operate and maintain the LWCF areas in accordance with the regulations.

Core Forest Index

As described in the 2016 State Forest Resource Management Plan, the purpose of Core Forest Focus Areas (i.e. LMUs within the top 20% of core forest index scores) is to assist in the inventory, management, maintenance, and monitoring of the most significant core forest tracts in the state forest system and to conserve the ecological values associated with interior forest conditions and unfragmented landscapes.

While the Bureau of Forestry manages for these values across the entire state forest system, Core Forest Focus Areas will serve as a means to ensure the appropriate balancing of these values in landscape-level forest management decisions. As such, special management guidelines will apply to these Core Forest Focus Areas. The following preliminary guidelines will guide the development of expanded management guidelines during the planning cycle.

Preliminary Guidelines

1. No permanent conversion of forest land will occur in these areas, including roads, pipelines, recreational parking lots, natural gas infrastructure pads, and other activities that permanently convert forest to non-forest.
2. The most restrictive, underlying Management Zones still apply in Core Forest Focus Areas. Wild and Natural Area guidelines apply in designated areas. Timber harvesting and other active management that does not involve permanent conversion is allowed per Management Zoning.
3. The temporary disturbances associated with timber harvesting and other forms of habitat management are allowed per state forest Management Zoning. Special consideration should be given in Core Forest Focus Areas to reducing the amount of haul roads, ensuring appropriate restoration, and maintaining closed canopy conditions in haul road corridors.
4. Where the Bureau of Forestry does not own mineral rights beneath Core Forest Focus Areas, it will work cooperatively with operators to avoid forest conversion.
5. When possible, the Bureau of Forestry will strategically purchase and/or exchange real estate interests to protect Core Forest Focus Areas where mineral rights are currently severed.
6. The Bureau of Forestry will consider, when available, acquiring key tracts that ensure connectivity of and expand and protect existing Core Forest Focus Areas.
7. The Bureau of Forestry will continually monitor the status of Core Forest Focus Areas. Deviation from these guidelines requires a State Forest Environmental Review and state forester approval.

8. The Bureau of Forestry will identify regionally important core forest Landscape Management Units. In these identified landscapes, long-term management goals and conditions will emphasize the promotion core forest conditions. When balancing uses and values in these landscapes, management decisions and plans will favor the promotion of these values.

The core forest analysis was based on the density of fragmenting features within a given area, which includes roads, pipelines, well pads, certain large rivers (large enough to show up on NLCD), etc. Based on fragmentation of an LMU, each LMU was given an index score between 0-100, representing the density of fragmenting features with a higher score representing a less fragmented area. As expected, all of state forest land across the state scored very high relative to more developed areas of the state. Because the scores were very similar, a rank/percentile was assigned to each LMU based on their Core Forest Index relative to all other LMUs.

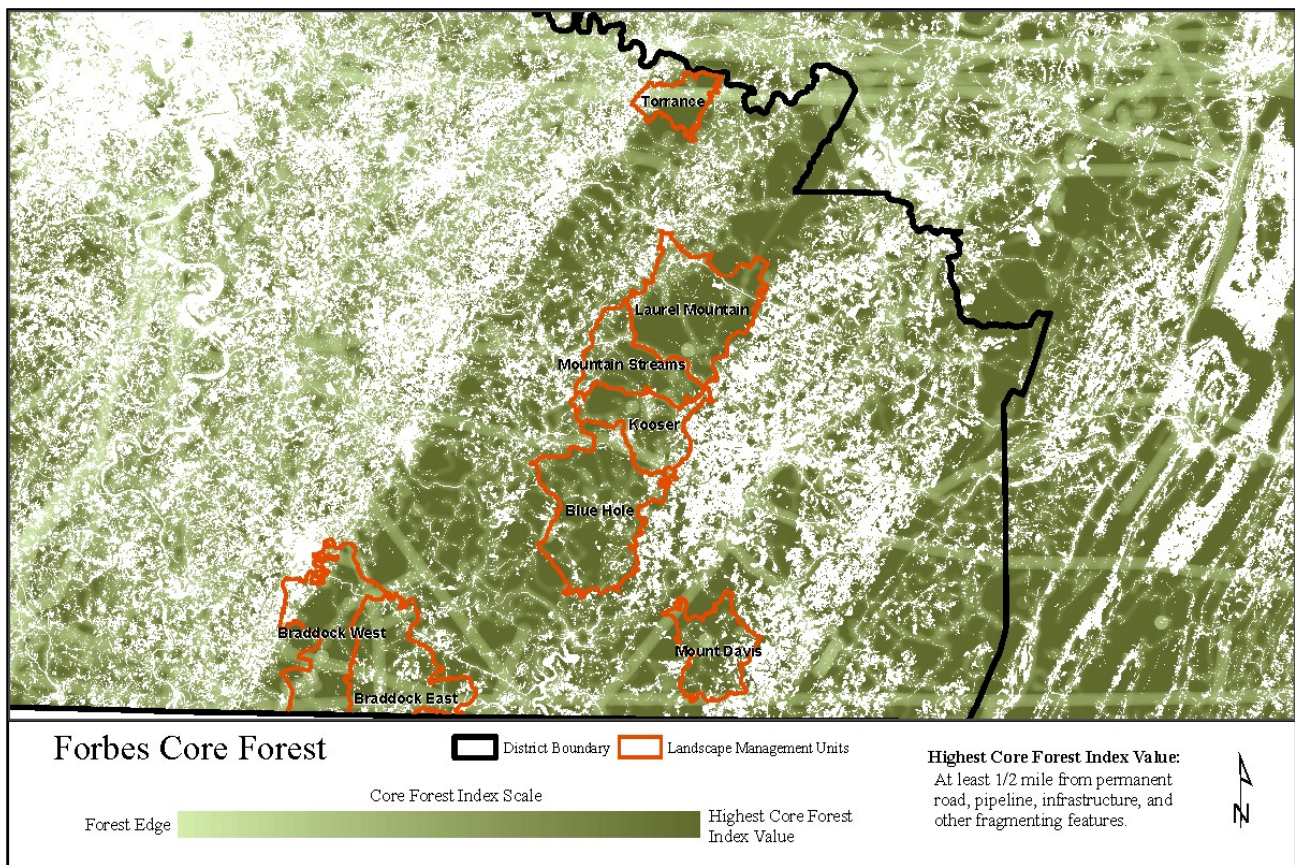


Figure 15-3. Map of core forest index in the region of Forbes Forest District.

Table 15-3. Core forest index value for state forest land in this forest district by LMU. The core forest index is a rating value out of 100 that expresses the proportion of the area within the LMU that is increasingly far away from dense areas of fragmenting features. The yellow highlighted LMUs are Core Forest Focus Areas (i.e. LMUs within the top 20% of core forest index scores state-wide).

LMU Name	Statewide Percentile	Core Forest Index Value
Torrance	96%	98.42
Kooser	72%	96.48
Braddock East	55%	95.29
Braddock West	50%	94.93
Laurel Mountain	38%	94.19
Blue Hole	35%	93.95
Mountain Streams	31%	93.56
Mount Davis	14%	89.43

In order to address Core Forest, Fragmentation, and Connectivity Objective 1.5 (pg. 38, SFRMP 2016), the top 20% of LMUs in terms of core forest index received the standard Core Forest Priority Goal as one of their LMU goals. Goals were kept intentionally broad so that they apply across SFL. Districts could further tailor the goal to address their specific plans for any Core Forest-related values in the LMU. For more discussion of Core Forest focus areas (LMUs) see the 2016 SFRMP, pgs. 34-38.

Supras

Supra means “above” or “over” or “beyond the limits of.” Some extensive areas of state forest should be managed to promote certain resources or values. These areas have discrete boundaries that may cross management zones, LMUS, and forest districts. Supra management area designation is best suited for areas that are large, require a specific management plan, or have certain management restrictions. Supra management areas can focus management on single or broad resource values, depending on the management context.

While no specific supra management areas are currently identified or delineated in Forbes State Forest by the Resource Planning Section or the local forest district two potential supra management areas may include portions of the Forbes State Forest encompassed by the Chestnut Ridge/Laurel Ridge Pennsylvania important mammal area (IMA) and the Forbes State Forest/Mt. Davis Section IMA as defined by the PGC. These areas encompass approximately 500,000 acres of both public and private lands. Characterized by heavy deciduous forest cover and steep hillsides, these IMAs provide habitat to several unusual or special concern mammals. Roaring Run Natural Area is a focal site of the Chestnut Ridge/Laurel Ridge IMA.

Other potential supra management areas may include Important Bird Areas (IBA) as delineated by The National Audubon Society. Several important bird areas have been identified throughout southwestern Pennsylvania on public and private lands and include portions of Forbes State Forest. Important bird areas promote proactive habitat conservation for the benefit of birds and biodiversity.

16) Ownership and Population Centers

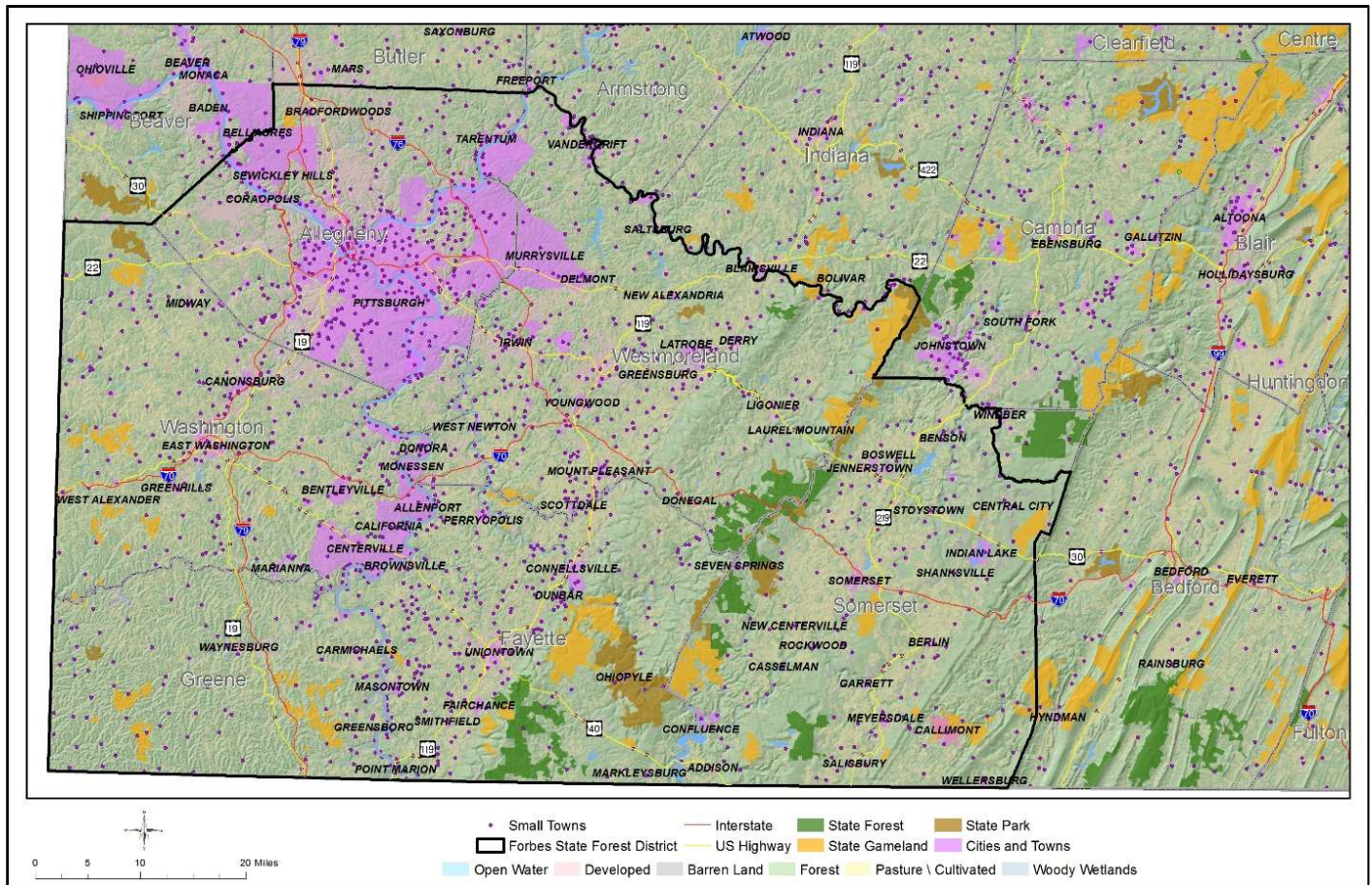


Figure 16-1. Map of public lands, population centers, and land use types (aggregated from National Land Cover Database).

As illustrated in Figure 16-1, within the Forbes Forest District, the largest population center is made up of Pittsburgh and its surrounding suburbs. Most of the population in the forest district resides in Allegheny County (60%) with neighboring Westmoreland (18%) and Washington (10%) Counties ranking as second and third most populated. Outside of Pittsburgh's sprawl, cities with a population above 10,000 include Greensburg, Westmoreland County; Washington, Washington County; and Uniontown, Fayette County. Most of the state forest land is in the eastern portion of the Forbes Forest District, while most of the district's population resides on the western side of the district. This means most of the population travels at least an hour by car to utilize the state forest land.

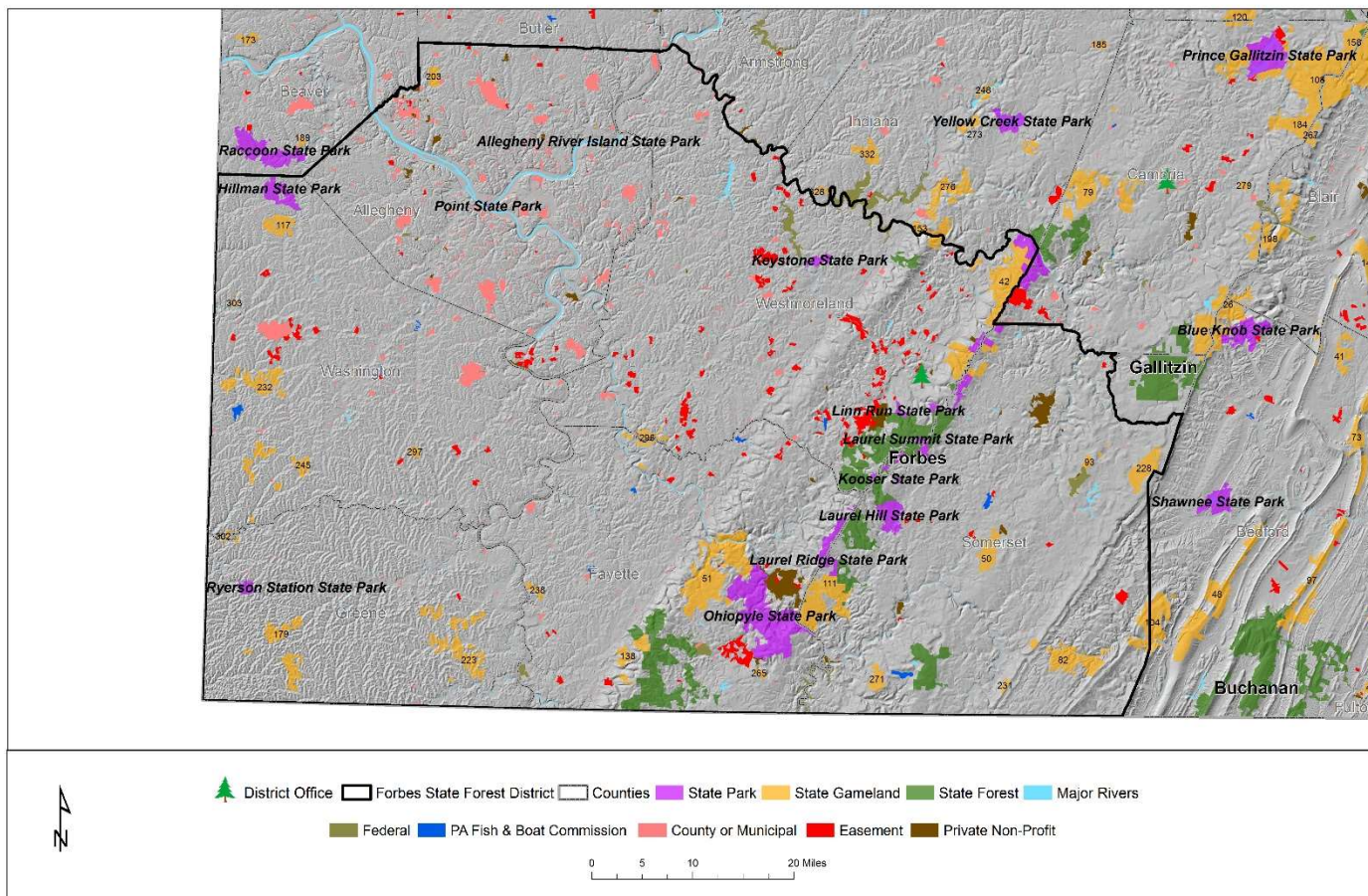


Figure 16-2. Public lands within entire Forbes Forest District.

Table 16-1. Acreages of various types of conserved land in Forbes District.

Land Ownership Type	Acres
State Forest	59,498
State Parks	43,270
State Gamelands	95,476
Federal	10,354
Local/Municipal	3,884
Conservation Easements	28,330
Total Acres	240,813

Public lands in the district are made up by the Forbes State Forest and several state parks along Laurel and Chestnut Ridges with state game lands and municipal parks scattered throughout the district.

The Forbes State Forest contains a little over 60,000 acres. The many state parks and state game lands combine to cover 73,000 acres in the district.

Conservancies, the most notable of which is Western Pennsylvania Conservancy (WPC), also hold land for conservation within the district. WPC holds two nature reserves within the district, Beechwood Farms Nature Reserve located in Allegheny County and Bear Run Nature Reserve in Fayette and Somerset Counties.

Additionally, in Allegheny, Westmoreland, and Washington Counties, county parks make up large areas of conserved land. Washington County has 5,500 acres within their park system, Westmoreland County has over 2,000 acres, and Allegheny County Parks cover over 12,000 acres.

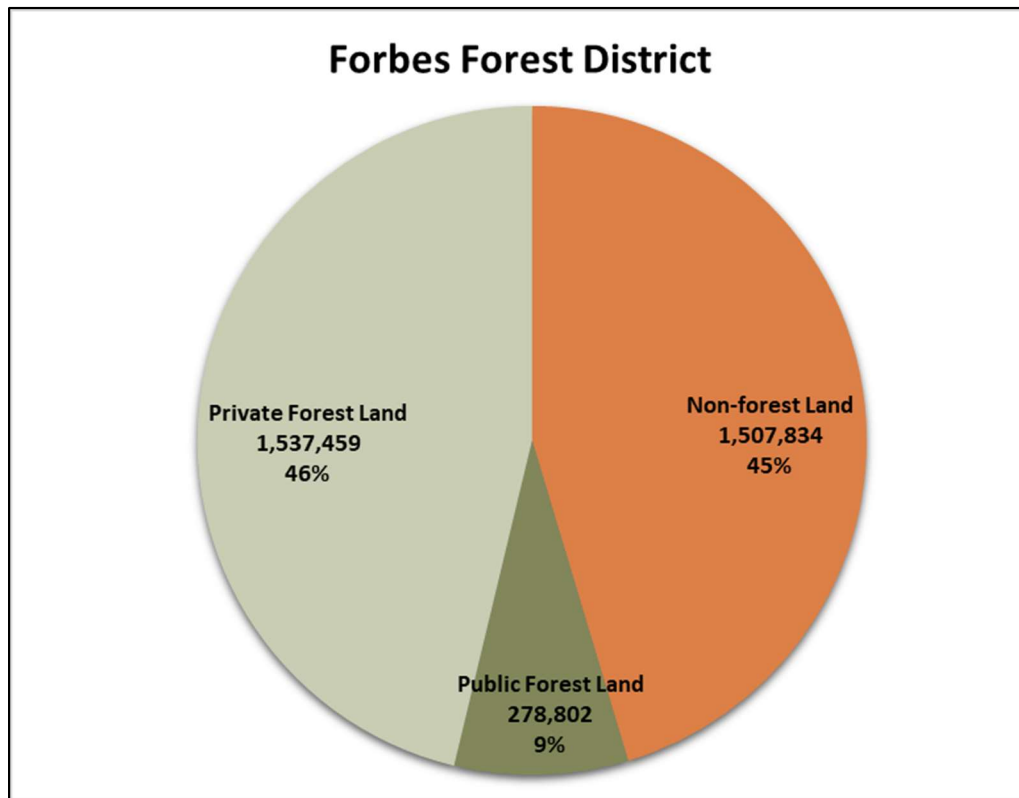


Figure 16-3. Percentage of total acreage within Forbes Forest District that is forested vs. non-forested and the ownership breakdown of the forestland (public vs. private), (based on US Forest Service FIA plot data: <https://www.fia.fs.fed.us/>).

There is about as much forest land as non-forest land in the Forbes Forest District. There are lots of developed, urbanized areas around Pittsburgh and Allegheny County, northern Washington County, and eastern Westmoreland County. The more undeveloped, rural areas in the district include western Westmoreland, Greene, Fayette, and Somerset Counties.

Most of the forestland in the district is owned by non-industrial private land owners in smaller acreages. However, there are sizeable areas of public lands, including state parks, state game lands, and the Forbes State Forest that provide many opportunities for the public to enjoy.

Within the district, there is also a diverse mix of urban and rural populations. Table 16-2. below illustrates the difference by county with Allegheny County as the most urban population and Somerset County having the highest percent rural population based on the 2010 Census definitions of urban and rural populations.

County	Total Population	Urban Population		Rural Population	
		Total	Percent	Total	Percent
Allegheny	1,223,348	1,192,932	98%	30,416	2%
Fayette	136,606	71,175	52%	65,431	48%
Greene	38,686	12,831	33%	25,855	67%
Somerset	77,742	22,699	29%	55,043	71%
Washington	207,820	143,760	69%	64,060	31%
Westmoreland	365,169	272,549	75%	92,620	25%

Table 16-2. Table of population by county including a breakdown of urban vs. rural population (aggregated from 2010 Census Data).

Because ecological processes ignore political boundaries, an ecosystem management approach to state forest land requires forest managers to look beyond state forest land boundaries when making management decisions. To practice ecosystem management, the Bureau of Forestry must consider the nature and character of adjoining lands when managing state forest lands. This approach requires partnerships between agencies, municipalities, private landowners, and other publics.

Forbes State Forest Adjoining Land Issues

- Land Acquisition Opportunities with Significant Ecological, Recreational, or Administrative Values
 - It is the policy of the Bureau of Forestry to acquire lands that expand public recreational opportunities, reduce administrative costs, protect the wild character of existing state forest land, and conserve biodiversity. The Forbes Forest District will pursue the acquisition of inholdings, indentures, and other lands that are considered important additions to the state forest system on a willing seller/buyer basis.
- Activities on State Forest Land Affecting Adjoining Lands
 - Most activities occurring on the Forbes State Forest have the potential to ecologically, economically, or otherwise affect adjoining land. The perceived effects could be positive or negative in nature. The Forbes Forest District will consider these effects when planning future activities on state forest land.
 - The existence of the Forbes State Forest and activities on it can have several positive effects on adjoining properties. Economic activity is sometimes stimulated by the sale of wood products and by recreational activities on the forest. Adjoining properties are protected from commercial or residential development along their border with the forest. Adjoining and nearby property owners have additional acreage available for hunting, bird watching, gathering of products such as fuelwood, berries and mushrooms and a variety of other recreational pursuits.
 - On the other hand, adjoining state forest lands block the possibility of expanding private holdings. The sale of wood products can result in noise and increased use of local roads for heavy hauling and can temporarily change the appearance of the area. State forest recreationists can also increase traffic and noise. In addition, users of the state forest will sometimes purposely or by accident stray unto adjoining private property. Wildlife such as deer can damage gardens shrubbery and farm crops belonging to adjoining land owners.

- Activities on Adjoining Lands Affecting State Forest Land
 - Most activities occurring on adjoining land have the potential to ecologically, economically, or otherwise affect the Forbes State Forest. The perceived effects could be positive or negative in nature. The Forbes Forest District will consider these effects when planning future activities on state forest land.
 - Residential and second home sites are rapidly being developed on land adjoining the Forbes State Forest. Such development can reduce the “wild” character of the forest. It can lead to increased recreational use: legal such as hiking and bird watching and illegal such as use of snowmobiles and ATVs in undesignated areas. The threat of wildfires and invasive plants entering the state forest is also increased. In some cases, developments along state forest roads results in increased traffic and demands for snow removal and higher standards of road maintenance. Litter and trash dumping on the state forest may also increase.
 - In places where access to the state forest has traditionally been thru private land it is becoming increasingly difficult to gain permission to cross. This affects the sale of wood products as well as recreational uses such as hiking and hunting. Posting of adjoining property against hunting in general or doe hunting, can create deer havens and increase damage on state land.
 - Buildings constructed close to state forest boundaries often result in use of the forest being restricted by safety zones and a need to move recreation trails deeper into the forest to prevent conflicts and protect the “wilderness” experience of people using them. This construction also leads to increasing the risk of hazard trees falling and damaging property and using the State Forest as a convenient place to dispose of trash.

17) Economy and Forest Products

Forbes Forest District Economy

The economy of the Forbes Forest District in Southwestern Pennsylvania is based on a unique mixture of mining, quarrying, oil, gas extraction, timber, agriculture, outdoor recreation, manufacturing, utilities, and healthcare. Resource extraction provides significant employment opportunities throughout the Forbes Forest District. Coal mining and steel production were by far the most important industries of the past that once required considerable amounts of wood, but no longer make a big demand on forest products.

Land use, and therefore impacts to local economies, in the Forbes Forest District can be broken down into specific regions. The Laurel Highlands in the far eastern part of the district includes Somerset County which has many traditional dairy and beef farms along with being one of Pennsylvania’s leading producers of maple syrup and maple sugar products.

The vast forests along Laurel and Chestnut ridges in Westmoreland, Somerset, and Fayette Counties grow high quality timber that contribute significantly to the local forest products industry in the district. The timber harvested from the Forbes State Forest helps feed the worldwide demand for high quality timber products, including export logs. The 133,000 acres of public lands along these ridges, including the Forbes State Forest, several state parks, and state game lands, draw thousands of recreating visitors yearly who contribute to local economies. Outdoor recreation and tourism has become one of the most important industries in the area and is very dependent on forest land, both for adventure sports and for hunting.

Per the Pennsylvania Visitor Use Monitoring (VUM) research conducted by Penn State University and the USDA Forest Service for the period of October 1, 2012 to September 30, 2013 the primary activity (most important purpose for visiting) the Forbes State Forest was Hiking and walking (31%), cross-country skiing or snowshoeing (14%), hunting (9.8%), driving (8.8%), viewing natural features (8.5%), mountain biking (5.2%), and snowmobile (4.7%). 58% of visitors spent money within 50 miles of the forest. 33% spent money at restaurants and bars, 31% spent money on gasoline and oil, 22% spent money on groceries, and 8% percent spent money on lodging. The average amounts of money spent (among all visitors) was \$88.88 per visitor.

Agriculture, particularly in Greene, Somerset, Westmoreland, and Washington Counties, is an important part of the local economy. Washington County ranks fifth in the state with sheep and goat production and continues to be one of the top natural gas producers in the state. Greene County is a myriad of forested hollows and rolling hills, pastureland, and abandoned farmland and produces the most bituminous coal in the state along with a lot of natural gas production from Marcellus Shale.

In the western part of the district, the largest population center is made up of Pittsburgh and its surrounding suburbs. The Forbes Forest District has a population of approximately two and one-half million people. Most of the population in the forest district resides in Allegheny County (60%) with neighboring Westmoreland (18%) and Washington (10%) Counties ranking as second and third most populated. The economy of Allegheny County specializes in mining, oil, gas extraction, finance and insurance, and utilities. The largest industries in the county include healthcare and social assistance, retail trade, and educational services.

Timber Products Industry in Southwest Pennsylvania

The research completed in 2007 on the *Economic Impact and Timber Requirements of the Wood Industry in Pennsylvania* for the Pennsylvania Hardwoods Development Council, states that the total economic impacts generated by Pennsylvania's wood industry were \$18.4 billion. This includes those individuals employed, their salaries, along with those economic groups that benefited from this industry such as trades, finances, real estate, transportation, and warehousing.

For the first time since the 1990's, the Bureau of Forestry conducted a Timber Product Output Survey (TPO) in 2013 among Pennsylvania's primary wood processing facilities, collecting information that reflects current characteristics of the wood products industry in the state. More information on the wood products industry in PA and reports from the Pennsylvania Timber Products Output Survey can be found at:

<http://www.dcnr.pa.gov/Business/ForestProducts/Pages/default.aspx>

Over 430 known primary wood processors were contacted across 62 of Pennsylvania's 67 counties. 312 facilities participated in the survey for a 73% statewide participation rate. More than 68% of the 41 known facilities in the 12 county Southwest Region participated in the survey. Here are some findings from the TPO Survey in the Southwest Region.

Table 17-1 – Total volume (lumber dimension, pulp/chips, exports) by PA county of origin (i.e. where harvested)

County of Origin	Volume (million cubic ft.)
Somerset	2.9
Fayette	1.3
Westmoreland	1.2
Greene	0.4
Allegheny	0.3
Washington	0.2

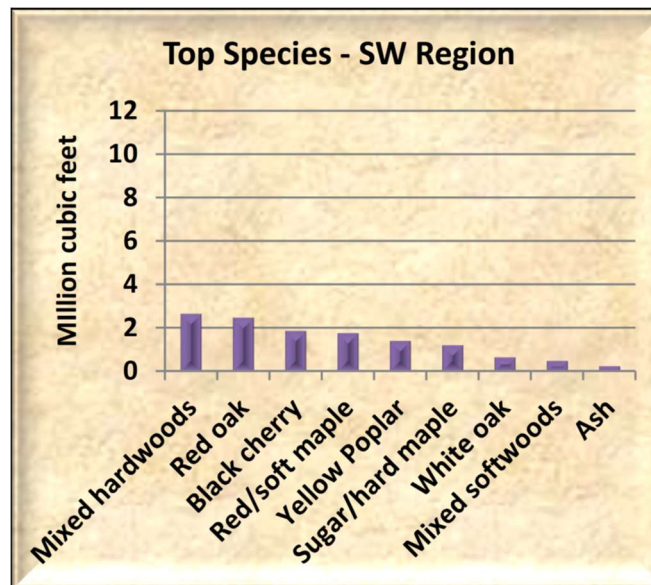


Figure 17-1 – Top species harvested from the Southwest Region with the highest reported volumes processed during 2012.

The Forbes Forest District has many sawmills that produce high quality dimensional lumber for furniture, flooring, cabinets, and housing. There are also some secondary wood processors who kiln-dry rough lumber and produce a variety of wood products. There are several small plain sect owned sawmills in southern Somerset County producing rough lumber and fuelwood. Third party certification has increased demand for low quality forest products on state forest lands. This has improved options for treating poor growing sites with minimal board foot per acre volumes and low-quality timber. Lower quality timber harvested from state forest lands to make forest products such as pulpwood, pallets, fuelwood, and biomass can be marketed as wood from sustainably managed forests. The demand for pallets remains steady since most pallets are one-use items. Log exports have also become a major marketing point for local forest products businesses. The Chinese and European demand for high-quality hardwood logs has been consistent over the last several years.

The 2008 recession in the United States impacted the timber industry, resulting in lower demand for wood products across Pennsylvania. In return, many small and medium sized sawmills found themselves unable to stay afloat, forcing them to close. However, in the past decade, timber prices have steadily rebounded as demand increased for the district's high-quality hardwoods, primarily oak and yellow-poplar. For the most part, the Penn State University ten-year price trends for southwest Pennsylvania reflect this upward trend from the period 2007 – 2017.

Annual average increase/decrease:

Mixed Oak	+ 5.21%
White Oak	+ 5.05%
Yellow-Poplar	+ 4.96%
Red Oak	+ 4.49%
Red Maple	+ 0.74%
Sugar Maple	- 0.32%
Black Cherry	- 6.44%

*Percentages taken from Penn State's Timber Market Report, Timber Prices: 10 Year Trends for Southwest Pennsylvania

The mission of the Bureau of Forestry states that state forest lands be managed to provide a sustained yield of high-quality timber and other wood products. Successful and timely regeneration of diverse forest communities will be promoted on state forest lands. The management of state forest lands will demonstrate and promote silvicultural practices that sustain ecological and economic forest values. It will be a main goal of the Forbes State Forest to continue to provide economic and social benefits through a sustained yield of forest products.

From 2013-2017, the Forbes Forest District sold 15 timber sales with 7,332,000 board feet of sawtimber and 280,800 cubic feet of pulpwood on state forest land to local timber buyers and sawmills for a total of \$2,018,117 pumped into the local economy.

18) Recreation

The Forbes State Forest offers opportunities for a variety of recreational uses including; picnic areas, scenic drives and vistas, hunting, fishing, camping, and trails for hiking, mountain biking, horseback riding, snowmobiling, and cross-country skiing. For more information on all the recreational activities available in the Forbes State Forest:

<https://www.dcnr.pa.gov/Recreation/WhatToDo/Pages/default.aspx>

The large land area of Forbes State Forest provides many opportunities for low-density outdoor recreation. Trails vary from narrow, rocky, and winding single-tracks to wider trail corridors with smoother tread surface, to even wider and gated administrative roads.

The Forbes State Forest receives extensive recreational pressure due to its proximity to major metropolitan areas. We are just a few hours' drive from population centers in Pennsylvania, Virginia, Ohio, Maryland, and Washington DC.

The Forbes is the largest public land base in the Laurel Highlands. We are uniquely positioned to provide recreation and provide continuity to other private and public partners. These partners include Linn Run State Park, Laurel Summit State Park, Laurel Ridge State Park, Laurel Hill State Park, Kooser State Park, Ohiopyle State Park, state game lands (42, 111, 51, 138), Seven Springs and Hidden Valley resorts, Laurel Caverns, Nemacolin Woodlands, Fort Necessity National Battlefield, and other entities. The Laurel Highlands Hiking Trail, a National Scenic Trail, passes through 15 miles of the Forbes as it meanders its way from Ohiopyle State Park to Seward. The Whitetail Trail in Fayette County starts on state forest, crosses through state game land 138, then crosses back onto state forest and terminates in the Quebec Run Wild Area.

Forbes State Forest provides four season recreation due to its location along the Laurel Ridge, Chestnut Ridge, and Mount Davis. The trail system is used by summer and winter enthusiasts alike.

Visitor Use Monitoring (VUM)

A year-long Visitor Use Monitoring (VUM) study was completed in August 2014. This study was a joint effort between The Pennsylvania State University, and the US Department of Agriculture - Forest Service. The study used visitor surveys to determine where our visitors were travelling from, how long they were staying, the purpose of the visit to state forest, how much they spent during the trip, and other factors. It also measured overall recreation use and specific visitation patterns including the number of visitors and vehicles. It identified visitor expectations and levels of satisfaction with various aspects of their visit. The report is very detailed. Below are some highlights from the report:

- The Forbes State Forest receives over 121,000 recreational visits a year – defined as one person entering and exiting the state forest for recreation. These same visitors used multiple recreation sites on the state forest during their visits.
- It was estimated that over 350,000 people (in addition to those listed above) visited the state forest for sightseeing.

- Most visitors were repeat visitors to the Forbes (88%).
- Most visitors came as families (42%) with smaller proportions of groups of friends. About 20% of visitors came to the forest by themselves.
- Most visitors (87%) were day users.
- Age of visitors was evenly divided, with an average visitor age of 46. Most (75%) were male. Almost all (94%) reported their race/ethnicity as White/Caucasian.
- The primary activity which most visitors listed as the most important purpose for visiting, was hiking and walking (31%). Other visitors listed cross-country skiing or snowshoeing as most important (14%), hunting (9.8%), driving (8.8%), viewing natural features (8.5%), mountain biking (5.2%) and snowmobiling (4.7%).
- When asked to rate the top reasons for visiting the Forbes the most important reasons were to be outdoors, experience natural surroundings, to relax, and to get away from crowds. Coming in second were physical exercise, family and friend recreation, challenge, and to build skills.

Trails and Roads

Trails and roads form the basis of most recreational pursuits in the state forest. The Forbes State Forest features over 100 trails and roads, totaling over 321 miles, open to many forms of recreation. Major uses include hiking, mountain biking, horse riding, snowmobiling, cross-country skiing, snowshoeing, backpacking, and many other forms of recreation.

Large inter-connecting trail systems can be found in the Laurel Highlands Trail System, Roaring Run Natural Area, and Quebec Run Wild Area.

All trails and roads can be found on our local use maps, located on the webpage or through mail. A current list of these maps available include Blue Hole Division/Barron Tract, Bob Ache Memorial Forest, Laurel Highlands Trail System, Lick Hollow Area/Whitetail Trail, Mountain Stream Trail System, Mt. Davis Area, Northwood's Trail System, Quebec Run Wild Area, and Roaring Run Natural Area.

Major Recreational Uses

Hiking

More than 277 miles of trails and gated roads suitable for hiking traverse the Forbes State Forest. Shared used trails (red blazed), cross-country ski trails (blue blazed), foot-travel only (yellow blazed), and gated state forest roads are popular for hiking.

Horseback Riding

Horses may be ridden on most of the state forest roads and trails, except state forest natural areas and the Laurel Highlands Hiking Trail. Some trails are not suitable for riding due to limited clearance and steep or rocky terrain. Riders are generally directed to gated dirt and gravel roads.

Mountain Biking

Mountain bikes may be used on most roads and trails in Forbes State Forest. Only state forest natural areas and the Laurel Highlands Hiking Trail are closed to this activity. The degree of difficulty ranges from beginner to expert.

Hunting and Trapping

Hunting for deer, turkey, grouse, squirrels, rabbits, and black bear is popular. Deer are generally the most sought-after species. The pursuit of black bear continues to be popular, as bears are common throughout the state forest. Other than a few safety zones around buildings and picnic areas, hunting and trapping are permitted throughout the state forest.

Fishing

Cold-water fishing is popular in many streams including Blue Hole Creek, Jones Mill Run, Mill Run, Quebec Run, Linn Run,

Roaring Run, Camp Run, Laurel Hill Creek and Indian Creek. A 1.6 mile delayed-harvest area has been established on Indian Creek.

Camping

Except for a few areas, the state forest is open to primitive backpack camping. There are also six designated motorized camping sites. These sites are set so a camper is near their vehicle. Up to date information on camping in the Forbes is found in our *Camping* brochure. Thirteen state forest leased campsites exist in the Forbes State Forest.

Picnicking

Two picnic areas are found in the Forbes. The Mt. Davis State Forest Picnic Area is located along Route 2004, northeast of the high point. Facilities include a pavilion, picnic tables, latrines, and stone and modern grills. Lick Hollow State Forest picnic area is located along Route 40 near Hopwood. At this picnic area are picnic tables, grills, and latrines. Other impromptu spots are used by visitors.

Cross-Country Skiing

Blue-blazed trails are maintained for cross-country skiing. These trails generally are wider and have a smoother surface compared to other trails. A total of 25 trails in the Forbes State Forest are maintained primarily for cross-country skiing. The North Woods Trail System has wider, groomed trails while the Laurel Highlands Trail System has more narrow and winding trails. The Laurel Mountain warming hut and Schafer Run warming hut are located within these two trail systems. Both warming huts are complete with picnic tables and a wood stove.

Snowshoeing

Snowshoeing has become increasingly popular throughout Forbes. Snowshoers can travel the many trails in the forest or walk overland while avoiding groomed, cross-country ski trails.

Snowmobiling

Forbes State Forest grooms 115 miles which includes 40 miles of state forest trails, 38 miles of joint-use roads, and 37 miles of trails on Laurel Ridge State Park.

Points of Interest

There are many points of interest throughout Forbes, including natural, cultural, and historic features. More information can be obtained from the LMU section on page 57 or the District Interpretive Plan in the Appendix A.

- Wharton Iron Furnace – a well-preserved historic iron furnace located north of Ellitsville, with interpretive panels. It is on the National Register of Historic Places
- Cole Run Falls – a short distance off Cole Run Road in the Blue Hole Division.
- Blue Hole – a deep spot in Blue Hole Creek named for its azure waters.
- Spruce Flats Bog – a rare high-elevation bog, 28 acres in size, near Laurel Summit State Park.

Sightseeing

Visitors use the network of dirt, gravel and paved roads on the Forbes to see a variety of wildlife, trees, and wildflowers. Trails can lead visitors to scenic vistas, water features, and other natural points of interest.

Vistas

Throughout the state forest many man-made and natural vistas are found, including:

- Pine Knob – a sweeping view of Uniontown and points from West Virginia to Pittsburgh
- High Point Overlook – an Americans with Disabilities Act (ADA) accessible view of High Point Lake and the surrounding countryside.
- High Point Observation Tower – at the highest point in PA (3213 feet above sea level)

- Beam Rocks – a short hike from Laurel Summit Road offers a spectacular view east into Somerset County
- Wolf Rocks – one of the most popular trails in the Forbes leads to this beautiful view of the Linn Run valley.

Volunteers

DCNR Conservation Volunteers are people who care about protecting and enhancing our natural resources. People of all ages can participate in the program, which matches interests and abilities with appropriate outdoor projects. The Forbes State Forest maintains a database of those wishing to function as a volunteer. Since 2007 an organized group of conservation volunteers, known as the Laurel Mtn. Volunteer Group, has been helping to maintain the recreation infrastructure in the Laurel Mtn Division. This group is made up of the main recreational groups that use this area. Three volunteer field days are held each year, notice is sent out to all volunteers in our database. Many volunteers take advantage of these organized field days, but other volunteers tackle smaller projects on their own, with approval from the District Forester.

Americans with Disabilities Act Information

The Bureau permits persons with mobility disabilities to use powered mobility devices for purposes of accessing state forest lands. In some instances, these areas are not otherwise open for motorized access by the general public. Permits can be obtained through the Forbes Forest District Office by filling out a Powered Mobility Device Permit Form. Once the form is completed the district can provide the Orange Placard for the vehicle that is to be utilized, or the blue Mobility Device Permit Sticker for the mobility device that is to be utilized. Each individual should contact the district where they wish to utilize their permit. The mobility device permit allows for only the individual to utilize the mobility device. However, someone may be with the permittee to assist in opening gates and collection of game. No other person should be hunting from the mobility device, unless it is a juvenile hunter(s), (up to three) that the permittee is mentoring. A list of areas where permits may be utilized and are not permitted can be found on the back of the Mobility Device Permit, on the Forbes State Forest Powered Mobility Device brochure, or by contacting the district office. Violations of the permit may result in the permit being terminated.

Planned Group Use and Events

One of the key policies in place to sustain “low density, dispersed recreation” within the state forest system is the requirement that any planned event by parties of ten or more individuals need to secure a Letter of Authorization (LOA) from local district managers prior to engaging in the event. Securing a LOA requires that the event organizer fill out a risk assessment form to identify potential types of risk to participants or other forest users resulting from the event and to sign and indemnification form freeing the Commonwealth from liability. For larger events, or events that charge a participation fee, a Special Activities Agreement (SAA) or Commercial Activities Agreement (CAA) is required which is a contractual document reviewed and approved by the Attorney General’s office.

Recreational Opportunity Spectrum (ROS)

Recreation Opportunity Spectrum (ROS) is an inventory system built on the premise that people expect certain types of recreational experiences on public land, and that land managers should be able to direct people to appropriate places for those experiences. To determine appropriate recreational opportunities, experiences, and uses of public lands, land managers need a systematic and consistent inventory and assessment as part of the long-range planning process. ROS allows the land manager to provide recreational opportunities across a spectrum, or continuum, of five land-use classes so that the user may find satisfying recreational experiences in a variety of recreation activities. The classes of ROS from the least developed to the most developed are Primitive, Semi-Primitive Non-Motorized, Semi-Primitive, Semi-Developed, and Developed.



Figure 18-1. Diagram of ROS categories and their characteristics.

The chart below (Figure 18-2) shows acreage of Forbes State Forest in relation to various categories of ROS. As you can see from the chart, very little of the Forbes State Forest contains land in the Primitive zone. Most the Forbes State Forest is categorized as ‘Other Zones’ which is Semi-Developed and Developed zones.

