

# Rothrock State Forest Resource Management Plan

Department of Conservation and Natural Resources

Bureau of Forestry

181 Rothrock Lane

Huntingdon, PA 16652

814-643-2340

[Fd05@pa.gov](mailto:Fd05@pa.gov)



**pennsylvania**

DEPARTMENT OF CONSERVATION  
AND NATURAL RESOURCES

BUREAU OF FORESTRY



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**Data Note:** Unless otherwise noted in text or caption, all data summarized in this document were compiled between February 2017 and March 2018.

## 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 of this land, and 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 resources and values, to ensure that the overarching goal of state forest management – ensuring sustainability – is achieved.

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 disease 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 provide for the protection, administration, 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 Rothrock 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 Rothrock 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 Rothrock State Forest Resource Management Plan 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 Rothrock 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 Rothrock 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 Rothrock 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 Rothrock State Forest consists of 96,361 acres of state forest lands and 8 Landscape Management Units (described below and beginning on page 66, some of which may span boundaries with neighboring state forest districts. The Rothrock Forest District consists of Centre, Huntingdon, and Mifflin Counties in the central part of Pennsylvania, in the Ridge and Valley ecoregion. Landforms, geology, and totality of ecosystem factors have made this forest district notable for: Red, white and chestnut oak timber production, high occurrences of vernal pools and wetlands, headwaters of streams that supply the Juniata River system within the Chesapeake Bay watershed, Raystown Lake, thriving brook trout populations, agricultural production, Penn State University, and high population density of human beings. Generally, soils and growing conditions on state forest lands here are of fair to good quality in terms that impact biomass production.

Major historic impacts to the forests here have included: deforestation, uncontrolled wildfires, charcoal production for iron furnaces, coal exploration, and various introduced pests and diseases.

Currently, most of the forest in this district is of uniform age class and structure because of widespread deforestation in the past followed by a lack of periodic disturbance. For many reasons, this uniformity places limitations on the forest's ability to regenerate optimally and provide the best benefit for multiple ecosystem factors, including human values. Additionally, the forest is under continuous threat from damaging plants, animals, and diseases, and the forest's role amidst a dynamic set of social circumstances is continuously evolving.

As part of a public trust, the Rothrock Forest District is charged with ensuring the long-term health, viability, and productivity of the commonwealth's forests and conserving native wild plants. The overarching management goal on Rothrock State Forest lands is to implement practices that enhance the sustainability of multiple ecosystem factors, including economic, environmental, and social dimensions.

Currently, most of the forest communities here are of the Dry Oak-Heath and Red Oak-Mixed Hardwood plant communities. Resource management on the Rothrock State Forest focuses on the maintenance and regeneration of these communities through routine silvicultural practices and overall forest health promotion.

This district's average annual timber harvest goal is 587 acres of which 430 acres are for forest regeneration and balancing the age classes. The remaining 157 ac. are intermediate stand and buffer stand 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. Prescribed fire,



invasive and competitive vegetation species treatments (manual, mechanical, and chemical), deer enclosures, and other techniques are also important land management tools in this district.

Additionally, the Bureau of Forestry is the jurisdictional agency for the conservation of native wild plants, and this district bears custodial responsibility for managing some outstanding communities and/ or ecosystems, including: the boreal bog/fen at Bear Meadows, Black Spruce/Red Spruce/Tamarack Peatland forest at Bear Meadows, Serpentine Pitch Pine-Oak forest and vernal pool complexes, as well as some specific plant populations of special concern.

Also, many wildlife species utilize the forest communities this district manages. By managing multiple forest communities for a diversity of age classes, the district routinely provides a suite of habitat factors that benefits a broad diversity of wildlife. However, the district may implement special management that targets specific wildlife because of some custodial responsibility, a mandated protection status, a wildlife's identity in the State Wildlife Action Plan, or the wildlife's recreational/ cultural value to people. This district practices targeted management for white-tailed deer, ruffed grouse, woodcock, golden winged warbler (and other early successional habitat loving species), northern flying squirrel, Allegheny woodrat, and brook trout.

Recreation is a **major** forest use on the state forest system and in this district. The State Forest's contribution of a large, nearly contiguous block of forest, easily accessible through an extensive road and trail system, supports various types of outdoor recreation. Popular recreational uses of this state forest include: mountain biking, hiking, trail running, gravel road cycling, camping, hunting, fishing, horseback riding, birding, snowmobiling and pleasure driving.

Additionally, the district seeks to couple some recreation opportunities with education and interpretation. This district manages multiple educational features, including: District Office, wayside exhibits, trailhead kiosks, ecosystem management tours, and conservation volunteer work days.

To facilitate land management objectives and meet public use demands, the district manages an array of infrastructure, including but not limited to: 179 miles of public use roads, 110 miles of administrative roads, 10 miles of drivable trails and a list of parking lots, bridges, culverts, trails, etc. The district is divided into (4) maintenance divisions that serve as bases for work crews and equipment. Due to universal weathering, infrastructure is always in various stages of disrepair, so maintenance is an ongoing and important operation.

District-wide priority management goals are the following (which are not in priority order):

***Rothrock State Forest Priority Goals:***

**Outreach and Communication:**

- \*Maintain and expand partnerships with NGO's, other conservation organizations, and stakeholder groups

- \*Expand conservation education and outreach activities

**Recreation:**

- \*Implement recommendations of the trail's assessment plan

\*Create new trails/ destination points/ trailheads to minimize the high-density recreation/overuse of popular trailheads/trails and develop an active outreach program to the user community

\*Within the scope of the SFRMP, provide for a diverse array of recreational opportunities for the populace of central PA.

#### **Forest Management:**

\*Create early successional habitat in areas not currently being worked in

\*Maintain a sustainable timber harvesting program meeting allocation goals while producing a diverse variety of habitats and contributing to/maintaining local economies

\*Continue to adapt and change management philosophies as the populace of the Centre Region place an increased dependence on state forest/public lands for solitude, recreation, and a source of sustainable supply of wood and fiber products.

\*Maintain and implement an active Early Detection, Rapid Response (EDRR) program to identify and control populations of invasive plant species. Maintain adequate funding for the 'control' portion of the EDRR program.

\*Continue monitoring of new infestations and outbreaks of invasive insects and forest diseases and devise an adequate response program for treatments.

#### **Habitats and Conservation:**

\*Implement stream habitat improvement projects on Laurel Run and other PFBC "high Priority" streams on the Rothrock

\*Maintain the District priority of conserving lands along Tussey Ridge through an active acquisition initiative to help mediate the increased development and forest fragmentation in the Centre Region

\*Conserve and expand habitats of unique and declining species.

\*Provide a consistent source of clean water to the municipal water supplies in the District.

#### **Safety and Infrastructure:**

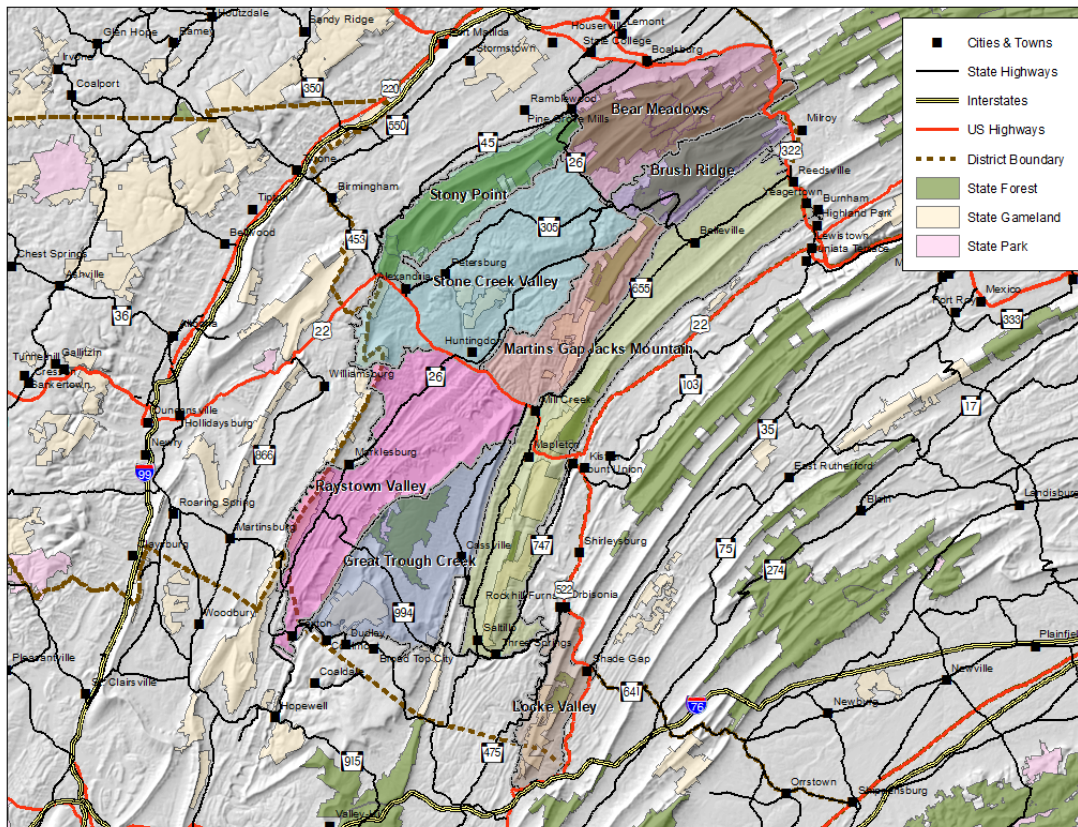
\*Provide for adequate staffing and resources to provide for public safety and maintenance of infrastructure as usage on the Rothrock State Forest increases.

#### **Infrastructure:**

The district's well-trained equipment operators will continue to maintain our road and trail systems, forest boundary line, equipment, and buildings/facilities. Route 26/Stone Creek Road breaks the district geographically into the areas of responsibility for each foreman but maintenance routines, staffing, buildings, and most equipment are the same although there are unique features in both divisions that they addressed differently. Each staff member has strong individual characteristics that we utilize across the board not only for efficiency but also for training other staff. We will evaluate our culvert pipes and bridges for structural integrity and to determine if they impair the movement of aquatic organisms. We

will continue to strive to develop our forest facilities making each forest visitor's visit as safe and enjoyable as reasonably possible.

We will use Best Management Practices (BMP's) to keep our roads functional while using Environmentally Sensitive Maintenance (ESM) practices to reduce the adverse effects of a road on the environment by treating the cause of the problem while keeping it as natural as possible. Continue to work with Dirt and Gravel Roads experimenting with new techniques to expand our 'toolbox'.



List of LMUs in the Rothrock State Forest:

- Bear Meadows
- Brush Ridge
- Great Trough Creek
- Jacks Mountain
- Locke Valley
- Martins Gap
- Raystown Valley
- Stony Point

## District Priority Goals

The 2016 SFRMP set 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 Rothrock State Forest over the next 5-10-year planning horizon.

### ***Rothrock State Forest Priority Goals:***

#### **Outreach and Communication:**

- Maintain and expand partnerships with NGO's, other conservation organizations, and stakeholder groups
- Expand conservation education and outreach activities

#### **Recreation:**

- Implement recommendations of the trail's assessment plan
- Create new trails/ destination points/ trailheads to minimize the high-density recreation/overuse of popular trailheads/trails and develop an active outreach program to the user community
- Within the scope of the SFRMP, provide for a diverse array of recreational opportunities for the populace of central PA.

#### **Forest Management:**

- Create early successional habitat in areas not currently being worked in
- Maintain a sustainable timber harvesting program meeting allocation goals while producing a diverse variety of habitats and contributing to/maintaining local economies

- Continue to adapt and change management philosophies as the populace of the Centre Region place an increased dependence on state forest/public lands for solitude, recreation, and a source of sustainable supply of wood and fiber products.
- Maintain and implement an active Early Detection, Rapid Response (EDRR) program to identify and control populations of invasive plant species. Maintain adequate funding for the 'control' portion of the EDRR program.
- Continue monitoring of new infestations and outbreaks of invasive insects and forest diseases and devise an adequate response program for treatments.

#### **Habitats and Conservation:**

- Implement stream habitat improvement projects on Laurel Run and other PFBC "high Priority" streams on the Rothrock
- Maintain the District priority of conserving lands along Tussey Ridge through an active acquisition initiative to help mediate the increased development and forest fragmentation in the Centre Region
- Conserve and expand habitats of unique and declining species.
- Provide a consistent source of clean water to the municipal water supplies in the District.

#### **Safety and Infrastructure:**

- Provide for adequate staffing and resources to provide for public safety and maintenance of infrastructure as usage on the Rothrock State Forest increases.

#### **Infrastructure:**

- The district's well-trained equipment operators will continue to maintain our road and trail systems, forest boundary line, equipment, and buildings/facilities. Route 26/Stone Creek Road breaks the district geographically into the areas of responsibility for each foreman but maintenance routines, staffing, buildings, and most equipment are the same although there are unique features in both divisions that they addressed differently. Each staff member has strong individual characteristics that we utilize across the board not only for efficiency but also for training other staff. We will evaluate our culvert pipes and bridges for structural integrity and to determine if they impair the movement of aquatic organisms. We will continue to strive to develop our forest facilities making each forest visitor's visit as safe and enjoyable as reasonably possible.
- We will use Best Management Practices (BMP's) to keep our roads functional while using Environmentally Sensitive Maintenance (ESM) practices to reduce the adverse effects of a road on the environment by treating the cause of the problem while keeping it as natural as possible. Continue to work with Dirt and Gravel Roads experimenting with new techniques to expand our 'toolbox'.

## District Overview

### 1) Location and Description

The Rothrock State Forest is located in central Pennsylvania within the Ridge and Valley province. It consists of 96,361 acres located in Huntingdon, Centre, and Mifflin Counties. Over 80 percent of the forest is in one unbroken tract containing 80,449 acres, the northern boundary of which follows Tussey Mountain from the Frankstown Gap at Water Street across the northern part of Huntingdon County and on to the eastern edge of the forest in Centre County - a total distance of approximately 27 miles. The southern boundary of this same tract follows Stone Mountain from Martin's Gap northeastward to U.S. 322 in Mifflin County. At its widest point this tract is approximately nine miles wide. The rest of the Rothrock State Forest is composed of several scattered tracts; the largest of these, which contains 11,333 acres, is in southwestern Huntingdon County in the drainage of Great Trough Creek. Three remaining tracts are: Jack's Mountain Tract, which is located on the east slope of Jack's Mountain in southern Huntingdon County and contains 578-acres; Lucy Furnace Tract located in Mifflin County about one mile north of Mount Union totaling 2,295-acres. Finally, Locke Valley Tract located just north of Shade Gap in southern Huntingdon county, consists of 1,622 acres.

The area in which the Rothrock State Forest is located has an interesting historical background. The well-known Jack's Mountain, through which the Juniata River flows, was named in honor of Captain Jack Armstrong, a famous Native American fighter. The name of Chief Logan, celebrated Native American Chief and scout during Revolutionary War days, is almost a byword in this region. The "Indian Steps" on State Forest land, legend has it, were built by the Lenape to quickly cross Tussey Mountain between Spruce Creek and Stone Creek.

Rothrock State Forest is host to four (4) State Parks; Whipple Dam, Greenwood Furnace, Penn Roosevelt, and Trough Creek. Six areas of land with special significance have been designated as State Forest Natural Areas totaling 2,701 acres. An additional 6,589 acres are classified as Wild Areas, which are the Thickhead Mountain and Trough Creek Wild Areas. Outdoor recreation enthusiasts have abundant opportunities on the many trails that traverse the rugged mountain terrain. Hunting for deer, turkey, bear, and a variety of small game are popular activities enjoyed by visitors. Some of the mountain streams are annually stocked with trout and others provide wild populations of trout, while the Juniata River, which borders the forest, provides good fishing for bass and other warm water fish.

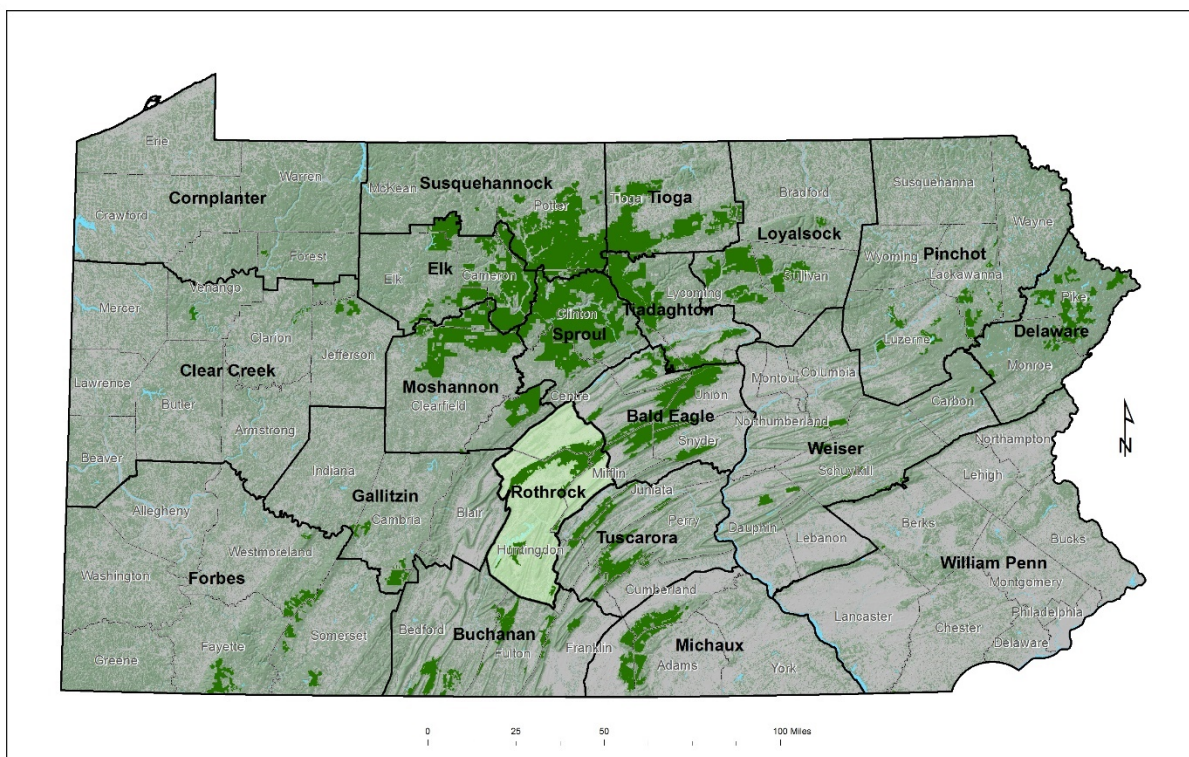
The Raystown lake Project, managed by the U.S. Army Corps of Engineers (USACE), provides more than 29,000 acres of public lands within Huntingdon County, Pennsylvania. Raystown Lake, an 8,300-acre lake of good quality water is situated in an attractive natural setting providing excellent opportunities for picnicking, boating, fishing, camping, hiking, hunting and swimming. Raystown Lake is the largest lake within Pennsylvania and is visited by approximately 1 million people per year. There are 14 different recreational areas available, including 7 public boat ramps with more than (1,000) car and boat trailer parking spaces. At the 450 acre Seven-Points Recreation Area, there are 260 campsites, a public beach and bathhouse, picnic facilities, public boat launch, the Raystown Lake Visitor Center and Seven Points Marina; a private 950 slip marina with boat rentals, restaurant, and fuel service. Lake Raystown Resort is near the center of the lake with shoreline villas, cabins, yurts, campground, lodge, restaurant, tour boat, waterpark, a 650-slip marina with fuel service, fishing guide services, full-service conference center, outdoor wedding facilities, gift shop, and private beach. Rental locations for kayaks, canoes, stand-up-paddleboards and inflatables are available at both Seven Points Marina and Lake Raystown Resort.



Rothrock Outfitters operates a mountain bike rental kiosk at Seven Points Marina. Heritage Cove Resort, located on the upper end of the lake, has a campground, cabins, gift shop and courtesy dock. A public beach and picnic area is located at Tatman Run Recreation Area. There is also Nancy's Boat-to-Shore Campground offering primitive camping sites. North of Raystown Dam, on the Raystown Branch of the Juniata River, there is a small primitive drive-in campground and public picnic areas with river access. Raystown Lake also has a privately-operated hydroelectric power generation facility.

The Raystown Lake Project is also home to approximately 70 miles of multi-use trails including the 36-mile purpose-built Allegrippis Mountain Bike Trails, the 28-mile Terrace Mountain Trail, and a 2-acre mountain bike skills park.

Included in Raystown's environmental stewardship mission is partnerships that provide wildlife food plots, American Chestnut planting and research, timber management, and waterfowl mitigation. The Raystown Field Station education and research facility is operated on Raystown lands by Juniata College.



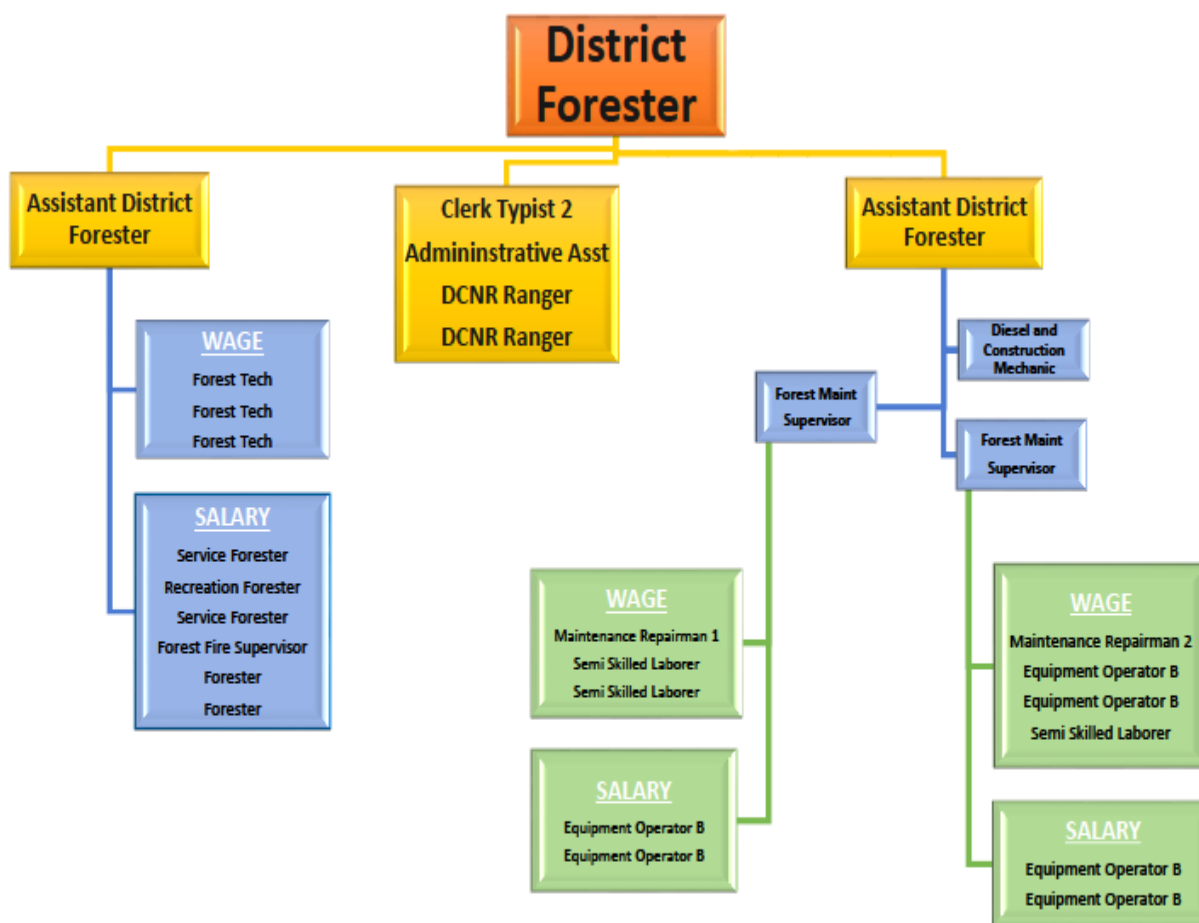
**Figure 1-1.** Location of Rothrock Forest District with state forest land (dark green).

## 2) District Organization and Human Resources

The Rothrock State Forest is one of the 20 state forests administered by the Pennsylvania Department of Conservation and Natural Resources, Bureau of Forestry. It comprises about 4.4% of the 2.2 million-acre state forest system. Within the bureau, the administrative responsibility of the Rothrock State Forest is

delegated to the district forester, whose office is located at 181 Rothrock Lane, Huntingdon, PA 16652. The district forester is responsible for executing all the sections of the State Forest Resource Management Plan.

Following is an organizational chart displaying the personnel of the Rothrock Forest District.



The District Office is located just outside of the town of Huntingdon, PA on a 4.3-acre parcel in roughly the center of the forest district. This location was purchased in 1989 and the original office building was constructed the following year. During this time a new 6-bay garage was also installed to provide to provide parking, storage, and a maintenance work area on site. In 2007 the office building and property were renovated to provide more work space and outfitted with updated technology. The renovation also included turning the basement garage into a conference room which is available for use by conservation

and public safety partners. The District Forester operates out of this building along with the clerical staff, two Forest Rangers, and two Assistant District Foresters. This is the primary location for the public to do business with the Rothrock Forest District. This facility is also where the Resource Management staff are headquartered. This includes five Foresters, a Forest Fire Specialist Supervisor, three Forest Technicians, and the forests interns.

Operationally speaking, the state forest land is divided into four forest maintenance divisions. Whipple Dam and Stony Point Divisions are under the supervision of the Maintenance Foreman stationed out of the Stony Point Maintenance Headquarters with a secondary headquarters located at Whipple Dam. The Whipple Dam Headquarters also houses the diesel and construction equipment mechanic's shop. The Greenwood and Trough Creek divisions are supervised by the Maintenance Foreman stationed at the Greenwood Maintenance Headquarters, which is located adjacent to Greenwood Furnace State park. There is also a small headquarters located in the Trough Creek division, which is adjacent to the Trough Creek State Park.

### 3) Historical Land Use and Disturbance

The original forest type of this area was predominately oak-chestnut. To a lesser extent, pure stands of white pine and hemlock occurred locally along the side hills and valleys. Stands of hard pine dotted the ridgetops.

Depending on the site quality, many species were associated with the oak-chestnut community. Generally, on the drier site's chestnut oak, black oak, scarlet oak, pitch pine, and Virginia pine were associates of the oak-chestnut community. On well-drained, loamy soils, white oak, black oak, red oak, chestnut, hickory, tulip poplar, ash, maples, hemlock, white pine, and black gum could also be found. On deep, fertile soils, red oak, basswood, white ash, black walnut, sugar maple, birch, and white pine predominated.

When Philadelphia botanist, John Bartram, saw these forests for the first time, he compared them to an ocean rolling on to infinity. By the beginning of the twentieth century, however, the "infinite" virgin forests had fallen to the logger's axe.

It is interesting to note here, that the area known as the "Seven Mountains" was by-passed during the early logging days and survived in a virgin state until almost 1900 - probably due to its inaccessibility at that time. Unfortunately, the need for wood finally overcame this obstacle and the area was cut, beginning in the later part of the 1800's. There are, however, two areas, the Alan Seeger State Forest Natural Area and the Detweiler State Forest Natural Area, that were not touched and remain in a virgin state today. They both continue to support remnants of large white pine-hemlock stands with dense under stories of rhododendron. However, they are in constant battle with invasive pests and natural weather disturbances, and some of these majestic trees have fallen due to insects, disease, or wind.

After the virgin forests were cut, regrowth occurred from a combination of seedlings and stump sprouts. Due to a flourishing local iron industry, the demand for charcoal increased and the forests were again cut when the wood was large enough to make charcoal bolts. By the early 1900's the iron industry in this area had ended and fewer demands were made on the forests. Our present forest stands are also mostly of sprout origin and are approximately 120 to 130 years of age.

### ***Biotic and Abiotic Influences on the Rothrock State Forest***

The original forest, consisting predominately of the mixed oak-chestnut type and white pine-hemlock type, has been changed by many factors to the now predominately mixed oak type. The major influence has undoubtedly been man with his logging and fires. Insects and diseases have brought about other major changes. Particularly insects and diseases from foreign lands, in addition to non-native, invasive plants.

Logging on the original forest began in the mid-1700's when the first permanent settlements were started. For the first 75 years, most of the cutting was done to clear the land for farms. The lumber needed for buildings was taken from the trees that were cleared from the fields. Very few, if any, trees were cut in the surrounding mountains until the late 1700's.

The establishment of the first iron furnace in the district in 1785 signaled the start of the wholesale removal of the forests for charcoal. By 1840 over 20 iron furnaces were in operation within the Forest district. The realization that hard coal and coke produced a better-quality iron, started the decline of the "charcoal iron" around 1850. Greenwood Furnace, which was the last operating iron furnace in this district, ceased operations in 1904.

Oak and hickory were the preferred woods for charcoal. Usually, the oak stands nearest the furnaces were cut first and gradually cutting was extended farther and farther away until the only oak stands not cut were on the mountain tops - such as the remote Seven Mountains area.

Logging for lumber other than local use started in the early 1800's. Vast areas of the forest were cut for construction lumber, and later trees were cut for use by the railroads. By 1840, there were 182 sawmills operating in Huntingdon County. In comparison, only 10 sawmills are in operation today. After the sawmills cut the valuable timber, the remaining timber was turned over to the iron companies to be cut for charcoal. Shortly after the middle of the 18th century, lumbering began to decline as the virgin forest steadily disappeared. The last major lumbering operation was carried out in the remote Seven Mountains area between Detweiler Run and Galbraith Gap. This operation was started around 1888 by the Linden Hall Lumber Company who used the technique of "wild catting" loaded log cars on wooden tramways to transport the logs from the mountains to the mill. In 1889, the Steele Lumber Company bought out the Linden Hall Lumber Company and began using a "Dinkey" locomotive to transport logs to their mill. The whole Seven Mountains were completely cut over except for the Alan Seeger and Detweiler Run sections, and then sold to the State Forestry Commission in 1902.

### ***Early Wildfires***

Fires in the late 1800's and early 1900's played a major role in the development of second-growth forests. Most of the mountain land has been burned over at least once and some areas have been burned over repeatedly. Although it is not documented, what was probably the largest fire in the district was reported to have burned from near McAlevys Fort across the mountains almost to Boalsburg. This fire occurred sometime prior to 1915, which was the first-year fire records were kept. Extremely bad fire years in the past were 1915, 1916, 1921, 1923, 1928, 1930, 1931, and 1946.

The influences of fire on the forest are many and varied. The most dramatic and most easily seen influence is the outright destruction of standing timber. More serious, but less easily seen, is the loss of quality and the decline in growth rates of surviving trees, negative impacts to soil ecosystems and soil quality, the change of the forest from one of predominately seedling origin to one of sprout origin, and the change in the composition of the forest to species that are more fire resistant, regardless of other ecosystem or commercial values.

### ***Forest Diseases***

The introduction of chestnut blight (*Endothia parasitica*) to the forests of the district in 1912 or 1913 brought about a very drastic change in the composition of the forest. By 1925, almost every chestnut was killed, leaving many of the mixed oak-chestnut stands grossly under stocked.

Oak wilt (*Cyratocystis fagacearum*) is another disease that may be influencing the forest types. Although not a serious threat, it is found scattered throughout the district.

### ***Insects***

Insect influences on the forest in the past have not been catastrophic. Cankerworms, oak leaf rollers, oak leaf tiers, and other defoliators have caused growth losses and some mortality. These and other insect pests may be a major factor in the oak mortality (predominately scarlet oak) in the area and the state. Other suspected causes of the "oak decline" are the drought years in the early 1960's, the advanced age of the trees, and the fact that many trees may not be growing on the most favorable sites for oak species.

Gypsy moth was first discovered in the district near Aaronsburg, Centre County in 1969.

That infestation remained under control for many years without significant defoliation. In 1980, the leading edge of the westward migration was poised on the eastern boundary of the Rothrock State Forest. 1981 saw the first onslaught of the gypsy moth. All hardwoods in the entire northern half of the district were completely defoliated. By the summer of 1982, total defoliation occurred on almost all forest land in the southern 3/4 of the district. A population collapse occurred in the northern section after the 1981 defoliation and in the southern section after the 1982 defoliation. 1983 and 1984 showed little defoliation throughout the district. 1985 saw populations in southern Huntingdon County build and significant defoliation occurred.

Mortality from the 1981-1982 defoliations was heavy in selected stands, reaching 60% on some south facing slopes but overall mortality was probably 10% or less.

The hemlock woolly adelgid (HWA) was accidentally introduced to Virginia from Japan in the 1950s, and by the late 1960s was reported in southeastern Pennsylvania.

The hemlock woolly adelgid (*Adelges tsugae*) is a serious threat to our state tree, the eastern hemlock, in Pennsylvania and across the United States. This non-native invasive insect has caused significant hemlock defoliation and mortality in Pennsylvania forests.

In an effort to forestall the impact of hemlock woolly adelgid, DCNR's Bureau of Forestry has developed the Eastern Hemlock Conservation Plan and has been treating high-value hemlocks in state parks and state forests since 2004.

To manage hemlock woolly adelgid in Pennsylvania's forests, the DCNR Bureau of Forestry uses integrated pest management principles that rely on surveying and monitoring of the insect and its hemlock host, including the following methods:

- Biological Control
- Insecticides
- Silvicultural
- Tree breeding for host resistance

The Forest District has had an active treatment program for HWA since 2004. District staff and volunteers have periodically treated hemlocks of highest conservation priority in the Alan Seeger Natural Area (in around the Seeger Loop Trail), in the Bear Meadows Natural Area, and around the Galbraith Gap Trailhead, off of Bear Meadows Road. These periodic treatments have been very successful at conserving these older hemlock trees in these areas. Eastern hemlock in other parts of the Forest, have succumbed or continue to decline as a result of impacts by HWA.