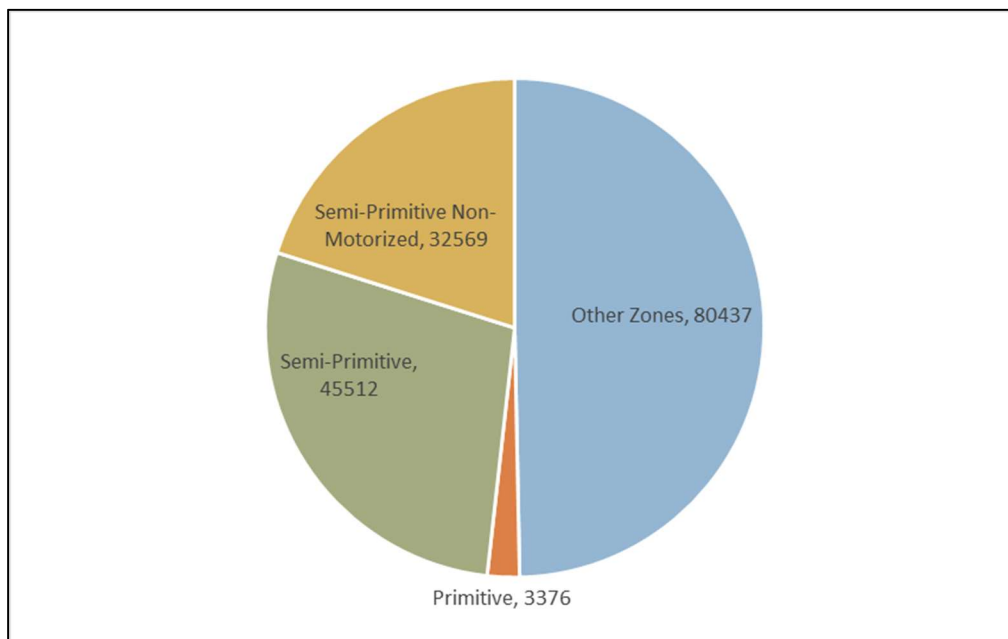


Figure 18-2. Acres of state forest land in this district by Recreation Opportunity Spectrum (ROS) classifications (2012). ROS is an inventory system developed by the U.S. Forest Service, to characterize land by types of recreation experiences. ROS is described on p. 42 of the 2016 SFRMP. “Other Zones” refers to Semi-Developed and Developed zones.

19) Communication, Education, and Interpretation

In addition to state forest lands, the Bureau of Forestry has Service Foresters whose purpose is to help educate private forest landowners and promote forest conservation on the over 70 percent privately owned forestlands in the Commonwealth. Forbes Forest District has three service foresters involved with our rural and community forestry program. Two foresters generally work with the rural component of the program and one forester generally works with the community component of the program. Service foresters are a free resource to the public and provide:

- advice on managing forests for a variety of benefits including timber production, wildlife habitat, recreation, water quality, and riparian benefits
- assistance with crop tree thinning, grapevine cutting, and other Timber Stand Improvement measures
- help determining which tree species are suitable for your planting site and objectives and provide instructions on seedling planting, care, and protection from deer browsing
- advice on controlling invasive species, landscape disease management, and forest pest identification
- programs and information on current forestry and natural resources topics to citizen groups, service clubs, schools and other organizations
- technical assistance about urban and community forestry to municipalities and organizations interested in
- advice and expertise on what type of timber harvest is best, and determine when you should harvest your trees

The bureau disseminates and receives information to and from various destinations via various channels. Recipients of bureau content include researchers, government agencies, the public, and various stakeholders. The bureau contributes articles for publications; it reports to government agencies and shares data with interested parties; and it develops educational content for broad use by the public. The bureau is also a source of unbiased, credible information on Pennsylvania forests and native wild plants, and it shares its data regularly.

Communication

Effective communication is vital to conservation agencies, where efforts are tied to resource stewardship on the parts of individuals and communities. The bureau employs effective communication and public outreach to foster stewardship and convey a message of environmental sustainability. Central to the bureau's communication strategy is to inform visitors and stakeholders about the timing and siting of management activities, the availability of various recreation opportunities, and the importance of forest resources. Bureau staff remain available to engage in thoughtful dialogue with stakeholders, to answer questions, field concerns, and provide information.

Education

Public education and outreach is an essential component of the bureau's mission. DCNR's enabling legislation mandates it to "promote forestry and the knowledge of forestry" throughout the commonwealth. The bureau's mission further states that it will accomplish this by "advising and assisting other government agencies, communities, landowners, forest industry, and the public in the wise stewardship and utilization of forest resources." This is especially important with youth. The bureau serves as the state sponsor for Project Learning Tree, an international forest education program. Most forest districts participate in numerous educational opportunities with stakeholders from Envirothon, to fire prevention and Smokey programs, to forest resource programming with schools.

Interpretation

Interpretation is as a mission-based communication process that forges emotional and intellectual connections between the interests of the audience and the meanings inherent in the resource. The bureau of forestry provides interpretive wayside panels located at various locations including trailhead parking areas, along trails, at district offices, and other areas of the high use by the public.

The Forbes Forest District takes an active role in communication, education, and interpretation through the following activities:

Communication

Media

- Web based - Most web-based communication with the public is conducted through social media and/or email.
- Social - Forbes State Forest has a social media presence through Facebook. District staff post updates on a weekly-basis.
- TV - Occasional media inquiries provide staff with the opportunity to share information with the public through local news television sources.
- Radio - Media interest in topics such as land management, fall foliage, workshops/events, and general forest information have been the highlight of radio interviews with local radio resources. District staff including managers, foresters, and environmental educators have and will continue to participate in radio-related media outreach on an as-requested basis.

Printed

- Newspapers - Local newspapers are utilized to highlight programming at Forbes State Forest, as well as to showcase projects or partnerships throughout the forest and surrounding communities.
- Brochures - Maps and other educational publications are provided to visitors in-house, as well as at several remote locations throughout the state forest. Publications are also available in a digital format online. Maps and publications are edited and reprinted on an average of every 3 years.
- Email distribution list - Service foresters and education staff keep an email distribution list to send notifications to potential participants about upcoming events sponsored or hosted by Forbes State Forest.

Public Contact/Engagement

- Fairs/expos/shows - Outreach events offer staff the opportunity to work closely with the public. Service foresters, environmental educators, forest rangers, and fire foresters often represent the Bureau of Forestry at outreach events such as the Allegheny Outdoor, Sport, and Travel Show; Earth Day Celebration at Winnie Palmer Nature Reserve; Arbor Day events; Fire Expo; Fayette County Fair; Mother Earth News Fair; and many more.
- Environmental education/interpretive programs - The environmental education specialist provides seasonal education opportunities from mid-February thru the end of October each year. Programs are offered to schools, scouts, general public, and special groups, ranging in topics from outdoor recreation education to the natural sciences.
- District office walk-in's - Clerical staff are often the first means of contact when the public visits the district office. Staff provides visitors with information about the state forest and/or answers questions.
- Career fairs - A number of staff have been involved in providing career information to high schools and colleges during career fair events. Urban forester staff now attends career fairs on a requested basis.
- Displays/exhibits - The forest has several areas that receives a large volume of visitation, and within these areas interpretive waysides and/or kiosks have been installed. These exhibits are often the only means of contact that visitors will have with forest staff, providing an important message about our resources.

Educational Presentations and Programs

Youth

- Envirothon - Service forester and environmental education staff is involved with the annual Envirothon competition, often offering study sessions prior to the competition, within Westmoreland, Somerset, Washington, and Fayette Counties. Service forester staff assist with the state competition.
- FFA/4H - Forestry staff offers programs to both the FFA and 4H on a request basis. Past programming opportunities have created successful partnerships with these organizations.
- Scouts - There is a large scout presence in communities surrounding Forbes, and staff takes program requests on a request basis from these groups. Eagle scouts have and continue to assist with various projects throughout the state forest including kiosk construction, bridge building, etc.
- Schools - Several partnerships exist between local school districts and Forbes' staff. Environmental education staff, service foresters, fire foresters, and management foresters work together to provide quality school programming on a request basis. Staff has and continues to work with preschool through college-age youth, as well as adult educators in both formal and informal settings.
- Fire Prevention/Smokey Bear - Fire forester staff plays a vital role in fire prevention education in communities that surround Forbes. Smokey Bear programs remain popular among schools, as well as at outreach events within the local communities.

Adult

- Project Learning Tree - Environmental education staff and service foresters are PLT facilitators, providing workshops to educators on an as-needed basis (to meet minimum facilitator standards). On average, one PLT workshop is offered per year among Forbes staff, often through a partnership with nearby state parks or other educational institutions.
- Woodland Owner Associations - Service foresters serve as technical advisors to Westmoreland Woodlands Improvement Association, Southwestern Pennsylvania Woodland Owners' Association and Laurel Highlands Forest Landowners Association.
- Forest Landowners - Service foresters act as the primary point of contact to promote sustainable forest management through a variety of services that include forestry education and outreach, silvicultural recommendations, public programs, forest insect and disease identification, and providing expertise on local forest markets.
- Urban Forestry/Tree City/Arbor Day - The Forbes Forest District service foresters provide technical assistance to communities and organizations in order to increase tree canopy in communities. Foresters assist communities in applying for TreeVitalize grant funding, developing shade tree programs, planning tree plantings and participating in the Tree City USA program.
- Volunteer Fire Departments - Fire forester staff provides courses and training for wildland firefighting to local VFDs within the area surrounding Forbes. Staff sometimes utilizes partnerships with VFDs to provide outreach at events.
- Public Libraries - Environmental education staff partners with local libraries to offer a variety of educational experiences for older adults.
- Non-profits - Forbes State Forest staff partners with nonprofit organizations to offer programming and/or educational materials to the public. Nonprofit partnerships include Tree Pittsburgh, Loyalhanna Watershed Association, Pittsburgh Parks Conservancy, Western PA Conservancy, Brandywine Conservancy, and many more.

Interpretation

- Interpretive Wayside Panels/Kiosks/Trails - Environmental education staff and the district forester are involved with seeking out funding opportunities and creating new interpretive wayside panels for the district. Maintenance staff assists with the installation of the panels, as well as the construction of the kiosks in which they are placed. Over 300 miles of shared-use trails and roads are maintained by maintenance staff, environmental education staff, district forester, volunteers, and the Youth Conservation Corps (YCC)/Pennsylvania Outdoor Corps (POC). The district's maintenance staff plays a large role in maintaining trails, in conjunction with the district forester. Trail assessments are seasonally conducted to help address trail needs and to make repairs and improvements.
- Demonstration Area - Service forester staff maintains a demonstration area within the Pondfield Division of Forbes to showcase common silviculture practices. The district office pollinator meadow showcases sustainable landscaping practices including planting native plants and establishing no mow areas.
- District office - Forbes district office offers interpretive brochures and maps for the public. The Bob Ache Memorial Forest offers a self-guided tree tour on the trails directly behind the office. Brochures are available at the district office. A pollinator meadow has been implemented into the landscaping at the district office. This new landscape attracts a variety of pollinators and provides habitat to other animals as well. This area is a part of a partnership opportunity that showcases other pollinator habitats within the Ligonier area.

Forbes State Forest Interpretive Goals:

- Encourage exploration and participation in low impact recreation within the Forbes State Forest.
- Create connections for sharing of information and resources between the state parks and forest within the Laurel Highlands, to present a complete interpretive picture for residents, visitors, schools, and partners.
- Foster awareness for the value of natural, cultural, and historic resources within Forbes State Forest, for recreation and economic development.
- Promote stewardship to residents and visitors through development of opportunities to become engaged in conservation issues.
- Encourage sustainable tourism and travel within public lands, local attractions, and local communities along the Laurel Ridge.
- Connect to the other state parks, state forests, and state heritage areas within the Laurel Highlands to promote consistent, sustainable recreational and interpretive opportunities for the region.
- Increase the public's knowledge of forestry and forest management practices.
- Increase volunteerism in the Forbes.
- Decrease vandalism to resources of natural, cultural, or historical value.

Refer to Appendix A for the complete District Interpretive Plan.

Landscape Management Unit Plans

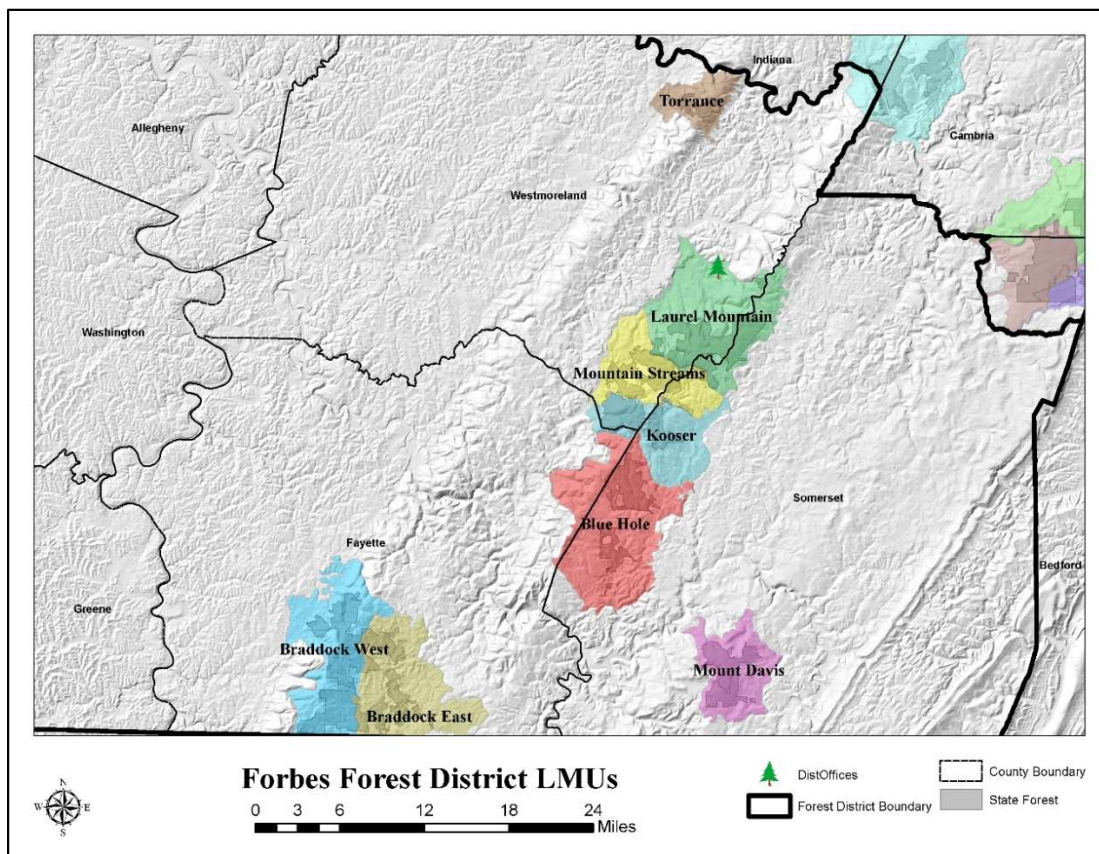
With the 2016 revision of the SFRMP, the bureau introduced the LMU concept to facilitate consistent, structured, and integrated resource management and planning across large landscape units on state forest and adjoining lands. LMUs were delineated for all state forest land in 2016-2017. The LMU, which complements other ecological delineations, now serves as the primary unit for landscape-level planning and management on state forest lands. LMUs help the bureau facilitate planning on a landscape scale that has ecological context, incorporate multiple forest uses and values, and promote ecological analysis. The units also serve as a tool to facilitate cooperative management with adjoining forest districts, landowners, and agencies. An explanation of how LMUs were delineated is found in the 2016 SFRMP on page 62.

The bureau has developed LMU Plans for every LMU containing state forest land. The LMU Plans for LMUs within Forbes Forest District are found below. Each LMU Plan contains three elements:

- **Overview** – a 1-2-page narrative describing the LMU and its important features;
- **LMU Priority Goals** – a list of points of emphasis for state forest land management within the LMU, like the District Priority Goals, but at the LMU level; and
- **Profile** – tables, charts, and accompanying text that more fully describe the LMU's characteristics.

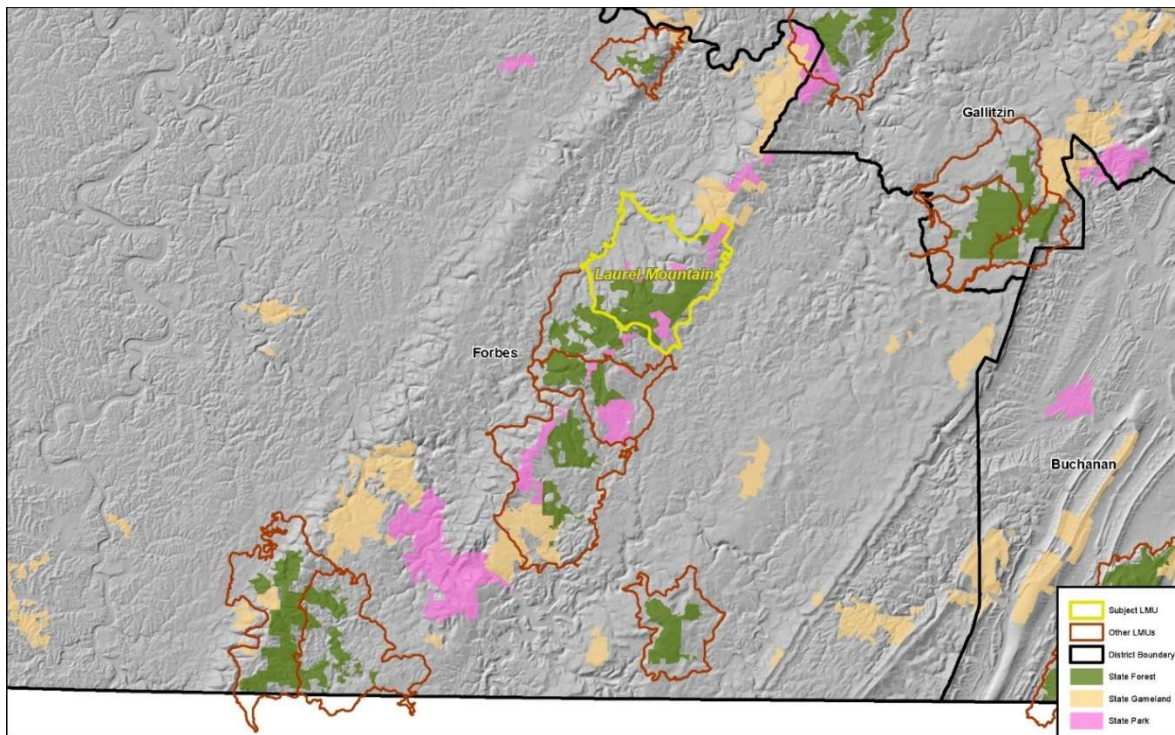
List of Landscape Management Unit (LMU's) in Forbes State Forest

- Laurel Mountain
- Kooser
- Mountain Streams
- Torrance
- Blue Hole
- Mount Davis
- Braddock West
- Braddock East



Laurel Mountain

Landscape Management Unit



Laurel Mountain LMU



Overview

The 40,023-acre Laurel Mountain landscape management unit is situated on Laurel Ridge in eastern Westmoreland and western Somerset Counties. Loyalhanna Creek forms the western boundary and drains the west slope of the Laurel Ridge in this LMU. 27% of the LMU is Forbes State Forest, and 3,655 acres (9%) is state park land, with the remaining acreage, and most of the LMU being private land. This LMU is within the Allegheny Mountain Ecoregion which consists of broad, rounded ridges separated by broad valleys.

Beginning in the late 1800s the forests of the Laurel Mountain LMU, which consisted primarily of old growth American chestnut, eastern white pine, eastern hemlock, and mixed oak, were clearcut to fuel the Industrial Revolution. Large uncontrolled wildfires followed, and forests regenerated to the mixed oak forests we see today. The initial state forest land acquisition in this LMU began in 1909, named the Westmoreland-Somerset Reserve at the time, the first state forestland acquisition in the Ohio River Valley.

The Laurel Mountain LMU is heavily forested (85%). Most forests are mature second growth mixed oak forests. Red oak is the most common oak species found throughout this LMU. Oak forests across this LMU are more mesic compared to many other oak forests in Pennsylvania, resulting in good timber production. Gypsy moth defoliation in the 1980/90s, and to a lesser extent 2007-08, caused significant mortality across this LMU. Fall cankerworm defoliations during the summers of 2007-2015 caused significant mortality in the Laurel Mountain LMU and on state forest land north of US Route 30.

This LMU provides excellent options for forest management due to good quality growing sites and accessible terrain. Recent timber management activities focus on shelterwood and overstory removal harvests, as the Bureau of Forestry implements its long-term sustainable forest management plan, with a primary goal being to balance the forest age classes across the state forest land system. Regeneration projects including deer exclosures, herbicide applications, prescribed fires, and tree plantings have been used to secure desirable regeneration as necessary. Natural gas development has been minimal, with a few shallow gas wells dotting the LMU. A People Natural Gas transmission pipeline bisects this LMU. The Laurel Highlands hiking trail, a National Scenic Trail, travels atop Laurel Ridge and bisects this LMU. This trail is administered by the Bureau of State Parks, as it crosses multiple land ownerships. Beam Rocks and Wolf Rocks are interesting rock outcrops in this LMU that draw many forest visitors. An extensive 65-mile multiple use trail system is maintained by the Bureau of Forestry. This trail system provides four season recreation for a diverse group of outdoor recreationists. The Laurel Mountain Volunteer Group is an active partner of the Bureau of Forestry in the stewardship of this trail system. The Laurel Summit Nordic Ski Patrol has provided services in this LMU for decades. Unique and important plant communities can be found through this LMU but more specifically in two Wild Plant Sanctuaries designated by the Bureau of Forestry. Spruce Flats Bog is a rare high-elevation bog in the heart of this LMU.

Priority Goals

- Continued implementation of the 200 ft. no cut, except for human safety, forested aesthetic corridor on each side of the Laurel Highlands Hiking Trail.
- Maintain and enhance two wild plant sanctuaries.
- Maintain and enhance recreational opportunities, while reducing user conflict from competing interests.

- Maintain Beam Rocks, Wolf Rocks and Spruce Flats Bog for the unique wildlife habitat and recreation opportunities they provide.
- Continue to fix eroded and muddy trails while seeking to find innovative ways to appease different user groups.
- Limit trail building in this high trail density area to needed connections.
- Continued partnership with the Laurel Mountain volunteer group and Laurel Summit Nordic Ski Patrol.
- Monitor and control destructive insect populations and invasive plant species when necessary.
- Continue working with research partners.
- Continued partnership with adjacent State Parks – Refer to the administrative transfer agreement.
- Manage and administer oil and gas activity in a manner that is consistent with the Bureau’s mission statement and the principles of ecosystem management by avoiding, minimizing, or mitigating adverse impacts to state forest land, ensuring compliance with executed agreements, and maintaining positive working relationships with severed rights owners.

Profile

Table 1. LMU acreage: total and state forest land only.

	Acres
State Forest Land	10,937
LMU Total	40,023

Ecoregion: Allegheny Mountain

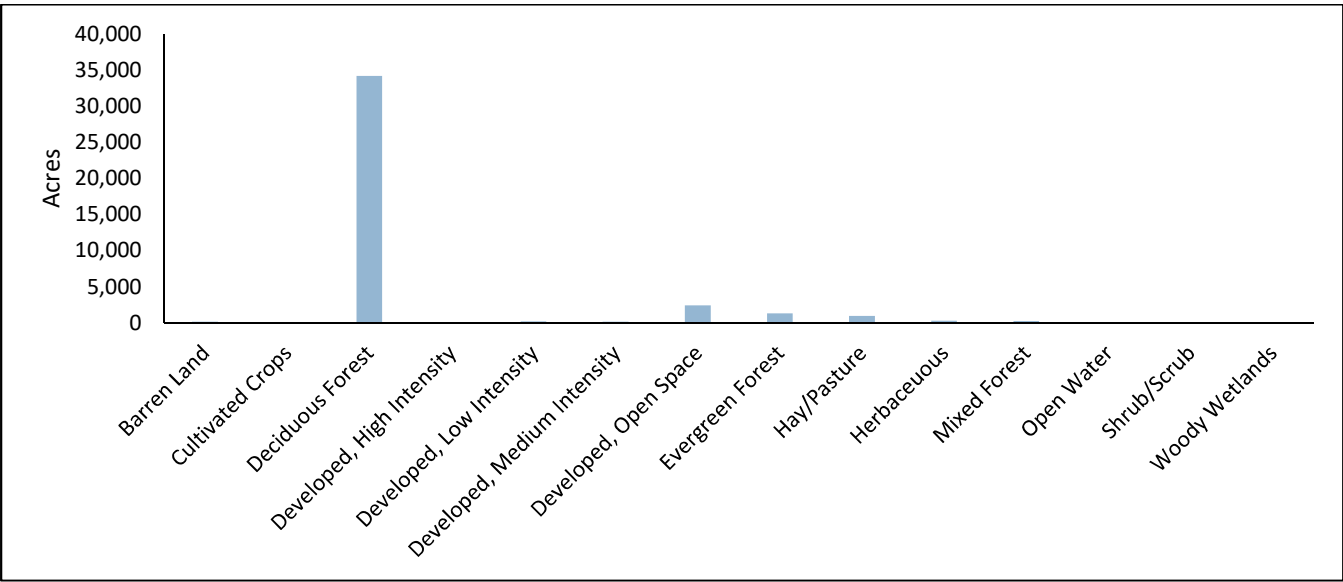


Figure 1. LMU acreage by land cover categories from the National Land Cover Dataset for the entire LMU.

Deciduous forests cover 85% of the Laurel Mountain LMU.

Table 2. Miles of roads by category on state forest land in this LMU. Road categories are described on p. 199 of the 2016 SFRMP.

Road Category	Total Miles
Z1 - Public Use Road	14
Z3 - Gated Road	27
Total	42

Z1 State Forest roads include Laurel Summit Road, Hickory Flats Road, Linn Run Road, J.E. Miller Road, and Weaver Road. Other roads open to public travel that provide access to this LMU include US Route 30, Hall Springs Road, Coxes Creek Road, and Felgar Road. Many of the Z3 – gated roads are also multiple use trails, and many are opened seasonally to snowmobiles.

Table 3. Miles of trails on state forest land in this LMU open to various types of recreational use. Note that miles are not additive and a single trail may be open to multiple use types. Shared-use trails, which make up the majority of trails on state forest land, are open to hiking, biking, horseback riding, and cross-country skiing.

Trail Category	Total Miles
Hiking	65
Biking	59
Equestrian	59
X-Skiing	65
ATV I	0
ATV II	0
Snowmobile / Joint Use Road	32

This table illustrates trial mileage open by designated use in the Laurel Mountain LMU. Most trails in this LMU are open to hiking, biking, x-skiing, and equestrian use. The Laurel Highlands Hiking Trail is open to hiking only. No trails are open to ATV use in this LMU.

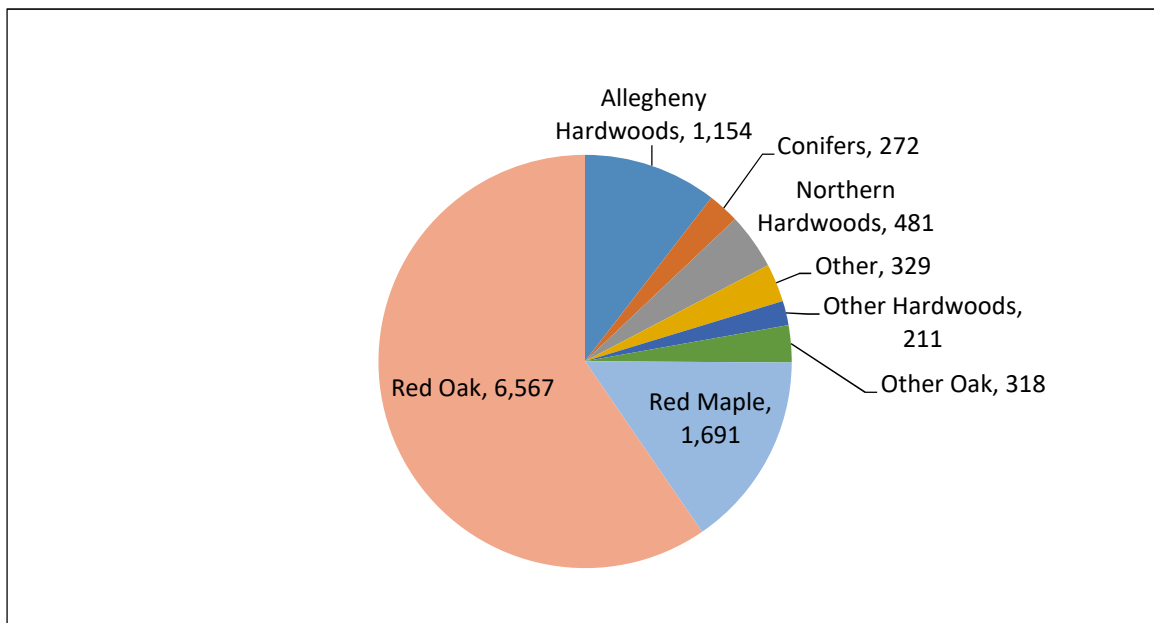


Figure 2. Acreage of state forest land in this LMU by aggregated forest type. The forest types are described on p. 108 of the 2016 SFRMP.

Mature red oak forests dominate state forest land (60%) in the Laurel Mountain LMU. Oak forests are beneficial for wildlife and timber production, therefore much of our management focuses on enhancing, maintaining, and regenerating these oak forests. Other common forest types include red maple (15%), Allegheny hardwoods (11%) and northern hardwoods (4%).

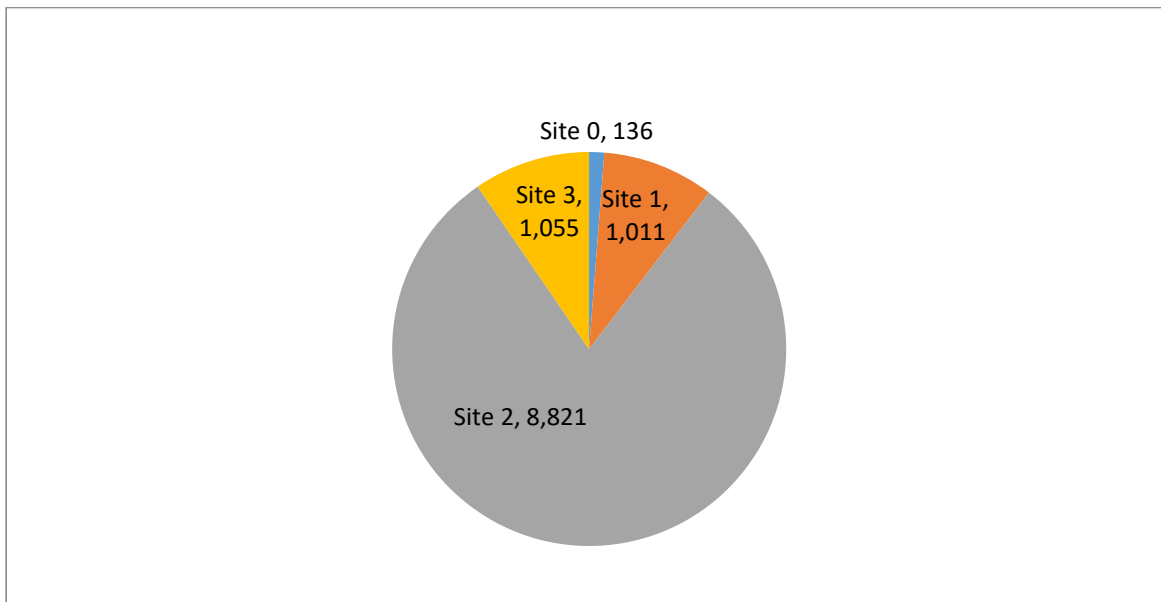


Figure 3. Acreage of state forest land in this LMU by site class. Site classes denote the potential quality of the growing site. “Site 0” indicates non-forested lands or forested lands where the vegetation has not yet been assigned. Other site classes are described on p. 53 of 2016 SFRMP.

On state forest land in the Laurel Mountain LMU medium quality growing sites (Site 2) account for 80%, followed by Site 3 (poor sites) (10%), and Site 1 (exceptional sites) (9%). The dominance of medium quality growing sites indicates that the Laurel Mountain LMU provides excellent opportunities for timber management with an abundance of good growing sites. Site 1 stands are found in small amounts through the Laurel Mountain LMU and include these best growing sites in this LMU. Site 3 stands found in the Laurel Mountain LMU are less feasible for commercial timber harvesting operations, but still important for wildlife habitat.

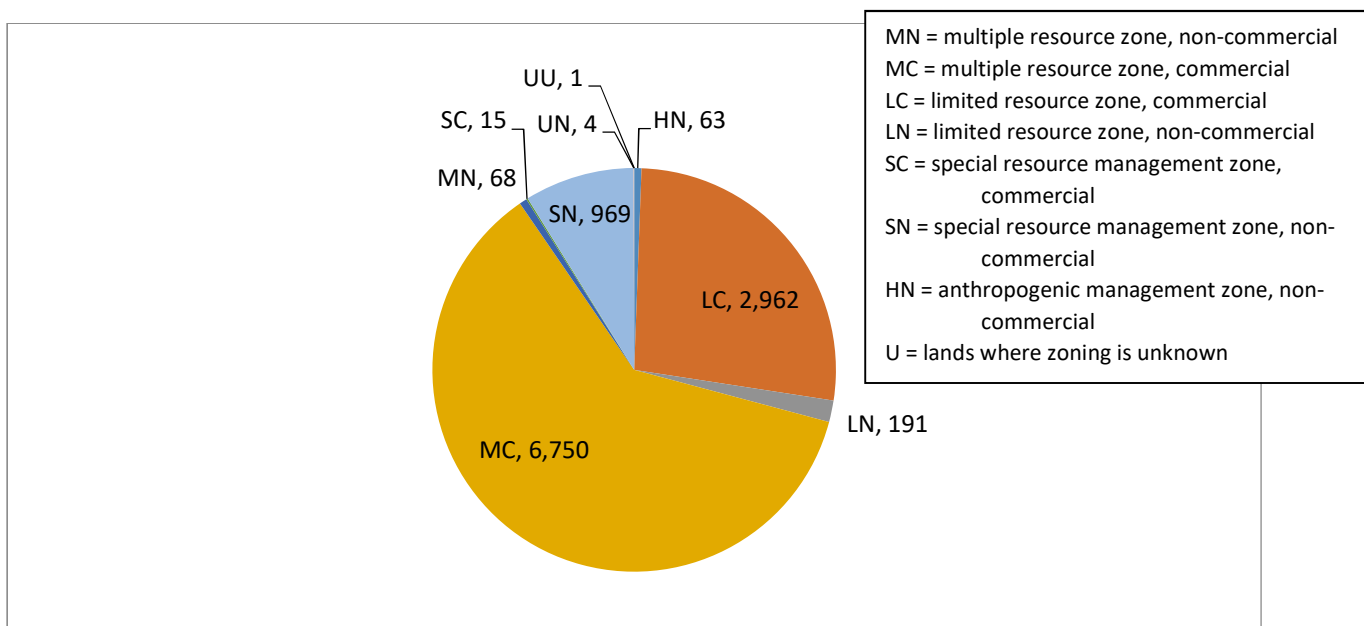


Figure 4. Acreage of state forest land in this LMU by management zone. Management zone is dictated by primary land use and land capability. Further descriptions of commerciality and zoning are found on p. 54 of the 2016 SFRMP.

Multiple resource, commercial forest land is the most common type of zoning in the Laurel Mountain LMU. Most the state forest land (61%) is suitable for timber production. Limited zoning accounts for 29% of state forest land in this LMU. Limited zoning in the Laurel Mountain LMU was applied to acreage with steep slopes surrounding high quality watersheds, areas with high concentrations of large boulders, or areas with exceptionally high-water tables and poor drainage.

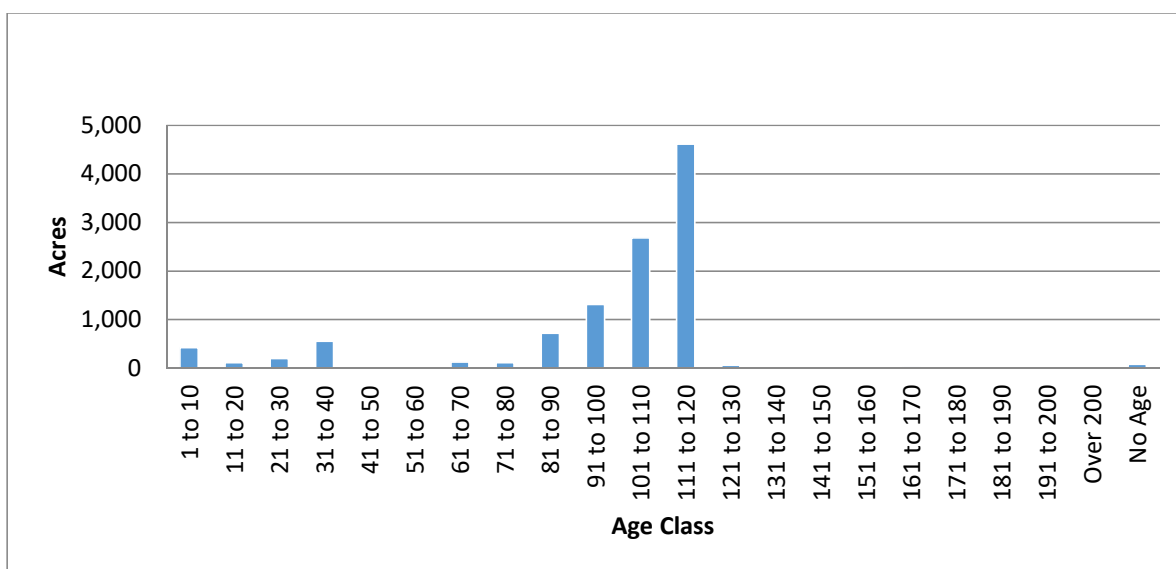


Figure 5. Acres of state forest land in this LMU by forest age classes.

Most forests on state forest land in the Laurel Mountain LMU are mature. 78% of the forests are 90 to 120 years old. 7% of the forests are 20 to 40 years old with many of these stands be initiated following salvage harvests due to gypsy moth defoliations in the late 1980s and early 1990s. Currently 5% of forests are 0-20 years old. Significant increases in young forests have been attained since the implementation of the timber

harvest allocation model. The percentage of young forests will increase, and older forests decrease as the Bureau of Forestry continues to balance forest age classes across state forest land.

Table 4. Miles of stream by classification within entire LMU. Department of Environmental Protection stream classifications are described in Chapter 93 Water Quality Standards of Title 25 in the Pennsylvania Code.

Class	Total (miles)
Undesignated	13
High Quality Waters	89
Perennial Cold Water Streams	1
Exceptional Value Waters	7
Total	110

The Laurel Mountain LMU is characterized by high quality streams with primarily forested watersheds. Furnace Run, near the northern boundary of this LMU is the only exceptional value stream in the LMU. Major high quality streams in the Laurel Mountain LMU include Furnace Run, Rock Run, Linn Run, Powdermill Run, and Spruce Run. (Please note there are two streams named Furnace Run in the Laurel Mountain LMU.)

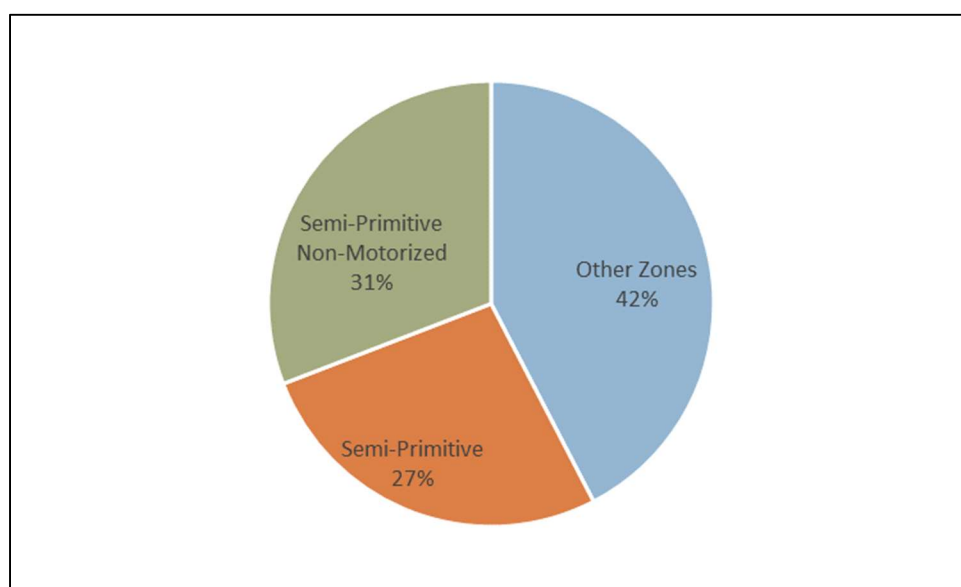


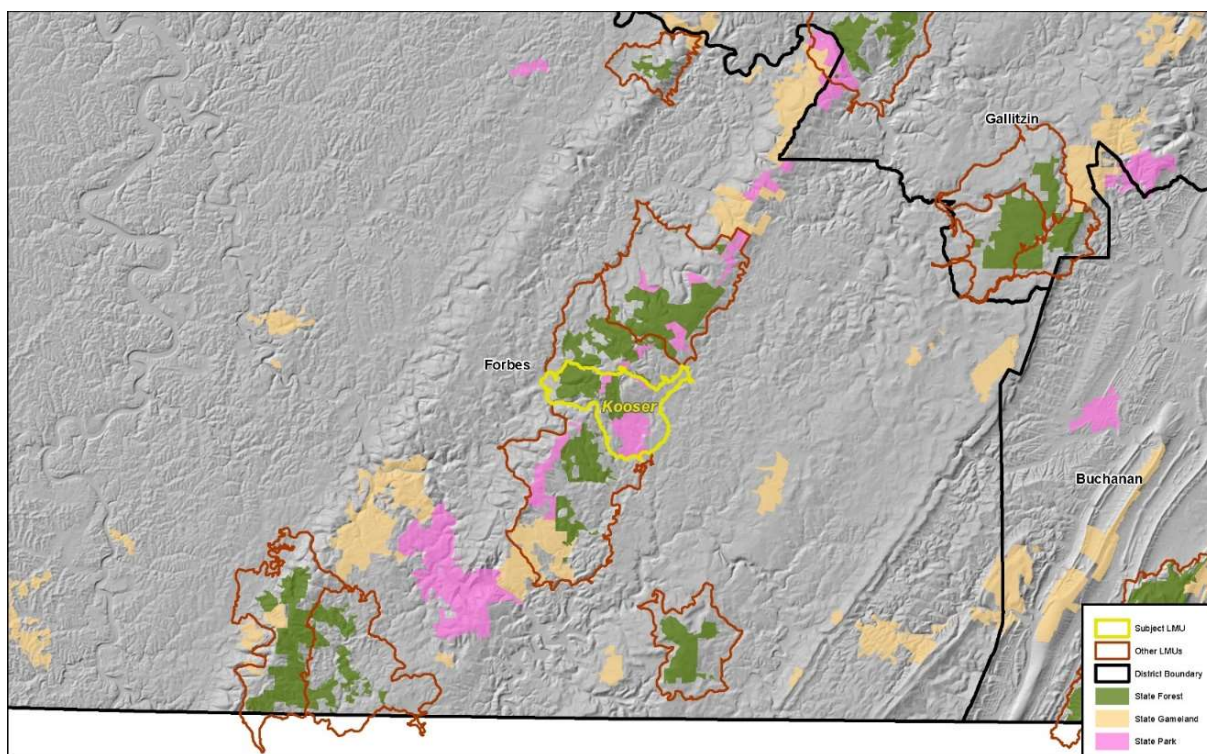
Figure 6. Acres of state forest land in this LMU by Recreation Opportunity Spectrum (ROS) classifications (2012). ROS is an inventory system developed by the U.S. Forest Service, to characterize land by types of recreation experiences. ROS is described on p. 42 of the 2016 SFRMP. “Other Zones” refers to Semi-Developed and Developed zones.

Recreation Opportunity Spectrum (ROS) is an inventory system built on the premise that people expect certain types of recreational experiences on public land, and that land managers should be able to direct people to appropriate places for those experiences. ROS classifications for the Laurel Mountain LMU indicate that visitors to this LMU can expect a range of primitiveness throughout the LMU. Much of the LMU has roads or trails throughout, surrounded by a natural environment. Areas adjacent to Z1 roads are less primitive and

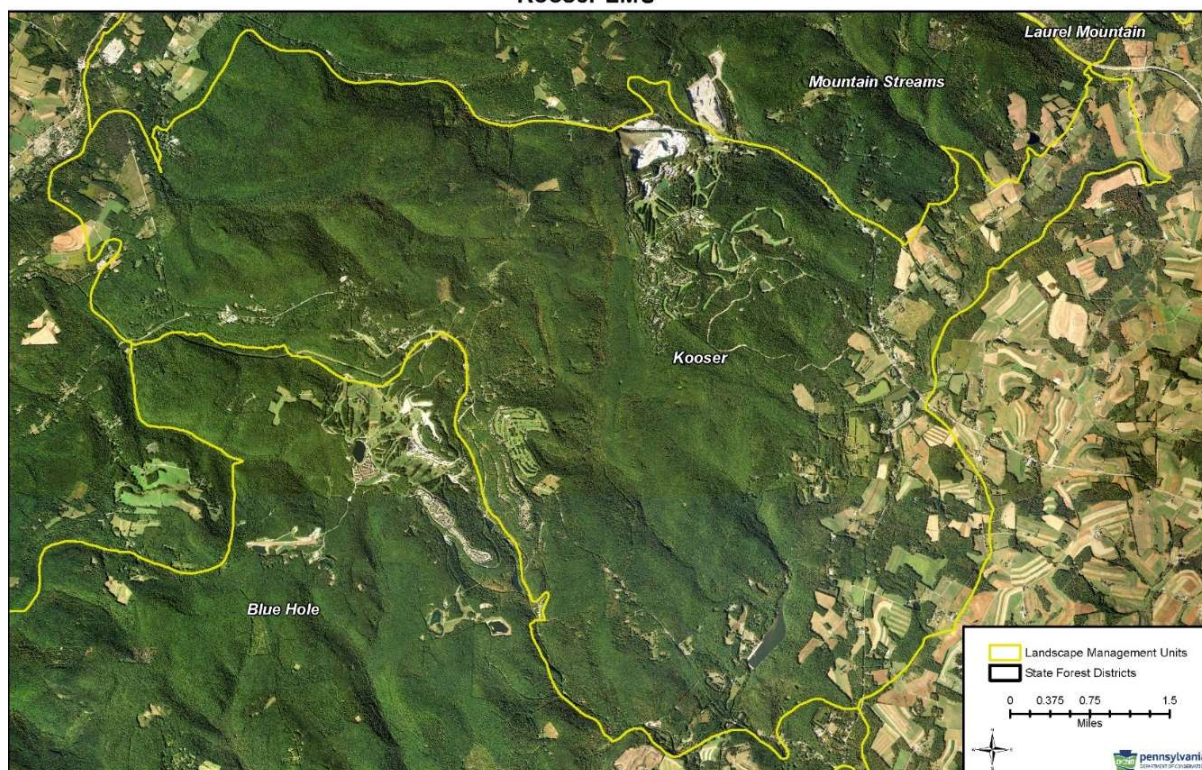
visitors are likely to find less independence. There are two areas designated as semi-primitive non-motorized in this LMU. One of these areas is found east of Laurel Summit Road and north of Hall Springs Road. The other is found west of Linn Run and Hickory Flats Roads in the forests surrounding Weaver Road, Rock Run Road, Quarry Trail, and Powdermill Loop. Visitors to these two areas can expect a predominately natural environment, a high probability of isolation, and a more challenging, independent experience.

Kooser

Landscape Management Unit



Kooser LMU



Overview

The 21,575 Kooser Landscape Management Unit lies on the east and west slopes of Laurel Ridge in northeastern Fayette, southeastern Westmoreland, and western Somerset counties. This LMU is bounded by Laurel Hill Creek to the east and the Indian Creek to the west. Both Indian Creek and Laurel Hill Creek flow south into the Youghiogheny River, part of the Ohio River Basin. 27% of this LMU is Forbes State Forest. 21% of the Kooser LMU is state park land, with Laurel Hill State Park accounting for most of the state park acreage. The remaining acreage (52%) is private land. The Kooser LMU is heavily forested (83%). Most of these forests are second growth red oak and northern hardwood forests. Medium quality growing sites (Site 2) dominate the Kooser LMU. Seven Springs Resort operates two four seasons resorts including ski slopes and golf courses in the Kooser LMU and owns large acreages. Elevations range from 1,500' to 2,900'. This LMU is within the Allegheny Mountain Ecoregion which consists of broad, rounded ridges separated by broad valleys.

Beginning in the second half of the 19th century the forests of the Kooser LMU, which consisted primarily of old growth American chestnut, Eastern white pine, Eastern hemlock, and mixed oak were clearcut to fuel the Industrial Revolution. Large uncontrolled wildfires followed, and forests regenerated to the oak and northern hardwood forests we see today. Much of the Kooser Division was acquired from the United Lumber Company in 1922. A later acquisition from the Western Pennsylvania Conservancy in 1974 included the acreage that would become the Roaring Run Natural Area.

The Kooser LMU provides excellent options for timber management due to medium quality growing sites and accessible terrain. Recent timber management activities focus on shelterwood and overstory removal harvests, as the Bureau of Forestry implements its long term sustainable forest management plan, with a primary goal being to balance the forest age classes across the state forest system. Regeneration projects including deer exclosures, herbicide applications to control competing vegetation, and tree plantings have been used to secure desirable regeneration as necessary. Natural gas development has been minimal, with a few shallow gas wells dotting the LMU. The Kooser LMU contains one wild plant sanctuary designated to conserve an assemblage of rare native plants.

Visitors to Seven Springs and Hidden Valley Resorts often visit surrounding public lands, which results in increased visitor use in this LMU. Hiking, biking, horseback riding, and snowmobiling are common uses of the trails on state forest land in the Kooser LMU. Seven Springs Resort annually acquires a commercial use agreement to conduct snowmobile tours on adjoining state forest land.

The Laurel Highlands Hiking Trail, a National Scenic Trail, travels atop Laurel Ridge and bisects this LMU. This trail is administered by the Bureau of State Parks, as it crosses multiple land ownerships.

The 3,459-acre Roaring Run Natural Area is located within the Kooser LMU. This natural area is unique in that it conserves the entire forested watershed of Roaring Run, a high quality, wilderness trout stream. As forested landscapes become increasingly fragmented across Pennsylvania, intact forested watersheds are becoming less common. The Roaring Run Natural Area is a High Conservation Value Forest characterized by large contiguous tracts of maturing forests. Trails in the Roaring Run Natural Area are open to foot traffic only.

There are several populations of threatened, endangered or species of concern, utilizing habitat including cool, moist wooded slopes, wet woods, and open wood edges. Jones Mill Run, an exceptional value stream, has a naturally reproducing trout population and is stocked by the PA Fish and Boat Commission. Roaring Run, a high-quality stream also has a naturally reproducing population of trout and is designated a Wilderness

Trout stream by the PA Fish and Boat Commission. Gross Run and Kooser Run, both high quality streams, also have naturally reproducing trout populations.

Priority Goals

- Maintain the RRNA under ‘primitive’ ROS guidelines by allowing no additional trails, take a comprehensive look at existing trails to reduce the current 3.4 miles of trail/square mile if possible, and encourage the township to abandon Paint Rock Road beyond the cemetery as it serves no useful purpose.
- No additional trails in the Jones Mill system unless they serve as important connections.
- Coordinate recreation uses among user groups and across land ownership.
- Cooperate with adjacent landowners, with a focus on large ownerships, to conserve forest resources and avoid conflicts.
- Continued implementation of the 200ft no-cut, except for human safety, forested aesthetic corridor, on each side of the Laurel Highlands Hiking Trail.
- Maintain and enhance the wild plant sanctuary through monitoring and active management if necessary.
- Continued partnership with the Laurel Mountain volunteer group.
- Continue working with research partners.
- Continued partnership with adjacent State Parks – Refer to the administrative transfer agreement.
- Protect and maintain important historical areas of interest.
- Manage and administer oil and gas activity in a manner that is consistent with the Bureau’s mission statement and the principles of ecosystem management by avoiding, minimizing, or mitigating adverse impacts to state forest land, ensuring compliance with executed agreements, and maintaining positive working relationships with severed rights owners.

Profile

Table 1. LMU acreage: total and state forest land only.

	Acres
State Forest Land	5,807
LMU Total	21,575

Ecoregion: Allegheny Mountain

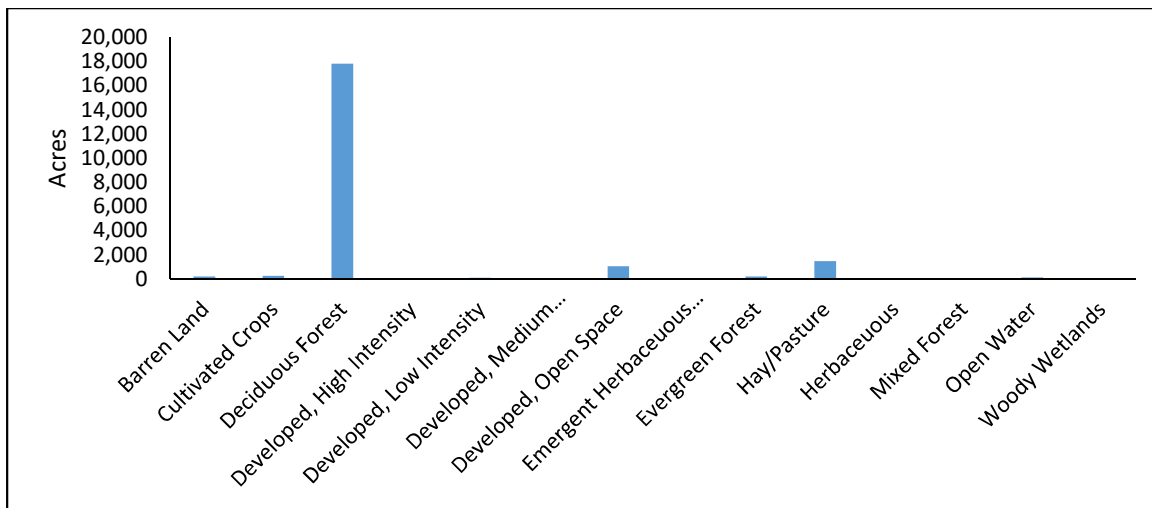


Figure 1. LMU acreage by land cover categories from the National Land Cover Dataset for the entire LMU.

The Kooser LMU is heavily forested - 83% is covered by deciduous forest. 7% is hay/pastureland located in the valleys on the east and west sides of Laurel Ridge. 5% is developed open space most of which is Seven Springs and Hidden Valley Resorts.

Table 2. Miles of roads by category on state forest land in this LMU. Road categories are described on p. 199 of the 2016 SFRMP.

Road Category	Total Miles
Z1 - Public Use Road	10
Z3 - Gated Road	9
Total	19

Many of the Z3 gated roads are also multiple use trails and some are opened seasonally for snowmobiles. The primary Z1, state forest road in this LMU is Jones Mill Run Road. Other roads open to public travel include SR 31, County Line Road, Firetower Road, Roaring Run Road, Gardener Road, Jimtown Road, and Laurel Hill State Park Road.

Table 3. Miles of trails on state forest land in this LMU open to various types of recreational use. Note that miles are not additive and a single trail may be open to multiple use types. Shared-use trails, which make up the majority of trails on state forest land, are open to hiking, biking, horseback riding, and cross-country skiing.

Trail Category	Total Miles
Hiking	33
Biking	13
Equestrian	13
X-Skiing	33
ATV I	0
ATV II	0
Snowmobile / Joint Use Road	12

This table illustrates trail mileage open by designated use in the Kooser LMU. The Laurel Highlands Hiking Trail is open to foot traffic only. Trails in the Roaring Run Natural Area are open to foot traffic only. No trails are open to ATV use in this LMU, but several miles of joint use roads and Z3 roads are open to snowmobiles.

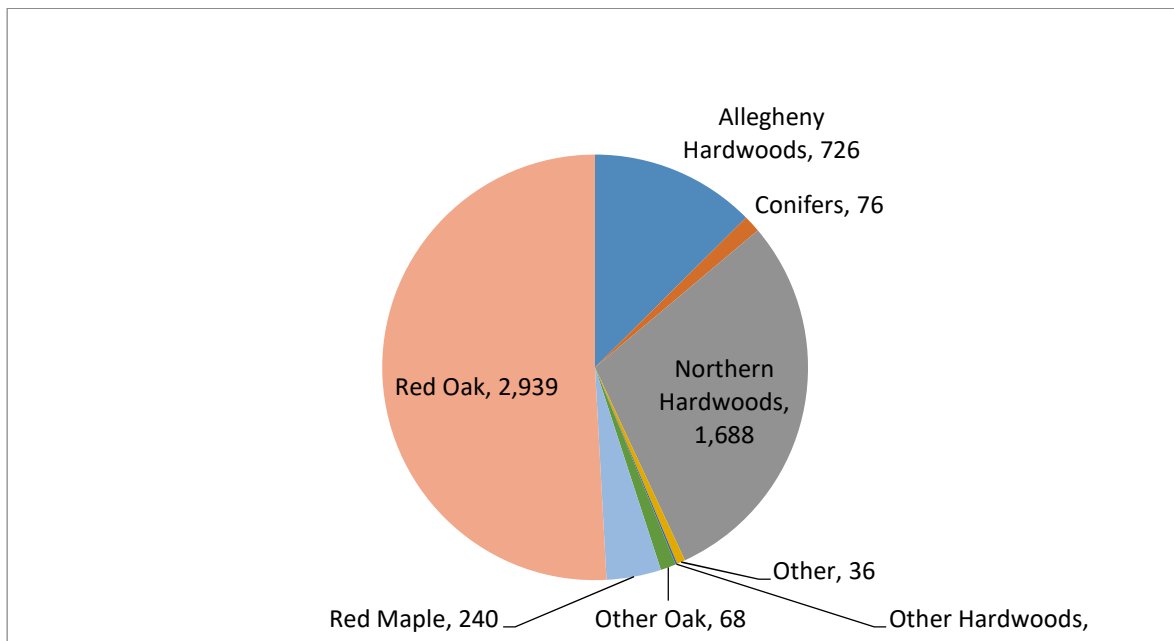


Figure 2. Acreage of state forest land in this LMU by aggregated forest type. The forest types are described on p. 108 of the 2016 SFRMP.

Half of state forest land forests in the Kooser LMU are red oak forests, followed by Northern hardwood forests (29%), and Allegheny hardwoods (13%). Red oak dominated forests are very beneficial from a wildlife and timber management perspective, therefore much of our forest management focuses on enhancing, maintaining, and regenerating these oak forests. Other forest types including red maple, other oak, and conifers account for the remaining forested acreage on state forest land.

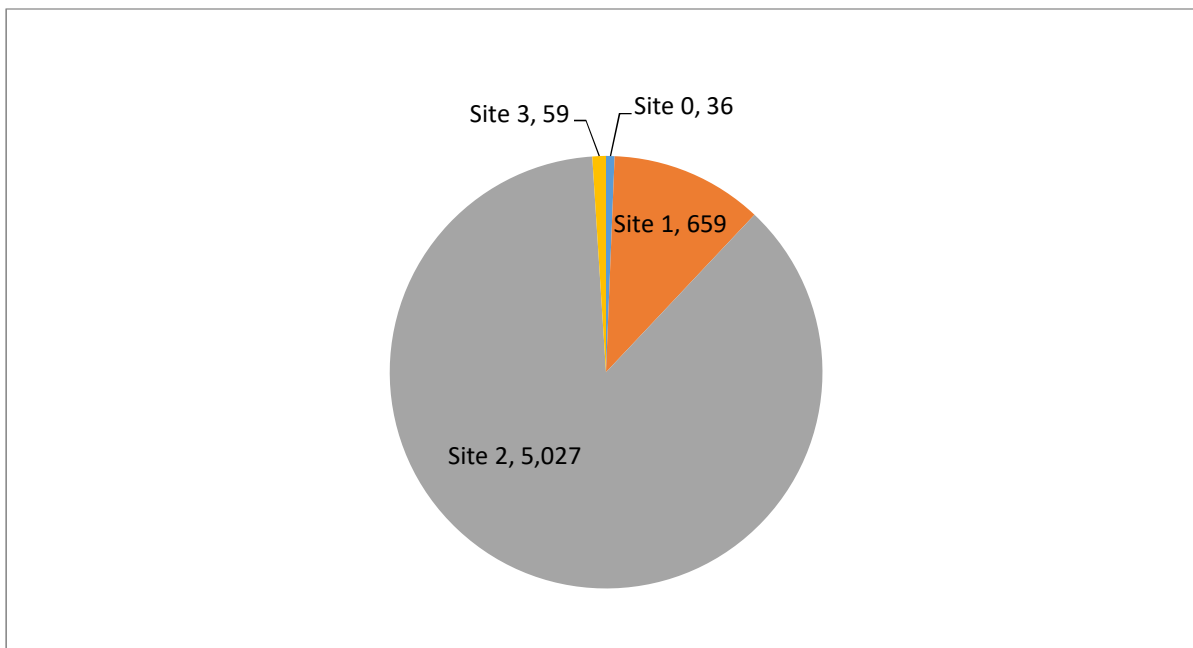


Figure 3. Acreage of state forest land in this LMU by site class. Site classes denote the potential quality of the growing site. “Site 0” indicates non-forested lands or forested lands where the vegetation has not yet been typed. Other site classes are described on p. 53 of 2016 SFRMP.

Medium quality growing sites (Site 2) dominate much of the state forest land (87%) in the Kooser LMU, followed by excellent growing sites (Site 1) at 11%. This indicates that the Kooser LMU has abundant opportunities for growing quality saw timber.

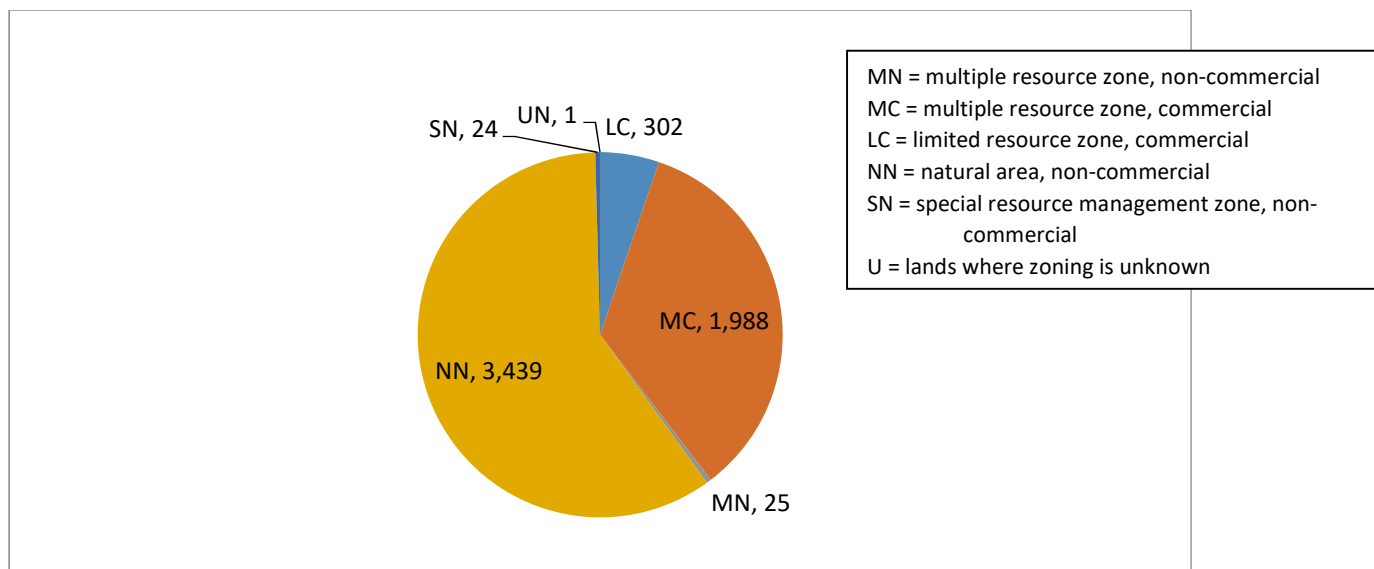


Figure 4. Acreage of state forest land in this LMU by management zone. Management zone is dictated by primary land use and land capability. Further descriptions of commerciality and zoning are found on p. 54 of the 2016 SFRMP.

60% of the state forest land in the Kooser LMU is zoned Natural Area, for the 3,459-acre Roaring Run Natural Area. 35% of the state forest land in the Kooser LMU is zoned multiple resource, commercial forest land. These acres are included in the timber harvest allocation model and are expected to be regenerated during the 140-year planning horizon. Limited resource zone acreage accounts for only 5% of the state forest land in the Kooser LMU.

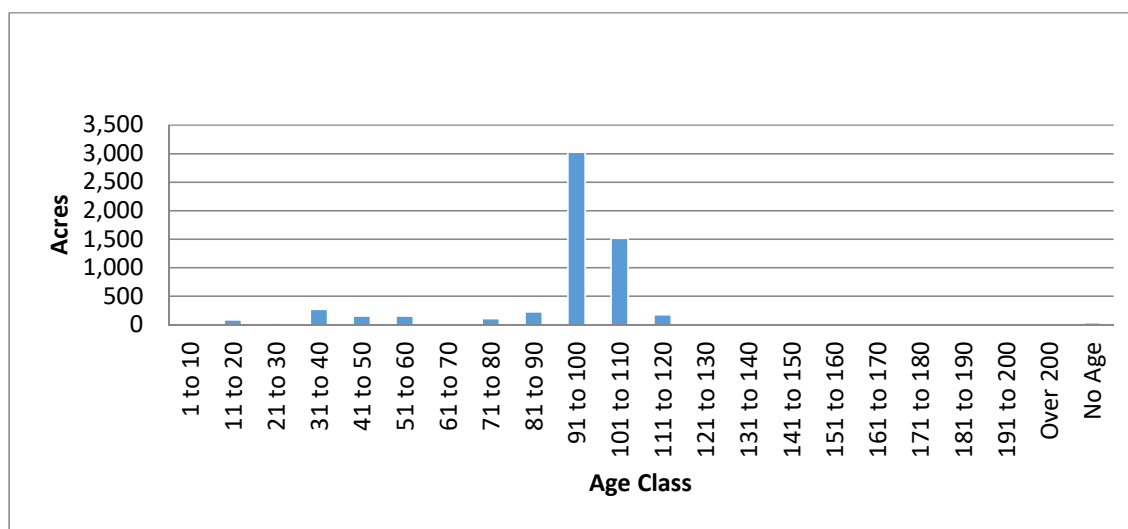


Figure 5. Acres of state forest land in this LMU by forest age classes.

79% of state forest land forests in the Kooser LMU are between 90-110 years old. 8% of the forests are between 21 and 50 years old, resulting from clearcut harvests conducted from the late 1960s through the 1990s. 2% of these forests are young forests 0-20 years old that are a result of more recent overstory removal harvests, implemented as part of the timber harvest allocation model, with one of the model's primary goals being, to balance forest age classes across state forest land.

Table 4. Miles of stream by classification within entire LMU. Department of Environmental Protection stream classifications are described in Chapter 93 Water Quality Standards of Title 25 in the Pennsylvania Code.

Class	Total (miles)
Undesignated	1
High Quality Waters	69
Exceptional Value Waters	10
Total	81

The Kooser LMU is characterized by high quality and exceptional value streams with primarily forested watersheds. Jones Mill Run is the only exceptional value stream located in the Kooser LMU. High quality streams include Pike Run, Roaring Run, Allen Creek, Kooser Run, Crise Run and Laurel Hill Creek,

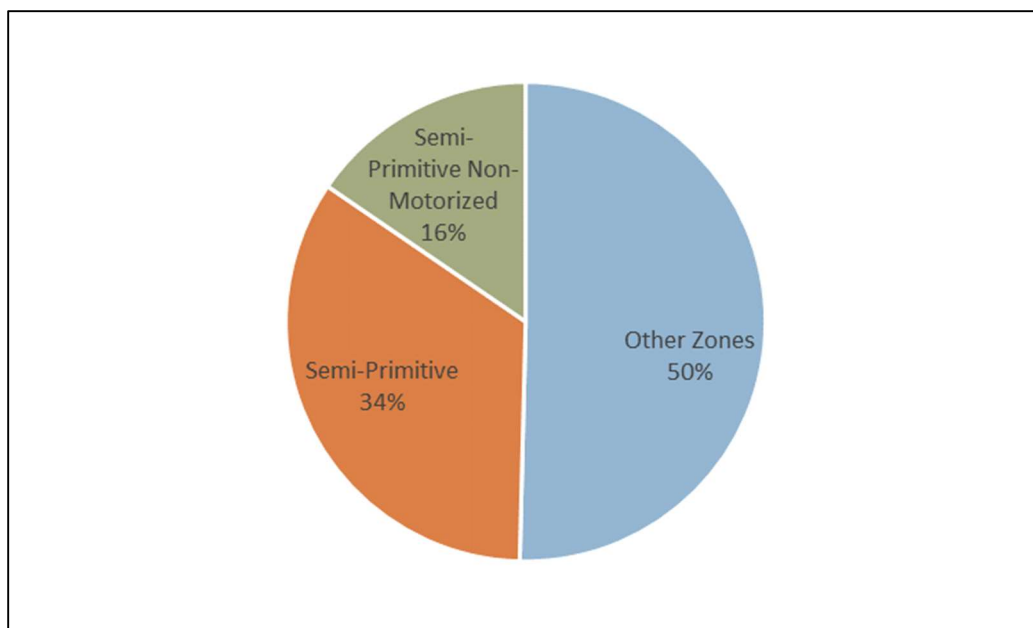
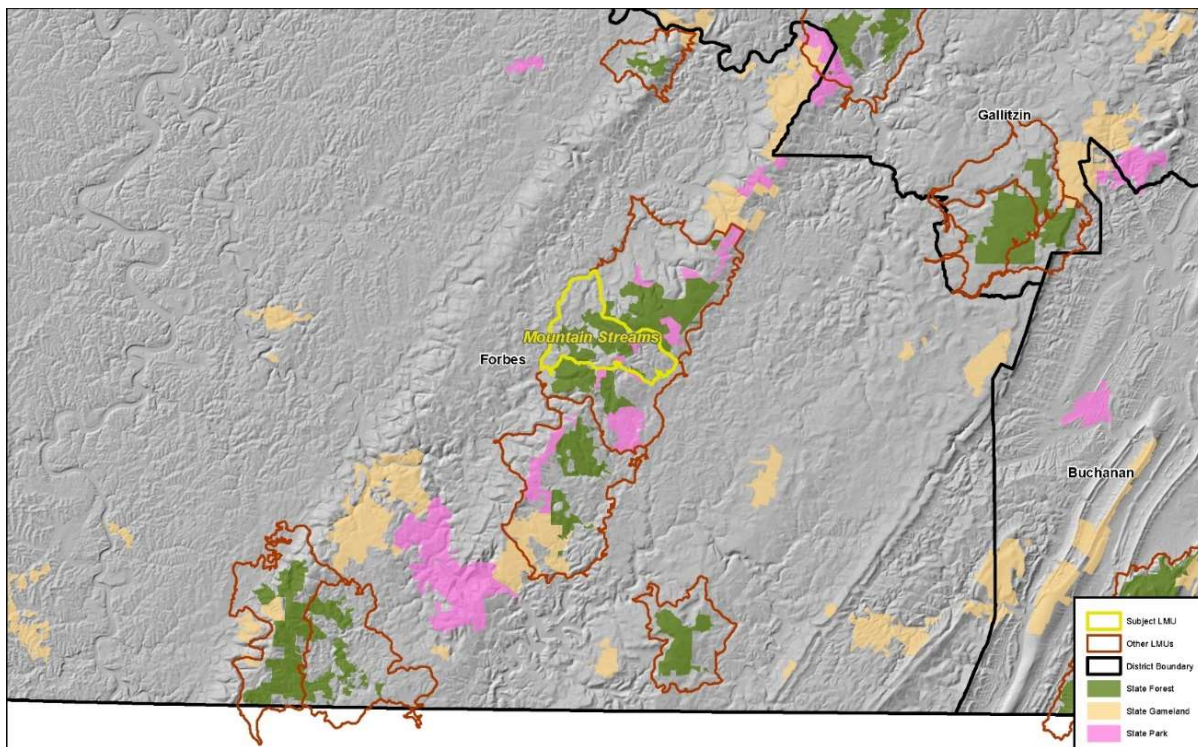


Figure 6. Acres of state forest land in this LMU by Recreation Opportunity Spectrum (ROS) classifications (2012). ROS is an inventory system developed by the U.S. Forest Service, to characterize land by types of recreation experiences. ROS is described on p. 42 of the 2016 SFRMP. "Other Zones" refers to Semi-Developed and Developed zones.

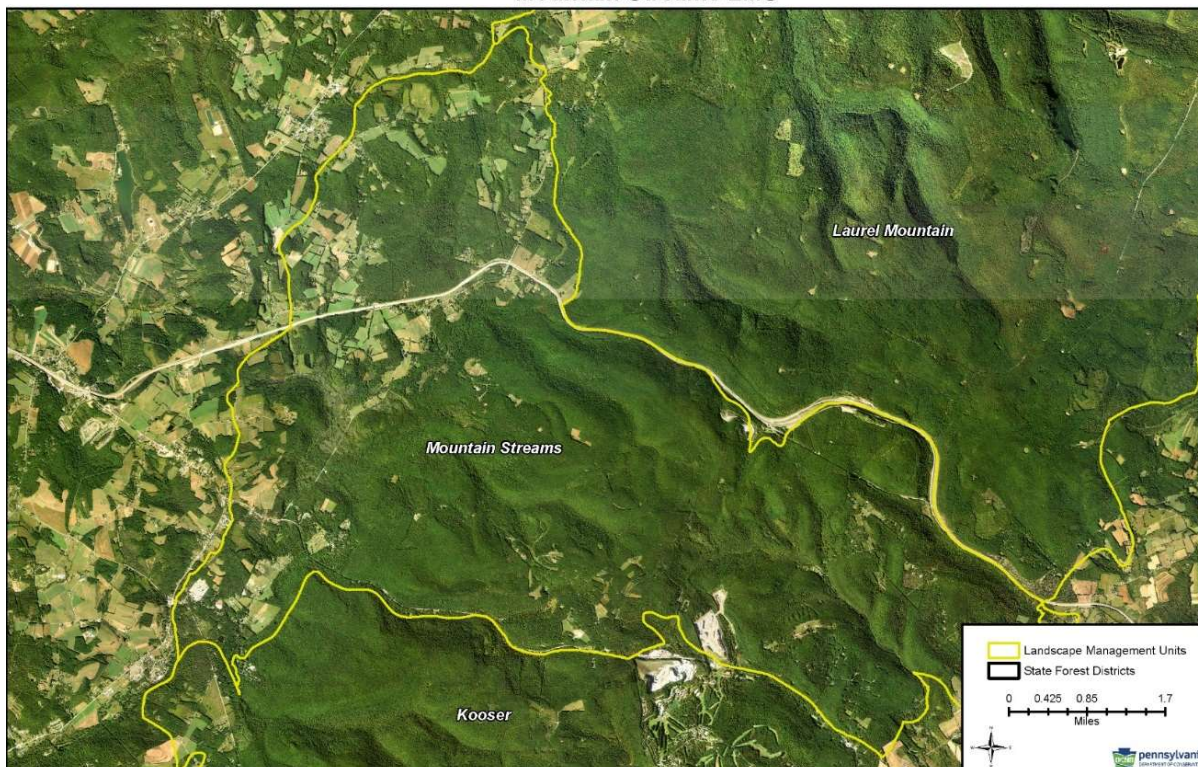
The Roaring Run Natural Area contains the only semi-primitive non-motorized area in the Kooser LMU. This area provides visitors with a predominately natural environment and opportunities for independence and challenge. The less primitive zones are located adjacent to roads open to public travel. Visitors can expect increased interaction with other visitors in these less primitive zones.

Mountain Streams

Landscape Management Unit



Mountain Streams LMU



Overview

The 21,582-acre Mountain Streams Landscape Management Unit straddles Laurel Ridge in southeastern Westmoreland and western Somerset counties. This LMU serves as a boundary between the Kiskiminetas-Conemaugh and the Monongahela Watersheds. On the western boundary of this LMU the headwaters of Loyalhanna Creek flow northeast and the headwaters of Indian Creek flow southwest. The eastern edge of the Mountain Streams LMU is bounded by the headwaters of Laurel Hill Creek flowing southwest. Thirty four percent of the LMU is Forbes State Forest, and 522 acres (2%) is State Parkland, with the remaining acreage, and most of the LMU being private land. This LMU is within the Allegheny Mountain Ecoregion which consists of broad, rounded ridges separated by broad valleys.

Historical records indicate that the forests of the Mountain Streams LMU were clearcut beginning in the late 1800s. Large uncontrolled wildfires followed, and forests regenerated to the mixed oak and northern hardwood forests we see today. Much of the state forest land in this LMU was acquired from Blair Lumber Company in 1973. These more recent acquisitions were in agricultural and timber production prior to state ownership. Remnants of coal mines, sawmills, railroads, farms, and homesteads in this LMU indicate active land use during the late 19th and early 20th centuries.

The Mountain Streams LMU is heavily forested with 86% of land covered by deciduous forests. This LMU has a more diverse mix of forest types compared to adjacent LMUs. Red oak forest cover 36% of state forest land acreage followed by Allegheny hardwoods (21%) and Northern hardwoods (21%). Most of these forests are mature or nearly mature second and third growth forests.

This LMU provides excellent opportunities for forest management due to good quality growing sites and accessible terrain. Approximately 2/3 of the state forest land in this LMU is suitable for timber production. Recent forest management activities on state forest land have focused on shelterwood and overstory removal harvests. Increases in early successional habitat have been gained throughout this LMU with overstory removal harvests implemented as part of the BOF's timber harvest allocation model. Other forest management activities include early successional habitat creation and maintenance at the Mountain Streams Woodcock Habitat Management Area.

Streams including Shafer Run (High Quality Cold Water Fish(HQCWF)), Little Run (HQCWF), Indian Creek (HQCWF), Pike Run (HQCWF) and Camp Run (Exceptional Value) have established, reproducing trout populations. Camp Run and Pike Run are Class A wild trout streams, which support a population of naturally producing trout of sufficient size and abundance to support a long-term and rewarding sport fishery, as designated by the PA Fish and Boat Commission.

The Laurel Highlands Hiking Trail, a National Scenic Trail, travels atop Laurel Ridge, and bisects this LMU. This trail is administered by the Bureau of State Parks. The North Woods trail system is promoted for cross country skiing and includes the popular Shafer Run Warming Hut. This trail system is also open to hiking, biking, and equestrian use. Mountain Streams Trail a 7.5-mile, multiple use district trail, travels from Camp Run Parking Lot to Tunnel Road. This trail is one of the most popular trails on Forbes State Forest for equestrian use.

Several unique plant species are found throughout the Mountain Streams LMU. An uncommon parasitic shrub, native to the Eastern United States, is found on several sites in this LMU. Other unique and significant plant populations recorded in the PNDI system can be found in the Mountain Streams LMU. While common throughout its native range, shingle oak, is uncommon on Forbes State Forest. The only known stands of shingle oak on Forbes State Forest occur in the Mountain Streams LMU near Camp Run and Indian Creek.

The BOF maintains a white ash treatment area in the Mountain Streams LMU. Many of the white ash in this stand are treated with insecticide periodically to prevent infestation from the emerald ash borer. These surviving white ash will help preserve the genetics of this species. This site was selected due to its exceptional white ash and their relatively healthy condition.

New Enterprise Stone and Lime Company operates a limestone mine in this LMU, near the intersection of Tunnel Road and PA Route 31. Natural gas development has been minimal with several pipeline ROWs and a few shallow gas wells in this LMU. Invasive species including tree-of-heaven, Japanese barberry, multiflora rose, oriental bittersweet, Japanese stilt grass, reed canary grass, and honeysuckle are common on portions of the Mountain Streams LMU, particularly in areas with more recent agricultural production. Invasive species are more common in this LMU compared to adjacent LMUs.

Priority Goals

- Continue partnering with the PGC and The Wildlife Management Institute to create, improve, and maintain early successional habitat in the Mountain Streams Woodcock Management Area.
- Enhance watershed integrity and pursue aquatic habitat improvement opportunities such as AMD cleanup, adding biomass to streams, erosion control, and/or streambank stabilization to improve aquatic populations.
- Continued partnership with the Bureau of State Parks on adjacent state park lands.
- Continued implementation of the 200ft no cut, except for human safety, forested aesthetic corridor on each side of the Laurel Highlands Hiking Trail.
- Maintain and promote cross country skiing opportunities on the North Woods Trail system.
- Invasive species monitoring and control where necessary.
- Seek to secure the snowmobile trail system by potentially purchasing private properties or seeking easements in this area and widen the public corridor near Route 31.
- Take a comprehensive look at the Little Run drainage area to determine if it should be left trail-less.
- Protect and enhance habitat for rare, threatened and endangered species or species and resources of concern, with increased focus on those unique to the Mountain Streams LMU.
- Manage and administer oil and gas activity in a manner that is consistent with the Bureau's mission statement and the principles of ecosystem management by avoiding, minimizing, or mitigating adverse impacts to state forest land, ensuring compliance with executed agreements, and maintaining positive working relationships with severed rights owners.

Profile

Table 1. LMU acreage: total and state forest land only.

	Acres
State Forest Land	7,269
LMU Total	21,582

Ecoregion: Allegheny Mountain

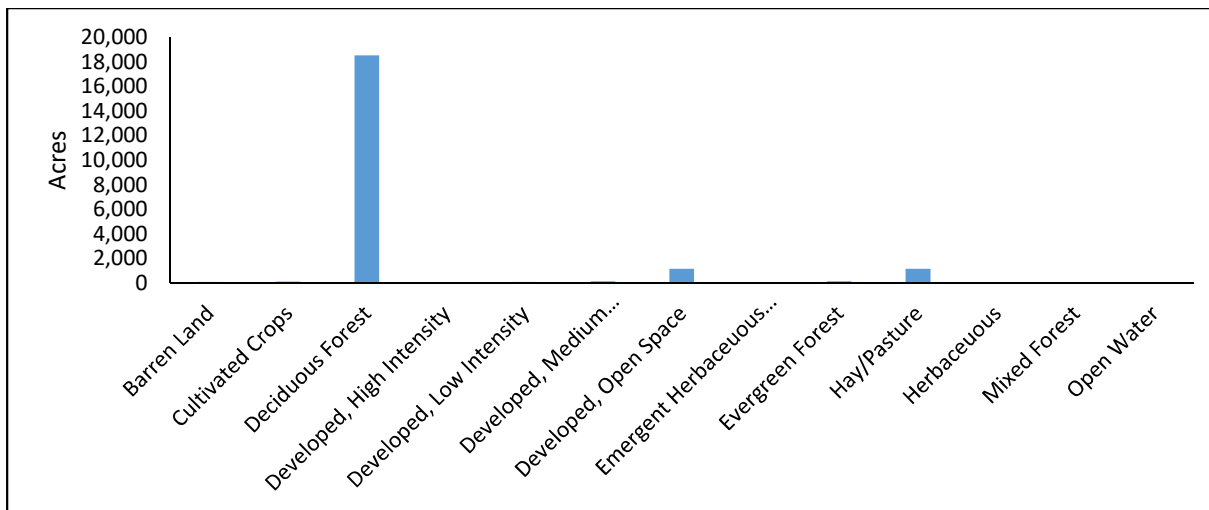


Figure 1. LMU acreage by land cover categories from the National Land Cover Dataset for the entire LMU.

Deciduous forests cover 86% of the Mountain Streams LMU.

Table 2. Miles of roads by category on state forest land in this LMU. Road categories are described on p. 199 of the 2016 SFRMP.

Road Category	Total Miles
Z1 - Public Use Road	14
Z3 - Gated Road	6
Total	20

Township roads open to public travel provide most of the access to the Mountain Streams LMU. Major township roads include Sky Road, Auckerman Road, Tunnel Road, Camp Run Road, Shafer Run Road and Kuhntown Road. SR 31 travels through this LMU and the PA Turnpike forms the northern boundary of the Mountain Streams LMU. Most of the Z3 – gated roads are also multiple use trails, and many are opened seasonally to snowmobiles.

Table 3. Miles of trails on state forest land in this LMU open to various types of recreational use. Note that miles are not additive and a single trail may be open to multiple use types. Shared-use trails, which make up the majority of trails on state forest land, are open to hiking, biking, horseback riding, and cross-country skiing.

Trail Category	Total Miles
Hiking	20
Biking	18
Equestrian	18
X-Skiing	20
ATV I	0
ATV II	0
Snowmobile / Joint Use Road	10

This table illustrates trail mileage open by designated use in the Mountain Streams LMU. Most trails in this LMU are open to hiking, biking, x-skiing, and equestrian use. The Laurel Highlands Hiking Trail is open to hiking only. No trails are open to ATV use in this LMU.

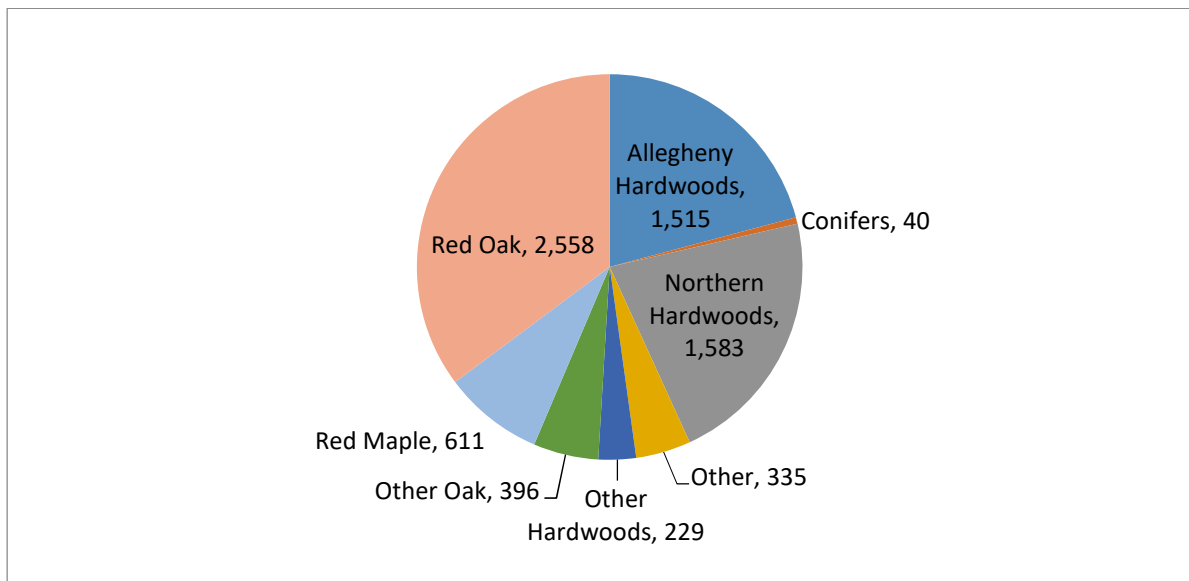


Figure 2. Acreage of state forest land in this LMU by aggregated forest type. The forest types are described on p. 108 of the 2016 SFRMP.

The Mountain Streams LMU has a more balanced diversity of forest types compared to adjacent LMUs. Red oak forests account for 35% of the acreage on state forestland, followed by Allegheny hardwoods (21%), and northern hardwoods (21%). Red oak dominated forests are very beneficial from a wildlife and timber management perspective, therefore much of our forest management focuses on enhancing, maintaining, and regenerating these oak forests.

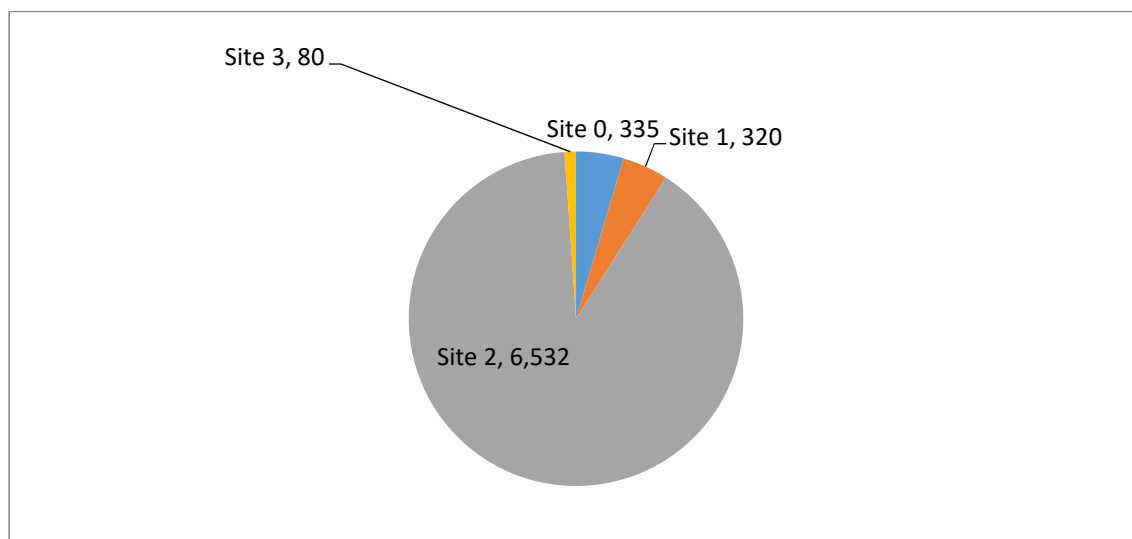


Figure 3. Acreage of state forest land in this LMU by site class. Site classes denote the potential quality of the growing site. “Site 0” indicates non-forested lands or forested lands where the vegetation has not yet been typed. Other site classes are described on p. 53 of 2016 SFRMP.