The emerald ash borer (EAB) was first recognized in North America in 2002. It was first identified in western Pennsylvania in 2007. EAB was confirmed in Mifflin County in 2010 and Huntingdon County in 2011. The EAB has devastated most all of the ash species in the Rothrock Forest District. There still can be found some 'lingering' ash. Those trees that continue to hold on, even though they continue to be impacted by the EAB. The Bureau has developed an Ash Management Plan, which includes plans for ash species re-establishment in the future, when the waves of EAB have declined. Seed from the five Pennsylvania ash species have been preserved, for future sowing by nurseries and eventual planting of seedling stock.

The newest insect pest is the spotted lanternfly (SLF). First observed in Berks county in 2014, much emphasis is currently provided by the PA Department of Agriculture and the Bureau of Forestry on locating new populations and efforts at eradication and limiting the movement of this invasive pest across the state. Confirmed outbreaks in Huntingdon County were observed in 2019. Currently Huntingdon and Mifflin counties fall into a quarantine zone, requiring extra precautions for movement of resources moved from the forest into counties not in the quarantine (i.e. Centre County). Ongoing efforts continue with this forest and agricultural pest.

## 4) Acquisitions 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 as expanding industries consumed increasingly 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 Rothrock State Forest can trace its beginning back to January 21, 1902 when 7,183-acres was purchased from the Provident Life and Trust Company for \$19,755.22 or \$2.75 an acre. This purchase encompassed the Diamond Valley area. After the initial transaction, additional purchases in 1902 accounted for 12,250-acres, mainly on Tussey Mountain and in the Trough Creek area. With this precedent firmly established, the state added to the public lands at an accelerated rate and only four years after the initial purchase in the Rothrock Forest District, 12 major transactions had been made involving over 67,000-acres, which were purchased at an average cost of only \$3.20 per acre. This flurry of activity ended in 1906, and it was not until 1918 that another major purchase of 4,362 acres was added to the existing holdings. Up to 2007, the last major purchase of 1,426 acres was in 1930 and only small tracts have been added since then. In 2007, the Glatfelter Pulp and Paper Company liquidated some of its lands. With the assistance of the Western PA Conservancy, the Bureau of Forestry was able to add some of these lands to the State Forest system. An additional 1,760 acres were added to the Rothrock in this acquisition.

Most of the land that makes up the Rothrock State Forest was purchased from the Logan Iron and Steel Company and from various local lumber companies. Evidence of the early iron and lumber industries can still be found throughout the forest in the form of charcoal hearths and tram road grades.

The following table shows the major purchases of land, to date, comprising the Rothrock State Forest.

**History of Rothrock Land Acquisitions:**

<b>Granted</b>	<b>Acres</b>	<b>Cost</b>	<b>Date</b>
Provident Life and Trust Co.	7,183	\$19,755.22	21-Jan-02
Humper, Harry A.			
P. B. Crider	5,446	16,327.57	1-May-02
P. F. Duncan	3,837	11,000.00	19-Aug-02
F. W. Stewart & J. E. Irwin	1,270	2,856.43	22-Oct-02
M. G. Brumbaugh	1,697	5,090.40	29-Dec-02
David Gring	3,140	8,635.00	7-Jan-03
Logan Iron & Steel Co.	8,210	20,525.32	6-Jul-03
Kulp Lumber Co.	8,441	32,503.42	19-Oct-03
Logan Iron & Steel Co.	2,752	6,881.81	1-Dec-03
Wm. Whitmer & Sons Co.			
Linden Hall Lumber Co.	10,320	31,033.65	15-Jan-04
Reichley Bros. & Co.	5,714	12,858.39	15-Aug-05
Logan Iron & Steel Co.	9,026	46,922.95	1-Feb-06
By S. H. Beaver, et. al.			
Assignees	4,362	13,908.12	9-Nov-18
T. G. Crownover	1,426	5,848.96	29-Oct-30
<b>TOTAL</b>	<b>72,824</b>	<b>\$234,147.24</b>	
<b>Average Cost Per Acre</b>		<b>\$3.22</b>	

Land prices have greatly increased from those early days. Over the last decade, approximately 2,500 acres have been conserved and added to the Rothrock State Forest. Much of this land acquisition work was due to efforts by Clearwater Conservancy and the Western PA Conservancy. The cost of these most recent acquisitions has average around \$4,500.00 per acre.

## 5) Cultural and Historic Resources

<b>Cultural</b>	<b>9</b>
CCC Camp	8
Old Building Foundation	1
<b>Ecological</b>	<b>181</b>
Archeological Site	1
Cemetery	3
Monument	2
Quarry	1
Spring	6
Tunnel	1
Vernal Pool	167
<b>Grand Total</b>	<b>190</b>

One of the significant cultural resources on the Rothrock State Forest are the number of Civilian Conservation Corps (CCC) camps that are located at various locations across the forest. While there are no longer any completely intact camps in the district, there are buildings that still remain in use and in good condition. Some of these buildings are currently in use as storage buildings for forest operations, some are state forest leased camp buildings, and others are pavilions created for forest visitors many years ago that are still enjoyed today. The CCC Camp located in the Martin's Gap area of the forest is likely the most studied and has the most features identified of all the CCC camps in this forest. The site has two old log structures remaining that are now State Forest leased camps, while the rest of the camp was raised and only the foundations remain.

The Bear Meadows Natural area and the bog associated with it is a National Natural Landmark that was designated in 1965. This area is unique due to its formation in an unglaciated locality. It has been set aside to maintain its ecologic value, along with its considerable scenic, historic and geologic interest.

## 6) Ecoregions, Physiography, and Land Cover

The Rothrock State Forest is situated completely within the large geologic province known as the Ridge and Valley Province, which is characterized by a parallel series of long, narrow ridges, and valleys that extend for tens of miles.

The relatively regular pattern of topography in this area, namely that of long, narrow mountain ridges and intermountain valleys was caused by the erosion of structurally folded rocks of unequal resistance or hardness, the softer rock formations being eroded more quickly to form valleys leaving the harder more resistant beds to stand out in relief as ridges. In the Rothrock State Forest the rock folds (also called

anticlinal highs and synclinal lows) are tens of miles long and trend approximately northeastward in a parallel pattern like that of folds in a crumpled rug.

At different times in the geologic past the surface of this area has been beveled by erosion to a nearly flat featureless coastal plain. The last major beveled surface (or peneplain) existed approximately ten million years ago, in the late Tertiary period of geologic time. At that time the plain was uplifted which started the erosional etching of the land into its present topographic form, mainly by stream erosion. Since the late Tertiary time, no glacial activity, and no significant structural activity (such as uplifting, faulting or folding of the land) has occurred within the confines of the area to markedly influence the topography or disturb the stream erosion process in progress.

The forest district contains two well-known mountain areas, the Seven Mountains area in the northern section of the district and the Broad Top Mountain area in the south. The topography in both these areas differs somewhat from the normal ridge and valley topography in that it is more complex and irregular.

The highest elevation in the District is 2,400 feet at Big Flat on state forest land in the Seven Mountains area in Jackson Township, Huntingdon County. Many of the mountains reach elevations over 2,000 feet. The lowest elevation is 460 feet where U.S. 522 crosses Kishacoquillas Creek in Lewistown, Mifflin County. The maximum relief in the district, therefore, is 1,940 feet.

The waters of the Juniata River and its tributaries drain most of the forest district. Tributaries of the West Branch of the Susquehanna River drain portions of the district in Centre County. All the water flowing from the district ultimately discharges into the Susquehanna River and the Chesapeake Bay.

The Rothrock State Forest lies primarily in the Ridge & Valley Eco-regions (DCNR, Bureau of Forestry). The presence of long, narrow ridges and broad to narrow valleys with some karst characterizes the Ridge & Valley Eco-Region (Appalachian Mountain Physiographic Section). Local relief in this region ranges from 301 to greater than 1,000 feet and elevations range from approximately 440 feet to 2,775 feet. Underlying rock types include sandstone, siltstone, shale, conglomerate, limestone, and dolomite. This region has trellis, angulate, and some karst drainage patterns.

### ***Ecological Unit Delineations***

The Rothrock State Forest lies in the following Ecological Unit Delineations:

A. Eco-Regions (DCNR, Bureau of Forestry):

Ridge and Valley Eco-Region

B. Physiographic Province (DCNR, Bureau of Topographic and Geologic Survey):

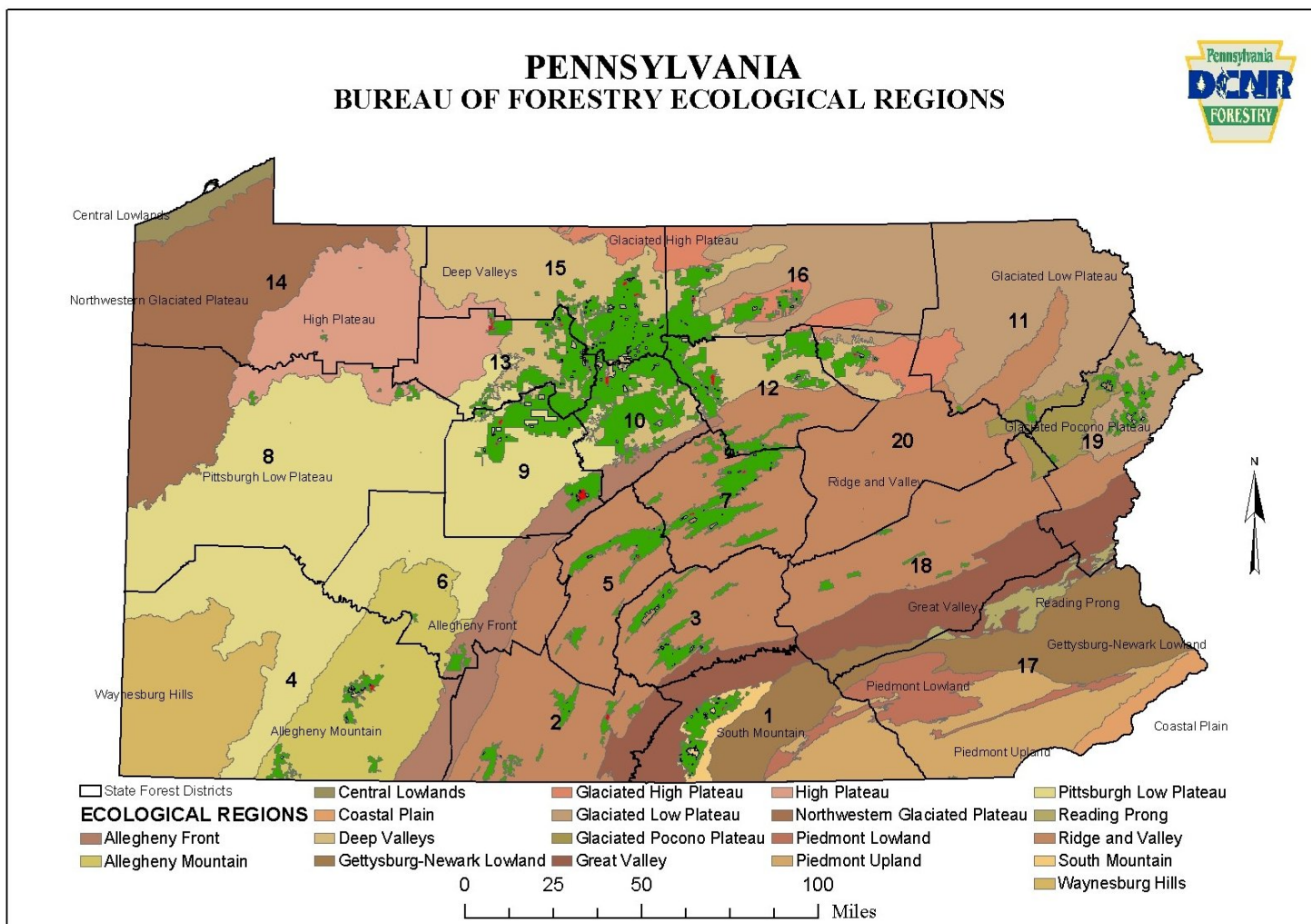
Ridge and Valley Province

C. Physiographic Section (DCNR, Bureau of Topographic and Geologic Survey):

Appalachian Mountain Section

### Ridge & Valley Sub-section





**Figure 6-2. Pennsylvania Bureau of Forestry Ecological Regions**

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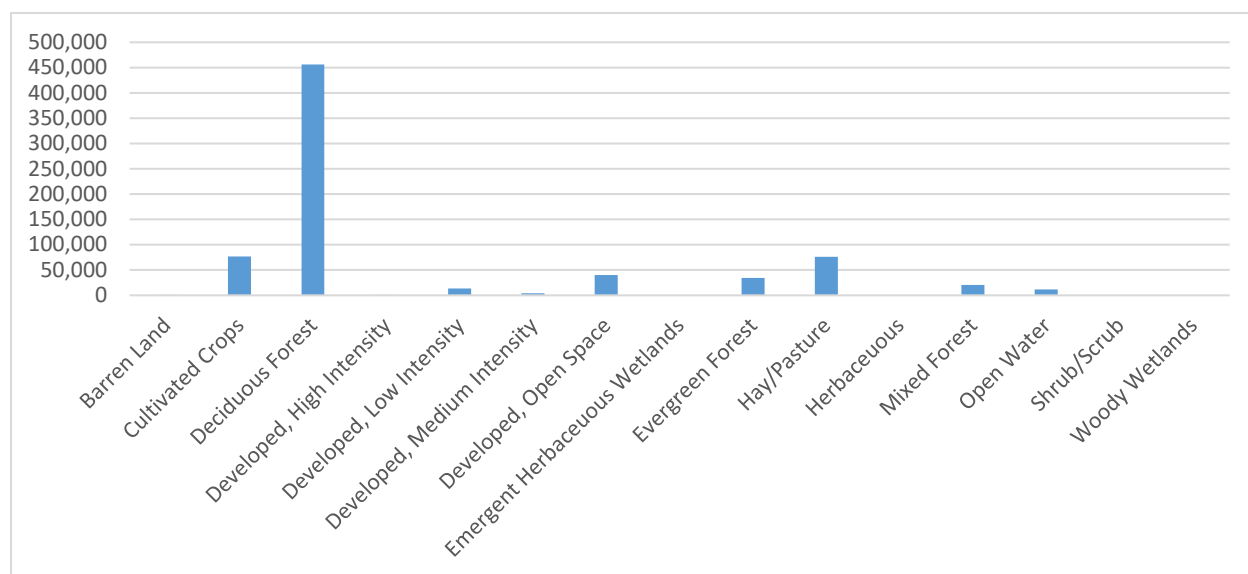


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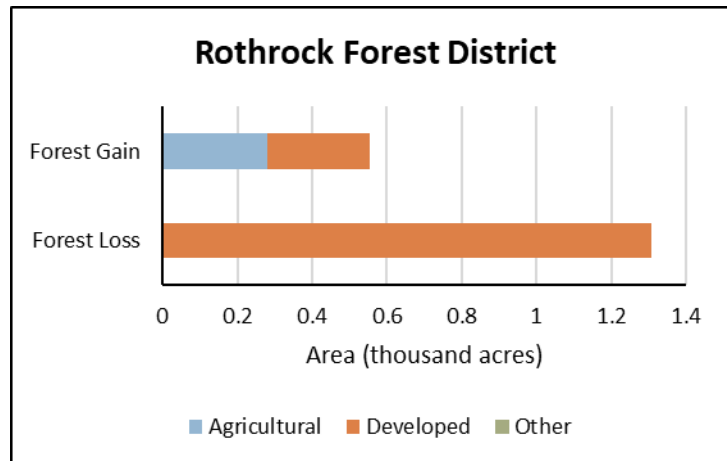
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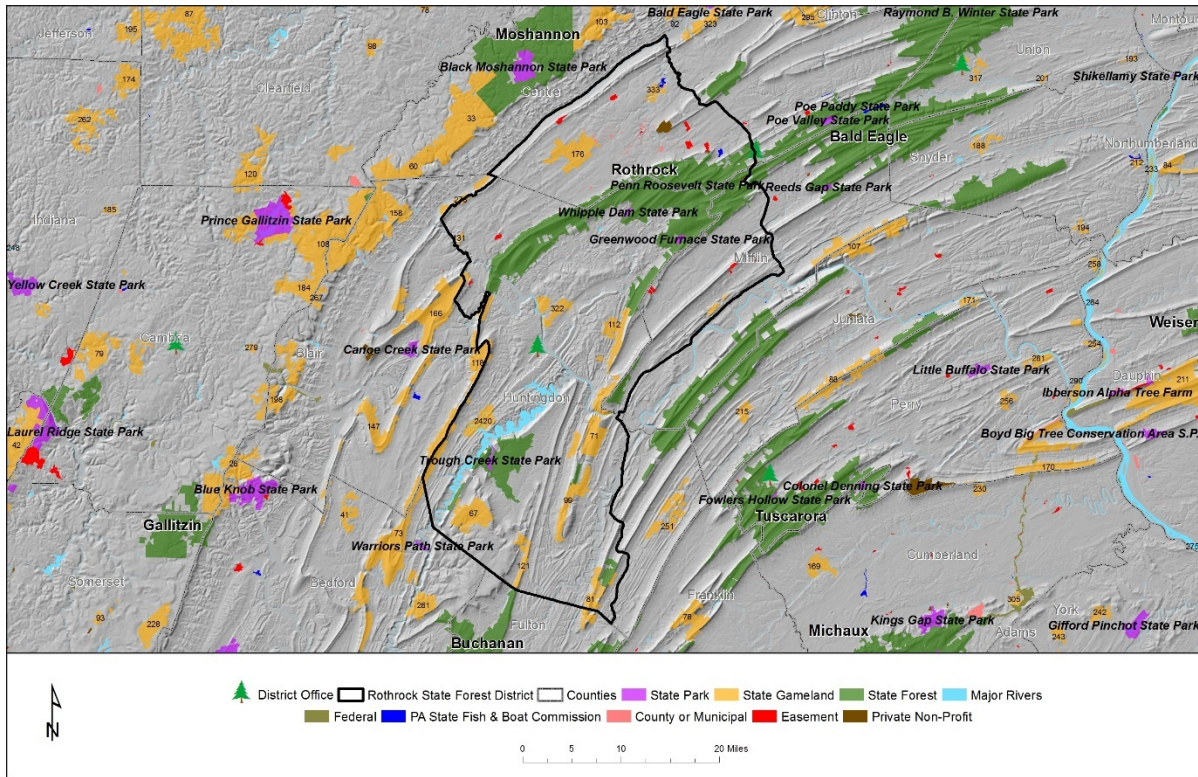
**Figure 6-3.** Acres of land cover types from National Land Cover Database for entire district.

In the Rothrock District, deciduous forests are the predominant land cover. Agricultural activities related to cultivating crops and hay/pasture areas follow then various levels of developed land types make up the remainder of the land base.



**Figure 6-4.** 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 within Rothrock Forest District.

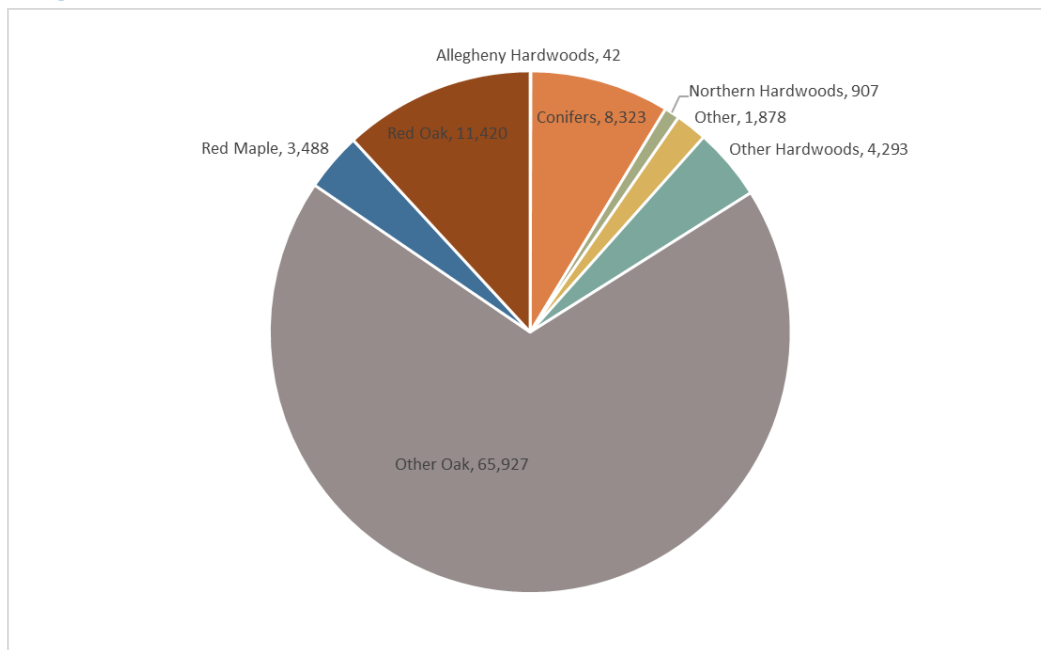
The US Forest Service Forest Inventory and Analysis (FIA) program characterizes the areas of the State using several use categories which are generalized to the following broad classes: forest, agriculture (including pasture and cropland), developed land (including residential and commercial areas, and rights-of-way), water, and other non-forest land. Estimates for land use are produced from all measured plots in an inventory cycle (i.e. these estimates are based on plot expansions, not on a cell by cell analysis of landcover, as in the NLCD shown in various maps in this document). However, these data can be useful in understanding land-use changes dynamics, which allows land managers to make informed policy decisions. The categories 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). To read more about this nationwide forest inventory program, visit <https://www.fia.fs.fed.us/>



**Figure 6-5.** Public/conserved lands within entire district.

Ecological processes are not limited by political or social boundaries, therefore in ecological management systems, such as state forest management, requires forest managers to take into consideration areas outside of the state forest land boundary when determining management decisions. To implement this successfully the Bureau of Forestry and Rothrock Forest District works to create functioning partnerships with other agencies, municipalities, private landowners, and conservation partners.

## 7) Vegetation Communities and Native Flora



**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 forests of the Rothrock are oak dominated. The majority of these stands are of medium quality. The balance is a mix of high quality, lowland stands and poor-quality ridge top forests.

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>.

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

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

## 8) Forest Health

### **Forest Diseases**

The introduction of chestnut blight (Endothia parasitica) to the forests of the district in 1912 or 1913 brought about a very drastic change in the composition of the forest. By 1925, almost every chestnut was killed leaving many of the mixed oak-chestnut stands grossly under stocked.

Oak wilt (Cyratocystis fagacearum) is another disease that may be influencing the forest types. Although not a serious threat, it is found scattered throughout the district.

### **Insects**

Insect influences on the forest in the past have not been catastrophic. Cankerworms, oak leaf rollers, oak leaf tiers, and other defoliators have caused growth losses and some mortality. These and other insect pests may be a major factor in the oak mortality (predominately scarlet oak) in the area and the state. Other suspected causes of the "oak decline" are the drought years in the early 1960's, the advanced age of the trees, and the fact that many trees may be growing off of the most favorable site. Pit-making oak scale has caused growth loss and mortality in the past and appears to be on the increase in the Trough Creek area.

### **Gypsy Moth:**

Gypsy moth was first discovered in the district near Aaronsburg, Centre County in 1969.

That infestation remained under control for many years without significant defoliation. In 1980, the leading edge of the westward migration was poised on the eastern boundary of the Rothrock State Forest. 1981 saw the first onslaught of the gypsy moth. All hardwoods in the entire northern half of the district were completely defoliated. By the summer of 1982, total defoliation occurred on almost all forest land in the southern 3/4 of the district. A population collapse occurred in the northern section after the 1981 defoliation and in the southern section after the 1982 defoliation. 1983 and 1984 showed little defoliation throughout the district. 1985 saw populations in southern Huntingdon County build and significant defoliation occurred.

Mortality from the 1981-1982 defoliations was heavy in selected stands, reaching 60% on some south facing slopes but overall mortality was probably 10% or less. The Bureau of Forestry will continue to suppress gypsy moth populations in oak stands in forest districts and state parks.

### **Hemlock Woolly Adelgid:**

The hemlock woolly adelgid (HWA) was accidentally introduced to Virginia from Japan in the 1950s, and by the late 1960s was reported in southeastern Pennsylvania.

The hemlock woolly adelgid (*Adelges tsugae*) is a serious threat to our state tree, the eastern hemlock, in Pennsylvania and across the United States. This non-native invasive insect has caused significant hemlock defoliation and mortality in Pennsylvania forests.

In an effort to forestall the impact of hemlock woolly adelgid, DCNR's Bureau of Forestry has developed the Eastern Hemlock Conservation Plan and has been treating high-value hemlocks in state parks and forests since 2004.

To manage hemlock woolly adelgid in Pennsylvania's forests, the DCNR Bureau of Forestry uses integrated pest management principles that rely on surveying and monitoring of the insect and its hemlock host, including the following methods:

- Biological Control
- Insecticides
- Silvicultural
- Tree breeding for host resistance

The Forest District has had an active treatment program for HWA since 2004. District staff and volunteers have periodically treated hemlocks of highest conservation priority in the Alan Seeger Natural Area (in around the Seeger Loop Trail), in the Bear Meadows Natural Area, and around the Galbraith Gap Trailhead, off of Bear Meadows Road. These periodic treatments have been very successful at conserving these older hemlock trees in these areas.

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. Recent introduction of the Hemlock Woolly Adelgid may alter species composition in the future by reducing Eastern Hemlock in many existing stands.

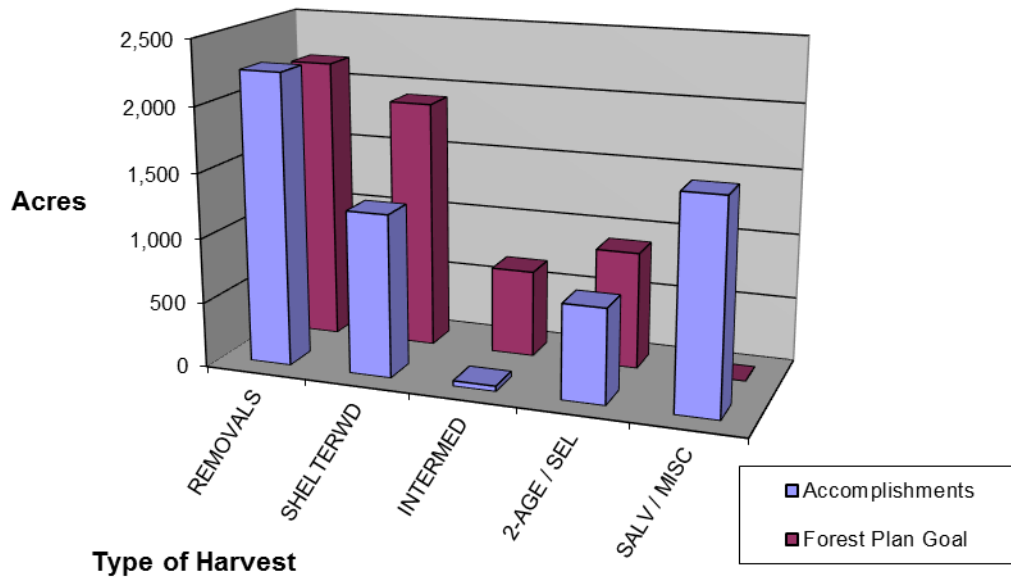
#### **Emerald Ash Borer:**

Districts will 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. Districts will continue to treat selected ash with a systemic insecticide according to the Bureau's Ash Management Plan.

## **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.





**Figure 9-1.** Chart of comparison between actual harvest accomplishments and harvest allocation model goals from the first decade of implementation of the harvest allocation model. 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.

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	2,248	1,253	41	727	4,269	1,614	5,883
Forest Plan Goal '04-'13	2,178	1,913	670	900	5,661	0	
% of Plan Goal Achieved	103%	65%	6%	81%	75%		

**Table 9-1.** Comparison between actual harvest accomplishments and harvest allocation model goals from the first decade of implementation of the harvest allocation model.

Timber harvesting treatments on the Rothrock State Forest overall were very close to the targeted goals from the Harvest Allocation Model. The primary driver of the model is to guide forest managers in meeting the objective of balancing the age classes of the forest. This is done through regeneration

harvests, particularly the final overstory removal harvests. The District met and slightly overachieved the removal goal by 3%. However, the model's goals for Shelterwood, Intermediate, and Two-aged/Uneven-aged/Buffer treatments were not on target. It should be noted that this district had experienced a series of major gypsy moth infestations and subsequent mortality at various levels across the forest. The salvage operations to account for these events included a little over 1,600-acres. The grand total of acres treated over the period of 2004 to 2013 was 5,883-acres, which is 222-acres more than what the plan called for. Going forward, when considering future model runs, the district will likely tweak both the shelterwood and intermediate treatment levels based on what has been learned from the actual utility and need for these treatments. There will also be a greatly reduced or eliminated amount of "salvage" treatment acreage as these types of events will be typed appropriately in the removal, shelterwood, and other treatment types.

The bureau is presently in the second harvest allocation period of the model. The district's timber harvest goals for the second period are shown in the table below.

Aggregated Forest Community Type	Site 1 Fully-stocked		Site 1 Under-stocked		Site 2 Fully-stocked		Site 2 Under-stocked		Site 3 Fully-stocked		Site 3 Under-stocked		Totals			
	Shelt	OR	Shelt	OR	Shelt	OR	Shelt	OR	Shelt	OR	Shelt	OR	Shelt	OR	Int	Buffer
Northern Hardwoods	0	0	0	0	0	0	0	0	0	0	0	0	0	0	670	900
Allegheny Hardwoods	0	0	0	0	1	4	0	0	0	0	0	0	1	4		
Red Oak	208	286	0	39	108	409	0	321	0	0	0	0	316	1,055		
Other Oaks	0	171	0	0	1,066	966	253	106	31	31	0	0	1,349	1,275		
Red Maple	0	0	0	1	0	0	1	2	1	7	0	0	1	10		
Other Hardwoods	16	134	10	0	0	15	4	0	0	0	0	0	30	148		
Conifers	8	0	0	3	16	77	0	0	0	9	0	0	24	89		
<b>Totals</b>	<b>232</b>	<b>591</b>	<b>10</b>	<b>43</b>	<b>1,191</b>	<b>1,471</b>	<b>258</b>	<b>430</b>	<b>31</b>	<b>47</b>	<b>0</b>	<b>0</b>	<b>1,722</b>	<b>2,581</b>	<b>670</b>	<b>900</b>

**Table 9-2.** 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, stocking level, and treatment. Additional shelterwood treatments for 3 or more stage shelterwoods are not represented in these targets.

## 10) Wildlife

DCNR's Policy Statement states "State forest lands will be managed to ensure the conservation of a diversity of native wild forest animals and the provision of suitable habitats for these creatures."

The first comprehensive management plans for State Forest lands were developed in 1949. Most forest resources were adapted to fit in with timber management as time and money allowed. In the early 1960's it became apparent that there must be a formal plan for the protection, development and use of all forest resources.

Between 1965 and 1970, work was completed on Forest Resource Plans for the 1970-1984 management period. These plans established objectives for all forest resources and coordinated their use and development. For the first time, the plans specifically addressed wildlife and fisheries resources. Matters pertaining to wildlife and fisheries were considered under the Recreation Section of the Forest Resource Plan.

In the 1970-84 Plan, habitat guidelines were developed in cooperation with the Pennsylvania Game Commission to promote a diversified forest suitable for all wildlife. Fisheries guidelines were also developed with assistance from the Pennsylvania Fish & Boat Commission to address such topics as instream restoration and improvement and wilderness trout stream management. Also, the coordination of the wildlife and fishery resources was accomplished through the consideration and integration of these values into the management of the other forest resources.

The 1985-2000 State Forest Resource Plan acknowledged that animals and plants are distinct forest resources and should be managed as such, thus a new section of the Plan was developed, the Fauna and Flora Management Section.

The 1985-2000 plan recognized that the forest is a complex ecosystem composed of animal and plant communities integrated with the physical environment. Animals in this ecosystem range from large mammals such as the black bear and white-tailed deer to invertebrates such as honeybees. Animals, plants and physical environment integrate to form a multitude of combinations all of which form the whole, the forest. The management of these organisms is predicated on both protection and use to meet society's needs and wants.

The Rothrock State Forest provides a wide variety of outdoor recreation opportunities. There is one key lake adjacent to the State Forest, Raystown lake, which is man-made and managed by the U.S. Army Corps of Engineers. Many clear mountain streams originate on the State Forest and eventually work their way down to the Juniata River. The streams provide excellent trout fishing for both native and stocked trout. Wildlife is plentiful throughout the area. The Rothrock State Forest is home to game species such as black bear, white-tailed deer, turkey, ruffed grouse, woodcock, fisher, bobcat, and coyote. Numerous species of songbirds such as golden-winged warbler and cerulean warbler thrive within this state forest land; and, waterfowl such as mallard ducks, wood ducks, and Canadian Geese abound. Numerous bald eagles and osprey can be seen hunting over the area's lakes, rivers, and streams. Golden eagles are regular visitors, soaring the thermals along the Rothrock's ridgetops. Many rattlesnakes and copperheads along with a plethora of non-venomous species of snakes can be found across the forest. There are great populations of turtles across the state forest lands such as woods turtles, and Eastern box turtles.

## **Wildlife Habitat Improvement Projects**

### **Stream Improvement Projects**

The district has been partnering with Trout Unlimited and the USA Youth Fly-Fishing Team on stream habitat improvement projects for about the last 3 years. We currently have Laurel Run in Huntingdon County planned to improve habitat from the headwaters to the lake at Whipple Dam State Park over the next 15 years. Projects are designed by Trout Unlimited staff and construction is completed with district staff and equipment under their guidance. US Youth Fly-fishing team coordinates educational opportunities and funding for these projects and bring children and youth to the projects for hands-on habitat experiences. Additional stream across the forest are currently being evaluated for prioritization of needed habitat improvement work and projects will be incorporated into our project lists.

### **Grouse Improvement Projects**

The Ruffed Grouse Society has assisted in two projects on the Rothrock State Forest. In 2017, a 55-acre and 18-acre failed overstory removal harvest areas from the early 2000s were cut down again to restart the early successional forest process again. This work was completed by a contractor and funded through the Ruffed Grouse Society to enhance grouse habitat in two areas of the Rothrock State Forest.