Medium quality growing sites (Site 2) dominate state forest land acreage (90%) in the Mountain Streams LMU. This indicates that the Mountain Streams LMU has abundant opportunities for growing quality saw timber. Site 0 accounts for 5% (346 acres) of the acreage in this LMU. These Site 0 stands are reverting agricultural

fields, scrub/shrub, or other miscellaneous herbaceous openings. These types are not assigned a site class during the inventory process. While these herbaceous openings don't make up a large portion of the Mountain Streams LMU, they provide unique habitat that is uncommon on the Forbes State Forest.

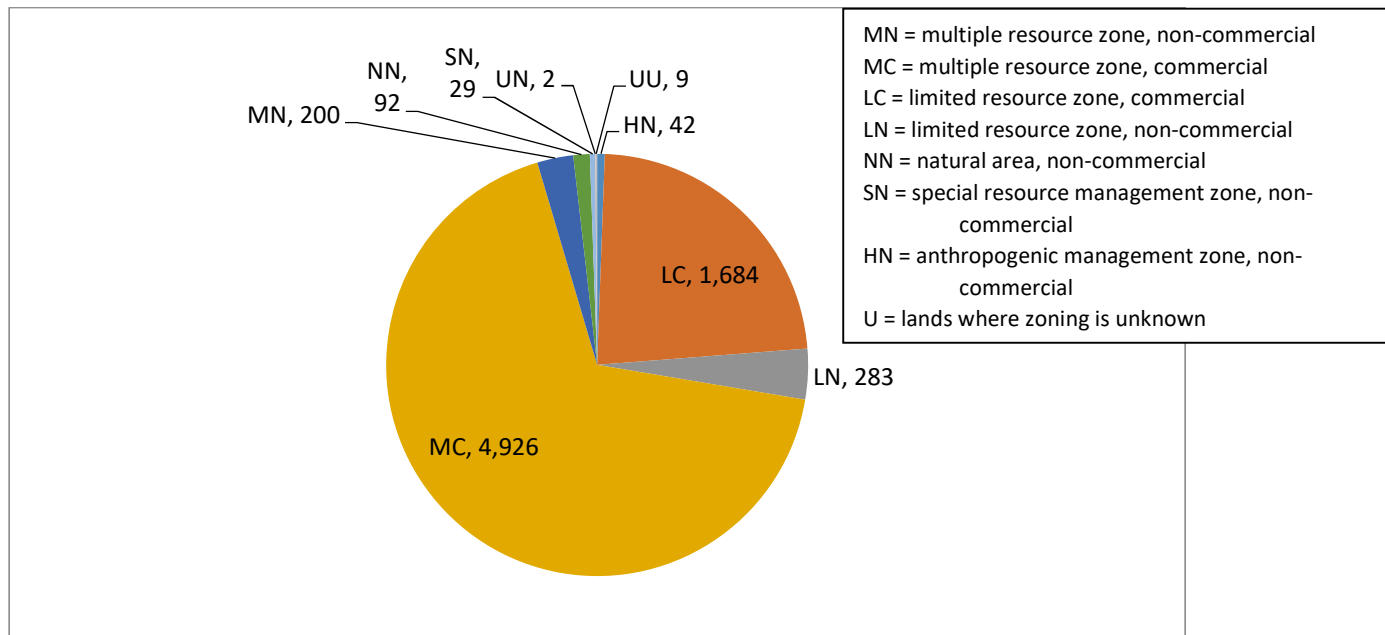


Figure 4. Acreage of state forest land in this LMU by management zone. Management zone is dictated by primary land use and land capability. Further descriptions of commerciality and zoning are found on p. 54 of the 2016 SFRMP.

Multiple resource, commercial forest land suitable for timber production accounts for 68% of the state forest land in the Mountain Streams LMU. Limited zoning also accounts for a significant portion of the state forest land acreage in the Mountain Streams LMU at 27%. Limited zoning was applied to extremely steep slopes surrounding high quality watersheds, areas with high concentrations of large boulders, or areas with exceptionally high water tables and poor drainage.

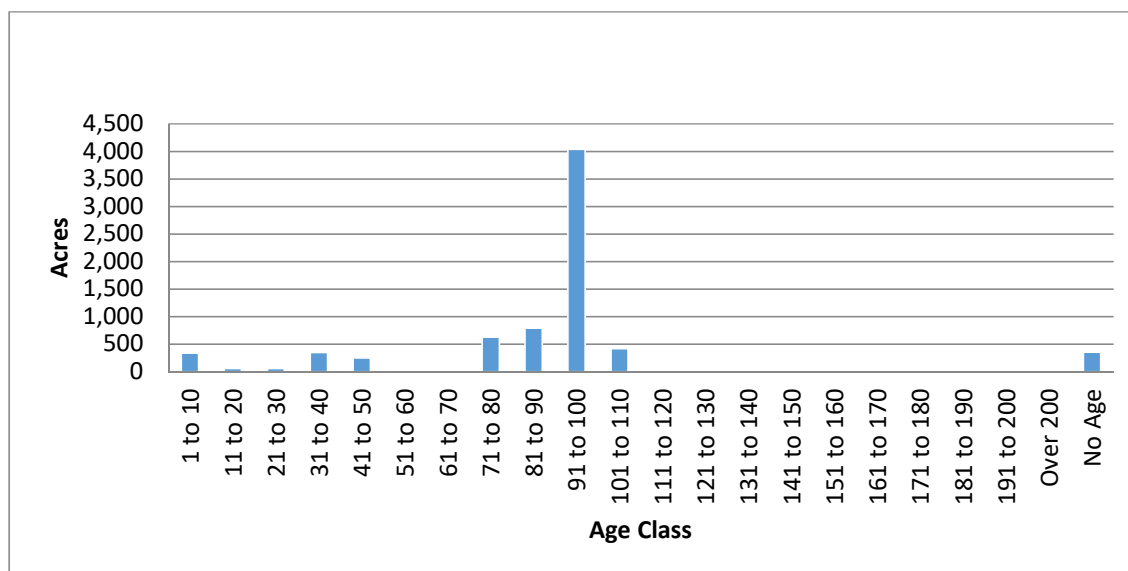


Figure 5. Acres of state forest land in this LMU by forest age classes.

Over half of forests on state forest land in the Mountain Streams LMU are mature. 61% of the forests are 90 to 110 years old. The Mountain Streams LMU has greater age class diversity compared to adjacent LMUs. Much of the state forest land acreage was acquired during the second half of the 20th century. These acquisitions were more recently in agricultural or timber production. Tree core data and BOF records indicate approximately 14% of these forests are 0-50 years old. Recent increases in young forests are a result of overstory removal harvests completed since the timber harvest allocation model has been implemented.

Table 4. Miles of stream by classification within entire LMU. Department of Environmental Protection stream classifications are described in Chapter 93 Water Quality Standards of Title 25 in the Pennsylvania Code.

Class	Total (miles)
Undesignated	1
High Quality Waters	68
Exceptional Value Waters	6
Total	75

The Mountain Streams LMU is characterized by high quality and exceptional value streams with primarily forested watersheds. Camp Run is the only exceptional value stream in the Mountain Streams LMU. High quality streams include but are not limited to Indian Creek, Little Run, Shafer Run, and Clear Run.

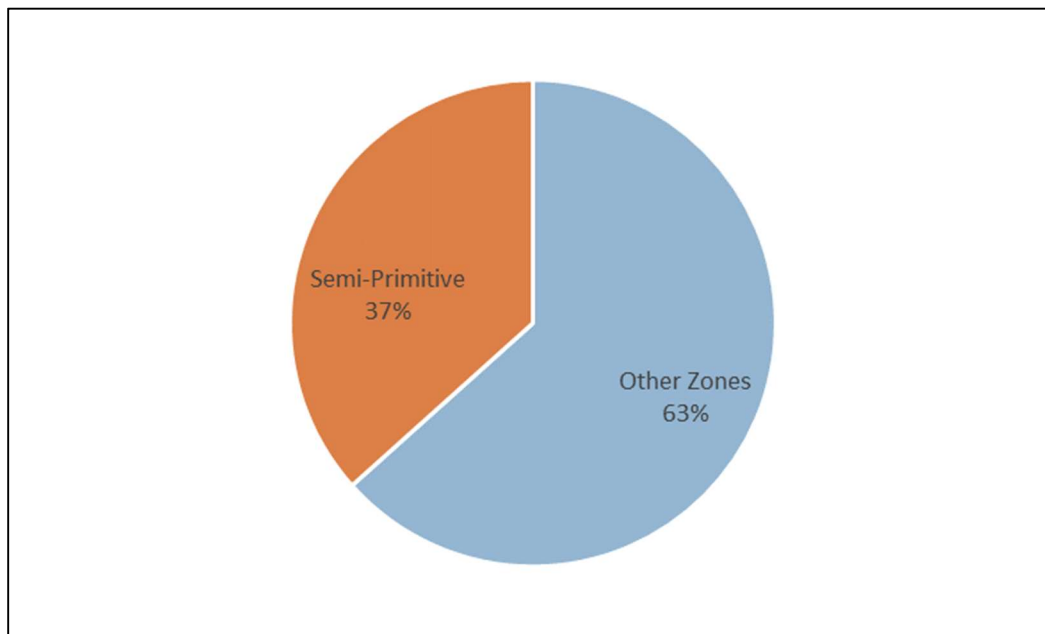
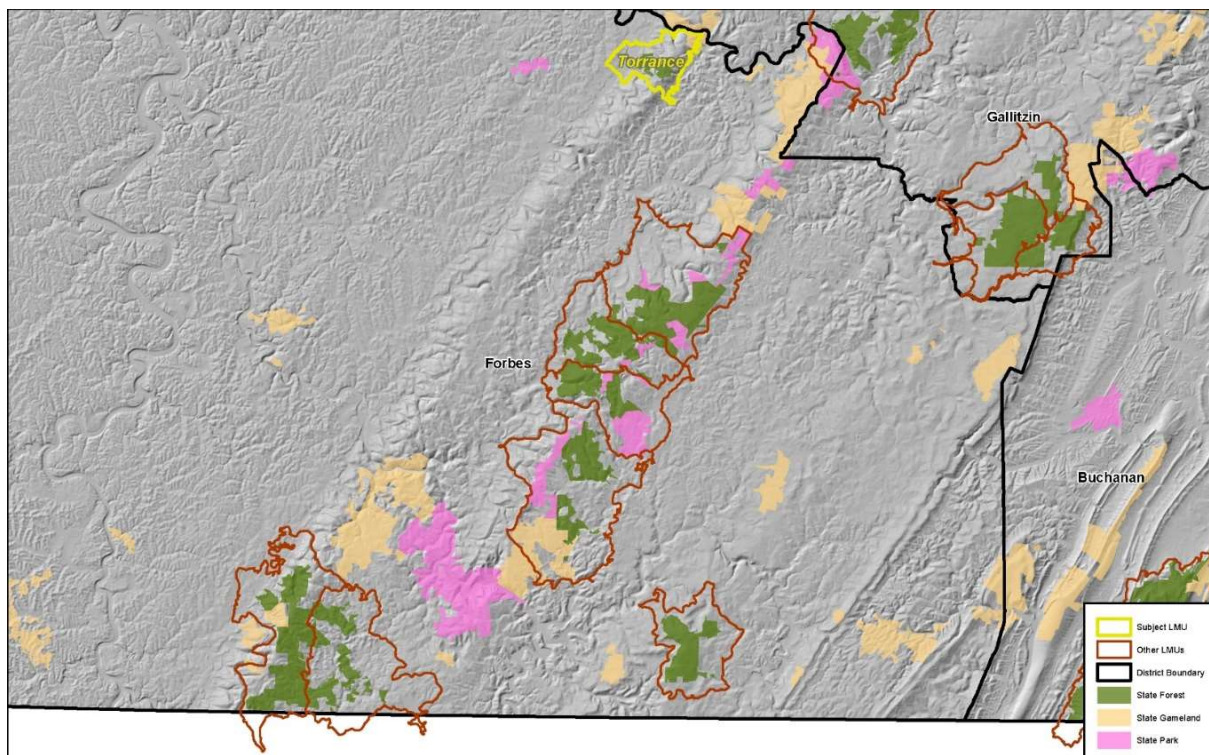


Figure 6. Acres of state forest land in this LMU by Recreation Opportunity Spectrum (ROS) classifications (2012). ROS is an inventory system developed by the U.S. Forest Service, to characterize land by types of recreation experiences. ROS is described on p. 42 of the 2016 SFRMP. “Other Zones” refers to Semi-Developed and Developed zones.

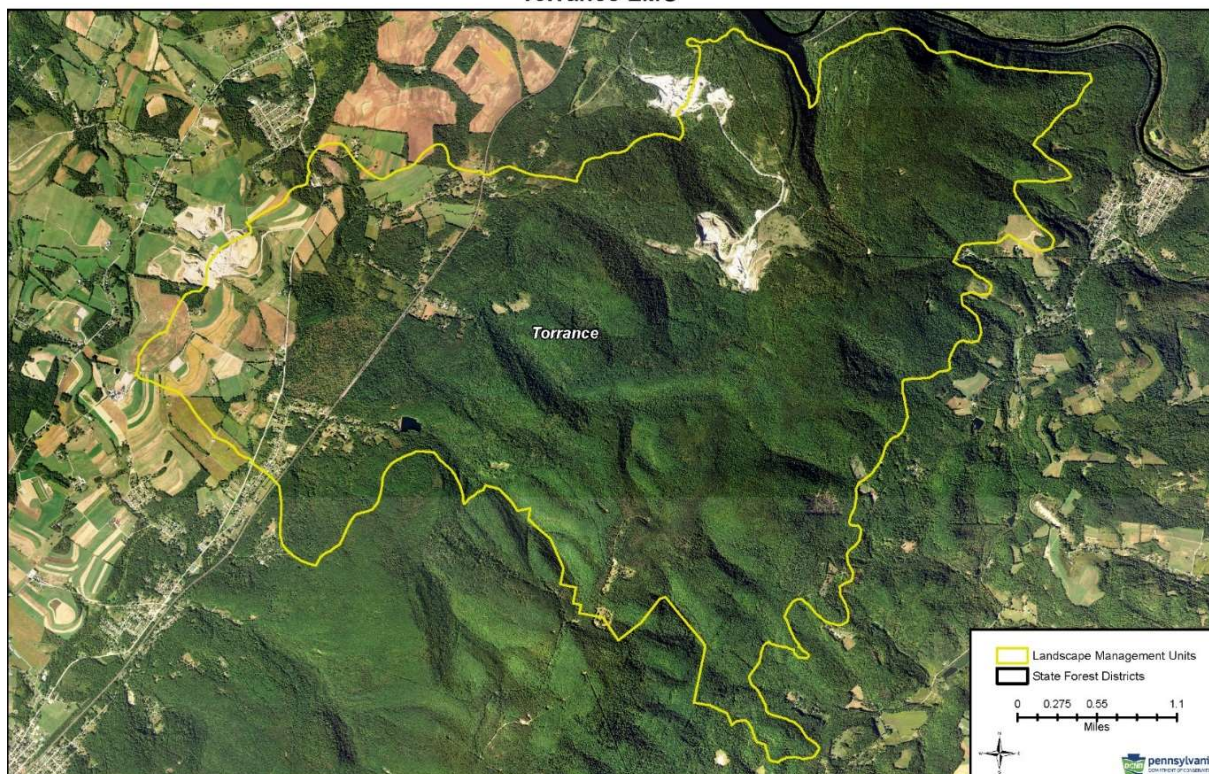
Overall the Mountain Streams LMU offers a less primitive experience compared to adjacent LMUs. Visitors to this LMU can expect less independence due to a network of roads open to public travel that traverse this LMU.

Torrance

Landscape Management Unit



Torrance LMU



Overview

The Torrance Landscape Management Unit is comprised of 10,243 acres, which includes the Torrance tract of Forbes State Forest, in Westmoreland county. The LMU sits at the base of Chestnut Ridge and is primarily in the Allegheny Mountain ecoregion, with a small portion being in the Pittsburgh Low Plateau ecoregion. One thousand four-hundred and sixty-nine acres of the LMU is state forest land (14%). Elevations in the LMU range from 1000' to 2400'. The Torrance LMU is mainly forestland (87%). Three miles of high quality streams run through the LMU, and it is a part of the Ohio River basin. Torrance Dam and a water supply line is located on SFL, which provides water to Torrance State Hospital.

Much of the land encompassing the Torrance tract was originally acquired in 1921 for the use of Torrance State Hospital. In 1982, through an Interdepartmental Transfer Agreement, it was transferred to the Bureau of Forestry. In 2003, an additional ~390 acres were purchased from the Western Pennsylvania Conservancy. Some areas of the Torrance tract were cut in the 1970's prior to the BOF gaining ownership. Hanson Aggregates operate a stone quarry adjacent to the northeast corner of the property which mines under the LMU.

Due to the ecological significance of the area, most of Torrance (90%) has been designated as High Conservation Value Forest. Because of this designation, an HCVF plan has been written for this tract. Timber management has been minimal on the Torrance tract since being acquired, which is why most of the acreage is mature forest. Red oak stands (44%) dominate the timber type followed by other hardwood stands (29%), and other oak stands (24%). Hemlocks have been treated for Hemlock Woolly Adelgid along Shirey Run. Shirey Run is a high-quality stream which also provides a supply of water to Torrance State Hospital. Invasive plants such as tree-of-heaven, stiltgrass, and oriental bittersweet are becoming present on Torrance.

Lemon Hole Cave and Coon Cave on SFL provide recreational opportunities and hibernaculum for bats. These caves are gated in the winter to prevent visitors from disturbing hibernating bats and protect them from the spread of white-nose syndrome. A third large cave, Bear Cave, is found on state property as a small inholding. A wetland, known as Bear Pond, is found on the tract. Currently, access to the property is very limited with a poor road/trail network, but there are plans for a parking lot and kiosk.

Priority Goals

- Maintain Lemon Hole Cave and Coon Cave for its unique features and recreational opportunities.
- Control invasive plants such as tree-of-heaven, stiltgrass, oriental bittersweet, etc. through biological and chemical means
- Protect Torrance Dam and water supply line
- Evaluate and continue treatment of hemlocks for HWA along Shirey Run
- Establish a parking lot and kiosk to provide access and information to Torrance
- Develop a trail plan and main road access to existing road network
- Maintain relationships with adjacent landowners of which some provide access to existing road network
- Protect, maintain, and manage threatened, endangered or rare species of special concern and their habitats including Allegheny Woodrat and bat species threatened by white-nose syndrome

- Identify and acquire land that would expand and improve SFL to the Torrance LMU
- Protect and maintain Bear Pond for its ecological importance to the area
- Prioritize the maintenance and promotion of core forest conditions and values.
- Maintain relationship with Mid Atlantic Karst Conservancy (MAKC) regarding caves in this LMU.

Profile

Table 1. LMU acreage: total and state forest land only.

	Acres
State Forest Land	1,469
LMU Total	10,243

Ecoregion: Allegheny Mountain & Pittsburgh Low Plateau

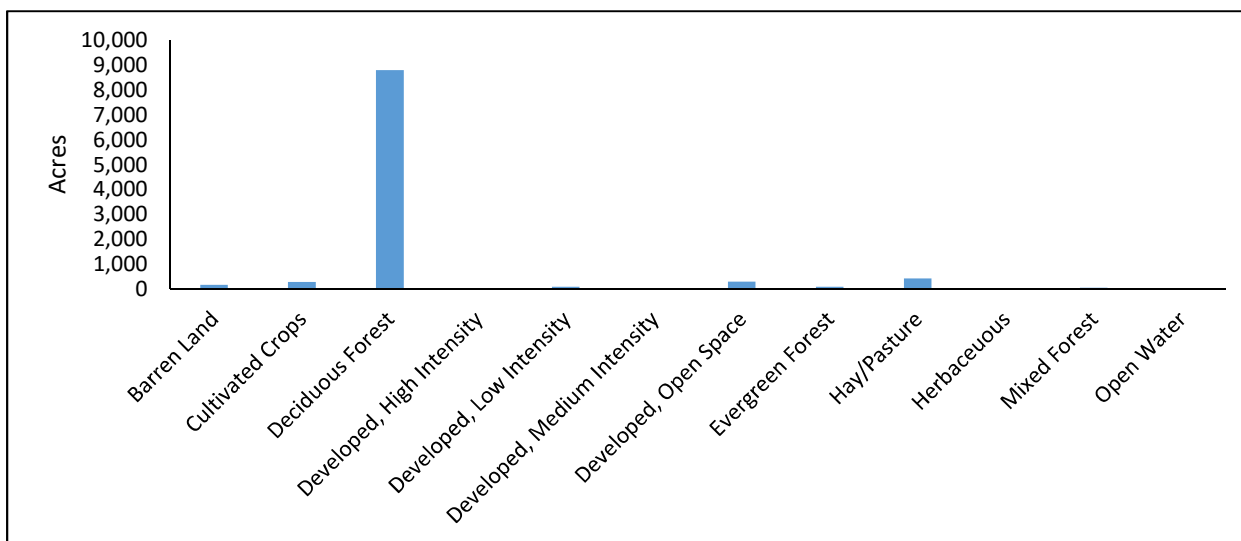


Figure 1. LMU acreage by land cover categories from the National Land Cover Dataset for the entire LMU.

The primary land cover of the Torrance LMU is deciduous forest. Farmland makes up most of the rest of the cover type followed by a small percentage of developed open space.

Table 2. Miles of roads by category on state forest land in this LMU. Road categories are described on p. 199 of the 2016 SFRMP.

Road Category	Total Miles
Z1 - Public Use Road	0
Z3 - Gated Road	2
Total	3

There are 2 miles of gated roads (Z3) on Torrance tract and less than 1 mile of roads (Gray Station Road) open to the public (Z1). Most of the current Z3 roads are accessed from private lands, through agreements made with the landowners. There are no state-maintained trails on Torrance tract.

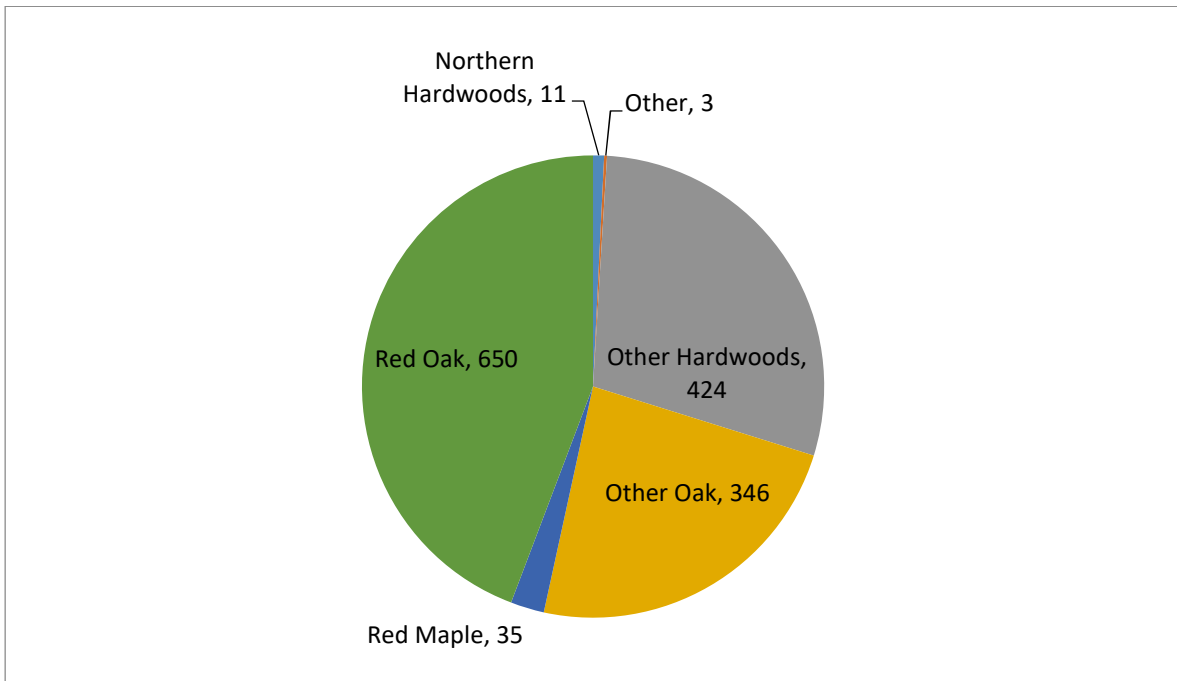


Figure 2. Acreage of state forest land in this LMU by aggregated forest type. The forest types are described on p. 108 of the 2016 SFRMP.

Red oak stands (44%) are the primary timber type in Torrance followed by other hardwoods (29%) and other oak (24%) stands. A special emphasis has been placed to maintain oak species that are difficult to regenerate to provide future timber and wildlife habitat.

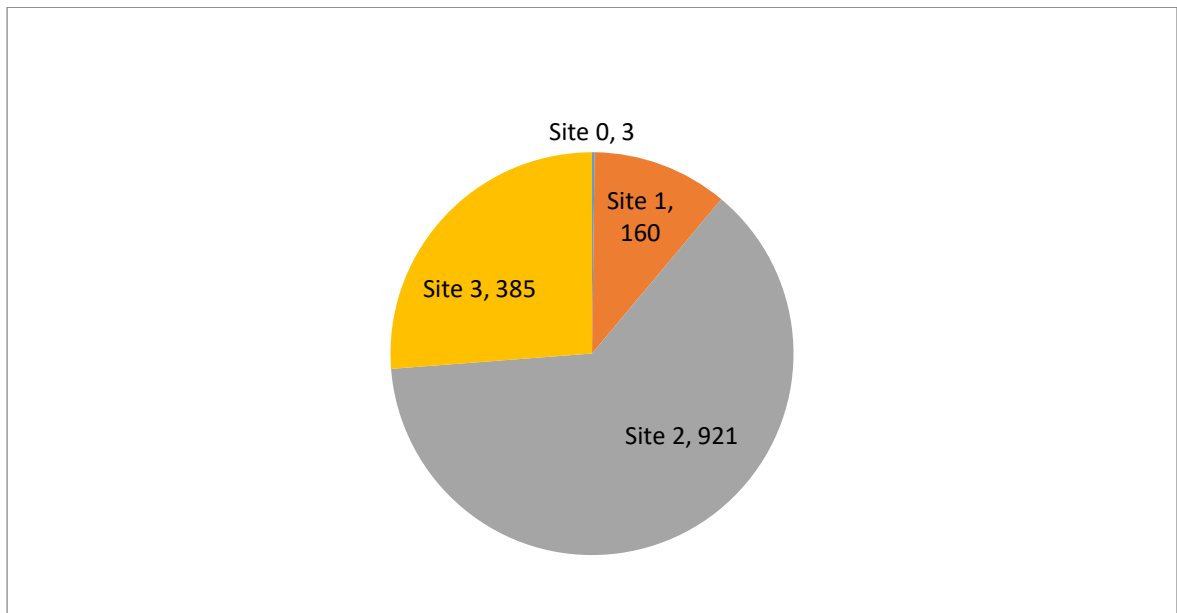


Figure 3. Acreage of state forest land in this LMU by site class. Site classes denote the potential quality of the growing site. “Site 0” indicates non-forested lands or forested lands where the vegetation has not yet been typed. Other site classes are described on p. 53 of 2016 SFRMP.

Most of Torrance (63%) has site class 2 or average growing sites. Site Class 3, which is poor growing sites make up 26%, and site class 1 or excellent growing sites are 11% of the LMU. The timber quality is good to

excellent in the site 1 and 2 stands and can be marketed easily to prospective timber buyers. The poorer site 3 stands are harder to sell to timber buyers due to the lower quality of timber produced per acre. All three site classes have their own challenges when it comes to regenerating new seedling growth following a timber harvest.

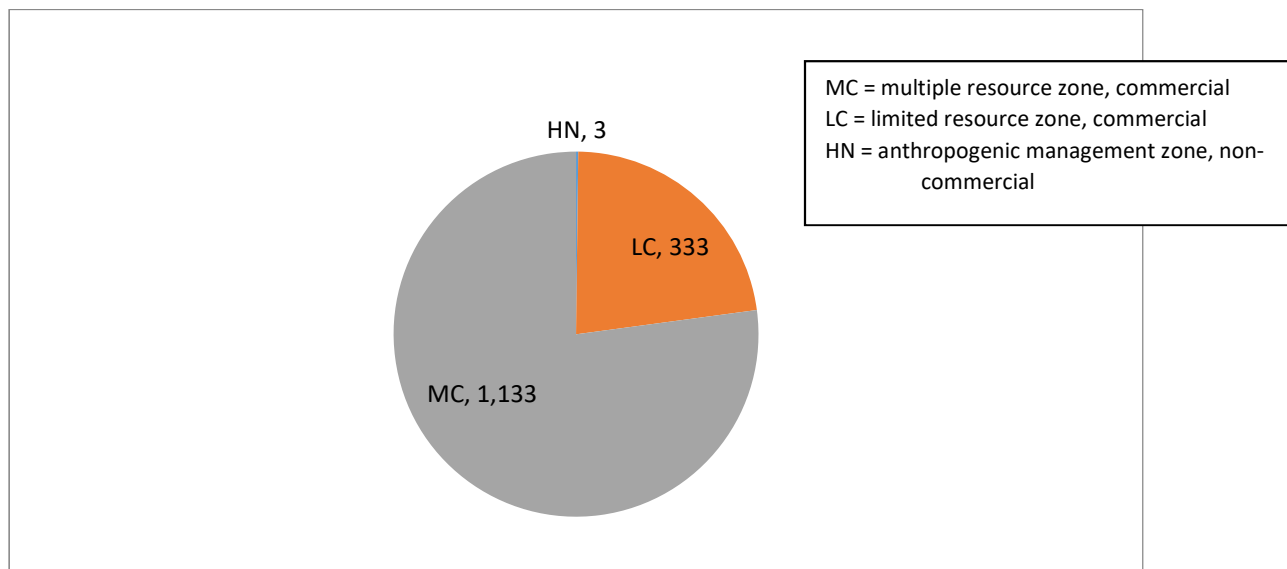


Figure 4. Acreage of state forest land in this LMU by management zone. Management zone is dictated by primary land use and land capability. Further descriptions of commerciality and zoning are found on p. 54 of the 2016 SFRMP.

77% of the zoning for the Torrance tract is multiple resource, commercial and 23% is limited use, due to topography.

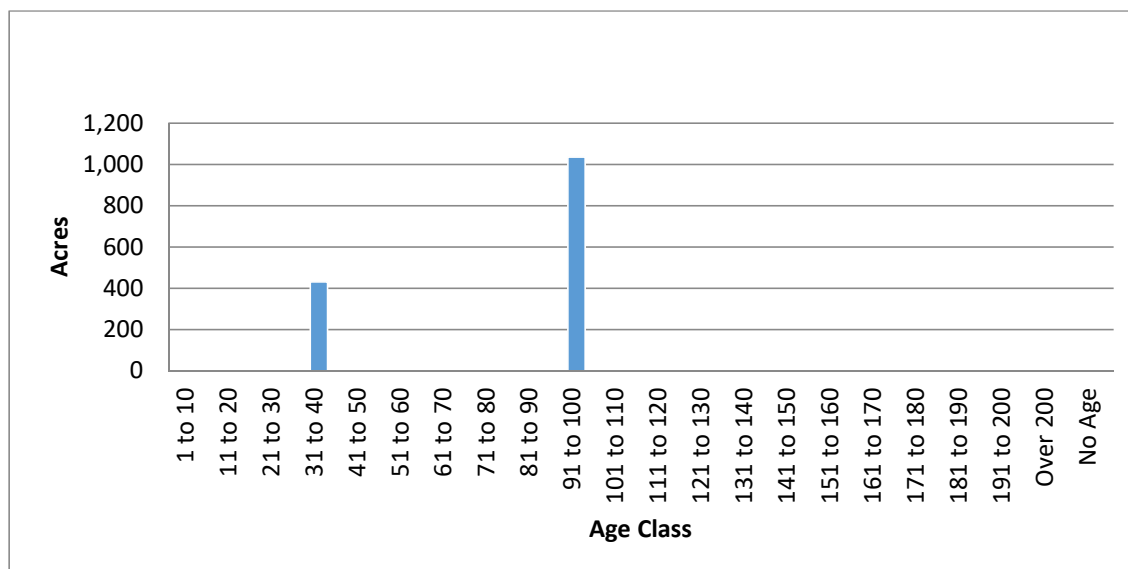


Figure 5. Acres of state forest land in this LMU by forest age classes.

Most of the timber on Torrance is mature (71%) ranging between 90 and 100 years old. Some of the timber (29%) was cut in the 1970's before the BOF gained ownership 38 years ago. Due to most of the area being HCVF and a poor road network, there are no plans to harvest in the immediate future.

Table 3. Miles of stream by classification within entire LMU. Department of Environmental Protection stream classifications are described in Chapter 93 Water Quality Standards of Title 25 in the Pennsylvania Code.

Class	Total (miles)
Undesignated	23
High Quality Waters	5
Exceptional Value Waters	2
Total	30

Three miles of Shirey Run (high quality stream) runs through the Torrance tract.

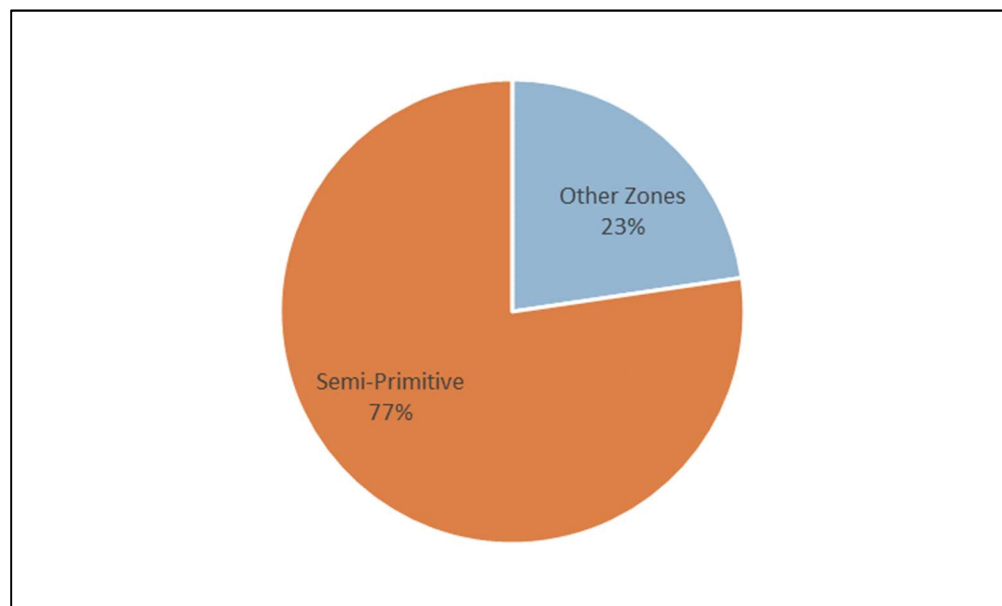


Figure 6. Acres of state forest land in this LMU by Recreation Opportunity Spectrum (ROS) classifications (2012). ROS is an inventory system developed by the U.S. Forest Service, to characterize land by types of recreation experiences. ROS is described on p. 42 of the 2016 SFRMP. “Other Zones” refers to Semi-Developed and Developed zones.

This LMU provides some recreational opportunities on state forest land. The ‘semi-primitive’ areas offer low levels of interaction with other visitors in a natural looking environment. The ‘other zones’ offer motorized recreation and more interactions with others in destination areas such as Coon and Lemon Hole Caves.

Table 6. High Conservation Value Forests (HCVFs) within the LMU.

Torrance	1322.5
Ecological Focus Areas	1322.5
Torrance Tract	1322.5

HCVF 1: Areas with significant concentrations of biodiversity values (e.g., endemism, endangered species, refugia).

- Concentrations of rare, threatened, endangered species.

HCVF 3: Forests that contain rare, threatened, or endangered ecosystems.

- Other rare, threatened, or endangered ecosystems.

HCVF4: Forests providing watershed protection, erosion control, and other basic services of nature.

- Forests primarily managed for providing community drinking water sources.

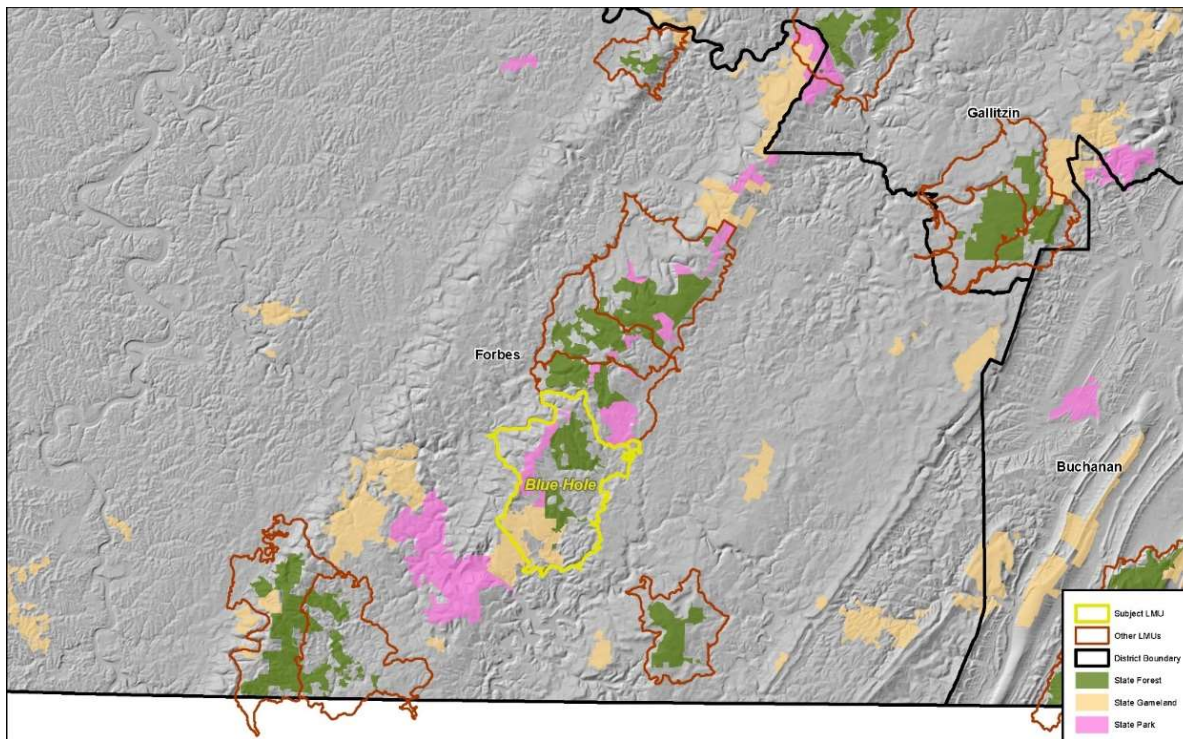
HCVF6: Forests with cultural, ecological, economic, religious, or other significance critical to local communities' traditional cultural identity.

- Significant cultural features created intentionally by humans' present.

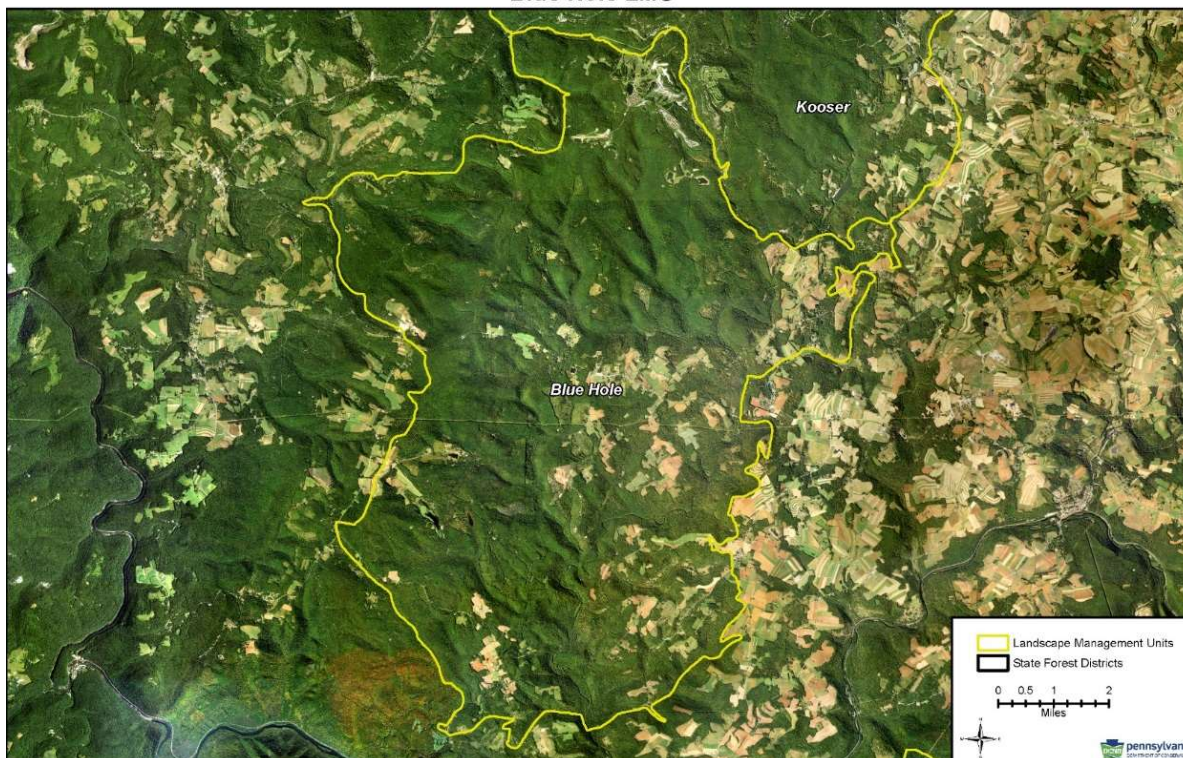
The HCVF contains hibernacula for bat species of concern and other species of concern, including a freshwater shrimp (*Stygobromus allegheniensis*) and Allegheny woodrat. It also contains occurrences of Solution Cave Terrestrial Natural Community. Geology should remain undisturbed.

Blue Hole

Landscape Management Unit



Blue Hole LMU



Overview

The Blue Hole Landscape Management Unit is comprised of 47,654 acres in southern Somerset County. This LMU is located on Laurel Ridge in the Allegheny Mountain Ecoregion of southwestern Pennsylvania. State forest land covers 7,411 acres or (16%) of the LMU. There are other public lands in the landscape including State Gamelands 111, Laurel Ridge State Park, and Laurel Hill State Park. The remaining land in the LMU is private ownership.

The pre-colonial forests of the Blue Hole Landscape consisted primarily of American chestnut, eastern hemlock, eastern white pine, and mixed oak. These forests were clearcut starting in the late 1800's for charcoal production, home construction, tanning, and to fuel the Industrial Revolution. Large uncontrolled wildfires and the chestnut blight followed the timber harvesting and converted the original forest type to the oak forests we have today. The initial state forest land acquisition in this LMU was a land purchase in 1930.

There are many High Quality (HQ) and Exceptional Value (EV) trout streams within the unit which flow into Laurel Hill Creek and eventually the Youghiogheny River in Confluence. The waters of Laurel Hill Creek and the Youghiogheny are cold water streams with populations of many species of invertebrates, reptiles, wild trout, river otters and other fish. The Youghiogheny River flows into the Monongahela River, which eventually flows into the Ohio River in Pittsburgh. The entire landscape is in the Ohio River Basin.

The Blue Hole LMU is over 90% forested with most of the forest land in a mature second growth stage. The landscape is well suited for timber production with almost all medium or exceptional growing sites. Because of these high-quality sites, and the fact that this unit has had very few issues with insect and disease, the Blue Hole LMU is one of the easiest units to regenerate. Emerald Ash Borer is the only insect causing widespread mortality of white ash in the landscape. The Ruffed Grouse Society currently holds a lease on the timber rights on the Barron Tract portion of state forest in the unit. Through this lease, RGS is harvesting timber and creating early successional habitat to promote ruffed grouse.

There are many recreational opportunities and points of interest in this unit. Seven Springs Ski Resort is a year-round tourist attraction that borders state forest land. Thousands of visitors come each year for skiing, snow tubing, golf, sporting clays, etc. along with various concerts and events. This LMU is bisected by a portion of the Laurel Highlands Hiking Trail. This is a National Scenic Trail used for hiking. The Blue Hole LMU is an important connector between Ohiopyle State Park, Laurel Ridge State Park, Laurel Hill State Park and the Laurel Mountain snowmobile trail systems. Other areas of interest in the landscape include Cole Run Falls, Blue Hole, Grindle Ridge Shelter Area, CCC Camp S-98 and Barronvale Covered Bridge. There are also threatened and endangered plants and plant communities, springs, and vernal ponds throughout the landscape.

Priority Goals

- Preserve and protect the integrity of Cole Run Falls and Blue Hole.
- Continue to build on relationships with Ruffed Grouse Society and Appalachian Forest Consultants on timber management and infrastructure development for the duration of the timber rights lease on the Barron Tract.
- Maintain the 200-foot forested corridor surrounding the Laurel Highlands Hiking Trail and Shelter Area.
- Maintain and improve Patterson Spring, motorized campsite and hiking trails.

- Protect, maintain, and manage threatened, endangered, or rare species of concern and their habitats such as riparian areas, spring seeps, and moist slopes with calcium soils unique to the Blue Hole Landscape.
- Continue to develop relationships with adjoining landowners to SFL, including State Parks, PGC, and Seven Springs Resort.
- Preserve and restore remnants of CCC Camp S-98 including pond, bridge and signage.
- Continue to work other entities to ensure snowmobile trail connectivity throughout this LMU.
- Protect and enhance the corridor along Laurel Hill creek by maintaining access and cooperating with other entities when possible.
- Establish and maintain wildlife openings throughout the landscape.
- Protect and enhance the High Quality and Exceptional Value streams on state forest land and pursue aquatic habitat improvement opportunities such as adding biomass to streams and/or streambank stabilization.

Profile

Table 1. LMU acreage: total and state forest land only.

	Acres
State Forest Land	7,411
LMU Total	47,654

Ecoregion: Allegheny Mountain

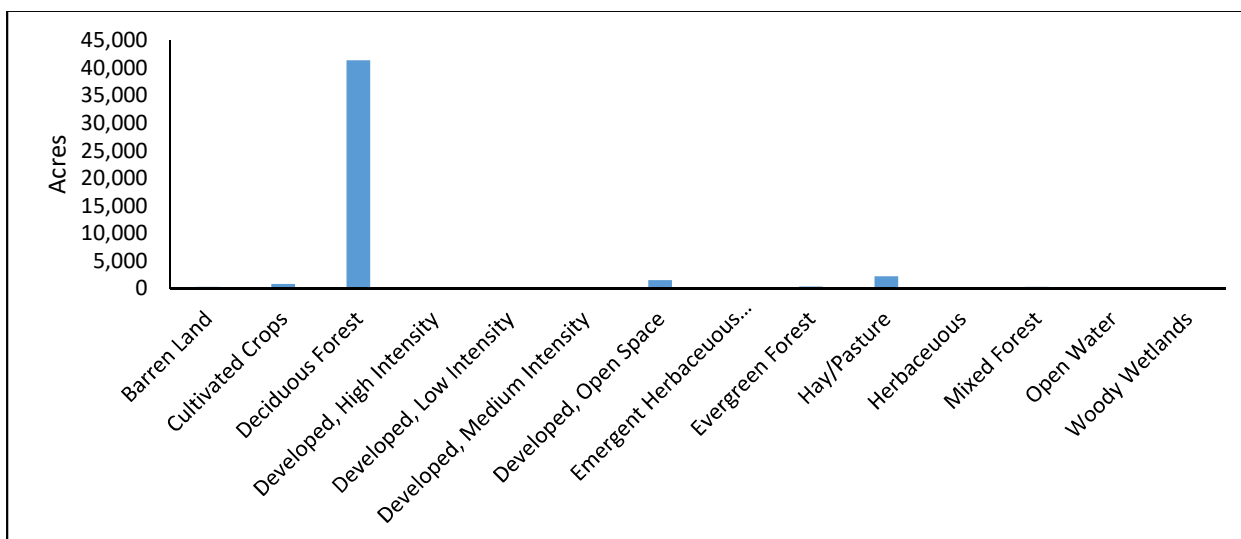


Figure 1. LMU acreage by land cover categories from the National Land Cover Dataset for the entire LMU.

The land cover in the Blue Hole LMU is comprised of 90% deciduous forest. The remaining 10% is mostly hay fields, cultivated crops, and open space.

Table 2. Miles of roads by category on state forest land in this LMU. Road categories are described on p. 199 of the 2016 SFRMP.

Road Category	Total Miles
Z1 - Public Use Road	17
Z3 - Administrative Road	9
Total	26

The major public use roads in this LMU include but are not limited to: Gary Run, Cole Run, Glade, Blue Hole, Grindle Ridge, Pletcher, Kanaul, and Sandy Run roads.

Table 3. Miles of trails on state forest land in this LMU open to various types of recreational use. Note that miles are not additive and a single trail may be open to multiple use types. Shared-use trails, which make up the majority of trails on state forest land, are open to hiking, biking, horseback riding, and cross-country skiing.

Trail Category	Total Miles
Hiking	5
Biking	3
Equestrian	3
X-Skiing	5
ATV I	0
ATV II	0
Snowmobile/Joint Use Road	10

There are 3 miles of trails in the Blue Hole LMU open to hiking, biking, cross country skiing, and equestrian use. There are 2 additional miles of trails only open to hiking and cross-country skiing. The LMU contains 8 miles of joint use roads that are open to vehicles and snowmobiles. ATV's are not permitted on the trail system in this LMU.

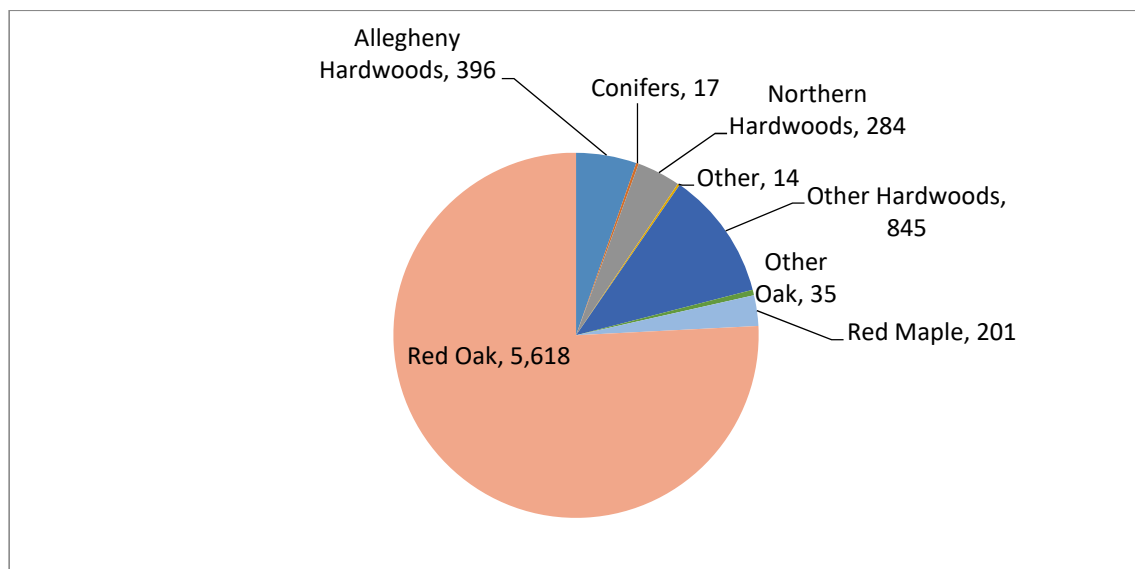


Figure 2. Acreage of state forest land in this LMU by aggregated forest type. The forest types are described on p. 108 of the 2016 SFRMP.

Red oak (76%) dominates the state forest land in the LMU. Other hardwoods (11%) are common followed by Allegheny hardwoods (5%) and northern hardwoods (4%). A special emphasis has been placed on maintaining oak species that are difficult to regenerate to provide future timber and wildlife habitat.

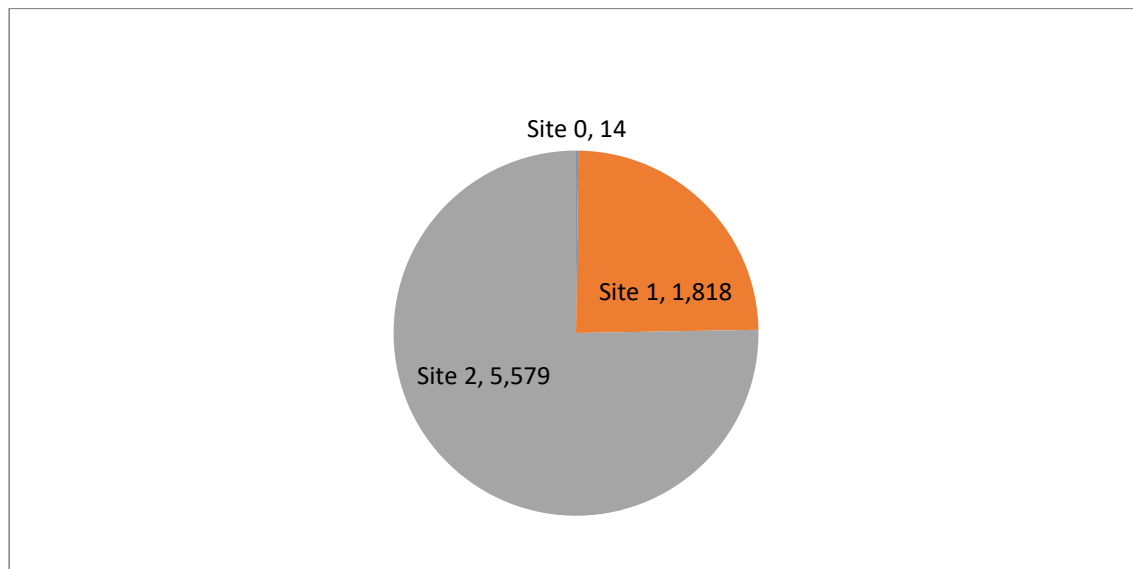


Figure 3. Acreage of state forest land in this LMU by site class. Site classes denote the potential quality of the growing site. “Site 0” indicates non-forested lands or forested lands where the vegetation has not yet been typed. Other site classes are described on p. 53 of 2016 SFRMP.

Medium growing sites (Site 2) account for 75% of the state forest land in the LMU followed by exceptional sites (Site 1) at 25%. The timber quality is good to excellent in the site 1 and 2 stands and can be marketed easily to prospective timber buyers.

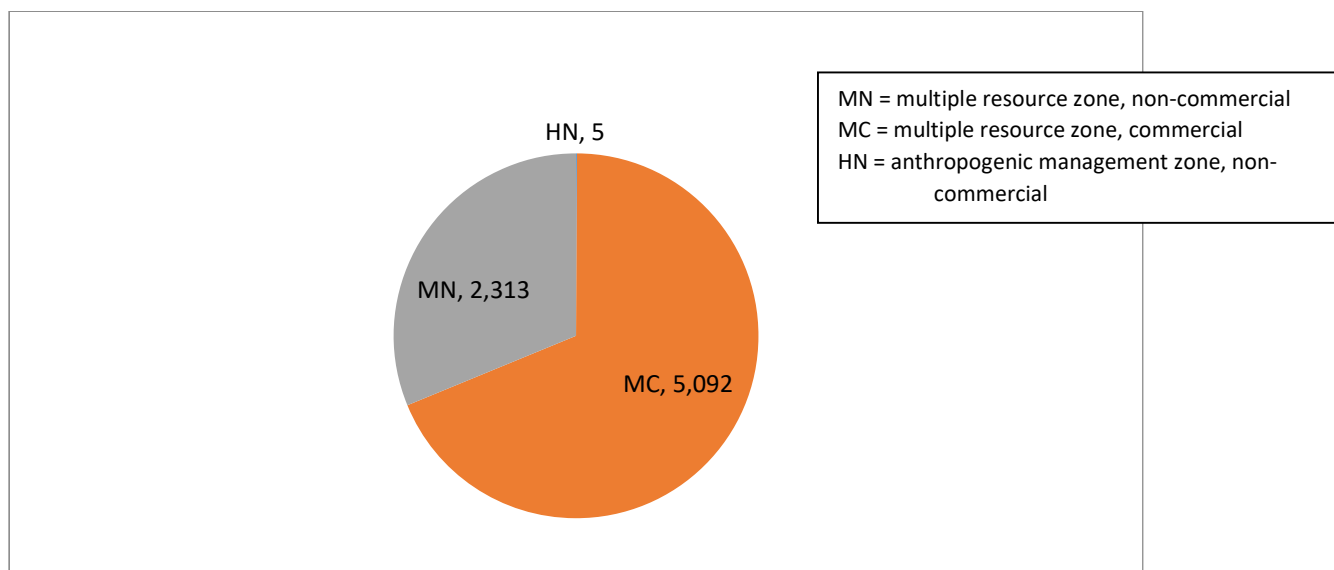


Figure 4. Acreage of state forest land in this LMU by management zone. Management zone is dictated by primary land use and land capability. Further descriptions of commerciality and zoning are found on p. 54 of the 2016 SFRMP.

Multiple resource, commercial forest land is approximately 69% of the state forest land in the LMU. These areas are suitable for timber production with few limitations. Multiple resource, non-commercial forest land accounts for 31% of the state forest land. These areas are designated non-commercial due to required trail and stream reservation buffers.

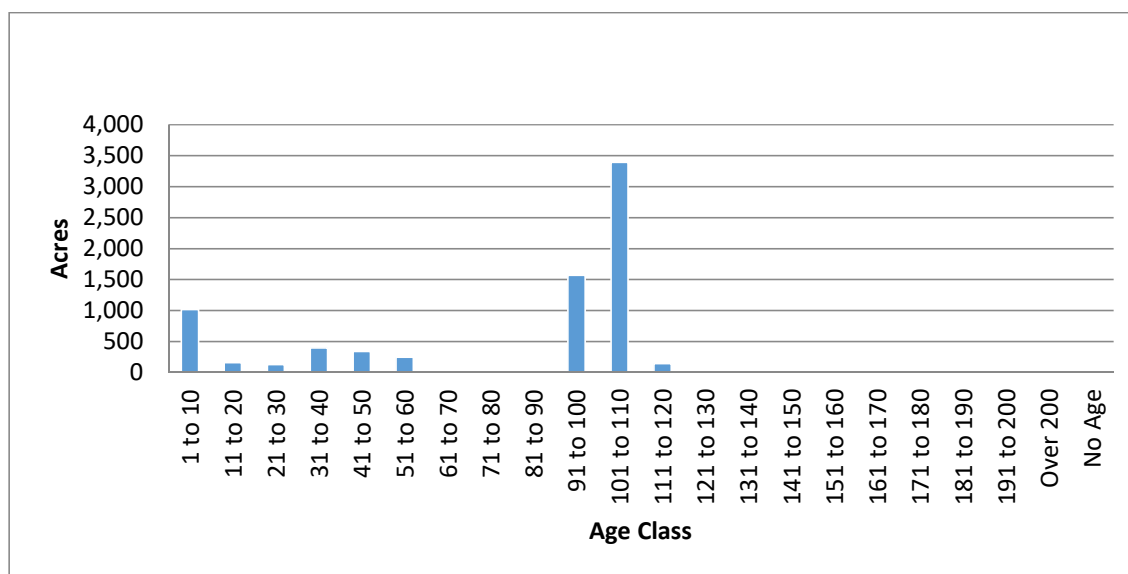


Figure 5. Acres of state forest land in this LMU by forest age classes.

Most of the forests on state forest land in the LMU are mature. Approximately 67% of these forests are between 90 -110 years old. To balance the age classes, we have recently implemented the Timber Harvest Allocation Model. Implementation of this model, accompanied by multiple recent overstory removal harvests, has caused a large component (14%) of forests under 10 years old. There is also a component of poles and small sawtimber (13%) 30 to 60 years old from clearcuts in the 1960's, 70's, and 80's.

Table 4. Miles of stream by classification within entire LMU. Department of Environmental Protection stream classifications are described in Chapter 93 Water Quality Standards of Title 25 in the Pennsylvania Code.

Class	Total (miles)
Undesignated	2
High Quality Waters	136
Perennial Cold Water Streams	0
Exceptional Value Waters	23
Total	161

The Blue Hole LMU is comprised of exceptional value and high quality cold water streams in primarily forested watersheds. Exceptional value waters on state forest land include Cole Run, Blue Hole and Gary's Run. High quality waters on state forest land include Fall Creek, Laurel Hill, and Sandy Run.

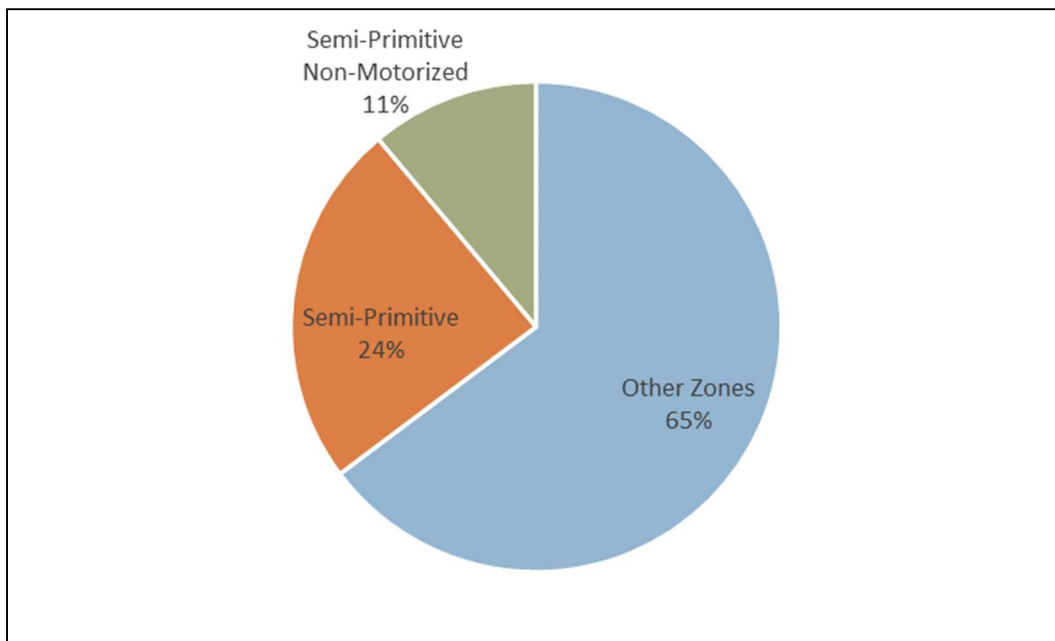
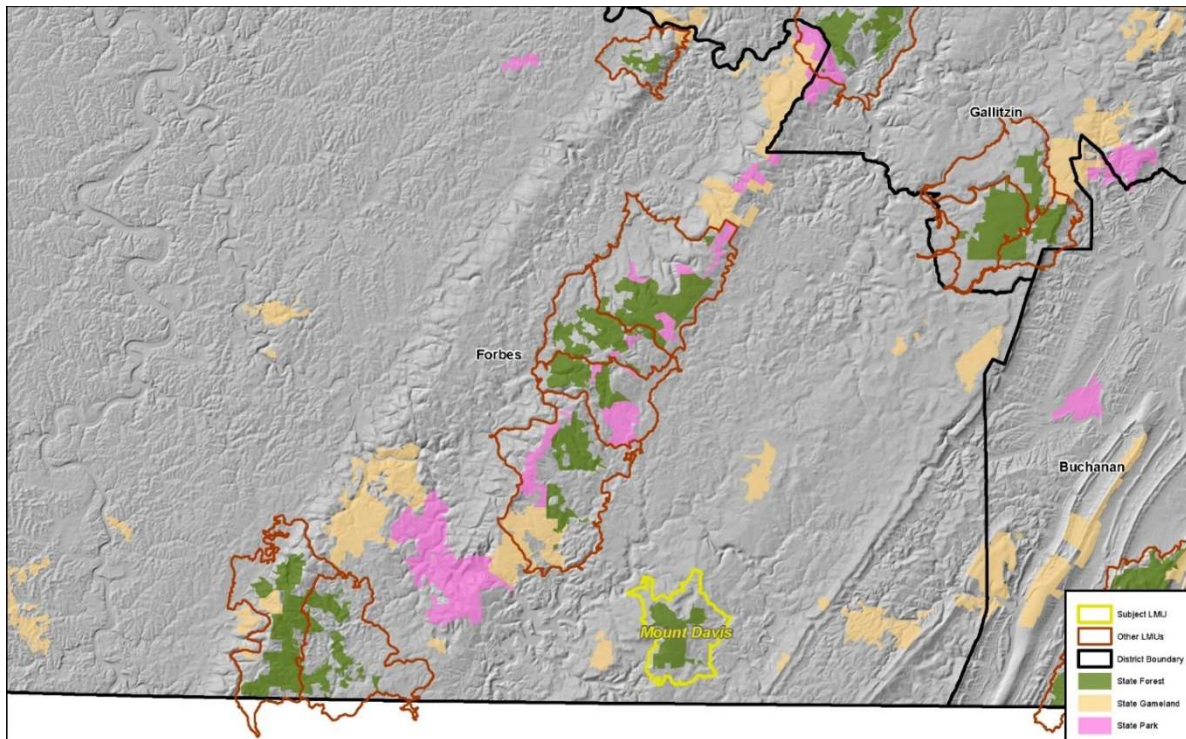


Figure 6. Acres of state forest land in this LMU by Recreation Opportunity Spectrum (ROS) classifications (2012). ROS is an inventory system developed by the U.S. Forest Service, to characterize land by types of recreation experiences. ROS is described on p. 42 of the 2016 SFRMP. “Other Zones” refers to Semi-Developed and Developed zones.

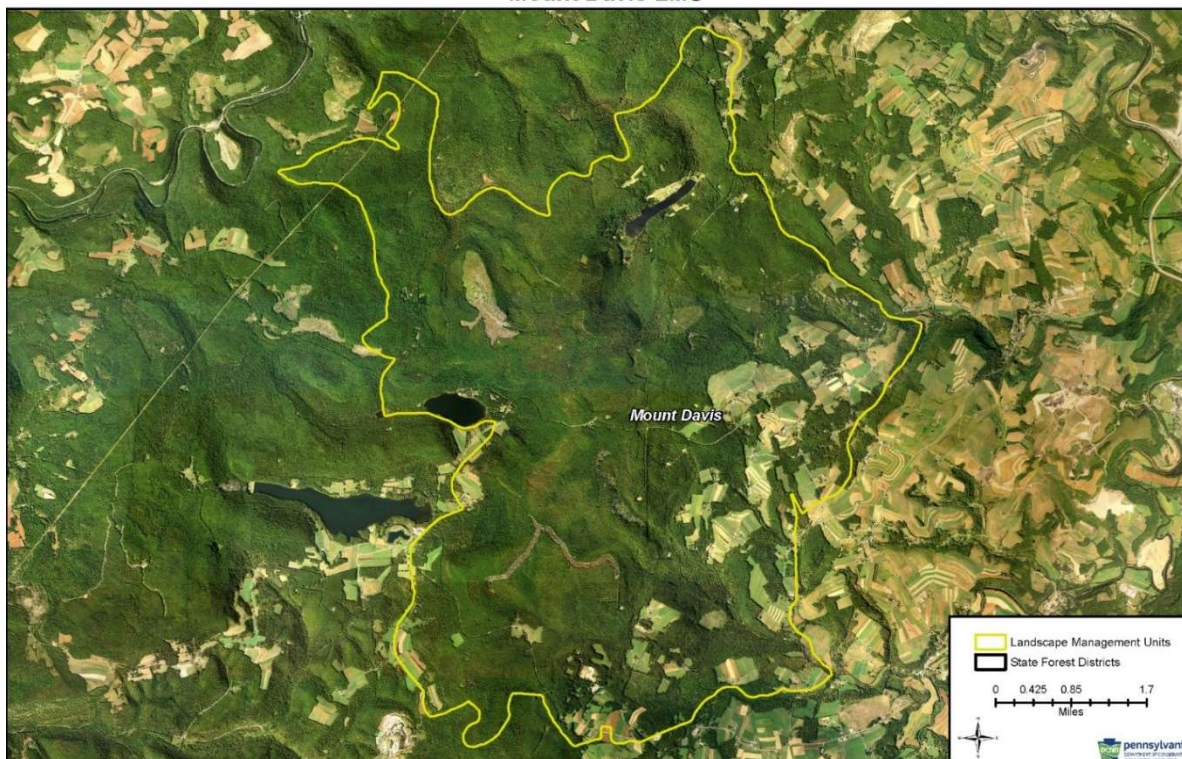
This LMU provides a variety of recreational opportunities on state forest land. The ‘semi-primitive, non-motorized’ areas offer a high probability of isolation from other visitors. The ‘semi-primitive’ areas offer low levels of interaction with other visitors in a natural looking environment. The ‘other zones’ offer motorized recreation and more interactions with others in destination areas such as the motorized campsite, Blue Hole and Cole Run Falls.

Mount Davis

Landscape Management Unit



Mount Davis LMU



Overview

The Mount Davis Landscape Management Unit is comprised of 19,977 acres in southern Somerset County. This LMU is located on Negro Mountain in the Allegheny Mountain Region of southwestern Pennsylvania. There are 6,124 acres of state forest land (31%) in the LMU with the remaining land under private ownership. The entire landscape is situated on a high plateau with elevations ranging from 2000' – 3213' (Highest point in Pennsylvania). Much of the LMU is forested with only small sections of farms and agricultural land to the east.

The pre-colonial forests of the Mount Davis Landscape consisted primarily of American chestnut, eastern hemlock, eastern white pine, and mixed oak. These forests were clearcut starting in the late 1800's for charcoal production, home construction, tanning and to fuel the Industrial Revolution. Large uncontrolled wildfires and the chestnut blight followed the timber harvesting and converted the original forest type to the oak forests we have today. The initial state forest land acquisition in this LMU was a land purchase from Elmira Humes in 1929.

There are many small streams within the unit which flow into the Casselman River and eventually the Youghiogheny River in Confluence. The waters of the Casselman and Youghiogheny are cold water streams with populations of many species of invertebrates, reptiles, wild trout, river otters and other fish. The Youghiogheny River flows into the Monongahela River, which eventually flows into the Ohio River in Pittsburgh. The entire landscape is in the Ohio River Basin.

The Mount Davis LMU is over 70% forested with much of the forest land in a mature second growth stage. Red oak is the dominating tree species found throughout the landscape. Most of the management unit is located at elevations of 2400' and above. These high elevations endure frequent winters of extended snow pack, ice storms, and harsh climates. Gypsy moth defoliation from the late 1980's along with defoliations in 2006-2008 caused significant mortality throughout this LMU, which has resulted in numerous salvage cuts forming a large component of early successional habitat. There are some early signs of hemlock wooly adelgid in the landscape along with widespread emerald ash borer infestations. The Bureau of Forestry maintains two white ash insecticide treatment sites in this landscape to preserve the genetics of the species.

There are many recreational opportunities and points of interest in this unit. The Mt. Davis High Point is the main attraction of the area. There is an observation tower at the high point that is over 50 ft. tall with scenic views of the surrounding area. From the tower one can see areas of intense fire damage, unique rock formations from thousands of years of freezing and thawing action, and various stages of forest succession. This LMU contains Mount Davis State Forest Picnic Area, High Point Lake Vista and numerous trails that provide four season recreation on state forestland. Cove Rocks and Baughman Rocks are unique rock outcrops which attract many visitors. There is a restored cabin from CCC Camp S97 along with signage about the camp. There are also unique plant communities throughout the landscape including one wild plant sanctuary containing numerous bog plants. Deer Valley YMCA camp is a large private facility on the western side of the LMU that is visited by thousands of campers and students each year. The Ringer Hill Windfarm is currently being constructed on the southern edge of the landscape.

Priority Goals

- Maintain the Mount Davis Natural Area as a core forest and preserve its unique and natural character.
- Maintain the High Point Tower and monument at the High Point.
- Develop a comprehensive interpretive plan for the high point and Mt Davis CCC areas and develop and install interpretive panels.
- Maintain and improve the High Point Lake and Cove Rocks Vistas, Baughman Rocks, Mount Davis Picnic Area, motorized campsite and all trails.
- Maintain and enhance ecologically important species and communities, including pitch pine, eastern hemlock, and oak forest types to improve diversity and wildlife habitat.
- Protect, maintain, and manage threatened, endangered, or rare species of concern and their habitats such as riparian areas, spring seeps, and moist slopes with calcium soils unique to the Mount Davis Landscape along with the Wild Plant Sanctuary.
- Identify and acquire key tracts of land that add SFL to the Mount Davis LMU.
- Continue to develop relationships with adjoining landowners to SFL, including Deer Valley YMCA camp, Laurel Falls Community, Amish Community and Coastal Properties.
- Continue to raise trout at the Mount Davis Maintenance Headquarters Pond in cooperation with the Salisbury-Elk Lick Sportsmen Club and Pennsylvania Fish and Boat Commission.
- Maintain relationships with radio tower site leaseholders including AT&T, PGC and Somerset 911.
- Preserve and restore historical CCC cabin.
- Establish and maintain wildlife openings and food plots throughout the landscape.

Profile

Table 1. LMU acreage: total and state forest land only.

	Acres
State Forest Land	6,124
LMU Total	19,977

Ecoregion: Allegheny Mountain

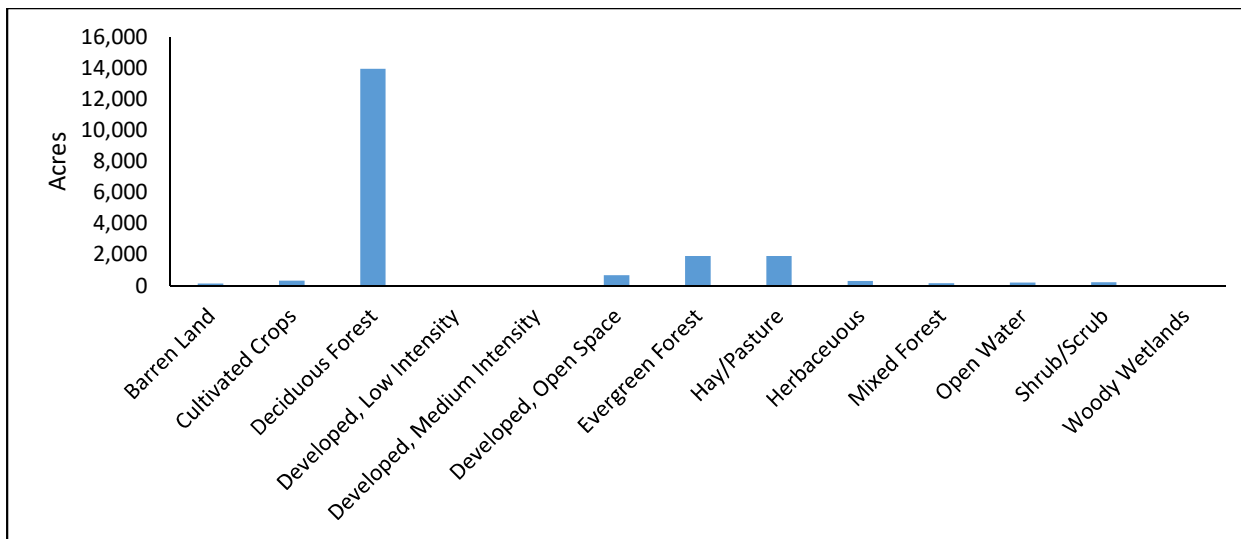


Figure 1. LMU acreage by land cover categories from the National Land Cover Dataset for the entire LMU.

The land cover in the Mount Davis LMU is comprised of 70% deciduous forest. Conifers cover about 10% of the LMU. The remaining 20% is mostly hay fields and cultivated crops.

Table 2. Miles of roads by category on state forest land in this LMU. Road categories are described on p. 199 of the 2016 SFRMP.

Road Category	Total Miles
Z1 - Public Use Road	18
Z3 - Gated Road	7
Total	25

The major public use roads in this LMU include but are not limited to: Vought Rock, North Wolf Rock, Camp Bucky, Mt. Davis, South Wolf Rock, Christner and Savage roads.

Table 3. Miles of trails on state forest land in this LMU open to various types of recreational use. Note that miles are not additive and a single trail may be open to multiple use types. Shared-use trails, which make up the majority of trails on state forest land, are open to hiking, biking, horseback riding, and cross-country skiing.

Trail Category	Total Miles
Hiking	11
Biking	8
Equestrian	8
X-Skiing	11
ATV I	0
ATV II	0
Snowmobile / Joint Use Road	13

There are 8 miles of trails in the Mount Davis LMU open to hiking, biking, cross-country skiing, and equestrian use. There are 3 additional miles of trails only open to hiking and cross-country skiing. The LMU contains 13 miles of joint use roads that are open to vehicles and snowmobiles. ATV’s are not permitted on the trail system in this LMU.

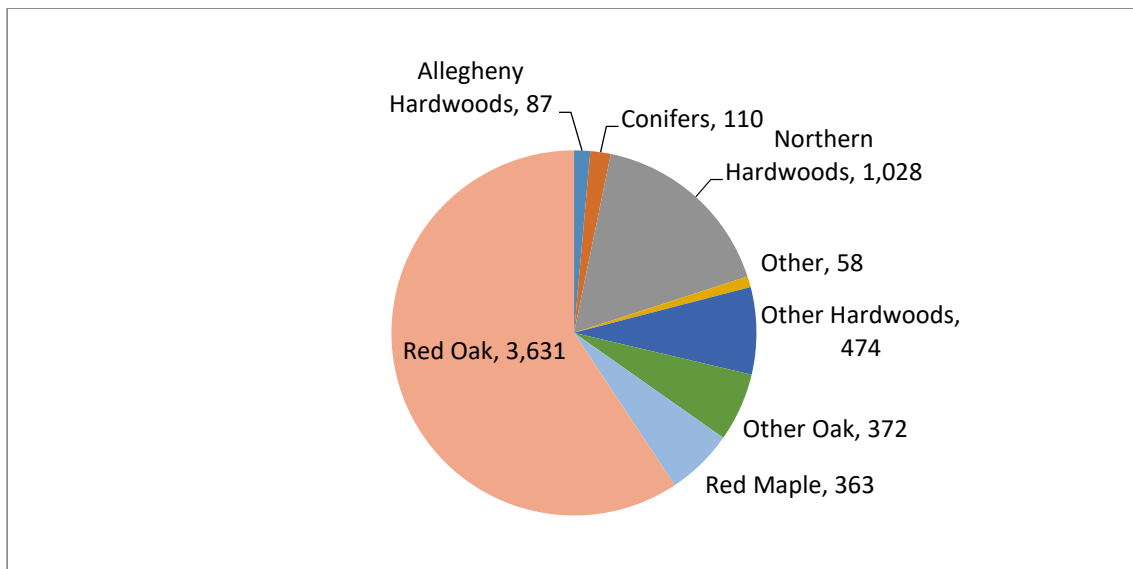


Figure 2. Acreage of state forest land in this LMU by aggregated forest type. The forest types are described on p. 108 of the 2016 SFRMP.

Red oak (59%) dominates the state forest land in the LMU. Northern hardwoods (17%) are also common followed by other hardwoods (8%) and other oak and red maple both at 6%. A special emphasis has been placed on maintaining oak species that are difficult to regenerate to provide future timber and wildlife habitat.

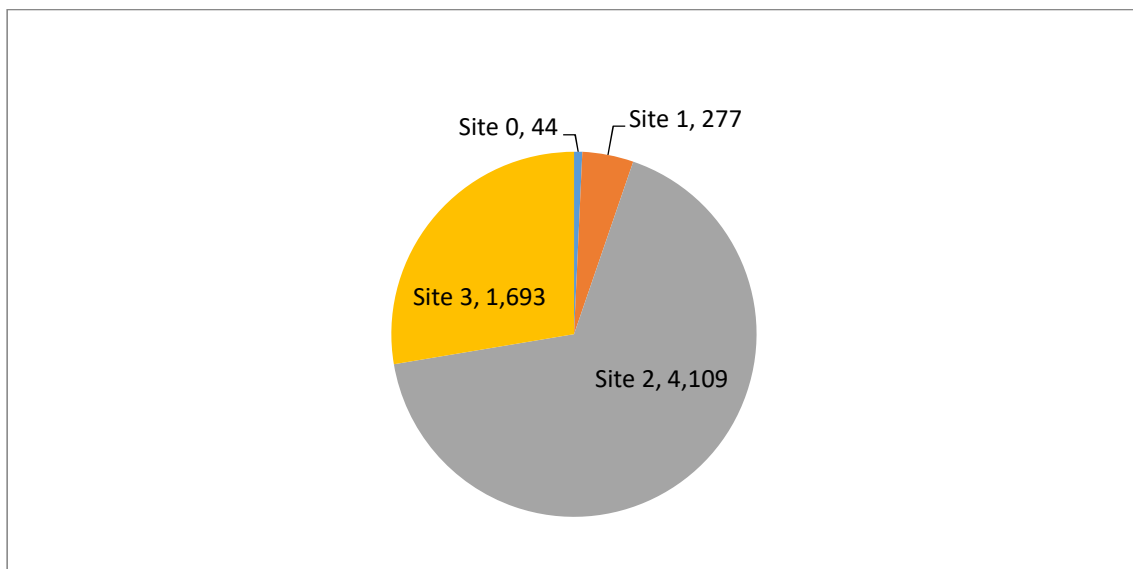


Figure 3. Acreage of state forest land in this LMU by site class. Site classes denote the potential quality of the growing site. "Site 0" indicates non-forested lands or forested lands where the vegetation has not yet been typed. Other site classes are described on p. 53 of 2016 SFRMP.

Medium growing sites (Site 2) account for 67% of the state forest land in the LMU. Poor growing sites (Site 3) account for 28% followed by exceptional sites (Site 1) at 5%. The timber quality is good to excellent in the site1 and 2 stands and can be marketed easily to prospective timber buyers. The poorer site 3 stands are

harder to sell to timber buyers due to the lower quality of timber produced per acre. All three site classes have their own challenges when it comes to regenerating new seedling growth following a timber harvest.

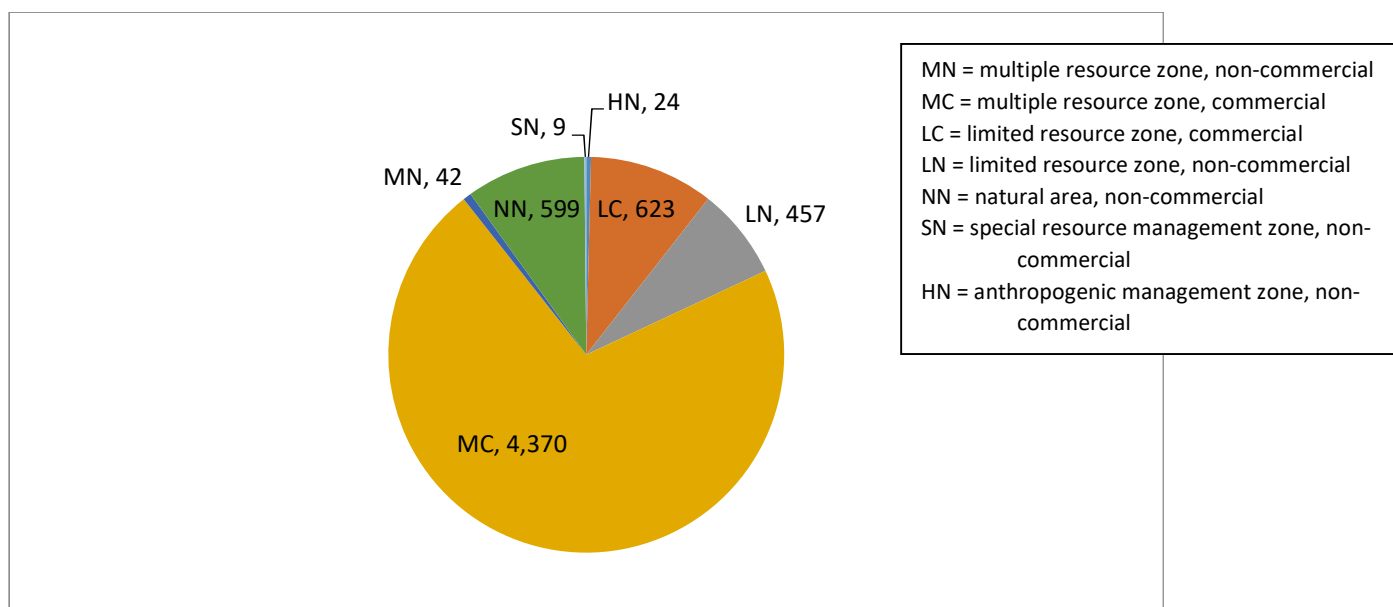


Figure 4. Acreage of state forest land in this LMU by management zone. Management zone is dictated by primary land use and land capability. Further descriptions of commerciality and zoning are found on p. 54 of the 2016 SFRMP.

Multiple resource, commercial forest land is approximately 71% of the state forest land in the LMU. These areas are suitable for timber production with few limitations. Limited zoning accounts for 18% of the state forest land. These areas are designated limited due to steep slopes difficult for logging that are prone to erosion, or areas with drainage issues or large boulders. The Mount Davis Natural Area comprises 10% of the state forest land base and is not open to logging activity.

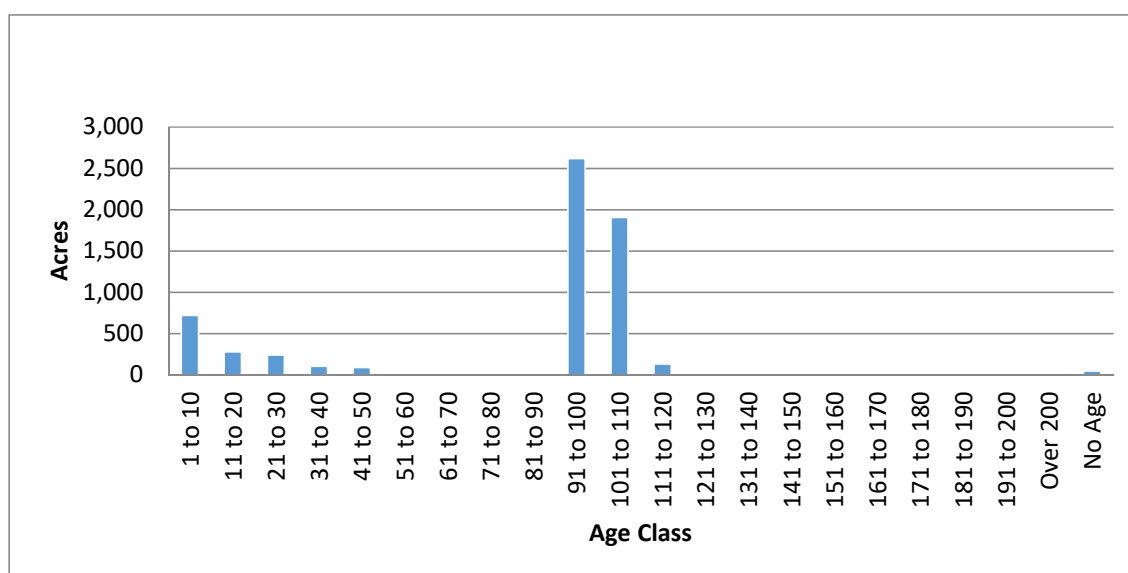


Figure 5. Acres of state forest land in this LMU by forest age classes.

Most of the forests in the LMU are mature. Approximately 76% of the forests are at least 80 years old with the clear majority (74%) between 90 -110 years old. To balance the age classes, we have recently implemented the Timber Harvest Allocation Model. Implementation of this model, accompanied by multiple salvage harvests from gypsy moth, has caused a large component (12%) of forests under 10 years old.

Table 4. Miles of stream by classification within entire LMU. Department of Environmental Protection stream classifications are described in Chapter 93 Water Quality Standards of Title 25 in the Pennsylvania Code.