### **Turkey Habitat Improvement Projects**

In the early 1990s, primarily with funds and assistance from the National Wild Turkey Federation (NWTF), approximately 40 permanent herbaceous openings had been established and maintained. These openings were of various sizes but generally  $\frac{1}{4}$  to  $\frac{1}{2}$  acre in size. They were planted with various grasses, shrubs, and fruit trees. Over time the adjacent forest stands crowded into these openings and maintenance was greatly reduced over the years due to staffing reductions. Currently the district is working to identify the openings with the best potential to be viable and valuable habitat areas. We plan to re-establish one plot annually through the next management period with continued assistance from the NWTF and local turkey federation chapters. The openings that are not chosen to be improved will have the invasive species currently present removed and be allowed to continue reverting back to the natural adjacent forest stands. The openings that are being kept will likely be expanded to larger sizes and be enhanced with supplemental plantings of native shrubs, flora, and fruit trees.

### **Bats**

Due to the presence of hibernacula – an overwintering location – for Indiana bats near Rothrock State Forest land, much of the State Forest has significant restrictions on the harvesting of timber. This buffer extends 10 miles from known hibernacula and places no-cutting restrictions on sales located here from March 31 to November 15. We are committed to following the guidelines provided to us from the US Fish and Wildlife Service as well as the guidelines provided by the Ecological Service Section of the BOF. In addition to the cutting restrictions, most dead trees as well as trees with loose bark will be reserved to provide additional roosting habitat. The BOF is currently involved in developing a Habitat Conservation Plan (HCP) that will address the needs of the Indiana as well as other threatened and endangered bat species across the entire Bureau of Forestry.

## **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. The wildlife includes 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.

### **Species of Special Concern**

The current State Wildlife Action Plan recognizes native fauna diversity as an integral part of the forest ecosystem that are highly valuable and that should be sustained.

Species of special concern on Rothrock State Forest:

SCOLOPAX MINOR – AMERICAN WOODCOCK

BONASA UMBELLUS – RUFFED GROUSE

HYLOCHLA MUSTELINA – WOOD THRUSH

HALIAEETUS LEUCOCEPHALUS - BALD EAGLE

TYLO ALBA - BARN OWL

SETOPHAGA CERULEA – CERULEAN WARBLER

VERMIVORA CHRYSOPTERA – GOLDEN-WINGED WARBLER

IXOBRYCHUS EXILIS – LEAST BITTERN

EURPHAGUS CAROLINUS – RUSTY BLACKBIRD

ACCIPITER GENTILLIS – NORTHERN GOSHAWK

LOXIA CURVIROSTRA – RED CROSSBILL

SOREX PALUSTRIS ALBIB

NEOTOMA MAGISTER – ALLEGHENY WOODRAT  
EPTESICUS FUSCUS – BIG BROWN BAT  
MYOTIS LEIBII – EASTERN SMALL-FOOTED BAT  
MYOTIS SODALIS – INDIANA BAT  
MYOTIS LUCIFUGUS – LITTLE BROWN BAT  
MYOTIS SEPTENTRIONALIS – NORTHERN LONG-EARED BAT  
PERIMYOTIS SUBFLAVUS – TRICOLORED BAT  
TERRAPENE CAROLINA – EASTERN BOX TURTLE  
LITHOBATES PEPIENS - NORTHERN LEOPARD FROG  
SCELOPORUS UNDULATUS A – EASTERN FENCE LIZARD

### **Hunting**

Hunting is a recreational activity, but in many cases, it also plays a key role in sustainable forest management. Forests can only be sustainably managed if balanced populations of wildlife are maintained. This is particularly true for herbivores, such as deer. If left to multiply unchecked, deer will eat the entire next generation of understory plants in a given area. If generations of new seedlings are lost, the forest soon loses its ability to renew itself following disturbances.

Central Pennsylvania continues to provide good hunting opportunities for a variety of wildlife. Regeneration cutting on public and private lands is expanding habitat diversification. This is evidenced by increased deer and turkey population numbers. A healthy, increasing population of bear exists in many parts of the forest district. Both the spring and fall turkey hunting seasons indicate an increase of hunters.

### **Fishing**

The Rothrock State Forest has many angling opportunities which are managed and supported with the cooperation of the Pennsylvania Fish and Boat Commission. Fishing is permitted on state forest land, unless otherwise posted, in accordance with the current State Forest Rules and (Regulations 17. Pa. Code, Chapter 21) and the laws, rules, and regulations of the Pennsylvania Fish and Boat Commission. In addition to the many streams, particularly in the headwater regions, that offer wild Brook Trout fishing opportunities, the lower reaches within the basin's flood plain, may offer additional fishing opportunities for wild Brown Trout, an introduced species, as well.

Bureau of Forestry streamside buffering policies and road construction and maintenance policies outlined in the Bureau "Timber Management Manual" and road construction and maintenance efforts outlined in the partnership with the Center for Dirt and Gravel Roads all contribute to healthy stream environments.

State forests have some of the most pristine waters in the Commonwealth and they support abundant aquatic life. The Department of Environmental Protection classifies 2,970 miles of waterways as high

quality and 626 miles of waterways are classified as exceptional value. In addition, the Fish and Boat Commission classifies 207 miles as wilderness trout streams.

Cold-water trout fishing on the Rothrock State Forest is available in some streams and rivers. Globe Run, Shavers Creek, Laurel Run, Standing Stone Creek, and Great Trough Creek in Huntingdon County are stocked with trout. Sinking Creek in Centre County and Lingle Creek in Mifflin County are also stocked with trout by the PA Fish and Boat Commission. In addition to the stocked streams, Standing Stone Creek (upper drainage), Laurel Run, Potter Run, Boal Gap Run, Galbraith Run, Roaring Run, Slab Cabin Run, and, of most notoriety, the Little Juniata River, contain healthy native trout populations that can provide good fishing.

**Trout Stocking** (data based on annual requests that may change year-to-year depending on availability)

**Polluted Waters** - There are no polluted waters in the Rothrock State Forest.

### **Birding/ Nature Observation**

Bird watching, and nature observation are uses that occur throughout the 2.2 million acres of state forest land. The best locations for these activities depend on the habitat requirements of the species involved. The Audubon Society has designated certain areas of state forest land with unique or unusual bird species as Important Bird Areas. These parts of the state forest have particularly large and unique habitats for some unusual bird species. Most state forest lands have diverse habitats and support great numbers of birds. More information on important bird areas can be found at [www.audubon.org/bird/iba](http://www.audubon.org/bird/iba). A wide swath, along Tussey Ridge, is designated as IBA in the Rothrock State Forest.

The ridges in the Rothrock State Forest are known migration routes for raptors. Three popular observation points are staffed each spring and fall, by Audubon members to record annual migration counts for these species. The three observation points are the hawk watch on Allensville Road on Stone Mountain, and two locations on Tussey Ridge: Jo Hays Vista and a bit west, on the powerline along the Mid State Trail.

State forest land with its many roads and trails and generally quiet environment is ideal for nature observation. A public use map of the roads and trails is available from each district to aid nature observers. Natural Areas and Wild Areas are managed with this objective in mind, but the entire state forest system is maintained in a largely natural system. Nature photographers and artists also find an abundance of natural settings on state forest land.

### **White-tailed Deer, DMAP, and the Deer-Forest Study**

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 timbered forest areas, and dramatically reduce habitat for other wildlife. Therefore, the Deer Management Assistance Program, DMAP, is a necessary tool to assist the Bureau of Forestry in providing additional hunting opportunities, which can help to work toward our goals of promoting a diverse, healthy natural habitat with native wild plants. The Rothrock SF has participated in the DMAP program since its inception. The goal is to reduce browsing pressure on acceptable species of tree species as well as understory vegetation. DMAP units are typically larger scale units placed in areas where there is active



timber management activity occurring. In addition, four units consisting of approximately 27,000 acres located in the north-eastern portion of the District in Centre, Huntingdon, and a small portion of Mifflin Counties. These units are paired with a similar unit in the Bald Eagle State Forest and is part of a long-term study in cooperation with the Pennsylvania Game Commission, the US Geological Survey, and Penn State University, known as the Deer-Forest Study. This study seeks on a large-scale area to compare the interactions of deer populations with the impacts of various forest treatments. Part of its goal includes developing guidelines for future management activities that will allow sustainable forest practices as well as sustainable populations of whitetail deer. This study is replicated with two blocks on the Susquehannock State Forest as well.

The Rothrock State Forest is separated into 17 Management Units, of which, nine are enrolled in the DMAP program. The DMAP Management units are divided by physical features, primarily roads. There have been continuous forest inventory plots and other forest growth data gathered from the forest since the 1950s. All units are evaluated each year for potential inclusion into the DMAP program. The final decision on their inclusion is based on the management activities occurring within the unit, insect and disease issues, understory health indicators, and social trends.

Our district is collecting data using the Vegetation Impact Protocol (VIP) to support DMAP decisions. The VIP was developed after analyzing continuous forest inventory (CFI) data (forest wide data collected by the Bureau of Forestry's Inventory and Analysis section), which indicated that supplemental CFI plots would add enough data to detect important biological changes in vegetation. The VIP was designed so that recently-collected data could be integrated with previously-collected data from the existing CFI.

The VIP collects information on competing vegetation, site limitations, indicator species, and tree regeneration. The protocol focuses heavily on using indicator species to determine if the deer herd is in balance with the vegetation. Providing healthy vegetation across Pennsylvania is part of the Bureau of Forestry's mission and is important for us to monitor in regard to deer impacts. The data collected from the VIP, CFI, and other measurements are then entered into a decision model, which utilizes utility functions and a dynamic linear modeling process to determine a best recommendation for each DMAP unit. Our district collects VIP data on a three-year cycle of data collection; therefore, every year our foresters are collecting data on approximately 47-plots. Our district collects data on a total of 141-plots. These data are compiled with approximately 119-plots collected by the CFI on our district. Therefore, every three years we have statistically robust data on 266-plots to detect changes in vegetation, including indicator species.

To add to the complicated nature of the deer forest balance, Chronic Wasting Disease (CWD) has been discovered in both wild and captive deer populations in Pennsylvania. CWD affects the brain and nervous system of infected deer and elk and is always fatal to the animal. In response to the detection of this disease, the Pennsylvania Game Commission established disease management areas (DMA) to reduce the risk of spreading CWD to other parts of the state. Two DMAs currently exist in Pennsylvania; however, newly confirmed cases can alter the boundaries. Portions of Rothrock State Forest in the Trough Creek Division, Jacks Mountain and Locke Valley Tracts became part of DMA2 in 2012. Since then DMA2 has expanded to include all of Bedford, Fulton, Franklin, Blair, Perry, and Juniata counties, and portions of Centre, Huntingdon, Mifflin, Adams, Cumberland, Snyder, Union, Somerset, Cambria, and Indiana counties. Hunters who harvest deer within the DMA should be aware that special rules and regulations apply, and that they can have their deer tested for CWD free of charge. Drop boxes for head testing and

dumpster for parts disposal are available at locations throughout DMA2. The current list of these sites and more details on the disease can be found on the Game Commissions CWD page at: <https://www.pgc.pa.gov/Wildlife/Wildlife-RelatedDiseases/Pages/ChronicWastingDisease.aspx>

<http://nrintraforestry/eco/WildlifeManagement/swap/Rothrockswap.pdf>

### **Chronic Wasting Disease on DCNR Lands**

Chronic wasting disease (CWD) is an always fatal disease that affects the brain and nervous system of infected deer and elk.

It has been detected in Pennsylvania in both captive and free-ranging deer. Following these detections, the Pennsylvania Game Commission established Disease Management Areas (DMAs) to reduce the risk of spreading CWD to other parts of the state.

Three DMAs currently exist in Pennsylvania; however, newly confirmed cases can alter the boundaries. The current DMAs include: DMA 1 on a captive deer farm in Adams County in 2012 (DMA 1 has since been eliminated); DMA 2 includes multiple free-ranging deer in Bedford, Blair, Cambria, and Fulton counties, as well as captive deer farms in Bedford, Franklin, and Fulton counties; DMA 3 includes two captive deer farms in Jefferson County and a free-ranging deer in Clearfield County; and DMA 4 contain a captive deer at a facility in Lancaster County.

All or portions of the Michaux, Buchanan, Gallitzin, Tuscarora and Rothrock State Forests as well as several State Parks fall within DMA 2. A portion of Clear Creek State Forest is located within DMA 3 and William Penn State Forest is located within DMA 4.

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](#)

## **11) Water**

Water resources are most important as a source of potable water and to provide for the needs of several related industries. Water Resources are also important as the major element needed to drive recreational development.

This region's potable water comes from several reservoirs and ground water sources. The Rothrock State Forest serves as a significant recharge area for many of the ground water sources. Many wells exist in the State College area that are thought to obtain their recharge from the Rothrock State Forest. There is a major surface water reservoir surrounded by State Forest (half in Rothrock and half in Bald Eagle State Forest) that serves the populated areas of Mifflin County. There are also many smaller residences and groups of residences have direct or indirect sources of water from the State Forest as well.

Recreation created by water is very important to this region. Main water features of this region are the Raystown Lake, the Juniata River, several high-quality headwater streams such as Standing Stone Creek,

**NHD HUC 4 Watershed**

Legend:

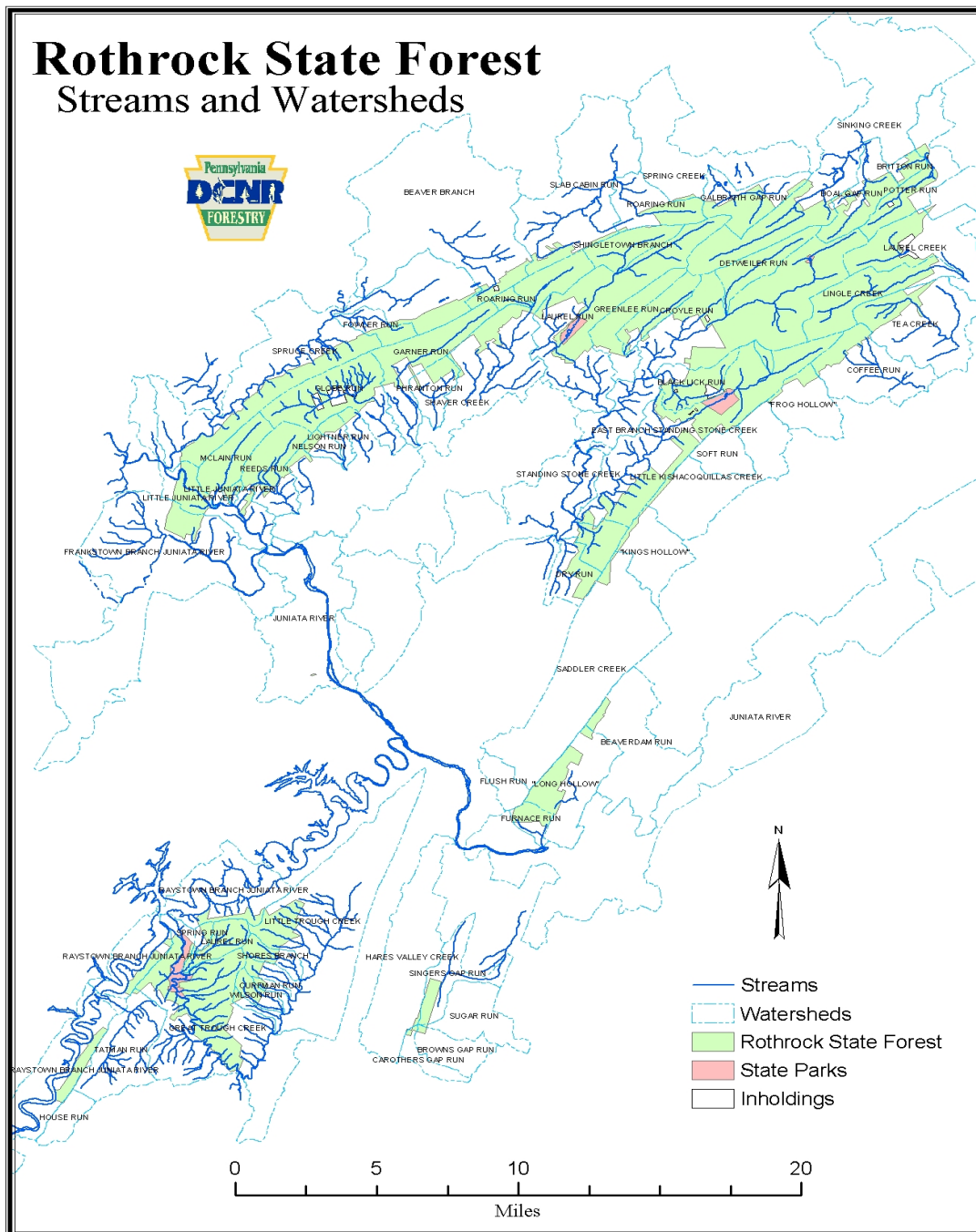
- Rohtock State Forest District
- NHD HUC10 Watershed
- Counties
- State Forest
- State Game Land
- State Park

Scale: 0, 5, 10, 20 Miles

Counties: Allegheny, Delaware-Mid Atlantic Coastal, Lake Erie, Monongahela, Potomac, Southern Lake Erie, Southwestern Lake Ontario, Susquehanna, Upper Chesapeake, Upper Ohio

[http://www.class.darpa.mil/cg/courses/public/documents/document/darp\\_20022045.pdf](http://www.class.darpa.mil/cg/courses/public/documents/document/darp_20022045.pdf)

[illegible]



### b) Major Municipal Supplies

It can be stated without reservation that water is one of the most valuable resource of the Rothrock 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.

Recognizing the importance and need for water, the Administrative Code of 1929, amended by Act 18, 1995 states in Section 302(b)(5), “The Department of Conservation and Natural Resources shall have the power: to give boroughs and other municipalities of this Commonwealth and to related municipal authorities, upon such terms and subject to restrictions and regulations as the department considers proper, the privilege of impounding water and drilling water wells upon any state forest, and of constructing, maintaining and operating lines of pipes upon and through state forests for the purpose of conveying water there from, whenever it shall be to the public interest so to do”.

The objectives of the Water Section are to ensure that the water resource is protected by restricting or limiting activities on the watersheds to practices that will neither reduce the quantity nor impair the quality of the water. For the present management period, it is not planned to have management practices aimed specifically at increasing water yield; however, this may be necessary at some time in the future.

Future land use and development within both existing and potential watersheds must be compatible with water production. Use and development that would adversely affect water quality must be avoided. The protection and enhancement of watersheds on the Rothrock State Forest, and their ability to produce high quality water, is of the highest priority. Every activity within a given watershed must be carefully evaluated to determine what impact it will have on the integrity of that watershed.

#### **Water Systems:**

##### **Existing Reservoirs on State Forest Lands –**

Municipality:	Impoundment Area (Acres)	Capacity (Gallons)	Watershed Area (Acres)	Annual Supply (million gals)
Petersburg	1.7	770,000	1,024	16
Rock Spring	Spring	n/a	n/a	n/a
Franklinville	Spring	n/a	n/a	n/a

### Existing Reservoirs near State Forest Lands –

Location	Municipality	Watershed Acres on SFL's
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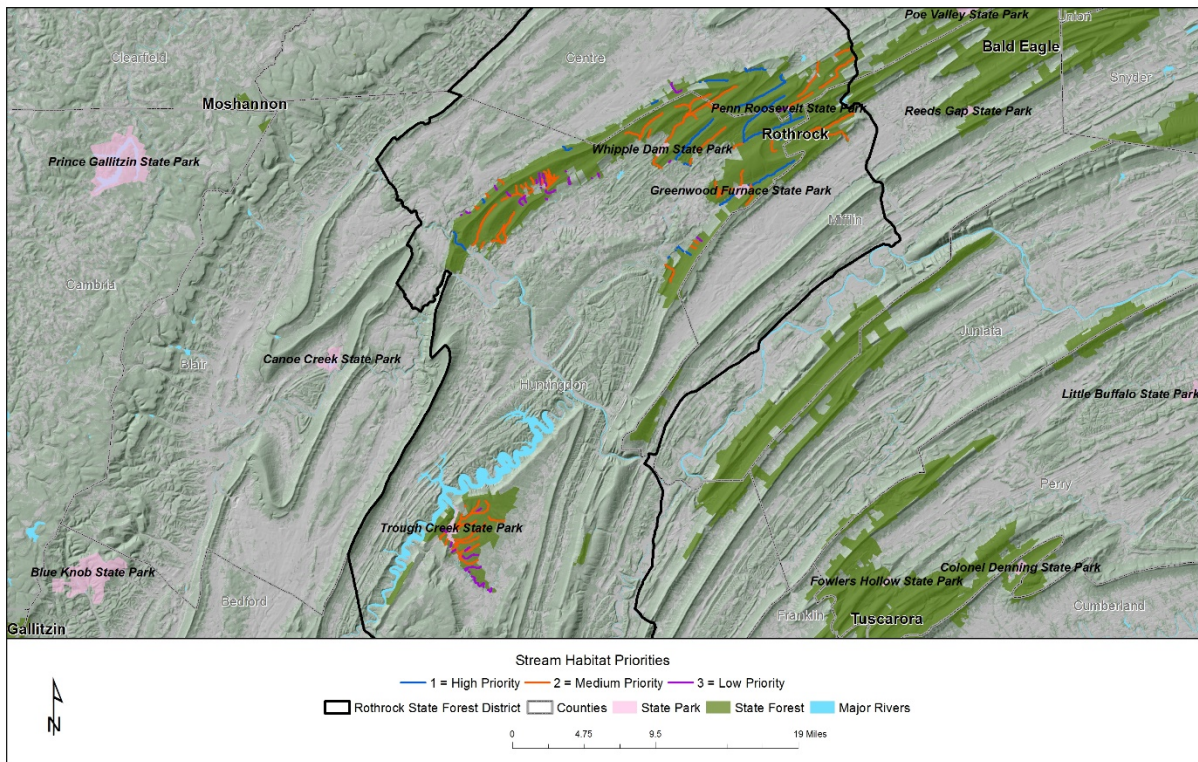
Stone Mountain	Allensville	143
Slab Cabin Run (Pine Grove Mills)	Ferguson Township	520
Laurel Creek	Lewistown	1,221
Roaring Run	State College (Shingletown)	1,074

Some of the municipalities with reservoirs on or near the State Forest lands have partial water treatment facilities. The State College Water Authority treatment facility consists of hypochlorination and fluoridation.

Other municipalities with reservoirs near State Forest lands consider their water supplies adequate for present and future demands. No immediate changes are being contemplated.



c) Fish and Boat Commission Stream Habitat Prioritization



**Figure 11-2.** Streams within the district prioritized for aquatic habitat improvement projects based on PFBC Stream Habitat Improvement Prioritization Tool.

Rothrock	UNT to East Branch Standing Stone Creek
Rothrock	UNT To Spruce Creek

**Table 11-1.** Priority 1 streams in this district from the PA Fish and Boat Commission's Stream Priorities for Habitat Improvement tool. UNT stands for Unnamed Tributary.



Rothrock Forest District has several streams listed as high priority for habitat improvement by the PFBC Prioritization Tool including:

#### **Centre**

<b>Priority 1</b>	<b>Miles</b>
Galbraith Gap Run	1.4
Roaring Run	1.6
Sinking Creek	4.7
Slab Cabin Run	0.5
<b>Priority 1 Total</b>	<b>8.2</b>

#### **Huntingdon**

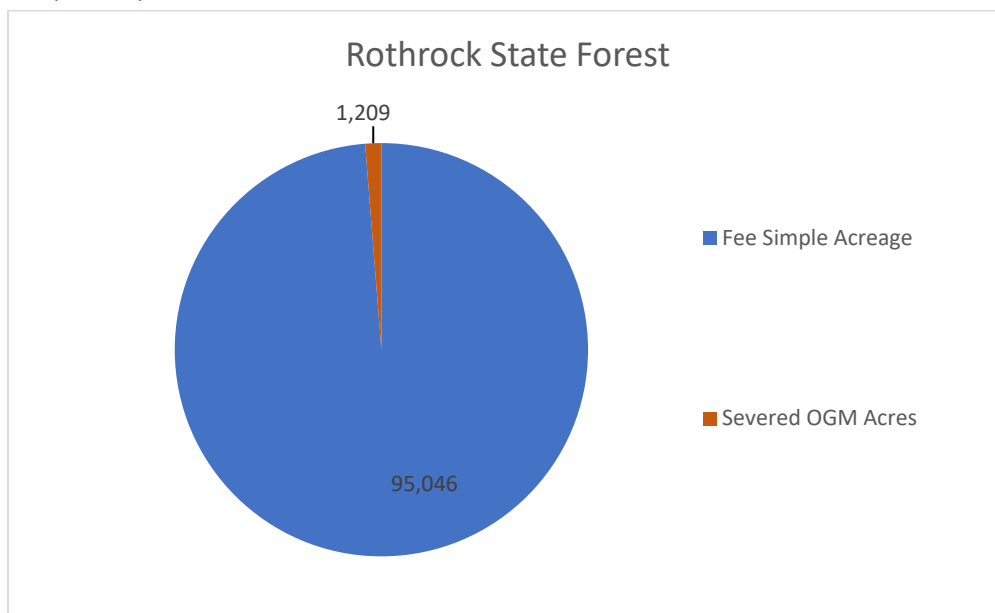
<b>Priority 1</b>	<b>Miles</b>
Detweiler Run	4.5
East Branch Standing Stone Creek	5.0
Fowler Run	0.8
Greenlee Run	4.4
Little Juniata River	1.7
Standing Stone Creek	4.5
UNT to East Branch Standing Stone Creek (rm 2.21)	0.7
UNT To Spruce Creek (rm 4.39)	0.3
UNT to Standing Stone Creek (RM 31.52)	1.1
UNT to Standing Stone Creek (RM 33.33)	0.9
<b>Priority 1 Total</b>	<b>23.9</b>

Currently, Rothrock Forest District, Trout Unlimited, and USA Youth Fly-fishing Team are collaborating on a long-term habitat improvement project for Laurel Run in Huntingdon County. Laurel Run is a 'Priority 2' in the PA Fish and Boat Commission's habitat prioritization tool (medium). The goal of the project is to improve native trout habitat and correct erosion and sedimentation problems and protect road infrastructure. This partnership is expected to continue to grow and improve additional streams in the future. Forest district staff are also working to identify areas to conduct "large woody material" fish habitat improvement projects in the coming years to further work to improve identified waters.

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.

## 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.

There are currently no major oil, gas, or mineral development areas nor any leases on any state forest lands within the Rothrock State Forest. On private lands, just south of the Trough Creek Tract, a gas company did create a gas pad and drill a test well into the Utica Gas Formation around 2010 but nothing has been put into production. No other areas have been tested. There is one abandoned shallow gas well that was inherited and added to the Trough Creek Division when we acquired some former Glatfelter Pulpwood lands in the early 2000's. This well is currently capped/plugged and not in production.

The makeup of subsurface ownership with the state forest is that 98% of the forest is owned fee simple and only 2% of the lands are severed rights lands. Currently, there is no form of OGM development on these lands.

## 13) Wildland Fire

### a) Wildfire Suppression

- The Commonwealth law of 1915 mandated that the Bureau of Forestry is to respond to, extinguish and investigate all wildfires in the state of Pennsylvania. The approximate 27 people that make up the Rothrock State Forest staff vary from basic wildland fire fighters to Incident Commander Type 3. The district has a full complement of vehicles and equipment available for use in suppression efforts.
- In recent history Rothrock State Forest staff extinguished and investigated a string of 26 arson fires, when an arsonist pleaded guilty in 2016. Utility lines were the cause of a 62 acres wildfire on a steep rocky knob in Huntingdon County in 2016 which took a couple days to get full containment. The district also has 43 Volunteer Fire Companies and 33 volunteer fire wardens that assist the district on wildfire suppression.

### b) Prescribed Fire

The Prescribed Burning Practices Act became law in 2009 which opened a door for using prescribed fire for silvicultural and habitat restoration treatments. The district completed a few burns and are monitoring results.

Name of Prescribed Fire	Date	Acreage
Harrys Valley	5 / 7 /13	30 acres
Beidlehiemer	5 / 3 /13	40 acres
Underwood Trail	5 / 14 /15	110 acres

The Rothrock State Forest is interested in conducting most prescribed fires to promote oak regeneration. These burns typically have two main objectives, including site preparation and release burning. Both types of burns are most successful if conducted in the late spring (April-May). These late spring burns achieve the greatest results because the sap needs to be flowing to ensure maximum mortality of the undesirable thin barked species in the understory layer. Burns conducted at any other time of the year are not achieving the desired objectives. However, burns conducted during this time of year (early spring) may impact bats and therefore, the United States Fish and Wildlife Service has placed seasonal restrictions on when burns can be conducted. Therefore, the future use of prescribed fire will be kept to a minimum for the section of the state forest in the bat hibernacula buffer. The Bureau of Forestry is working with the Pennsylvania Game Commission and the USFWS to write a Habitat Conservation Plan (HCP). The (HCP) is in the development stages. The goals of the HCP are to –

- Avoid and minimize incidental take of Indiana bats resulting from forestry management and other related activities to the maximum extent practicable on state lands
- Accommodate current and future forestry management activities on state lands
- Support state conservation goals such as those described in the Game and Wildlife Code, the Conservation and Natural Resources Act (Act 18), the Wild Resource Conservation Act, the Cave Protection Act, and other applicable state laws and regulations

- Identify targeted conservation efforts that can improve the value of state lands for Indiana bats and thus help stabilize and aid in the recovery of the species.

Once this plan is completed, the district will use its guidance to decide if prescribe fire will be a viable resource for the district to use.

## 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 of these tasks possible.

### ***Infrastructure and Development on the Rothrock State Forest***

The Rothrock State Forest is named in honor of Joseph T. Rothrock, a native of McVeytown, Mifflin County. Dr. Rothrock was instrumental in starting the early conservation movement in Pennsylvania and served as the first Commissioner of Forestry. He is known as the Father of Pennsylvania Forestry.

The Rothrock District, as we know it today, includes nearly all of Huntingdon County and parts of Centre, Mifflin and Blair Counties. The total land area in the District is 774,700-acres, 506,000 of which are forested. The total State Forest land in the District amounts to almost 96,361 acres.

Historically, a number of changes occurred before the Rothrock District came into being.

Originally, the Division of Forestry was established by the Legislature in 1895. Acquisition of unseated lands had a high priority and by 1905, 80-percent of the state forest reservation (changed to state forest land in 1919), which comprises the present, Rothrock State Forest had been acquired.

The earliest administrative units were the Trough Creek Forest, the Seven Mountains Forest, and the Penn Forest. The Seven Mountains Forest was further subdivided into the Barree, Bear Meadows, Greenwood and Kishacoquillas Divisions with a professional forester in charge of each Division.

In 1920 the administrative units were amplified by legislation. The whole state was divided into twenty-four districts with a district forester in charge of each district. At that time, the Rothrock District, Logan District, and part of the Penn District formed the present Rothrock District. The district offices were located in Mount Union, Petersburg, and Milroy.

In 1952, the number of districts was reduced to 20, and the present Rothrock District then emerged.

Initial forest development was impeded by the lack of technically trained personnel, and in an effort to improve that situation the State Forest Academy was established at Mont Alto in 1903. Two years later, the Pennsylvania State College responded similarly by initiating a four-year undergraduate course in forestry. Within a few years, a constant supply of technically trained foresters was available to fill positions throughout the state.

One of the first major projects undertaken by the early district foresters was a boundary line survey of the state forest land in their divisions. The 1912-1913 Department of Forestry report indicates that most of the surveying had been completed by 1913 at an average cost of only \$7 per mile.

In 1895 a Division of Forestry was created in the Department of Agriculture. Six years later a separate Department of Forestry was established. In 1921, the name was changed to the Department of Forests and Waters and changed again in 1972 to the Department of Environmental Resources.

From its very inception, the Department of Forestry practiced what was later to be known as the multiple-use concept in the management of state forest land. Fire suppression and reforestation had the highest priorities, followed by recreation and timber management.

The management of forest land was hampered by the lack of a good road network. To alleviate this situation existing roads from the charcoaling and logging days were brushed out, graded, and periodically maintained. In 1913 there were 130-miles of roads, 52-miles of trails and fire breaks. In 1933, the Civilian Conservation Corps was organized, and an era of road construction began in earnest on the state forest lands. As a result of this effort by the CCC and further improvements by District staff, the District now has 179-miles of gravel/dirt forest roads, 10-miles of asphalt roads, and 292-miles of trails.

Fire protection efforts began in 1917 with the construction of observation towers. The first observation towers were merely wooden platforms in tree tops with no method of communication. Later steel towers replaced the wooden towers. The first steel tower in the district was erected at Greenwood in 1921. Tower construction ended in 1933 after a total of seven towers had been constructed. At that time the only means of communication was by telephone, but in 1936 telephone communications were supplemented with two-way radios.

Reforestation efforts began in 1908 and continued intensively until the mid-thirties. Planting was done in old fields, burned-over land and along roadways. The 1955 management plan indicated a total of 89 satisfactorily stocked plantations on 843-acres.

To supply seedlings for reforestation, two state forest tree nurseries were started in the district. Greenwood Nursery was established in 1906, followed by Penn Nursery a few years later. Both nurseries eventually increased their combined production to 5½ million seedlings annually. At its peak, the Greenwood Nursery produced an average of three million seedlings per year. The Greenwood Nursery closed in 1993. In the mid-1920's another nursery was located on an island, in the Juniata River, owned by the Pennsylvania Industrial Reformatory in Smithfield. This nursery was a cooperative arrangement between the Department of Forestry and the Bureau of Corrections and has since reverted back to farm land. Penn Nursery is the last remaining nursery to provide tree seedlings for state forest management with an annual production of approximately one million tree seedlings.

Following authorization in 1909 to appoint fire wardens throughout the state, fire suppression efforts gathered momentum. Over the years, the fire protection organization has become more efficient with the introduction of heavy equipment, tank trucks, and airplanes to help in combating forest fires. The efforts of these fire suppression crews and an emphasis on wildland fire prevention programming, by the Forest District and the Bureau of Forestry, has resulted in a reduction of total acreage burned today to four (4%) percent of what was burned annually almost 90 years ago. The average size of a wildfire in 1913 was 412 acres, whereas today, the average wildfire is 3 acres.

Use of the state forest lands for recreation began in 1914 when campsites near Bear Meadows were first leased to the public. Active leases on state forest land now number 348. Hunters, anglers, and vacationers use these camps throughout the year.

Since the 1920's many thousands of people have enjoyed the facilities at the four state parks in the district. Whipple Dam, Greenwood, and Trough Creek are especially popular. For nature lovers, there is still a glimpse into forests of the past at Alan Seeger, Detweiler Run, and Bear Meadows Natural Areas.

Systematic timber management did not begin until 1955 when detailed management plans for the state forest lands were put into effect. The average annual allowable cut for the first year was five and one-half million board feet. Originally, management was by the selection system. In 1965 the plan was amended, and even-age management was permitted.

Bureau staff manage the following infrastructure on Rothrock State Forest.

The district's well-trained equipment operators will continue to maintain our road and trail systems, forest boundary line, equipment, and buildings/facilities. Route 26/Stone Creek Road breaks the district geographically into the areas of responsibility for each foreman but maintenance routines, staffing, buildings, and most equipment are the same although there are unique features in both divisions that they addressed differently. Each staff member has strong individual characteristics that we utilize across the board not only for efficiency but also for training other staff. We will evaluate our culvert pipes and bridges for structural integrity and to determine if they impair the movement of aquatic organisms. We will continue to strive to develop our forest facilities making each forest visitor's visit as safe and enjoyable as reasonably possible.

- We will use Best Management Practices (BMP's) to keep our roads functional while using Environmentally Sensitive Maintenance (ESM) practices to reduce the adverse effects of a road on the environment by treating the cause of the problem while keeping it as natural as possible. Continue to work with Dirt and Gravel Roads experimenting with new techniques to expand our 'toolbox'.
- DCNR Bureau of Forestry has adopted the North Atlantic Aquatic Connectivity Collaborative (NAACC) stream crossing survey protocol to evaluate Aquatic Organism Passage (AOP) at State Forest stream and road crossing sites at culverts and bridges. We will conduct the surveys which will help prioritize the order the structures need to be addressed.
- Continue to work with Trout Unlimited to create quality fish habitat while also reducing erosion and sedimentation.
- We will maintain, upgrade, or build facilities that will be safer for forest visitors and staff by make their experience more enjoyable. (i.e. boundary line, trails, vistas, picnic areas, latrines, parking lots)
- We will continue to provide quality visitor services in a timely and professional manner.

#### Infrastructure Inventory

- **Roads:** There are 179 miles of public use (Z1) roads on the Rothrock State Forest that are maintained to standards that are fit for travel by automobile. An additional 10 miles are woods

roads or drivable trails (Z2) maintained intermittently and suitable for travel by four-wheel drive vehicles. There are also 110 miles of administrative or timber sale haul roads (Z3) which are gated or barricaded. Maintenance is typically only done on these roads when erosion becomes a problem or when we need to resume use.

- **Trails:** The Rothrock State Forest approximately 292 miles of trail with 112 miles of these being designed for “foot traffic” only and 180 miles of shared use trails open for hiking, biking, and horseback riding. Not all shared-use trails are suitable for all users and user types.
- **Gates:** There are approximately 297 gates on the Rothrock State Forest.
- **Department owned bridges and culverts:** There are 40 bridges and box culverts on the state forest on roads open to public travel. Three of these bridges are on private ground and one on state park land.
- **Leased Tower sites:** 12 commercial towers and 7 government owned
- **Buildings:** There are 45 buildings (1 district office, 4 maintenance headquarters, 20 storage buildings, 6 picnic pavilions, and 3 restroom facilities) on the Rothrock State Forest. There are also 9 state-owned lease camps.
- **Picnic Areas:** We have 2 picnic areas in the district. Pine Hill which is located off Diamond Valley Road in the Stony Point Division. This picnic area has 2 pavilions and a restroom. Alan Seeger Picnic Area is located off Stone Creek Road in the Greenwood Division. This picnic area had 4 pavilions and a restroom.
- **Boundary Line:** District staff maintain approximately 1/5<sup>th</sup> of the District’s boundary line each year. There are 263 miles of boundary line on the Rothrock requiring this routine maintenance.
- **Fire Towers:** The district has 4 inactive fire towers (Greenwood, Little Flat, Jacks, and Loop). Loop Tower is located on State Game Lands while the other three are on State Forest Land
- **Radio and Communications Towers: Statewide** 800mh radio towers are located on Loop Mountain and Little Flat. The current radio system has repeaters on Loop, Little Flat, and Cove.
- **ROWS:** There are numerous gas, electric, and telephone lines crossing the state forest land.
- **Parking Lots and facilities:** There are currently 14 official parking lots on the forest that have stone surface. They vary in size from ¼ to 1 acre in size. They are located at west end of Colerain Road, Kepler Road/route 26 intersection, Musser Gap off Route 45, Gailbraith Gap off North end of Bear Meadows (restroom located here), Stone Creek Road/ Route 322 intersection, Coopers Gap on East end near Woodland, Coopers Gap just West of Coopers Gap Road/Kettle Road intersection, Bear Meadows Road at the Natural Area, Juniata Natural Area along the river, Little Flat Tower Road, along west end of Broad Mountain Road, Locke Valley Road near old cemetery, Coder Road near private property end, and along Allensville Mountain Road at the mountain summit.
- **Culverts:** 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 in regard to AOP. 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. The end goal is for the road to not impact the stream. The following is a list of priorities to consider when replacing stream crossings, from highest to lowest priority.



### Priorities for Culvert Replacement

1. Failing critical infrastructure
2. Assessed as no aquatic organism passage (AOP)
1. Class A brook trout streams
2. Exceptional Value (EV) streams
3. Wild brook trout streams
4. High Quality (HQ) streams
5. PA Fish and Boat Commission Stream Priority 1 for habitat improvement
6. NAACC priority tool (length of stream reconnected)

This District has approximately 191 culverts, which will be assessed over time using the NAACC protocol.

## 15) Special Designations

### *a) 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.

<b>Rothrock</b>	<b>Name</b>	<b>Acreage</b>
<b>Natural Areas</b>	Alan Seeger Natural Area	371.5
	Bear Meadows Natural Area	896.1
	Big Flat Laurel Natural Area	184.0
	Detweiler Run Natural Area	466.5
	Little Juniata Natural Area	682.3
	Rocky Ridge Natural Area	114.0
	<b>Natural Area Total</b>	<b>2,714.3</b>
<b>Wild Areas</b>	Thickhead Wild Area	4,137.5
	Trough Creek Wild Area	1,743.9
	<b>Wild Area Total</b>	<b>5,881.4</b>
<b>Total</b>		<b>8,595.7</b>

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

#### b) 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.** 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.

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	129
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?	5,131
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	5,131
3.1, old growth stands	779
4.1, areas providing a source of community drinking water	311
6.2, areas with cultural features created intentionally by humans	1

### c) 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.

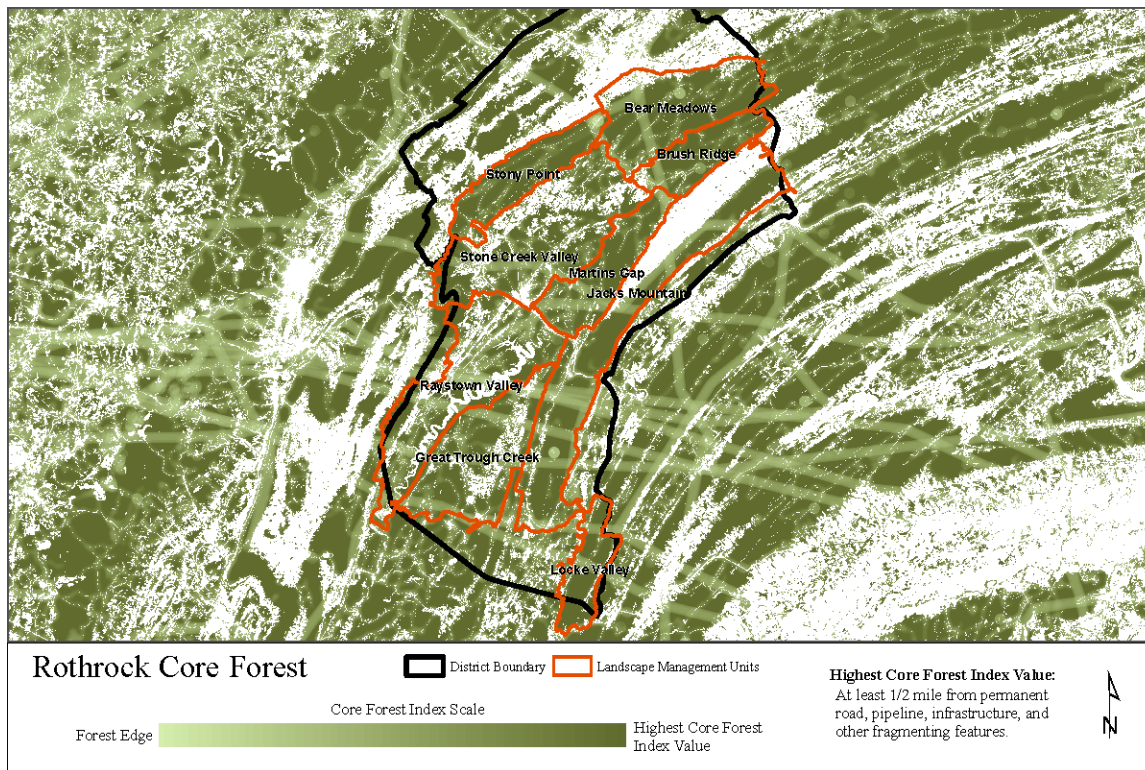
#### **Preliminary Guidelines**

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.

LMU Name	Statewide Percentile	Core Forest Index Value
Jacks Mountain	91%	98.02
Martins Gap	65%	96.14
Locke Valley	58%	95.60
Raystown Valley	57%	95.60
Bear Meadows	53%	95.20
Brush Ridge	49%	94.87
Stony Point	48%	94.86
Great Trough Creek	24%	92.67

**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).

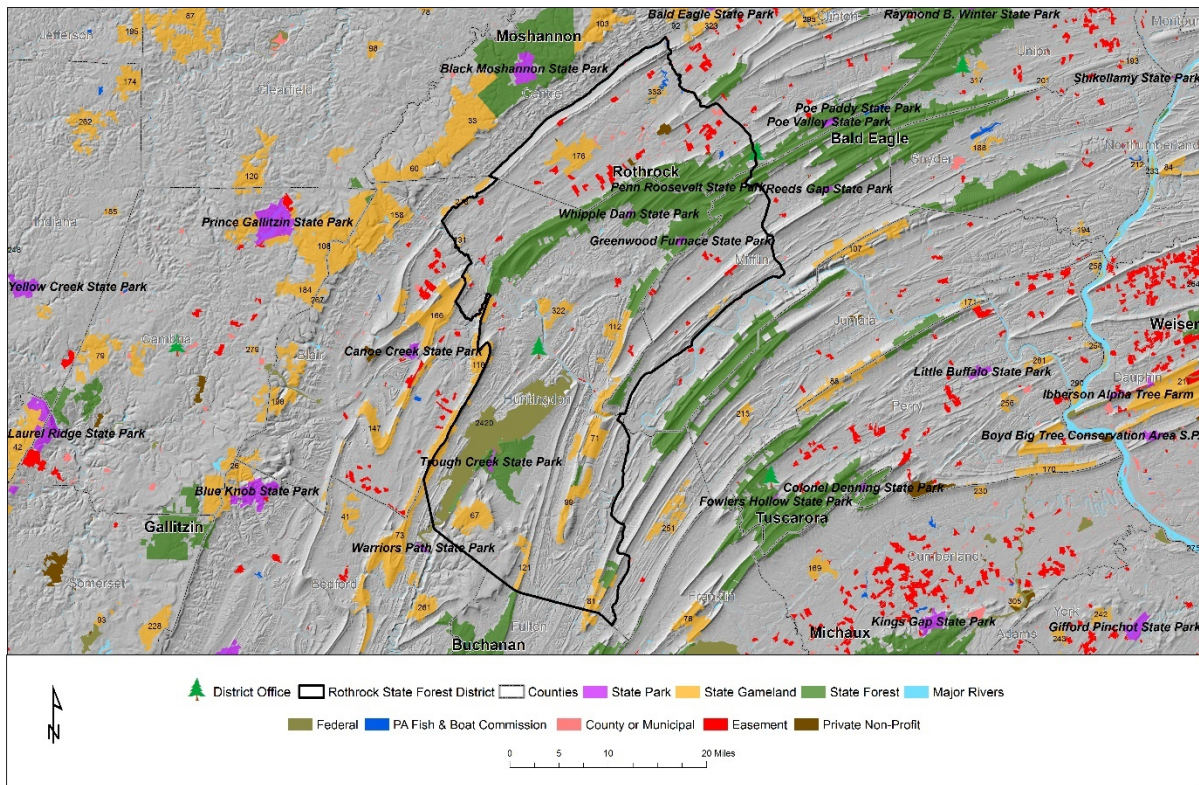


**Figure 15-1. Map of core forest index in the region of Rothrock Forest District.**

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.



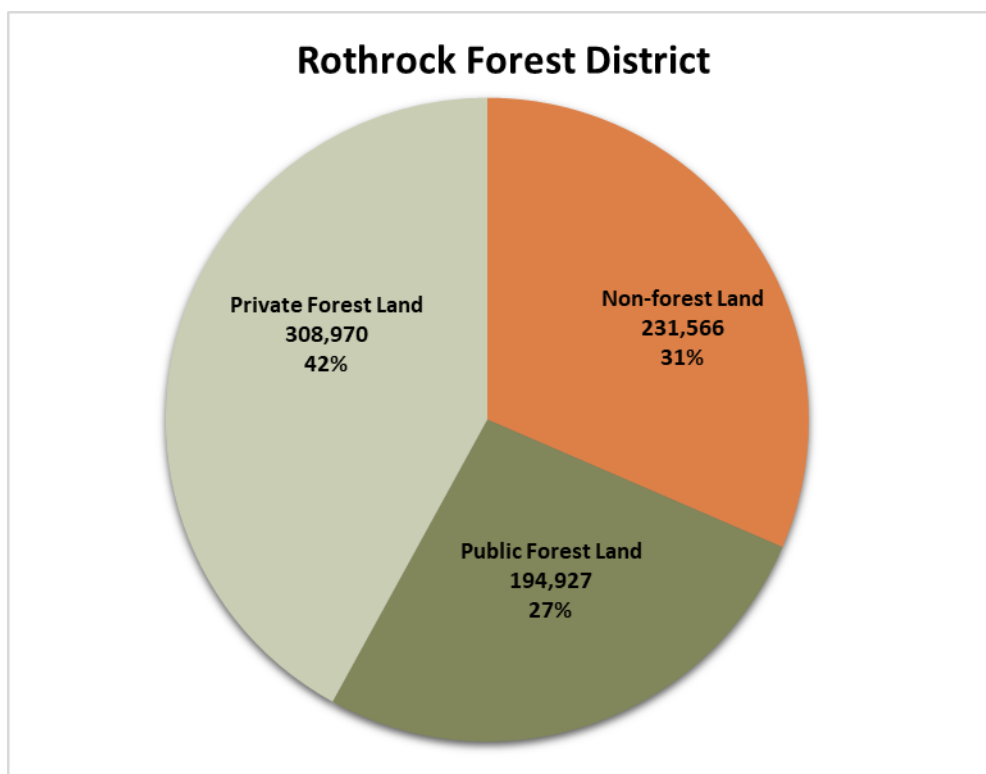
## 16) Ownership and Population Centers



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

State College in Centre county and Huntingdon in Huntingdon county are the two largest population centers in the forest district. It should be noted that given the relation of the Pennsylvania State University main campus in State College creates a unique opportunity for this Forest District. Penn State draws students and people from across this state, the United States, and many other countries across the globe to the area. Many of these folks find their way on to the Rothrock State Forest for one reason or another and create lasting memories. There are also numerous smaller towns and boroughs across the district that are home to the many constituents that visit and work in the Rothrock Forest District. Large population centers just outside of the district bounds, also have people that come to visit, work, and recreate on the Rothrock. They include Altoona, Hollidaysburg, Lewistown, Shippensburg, and Chambersburg.





**Figure 16-2.** Percentage of total acreage within Rothrock 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/>).

Rothrock District	
Land Ownership Type	Acres
State Forest	96361.00
State Parks	1244.99
State Gamelands	41145.7
Federal	29923.93
Local/Municipal	189.04
Conservation Easements	7752.45
<b>Total Acres</b>	<b>176617.6</b>

## 17) Economy and Forest Products

The natural resources in and around the Rothrock State Forest have shaped the local economy in the past through today. The area's woodlands are one of its important resources and it covers a large portion of this region. Prime agricultural land is another found in several of the valleys that are located between forests on the surrounding ridges. Iron making was important in this region in the late 1700's and early to mid-1800's. This was directly due to the quality and quantity of iron ore, limestone, and charcoal that were available. Coal mining in the Broad Top area was also a significant operation as it supported this iron making industry of the Juniata Valley in the later years. The Juniata River is near its headwaters in this region and the river is important for its past transportation commerce and its current recreational value. Raystown Lake is one of the largest manmade lakes in Pennsylvania and is an important tourist attraction and source of income for the region. Transportation in this region has, since the 1700's, transformed from using the Juniata River to the Pennsylvania Canal to the main line Pennsylvania Railroad (Norfolk/Southern today) and finally to the airports (at State College and Mifflin County) and interstate highways located nearby. The Rothrock District has a promising future given its resources, landscapes, and being the type of place that people would like to live and make a living.

### **Timber**

Timber resources have always been a part of this region's economy.

The pulp or fiber markets have only improved in this region over the last decade and are likely to stay stable for the near future. There are no pulpwood mills within the boundaries of the Rothrock Forest District, however, nearly all the pulpwood from the Rothrock finds its way to the Domtar Company in Johnsonburg PA, the PH Glatfelter Company in Spring Grove PA, or the Verso Corporation in Luke, MD.

### **The Local Forest Products Industry**

The wood producing, and processing industries include many small sawmills, the largest of which produce slightly over one million bd. ft. per year. Also, there are several planing mills that finish native lumber for domestic use.

The demand and markets for sawtimber will continue. The trend in the district has been away from the very small, marginal sawmills to larger mills employing more workers and cutting more than a million board feet per year. While the trend to bigger sawmills will probably continue the number of people employed will not increase appreciably and may possibly decline. The reason is that sawmill owners are finding it harder to compete in the labor pool with other manufacturing plants. This situation parallels the problem that existed on the farms during the past thirty years and the answer seems to be automation.

The markets for sawn lumber in the area are fairly diversified, but most of it goes into railroad ties, pallet stock, or blocking. The high-grade lumber market continues to fluctuate from year to year. The market for railroad ties has always been variable depending upon the fiscal situation of the railroads. The future of the tie market depends entirely on the future of the railroad.

The majority of the timber on State Forest land in the district consists of low value, low quality oak which is the result of the vegetative or coppice regeneration after the original forests were cleared. Although markets have developed which can utilize this low-quality oak, one objective of timber management in the district is to diversify the species composition, through judicious cuttings, to high quality red oak, tulip poplar, and other hardwoods, and white pine which will be of higher commercial value than the present timber and offer greater resistance to the ravages of the gypsy moth.

### **Timber Product Output Survey**

The Pennsylvania Department of Conservation and Natural Resources, Bureau of Forestry (BOF), along with its partners, led an effort to gain information that reflects the current characteristics of the wood products industry in the state. In 2013, the Bureau of Forestry conducted a Timber Product Output (TPO) survey among Pennsylvania's primary wood processing facilities, collecting information from the 2012 production year and again in 2017, to gather information on the 2016 production year. The survey was reinstituted in order to gain insight into volumes, species, uses, products and origins of the wood harvested and processed in PA, as well as information about the facilities operating in PA (employment, age, functions, etc.). The survey process also provided an opportunity for BOF foresters to interact directly with the private facilities located in their districts and enhance vital professional relationships. The survey information can be used by land owners, wood-processing businesses, and other interested parties to plan and adapt to the needs and current condition of the market. In addition, the data collected from such surveys contributes to broader datasets that could be used in long-term trend analysis and assessments of regional dynamics.

More information on the wood products industry in PA, as well as reports from the Pennsylvania Timber Products Output Surveys can be found at:  
<https://www.dcnr.pa.gov/Business/ForestProducts/Pages/default.aspx>

## **18) Recreation**

Outdoor recreation and the features that attract outdoor recreation are numerous in the Rothrock State forest area. Its input to the local economy is worth much attention. State and county planning agencies have recognized this fact and are pursuing enhancement and expansion of Outdoor recreation.

The forest is a renewable resource that has the side benefit of still providing huge amounts of outdoor recreational opportunity such as seasonal cabins, hunting, hiking, mountain biking, camping, horseback riding, and a chance to seek solitude from everyday bustle. This generates significant revenues for this region. Other forests in this region that add to the outdoor recreation are the Pennsylvania Game Commission Land, U.S. Army Corps of Engineers Land, and several large tracts of private land that are open, sometimes by fee only, to designated public uses.

The State Forest Natural Areas, Wild Areas, Old Growth Areas, Bioreserve Areas, woodland trail systems, camping opportunities, vistas and educational sites are numerous and accessible for everyone in the Rothrock State Forest. There are also several State Parks such as Greenwood Furnace, Whipple Dam, Penn

Roosevelt, and Trough Creek. The history of iron making is found many places in this region and is the focus at Greenwood Furnace State Park. The Raystown Lake and its related camping, hiking, fishing and hunting provide many of these features and all are on one of the largest manmade lakes in the eastern US. There are several geologic and historic sites in this region. Most are on private land, but some are on Commonwealth owned land. Several limestone caverns exist, and two commercial operations are at Lincoln Caverns and Indian Caverns. The East Broad Top Railroad is a nationally recognized historic landmark that draws visitors from many other states. The Rockhill Trolley Museum is also located at that location. The Coal mining heritage can be examined in the Robertsdale and Broad Top area. The remains of the Pennsylvania Canal and former main line Pennsylvania Railroad also have many historic developed and undeveloped sites to visit.

There are two renowned and popular long-distance hiking trails that have portions that travel through the Rothrock Forest District. The Mid-State Trail stretches from the Maryland border in the Buchanan State Forest north through the center of Pennsylvania (and the Rothrock) to end at the New York state line. This trail is known as the “wildest footpath in PA” and is one of the 18 designated “State Forest Hiking Trails” in PA. Regarding the Rothrock Forest District, it crosses approximately 56 miles of the forest. It enters the from the south-west through private lands and State Game Lands until it reaches Short Mountain outside of Alexandria. From there it climbs up on to Tussey Mountain and follows the ridgetop until it nears the Greenwood Fire Tower and crosses the Standing Stone Trail as it heads east across the forest. The Mid-State Trail leaves the Rothrock State Forest as it crossed under the Rte. 322 highway via the hiking trail tunnel and enters Bald Eagle State Forest.

The second long-distance trail that has a portion in the Rothrock Forest District is the Standing Stone Trail which also enters the district from the south. The Standing Stone Trail includes 17 miles across Rothrock State Forest, entering from the Buchanan State Forest across private and State Game lands until it reaches the first portion of the Rothrock on the Jack’s Mountain Tract. The trail continues north from there again traversing Game Lands, up the Thousand Steps Trail and back on to Rothrock at the Lucy Furnace Tract. From there it continues north crossing over to Stone Mountain and traversing through the Rocky Ridge Natural Area. It finally terminates at the Greenwood Fire Tower after it goes through the Greenwood Furnace State Park. In 2014 Standing Stone Trail was named Pennsylvania’s “Trail of the Year” in 2014 and is also part of the America’s Great Eastern Trail.

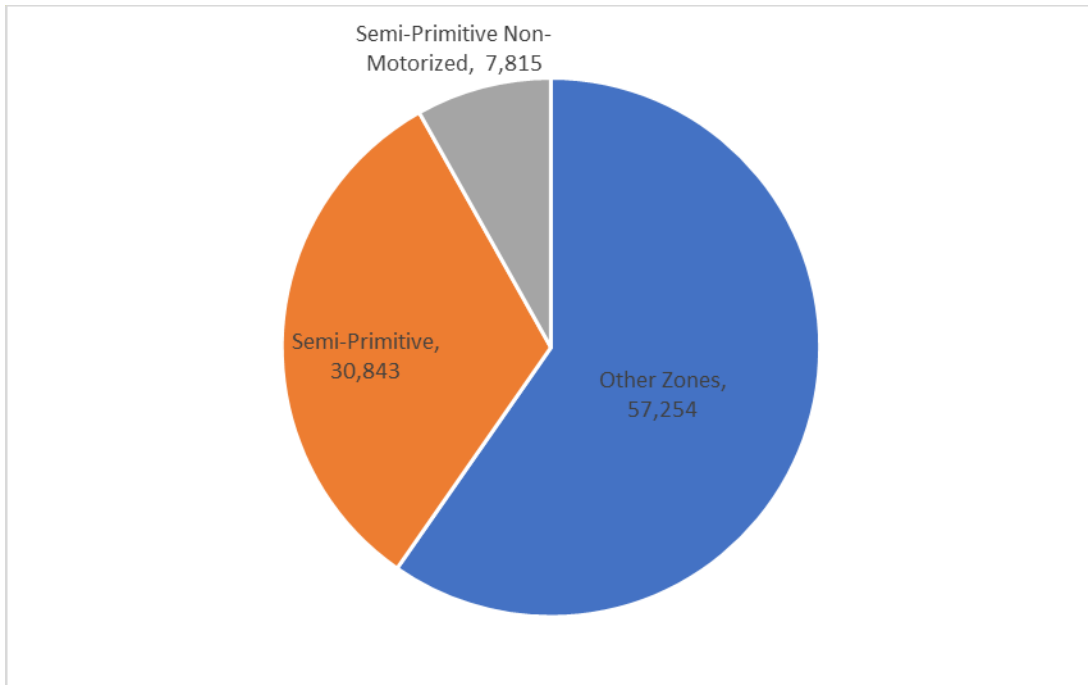


Figure 18-1. Acres of state forest land in this district by Recreation Opportunity Spectrum (ROS) classifications (2012). ROS is an inventory system developed by the U.S. Forest Service, to characterize land by types of recreation experiences. ROS is described on p. 42 of the 2016 SFRMP. “Other Zones” refers to Semi-Developed and Developed zones. This chart shows the breakdown of the Rothrock State Forest in association with its proximity to public access roads. The designations become more primitive the further away the lands are from a public road.



**Figure 18-2.** Graphical depiction of ROS zones and their characteristics.

### *Visitor Use Monitoring*

The Rothrock as has recently been chosen to be the next forests to participate in the Visitor Use Monitoring Study in the next year or so. The VUM study is a joint effort between Pennsylvania State University, the US Forest Service, and DCNR Bureau of Forestry. This will study will provide a long-term systematic approach to better understand recreational visitors who use the State Forest. This includes understanding visitor's use patterns, as well as their expectations, spending patterns, desires and satisfaction levels. From results of the study we as forest managers hope to provide better recreational experiences while meeting forest management goals and objectives on a working forest.

## *Camping*

Rothrock State Forest is committed to a low-density dispersed recreational experience for forest visitors and recreational users. Based on this philosophy the following types of camping are available in the state forest in addition to the many camping opportunities offered by three of the four state parks found within the bounds of the forest.

### ***Primitive Backpack Camping***

No camping is permitted in Natural Areas, or at picnic areas, vistas, or Forest Foreman Headquarters. The only exception to this is the five designated camping sites within the Little Juniata Natural Area along the Little Juniata Water Trail.

### ***Motorized Camping***

There are eight designated motorized camping sites scattered throughout the state forest. These sites are set up, so a camper is near their vehicle, a picnic table and fire ring are provided. Individuals must obtain a camping permit from the District Office prior to camping on the sites. Up to date information on camping in the Rothrock State Forest is found in our "Camping" brochure. No water or sanitary facilities are provided.

### ***Group Camping***

Group camping is available on all of our motorized camping sites. Groups of 10 people or more are required to first obtain a Letter of Authorization (LOA) from the District Forester in addition to the camping permit. No water or sanitary facilities are provided.

### ***Organized Group Camping***

There are no organized group camping sites available on the Rothrock State Forest.

### ***Leased Campsite Users***

There are 348 state forest leased campsites on the Rothrock State Forest. These camps are scattered across most areas of the forest. There are none located on the Jack's Mountain, Lucy Furnace, or Locke Valley Tracts.

### **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 District Offices by filling out a 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. It should be understood that 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. Violations of the permit may result in the permit being terminated.

## 19) Communication, Education, and Interpretation

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 Rothrock State Forest takes an active role in communication through the following:**

**Communication:**

Media

- Web based – The district has a web page that offers an overview of what the forest district is made up of and includes maps and links to additional information that may be of value to potential forest visitors and people researching information regarding the Rothrock State Forest.
- Social – The district participates in social media outreach through FACEBOOK postings on the District's Facebook page. These postings cover everything from educational posts related to features and places in the forest district to public notices of potential impacts that visitors may encounter.

Printed

- Newspapers – The district is in contact with local newspapers near the forest for events, public awareness of forest related issues, and general information for the surrounding communities. The articles and notifications are initiated by either an outreach stemming from the district or bureau getting information out to the public or from interest articles completed by staff reporters of the publications. The primary newspapers that we correspond with are the Huntingdon Daily News and the Centre Daily Times.
- Newsletters – as time permits, the District produces an annual newsletter, sharing ongoing activities and information about the District to our stakeholders.
- Brochures – The district produces a multitude of brochures and informational packet available for the public. These include specific trail maps and brochures, firewood and mountain stone collection information, camping guidance, and Rothrock State Forest's plants and wildlife pamphlet.
- District Yearly Activity Plan – This document is available to the public and highlights the activity that are planned across the forest for the current year.

**Public Contact/Engagement**

- Fairs/Expos/Shows – District staff prepare and participate in outreach events at local fairs. Annually the district has booths at both the Huntingdon County Fair and the Grange Fair in Centre County. The district also staffs the booth for the Timber Expo along with Central Office Staff. Ag Progress Days is another large event that this district participates in by assisting with manning the booth to leading forestry related tours. Outreach and public contact are quite prevalent in this district since Penn State University is within our service area. Our service foresters and other district staff regularly engage in many of the forestry, environmental science based, and outdoor educational programs and events initiated by the university.
- Career Fairs – District Staff participate in career fairs each year at local colleges, universities, and high schools within Centre and Huntingdon Counties.
- DCNR Conservation Volunteer Trainings and Work Days

- “Walk in Penn’s Woods” – Each year the forest partners with other organizations and participates in this annual event.
- Displays/Exhibits
- Incidental (while staff is performing other duties)
- District office walk in
- Rangers
- Others – Job Shadow programs. Staff from the forest district participate with job shadowing programs that are required by local high schools for students interested in outdoor or environmental careers. These shadowing opportunities cover each of the program areas in the district including: Resource Management with the Foresters and Forest Technicians, Maintenance and Trades with the Forest Foremen, Equipment Operators, and Maintenance Repairmen positions, and the Forest Rangers.