Class	Total (miles)
Undesignated	9
Perennial Cold Water Streams	26
Exceptional Value Waters	10
Human-made Impoundment/ Pond	2
Total	47

The Mount Davis LMU is comprised of exceptional value and cold water streams in primarily forested watersheds. Exceptional value waters on state forest land include Town Line Run and Vought Run.

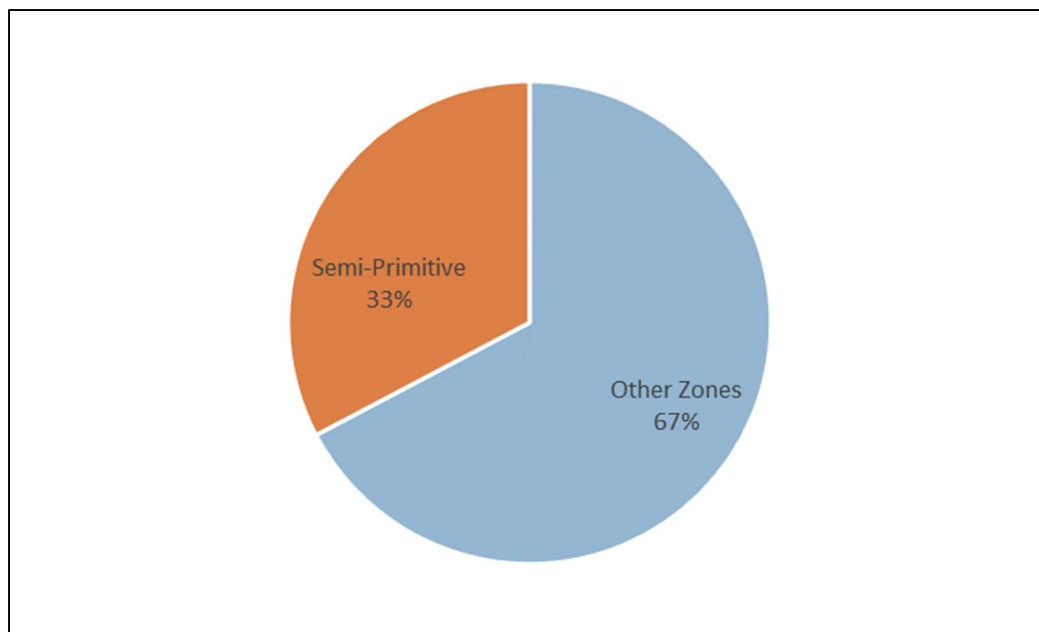
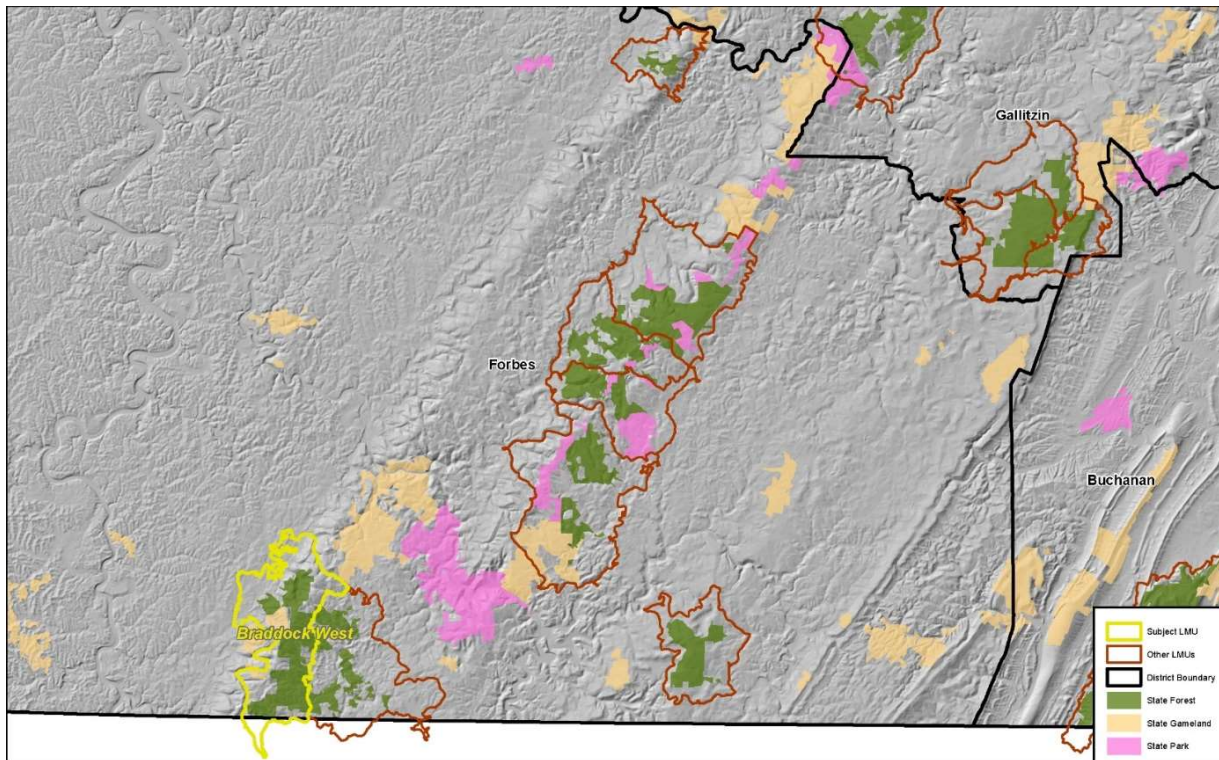


Figure 6. Acres of state forest land in this LMU by Recreation Opportunity Spectrum (ROS) classifications (2012). ROS is an inventory system developed by the U.S. Forest Service, to characterize land by types of recreation experiences. ROS is described on p. 42 of the 2016 SFRMP. “Other Zones” refers to Semi-Developed and Developed zones.

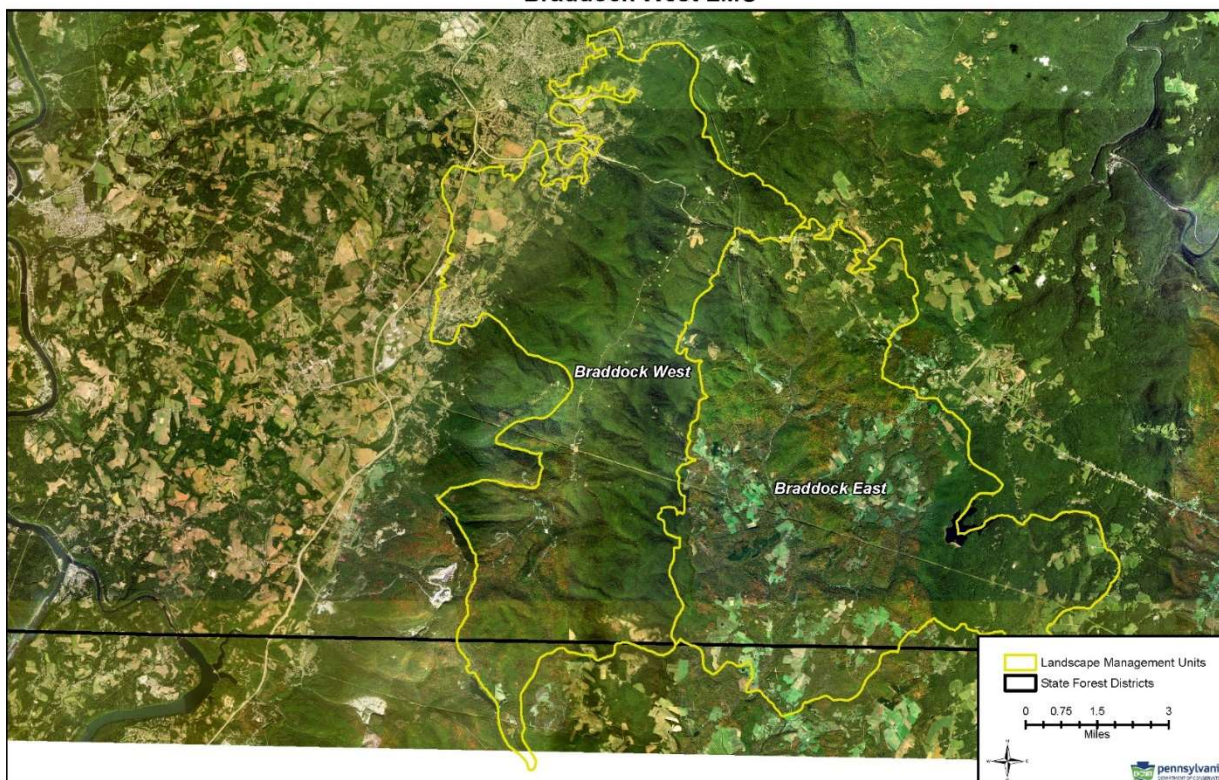
This LMU provides some recreational opportunities on state forest land. The ‘semi-primitive’ areas offer low levels of interaction with other visitors in a natural looking environment. The ‘other zones’ offer motorized recreation and more interactions with others in destination areas such as the motorized campsite, High point observation tower, Baughman Rocks and High Point Lake overlook.

Braddock West

Landscape Management Unit



Braddock West LMU



Overview

The Braddock West Landscape Management Unit encompasses 35,369 acres in the Braddock Division of Forbes State Forest in Fayette County. The LMU is draped over Chestnut Ridge in what is known as the Laurel Highlands of the Allegheny Mountain Ecoregion with a small NW portion spilling into the Pittsburgh Low Plateau. The LMU lies on Chestnut Ridge, the first mountain range moving east from Ohio and western PA that provides large tracts of high elevation oak dominated forests in stark contrast to the open fields and fragmented forests that lie to the west. There are 13,204 acres of state forest land in the LMU (37% of the LMU). Elevations range from around 1,100' to 2,775'. The LMU is primarily forested with only 4,900 acres of non-forested lands in the valley consisting of agricultural, pasture, and small residential properties. This LMU contains several High-Quality streams along with one Exceptional Value stream. There are a few old shallow gas wells scattered throughout the landscape along with the active North Summit natural gas storage field under a large portion of SFL. Several pipelines and electric rights-of-way cross this LMU, including West Penn Power's important 500 kV HAT-BO electric line. The forest foreman's maintenance headquarters is in this LMU along with the historic Pondfield fire tower. 1,182 acres of State Game Land 138 borders the western edge of SFL of this LMU, and the popular Ohiopyle State Park is about six miles to the northeast. Soils are moderately-deep or deep and moderately-well to well-drained. Water drains into the Youghiogheny River to the east and into the Monongahela River to the west with all water eventually ending up in the Ohio River.

The pre-colonial forest type (American chestnut/mixed oak/white pine-hemlock) was first harvested in the mid 1800's for charcoal, homes, mines, and farmland and then it was harvested again around 1930-1940. The state forest land in this LMU was bought by the Commonwealth in 1950. Past clearcutting, the chestnut blight, and uncontrolled wild fires in the early 1900's changed the original forest type to the current oak forests with tulip tree-maple forests in the hollows. Timber management was light in the young forests but picked up in the 2000's as the timber matured. Currently, about 29% of the available acres in the LMU have been harvested with some type of silvicultural treatment, including some gypsy moth salvage operations after heavy infestations in the 80's. The hemlock wooly adelgid has not caused widespread hemlock mortality yet in this LMU, but the emerald ash borer is currently killing all ash species in the region.

Recreational activities in this LMU attract visitors from nearby major towns and cities including, Uniontown, Pittsburgh, Greensburg, Cumberland MD, and Morgantown WV. The Lick Hollow State Forest Picnic Area, Whitetail Trail, and Pine Knob Overlook are important to many engaged stakeholders. Other points of interest in this LMU on state forest land are the Pondfield fire tower, Dupont powder mill, grist mill, and Sisters of Charity structures. Most of the Quebec Run Wild Area is within this LMU and contains several unique forest communities home to some state- and/or federally-listed species. A Wild Plant Sanctuary has been designated to protect a globally rare plant along with two ecological focus areas to protect a globally rare amphibian. Barton Cave is gated in the winter to prevent visitors from disturbing hibernating bats which makes them more susceptible to white-nose syndrome. This LMU contains several invasive species that are of concern, including Japanese barberry, bush honeysuckle, multi-flora rose, tree of heaven, and an emerging mile-a-minute weed problem.

Priority Goals

- Maintain large uninterrupted, high-elevation forested tracts of SFL creating a wild character component on Chestnut Ridge unique to southwestern Pennsylvania
- Maintain the Quebec Run Wild Area as a core forest area and preserve its unique wild character

- Develop access to the Ruane Tract and take a comprehensive look at recreational opportunities within the tract with possible connections to the Whitetail Trail.
- Maintain and enhance ecologically important species and communities, including pitch pine, oak forest types and Eastern hemlock, to improve diversity and wildlife habitat
- Protect, maintain, and manage rare species and their habitats, including rare plants, amphibians and reptiles, Allegheny woodrats, and bat species threatened by white-nose syndrome
- Continue cooperation with lease holder in management of the North Summit natural gas storage field
- Control and try to eradicate mile-a-minute weed and tree-of-heaven, especially on utility rights-of-way
- Manage and administer oil and gas activity in a manner that is consistent with the Bureau's mission statement and the principles of ecosystem management by avoiding, minimizing, or mitigating adverse impacts to state forest land, ensuring compliance with executed agreements, and maintaining positive working relationships with severed rights owners.
- Preserve and interpret the historic Dupont powder mill, Pondfield fire tower, grist mill, and Sisters of Charity structures
- Protect, maintain, and manage the wild plant sanctuary in this LMU and the two ecological focus areas, Laurel Run and Oliphant Furnace-White Rocks for an important globally rare amphibian
- Develop relationships and promote sustainable forestry practices with private landowners that own large tracts (more than 100 acres) of land within the LMU
- Identify and acquire key tracts of land that add SFL to the Braddock West LMU
- Continue to develop relationships with adjoining landowners to SFL, including the PGC, Laurel Caverns, and windmill farm operator
- Maintain Barton Cave for its unique ecological benefits and recreational opportunities and increase public awareness of how white-nose syndrome is killing bats
- Look for opportunities to create habitat for cerulean warblers and early successional habitat to benefit a multitude of wildlife and bird species, including the golden-winged warbler

Profile

Table 1. LMU acreage: total and state forest land only.

	Acres
State Forest Land	13,204
LMU Total	35,369

Ecoregion: Allegheny Mountain with small NW part in Pittsburgh Low Plateau

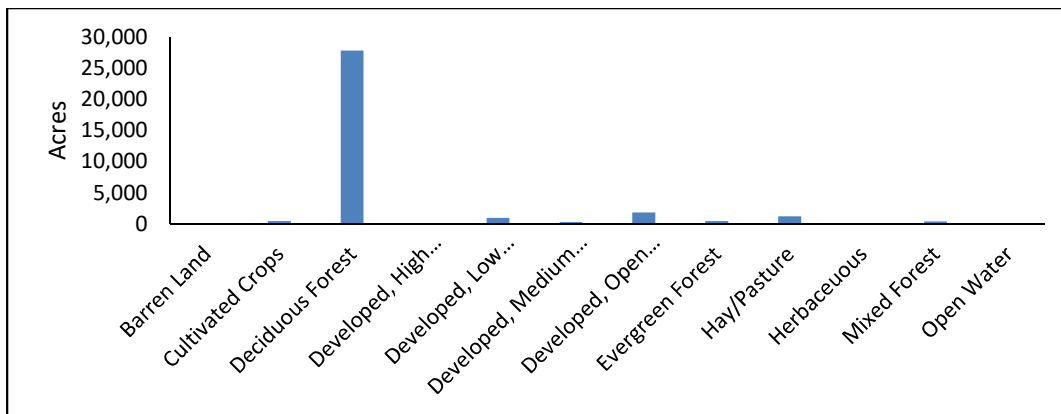


Figure 1. LMU acreage by land cover categories from the National Land Cover Dataset for the entire LMU.

Most of this LMU is dominated by large uninterrupted deciduous forests along Chestnut Ridge. The NW part of this LMU is flatter, valley terrain more conducive to residential development and agriculture. The woodlots in the valley are smaller and more fragmented in nature. Residential development on the western edge of this LMU is increasing as more people move into rural areas.

Table 2. Miles of roads by category on state forest land in this LMU. Road categories are described on p. 199 of the 2016 SFRMP.

Road Category	Total Miles
Z1 - Public Use Road	14
Z3 - Gated Road	15
Total	29

Most of the roads that travel through state forest land in this LMU are township and state-owned roads, like State Route 40, Skyline Drive, Shepherd Road, Kirby Road, Quebec Road, and Wirsing School Road. The only road owned by the Bureau of Forestry is Quebec Run Road which passes through the Quebec Run Wild Area and is a Z3 gated road.

Table 3. Miles of trails on state forest land in this LMU open to various types of recreational use. Note that miles are not additive and a single trail may be open to multiple use types. Shared-use trails, which make up the majority of trails on state forest land, are open to hiking, biking, horseback riding, and cross-country skiing.

Trail Category	Total Miles
Hiking	34
Biking	34
Equestrian	34
X-Skiing	34
ATV I	0
ATV II	0
Snowmobile/ Joint Use Road	0

Most of the trails in this LMU are located within the Quebec Run Wild Area except for a few trails in the Lick Hollow Picnic Area and the Whitetail trail. The Whitetail trail runs north and south from the north gate parking lot of the Quebec Run Wild Area to the Pine Knob overlook. We do not permit ATV's on the Forbes State Forest except for persons with disabilities who possess a valid permit for a powered mobility device.

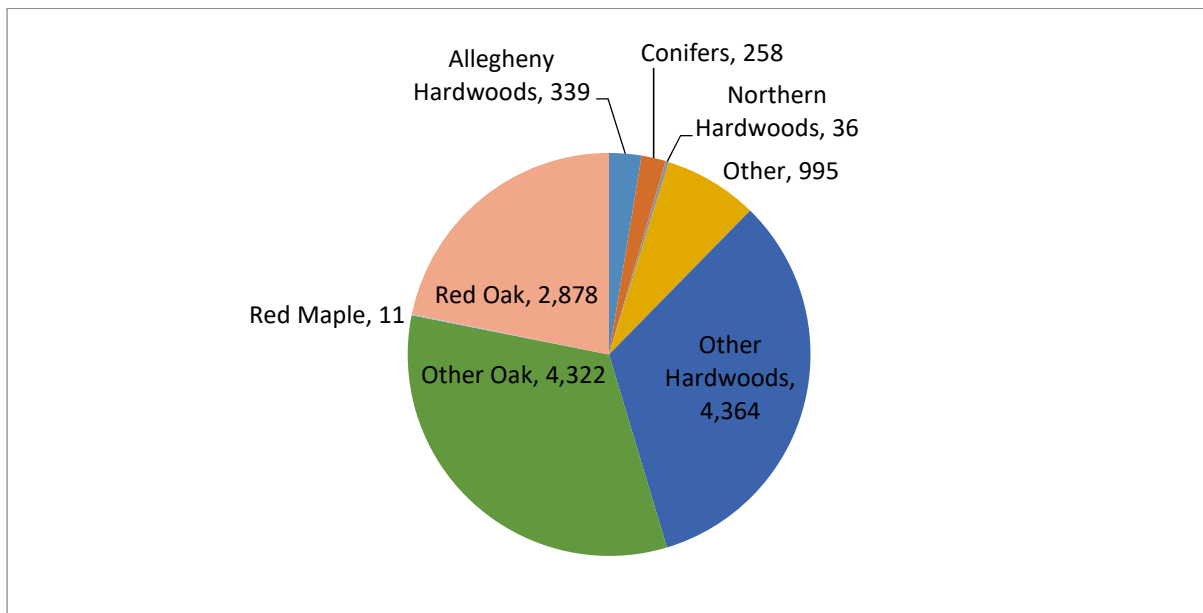


Figure 2. Acreage of state forest land in this LMU by aggregated forest type. The forest types are described on p. 108 of the 2016 SFRMP.

The LMU is dominated by red oak dominated stands (22%), other oak (white oak, chestnut oak) forest types (33%), and other hardwoods (33%), which includes some tulip poplar dominated stands. A special emphasis has been placed on maintaining oak species that are difficult to regenerate to provide future timber and wildlife habitat. Prescribed fire is showing promising results in helping regenerate oak seedlings. The tulip poplar dominated stands in this LMU are not common in our other state forest divisions. There is very little conifer cover in this LMU, with only small patches of pitch pine along the ridge top and Eastern hemlock along the streams. Conifer cover is a priority to conserve and enhance. The large acreage in the “Other” forest type pertains to a more recent state forest land acquisition that has yet to be officially surveyed and therefore not stand typed yet.

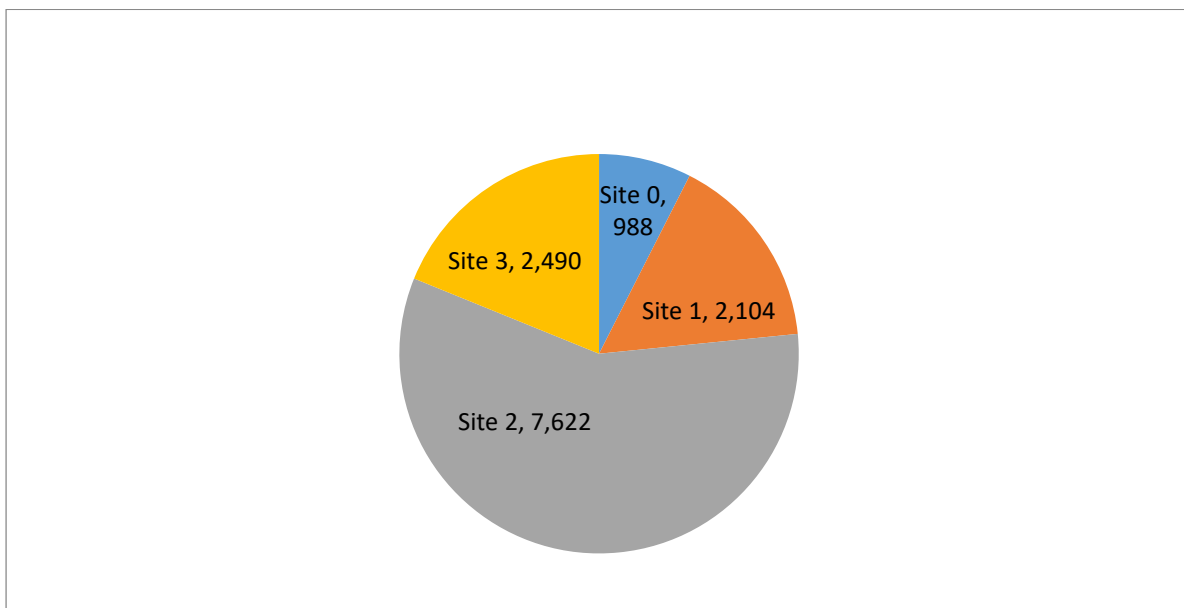


Figure 3. Acreage of state forest land in this LMU by site class. Site classes denote the potential quality of the growing site. “Site 0” indicates non-forested lands or forested lands where the vegetation has not yet been typed. Other site classes are described on p. 53 of 2016 SFRMP.

This LMU is mostly site class 2 (58%) along with an even mix of higher site class 1 (16%) and lower quality site class 3 (19%) sites. The timber quality is good to excellent in the site 1 and 2 stands and can be marketed easily to prospective timber buyers. The poorer site 3 stands are harder to sell to timber buyers due to the lower quality of timber produced per acre. All three site classes have their own challenges when it comes to regenerating new seedling growth following a timber harvest. The large acreage in site class 0 pertains to a more recent state forest land acquisition that has yet to be officially surveyed and stand typed.

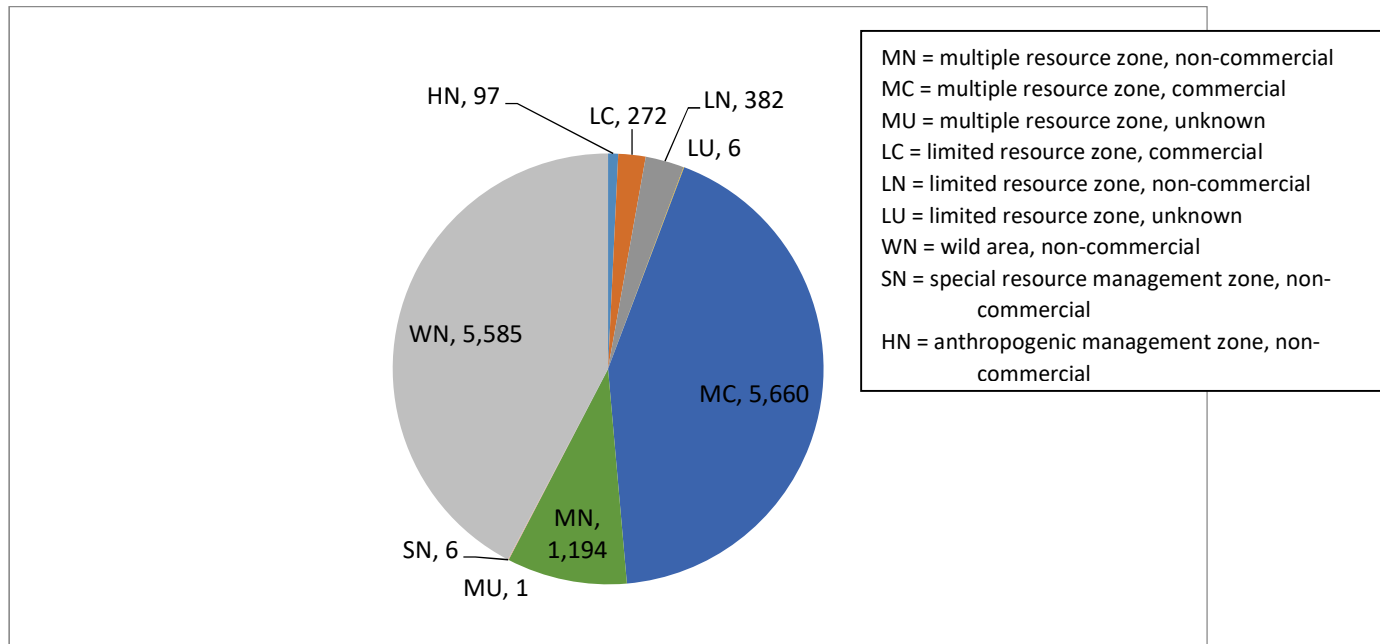


Figure 4. Acreage of state forest land in this LMU by management zone. Management zone is dictated by primary land use and land capability. Further descriptions of commerciality and zoning are found on p. 54 of the 2016 SFRMP.

This LMU is mostly multiple resource, commercial (43%) with lots of accessible good quality timber. However, there are some areas typed as limited (5%) due to steep slopes that make accessing timber difficult and challenging. The Quebec Run Wild Area (42%) dominates the southern portion of state forest land in this LMU and is typed non-commercial.

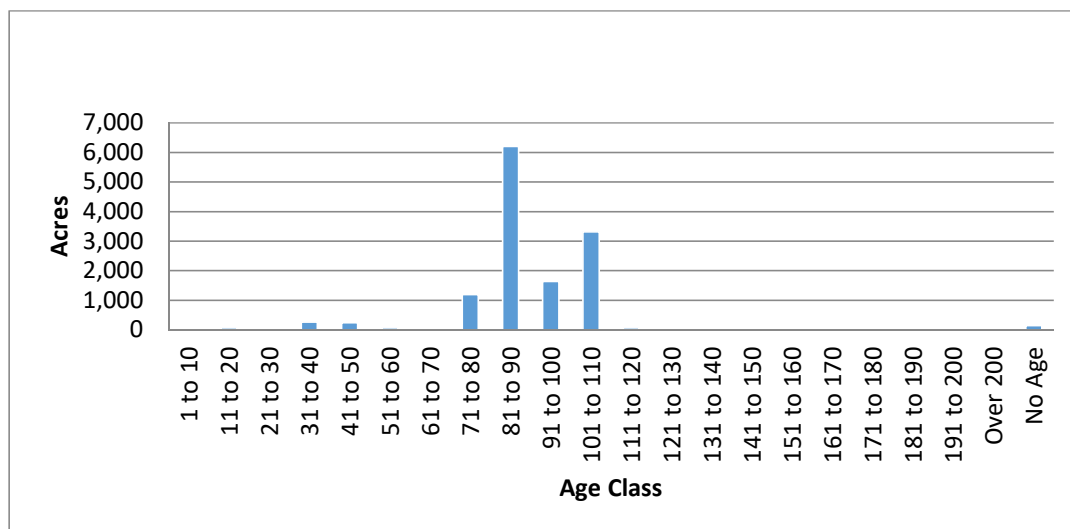


Figure 5. Acres of state forest land in this LMU by forest age classes.

Almost all the stands (94%) in this LMU are between 70 and 110 years old with most stands (47%) around 80-90 years old. There is a very small number of acres in the lower age classes resulting from previous timber sales and a few gypsy moth salvage cuts. We have been increasing the number of timber sales on state forest land in this LMU as the timber matures to better balance the age classes and create more early successional habitat.

Table 4. Miles of stream by classification within entire LMU. Department of Environmental Protection stream classifications are described in Chapter 93 Water Quality Standards of Title 25 in the Pennsylvania Code.

Class	Total (miles)
Undesignated	32
High Quality Waters	47
Exceptional Value Waters	8
Total	88

This LMU contains eight High Quality (HQ) streams; Lick Run, Big Sandy Creek, McIntire Run, Mill Run, Laurel Run, Piney Run, Laurel Run (near Devies Mt), and Tebolt Run along with one Exceptional Value (EV) stream; Quebec Run. Quebec Run weaves its way through the Quebec Run Wild Area through heavy rhododendron thickets and holds a reproducing population of native Brook Trout. The water from this LMU drains into the Youghiogheny River to the east and into the Monongahela River to the west with all water eventually finding the Ohio River.

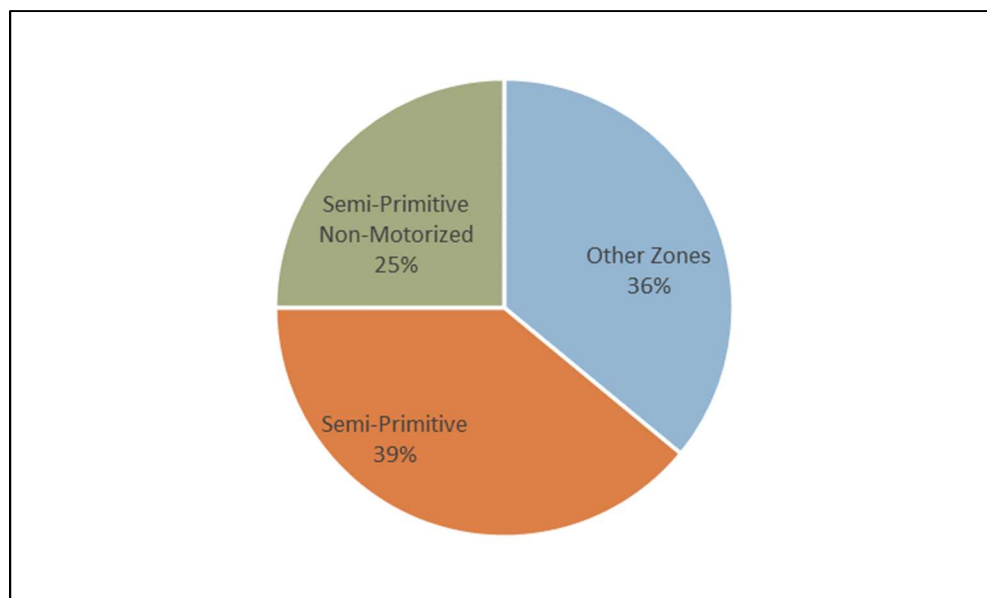


Figure 6. Acres of state forest land in this LMU by Recreation Opportunity Spectrum (ROS) classifications (2012). ROS is an inventory system developed by the U.S. Forest Service, to characterize land by types of recreation experiences. ROS is described on p. 42 of the 2016 SFRMP. “Other Zones” refers to Semi-Developed and Developed zones.

The ‘semi-primitive, non-motorized’ areas of state forest land in this LMU are contained within the Quebec Run Wild Area which will be maintained in this category for future generations. There are ‘semi-primitive’ areas found throughout the state forest land in this LMU. This LMU offers a diversity of recreational opportunities to state forest visitors from a high probability of isolation from other visitors, like the Quebec Run Wild Area, to limited isolation with some amenities, like the Lick Hollow State Forest Picnic Area. We

strive to offer as much diversity as possible in recreational experiences on state forest land without compromising the mission of the Bureau of Forestry.

Recreational activities in this LMU attract visitors from nearby major towns and cities including, Uniontown, Pittsburgh, Greensburg, Cumberland, MD, and Morgantown, WV. The Lick Hollow Picnic Area, Whitetail Trail, and Pine Knob Overlook are important to many engaged stakeholders. The Lick Hollow Picnic Area is open from Memorial Day to Labor Day. The most common activity in the LMU is hunting. Fishing is most common in streams stocked with trout, like Big Sandy Creek, and in streams that contain native Brook trout, like Quebec Run and Tebolt Run. Hiking is common throughout the area on the Pine Knob Trail, Whitetail Trail, and the many trails in the Quebec Run Wild Area. Sightseeing is also a common recreational pursuit within this LMU. There is one motorized campsite within this LMU along Kirby Road which is popular with campers. Recreational opportunities are continually maintained and enhanced in the Quebec Run Wild Area, Ruane Tract, Lick Hollow Picnic Area, and Barton Cave. There are documented problems with illegal ATV use within this LMU.

Table 6. Cultural and historical resources of significance within this LMU.

Cultural/Historical Resource
Grist Mill Site
Sun Racer Airplane Crash Site
Pondfield Fire Tower
Sisters of Charity Structures
Dupont Powder Mill

The remnants of a Grist Mill can be found in the Quebec Run Wild Area. The Grist Mill is believed to have been built by a Mr. Cross around 1832.

A TWA Sun Racer crashed in 1936 near Laurel Caverns on what is now state forest land. A monument “Sun Racer” was erected at the crash site in 2002 to commemorate the event. Fire Warden and Forest Ranger, Ray Addis, was at the Pondfield Cabin the day of the crash.

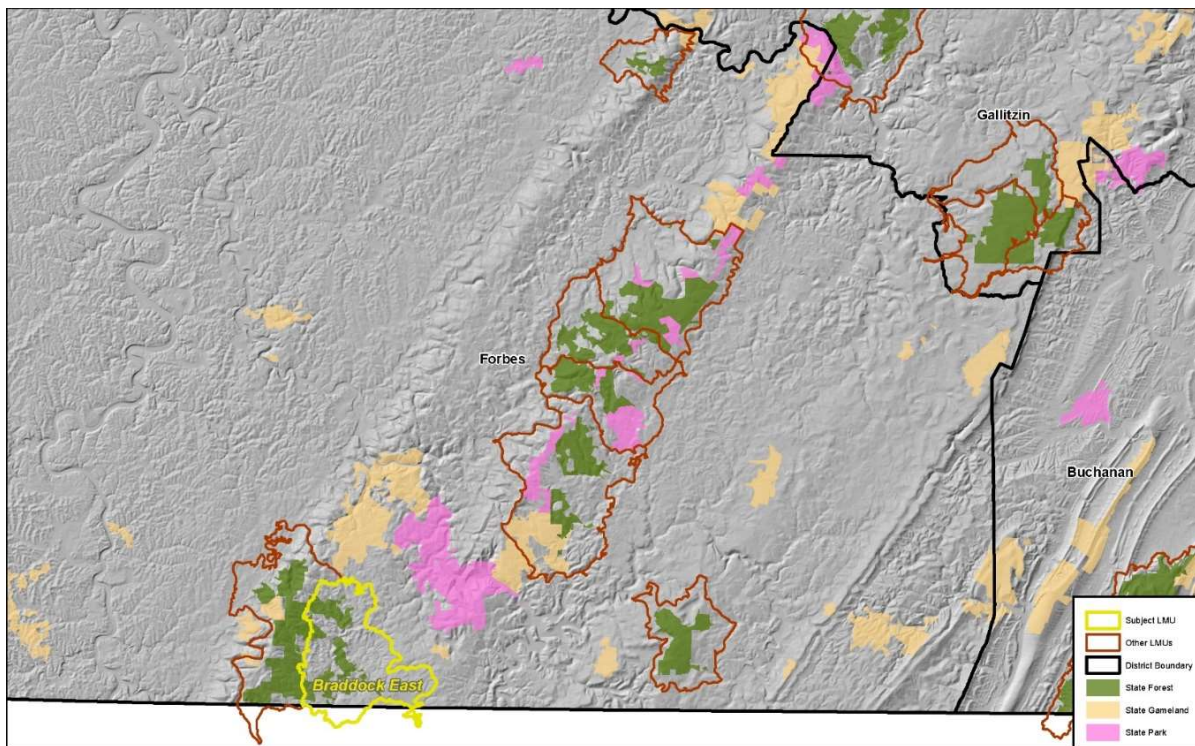
The Pondfield Fire Tower was built in 1935. It is a ‘steel, M-M’ tower that stands to this day but has not been consistently used as a wildfire lookout for many years. The fire tower is maintained for historical purposes.

Sisters of Charity (Marymount) structures and surrounding grounds were acquired from Rev Father Owen J. Kirby, pastor of St. Leonard’s Roman Catholic Church. The Sisters of Charity (SOS) conducted summer camps for girls in 1957-58, organized annual community days, and the grounds were used by the Seminary for retreats for Vicars. The 609-acre property and structures were sold to the Western PA Conservancy in December 1989 and subsequently to the Bureau of Forestry in 1991.

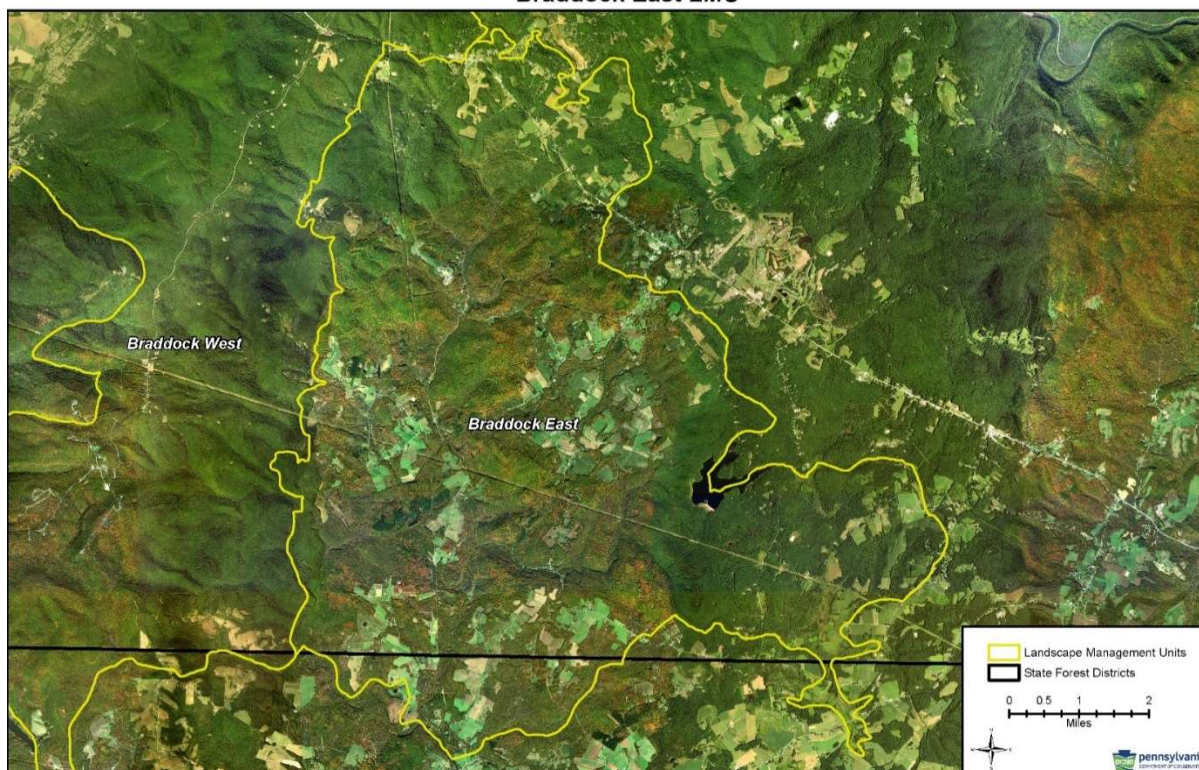
Remnants of a WWI Dupont powder mill can be found in the Ruane Tract that was acquired by the Bureau of Forestry in 2008. History on the old powder mill site is currently being investigated.

Braddock East

Landscape Management Unit



Braddock East LMU



Overview

The Braddock East LMU is 35,692 acres in size, though only one fifth of the land is state forest land. State forest land totals 7,278 acres (20.4%). This LMU is positioned on the east side of the Chestnut Ridge of the Allegheny Mountains Ecological region. Elevations within this LMU range from 2,480' to 1,560'. This LMU is primarily made up of deciduous forest (80%) followed by hay/pasture land (8%), developed open space (4%), cultivated crops (3.5%), and evergreen forest (2.5%). Within in boundaries of this LMU are several large electric rights-of-way maintained by West Penn Power along with a power substation for a neighboring wind farm of 23 windmills. The Wharton Iron Furnace, listed on the National Register of Historic places, is located within this LMU.

Fort Necessity National Park is encompassed within this LMU. There is a remaining Civilian Conservation Corps camp located within the park (S-12 Fort Necessity). The Fort along with the Braddock Monument were at one point in time part of Forbes State Forest and were turned over to the National Park Service in the 1960's. Along the eastern LMU boundary is Lake Courage, a 255-acre lake. This lake is part of the Heritage Reservation, a Boy/Cub Scout Camp, of the Laurel Highlands Council of the Boy Scouts of America.

The pre-colonial forests which spread across this landscape were comprised of mixed oak, American chestnut, white pine, and hemlock. These forests were harvested in the early to mid-1800's lumber, coal mines, and charcoal production while some areas were cleared for crops and pastureland. The second-growth forest was harvested again in the 1930-1940's prior to any of the forest being acquired as State Forest land. The current forest has seen minimal harvesting since that time, with only 12.2% (886 Acres) seeing any form of harvesting. The soils in this LMU are deep to moderately-deep and well-drained to moderately well-drained. Forest pests have not had a huge impact in this area. The most noticeable is from the emerald ash borer. Ash is small component of the forest of this LMU but the effects of the damage can be seen in most stream bottoms. Hemlock wooly adelgid was detected in 2013 on trees above Little Sandy Creek but subsequent years with subzero temperatures have caused populations of the insect to decline.

The proximity of Morgantown, WV and Pittsburgh, PA draw many recreationists to this section of the Forbes State Forest. The three main forms of recreation are hunting, fishing, and hiking. This LMU is also home to several rare or threatened populations of plants. There is a population of magnolia, endemic to the southern Appalachian Mountains, located on state forestland. This is the only population documented in Pennsylvania and the farthest north existing group of this species. One fourth of the State Forest land (1,837 Acres) within this LMU is part of the Quebec Run Wild Area.

Priority Goals

- Balance the age/size classes and promote species diversity of trees within the state forest land throughout the LMU.
- Identify tracts of land for acquisition that connect the standalone parcels of state forest land with each other.
- Protect, maintain, and manage wild populations of rare, threatened, or endangered plant and species and communities of special concern. Careful planning in both Silviculture and maintenance activities will be used to best promote these species.

- Conserve and enhance the riparian buffers lined with Eastern hemlock using insecticide and supplemental tree plantings when necessary.
- Consider designing a trail that connects to Fort Necessity National Battlefield.
- Maintain Forbes State Forest as one of the largest land bases for public hunting opportunities in Southwestern PA.
- Designate special management areas of early successional habitat for golden winged warbler and cerulean warbler.
- Implement management strategies to improve habitat for species of high interest such as whitetail deer, black bear, ruffed grouse, and brook trout.
- Plan to minimize impacts of adjacent lands on state forest in terms of invasive species dispersal and the suppression of forest fragmentation. We will use the early detection and rapid response (EDRR) method for the treatment of newly discovered invasive plant species.
- Preserve and maintain the Wharton Iron Furnace.
- Manage and administer oil and gas activity in a manner that is consistent with the Bureau’s mission statement and the principles of ecosystem management by avoiding, minimizing, or mitigating adverse impacts to state forest land, ensuring compliance with executed agreements, and maintaining positive working relationships with severed rights owners.

Profile

Table 1. LMU acreage: total and state forest land only.