### **Educational Presentations and Programs**

- Youth
  - Envirothon – Each year the service foresters participate in the local county level Envirothon’s for Centre and Huntingdon Counties along with the County Conservation Districts and other partners.
  - STEM in schools – District staff participates in the science, technology, engineering, and mathematics (STEM) in schools’ program.
  - FFA/4H
  - Scouts
  - Forestry related educational programs in schools
  - Project Learning Tree
  - Fire Prevention/Smokey Bear – District staff and District Forest Fire Wardens conduct well over 50 programs for Wildland Fire Prevention and Smokey Bear appearances each year. These include programs put on at local state parks, parades, school and daycare programs to name a few.
- Adult
  - Woodland Owner Associations
  - Forest Landowners
  - Civic Organizations
  - Natural Resource NGO’s
  - Public Tours
  - Local Community Shade Tree Commissions
  - Urban Forestry/Tree City/Arbor Day
  - Project Learning Tree Educator Workshops
  - Annual Forest Fire Warden Training

### **Interpretation**

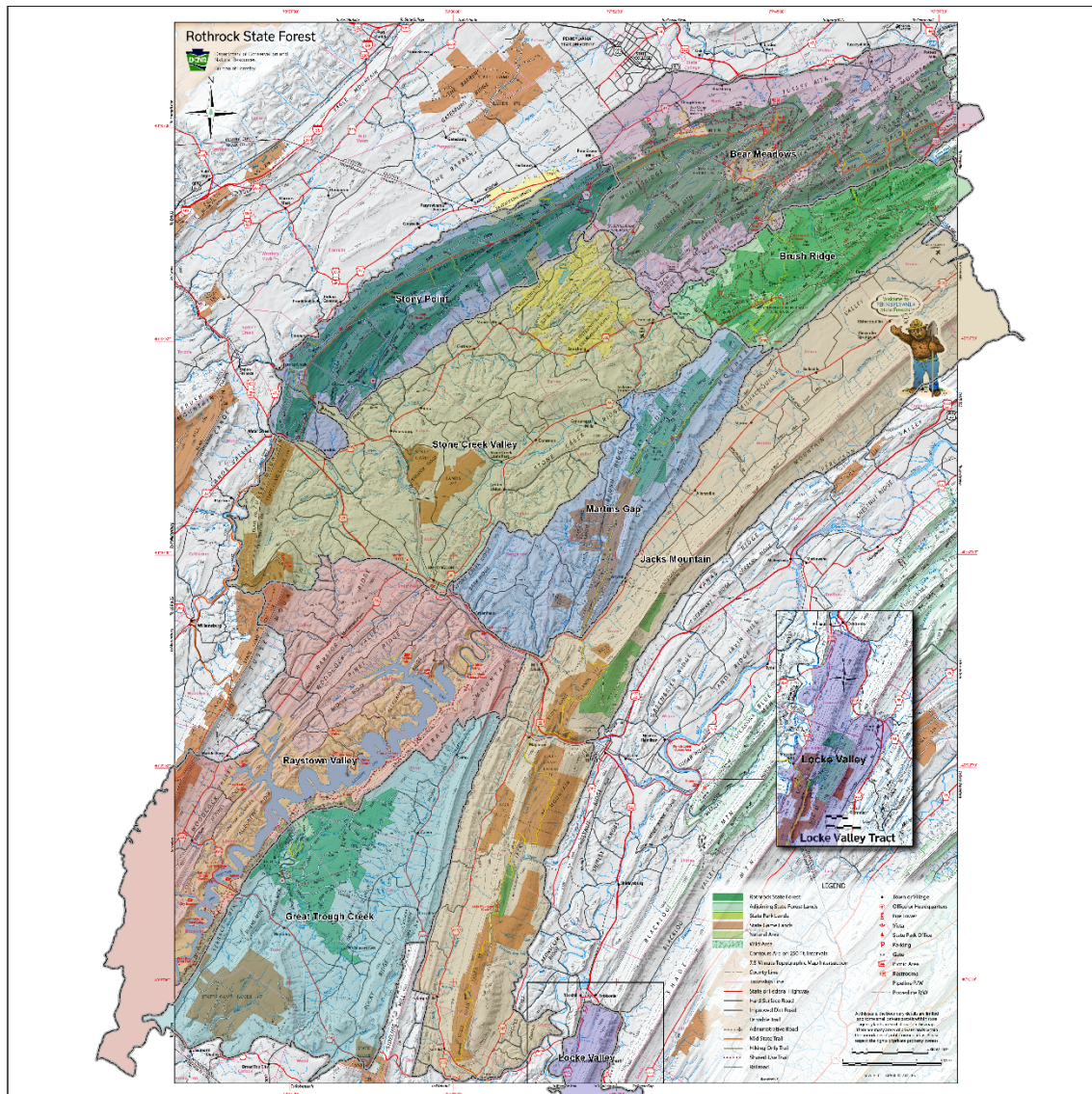
- Interpretive Wayside Panels/Kiosks/Trails
- Demonstration Areas
- RMC/District offices

## 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 Rothrock District are found below. Each LMU Plan contains three elements:

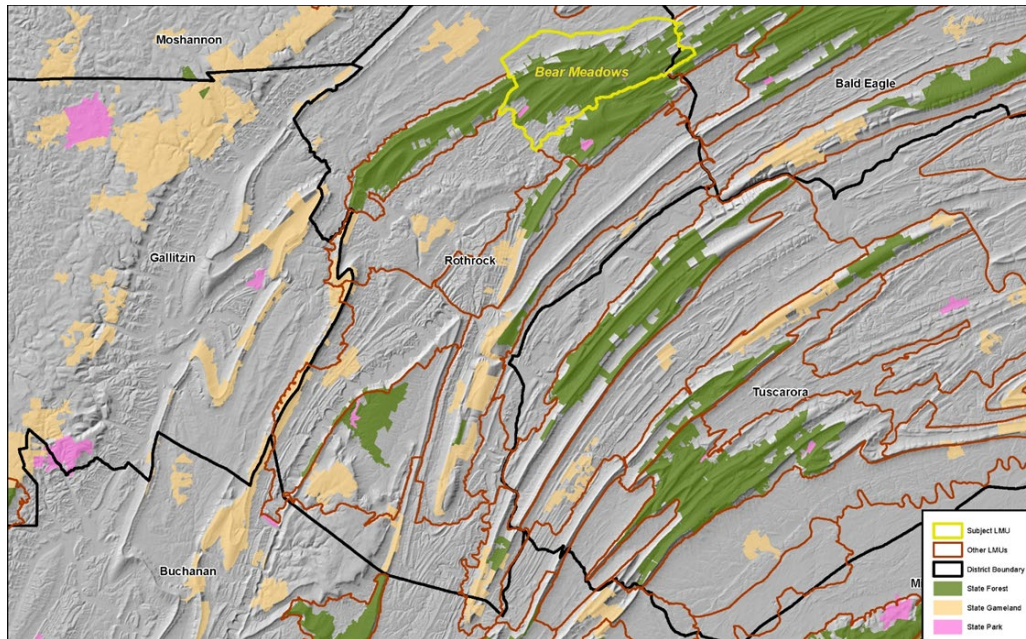
- Overview – a 1-2-page narrative describing the LMU and its important features;
- LMU Priority Goals – a list of points of emphasis for state forest land management within the LMU, similar to the District Priority Goals, but at the LMU level; and
- Profile – tables, charts, and accompanying text that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





# Bear Meadows

## Landscape Management Unit



**Bear Meadows LMU**



## Overview

The Bear Meadows LMU consists of 57,038 acres, with 34,877 of those acres being Rothrock State Forest Land. Private lands within this LMU are best described as a mix of rural and suburban homesteads, agricultural fields and horse farms. This LMU is located in the NE corner of Huntingdon County, a small section of South-Central Centre County and an even smaller section of the NW corner of Mifflin County, and is located, overall, in the Ridge and Valley ecoregion. This LMU is bounded by State Routes 45 and 322 to the north, SR26 to the west, TR1023 and Stone Creek Road to the south and SR 322 to the east. Note that approximately 1032 acres of this LMU are located east of 322 with most of this acreage classed as Bald Eagle State Forest. Portions of several mountain ridges traverse through this LMU, with Thickhead Mountain, Broad Mountain, Gettis Ridge, Greenlee Mountain and Rudy Ridge the most prominent. Portions of Boalsburg, Pine Grove Mills and Potters Mills are located within the Bear Meadows LMU.

By 1903, the majority of this LMU had been virtually stripped bare of trees to provide wood to make charcoal. One of the charcoal furnaces used to smelt iron, the Monroe Furnace, can be found at the intersection of SR 26 and SR 1029. Portions of two areas within this LMU, Alan Seeger Natural Area and Bear Meadows Natural Area, were spared the woodsman's axe. Stands of virgin white pine, eastern hemlock and yellow birch can be found in Alan Seeger. The "bog" of Bear Meadows has never been logged. In fact, age of the peat at 12 inches in the "bog" has been established as 780 years old (+ or – 150) and at 7 feet as much as 10,320 years (+ or – 290). The Bear Meadows natural area includes the rare plant communities of hemlock palustrine forest and black spruce-tamarack peatland forest. The presence of the conifers provides good raptor habitat.

Two Wild Plant Sanctuaries are found within this LMU. Also numerous rare or endangered plants, vernal pools, federally-listed plant species. This landscape is conducive for improving raptor habitat due to a significant conifer component.

Prior to 1953, State Forest Land within this LMU was known as Logan State Forest. This area later merged with other sections of state forest land and became known as Rothrock State Forest. In the 1930's and early 1940's, this LMU was host to numerous projects and activities associated with the Civilian Conservation Corps (CCC).

Over 90% of the forest resource within this LMU is between 111 and 120 years old. Being comprised of over 30,000 acres of mixed oak stands, created in large part due to harvesting, fire and the loss of the American Chestnut, has led to severe gypsy moth caterpillar infestations and subsequent widespread mortality since the 1980's to occur in this LMU. Recent infestations of emerald ash borer and hemlock wooly adelgid have also decimated these two-tree species in the Bear Meadows LMU. Canopy gaps created by insect invasions have led to establishment of some invasive and undesirable plant species, further decreasing the productivity and health of the forest within this LMU.

There are numerous mountain ridges within this LMU which contain thousands of acres of poor site growing conditions. Active management options are limited throughout this LMU due to these site conditions, insect related mortality and set aside areas such as Thickhead Mountain Wild Area, Big Flat Laurel Natural Area, Detweiler Run Natural Area, and of course, Bear Meadows and Alan Seeger Natural Areas.

The Bear Meadows LMU is a hotbed of recreational activity and opportunity and offers some of the most notable and cherished trails within the Rothrock State Forest. Whipple Dam State Park, Penn Roosevelt

State Park, Bear Meadows Natural Area, Alan Seeger Natural Area, Thickhead Mountain Wild Area, Colyer Lake Recreation Area, Tussey Mountain Ski Slopes, Jo Hays Vista, Musser Gap Trail and the Mid-State Trail can all be enjoyed and explored within this LMU. Galbraith Gap Trailhead, located just outside of State College, is one of our most popular starting areas for a wide range of recreational activities that are accessed from there, including mountain biking, hiking, trail running, road biking, and snowmobiling. Musser Gap Trailhead, off of Rte. 4, just south of State College, ties into the Greenway from the town and affords visitors a direct route into the forest. As part of the district's long-term recreational planning, we will be focused on creating a trail system from the Musser trailhead over Tussey Mountain to Whipple Dam State Park. In addition to that key trail we will have many other trails built and improved for a multitude of trail loops for our forest visitors.

## Priority Goals

- a) Continue to foster and advance positive working relationships with public and private groups interested in recreational activities and forest management activities such as: recreational trail improvements, invasives insect control at Bear Meadows and Alan Seeger Natural Areas, invasive plant control work. improving such activities.
- b) Continue with the district's EDRR (Early Detection Rapid Response) program of identification and immediate treatment of key invasive species such as: Japanese knotweed, poison hemlock, phragmites, glossy buckthorn and Japanese angelica tree to ensure that they are not permitted to colonize the many natural and wild areas within this LMU.
- c) Balancing of the age classes will continue in the forested areas that are not already specifically set aside for other purposes such as wild and natural areas. The great percentage of acreage in the 111-120 age class is within the wild and natural area zones and thereby will follow nature's course with minimal influence by humans.
- d) Implement the district's long-term strategic recreational trail plan that will satisfy both DCNR's and the user community's objectives for this LMU. This plan will showcase the development of a sustainable shared-use trail system within a working forest. This undertaking will be done through the partnering with the local Friends of Rothrock State Forest Group, Nittany Mountain Biking Association, Clearwater Conservancy, and other groups and organizations.
- e) Partner and work with Whipple Dam State Park Manager on developing a suitable trailhead and other suitable infrastructure more appropriate on a park that meets the needs of forest and park visitors and offers additional access to the network of trails on the forest.
- f) Continue the stream habitat work being done on Laurel Run with our partners, Trout Unlimited and USA Youth Fly-fishing Team, to improve overall stream habitat, improve and protect forest infrastructure, and educate school and other groups on the value of healthy streams and forests.
- g) To 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.

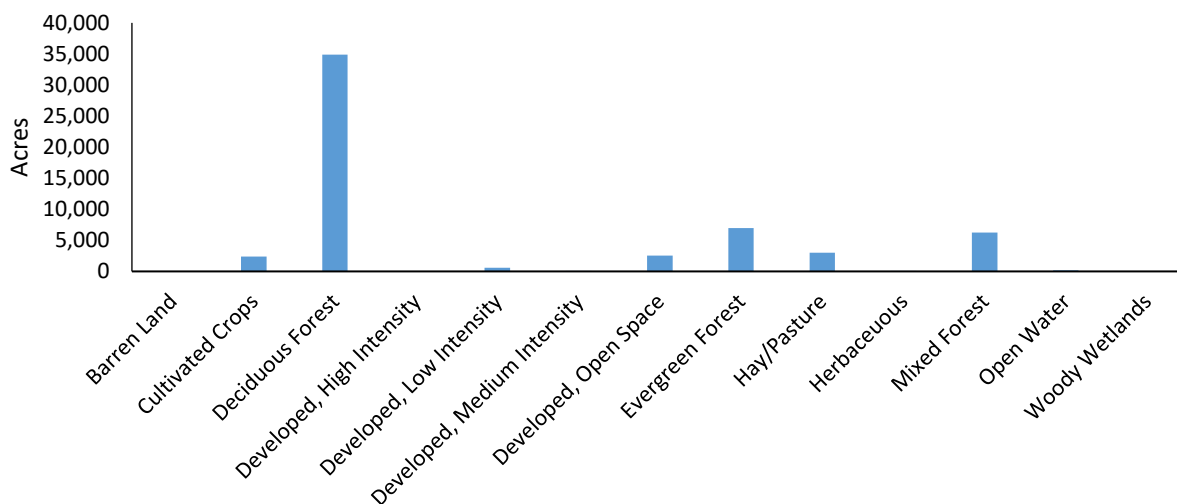


## Profile

	Acres
State Forest Land	34,877
LMU Total	57,083

**Ecoregion:** Ridge and Valley

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



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

Over 60% of land cover in this LMU is deciduous forest dominated by various oak species. Nearly 9% of land cover in this LMU is developed (open space, low, medium or high intensity), hay/pasture and cultivated crops, reflecting a strong influence of land usage by rural and suburban private landowners.

Road Category	Total Miles
Z1 - Public Use Road	70
Z2 - Drivable Trail	5
Z3 - Administrative Road	41
<b>Total</b>	<b>116</b>

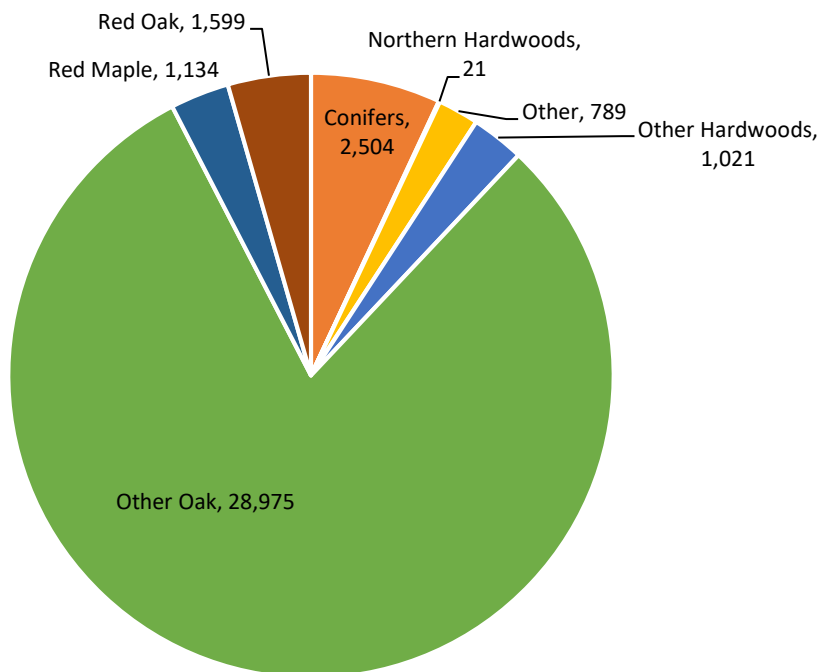
**Table 2.** Miles of roads by category on state forest land in this LMU. Road categories are described on p. 199 of the 2016 SFRMP.

The public use roads within this LMU are likely the most heavily utilized within the entire state forest. This road system allows for access for not only the public needs but also for efficient forest management activities such as wildland fire control, removal of forest products, treatment of invasive pests and vegetation, forest improvement projects and habitat work. Key public use roads within the LMU are: Bear Meadows Road, Stone Creek Road, Pine Swamp Road, Greenlee Road, Beidleheimer Road, Crowfield Road, Treaster Kettle Road, Krise Valley Road and Boal Gap Road.

Trail Category	Total Miles
Hiking	112
Biking	67
Equestrian	67
X-Skiing	70
ATV I	0
ATV II	0
Snowmobile/ Joint Use Road	65

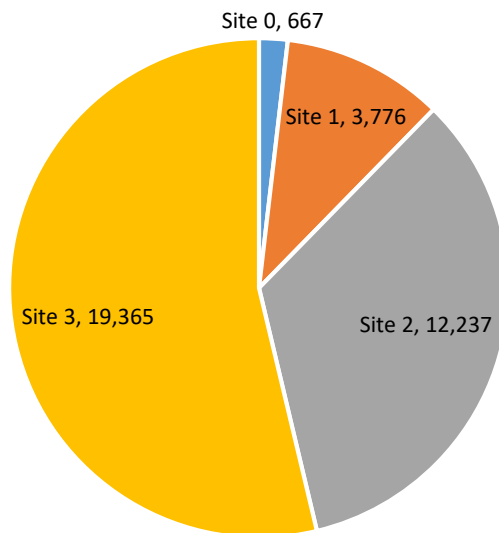
**Table 3.** Miles of trails on state forest land in this LMU open to various types of recreational use. Note that miles are not additive, and a single trail may be open to multiple use types. Shared-use trails, which make up the majority of trails on state forest land, are open to hiking, biking, horseback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

An extensive trail network has been established within this LMU. Numerous recreational opportunities are possible due to this network, enhancing both passive and intensive activities. If ever there was the true description of multiple use management, Bear Meadows LMU would be the shining example. Some of the key trails currently located within this within this LMU are: Lonberger Path, Bear Meadows Loop Trail, North Meadows Road, Long Mountain Trail, Tussey Mtn Trail, Little Shingletown Trail, Croyle Trail Lower Trail to name a few. In addition to these we have portions of two long-distance hiking trails, the Mid-State Trail and the Standing Stone Trail. It should also be noted that as the District's long-term recreation trail plan is implemented there will be nearly 60 miles of new professionally built shared-use trails added to this and adjacent LMU areas.



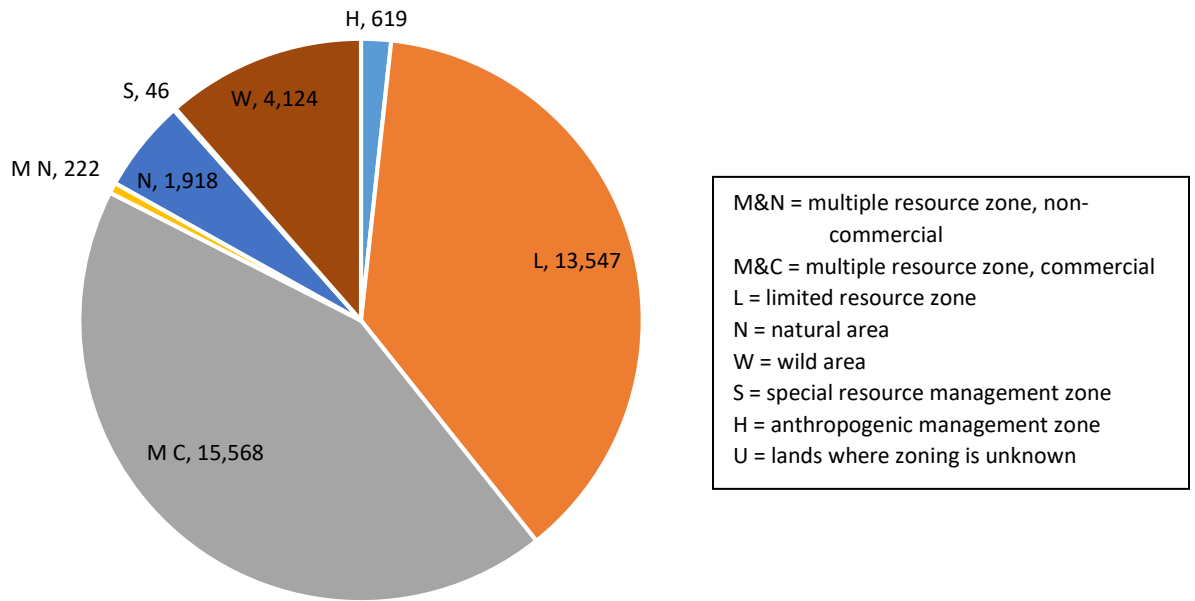
**Figure 2.** Acreage of state forest land in this LMU by aggregated forest type. The forest types are described on p. 108 of the 2016 SFRMP.

Approximately 80% of the aggregated forest type of this LMU is “other oak”, which equates to a mix of white oak and chestnut oak species.



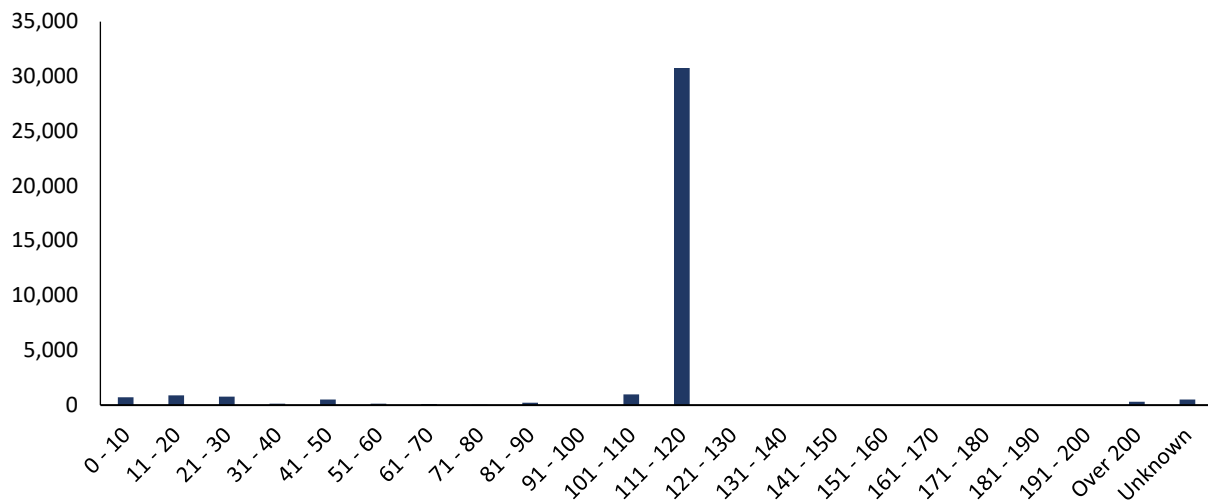
**Figure 3.** Acreage of state forest land in this LMU by site class. Site classes denote the potential quality of the growing site. “Site 0” indicates non-forested lands or forested lands where the vegetation has not yet been typed. Other site classes are described on p. 53 of 2016 SFRMP.

Nearly 60% of the acres in this LMU are Site 3, or poor production growing sites in relation to timber quality. This is quite common in the ridge and valley areas of Pennsylvania.



**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.

Slightly less than 50% of this LMU is classed as Multiple Resource Commercial due to poor growing sites (ridges, steep and rocky areas) and wild and natural set asides.



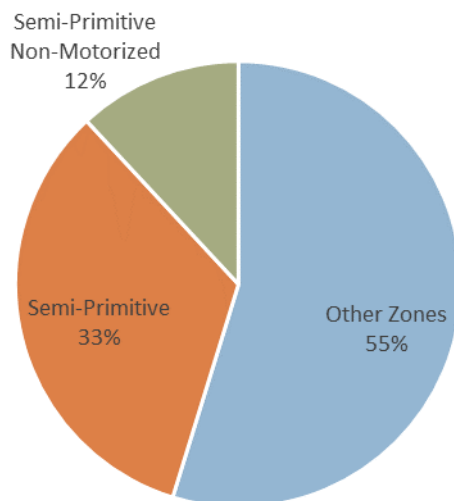
**Figure 5.** Acres of state forest land in this LMU by forest age classes.

Balancing of the age classes will continue in the forested areas that are not already specifically set aside for other purposes such as wild and natural areas. The great percentage of acreage in the 111-120 age class is within the wild and natural area zones and thereby will follow nature's course with minimal influence by humans. The remaining acreages will continue to be managed as a working forest with a balanced age class structure.

Class	Total Miles
High Quality	66
Perennial Cold Water	0
<b>Total</b>	<b>66</b>

**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.

High quality stream conditions are important to a wide array of flora and fauna. Recreational activities such as fishing are also positively impacted by the quality of the water resource. Continued stream habitat work will be implemented on streams in this LMU in cooperation with our partners. We will continue this work on Laurel Run from the headwaters through Whipple Dam S.P. and other streams as they are identified as needing habitat work. Notable high quality designated streams within the LMU are: Laurel Run, Shaver Creek, Standing Stone Creek, Galbraith Gap Run, Deitweiler Run, and Greenlee Run.



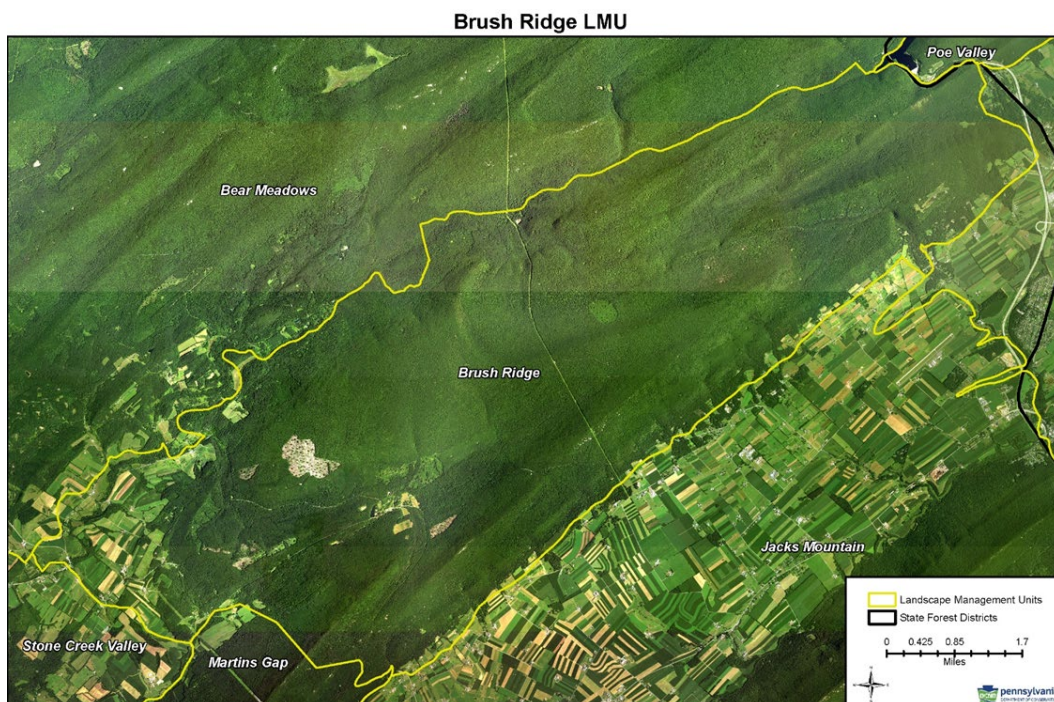
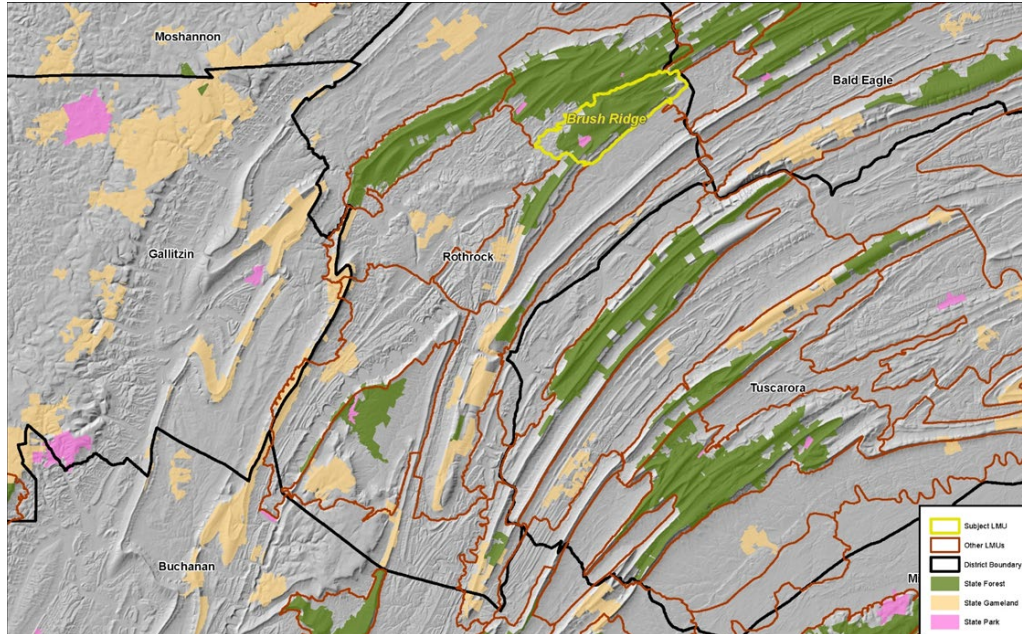
**Figure 6.** Acres in 2012 of state forest land in this LMU by Recreation Opportunity Spectrum (ROS) classifications. ROS is an inventory system developed by the U.S. Forest Service, to characterize land by types of recreation experiences. ROS is described on p. 42 of the 2016 SFRMP. "Other Zones" refers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

Recreation Opportunity Spectrum (ROS) is an inventory system used to measure and characterize land by types of recreation experience. ROS classifications range from “Primitive” to “Developed” land characteristics. Nearly 52% of this acreage is classified as “Other” meaning these areas have more man-made occurrences and infrastructure. Approximately 48% of land acreage within this LMU is classified as “Semi-Primitive” and “Semi-Primitive Non-Motorized” meaning an environment with low to moderate man-made occurrences.



# Brush Ridge

## Landscape Management Unit



## Overview

The Brush Ridge LMU is a unique landscape in the north-eastern portion of Rothrock State Forest located within the Ridge and Valley Ecoregion. This LMU is 26,030 acres in size, composed of 18,382 acres of Rothrock State Forest, 16 acres of Bald Eagle State Forest, and approximately 7,632 acres of private ownership. It is located in portions of both Mifflin and Huntingdon Counties. This LMU includes Stone Mountain along its southern and eastern boundary, Broad Mountain in the west and Spruce Mountain in the northeast. Numerous smaller ridges included in the LMU are Brush Ridge, Buck Ridge, and Slate Ridge. Stone Creek Road forms the northern boundary of the LMU. Elevations within this LMU reach approximately 2,300' at Greenwood Fire Tower on Broad Mountain. No State Game Lands or Federal Lands are found in the LMU. Greenwood Furnace State Park is found in the southern portion of the LMU. This LMU is represented by forested mountains, ridges and narrow valleys, the only exception being a small acreage of Stone Creek Valley in the west near the town of McAlevys Fort.

The forests, primarily dry oak heath on southern exposures and red oak forest types on north faces, were logged by both the timber and charcoal industries by the late 1800s. Wildfires were common place in this region, partly due to the production of charcoal. Other drastic changes to the forest composition included the elimination of the American chestnut in the 1930s and Gypsy Moth infestations beginning in the late 1970s and 1980s. The forested areas of the LMU have been logged over once with some areas being logged multiple times since the early 1900s. Exceptions include rocky, steep slopes with limited access and have been designated as limited resource zones.

Notable streams in the narrow drainages include Stone Creek, East Branch Stone Creek, Black Lick Run, Lingle Creek, and Tea Creek. Stone Creek supports a native trout population, however has also been stocked with trout by the PA Fish and Boat Commission. Aquatic organism passage and culvert work for stream crossing is evaluated and planned for at each opportunity of replacing or upgrading stream culverts.

The Brush Ridge LMU is in the Greenwood Division of Rothrock State Forest. This area gets its name from Greenwood Furnace, an iron furnace located in what is now known as Greenwood Furnace State Park. The iron furnace is still standing, along with the blacksmith shop, iron master's home, a church and other buildings of the period. The ore banks and tramway trail are located on SFL outside of the park boundary. The Greenwood fire tower is also a notable feature within this LMU. It was originally constructed in 1921 and is a 60-foot tall Aeromotor style tower. The tower is no longer being utilized as a forest fire lookout and is currently a destination point for visitors when hiking.

A network of shared-use trails spans across the entire Brush Ridge LMU. Volunteer groups maintain these trails which include the Ross Trail, Chestnut Springs Trail, Brush Ridge Trail, Indian Trail, Spruce Mtn. Trail, Sassafras Trail and Spencer Trail to name just a few. The Standing Stone Trail, part of the Great Eastern Trail, traverses through Greenwood Park in the southern portion of the LMU, then becomes the Greenwood Spur as it travels north near Greenwood Fire Tower. In addition to hiking and biking, other recreational activities in the area include hunting, fishing, snowmobiling, birding, camping, and just enjoying nature. It is important to note that the Brush Ridge LMU is within the Rothrock State Forest & Stone Mountain Audubon IBA, designated for old growth and raptor migration.

Rothrock State Forest is a working forest. Sustainable silvicultural practices including both even age and uneven age management provide local mills with a source of timber and pulpwood, while ensuring a healthy forest for generations to come.

## Priority Goals

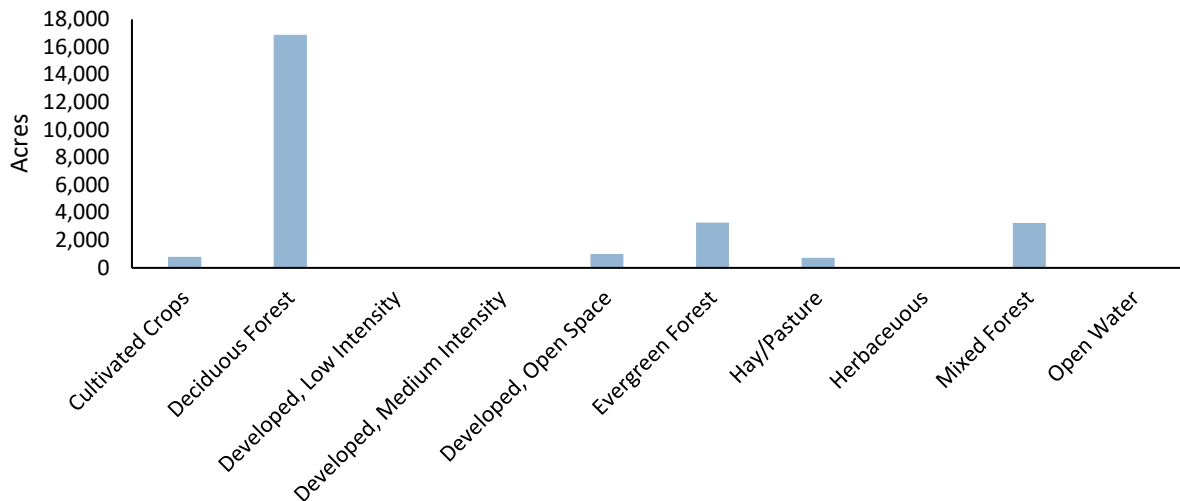
- a) Continue to implement sound silvicultural practices in order to balance the age classes, provide a source of timber and pulpwood, promote young successional forest habitat, and improve forest health. Timber management is a focus of the Brush Ridge LMU due to excellent access to multiple use-commercial stands across sites 1, 2, and 3. Brush Ridge LMU is centrally located in the state and provides a local source of timber products to surrounding sawmills. Interest in timber sales from this LMU is evident in the competitive bidding received on both sawtimber and pulpwood sales.
- b) Continue to foster relationships with research communities. The Brush Ridge LMU is located within driving distance to Penn State University and Juniata College. The LMU has received interest from researchers focusing on invasive species, vernal pools, and timber rattlesnakes, to name a few.
- c) Continue to monitor forest health issues and implement Integrated Pest Management strategies as needed. While the Brush Ridge LMU shares forest health issues common across this part of state, it does harbor an invasive shrub community from wildlife plantings of the 1970's. Continue with the district's EDRR (Early Detection Rapid Response) program of identification and immediate treatment of key invasive species such as: Japanese knotweed, poison hemlock, phragmites, glossy buckthorn, and Japanese angelica tree to work to ensure they are not permitted to colonize and become established on State Forest Land within this LMU.
- d) The Greenwood Fire Tower early successional habitat area focused on creation of high-quality ruffed grouse habitat on approximately 900-acres over the next 10 years. This work is in partnership with Pennsylvania Game Commission and the Ruffed Grouse Society and includes harvesting of the poor-quality timber and various planting projects on the site.
- e) Approximately 50 herbaceous openings containing barberry, autumn olive, honeysuckle, and multiflora rose are scattered across SFL in this LMU. The district plans to herbicide invasive species on these openings and either expand the ones located in areas that are most likely to be successful and reclaim other to forest habitats in conjunction with silvicultural treatments. Currently we are looking to retain 10 locations and improve, rehabilitate these openings with native shrub and forb plantings.
- f) Continue to build relationships with the recreation communities in the area and the Standing Stone Trail Club.