	Acres
State Forest Land	7,278
LMU Total	35,692

Ecoregion: Allegheny Mountains

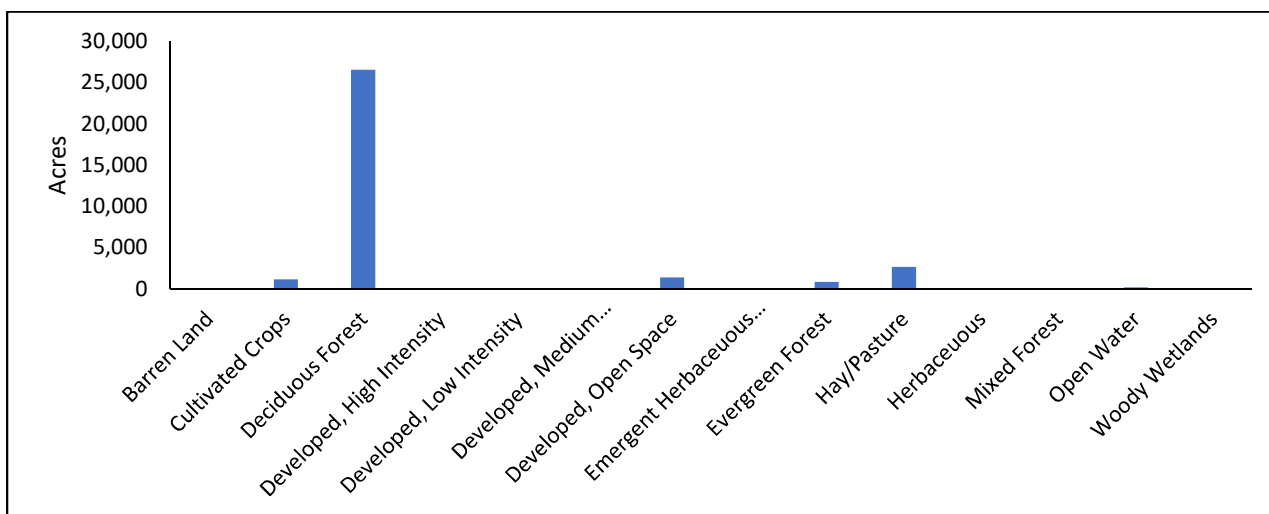


Figure 1. LMU acreage by land cover categories from the National Land Cover Dataset for the entire LMU.

This LMU has many large contiguous tracts of deciduous forest along the eastern slopes of Chestnut Ridge. Coniferous forests make up only 2.5% of the total land cover. The central part of the LMU is more fragmented by hay/pasture land, cultivated crops, and with low intensity development.

Table 2. Miles of roads by category on state forest land in this LMU. Road categories are described on page 199 of the 2016 SFRMP.

Road Category	Total Miles
Z1 - Public Use Road	13
Z3 - Gated Road	2
Total	15

Most of the roads within this LMU are classified as Z1 public use roads which receive regular maintenance which are open to the public for travel by licensed motor vehicles. Most roads within this LMU are either State Routes or township roads. The Z3 gated roads are maintained by district staff. Some of the major Z1 roads are: U.S. Route 40, SR381, Wharton Furnace Rd., Shepherd Rd., Fayette Springs Rd., Brethren Summit Rd., Workman Rd., Scott Run Rd., Quebec Rd., Sumey Rd., Wirsing School Rd., Guthrie School Rd., Canaan Church Rd., Stuckslager Rd., Gibbon Glade Rd., Potter School Rd., Memorial Drive., Maust Rd., and Dinner Bell Rd.

Table 3. Miles of trails on state forest land in this LMU open to various types of recreational use. Note that miles are not additive and a single trail may be open to multiple use types. Shared-use trails, which make up the majority of trails on state forest land, are open to hiking, biking, horseback riding, and cross-country skiing.

Trail Category	Total Miles
Hiking	4
Biking	4
Equestrian	4
X-Skiing	4
ATV I	0
ATV II	0
Snowmobile/ Joint Use Road	0

There are only 4 miles of maintained trails within this LMU, all of which are within the Quebec Run Wild Area. All 4 miles are open to hiking, biking, cross country skiing, and equestrian users. The Grist Mill and Mill Run Trails are interconnected with many of the other trails and roads throughout the Wild Area. The Plantation trail is a 1.38-mile standalone trail which can be accessed from the Pine Plantation Road off Route 381.

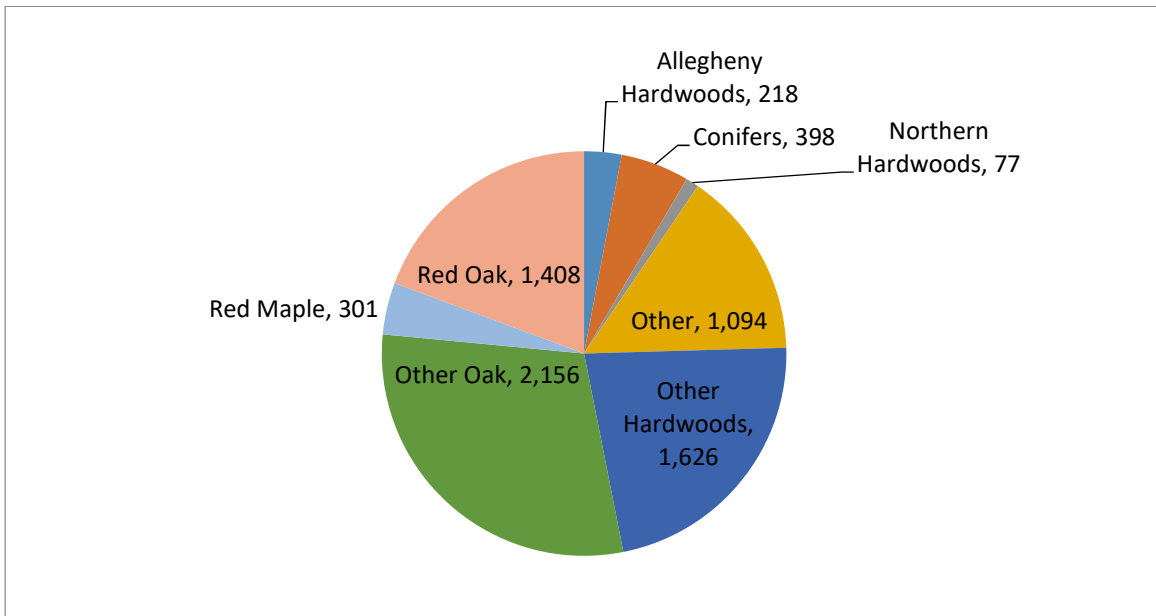


Figure 2. Acreage of state forest land in this LMU by aggregated forest type. The forest types are described on p. 108 of the 2016 SFRMP.

This LMU is dominated by oak forest types (49%), other hardwoods (22%), conifers (6%), red maple (4%), Allegheny hardwoods (3%), and northern hardwoods (1%). The stands listed as other hardwoods are mainly dominated by tulip poplar. Conifer stands are a small percentage of the total. These stands are either a stream bottom lined with Eastern hemlock or part of the pine stands planted by the CCC in the 1930's. Conifer cover will be increased through management in the future. The large acreage in the "Other" forest type pertains to a more recent state forest land acquisition that has yet to be officially surveyed and therefore not stand typed yet.

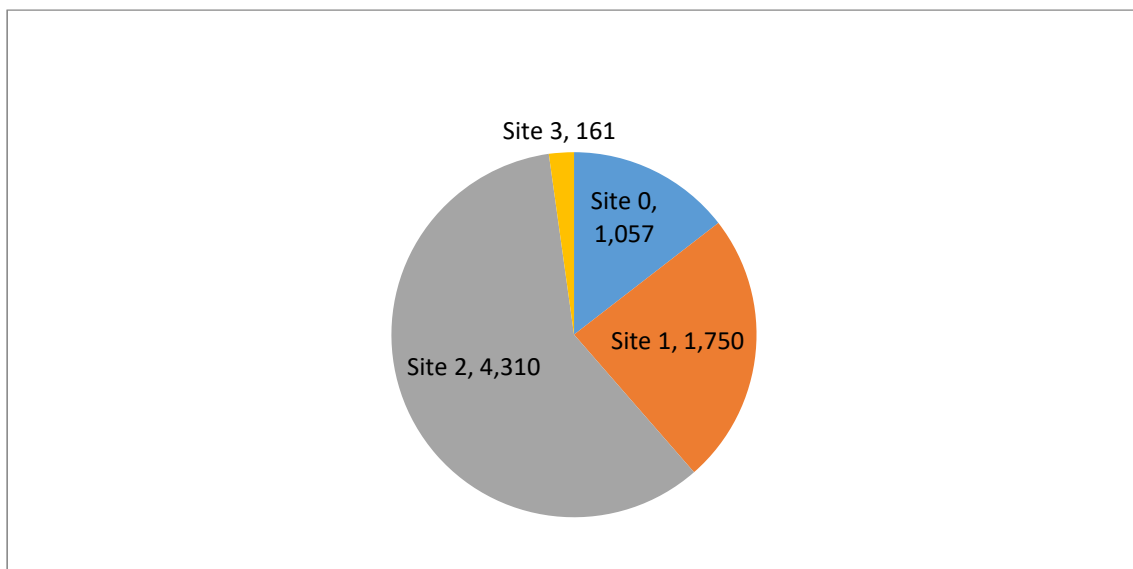


Figure 3. Acreage of state forest land in this LMU by site class. Site classes denote the potential quality of the growing site. "Site 0" indicates non-forested lands or forested lands where the vegetation has not yet been typed. Other site classes are described on p. 53 of 2016 SFRMP.

This LMU is mostly site class 2 (59%) along with higher quality site class 1 (24%) sites and a small amount of lower quality site class 3 (2%) sites. The timber quality is good to excellent in the site 1 and 2 stands and can be marketed easily to prospective timber buyers. The large acreage in site class 0 pertains to a more recent state forest land acquisition that has yet to be officially surveyed and therefore not stand typed yet.

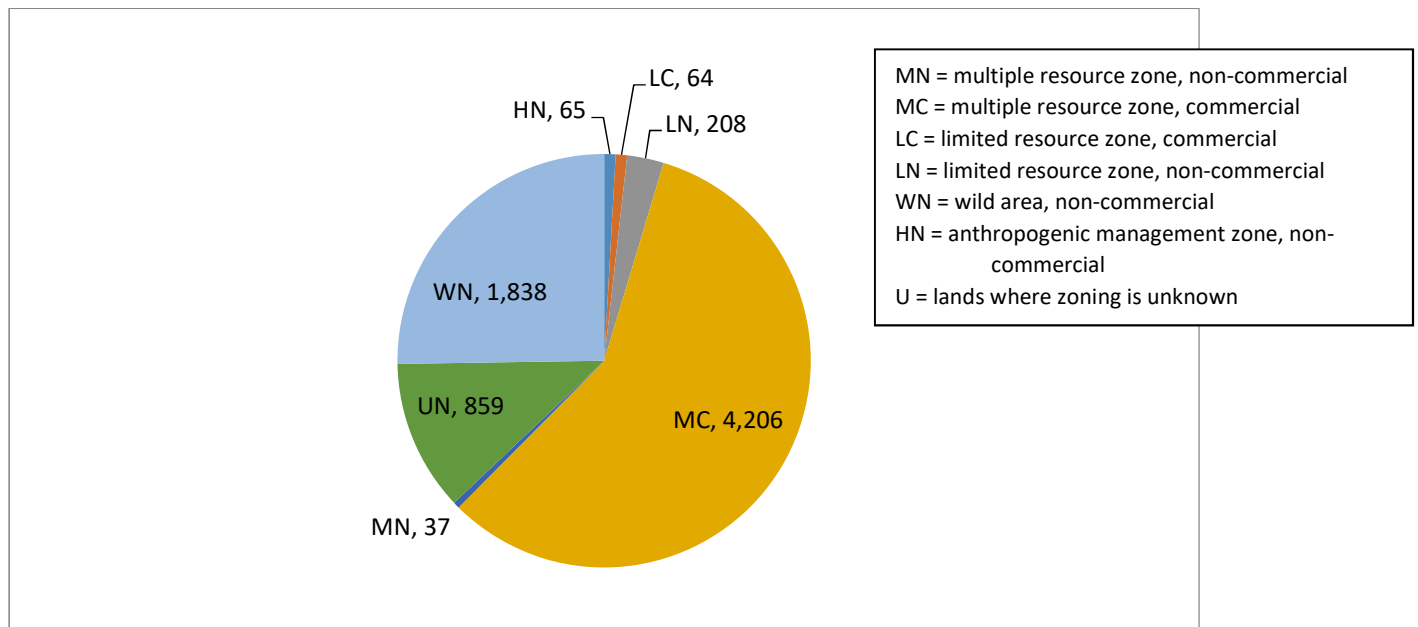


Figure 4. Acreage of state forest land in this LMU by management zone. Management zone is dictated by primary land use and land capability. Further descriptions of commerciality and zoning are found on p. 54 of the 2016 SFRMP

This LMU is mostly multiple resource, commercial with 58% of the timber accessible and of good quality. Some areas are typed as limited (4%) due to steep slopes or poorly drained soils which make accessing timber difficult and challenging. The Quebec Run Wild Area (25%) dominates the western portion of state forest land in this LMU. The unknown zones in this LMU will be re-evaluated and placed in the proper zone when the timber typing is updated.

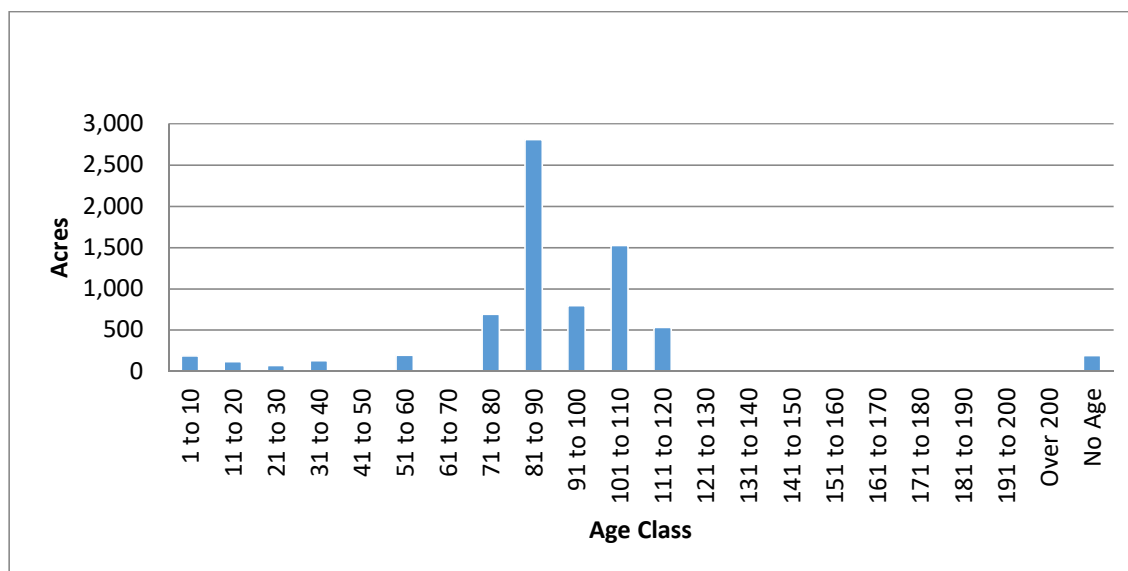


Figure 5. Acres of state forest land in this LMU by forest age classes.

Almost all the stands (87%) in this LMU are between 70 and 120 years old with most stands (39%) around 80-90 years old. 4% of forest stand are under 20 years old as we increase the number of timber sales on state forest land in this LMU to better balance the age classes and create more early successional habitat. Overall, the timber in this LMU is slightly younger compared to other LMU's on the Forbes State Forest.

Table 4. Miles of stream by classification within entire LMU. Department of Environmental Protection stream classifications are described in Chapter 93 Water Quality Standards of Title 25 in the Pennsylvania Code.

Class	Total (miles)
Undesignated	0
High Quality Waters	119
Human-made Impoundment/ Pond	0
Total	119

This LMU contains nine High Quality (HQ) streams; Little Sandy, Big Sandy, Fike Run, Stony Fork, Workman Run, Scotts Run, Chaney Run, McIntire Run, and Braddock Run. Most streams in the LMU drain south into the Cheat River in West Virginia. From there they flow into the Monongahela River and then converge with the Allegheny River to form the Ohio River. A small portion of unnamed tributaries in the NE corner of the LMU drain into the Youghiogheny River and from there find their way to the Monongahela and then to the Ohio River.

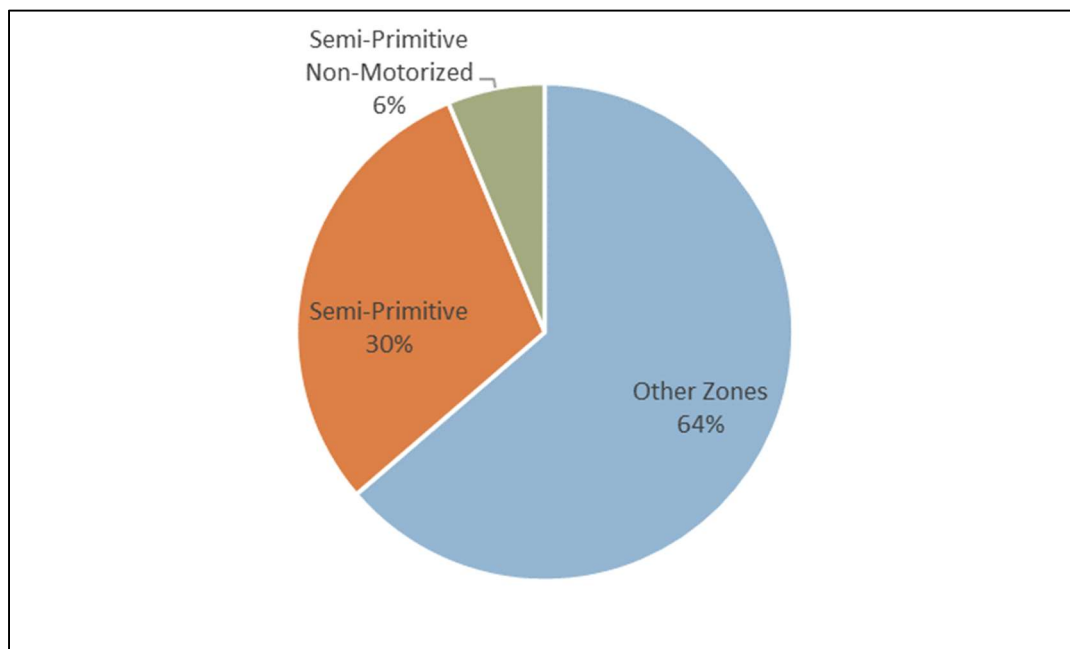


Figure 6. Acres of state forest land in this LMU by Recreation Opportunity Spectrum (ROS) classifications (2012). ROS is an inventory system developed by the U.S. Forest Service, to characterize land by types of recreation experiences. ROS is described on p. 42 of the 2016 SFRMP. "Other Zones" refers to Semi-Developed and Developed zones.

The 'semi-primitive, non-motorized' areas of state forest land in this LMU are contained within the Quebec Run Wild Area which will be maintained in this category for future generations. These areas are characterized as being at least 1/2 mile from all maintained roads open to the public, active railroads, lakes, or trails with motorized use (combustible engines) and are normally 500 acres or larger. There are 'semi-primitive' areas

found throughout the state forest land in this LMU which are characterized as areas that are located at least 1/4 mile from all maintained roads open to the public, active railroads, lakes, or trails with motorized use (combustible engines) and are normally 250 acres or larger.

Recreational activities in this LMU attract visitors from nearby major towns and cities including, Uniontown, Pittsburgh, Washington, Cumberland, MD, and Morgantown, WV. The most common activity in the LMU is hunting. Fishing would have the second most recreationists, focusing on trout stocked streams like Big Sandy. Some of the smaller HQ streams in the LMU have native brook trout populations but are not fished as much as the larger streams. Hiking would be the third most popular form of recreation in this LMU, especially on the Grist Mill and Mill Run trails since these trails interconnect with many of the other trails throughout the Quebec Run Wild Area.

Glossary of Terms and Acronyms

Glossary

Acceptable Regeneration — Seedlings or saplings of specific tree species deemed appropriate by forest manager to replace larger trees removed by timber harvesting on an individual stand basis. Appropriate species often include species that currently exist in the overstory, species of desirable trees for the area/region, or native species that can thrive in the ecosystem of the site.

Acid Deposition — Acid deposition occurs when acid-forming substances are transferred from the atmosphere to the surface of the earth (into the soil), often through precipitation. The deposited materials include ions, gases, and particles typically resulting from power generation and heavy manufacturing. Research has shown that acid deposition can cause slower growth, injury, or death of trees, particularly sugar maple and red spruce. Acid deposition generally causes stress to trees by interfering with calcium and magnesium nutrition and the physiological processes that depend on these elements.

Age Class — An interval into which the age range of trees or forest stands is divided for classification or use (e.g., 0–10 years, 10–20 years).

Basal Area — The area of the cross section of a tree stem, including the bark, generally at breast height (4.5 feet above the ground).

Buffer Treatment (harvesting) — A management activity that happens within a vegetated strip or management zone of varying length and width maintained along a road, stream, wetland, lake, or other special feature. Buffer areas are managed differently than other zones of state forest land for many reasons, including aesthetics, water quality, or ecological resource protection or enhancement. Some buffers are no-management (i.e. tree cutting) zones, and others require at least a partial canopy be maintained. In general, timber harvesting within buffers is more limited than in other zones and the width of the buffer depends on the feature which is being surrounded.

Charcoal Hearth - Excavated area where wood fuel was stacked, covered with soil, and lit on fire to produce charcoal.

Clearcut — The removal of the overstory in the absence of advance regeneration. Regeneration may be dependent on natural seed, root suckers, stump sprouts or from artificial plantings. The differentiating factor that sets this cut apart from an overstory removal is that less than 50% of the site is stocked with adequate advanced regeneration and relies on seedlings or sprouts that will become established after the cut. For clearcuts, as with overstory removals on State Forest Lands, 10-20 square feet per acre of basal area must be reserved per acre. Clearcuts on State Forest Lands can be referred to as “clearcuts with residuals.”

Climate Change — The long-term fluctuations in trends in temperature, precipitation, wind, and all other aspects of the earth’s climate.

Core Forest Index - The core forest analysis was based on the density of fragmenting features within a given area, which includes roads, pipelines, well pads, certain large rivers (large enough to show up on NLCD), etc. Based on fragmentation of an LMU, each LMU was given an index score between 0-100, representing the density of fragmenting features with a higher score representing a less fragmented area.

Crop Tree Thinning — Crop tree thinning is done for many of the same reasons as improvement cuts but at a much younger, pre-commercial age. The primary reason for entering a stand in the pre-commercial stage versus waiting until merchantable volume can be extracted is to alter the species composition of the stand prior to the most desirable

stems losing positions of competitive advantage. No more than 50 crop trees should be selected per acre and a crown-touch release should be used, cutting all trees that touch the crown on a crop tree on three out of four sides. Co-dominant and intermediate trees should be the focus of crown-touch release treatments. Trees in the dominant stage will most likely be in the stand at the time of commercial thinning and most likely already enjoy dominance over its closest competitors.

Cultural/ Historic Resources — A site, structure, object, natural feature, or social account that is or was of significance to a group of people traditionally associated with it. A significant cultural resource is defined as one which is listed or eligible for listing in the National Register of Historic Places. Archaeological sites are important in elucidating information about past cultural behavior.

Damage-causing Agents - Something that negatively effects ecosystems such as, non-natural or exotic pests, disease and invasive plants, climate change, inadequate forest regeneration, acid mine drainage, acid deposition, waste and littering, habitat fragmentation, overabundant deer populations and wildfire.

Deer Management Assistance Program (DMAP) — DMAP is a Pennsylvania Game Commission program that provides additional means for landowners to meet land-use goals by allocating additional antlerless deer tags to reduce deer populations in specific areas.

Defoliation – the destruction or causation of widespread loss of leaves usually by insects or disease.

Early Successional Habitat – The period in forest development, soon after establishment, in which the growing forest is not yet dominated by tree canopies. This stage is characterized by high productivity, high structural and spatial complexity and provides habitat with vigorously growing grasses, forbs, shrubs and trees that usually require full sun exposure. Early successional habitat provides excellent food and cover for wildlife but needs disturbance to arrest forest succession and prevent the site from progressing to a more mature stage of stand development.

Ecoregion — A contiguous geographic area having a relatively uniform macroclimate, possibly with several vegetation types, and used as an ecological basis for management or planning.

Ecosystem — A conceptual unit comprised of abiotic factors and biotic organisms interacting with each other and their environment, having the major attributes of structure, function, complexity, interaction and interdependency, temporal change, and no inherent definition of spatial dimension.

Ericaceous Plants – Plants in the heath family, such as mountain laurel, rhododendron, and blueberry, that do not grow well in alkaline or basic soils (soils that have a high pH).

Even-aged Stand - Is a given area of a forest in which the trees are within 20 percent of a given age, relative to the rotation length. Rotation length is the segment of time that forest trees are grown before they are cut, and a new regeneration cycle starts.

Extirpated — A species is eliminated from a certain geographic area, while it still exists elsewhere.

Fee Simple Ownership — An ownership situation whereby the landowner owns both the surface and subsurface rights.

Fire Adapted Ecosystem –Natural communities or ecosystems that have evolved with a regular fire interval and can rebound readily and benefit from fire that is consistent with the regimes to which they are adapted. A “fire regime” describes the frequency at which fires in a given forest type typically burn, the season(s) in which they burn, and the amount of vegetation killed.

Fire Dependent – Natural communities or ecosystems requiring one or more fires of varying frequency, timing, severity, and size to achieve optimal conditions for population survival or growth.

Forest Fragmentation — The process by which a forest landscape is converted into islands of forest within a mosaic of other land uses.

Forest Type – A category of forest community usually defined by its vegetation, particularly its dominant vegetation as based on percentage cover of trees. All delineated stands on State Forest Land are coded with a ‘forest type’. Most vegetated types are based on the plant community types recognized in *Terrestrial & Palustrine Plant Communities of Pennsylvania 2nd Ed.* Non-vegetated types are based on specific anthropogenic use. See the Bureau of Forestry’s *STATE FOREST RESOURCE DESIGNATIONS, CLASSIFICATIONS AND TYPING MANUAL* for more information

Fully Stocked – A quantitative measure of the area occupied by trees, usually measured in terms of well-spaced trees or basal area per hectare, relative to an optimum or desired level of density. A classification of forest land in terms of potential annual cubic-foot volume growth per acre at culmination of mean annual increment in fully stocked natural stands. Stocking is a relative concept - a stand that is overstocked for one management objective may be understocked for another.

Group Selection — A treatment in which the desired outcome is to create an uneven-aged or all-aged stand structure over time by performing small group overstory removals or clearcuts, creating patches of younger trees. Through time, the entire stand is removed in groups (3 or 4 harvests spaced 20–30 years apart) creating patches of several age classes throughout the stand.

Habitat Diversification — The process by which a forested landscape is broken into a mosaic of seral or successional stages of vegetation types, through management practices and/or natural processes, for utilization by a diversity of organisms.

Hibernacula – Latin for “tent for winter quarters” is a place in which a creature seeks refuge, such as a bear using a cave to overwinter. The word can be used to describe a variety of shelters used by many kinds of animals of various species. Behavior other than hibernating can also occur at hibernacula. Often used in description of sites for over-wintering bats.

High Canopy — The uppermost vegetative layer of a mature forest. High-canopy species, such as oaks and hickories, have the potential to form the dominant overstory layer of the forest. Species that would NOT be considered high-canopy species include trees that reach their full potential in the understory or mid-canopy layers, such as dogwood or striped maple.

General Permits (GP) – Department of Environmental Protection (Department) permits for Chapter 105 Wetland and Waterway Obstruction and Encroachment.

Important Bird Areas – (IBA) As identified by the Audubon Society, these are geographic regions that offer key habitat factors for the occupancy and survivability of some bird species. There are over 80 IBA sites encompassing over two million acres of Pennsylvania’s public and private land. These areas include migratory staging areas, winter roost sites, and prime breeding areas for songbirds, wading birds, and other species.

Improvement Cutting — An intermediate treatment (after establishment of the new stand and prior to final harvest) is conducted to remove trees that will improve residual stand composition and improve residual tree quality, and where the intention of the harvest is not to establish natural regeneration. The goal of this treatment is to expedite growth of higher quality trees by allowing more sunlight and nutrients to residual trees by reducing competition. This is a non-reproductive treatment and the stand’s residual basal area should be at least B level stocking or greater. The difference between this and a crop tree treatment is that this type of treatment is

performed later in the rotation and through a commercial sale.

Intermediate (harvest) – A timber harvest to enhance growth, quality, vigor, and composition of a stand of trees after establishment or regeneration and prior to final harvest.

Invasive Insects - is an insect that is not native to a specific location (an introduced species), and that has a tendency to spread to a degree believed to cause damage to the environment.

Invasive Plants — Non-native plant species that grow quickly and aggressively, spreading and displacing other native plants. Their establishment causes or is likely to cause economic, environmental or human harm. Invasive plants are usually introduced by people either accidentally or on purpose, into a region far from their native habitat.

Iron Furnace - A historic type of blast furnace that is used for smelting to produce industrial metals, generally pig iron, but also others such as lead or copper. Most iron furnaces used large amounts of wood charcoal as fuel.

Landscape — A land area of generally large size and commonly a mosaic of land forms and plant communities irrespective of ownership or other artificial boundaries.

Natural Area — A Natural Area is a state forest zone that is an area of unique scenic, historic, geologic or ecological value that will be maintained in a natural condition by allowing physical and biological processes to operate, usually without direct human intervention. They are set aside to provide locations for scientific observation of natural systems, to protect examples of typical and unique plant and animal communities, and to protect outstanding examples of natural interest and beauty.

Natural Regeneration — A newer age class of trees created from natural seeding, sprouting, or suckering that will serve to replace trees removed from the canopy, either through aging or harvesting.

Oak Savannah — A type of savanna, or lightly forested grassland, where oaks are the dominant trees. These savannas were maintained historically through wildfires set by lightning or humans, grazing, low precipitation, and/or poor soil.

Overstocked – Is the state of having too many trees in a forested area for the most efficient growth, usually measured in terms of well-spaced trees or basal area. A desirable level of stocking is often considered that which maximizes timber production.

Overstory — The portion of the trees, in a forest of more than one story (stratum), forming the upper most canopy layer.

Overstory Removal — The complete removal of the overstory to release established advanced regeneration. The differentiating factor between this cut and a “clear cut,” is that advanced regeneration is present and established with at least 50% stocking of the site. On State Forest Lands, 10-20 square feet of basal area per acre must be retained. Overstory removals on State Forest Lands are referred to as “Overstory Removals with Residuals”.

Pennsylvania Conservation Explorer (Explorer) — An online tool designed to facilitate conservation planning and environmental review (PNDI) for threatened and endangered species, species of special concern, and other natural resources of concern. The environmental review portion of Explorer screens projects for potential impacts to species under the jurisdiction of PA Game Commission, PA Fish and Boat Commission, PA DCNR, and the US Fish and Wildlife Service. All silviculture and land management activities should be submitted through the PNDI system. The purpose of this system is to call attention to the forester that species of concern, threatened or endangered nature are nearby or within the project area.

Pennsylvania Natural Heritage Program — The Pennsylvania Natural Heritage Program (PNHP) is a member of NatureServe, an international network of natural heritage programs that gather and provide information on the location and status of important ecological resources (plants, vertebrates, invertebrates, natural communities and geologic features). Its purpose is to provide current, reliable, objective information to help inform environmental decisions. PNHP information can be used to guide conservation work and land- use planning, ensuring the maximum conservation benefit with the minimum cost. PNHP manages PNDI (see above).

Pennsylvania Scenic Rivers Program — Scenic river designations are intended to preserve the primitive qualities the natural, and aesthetic values of a river and to protect the existing character and quality of both the river and its adjacent land environment. They shall be free-flowing and capable of, or under restoration, to support water-cased recreation, fish and aquatic life. The view from the river or its banks shall be predominately wild but may reveal some pastoral countryside. The segment may be intermittently accessible by road. The Pennsylvania Scenic Rivers Act of 1982 authorized the statutory designation of outstanding aesthetic or recreational rivers.

Recreational Opportunity Spectrum Continuum (ROS) — ROS is an inventory system developed by the U.S. Forest Service, to characterize land by types of recreation and experiences. This version adopted by the Bureau of Forestry defines five recreation classes for the state forests (primitive, semi-primitive non- motorized, semi-primitive, semi-developed, developed).

Regeneration — Seedlings or saplings existing in a stand or the act of renewing tree cover by establishing young trees naturally or artificially.

Regeneration period — The time between the initial regeneration treatment and the successful re-establishment of a new age class by natural means, planting, or direct seeding.

Reserve or Residuals trees — Trees, pole sized or larger, retained after an intermediate or partial timber harvest of a stand.

Rotation — In even aged systems, the period between regeneration establishment and final cutting.

Salvage Harvest — A timber harvest in which only dead and dying trees are harvested while they still retain a degree of economic value, or in conjunction with other treatments in which the goal is both economic salvage and a silvicultural goal such as salvage-overstory removal, salvage-shelterwood, salvage-improvement, etc. Timber sales in which 20% or more of the volume being removed is dead or dying should be classified as salvage, or salvage along with any other treatment being implemented.

Seed Tree Cut — The attempted establishment of a new stand from a partial overstory removal and retention of scattered trees for genetically superior seed production and seedling establishment. Usually less than 40 BA is retained to allow almost full exposure of a site to sunlight. Species that are shade intolerant and wind dispersed usually benefit under this type of cut. Once advanced regeneration is established the seed trees are removed.

Severed Ownership — an ownership situation whereby the surface landowner has either partial ownership of the subsurface or the subsurface is owned completely by another entity.

Shade Tolerance — The relative capacity of a plant to become established and grow beneath overtopping vegetation, where sunlight is fully or partially obscured.

Shelterwood (harvest) — The attempted establishment of a new cohort of natural regeneration from the partial removal of the overstory. A shelterwood harvest may be a single treatment or a series of cuts to ensure that adequate seed source is retained, and light levels are manipulated to allow the establishment or promotion of a

target species or group of species. The essential characteristic is that the new stand is being established naturally or artificially under the overstory or the “shelter” of the original stand. The characteristic difference between this cut and a seed tree cut is that a relatively contiguous canopy is retained (approximately ≥ 40 BA) and most often species regenerated under this system are moderate to shade tolerant species. Once advanced regeneration is established, the overstory is removed.

Single Tree Selection (harvest) — A harvest in which the desired goal is to create an all-aged stand by removing a uniform number of trees from each age class in an uneven-aged stand or size class in an even-aged stand. This leaves an inverse j-shaped curve for diameter distribution, creating space for the establishment of new seedlings and increased growth of remaining trees.

Silvicultural System — A planned process whereby a stand is tended, harvested, and re-established. The system name is based on the number of age classes and/or the regeneration method used.

Site Class — A classification of growing site quality, expressed in terms of ranges of dominate tree height at a given age or potential mean annual increment at culmination. For the Bureau of Forestry, site classes are numbered 1 (the best), 2 and 3 (the poorest). These classes are designated as follows:

0 Non-Forest

1 Site 1: Characterized by moist, well-drained, fairly deep soils that usually occur in protected coves, along streams, or in bottomlands that remain moist throughout the year. On northern exposures, Site 1 may extend higher up a slope than on southern exposures because of more favorable soil moisture conditions. Dominant and codominant total tree heights have the potential to average > 85 feet at maturity.

2 Site 2: Characterized by soil intermediate in moisture, depth, drainage and fertility that may dry-out for short periods during the year. This site is usually located on slopes between the ridge tops and the coves and bottomlands. Dominant and codominant total tree heights have the potential to average > 65 feet but < 85 feet at maturity.

3 Site 3: Characterized by shallow, rather dry, stony or compact soils which usually occur on ridges or broad flat plateaus. Dominant and codominant total tree heights average < 65 feet at maturity.

Site Index — a species-specific measure of actual or potential forest productivity expressed in terms of average height of trees included in a specific stand component at a specific index or base age. Site index curves are created for different regions to show the total height expectations for a certain species given the site conditions (index) and the age of the tree or stand.

Stand — A contiguous group of trees sufficiently uniform in age class distribution, composition, and structure, and growing on a site of sufficiently uniform quality, to be a distinguishable unit.

State Forest Environmental Review — SFER is the process used by the bureau to assess impacts to a variety of forest resources for projects that may or will disrupt, alter or otherwise change the environment.

Stems Per Acre — a standard measure of the density of trees within a given area, which is given as an average number of stems on an acre. Stem is considered the trunk of an individual tree.

Stocking Level — An indication of growing space occupancy relative to a pre-established standard.

Succession — The gradual supplanting of one community of plants by another; the aging of the forest from young to mature.

Sustainability — The capacity of forests, ranging from stands to ecoregions, to maintain their health, productivity, diversity, and overall integrity, in the long run, in the context of human activity and use.

Systemic Insecticides – Pesticide that is absorbed by and permeates some or all host tissues and is more toxic to the target insects and pathogens than to host.

Two-Aged Harvest — The final overstory removal or clearcut in a stand in which a significant portion of the stand will be retained until the next rotation. Usually 20 to 30 square feet of BA is retained in oak stands and 10 –20 BA in northern hardwood stands. The residual stand is not removed upon successful regeneration, but instead carried as an older age class (creating two distinct age classes on the same site) well into the next rotation, and usually removed before the next age class reaches maturity.

Two-Aged Shelterwood — This treatment is a preparatory cut for a two-aged harvest. A shelterwood treatment or treatments performed in a stand to establish or promote advanced regeneration, once there is seedling establishment a two-aged harvest will occur.

Under Stocked – Is the state of not having enough trees in a forested area for production of most board feet volume in standing trees measured in terms of basal area. A desirable level of stocking is often considered that which maximizes timber production.

Uneven-aged stand - is a given area of a forest in which the trees are having at least three distinct tree-age classes. Classic uneven-aged forest management aspires to perpetuate an all-aged stand, with many young trees and progressively fewer older trees.

Wild Area — A Wild Area is a state forest zoning category which characterizes an extensive area, which the public will be permitted to see, use and enjoy for such activities as hiking, hunting, fishing, and the pursuit of peace and solitude. No development of a permanent nature will be permitted to retain the undeveloped character of the area.

Acronyms

A

ACF – Association of Consulting Foresters
ADA – American Disabilities Act
AFF – America Forest Foundation
AHUG – Allegheny Hardwood Utilization Group
ALB – Asian Longhorn Beetle
AML – Abandoned Mine Land
ANF – Allegheny National Forest
APHIS – Animal and Plant Health Inspection Service
ARRI – Appalachian Regional Reforestation Initiative
ATFS – American Tree Farm System
ATV – All Terrain Vehicle

B

BAMR – Bureau of Abandoned Mine Reclamation
BMP – Best Management Practice
BOF – Bureau of Forestry
BRC – Bureau of Recreation and Conservation
BSP – Bureau of State Parks

C

CAA – Commercial Activities Agreement
CAR – Corrective Action Request
CBF – Chesapeake Bay Foundation
CCC – Civilian Conservation Corps
CFHP – Cooperative Forest Health Management Program
CFI – Continuous Forest Inventory

CFM – Cooperative Forest Management
CHR – Cultural Historical Resource
CLEAR – Center for Land Use Education and Research
CLI – Conservation Landscape Initiative
CREP – Conservation Reserve Enhancement Program
CSP – Conservation Security Program
CWD – Chronic Wasting Disease
CWPP – Community Wildfire Protection Plans
CWWA – Cooperative Weed Management Area

D

DCED – Department of Community and Economic Development
DCNR – Department of Conservation and Natural Resource
DEP – Department of Environmental Protection
D & G – Dirt and Gravel
DGS – Department of General Services
DMAP – Deer Management Assistance Program
DOI – Department of the Interior

E

EAB – Emerald Ash Borer
E & S – Erosion and Sedimentation
EAC – Environmental Advisory Council
EDRR – Early Detection Rapid Response
EES – Environmental Education Specialist
EHS – Hemlock Elongated Scale
EMA – Emergency Management Agency
EMAC – Ecosystem Management Advisory Committee

EPA – Environmental Protection Agency
EV – Exceptional Value
EQIP – Environmental Quality Incentives Program

F

FDC – Facility Design and Construction
FED – Federal
FEMA – Federal Emergency Management Agency
FEPP – Federal Excess Personal Property
FERC – Federal Energy Regulatory Commission
FFP – Forest Fire Protection
FFW – Forest Fire Warden
FHM – Forest Health Monitoring
FIA – Forest Inventory and Analysis
FIMS – Forest Information Management System
FMP – Forest Management Plan
FPM – Forest Pest Management
FPUF – Friends of Pittsburgh Urban Forest
FS – Forest Service
FSA – Farm Service Agency
FSC – Forest Stewardship Council
FSP – Forest Stewardship Plan

G

GIS – Geographic Information System
GM – Gypsy Moth
GP – General Permit
GWWA – Golden Wing Warbler

H

HAM – Harvest Allocation Model

HCVF – High Conservation Value Forest

HDC – Hardwood Development Council

HQ – High Quality

HWA – Hemlock Woolly Adelgid

I

IBA – Important Bird Area

ICS – Incident Command System

IMT – Incident Management Team

IPCC – Intergovernmental Panel on Climate Change

IPM – Integrated Pest Management

IQS – Incident Qualification System

ISA – International Society of Arboriculture

ITC – Instructor Training Course

L

LiDAR – Light Detection and Ranging

LOA – Letter of Authorization

LWCF – Land Water Conservation Fund

LMU – Landscape Management Unit

M

MAFFC – Mid-Atlantic Forest Fire Compact

MBF – 1000 Board Feet

MTRP – Municipal Tree Restoration Program

N

NAAEE – North American Association for Environmental Education

NAASF - Northeastern Area Association of State Foresters

NAI – Natural Areas Inventory

NASF – National Association of State Forest

NGO – Non-Government Agency

NLT – Natural Lands Trust

NPS – National Parks Service

NRCS – Natural Resource Conservation Service

NTFP – Non-Timber Forest Products

NWCG – National Wildland Fire Coordinating group

NWTF – National Wild Turkey Federation

O

OGIT – Oil and Gas Tracking System

OGM – Oil and Gas Management

OHV – Off Highway Vehicle

P

PABS – Pennsylvania Biological Survey

PACD – Pennsylvania Association of Conservation Districts

PAFS – Pennsylvania Forest Stewards

PA-IMT – Pennsylvania Incident Management Team

PALTA – Pennsylvania Land Trust Association

PASA – Pennsylvania Association for Sustainable Agriculture

PCC – Pennsylvania Conservation Corps

PDA – Pennsylvania Department of Agriculture

PEMA – Pennsylvania Emergency Management Agency

PennDOT – Pennsylvania Department of Transportation
PFA – Pennsylvania Forestry Association
PFBC – Pennsylvania Fish and Boat Commission
PFPA – Pennsylvania Forest Products Association
PGC – Pennsylvania Game Commission
PHMC – Pennsylvania Historical and Museum Commission
PHS – Pennsylvania Horticulture Society
PILT – Payment in lieu of Taxes
PLNA – Pennsylvania Landscape and Nursery Association
PLT – Project Learning Tree
PNDI – Pennsylvania Natural Diversity Inventory
PNHP – Pennsylvania Natural Heritage Program
PPFF – Pennsylvania Parks and Forest Foundation
PSP – Pennsylvania State Police
PSSA – Pennsylvania State Sportsmen’s Association
PSU – Penn State University

Q

QDMA – Quality Deer Management Association

R

RAC – Recreation Advisory Committee
RAWS – Remote Automated Weather Station
RC&D – Resource Conservation and Development
RCF – Rural and Community Forestry
RGS – Ruffed Grouse Association
RMC – Resource Management Center
ROS – Recreation Opportunities Spectrum

ROW – Right of Way
RPF – Rare Plant Forum
RTE – Rare Threatened Endangered
RUA – Road Use Agreement
Rx – Prescribed

S

SAA – Special Activities Agreement
SAF – Society of American Foresters
SAR – Search and Rescue
SCORP – Statewide Comprehensive Outdoor Recreation Plan
SFER – State Forest Environmental Review
SFI – Sustainable Forestry Initiative
SFL – State Forest Land
SFO – State Forest Officer
SFRMP – State Forest Resource Management Plan
SLF – Spotted Lantern Fly
SRBC – Susquehanna River Basin Commission
STC – Shade Tree Commission

T

TACF – The American Chestnut Association
TCUSA – Tree City United States of America
TIMO – Timber Investment Management Organization
TMDL – Total Maximum Daily Loads
TNC – The Natural Lands Trust
Topo Geo – Topographical and Geologic Services
TPO – Timber Products Output Survey

TSP – Technical Service Provider

TU – Trout Unlimited

U

UTC – Urban Tree Canopy

USDA – United States Department of Agriculture

USFS – United States Forest Service

USFWS – United States Fish and Wildlife Service

USGS – United States Geological Survey

V

VFD – Volunteer Fire Department

VPTC – Vascular Plant Technical Committee

VUM – Visitor Use Monitoring

W

WHIP – Wildlife Habitat Incentives Program

WOA – Woodland Owner Association

WMU – Wildlife Management Unit

WNA – Wild and Natural Areas

WPC – Western Pennsylvania Conservancy

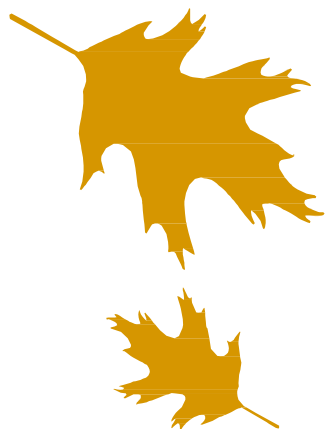
WRCA – Wild Resource Conservation Act

WUI – Wildland Urban Interface

Appendices

Appendix A - District Interpretive Plan

Forbes State Forest District: Interpretive Plan



Date Revised: July 20, 2018

Planning Team Members:

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pennsylvania
DEPARTMENT OF CONSERVATION
AND NATURAL RESOURCES

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Introduction

Forbes State Forest is located within the heart of the Laurel Highlands, consisting of a total of over 60,000 acres of land. Forbes spans Westmoreland, Somerset, and Fayette counties and is separated into five divisions: Laurel Mountain (Westmoreland and Somerset), Kooser (Somerset), Bluehole (Somerset), Negro Mountain (Somerset), and Braddock (Fayette). Forbes is situated within the Allegheny Mountain section of the Appalachian Plateau Province, expanding beyond the Laurel and Chestnut Ridges, as well as Negro Mountain.

Forbes has four unique management areas that are recognized and protected for their special geologic, biologic, historic, and scenic features. These are Roaring Run Natural Area, Mt. Davis Natural Area, Spruce Flat Wildlife Management Area, and Quebec Run Wild Area.

Outdoor recreation and the pursuit of peace and solitude draw many visitors to the Forbes. Over 300 miles of multi-use trails and forest roads provide year-round recreational activities, such as mountain biking, horseback riding, and hiking. Camping, hunting, and fishing are also popular year-round uses of this land. Winter recreation also attracts many outdoor enthusiasts onto Forbes. Popular winter activities include cross-country skiing, snowmobiling, and snowshoeing.

Forbes State Forest was protected early in the history of the state forest land protection. Its conservation is now especially significant due to its proximity to large population centers. Purchased primarily from lumber companies that harvested the old growth forest, the practice of sound resource management and early conservation efforts is a large part of Forbes history.

Each division of Forbes tells its own story, whether it be that of historical, cultural, or natural significance. All divisions have a history rooted in industry and natural resources as well as unique natural features, all which are highlighted in the ‘current interpretation,’ ‘non-personal services’ section of this document.

DCNR and Bureau of Forestry Missions and Key Messages

Both the department and bureau missions and key messages should be present in our interpretive efforts. Keep these in mind as you plan your interpretive projects. If an interpretive project does not address our mission or contain a key message, it should not be considered.

The Bureau of Forestry's Mission...

...is to ensure the long-term health, viability and productivity of the commonwealth's forests and to conserve native wild plants.

Bureau of Forestry's Key Messages:

The Bureau of Forestry has developed a set of forest-related key messages that complements the department's communications efforts. The bureau considers and uses these key messages when developing communications products.

Natural resources are critical to our health, economy, and quality of life.

- Forests are Pennsylvania's principal land use.
- Forests provide vital services to society. They clean our air, purify our water, provide habitat for plants and animals, and support key ecological processes.
- Forests provide a renewable source of wood products to society.

Everyone uses and has the opportunity to enjoy Pennsylvania's vast natural resources.

- Healthy forests benefit all citizens, no matter where they live.
- Forests provide nearly boundless opportunities for healthful recreation.
- Forests serve as a source of inspiration and wonder.
- There is a forest to explore near you.

DCNR leads everyday efforts to conserve Pennsylvania's natural resources and connect people to the outdoors.

- DCNR Bureau of Forestry leads Pennsylvania in forest and native wild plant conservation and stewardship.
- DCNR Bureau of Forestry seeks to foster an awareness of the forests' many uses and values and inspire people to conserve them.

The future of Pennsylvania's natural resources depends on you.

- People and communities every day shape the future of Pennsylvania's forests.
- Sustaining our forests and associated values depends on wise stewardship.
- We have a responsibility to manage our forests for current and future generations.

State Forest Resource Management Plan: Communications Management Principle

This guiding principle for Communication Management is established in our State Forest Resource Management Plan and should assist in setting the direction of interpretive efforts.

Communications Management Principle

The citizens of Pennsylvania appreciate the forests of Pennsylvania and their resources and values and are engaged in the issues that affect them.

Goals	Objectives
1. To provide education and interpretive opportunities regarding the values, services, and benefits of sustainable forest management.	1.1 Promote Project Learning Tree with Pennsylvania educators and youth leaders through workshops and material support.
	1.2 Promote forestry and conservation through public education and outreach such as the statewide Envirothon, natural gas tours, ECO Camp, and other public programming partnerships.
	1.3 Provide forest demonstration areas throughout the state forest system that show forest management practices.
	1.4 Create statewide and district interpretive plans and increase the use of interpretive resources.
	1.5 Promote a public stewardship ethic regarding the commonwealth's forests and wild plant resources.
	1.6 Develop state-of-the-art resource management centers to house educational displays and stimulate interest in forest conservation.
2. To provide customer service and information that promote the use and enjoyment of the state forest system.	2.1 Maintain a steady and available supply of our public use maps, guides, and printed materials.
	2.2 Continually update and utilize electronic media, providing information in an engaging format on the bureau and its work.
3. To engage the public and consider input in state forest management decisions.	3.1 Utilize advisory committees to engage stakeholders.
	3.2 Provide information on forests, forest issues, and native wild plants.
	3.3 Plan and coordinate public meetings on specific bureau topics including the SFRMP process and shale-gas management as well as issues of local interest at the district level.
	3.4 Monitor and respond to social media questions and comments.
	3.5 Coordinate responses to public inquiries on state forest management topics.

Overview of Forbes State Forest

Introduction

Forbes was founded in 1909, marked by the first land purchase from the Byers-Allen Lumber Company. Forbes was first named the Westmoreland- Somerset forest reserve later to gain its current designation as a state forest. Forbes State Forest was named after the British General John Forbes, who planned an attack on Fort Duquesne from Fort Ligonier, in the French and Indian War.

History

Like much of Pennsylvania, Forbes State Forest's landscape was impacted by heavy logging activity during the early 1900s. Both the Laurel Hill and the Chestnut Ridge were rich in valuable timber and mineral resources that were strongly sought after to fuel the Industrial Revolution. Railroads that were primarily built to move the resources to the center of industry also expanded the opportunity for tourists to visit the mountains. The industrialization of the Laurel Highlands left a scar on the landscape, but that was soon to be changed through a new concept called resource conservation.

Dr. Joseph T. Rothrock and other visionary leaders, such as President Franklin D. Roosevelt, Gifford Pinchot, and Mira Lloyd Dock, worked to restore and revive our depleted forests. Through the advent of forest resource management and the implementation of sustainable management practices, Pennsylvania's forests were able to regenerate and become some of the most productive forests in the nation today.

In the 1930s, the Civilian Conservation Corps (CCC) played a key role in the development of many of the state parks and forests within Pennsylvania. The CCC occupied a total of four camps within Forbes State Forest and some remnants of these camps can still be seen in the forest today. The camps included Fort Necessity (SP-12), Negro Mountain (S-97), Kooser (S-99), and Blue Hole (S-98).

Goals of Region Wide Interpretive Plans...

- PA Wilds Interpretive Plan
- Allegheny RU Interpretive Plan
- Laurel Ridge Comp Interpretive Plan
- Pine Creek RU Interpretive Master Plan

Key Resources and Events

Events

General winter recreation – The Laurel Mountain warming hut is staffed during the winter by the Laurel Mountain Nordic Ski Patrol, providing cross-country skiers, snowmobilers, and snowshoers with first aid assistance.

Woodcock Weekends – Back-to-back educational programs on the American woodcock, led by Laurel Hill State Park and Forbes State Forest EES. This event takes place annually around the 3rd Friday and Saturday evenings in March. Other state parks participate, including Keystone and Ohiopyle State Park, but these programs are often on other weekends.

National Trails Day – Annual Laurel Mountain Volunteer Group (LMVG) work day on the first Saturday in June. This work day takes place on Laurel Mountain and includes trail brushback, re-blazing, trail resurfacing, and any other special projects that may need to be completed.

National Public Lands Day – Annual Laurel Mountain Volunteer Group (LMVG) work day on the last Saturday in September. The date of this volunteer work day varies by season, but usually occurs on this date. This work day takes place on Laurel Mountain and includes trail brushback, re-blazing, trail resurfacing, and any other special projects that may need to be completed.

Fall Foliage Hike(s) – Annual hike(s) that takes place on Laurel Mountain, usually on the 2nd or 3rd weekend in October. This event highlights seasonal tree adaptations and tree identification.

Unique Ecology

- *Timber rattlesnake habitat*
- *Woodcock habitat management area(Mountain Streams)*
- *Golden eagle research/study(various locations throughout Forbes)*

Purpose and Goals

Purpose

Forbes State Forest was founded to protect, conserve, and sustainably manage our forest resources, while providing recreational opportunities for visitors.

District Interpretive Goals

Goals state *what it is that you want interpretation to do for your district*. They should be broad and general. The objectives will get to the specifics. Many goals may already be written if you have interpretive plans completed for your local Conservation Landscape Initiative such as PA WILDS, Allegheny Rec Unit, Pine Creek Rec Unit or the Laurel Ridge Comprehensive Interpretive Plan. You could also check out the interpretive plans for state parks that are located nearby. (For state park interpretive plans, go to: <http://nrintraparks/>, choose Outdoor Programming Services Division, then choose Prospectuses/Interpretive Plans under Interpretive Planning.)

Goals

- I. Encourage exploration and participation in low impact recreation within the Forbes State Forest.
- II. To create connections for sharing of information and resources between the state parks and forest within the Laurel Highlands, in order to present a complete interpretive picture for residents, visitors, schools, and partners.
- III. To foster awareness for the value of natural, cultural, and historic resources within Forbes State Forest, for recreation and economic development.
- IV. To promote stewardship to residents and visitors through development of opportunities to become engaged in conservation issues.
- V. To encourage sustainable tourism and travel within public lands, local attractions, and local communities along the Laurel Ridge.
- VI. To connect to the other state parks, state forests, and state heritage areas within the Laurel Highlands to promote consistent, sustainable recreational and interpretive opportunities for the region.
- VII. To increase the public's knowledge of forestry and forest management practices.
- VIII. To increase volunteerism in the Forbes.
- IX. To decrease vandalism to resources of natural, cultural, or historical value.

Objectives (outputs, outcomes and impacts)

The objectives provide a measurable way in which the goals will be accomplished.

What we do...

Outputs: What Forbes State Forest will do for the visitor: “What we do”
Link them back to the goals.

- I. Interpret and communicate to the visitor our resource management efforts while maintaining the wild character of the state forest. (Goals I,III,IV,VI,VII)
- II. Provide coordinated interpretive, educational, and recreational programming between state parks, state forests, and partner sites. (Goals II, III, V, VI)
- III. Identify and support regional conservation initiatives that promote public lands as a benefit to residents and visitors or the region. (Goals III, IV,IX)
- IV. Model sustainable use practices at Forbes State Forest to provide education and to encourage visitor participation in conservation. (Goals I, III, IV,VII)
- V. Provide, maintain, and create new waysides or other interpretive publications for historic, natural, and culturally significant sites in Forbes. (Goals II, III, IV,VII,IX)
- VI. Increase the visibility of the Forbes State Forest by engaging in public outreach via community events and partnership opportunities. (Goals II, III, IV,VII,VIII)
- VII. Work cooperatively with local schools, community organization, and specialized groups to encourage these individuals to visit the forest. (Goals I, III, IV, V,VII)
- VIII. Provide volunteer opportunities for visitors in the Forbes. (Goals I, III, IV, VIII)

...to get the visitor to do...

Outcomes: The anticipated short-term action resulting from the above outputs – “What the visitor will do.” Link them to the outputs.

- I. Volunteer participation will increase by 1% at Forbes State Forest. (Outputs I, II, IV, VI, VII)
- II. Local school, scout, and community group interaction/visitation to the forest will increase by 5%. (Outputs I, II, III, IV, V, VI, VII)
- III. 10% of local communities’ residents will acquire a more positive attitude towards the Bureau’s role in forest management (i.e. salvage cuts). (Outputs III, IV, VI)
- IV. At least 20% of visitors who participate in a guided interpretive or recreational program on Forbes will visit at least one other state park or forest location within this region. (Outputs II, III, IV, VII)
- V. At least 10% of visitors who participate in a guided interpretive or recreation program at Forbes State Forest will visit a local community historic, cultural, or recreational attraction or event. (Outputs II, VII)

...to
benefit
Forbes
Forest
District
this way.

Impacts: The long-term benefits to the state forest as a result of the above outputs and outcomes – What happens long-term. Link these to outcomes.

- I. Participation in environmental issues and conservation actions on DCNR lands among residents and visitor will increase by 10%. (Outcomes II, III, IV, V)
- II. The maintenance hours and costs for damages to resources will be reduced by 5% within one year. (Outcomes I, III)
- III. Visitor use patterns will change to provide a more even distribution of visitors seasonally and year-round throughout the Laurel Highlands, in state forests. (Outcomes I, II, III, IV, V)
- IV. Resident participation and support of Forbes State Forest interpretive and recreation programs will slowly increase over the next 2 seasons. (Outcomes II, III)

Audiences and Market Considerations

Forbes State Forest underwent a visitor use study from October 1, 2012 to September 30, 2013, by Penn State University and the USDA Forest Service. This research included a number of studies, all to gain knowledge on who comes out to Forbes and what these individuals do when they visit. Below is an illustration highlighting the main research findings that provide our staff with better insight on visitor use of the forest. Some of this data was collected through electronic counters (visitation) while much of the more detailed information was gathered by on-site surveying of visitors (1,976 people) throughout the yearlong study. Below is a brief summary of key findings that can help our forest district determine Forbes' overall perception to the public, as well as any potential interpretive, directional, or infrastructure needs for the future.

The total number of visitors is separated based on outdoor recreation and sightseeing. Recreational visits are defined as an individual entering and exiting the state forest for the purpose of recreation. It is also estimated that an individual may participate in more than one activity or may visit more than one site during a single visit. Researchers have estimated that forest visitors went to 190,196 different forest sites during this time period.

Total Number of Visitors	
Total # of visitors (recreation)	121,233
Total # of visitors (sightseeing)	352,006

Of the total number of visitors during the time of this study, 88% were repeat visitors. The number of trips these visitors made to the forest per year varied.

Visitation (#trips/year)	
Minimum visitation (50% of visitors)	0-5 trips/year
Maximum visitation	50 trips/year
Average visitation	22.87% trips/year

The average number of individuals per vehicle was 2. The most common groups of visitors were families, which made of 42% of total visitors, with a smaller proportion being groups of friends.

Visitor Demographics (sex and age)	
% Male visitors	75%
% Female visitors	25%
% 18-35 age	27%
% 36-50 age	31%
% 51-64 age	32%

Recreation is an important part of Forbes State Forest. Each year, the forest draws numerous visitors seeking outdoor recreation opportunities. The most popular activity was hiking and walking, with winter recreation activities coming in at a close second.

Outdoor Recreation	
Hiking/walking	57%
Sightseeing	45%
Driving	29%
Relaxing	20%
Cross-country ski/snowshoe	15%
Hunting	12%
Visiting historic sites	10%

**The totals add up to more than 100% because visitors were allowed to choose more than one activity.*

The overall recreation experience of each individual was very good. About 90% of individuals reported that they were able to recreate without feeling crowded. While 89% of visitors mentioned that they were able to recreate without conflict from other visitors.

Visitor satisfaction is another important aspect of this study, as it allows us to gauge how well we are accommodating to the public, and it can also provide insight on areas that may need improvement.

Visitor Satisfaction	
Scenery and attractiveness of forest landscape	96% (VERY GOOD)
Condition of the natural environment	96%
Feeling of safety	95%
Availability of parking	83% (GOOD)
Parking lot condition	80%
Condition of forest roads	75%
Adequacy of signage	74%
Availability of information on recreation	56% (FAIR)
Overall satisfaction of Forbes State Forest	79% (VERY SATISFIED)

In correlation with visitor satisfaction is the importance of facilities provided to the public. This information provides us with the public's perception of our current infrastructure and provides us with feedback for future reference.

Importance of Facilities	
Non-motorized trails	85% (VERY IMPORTANT TO EXTREMELY IMPORTANT)
Signs	75% (VERY IMPORTANT)
Wildlife viewing opportunities	63% (VERY IMPORTANT)
Printed interpretation	67% (VERY IMPORTANT)
Parking	60% (VERY IMPORTANT)
ATV trails	55% (NOT AT ALL IMPORTANT)
Snowmobile trails	58% (NOT AT ALL IMPORTANT)

There were other aspects of this study that can be referenced for more detailed information. Overall, the study shows that individuals choose to visit Forbes State Forest to be outdoors, to experience natural surroundings, for relaxation, as well as to experience peace and solitude. Other motivations for people to visit the Forbes were for physical exercise, family recreation, visit with friends, for a challenge or sport, and/or to build skills.

Theme and Subthemes

Central Theme

Forbes State Forest connects public lands with local communities, providing year-round recreational, as well as historical and cultural experiences for visitors.

Subthemes

Sub-theme A: The character of small, traditional communities provides opportunities to experience the history of local mountain culture and new innovation and progress. (community)

Storyline AI: Traditional values of southwestern PA mountain culture are characteristic of the Laurel Highlands.

Storyline AII: Remnants of former settlements and industry serve as links to local history.

Sub-theme B: Development of transportation routes to the region opened the land for access to resources for timbering, mining and settlement. (history)

Storyline BI: Following Native American paths and river corridors, the development of transportation routes through rugged terrain for the movement of goods laid the groundwork for future westward expansion.

Storyline BII: Development of railroads and improved transportation corridors created access to the abundant natural resources and provided opportunities for settlement.

Storyline BIII: In the post industrial revolution era, the evolution of modern transportation routes created access to the recreational opportunities in the Laurel Highlands region.

**Sub-theme C: The geology of the ridge influences the climate and natural resources of the region.
(geology/natural resources)**

Storyline CI: Rock composition, geologic folding/tectonic movement (deformation) and weathering processes through time have led to mountainous terrain, winding rivers, significant geologic features and the natural scenic beauty of the Laurel Highlands.

Storyline CII: The Laurel Ridge's geologic composition and geographic profile influence the region's water chemistry, flow, quantity and availability.

Storyline CIII: The geodiversity in Laurel Ridge influences the ecological diversity, land use patterns and recreational pursuits.

Storyline CIV: The topographic profile, composition and orientation of the Laurel Ridge have a major influence on local climate and weather.

Storyline CV: The forested ridge protects local watersheds, influences the kinds of plants and animals found there and provides an important habitat corridor for wildlife.

Sub-theme D: The accessibility to natural areas and wilderness settings provide year round recreation opportunities. (recreation)

Storyline DI: There are 100,000 acres of public land within proximity to major urban areas.

Storyline DII: The diversity of public lands provide intimate front-country and secluded backcountry experiences.

Storyline DIII: Year-round recreational opportunities result from the confluence of natural resources, visitor facilities and services.

**Sub-theme E: Efforts to protect and restore the resources influenced conservation on these contiguous public lands whose future depends on the stewardship ethic residents and visitors.
(conservation/stewardship)**

Storyline EI: The establishment and continuing support of these lands are a result of individual actions and large scale efforts of public and private entities to protect, restore and conserve the resources.

Storyline EII: The current visitor experience on these lands inspires and provides opportunities for continued efforts to meet modern challenges to conservation.

Storyline EIII: Sustainable forest practices demonstrate ecosystem management and the idea of a 'working forest.'

Current Interpretation (personal and non-personal)

Create an inventory and overview of the programs, waysides, exhibits, brochures, maps, etc., currently offered by this state forest.

Interpretation and environmental education have always been an important aspect of Forbes State Forest. Interpretive waysides, brochures, and other publications provide visitors with a ‘take home message’ when they visit areas of Forbes where staff may not be present. Interpretive signs allow visitors to become more aware of the forest and its resources, with the hope that individuals will want to protect these natural resources and become future stewards of the forest. Public program services are becoming more popular throughout the Forbes, with the recent addition of an environmental education specialist position. More public contact and connections are being made throughout the local communities surrounding the Forest. Local school, scout, and special interest group programming is common and becoming more widespread each year. Recreation-based programming is the most popular, highlighting the numerous trails and natural features throughout Forbes.

Personal

Interpretive Programs – Outdoor Recreation

- Outdoor recreational programming at Forbes State Forest focuses on popular types of recreation in the various forest tracts throughout its three counties. All recreational programs include a brief instruction on that particular activity and an overview of natural history or cultural history of that specific area.
- Day/evening hikes are the most common type of program offered at Forbes. These programs occur at various locations throughout Forbes, aiming to highlight the most unique and interesting features in the forest. Laurel Mountain is a popular and very accessible location for both day and evening hiking programs. The Bog Trail, Wolf Rocks Trail, Wolf Rocks Loop Trail, Summit Trail, Spruce Run Trail, Beam Rocks Trail, and a portion of the Laurel Highlands Hiking Trail (managed by Laurel Ridge State Park) are frequently used for hiking programs. The Wolf Rocks Trails and Beam Rocks Trails offer spectacular vistas of the surrounding countryside, and they provide a great view of the foliage during the fall. The Bog Trail is popular for plant-enthusiasts hoping to spot the carnivorous pitcher plant or sundew in the Spruce Flats Bog; this trail is an easy walk that’s accessible for visitors of all skill levels. Other hiking program destinations include Roaring Run Trail (Kooser Division), McKenna Trail (Kooser Division), Cole Run Trail (Blue Hole Division), Blair Brothers RR Trail (Laurel Mountain Division), Schafer Run Trail Loop (Kooser Division), Miller Trail (Braddock Division), Rankin Trail (Braddock Division), Mill Run Trail (Braddock Division), Grist Mill Trail (Braddock Division), and Hess Trail (Braddock Division).
- Mountain biking also attracts visitors to the Forbes, specifically to Laurel Mountain. The series of looping trails on the ridge allows riders to cater their ride to whatever distance or terrain best suits their riding-level. Many of the trails on Laurel Mountain are intermediate or expert-level, due mostly to the aggressively, rocky terrain. Riders can easily incorporate surrounding snowmobile trails (forest roads) into a ride to create a less technical route. Mountain biking programs at the Forbes are focused on beginner mountain bikers. This type of program occurs once or twice a year, providing visitors ages 12 and up, with information on types of mountain bikes; bike anatomy; how to use the specific bike; and basic bike maintenance. Following the instructional portion of the program, participants are then able to go out for a guided ride (2-3 miles) on the nearby trails. Forbes currently borrows mountain bikes from the Bureau of State Parks Region 2 office.
- Backpacking is an activity that is sought after by a more specialized group of visitors. Intermediate backpacking programs are offered at Forbes one to two times each year (spring and fall). This type of program often caters to visitors who either want more information and experience with backpacking, or for those who want to go out with a group of people. The ‘intermediate’ aspect of this program requires the participant to provide their own equipment and meals, as well as to be in good physical shape to hike with pack for an average of 6-8 miles for two days. This program is accompanied by one overnight. Popular locations for the

backpacking programs are Quebec Run Wild Area (Braddock Division), Roaring Run Natural Area (outside of the natural area boundaries; Kooser Division), or Laurel Mountain. Due to the lack of backpacking equipment available to lend out to the public, it is not possible to lead an introduction to backpacking program at this time.

- Winter recreation is very popular among public during the colder months of the year. Winter recreation programming is relatively new at the Forbes, but it is becoming quite popular among those willing to brave the cold temperatures. Introduction to snowshoeing programs are conducted at the end of the winter, when the forest EES returns from LWOP. These programs have been very successful due to public interest and partnership with the Laurel Highlands Nordic Ski Patrol. Forbes district office owns 10 pairs of snowshoes, in various sizes, and several pairs of trekking poles that are used for these programs. Winter recreation programming may expand beyond snowshoeing in coming years, incorporating cross-country skiing programs into the mix. Forbes does not own any cross-country skis so this is equipment that would need to be borrowed from neighboring state parks or ski rental businesses.
- Recreation programming is also regularly requested by various community groups: Ligonier Valley Public Library, Master Gardeners of Somerset County, Fayette County Healthy Lifestyles Taskforce, and local girl/boy scout troops.

Interpretive Programs – Environmental

There is a variety of environmental/natural history programming at Forbes State Forest. Much of this programming takes place along hikes, but also frequently occurs at the Laurel Summit warming hut. The Forbes district office's conference room is another option for more formal programming and has been utilized for workshop-based programs, such as the 'beautiful bluebirds' program.

There are many unique natural features at the Forbes, providing ample opportunity to present on a variety of topics. Popular environmental programming includes forestry talks, woodcock hike, spring wildflower walks, bog walks, fall foliage hikes, evening hikes, and tree ID hikes.

Environmental Education Programs

Environmental education programs are frequently scheduled throughout the spring and fall seasons. These programs are usually requested by a local school, church, or scout troop looking to either come visit the Forbes or for the Forbes' staff to visit their group. Groups that regularly request programs include: Greensburg-Salem Middle School, Trinity Christian School, Outside-In School of Experiential Education, Girl Scouts of Western PA (troops in Westmoreland County), and Boy Scouts (troops in Somerset and Westmoreland Counties). Other program requests come at large by county school district requests during the Envirothon competition; Somerset County, Fayette County, Westmoreland County, Washington County, and Greene County. A few of these schools or counties will request a study session prior to the Envirothon competition.

The main focus of many of these EE programs is PA forests, utilizing Project Learning Tree (Early Childhood and K-12), Project WILD (Early Childhood and K-12), and PLT Focus on Forests EE curriculum.

Interpretive Publications and Waysides

Below is an inventory of the public use brochures and interpretive waysides currently created by/on the Forbes. Please refer to the table for more detailed information.

Map Inventory

Forbes State Forest Public Use Map	printed by BOF staff
Bob Ache Memorial Forest map	printed by Forbes staff
Laurel Highlands Trail System map	printed by Forbes staff
Mountain Streams Trail map	printed by Forbes staff
North Woods Trail System map	printed by Forbes staff
Roaring Run Natural Area map	printed by Forbes staff
Blue Hole Division/Barron Tract map	printed by Forbes staff
Mt. Davis Area map	printed by Forbes staff
Quebec Run Wild Area map	printed by Forbes staff
Lick Hollow Area/Whitetail Trail map	printed by Forbes staff
Braddock Hunting Map	printed by Forbes staff
Laurel Mountain Hunting Map	printed by Forbes staff
Blue Hole Hunting Map	printed by Forbes staff
Mt. Davis Hunting Map	printed by Forbes staff

Brochure Inventory

Camping brochure	primitive and motorized camping brochure – printed by Forbes staff
Motorized Camping Site Overview brochure	printed by Forbes staff
Firewood Cutting brochure	printed by Forbes staff
Stone Sales brochure	printed by Forbes staff
Powered Mobility Devices brochure	printed by Forbes staff
Forbes State Forest Quick Facts brochure	printed by Forbes staff
Spruce Flats Bog & Wildlife Area brochure	printed by Forbes staff
Forbes State Forest: Celebrating 100 Years	printed by Forbes staff
Mt. Davis History & Geology	printed by Forbes staff
Winter Trail Etiquette brochure	printed by Forbes staff
Equestrian brochure	printed by Forbes staff
Wharton Furnace brochure	printed by Forbes staff

Wayside Inventory

Spruce Flats Bog waysides (3)	2012?
Laurel Summit SP/FSF waysides (2)	2012?
CCC waysides Mt Davis (2)	2014
Timber rattlesnake wayside (1)	2014
CCC Blue Hole (S-98) waysides (4)	2016 (installed 2017)
Wharton Furnace waysides (3)	2016 (installed 2017)
Laurel Mountain wayside (1)	2016 (installed 2017 by eagle scout)

Non-Personal

Historical Resources

Laurel Mountain Division

- *PW&S Railroad* – The Pittsburgh, Westmoreland, and Somerset Railroad was constructed in 1899 to haul timber from Laurel Mountain to the Byers-Allen Lumber Company, in Ligonier. The PW&S railroad was short-lived and ceased operation in 1916.
- *Blair Brothers Railroad* – 1908-1926; Blair Brothers Lumber Company owned by James and David Blair originally shipped timber to the PW&S Railroad. In 1911 the company relocated to Kregar, laying new track and rebuilding their sawmill. Remnants of the railroad grade can be seen on the Blair Brothers Trail, located in the Mountain Streams tract.
- *Bluestone Quarry* – mined from 1899-1916; bluestone was hauled on the PW&S railroad to the Pittsburgh market. The bluestone was used to construct the Ligonier Methodist Church, in the famous ‘diamond’ town square in downtown Ligonier, in 1903. The quarry remains off of Quarry Trail on Forbes, near the boundary of Linn Run State Park.
- *Airglow Observatory* – built on leased property, observatory owned by the University of Pittsburgh.
- *Camp Run School* – located in the Mountain Streams tract.
- *Shawley Farm* – located off of Mountain Streams Trail, in the Mountain Stream tract.
- *Larimer Farm* – located in the Mountain Streams tract.
- *Benford Farm* – located off of Camp Run Road.
- *Benford Cemetery* – located off of Camp Run Road.
- *Ritter Cemetery* – located off of Felgar Road.
- *Hunt Springs* – located off of Aukerman Road.

Kooser Division

- *Indian Creek Valley Railroad* - built in 1902-1926 for Laurel Hill timbering operations. The railroad spanned 22 miles, from Jones Mills to the Youghiogheny River. The railroad was abandoned in 1969 by the B&O Railroad.
- *Neiderheiser Cemetery*—family cemetery located on Cherry Trail. Buried within this cemetery is civil war veteran, Samuel Neiderheiser.
- *Kooser fire tower* – built in 1934; on Forbes property but managed by Laurel Hill State Park complex.
- *CCC camp (S-99)* – 1933-1940; located within Kooser State Park.
- *Beck Spring* – initially built by CCC; connects to Jones Mill Run, which runs into Laurel Hill Creek within Laurel Hill State Park. Along Jones Mill Run Road.
- *Ursina and North Fork Railroad* – 1870(?)–1936; located in Kooser Division, Blue Hole Division, and the Barron Tract.

- *Mt. Hope School/Nedrow* – small school house abandoned in the mid-1950s; school house foundation still remains in Roaring Run Natural Area; located off of Painter Rock Road.
- *Monument* – A stone memorial commemorating lives lost in a sled-riding accident in 1896. A tree fell on a sled on the way home from church and killed 3 passengers.
- *Ferguson-Nedrow cemetery* –family cemetery located within the Roaring Run Natural Area, located off of Painter Rock Road.
- *Charles Nedrow Farm* –pond and foundations located off of Fire Tower Road; coal mine and reservoir located off of McKenna Trail, all within Roaring Run Natural Area.
- *Ira Nedrow Farm* – located off of Fire Tower Road, across from the Charles Nedrow Farm.
- *Jones Mill* – grist mill located on Cherry Trail.

Blue Hole Division

- *CCC camp (S-98)* – 1933-1936; located along Fall Run Road; evidence of past structures can be seen.
- *Ursina and North Fork Railroad* – 1870-1936; located in Kooser Division, Blue Hole Division, and the Barron Tract.

Braddock Division

- *Wharton Furnace* – iron furnace built by Andrew Stewart, in Wharton Township, in 1839. The iron from this furnace was hauled to Brownsville and shipped to Pittsburgh, via the Monongahela River. The furnace operated until 1873 when it was abandoned.
- *Pondfield fire tower* – 80-foot tower, built in 1937; discontinued use for fire spotting in mid-1900s.
- *Grist mill* – built in the late 1700s, owned by Mr. Cross. The mill was used to grind corn and wheat to make flour.
- *Dupont gunpowder plant* – located within the Ruane Tract of Forbes, this plant produced gunpowder during both WWI and WWII. Several explosions occurred at this plant during the time of its operation.
- **CCC camp (SP-12)*, Fort Necessity, was once part of Forbes State Forest but today is owned by the Federal Government and managed by the National Park Service (NPS).
- *Hull cemetery*
- *Indian Creek Coal and Coke Company* – 1906-1976; extracted coal from the Indian Creek coalfield.
- *Summit Lumber Company* – 1926-1947; narrow-gauge railroad.
- *Sun Racer Plane crash site* – April 7, 1936; flight took off from Newark, NJ and crashed due to storm, near Skyline Drive. Stewardess, Nellie Granger was the only survivor.

Negro Mountain Division

- *CCC camp (S-97)* – 1933-1937; located off of South Wolf Rock Road. Two cabins still exist on this site, in addition to old stone fireplace with chimney and bridges. Camp assisted with constructing picnic area.

- *High Point observation tower* – built in 1935; not actual highpoint.
- *Mt. Davis picnic area* – built by the CCC in the mid-1930s.
- *McClosky Farm/ Mill* – 42 acre farm is located near the maintenance shop; mill was tub mill.
- *Anna Bookman's grave* – headstone of grave located off of South Wolf Rock Road, near Tub Mill Run; family was McClosky.
- *Muncy Lumber Company*- 1915-1922
- *Markleton Lumber Company* – 1892-1906; changed their name to Enterprise Lumber Company, 1906-1918
- *Cook and Sechler Lumber Company* – 1910-1920(?)

Natural Resources

Laurel Mountain Division

- *Wolf Rocks vista* – located on the Laurel Ridge, off of Linn Run Road. This sandstone rock outcropping is accessible from Wolf Rocks Trail, a 2-mile hike from the Laurel Summit State Park parking lot.
- *Beam Rocks vista* – located on the Laurel Ridge, off of Laurel Summit Road. This sandstone rock outcropping is accessible from the Beam Rocks Trail, a ½ mile hike from the parking lot or from the Laurel Highlands Hiking Trail (LHHT).
- *Spruce Flats Bog* – a unique mountaintop wetland that houses a variety of special plants and animals. The bog is located on the Laurel Ridge and can be accessed from the Laurel Summit State Park parking lot. It is a ¼ mile walk to the bog, on a flat, gravel surface.
- *Roaring Run Natural Area* – 3,593 acres located on the Laurel Ridge, between Route 31 and Seven Springs. Roaring Run was extensively logged for the construction of the Indian Creek Valley Railroad and today, is reverting back to forest. The natural area is limited to foot-traffic only and camping is prohibited. Roaring Run is unique in that it features a complete mountain stream protected within its own watershed.
- *Painter Rock Hill* – clear-cut in the 1960s; rock outcrop located along Painter Rock Trail that features views of the Roaring Run Valley.
- *Birch Rock Hill* – rock outcrop located along Birch Rock Trail; offers views of the ski slopes at Seven Springs.

Multi-use trail system suitable for hiking, horseback riding, mountain biking, snowmobiling, and cross-country skiing.

*Proximity to Linn Run, Laurel Ridge, Laurel Hill, Laurel Summit, and Kooser State Parks

Kooser Division

- *Jones Mill Run* –stream classified as ‘Approved Trout Waters’ by the PA Fish and Boat Commission.
- *Roaring Run* –pristine stream classified as ‘Wilderness Trout Waters’ by the PA Fish and Boat Commission.

*Proximity to Seven Springs and Hidden Valley Ski Resorts, as well as Laurel Hill State Park complex

Blue Hole Division

- *Cole Run Falls* – a waterfall located on Cole Run; can be accessed from Cole Run Road parking lot.
- *Blue Hole* – deep hole located in Blue Hole Creek, near the mouth of Gary Run.

*Proximity to Seven Springs and Hidden Valley Ski Resorts, as well as Laurel Hill State Park complex

Braddock Division

- *Quebec Run Wild Area*—7,441 acres; no permanent development permitted to retain wild character. Hiking, hunting, fishing, and backpack style camping are permitted.
- *Lick Hollow picnic area* – picnic area/rest area located off of Route 40 near Hopwood. Open from Memorial Day to Labor Day.
- *Pine Knob overlook* – scenic vista provides view of Uniontown and other surroundings; accessible from Pine Knob Trail.
- *Cabin Hollow Rocks*
- *White Rocks*—Pottsville sandstone outcrop located in Georges Township. Provides habitat for the green salamander, Allegheny woodrat, timber rattlesnake, and northern copperhead. White Rocks is famous for the tale of Polly Williams who died at this site in 1810; her grave can be found at the nearby Little White Rock Methodist Cemetery.
- *Barton Cave* – cave located in Fayette County.
- *Hess Trail* – hiking trail located within the Quebec Run Wild Area. Folklore says that during the Civil War, Confederate soldiers stole gold from local banks and buried it along this trail. Many have searched for this hidden treasure, but no one has reported finding it.

Multi-use trail system suitable for hiking, mountain biking, and cross-country skiing.

*Proximity to Laurel Caverns, Nemacolin Woodland Resort, Fort Necessity National Battlefield, Braddock's Grave, and Ohiopyle State Park

Negro Mountain Division

- *Mt. Davis Natural Area*—581 acres; highest point in Pennsylvania at 3,213 feet. Camping is prohibited and activity is restricted to foot travel only
- *Mt. Davis highpoint* – USGS marker on rock that marks 3,213 feet elevation above sea-level.
- *Highpoint Lake overlook* – viewing platform along South Wolf Rock Road; constructed in 1989 by local eagle scout.
- *Vought Rocks*—along Vought Rock Road
- *Wolf Rocks*—between CCC Camp and Mt. Davis tower
- *Shelter Rocks*—along Shelter Rock Trails
- *Baughman Rocks*—along SR2004
- *Tar kiln*—South Wolf Rock Road near tower entrance

*Proximity to Laurel Hill State Park complex. Nearby state parks that also provide similar cultural, historical, and natural resources to the Laurel Highlands region.

Regional Points of Interest

- *Linn Run State Park* – 612-acres bordering Forbes State Forest. Main attractions include cabin rentals, picnicking opportunities, and fishing in Grove, Rock, and Linn Run trout streams.
- *Laurel Hill State Park* – 4,062 acres in the heart of the Laurel Ridge. Laurel Hill Lake is a huge draw for visitors, in addition to the camping, mountain biking, hiking, fishing, winter recreation, and environmental education programs.
- *Kooser State Park* – 250 acres surrounded by state forest and state park land. Cabin rentals, camping, fishing, and winter recreation are all popular activities in this state park.
- *Laurel Ridge State Park* – manages and maintains the 70-mile Laurel Highlands Hiking Trail (LHHT) that spans from Ohiopyle State Park to Johnstown.
- *Laurel Summit State Park* – 6 acres of land surrounded by Forbes State Forest. This area provides a picnic area with tables and charcoal grills, as well as a parking lot that provides access to trails on the adjacent forest property.
- *Ohiopyle State Park* – 20,500 acres of land separated by the Youghiogheny River. Whitewater boating, hiking, and biking are the largest draws to this state park.
- *Point State Park* – 36 acres of land located where the three rivers meet, in the city of Pittsburgh. Boating and historical programming are most common.
- *Lincoln Highway Heritage Corridor* – also known as Route 30 or in some areas, ‘Forbes Road.’
- *National Road Heritage Area* – also known as Route 40 and dependent on location ‘Braddock’s Road.’

Issues, Challenges and Opportunities

Key issues and challenges to interpretation/operations at the site and a list of possible solutions to each of these concerns. Interpretation is a management strategy.

How can you use interpretation to resolve some of your key management issues?

Infrastructure & Signage

There will always be a need to improve/maintain roads, latrines, parking areas, trails, etc. on Forbes State Forest land. In addition, new interpretive signage and/or waysides will allow for better visitor orientation and understanding of natural, cultural, and historical aspects of the forest.

Disperse Visitors

Some areas of Forbes see a larger number of visitors, creating potential human impact to the natural environment. Established backcountry sites, with obvious fire pits are a good example. Some areas of Forbes are overused while others are rarely used.

Visitor use conflict is always possible, and it can occur on any of our multi-use trails. Conflict can be deterred by separating recreation types and guiding visitors to areas that are commonly used for similar activities.

Staffing

The current Bureau of Forestry staff that develops and delivers interpretive, recreation and environmental education programming is limited.

Identity

Many visitors do not know that Forbes State Forest is a state forest, managed by the Bureau of Forestry. Oftentimes, visitors mistake the state forest for a state park. It is important that we strive to educate the public about the BOF, to create an awareness of our vast forest resources in this region.

Recommendations for Personal and Non-personal Media

Includes the specific descriptions for personal (staffing, programs) and non-personal (exhibits, publications, waysides, etc.) media as well as costs for each recommendation.

This is how you accomplish the objectives and prioritize your interpretive projects and funding.

This section is linked to the Project Request Sheet. Your priorities become our priorities.

Example:

Priority	Recommendations (in priority order)	Corresponding Objectives	Estimated Cost	Project Lead
	Personal Services:			
	P1 Staffing (8 additional) 3 salaried/5 seasonal		\$280,000/year	Callahan
	P2 Interpretive Programs		Free (partnership programs may require fee)*	Mahony
	P3 Recreational Programs		Free (partnership programs may require fee)*	Mahony
	Non Personal Services:			
	NP1 Mount Davis Waysides (updated/replaced)	Stand-by	\$80,000.00	Mahony
	NP2 Beam Rocks Wayside/Kiosk	Stand-by	\$7,500.00	Mahony
	NP3 Mount Davis Kiosk	COMPLETED	\$3,500.00?	Callahan
	NP4 CLI Exhibit for other sites		\$300.00/sq.ft	
	NP5 Traveling Exhibit		\$150.00/ sq.ft	

	NP6 Laurel Mountain Wayside	COMPLETED	\$3,500.00	Mahony
	NP7 Spruce Flats Bog Waysides/Kiosk	COMPLETED	\$18,500.00	Callahan
	NP9 CCC History Wayside	COMPLETED	\$850.00 each	Callahan
	NP10 Wharton Furnace Wayside(s) (3)	COMPLETED	\$12,000.00	Mahony
	NP11 Blue Hole Wayside (1) w/frame and kiosk	COMPLETED	\$3,500.00	Mahony
	NP12 Interactive Web Site		In house	
	NP13 Marketing		In house & w/partners	
	NP14 Self-Guided Tours	COMPLETED (self-driving tours)	In house	FD04 Staff
	NP15 Laurel Ridge Map	?	\$7,000.00	
	NP16 Recreation Activity Guides	?	\$50,000.00 each	
	NP17 Spruce Flats Bog Brochure	COMPLETED	\$5,000.00	Callahan
	NP18 Mount Davis Brochure	COMPLETED?	\$5,000.00	Callahan
	NP19 Bob Ache Memorial Forest Brochure/tree signs	In progress	In house	Mahony
	NP20 Nature Trail at Lick Hollow		In house	Mahony

Evaluation Strategies

- How did we do?
- These are the methods that will be used to measure the effectiveness in meeting the objectives.
- Is that wayside effective?
- Are there fewer complaints?
- Review this plan every cycle in conjunction with the District Plan and SFRMP to discuss updates and changes needed.

Implementation Plan

For this section, you can take the recommendations and group them into “Ongoing Efforts”, “Phase I” and “Phase II” projects, it that is helpful in planning.

- Ongoing Efforts:
 - P2 Interpretive Programs
 - NP2 CLI Exhibit for other sites
 - P3 Recreational Programs
 - NP27 Recreation Activity Guides
- Phase I Projects:
 - NP2 CLI Exhibit for other sites
 - P3 Recreational Programs
 - NP27 Recreation Activity Guides
- Phase II Projects:
 - NP2 CLI Exhibit for other sites
 - P3 Recreational Programs
 - NP27 Recreation Activity Guides

References

- *Laurel Ridge Comprehensive Interpretive Plan*, October 2009
- *Visitor Use Monitoring of Pennsylvania’s State Forests: Year 2 Report*, PSU and USDA Forest Service, August 2014
- Various resources located in Forbes State Forest history files, information compiled by Kirk Moore and Kathy Hugo
- DCNR website