## Profile

	Acres
State Forest Land	18,382
LMU Total	26,030

**Ecoregion:** Ridge and Valley

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



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

The majority of the deciduous forest acres in this LMU are comprised of mostly of mixed oak/ hickory forest type. Chestnut oak typically dominates the poorer sites at higher elevations while mixed oak (red and white oak) stands are found on lower slope positions on better sites. The evergreen forest is primarily hemlock or white pine/hemlock dominated, with a few plantations of mixed spruce/pine near Greenwood Furnace State Park. Pitch pine is common on poorer sites, however not in pure stands.

Road Category	Total Miles
Z1 - Public Use Road	43
Z3 - Administrative Road	19
<b>Total</b>	<b>62</b>

**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.

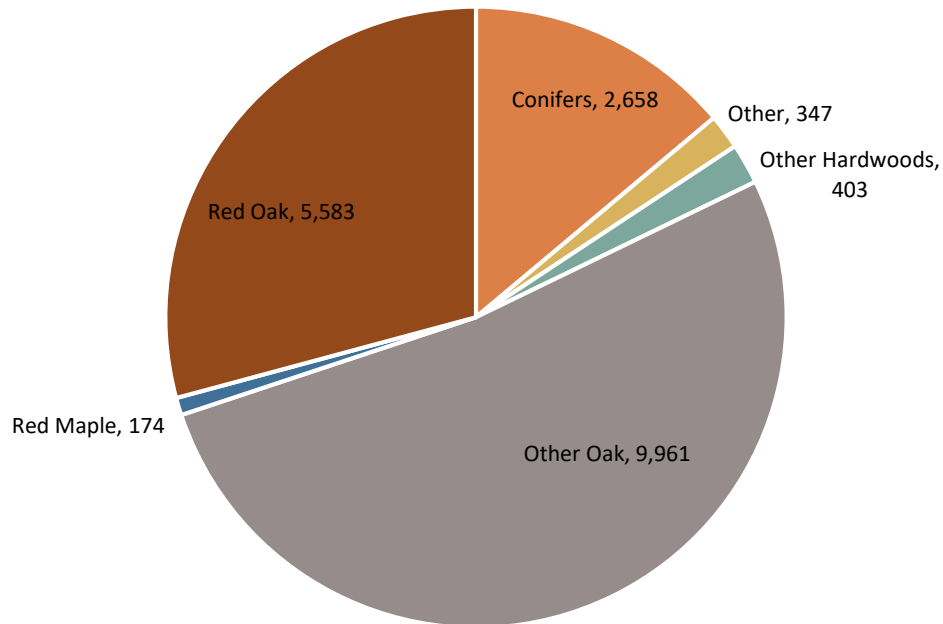
Public vehicular access on the LMU is exceptional. Roads are maintained to a high standard and are composed of either conventional limestone aggregate or DSA. Stone Creek Road forms the northern boundary of the LMU and provides access from the eastbound lane of route 322. Seeger Road provides access to the Greenwood Fire Tower and Alan Seeger NA, while Kettle Road offers views to the north from its vista.



Trail Category	Total Miles
Hiking	72
Biking	62
Equestrian	60
X-Skiing	62
ATV I	0
ATV II	0
Snowmobile/ Joint Use Road	44

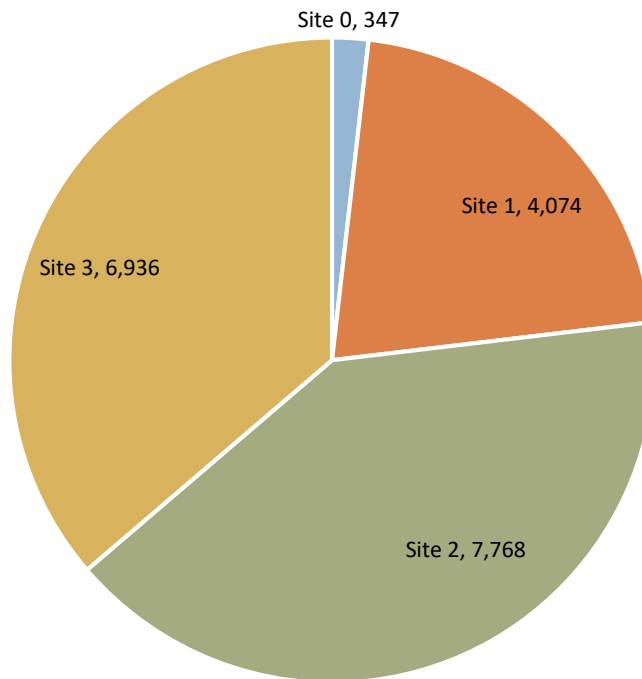
**Table 3.** Miles of trails on state forest land in this LMU open to various types of recreational use. Note that miles are not additive, and a single trail may be open to multiple use types. Shared-use trails, which make up the majority of trails on state forest land, are open to hiking, biking, horseback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

A vast network of recreational trails provides a variety of opportunities to navigate through the forest. Some of the more prevalent recreational activities in this LMU include mountain biking, hiking, horse-back riding, and snowmobiling in the winter.



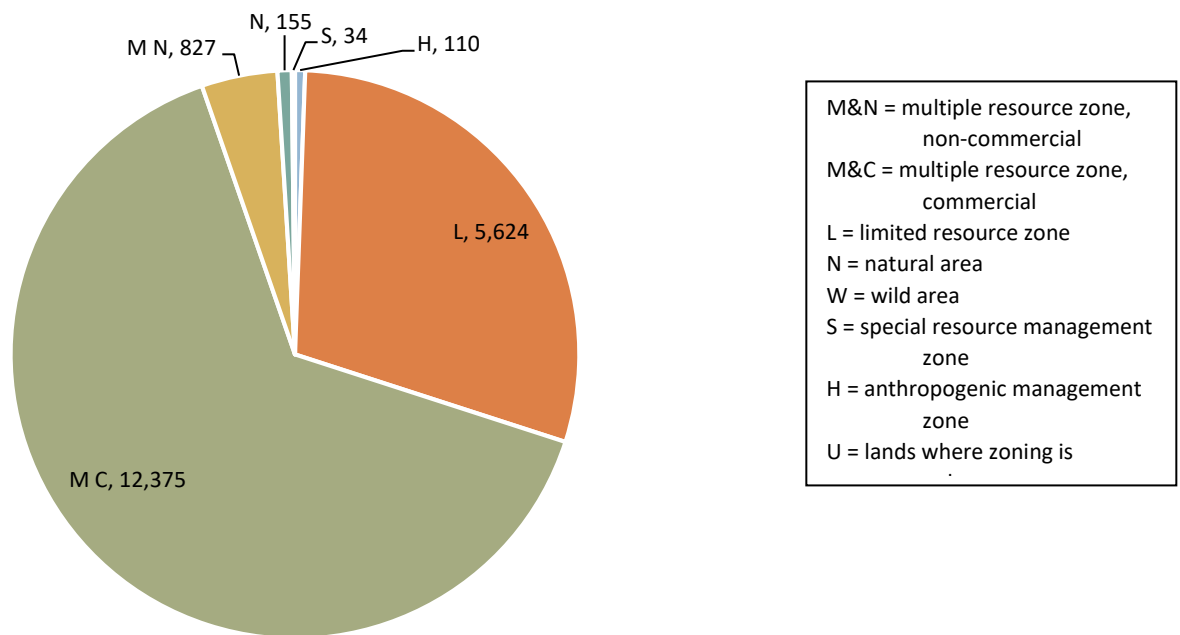
**Figure 2.** Acreage of state forest land in this LMU by aggregated forest type. The forest types are described on p. 108 of the 2016 SFRMP.

The 'other oak' categories are typically chestnut oak or white oak dominated types.



**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.

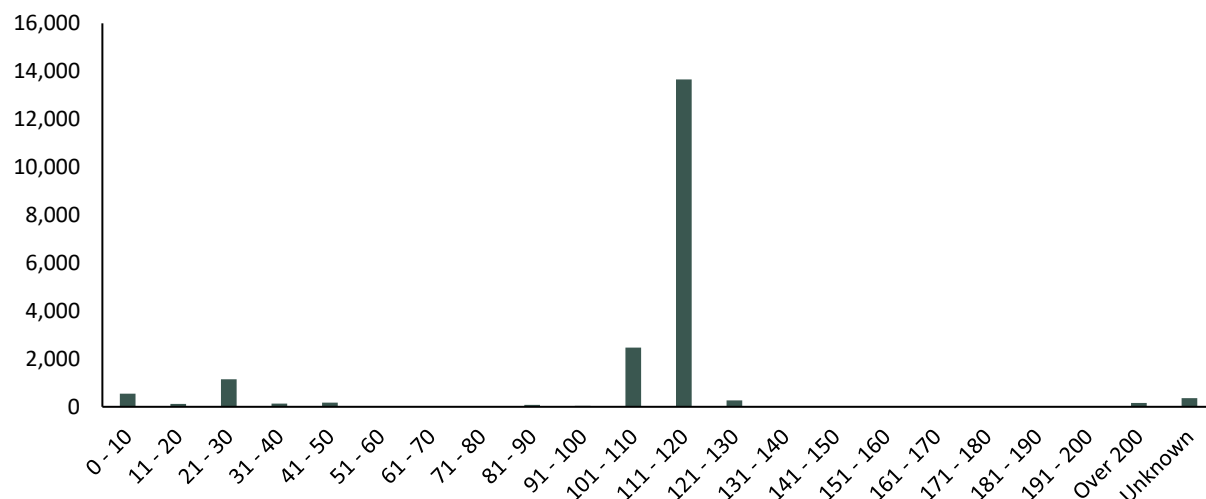
Site 1 areas are often located in narrow valleys associated with riparian systems. Site 2 and 3 areas are mid slope to ridge or mountain top topographic positions. Much of this area is available for timber management, exception being those areas too rocky or steep for equipment (Figure 4.)



**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.

Much of the LMU is accessible for management and emerging pulpwood markets have increased commercial acreage.





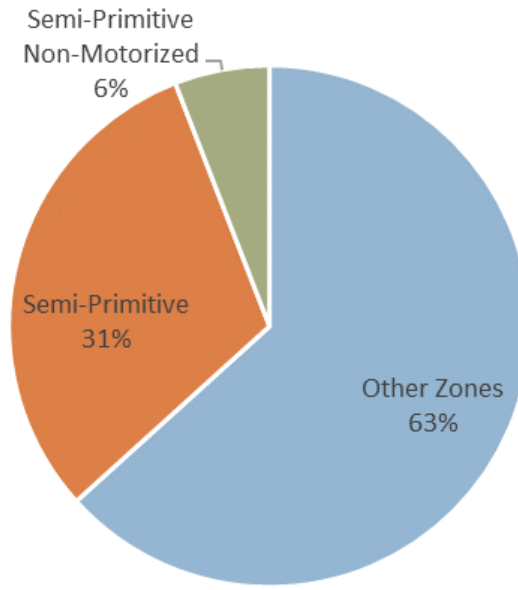
**Figure 5.** Acres of state forest land in this LMU by forest age classes.

Much of the Brush Ridge LMU remains in the 101-120-year-old age classes. Efforts continue to balance the age classes in this LMU area for the foreseeable future.

Class	Total Miles
High Quality	33
<b>Total</b>	<b>33</b>

**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.

High quality streams improve water quality for human sources, as well as provide wildlife habitat and recreational opportunities. Standing Stone Creek offers both native and stocked trout fishing opportunities. Some notable high-quality streams in this LMU are: Standing Stone Creek, Lingle Creek, Tea Creek, East Branch Standing Stone Creek, and Laurel Creek.

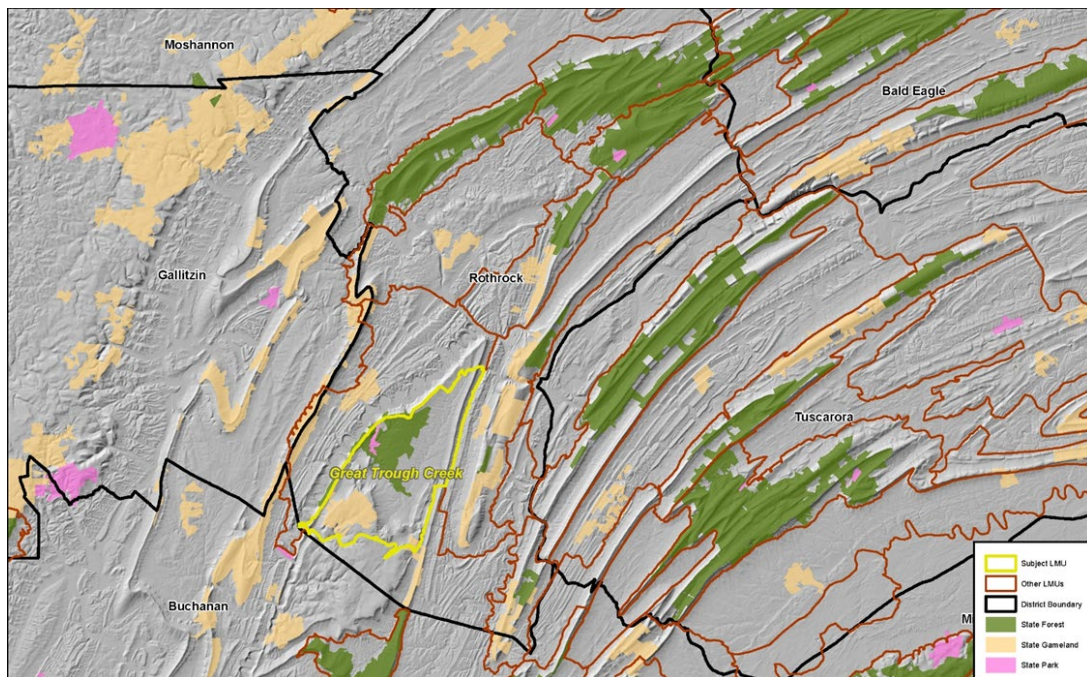


**Figure 6.** Acres of state forest land in this LMU by Recreation Opportunity Spectrum (ROS) classifications in 2012. ROS is an inventory system developed by the U.S. Forest Service, to characterize land by types of recreation experiences. ROS is described on p. 42 of the 2016 SFRMP. “Other Zones” refers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

Recreation Opportunity Spectrum (ROS) is an inventory system used to measure and characterize land by types of recreation experience. ROS classifications range from “Primitive” to “Developed” land characteristics. The majority of the total public land acreage is classified as “Other” meaning these areas have more man-made occurrences and infrastructure. The remaining public land acreage within this LMU is classified as “Semi-Primitive Non-Motorized” and “Semi-Primitive” meaning an environment with low to moderate man-made occurrences.

# Great Trough Creek

## Landscape Management Unit



Great Trough Creek LMU



## Overview

The Great Trough Creek LMU is a unique landscape in the southeastern portion of Rothrock State Forest located within the Ridge and Valley Ecoregion. This LMU is 58,074 acres in size, though less than 17 percent (9701 acres) is comprised of state forest land. It is located entirely within Huntingdon County, and is bounded by Terrace Mountain on the western side of the unit. The LMU is named for the largest stream in the unit which drains much of the watershed that lies within it. Elevations within this LMU range from the valley floor to approximately 1800 feet. It includes State Game Lands 67 and portions of State Game Lands 121 and Army Corps of Engineers property at Raystown Lake. This LMU is represented by forested mountains and hills with agricultural lands in the valleys.

The forests, primarily listed as “other oak”, were logged by both the timber and charcoal industries through the late 1800s. Wildfires were common place in this region, partly due to the production of charcoal. Other drastic changes to the forest composition included the elimination of the American chestnut in the 1930s and Gypsy Moth infestations beginning in the late 1970s and 1980s. The forested areas of the LMU have been logged over once with some areas being logged multiple times since the early 1900s except for mountain tops and areas with limited access.

Intensive forest management is evident across the “Trough Creek” tract of state forest land that lies within this unit. Many stands have been successfully regenerated with desirable tree species while other, mature, stands are generally well stocked with advanced regeneration which will facilitate future timber management activities. Over the last decade there have been 2 small (adjacent) tracts of land added to the state forest which were acquired in 2007 and formerly owned by the Glatfelter Pulp and Paper Company.

The Trough Creek Tract is easily accessible by SR. 829 to the east and SR. 994 to the south. Administrative roads provide great access for the public throughout this tract of state forest land. Recreational opportunities about in Trough Creek which include hunting, fishing Trough Creek (which is a stocked trout stream), hiking, biking, horseback riding, camping, snowmobiling and more. A small portion of the 1,703-acre Trough Creek Wild Area is also located in this unit where Trough Creek empties into Raystown Lake. A Wild Area is an area set aside to protect the forest’s wild character and provide backcountry recreational opportunities.

Trough Creek State Park is situated within the bounds of the Trough Creek tract of state forest land. This 541-acre State Park is a scenic gorge formed as Great Trough Creek cuts through Terrace Mountain before emptying into Raystown Lake. Rugged hiking trails lead to wonders like Balanced Rock and Rainbow Falls. The park was opened in 1936 when the Paradise Furnace CCC camp created it and is steeped with history. This location once had a gristmill in 1789 to grind grain, a bloomery in 1789 (and another in 1818) to smelt iron, and the “Trough Creek Furnace” which produced far more pig iron than the bloomeries. All in all, this park is rich in history, as is the southern portion of the LMU where coal mining was quite common through the nineteenth and first half of the twentieth centuries.



## Priority Goals

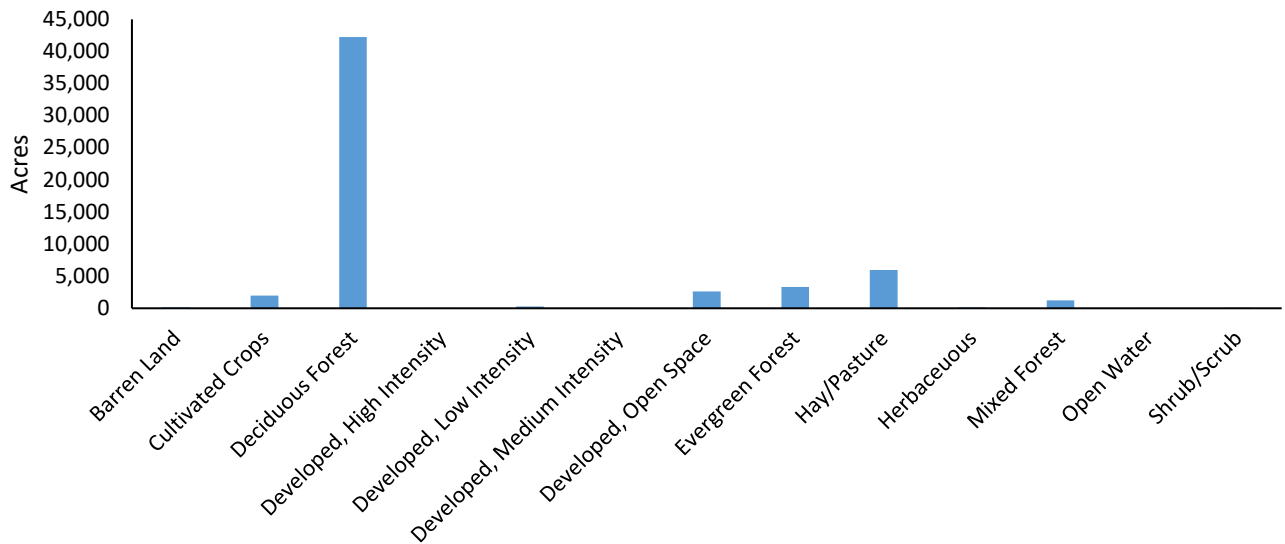
- a) Continue to foster a good working relationship with the U.S. Army Corps at Raystown Lake as well as Trough Creek State Park.
- b) Continue to apply sound silvicultural practices to balance the age classes, improve forest health, create young successional wildlife habitat and provide sawtimber and pulpwood to timber buyers.
- c) Continue to monitor forest health issues and implement Integrated Pest Management strategies as needed particularly with the district's EDRR (Early Detection Rapid Response) program of identification and immediate treatment of key invasive species such as: Japanese knotweed, poison hemlock, phragmites, glossy buckthorn, and Japanese angelica tree to work to ensure they are not permitted to colonize and become established on State Forest Land within this LMU.
- d) This area has had Gypsy Moth defoliation numerous times throughout the last few decades and those stands most affected will be given first priority for silvicultural activities. Future monitoring for current and impending forest health threats will be ongoing.
- e) Maintain existing recreation infrastructure on State Forest Land such as hiking, equine, and snowmobile trails.

## Profile

	Acres
State Forest Land	9701
LMU Total	58,074

**Ecoregion:** Ridge and Valley

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



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

The majority of the deciduous forest acres in this LMU are comprised of mostly of mixed oak. The areas that are comprised of hay/pasture land are typically found in the private farmland generally located in the valleys.

Road Category	Total Miles
Z1 - Public Use Road	24
Z3 - Administrative Road	19
<b>Total</b>	<b>44</b>

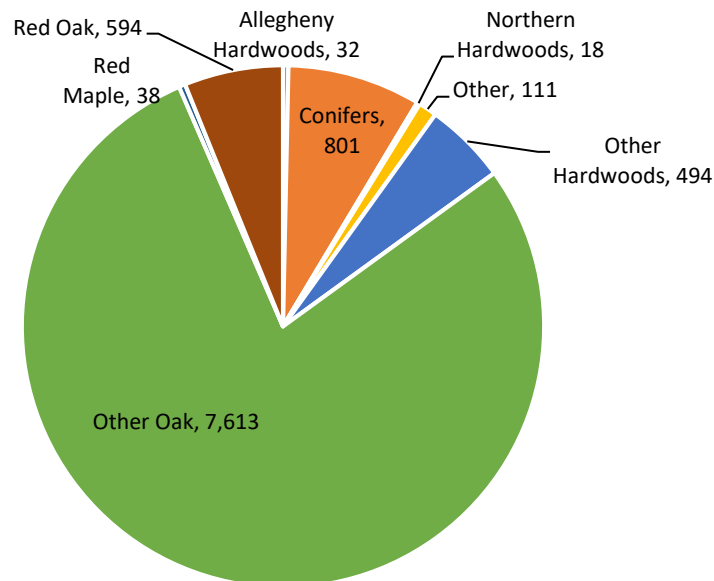
**Table 2.** Miles of roads by category on state forest land in this LMU. Road categories are described on p. 199 of the 2016 SFRMP.

Public use State Forest Roads such as Tar Kiln, John Bum, and Fink (to name a few) are high quality limestone (gravel) roads open to travel for properly licensed motor vehicles. Administrative roads are minimally maintained, gated roads that are open to the public, however they may not be accessed with vehicles.

Trail Category	Total Miles
Hiking	25
Biking	22
Equestrian	22
X-Skiing	22
ATV I	0
ATV II	0
Snowmobile/ Joint Use Road	44

**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.

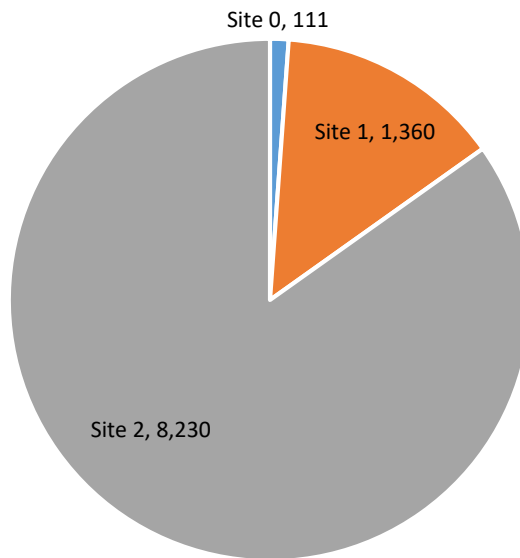
Various types of trails are open to the public throughout state forest land in this LMU.



**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.

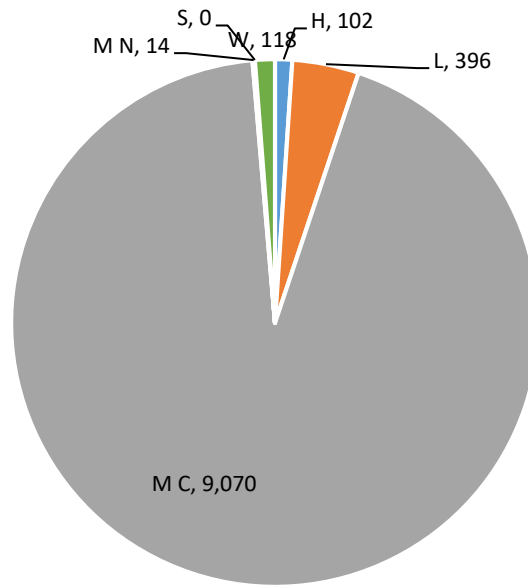
This is a typical mixed oak forest within the Ridge and Valley Ecoregion. “Other oak” typically comprises a mix of red and white oak types.





**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.

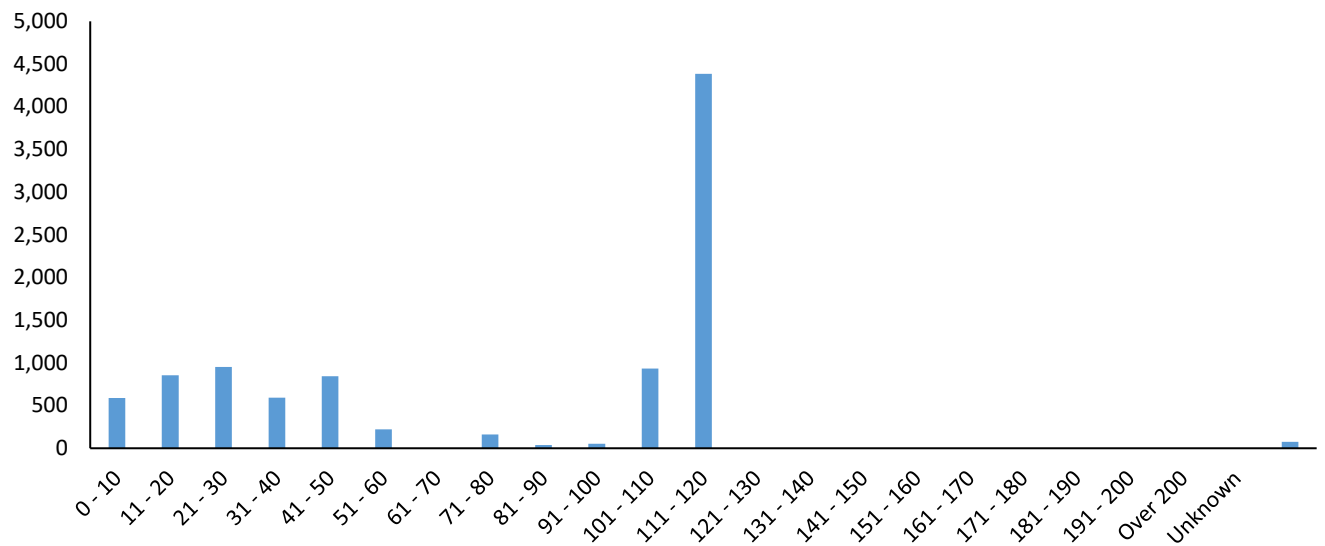
The majority of the state forest land within this LMU is generally high in elevation and relatively flat with a few moist coves.



**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.

The vast majority of the land is flat and easily assessable so most of the stands are multiple use and commercial.

#### Forest Age Class Distribution



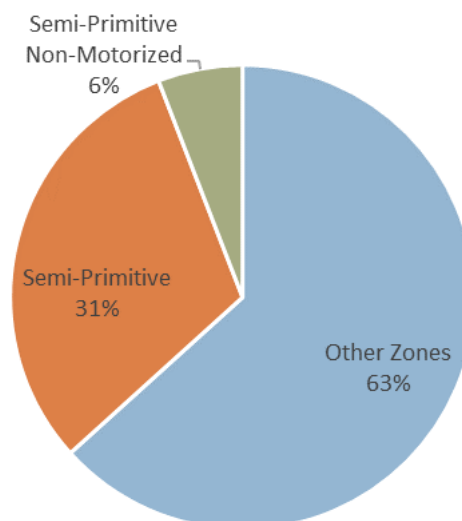
**Figure 5.** Acres of state forest land in this LMU by forest age classes.

This area has been well managed over the last 50-60 years, but there are still plenty of older stands that need managed in order to balance the age classes.

LMU Name	Great Trough Creek
Class	Total Miles
High Quality	33
<b>Total</b>	<b>33</b>

**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.

Great Trough Creek, the creek for which the LMU is named after is one of the largest streams in the unit.



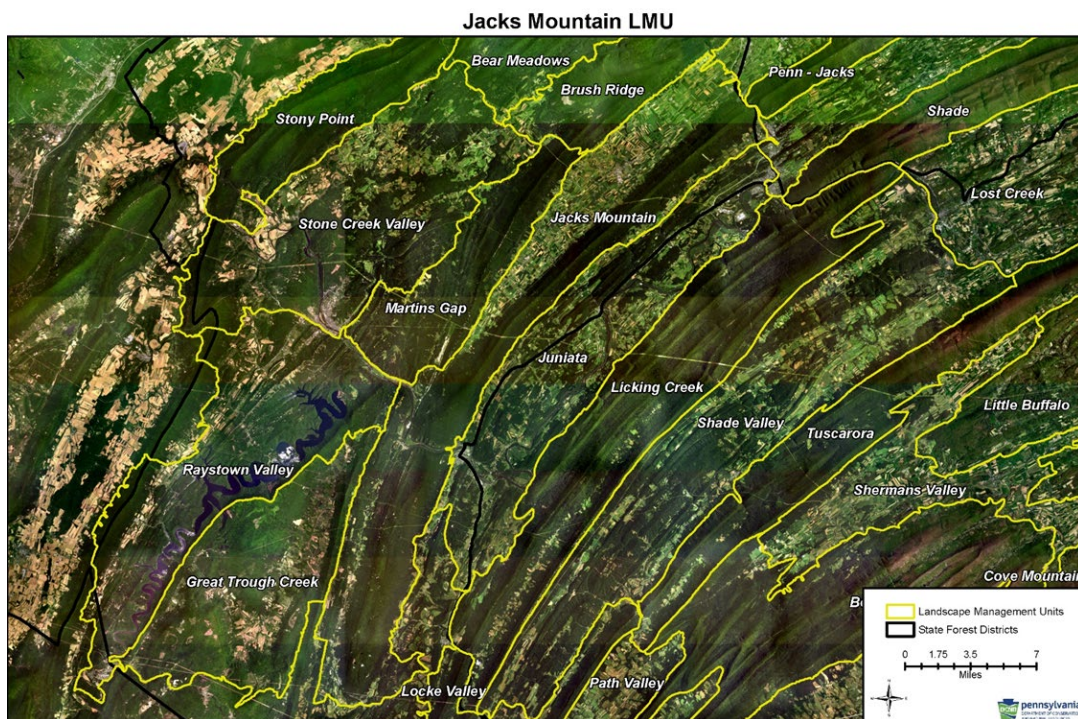
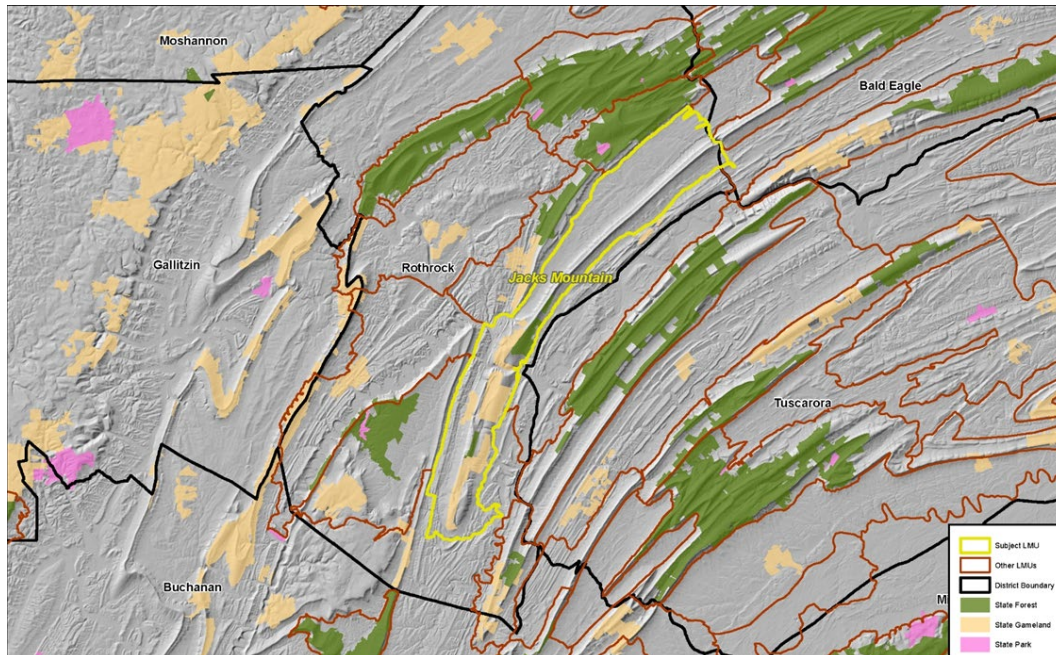
**Figure 6.** Acres of state forest land in this LMU by Recreation Opportunity Spectrum (ROS) classifications in 2012. ROS is an inventory system developed by the U.S. Forest Service, to characterize land by types of recreation experiences. ROS is described on p. 42 of the 2016 SFRMP. “Other Zones” refers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

Recreation Opportunity Spectrum (ROS) is an inventory system used to measure and characterize land by types of recreation experience. ROS classifications range from “Primitive” to “Developed” land characteristics. The majority of the public land acreage within this LMU is classified as “Other” meaning

that these areas have more man-made occurrences and infrastructure. The remaining public land acreage is made up of areas that have less man-made occurrences and infrastructure.

# Jacks Mountain

## Landscape Management Unit



## Overview

The Jacks Mountain LMU is a unique landscape in the eastern portion of Rothrock State Forest located within the Ridge and Valley Ecoregion. This LMU is 103,993 acres in size, though less than three percent, 2,873 acres of the land is state forest. It is located in portions of both Mifflin and Huntingdon Counties and stretches along part of Jacks Mountain Range. Elevations within this LMU range valley floor up to 2,300'. It includes all or portions of State Game Lands 99(4,470ac.), 71 (5,204ac.), and 112 which represents a large area of the southern portion of the LMU. This LMU is represented by forested areas along the ridges and heavily utilized agricultural lands in the valleys passing through several Amish communities.

The forests, primarily dry oak heath and hickory forest types, were logged by both the timber and charcoal industries by the late 1800s. Wildfires were common place in this region, partly due to the production of charcoal. Other drastic changes to the forest composition included the elimination of the American chestnut in the 1930s and Gypsy Moth infestations beginning in the late 1970s and 1980s. The forested areas of the LMU have been logged over once with some areas being logged multiple times since the early 1900s except for mountain tops with limited access.

The Kishacoquillas Valley makes up a considerable portion of the LMU. That valley was settled by the Amish beginning in 1791. This community is the third oldest Amish settlement still in existence. The vast majority of the valley is still heavily farmed by both Amish and other landowners.

A major component of the underlying geologic material of Jacks Mountain is composed of Oriskany Sandstone. US Silica mining owns large acreages of land within this LMU that they actively remove the Oriskany sandstone material for various global markets.

The Standing Stone Trail, part of the Great Eastern Trail, traverses the ridgetop of Jacks Mountain in the southern portion of the LMU. Key features along this section of trail include the Thousand Steps, Throne Room Vista, and Butler Knob Adirondack shelter. Other recreational activities in the area include hiking, biking, hunting and fishing.

Jacks Mountain Fire Tower is located on the Butler Knob Tract of the Rothrock State Forest. From the 1930's through the 1980's, this tower was used for fire observation and overlooks both Hill Valley and Hares Valley. This tower is no longer utilized for fire observation.



## Priority Goals

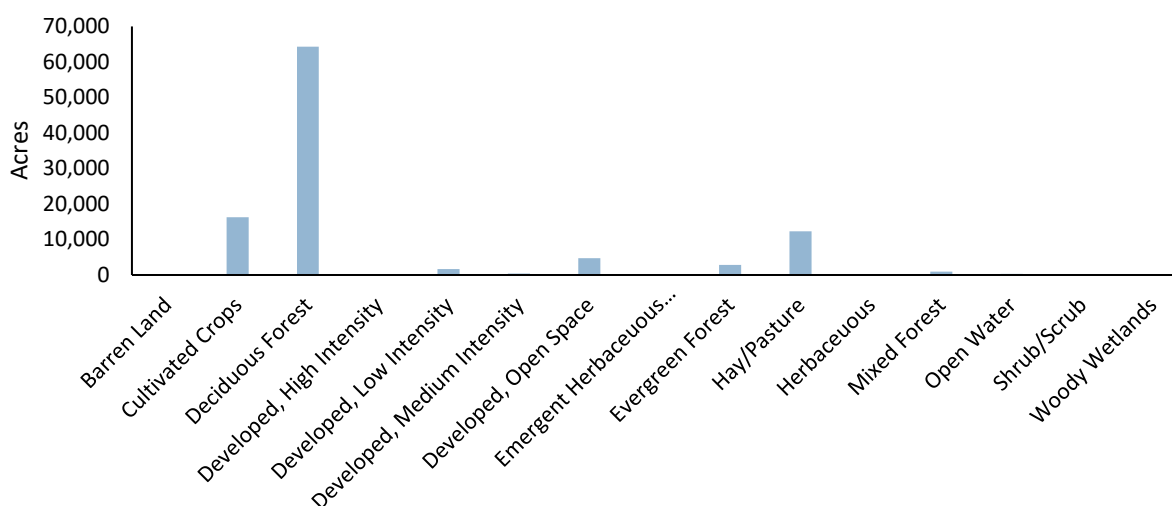
- Continue to foster a good working relationship with the Pennsylvania Game Commission for habitat management to benefit Allegheny woodrat populations and for rare plants located on state gamelands.
- Continue to monitor forest health issues and implement Integrated Pest Management strategies as needed. We will continue to implement the district's EDRR (Early Detection Rapid Response) program of identification and immediate treatment of key invasive species such as: Japanese knotweed, poison hemlock, phragmites, glossy buckthorn, and Japanese angelica tree ensure they are not permitted to colonize and become established on State Forest Land within this LMU.
- Continue to build relationships with the recreation communities in the area and the Standing Stone Trail Club.
- Prioritize the maintenance and promotion of core forest conditions and values.

## Profile

	Acres
State Forest Land	2873
LMU Total	103,993

**Ecoregion:** Ridge and Valley

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



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

Most of the deciduous forest acres in this LMU are comprised of mainly of mixed oak located on public and private lands.



Road Category	Total Miles
Z1 - Public Use Road	1
Z2 - Drivable Trail	1
Z3 - Administrative Road	7
<b>Total</b>	<b>8</b>

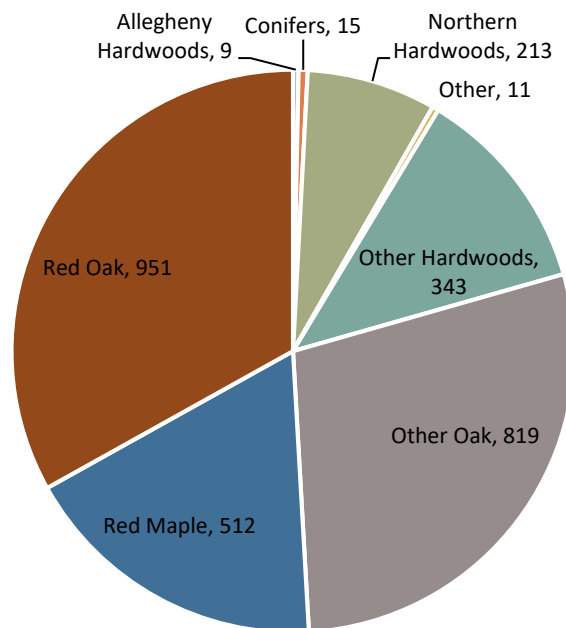
**Table 2.** Miles of roads by category on state forest land in this LMU. Road categories are described on p. 199 of the 2016 SFRMP.

Public vehicular access on both the Butler Knob and Lucy Furnace Tracts is limited. Much of the road mileage is made up of minimally maintained administrative roads that are gated.

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

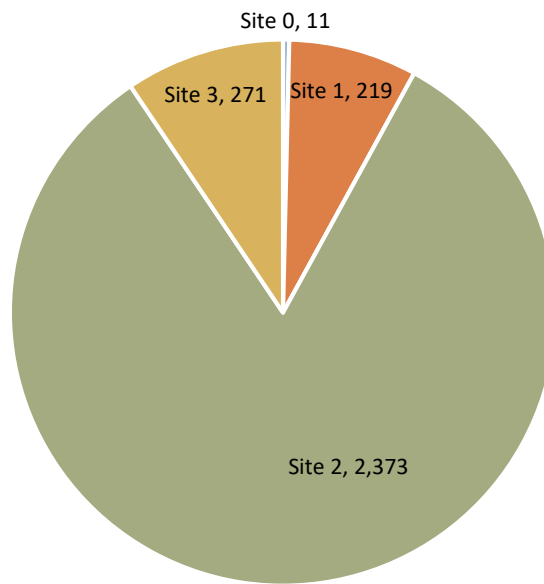
**Table 3.** Miles of trails on state forest land in this LMU open to various types of recreational use. Note that miles are not additive, and a single trail may be open to multiple use types. Shared-use trails, which make up the majority of trails on state forest land, are open to hiking, biking, horseback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

The 5 miles of hiking trail is exclusively the Standing Stone Trail as it traverses through the Butler Knob and Lucy Furnace Tract of Rothrock State Forest. However, this trail has significant mileage on both game lands and private property as it traverses through the LMU. This trail has several sections that descend and ascend the ridge, making it a challenging hike.



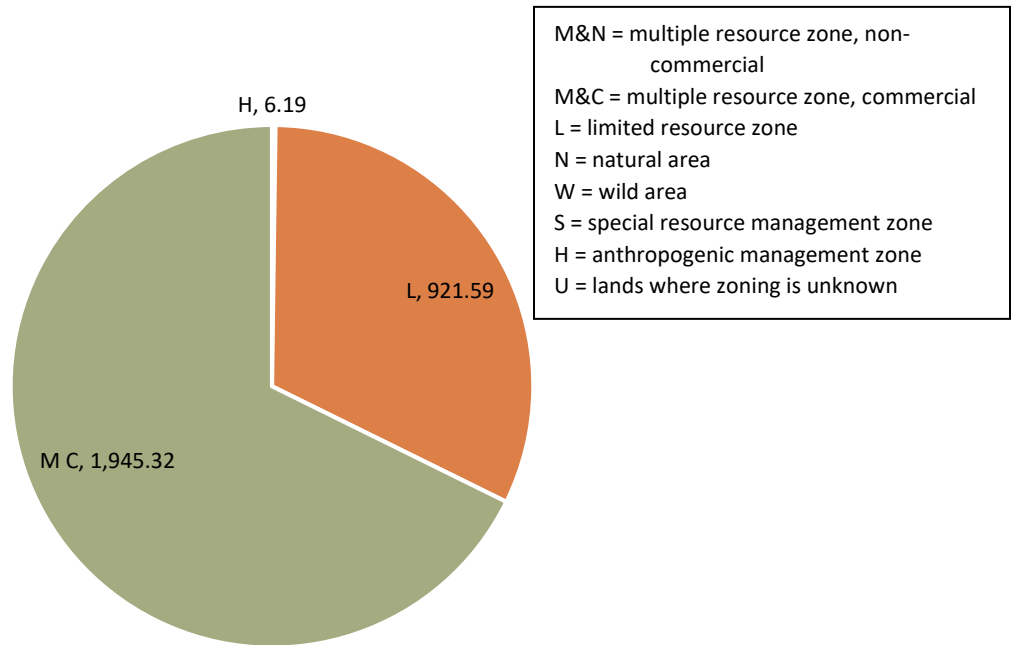
**Figure 2.** Acreage of state forest land in this LMU by aggregated forest type. The forest types are described on p. 108 of the 2016 SFRMP.

This is a typical mixed oak forest within the Ridge and Valley landscape.



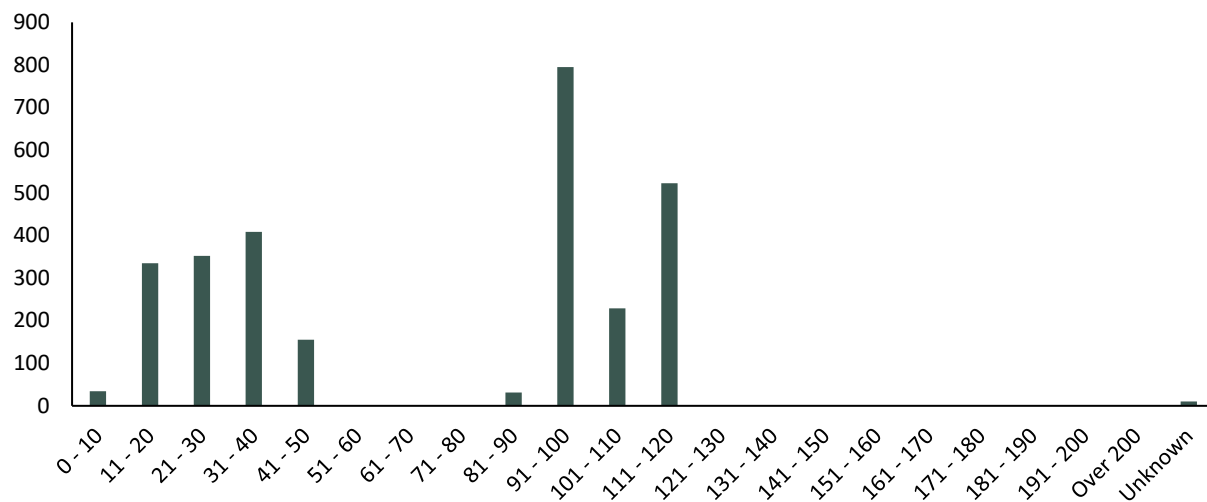
**Figure 3.** Acreage of state forest land in this LMU by site class. Site classes denote the potential quality of the growing site. “Site 0” indicates non-forested lands or forested lands where the vegetation has not yet been typed. Other site classes are described on p. 53 of 2016 SFRMP.

All three state forest tracts are east facing mountain sides; private lands within the LMU hold a higher percentage of site one classifications.



**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.

The state forest area of this LMU is relatively low and close to one third of the area is classified as limited, which is mostly very steep sides of Jacks Mountain.



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

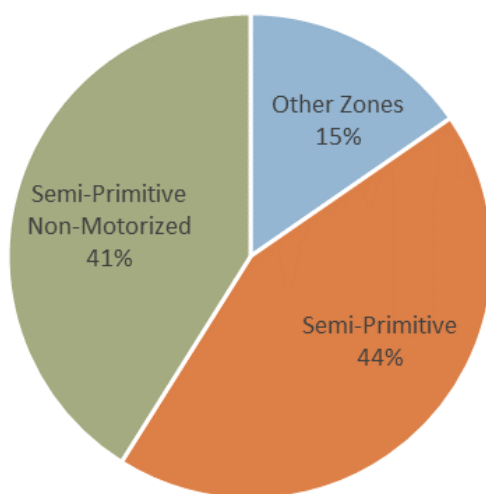
A large proportion of the acreage is in the 90-120-year-old age classes showing the traditional mature forest structure. Many of these stands are likely located on steep slopes or land-locked parcels. The

acreage in the 10-50-year-old age classes show the efforts to balance the age-classes through harvesting on sites that are accessible.

Class	Total Miles
High Quality	1
<b>Total</b>	<b>1</b>

**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.

There are only minimal amounts of High-Quality Streams within this Landscape Management Unit and no exceptional value quality streams. The streams that currently carry the high-quality designation that have portions within this LMU are: Mifflin County HQ streams - Tea Run, Strodes Run, Musser Run, Wakefield Run, Upper portions of Kishacoquillas Creek. Huntingdon County HQ streams - Hills Valley Creek, and Scrub Run. There are many miles of streams and rivers that have portions within this LMU, however they don't have the highest quality designations for numerous reasons, some being their closeness to human populations either residential or farmlands and much of the rivers are down stream and receive concentrations of pollutants and impacts that continue to increase as they flow their courses.



**Figure 6.** Acres of state forest land in this LMU by Recreation Opportunity Spectrum (ROS) classifications in 2012. ROS is an inventory system developed by the U.S. Forest Service, to characterize land by types of

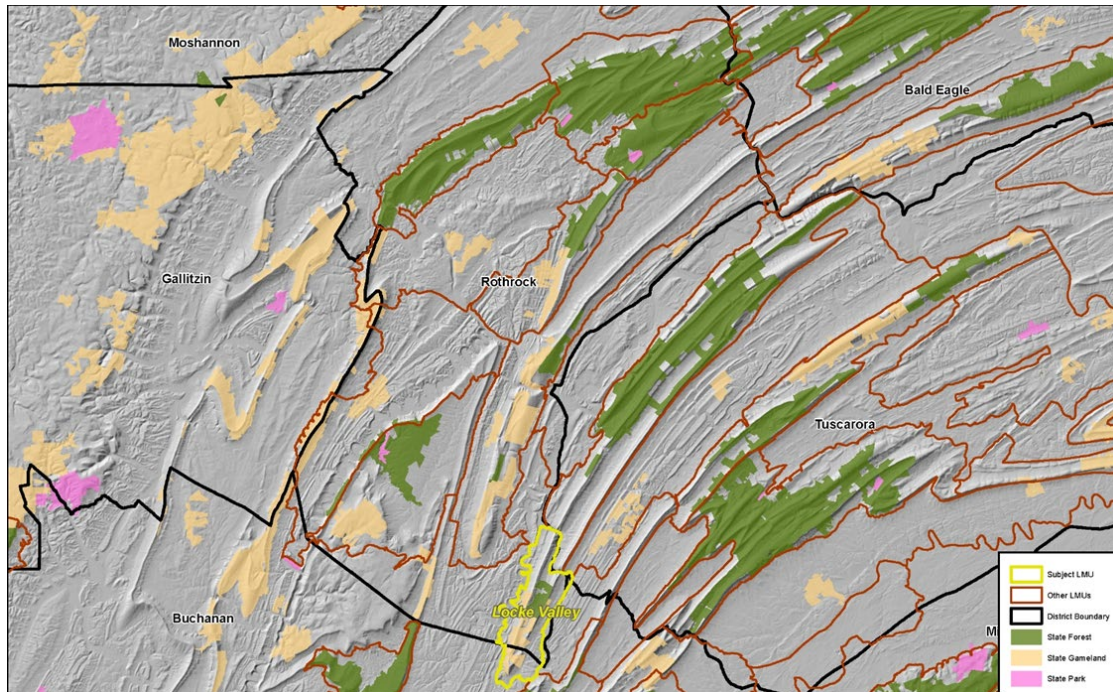
recreation experiences. ROS is described on p. 42 of the 2016 SFRMP. “Other Zones” refers to Semi-Developed and Developed zones.

The Semi-Primitive Non-Motorized and Semi-Primitive acres are bolstered heavily by the inclusion of game lands. The game lands located within this LMU have limited vehicle access.



# Locke Valley

## Landscape Management Unit



**Locke Valley LMU**





## Overview

The Locke Valley LMU is a unique landscape in the southeastern portion of Rothrock State Forest located within the Ridge and Valley Ecoregion. This LMU is 21,112 acres in size, though less than eight percent, (1622 acres) is state forest. It occupies portions of both Fulton and Huntingdon Counties, and includes Blacklog Mountain to the west and Shade Mountain to the east. The LMU is named for the narrow valley situated between these two mountains. Elevations within this LMU range from the valley floor to approximately 1800 feet. It includes State Game Lands 81, which represents a large area of the southern portion of the LMU. This LMU is represented by forested mountains and hills with agricultural and residential lands skirting its boundaries.

The forests, primarily dry oak heath and hickory forest types, were logged by both the timber and charcoal industries by the late 1800s. Wildfires were common place in this region, partly due to the production of charcoal. Other drastic changes to the forest composition included the elimination of the American chestnut in the 1930s and Gypsy Moth infestations beginning in the late 1970s and 1980s. The forested areas of the LMU have been logged over once with some areas being logged multiple times since the early 1900s except for mountain tops with limited access.

The Locke Valley Tract of Rothrock State Forest is 1622 acres in size. This land was acquired in 2007 and was formerly owned by the Glatfelter Pulp and Paper Company. Intensive forest management is evident across the tract. Many of the stands have regenerated successfully with desirable tree species, while others have been planted with larch. Rights to the timber were not retained by the Glatfelter Company, and three overstory removal harvests have been completed since the acquisition. Craig's Run is the main drainage fed by many unnamed tributaries and is considered a warm water fishery. Aquatic organisms can pass freely where Craig's Run intersects each roadway, as large culvert pipes have been installed correctly. Evidence of early agricultural use includes rock walls and barbed wire that line what use to be fields. Portions of the Locke Valley tract were used to pasture cattle as late as the 1950's and 1960's. A small private cemetery is well maintained and represents the history of the surrounding area.

The Locke Valley Tract is easily accessed by Locke Valley Road, maintained by Springfield Township. Administrative roads provide access to much of the SFL, as well as a portion of SGL 81 bordering to the south. In addition to hunting, outdoor enthusiasts can hike the Standing Stone Trail through SGL 81 and the western edge of SFL.

Soil disturbance has invited problem plant species including mile-a-minute vine, ailanthus, bush honeysuckle, multiflora rose, autumn olive and barberry. Control efforts have begun including herbicide applications as well as two release sites for the mile-a-minute weevils. A contract herbicide application has been completed to control invasive shrubs in the Craig's Run drainage. Two deer enclosure fences have been built since the acquisition, and three overstory removal harvests have been completed as well. A prescribed fire was conducted in 2011. Fences will be removed after several growing seasons, and additional invasive plant control is likely in the future.

## Priority Goals

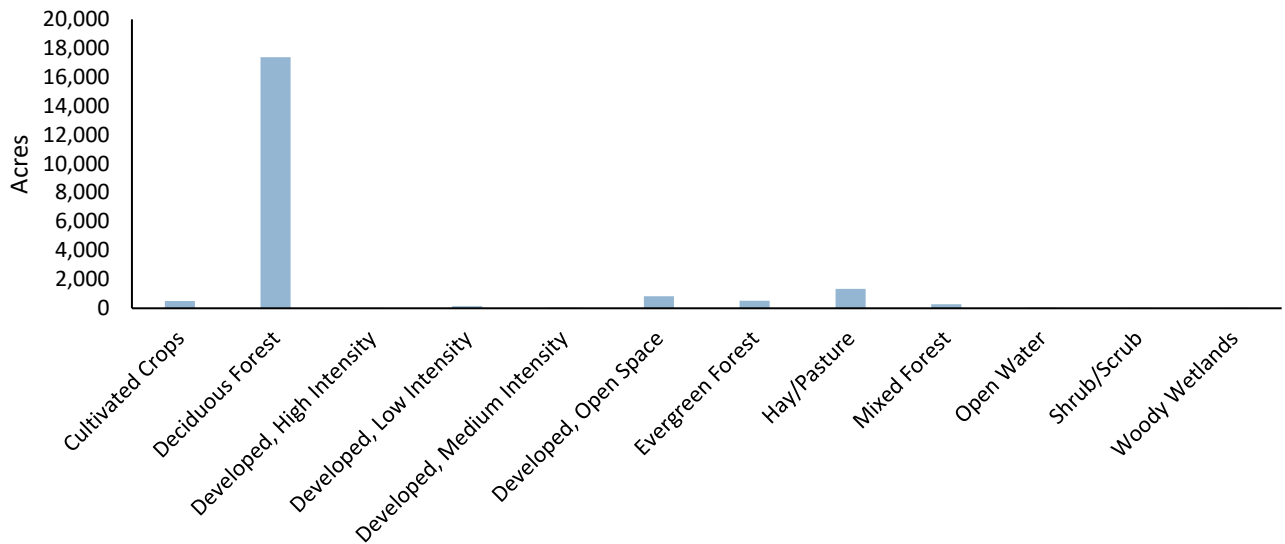
- a) Continue to foster a good working relationship with the Pennsylvania Game Commission for habitat management. Consult PGC experts in habitat management for wildlife associated with palustrine woodlands. Continue to provide hunter access to both SGL 81 and state forest land by maintaining infrastructure and opening gated access roads in hunting seasons.
- b) Continue to apply sound silvicultural practices to balance the age classes, improve forest health, create young successional wildlife habitat and provide sawtimber and pulpwood to timber buyers. Stands in this tract respond exceptionally well to silvicultural treatments and continued management will ensure wildlife and stand diversity for the future.
- c) Continue to monitor forest health issues and implement Integrated Pest Management strategies as needed. Contract herbicide applications as opportunities arise and follow-up with district personnel. Continue monitoring control efforts towards invasive shrubs and success of native plant recolonization. Finally, continue to incorporate invasive plant herbicide control in conjunction with silvicultural treatments and wildlife habitat enhancement.
- d) Continue with the district's EDRR (Early Detection Rapid Response) program of identification and immediate treatment of key invasive species such as: Japanese knotweed, poison hemlock, phragmites, glossy buckthorn, and Japanese angelica tree to work to ensure they are not permitted to colonize and become established on State Forest Land within this LMU.
- e) Continue to build relationships with the recreation communities in the area and the Standing Stone Trail Club.

## Profile

	Acres
State Forest Land	1622
LMU Total	21,112

**Ecoregion:** Ridge and Valley

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



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

The majority of the deciduous forest acres in this LMU are comprised of mostly of mixed oak. Riparian areas of the Locke Valley tract include tree species such as elm, willow, poplar, ash, white oak and cucumber magnolia.

Road Category	Total Miles
Z1 - Public Use Road	2
Z2 - Drivable Trail	1
Z3 - Administrative Road	2
<b>Total</b>	<b>4</b>

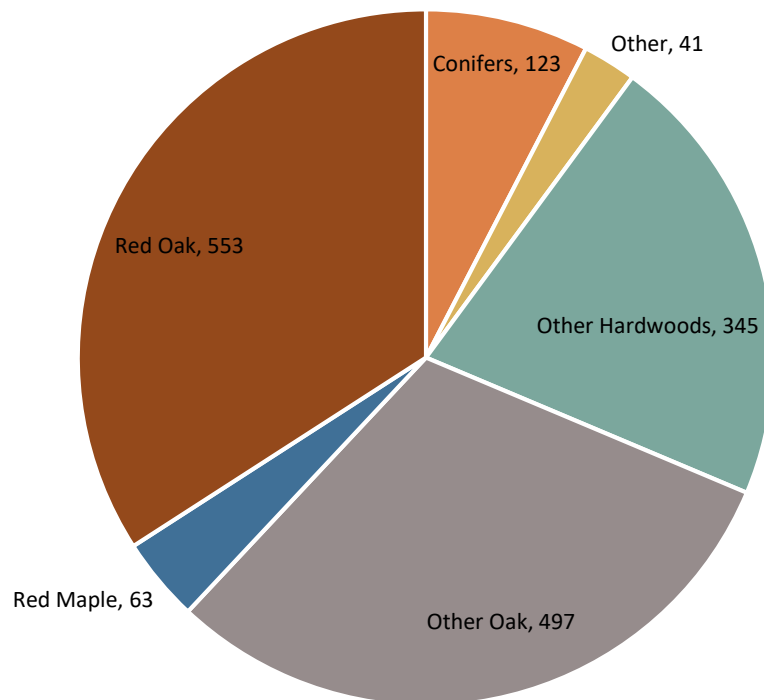
**Table 2.** Miles of roads by category on state forest land in this LMU. Road categories are described on p. 199 of the 2016 SFRMP.

Much of the road mileage is made up of minimally maintained administrative roads that are gated, open for public use during hunting seasons.

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

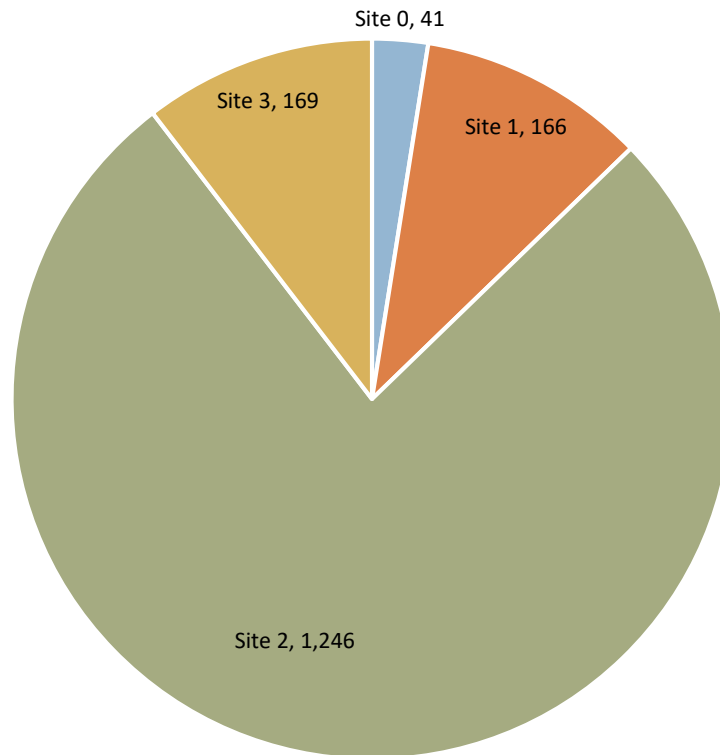
**Table 3.** Miles of trails on state forest land in this LMU open to various types of recreational use. Note that miles are not additive, and a single trail may be open to multiple use types. Shared-use trails, which make up the majority of trails on state forest land, are open to hiking, biking, horseback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

The Standing Stone Trail passes through the Locke Valley Tract of the Rothrock for a distance of about .45 miles.



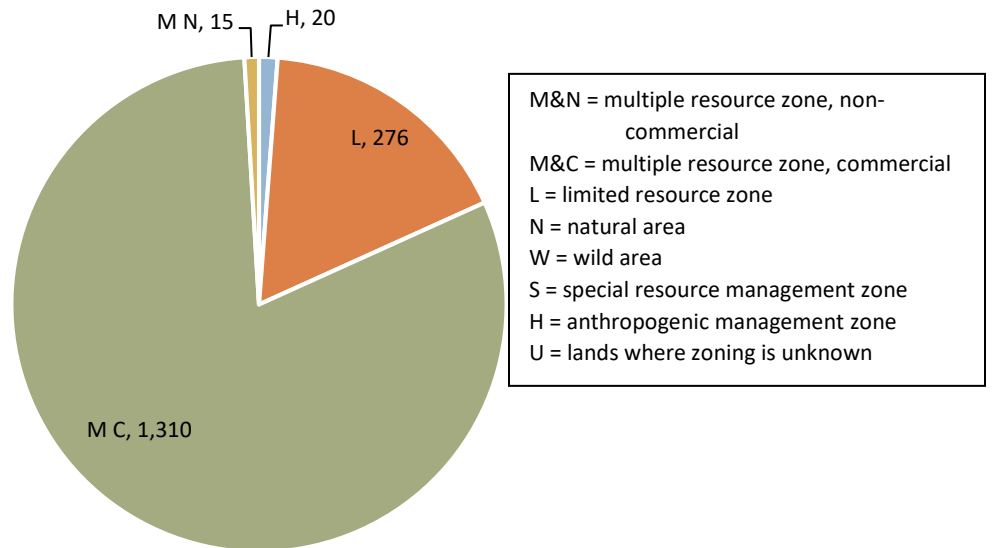
**Figure 2.** Acreage of state forest land in this LMU by aggregated forest type. The forest types are described on p. 108 of the 2016 SFRMP.

This is a typical mixed oak forest within the Ridge and Valley landscape. Conifers are represented as planted stands from previous ownership, specifically larch.



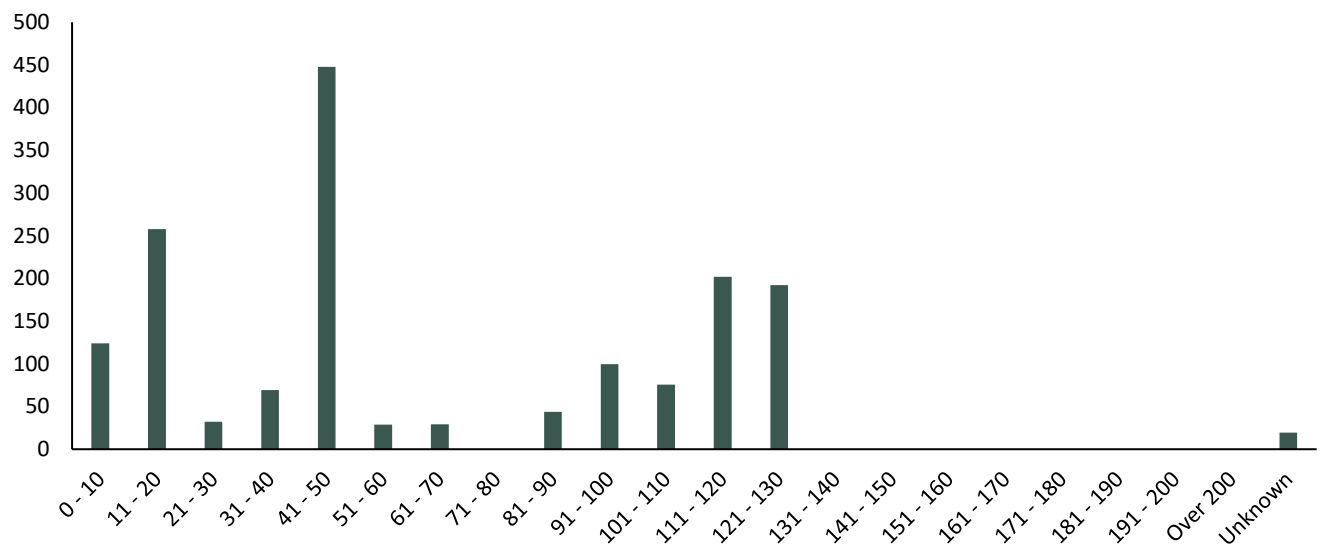
**Figure 3.** Acreage of state forest land in this LMU by site class. Site classes denote the potential quality of the growing site. “Site 0” indicates non-forested lands or forested lands where the vegetation has not yet been typed. Other site classes are described on p. 53 of 2016 SFRMP.

Site 2 is represented as 77% of the SFL acreage.



**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.

About 80% of the SFL is zoned as multiple use commercial. Limited zoning accounts for about 17% of the SFL, where steep or extremely rocky slopes prevent management.



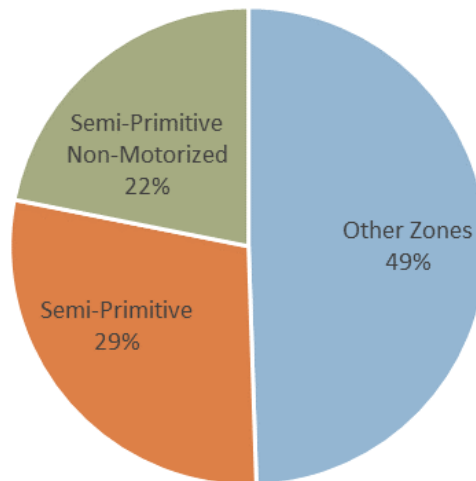
**Figure 5.** Acres of state forest land in this LMU by forest age classes.

The age class distribution is not typical of SFL in other LMU's. Intensive management prior to DCNR acquisition is shown in this bar graph. As mentioned previously, forest stands have responded favorably to silvicultural treatments, however invasive species are present in the LMU.

Class	Total (miles)
Undesignated	36
Warm Water Streams	0
High Quality Waters	14
<b>Total</b>	<b>51</b>

**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.

Craig’s Run is classified as a warm water stream. (no chart available)



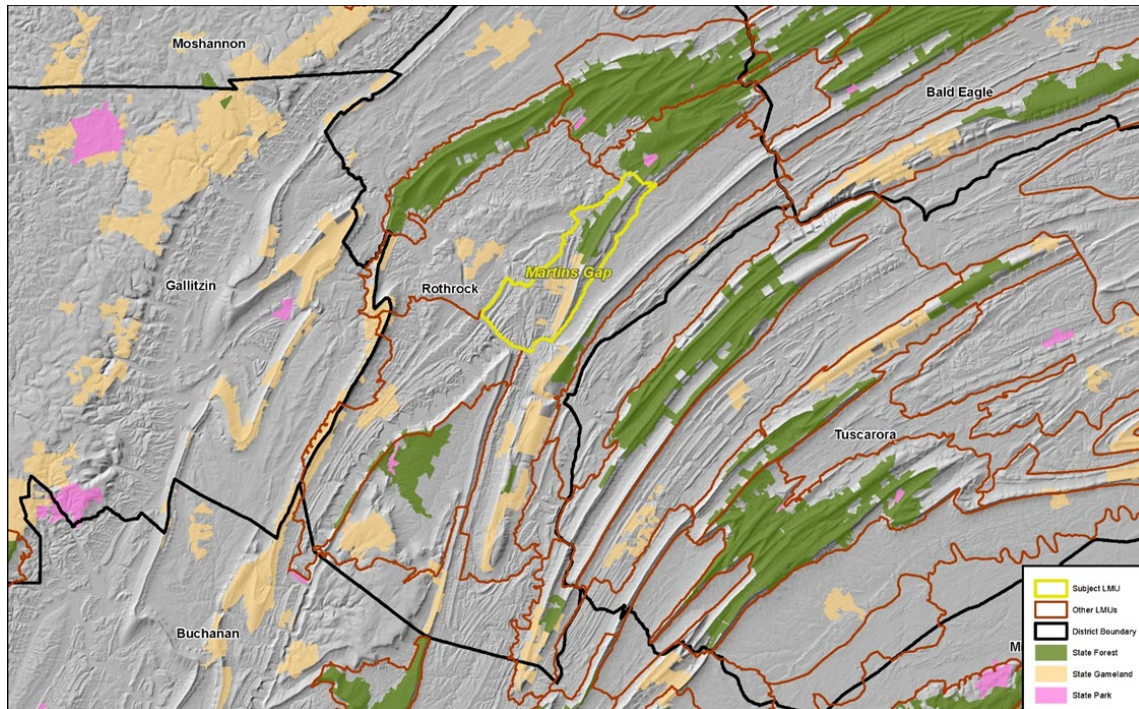
**Figure 6.** Acres of state forest land in this LMU by Recreation Opportunity Spectrum (ROS) classifications. ROS is an inventory system developed by the U.S. Forest Service, to characterize land by types of recreation experiences. ROS is described on p. 42 of the 2016 SFRMP. “Other Zones” refers to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

Recreation Opportunity Spectrum (ROS) is an inventory system used to measure and characterize land by types of recreation experience. ROS classifications range from “Primitive” to “Developed” land characteristics. The majority of the public land acreage within this LMU is classified as “Semi-Primitive Non-Motorized” and “Semi-Primitive” meaning an environment with low to moderate man-made occurrences. This classification is bolstered heavily by the inclusion of game lands. The game lands located within this LMU have limited vehicle access. The remaining public land acreage is classified as “Other” meaning these areas have more man-made occurrences and infrastructure.



# Martins Gap

## Landscape Management Unit



Martins Gap LMU



## Overview

The Martins Gap LMU is a unique landscape in the north-eastern portion of Rothrock State Forest located within the Ridge and Valley Ecoregion. This LMU is 35,150 acres in total size. The public land holdings are primarily the mountains with the smaller ridges and valley lands owned privately. The public-owned lands comprise of 4,791 acres of Rothrock State Forest (approximately 14% of the LMU is Rothrock State Forest Land), and a little more than half of the 6,441 acres of Pennsylvania Game Commission's game lands #112 (approximately 10% is Game Lands #112). The remaining 76% of the unit lands are owned by private landowners. It is located primarily in Huntingdon County but there is a small portion within Mifflin County on the eastern boundary. This LMU includes Stone Mountain running primarily through the center of the unit acting as the spine of the unit. The southern boundary is the Juniata River corridor, Stone Creek and its drainage valley to the west, Broad Mountain to the north and the west is comprised of the western edge of Kishacoquillas Valley. Numerous smaller ridges included in the LMU are Rocky Ridge, Stone Ridge, Bark Ridge and Brush Ridge. Elevations within this LMU reach approximately 2,200' on Stone Mountain just east of the Rocky Ridge. There are no State Parks within the LMU, however Greenwood Furnace State Park is found just to the northwest. This LMU is represented primarily by forested mountains, numerous ridges, and the head of long flat valleys. There are no major population centers within the LMU (cities or towns), only interspersed rural residential homes and farms.

The forests, primarily dry oak heath on southern exposures and red oak forest types on north faces, were logged by both the timber and charcoal industries by the late 1800s. Wildfires were common place in this region, partly due to the production of charcoal. Other drastic changes to the forest composition included the elimination of the American chestnut in the 1930s and Gypsy Moth infestations beginning in the late 1970s and 1980s. The forested areas of the LMU have been logged over once with some areas being logged multiple times since the early 1900s. Exceptions include rocky, steep slopes with limited access.

Notable waterways in the unit include Stone Creek, East Branch Stone Creek, Mill Creek, Dry Run, Murray Run, Standing Stone Creek and the Juniata River. The lesser streams may have a native trout populations and some warmer water species in portions. Stone Creek supports a native trout population, however has also been stocked with trout by the PA Fish and Boat Commission. Juniata River supports a thriving water fisheries species group.

The Martin Gap LMU is in the Greenwood Division of Rothrock State Forest. This area gets its name from Greenwood Furnace, an iron furnace located in what is now known as Greenwood Furnace State Park. The Martins Gap CCC camp was active from 1933-1937 and spanned a nearly 50-acre site which included everything from typical officer quarters, mess hall, and bunk-houses to a baseball field. The Rocky Ridge Natural Area is located nearly dead-center of this LMU. This 150-acre natural area was designated in the late 1990s. The area supports numerous unique wildflowers interspersed among the many exposures of Oriskany Sandstone and limestone outcrops. The forest in the area is of high quality and great diversity mixed-oak stands. This LMU also contains a Wild Plant Sanctuary.

There are a small number of individual shared-use trails spread across the state forest land portion of Martin Gap LMU such as Martin Trail and New Martin Trail, Wetzell Trail, Dogwood Trail, and Carbon Trail. The primary recreational trail feature for the unit (on state forest land) is the Standing Stone Trail, part of the Great Eastern Trail that bisects the unit from southwest to northeast as it traverses Stone Mountain from the Juniata River to its terminus at the Greenwood Fire Tower. The most prominent trail on the



State Game lands is the portion of the Standing Stone Trail known as the “Thousand Steps” trail which sees hundreds of hikers each week year-round. In addition to hiking and biking, other recreational activities in the area include hunting, fishing, snowmobiling, birding, camping, and just enjoying nature. Regarding, “birding” activities there is a constructed viewing platform located northeast of Allensville Road. It is important to note that this LMU on Stone Mountain is listed by PA Audubon as an Important Bird Area designated for old growth and unique habitats, raptor migration, and research and education.

Rothrock State Forest is a working forest. Sustainable silvicultural practices including both even age and uneven age management provide local mills with a source of timber and pulpwood, while ensuring a healthy forest for generations to come.

## Priority Goals

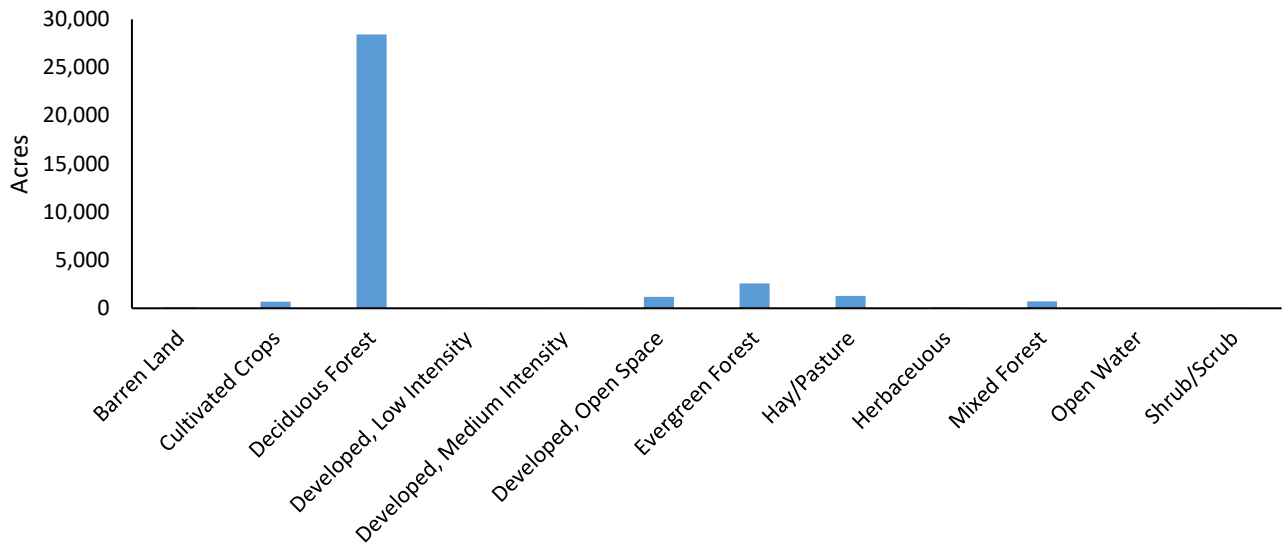
- a) Continue to implement sound silvicultural practices to balance the age classes, provide a source of timber and pulpwood, promote young successional forest habitat, and improve forest health.
- b) Continue to foster relationships with research communities and strengthen and promote existing relationships with Pennsylvania Game Commission, and PA Fish and Boat Commission in working on habitats to benefit reptiles and amphibians and forest habitats that would benefit using prescribed fire in as much of a joint endeavor as our agency’s missions allow.
- c) Continue to monitor forest health issues and implement Integrated Pest Management strategies as needed to control invasive species such as ailanthus, multiflora-rose, low smartweed, Japanese honeysuckle, Japanese barberry, Canadian thistle, and autumn olive particularly in areas within and adjacent the designated plant sanctuary.
- d) Continue to build relationships with the recreation communities, volunteer groups, and the Standing Stone Trail Club.
- e) Preserve the historical aspects of the Martin Gap CCC camp and find ways to promote that history to the visiting public. Make use of local subject matter experts to tell the story of this camp and interpret that history to the public.
- f) Preserve and protect and promote sound management where applicable within the established Rocky Ridge Natural Area, plant sanctuary, and sensitive areas within the Martin Gap LMU.

## Profile

	Acres
State Forest Land	4,791
LMU Total	35,150

**Ecoregion:** Ridge and Valley

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



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

The majority of the deciduous forest acres in this LMU are comprised of mostly of mixed oak/ hickory forest type.

Road Category	Total Miles
Z1 - Public Use Road	11
Z2 - Drivable Trail	1
Z3 - Administrative Road	3
<b>Total</b>	<b>15</b>

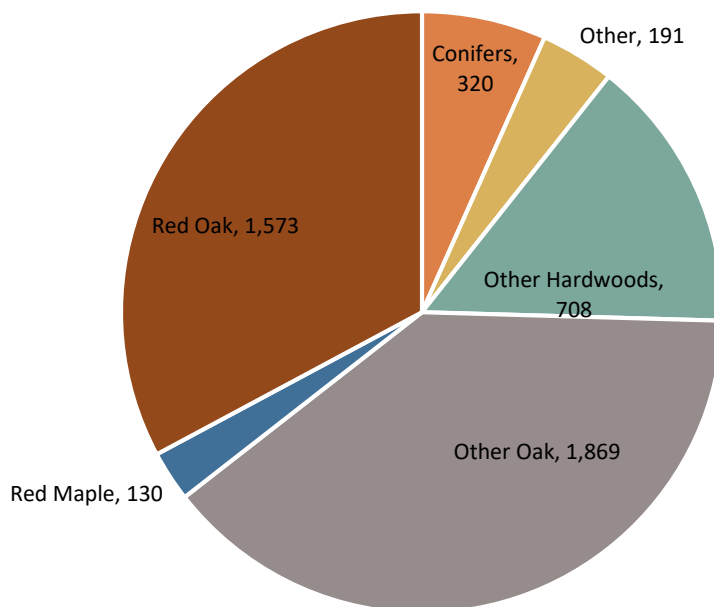
**Table 2.** Miles of roads by category on state forest land in this LMU. Road categories are described on p. 199 of the 2016 SFRMP.

Public vehicular access on the LMU overall is very good. Roads are maintained to a high standard and are composed of either conventional limestone aggregate or DSA on public use roads on state forest lands. The primary Public Use Roads in this LMU are Martin Road, Flat Road, and Turkey Hill Road.

Trail Category	Total Miles
Hiking	12
Biking	2
Equestrian	2
X-Skiing	2
ATV I	0
ATV II	0
Snowmobile/ Joint Use Road	13

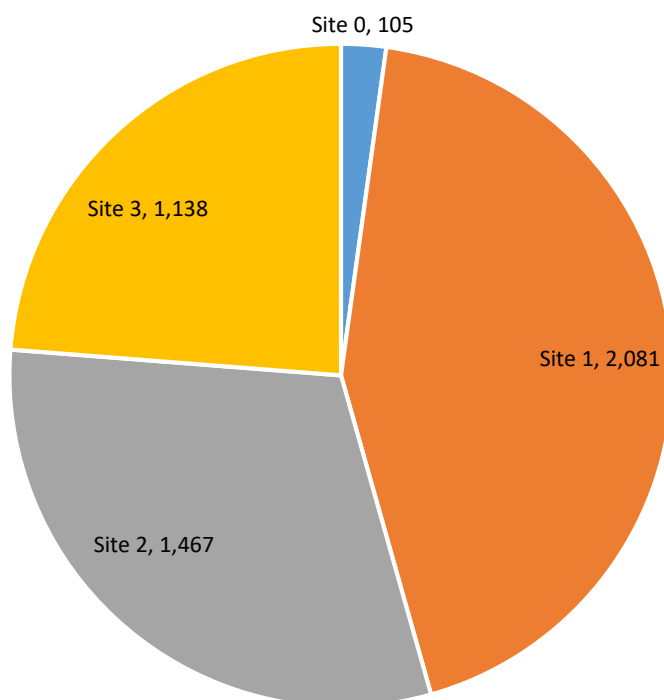
**Table 3.** Miles of trails on state forest land in this LMU open to various types of recreational use. Note that miles are not additive, and a single trail may be open to multiple use types. Shared-use trails, which make up the majority of trails on state forest land, are open to hiking, biking, horseback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

A relatively small network of recreational trails provides a variety of opportunities to navigate through the forest. Some of the most prevalent recreational activities in this LMU include, hiking on the Mid-State Trail and snowmobiling on the snowmobile trail and joint use roads in the winter.



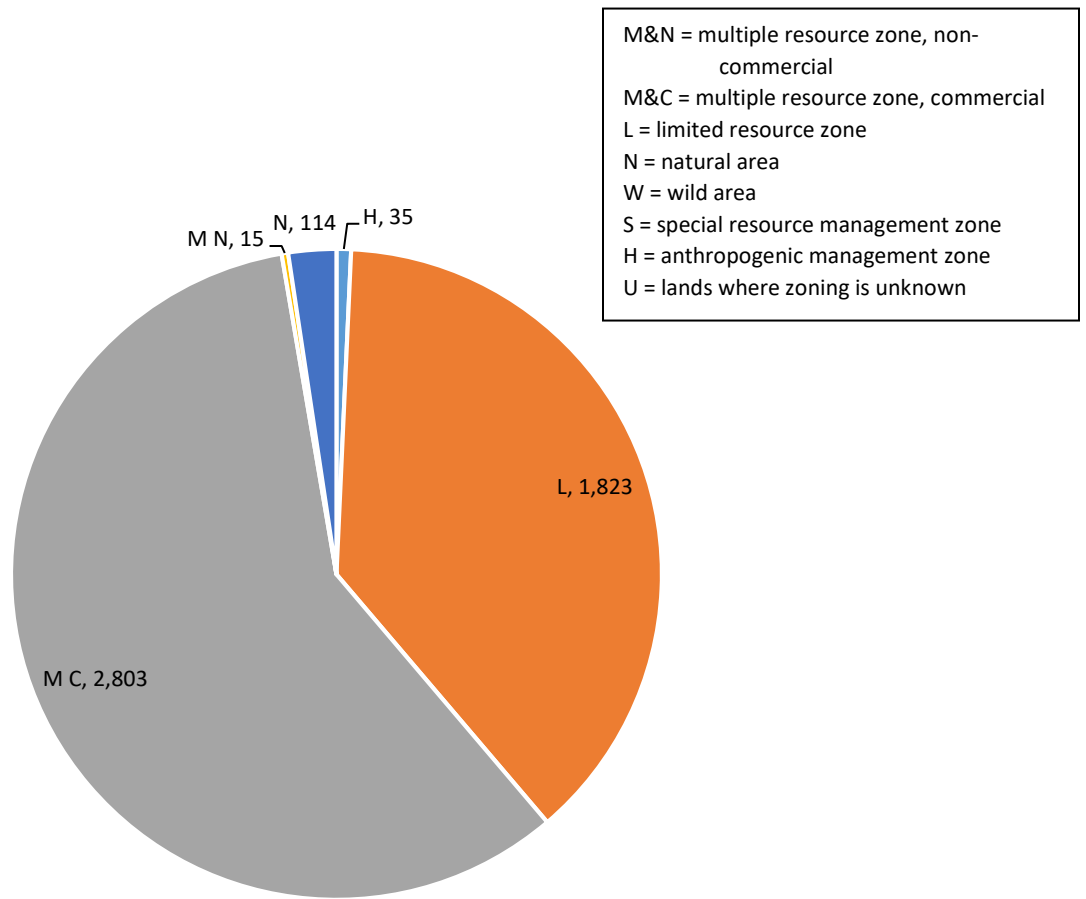
**Figure 2.** Acreage of state forest land in this LMU by aggregated forest type. The forest types are described on p. 108 of the 2016 SFRMP.

The 'other oak' categories are typically chestnut oak or white oak dominated types.



**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.

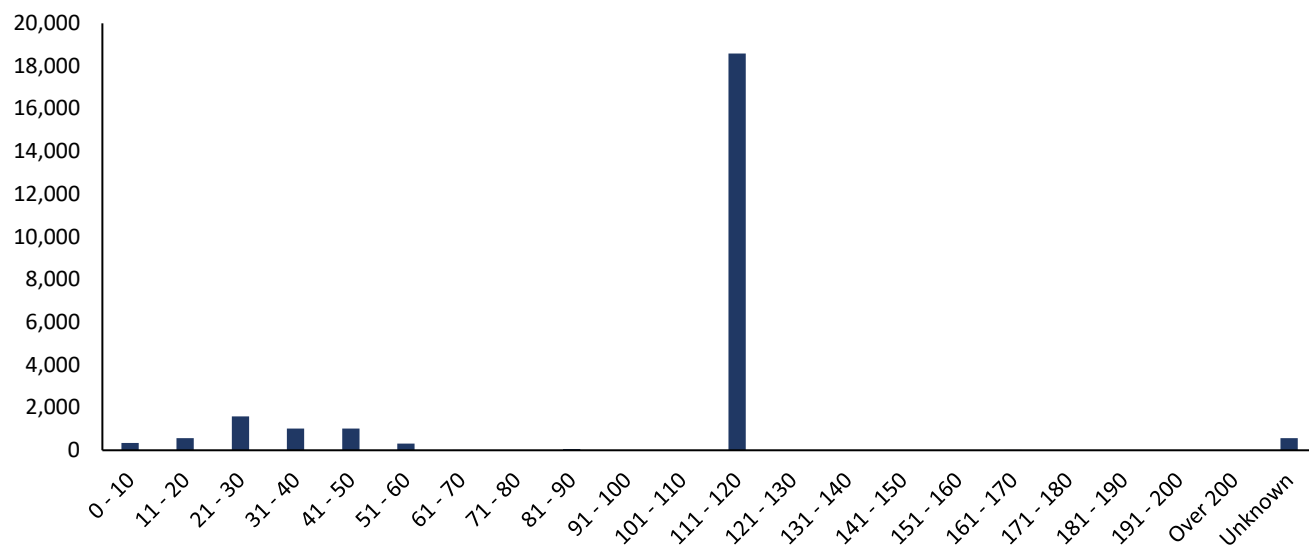
Site 1 areas are often located in narrow valleys associated with riparian systems. Site 2 and 3 areas are mid slope to ridge or mountain top topographic positions.



**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.

Much of the LMU is accessible for management and emerging pulpwood markets have increased commercial acreage.





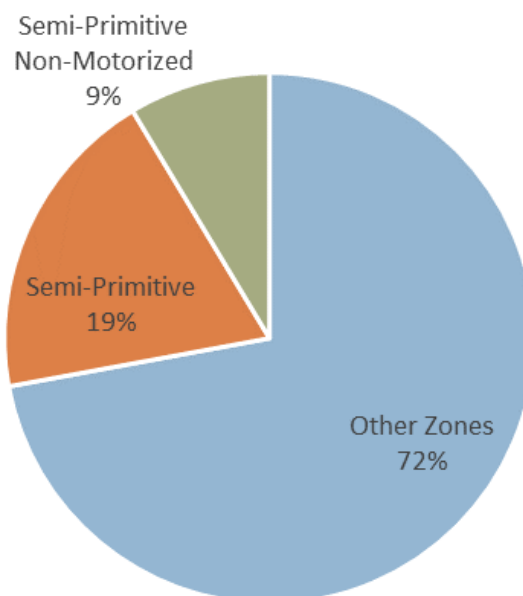
**Figure 5.** Acres of state forest land in this LMU by forest age classes.

Much of the Martin Gap LMU remains in the 111-120-year-old age classes.

Class	Total Miles
High Quality	9
Total	9

**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.

High quality streams improve water quality for human sources, as well as provide wildlife habitat and recreational opportunities. This LMU has a few “key” High Quality” streams flowing within it such as: Standing Stone Creek, East Branch Standing Stone Creek, Spruce Run, and Dry Run.

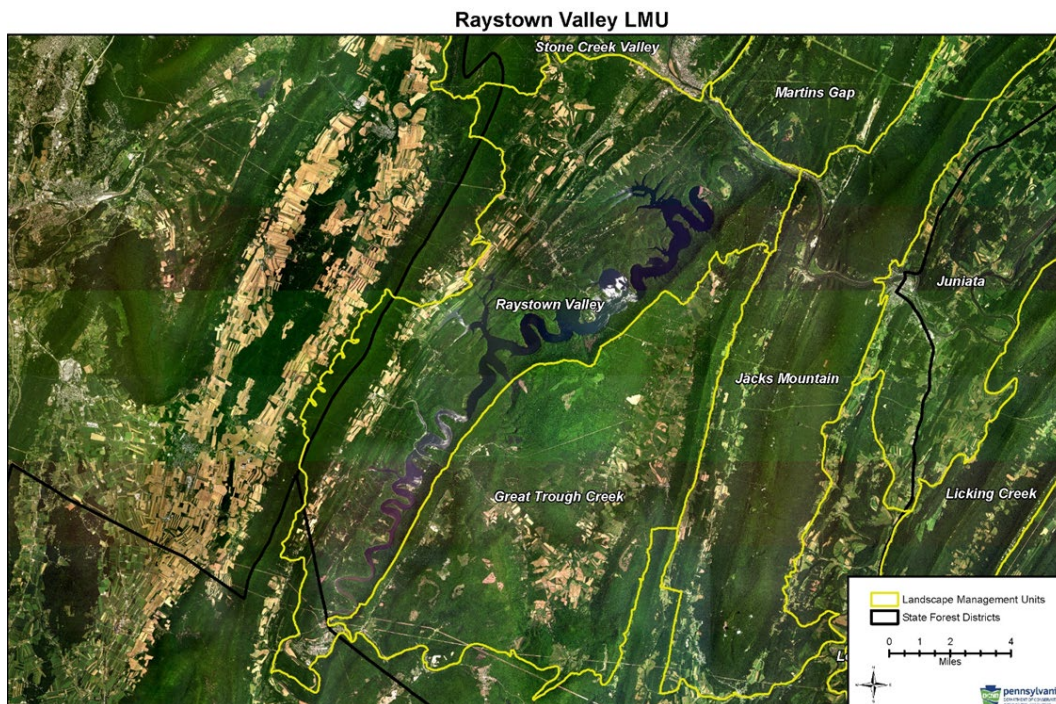
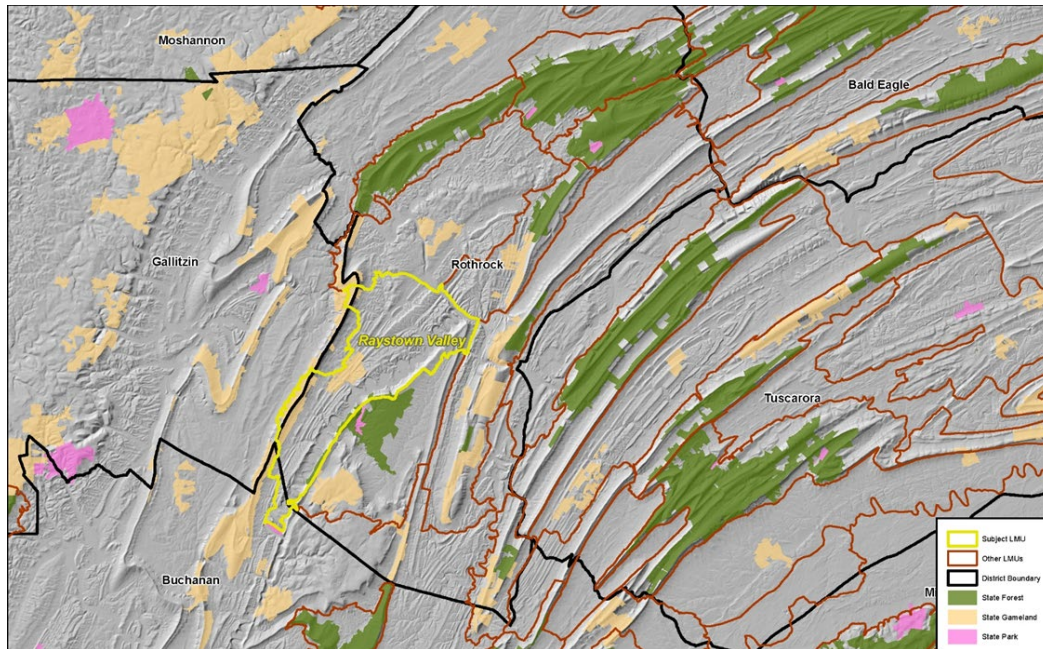


**Figure 6.** Acres of state forest land in this LMU by Recreation Opportunity Spectrum (ROS) classifications in 2012. ROS is an inventory system developed by the U.S. Forest Service, to characterize land by types of recreation experiences. ROS is described on p. 42 of the 2016 SFRMP. “Other Zones” refers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

Recreation Opportunity Spectrum (ROS) is an inventory system used to measure and characterize land by types of recreation experience. ROS classifications range from “Primitive” to “Developed” land characteristics. The majority of the total public land acreage is classified as “Other” meaning these areas have more man-made occurrences and infrastructure. The remaining public land acreage within this LMU is classified as “Semi-Primitive Non-Motorized” and “Semi-Primitive” meaning an environment with low to moderate man-made occurrences and the expectations to have a more natural experience.

# Raystown Valley

## Landscape Management Unit



## Overview

The Raystown Valley LMU is a landscape in the central portion of Huntingdon County below the Juniata River encompassing the 8,300-acre Raystown Dam on the Raystown Branch Juniata River. It is located within the Ridge and Valley Ecoregion. This LMU is 78,360 acres in size, with two percent, 1,632 acres of the land in state forest. It is in Huntingdon County and stretches between Tussey and Terrace Mountain Ranges. The elevations within this LMU range valley floor up to 2,300' on Tussey and 1600' on Terrace. It includes all of State Game Lands #420 (3,000 ac.), which is within the 21,000 acres of Raystown Recreation Area managed by the US Army Corp of Engineers.

The forests, primarily mixed oak/hickory forest types, were logged by both the timber and charcoal industries by the late 1800s. Wildfires were common place in this region, partly due to the production of charcoal. Other drastic changes to the forest composition included the elimination of the American chestnut in the 1930s and Gypsy Moth infestations beginning in the late 1970s and 1980s. The forested areas of the LMU have been logged over once with some areas being logged multiple times with diameter limit cutting since the early 1900s.

The Raystown Recreation Area makes up a large portion of the LMU (27%). With an 8,300-acre lake, recreation opportunities abound. There are over 700 public and private campsites available. Boating is very popular with ten boat launches, 2 marinas, and private boat service centers. Hunting and fishing is open in the Recreation area. The extensive trail system offers the nationally recognized Allegrippis Trails for mountain biking. Formal trail hiking opportunities are available in this LMU on Army Corps lands, Rothrock State Forest land and Trough Creek State Park with notably Terrence Mtn Trail crossing all three ownerships.

## Priority Goals

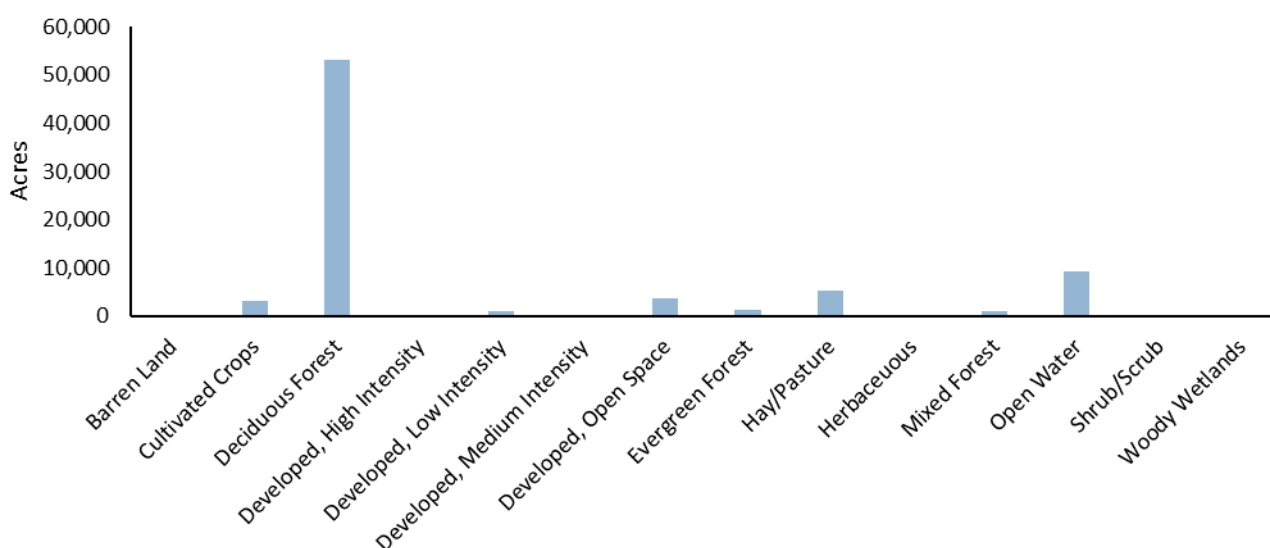
- a) Implementation of Rural and Community forestry programs in cooperation with NRCS, PSU Extension, and Soil Conservation Service and Huntingdon County Conservation District as partners. Focus being guidance of proper forest management for private landowners with goal of increasing goldenwing and cerulean warbler habitats and also promote increasing riparian forest buffers.
- b) Continue with the district's EDRR (Early Detection Rapid Response) program of identification and immediate treatment of key invasive species such as: Japanese knotweed, poison hemlock, phragmites, glossy buckthorn, and Japanese angelica tree to work to ensure they are not permitted to colonize and become established on State Forest Land within this LMU, particularly important to keep them out of the Trough Creek Wild Area.
- c) Maintain existing levels and scope of recreation trails in the LMU.

## Profile

	Acres
State Forest Land	1632
LMU Total	78360

**Ecoregion:** Ridge and Valley

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



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

Most the deciduous forest acres in this LMU are comprised of mostly of mixed oak. A unique feature to this LMU verses other LMUs is the nearly 10,000 acres of open water, which is comprised heavily from Raystown Lake and the many rivers within the LMU boundaries. The majority of the SFL acreage includes the Trough Creek Wild Area.

LMU Name	Raystown Valley
Road Category	Total Miles
Z3 - Administrative Road	0
Total	0

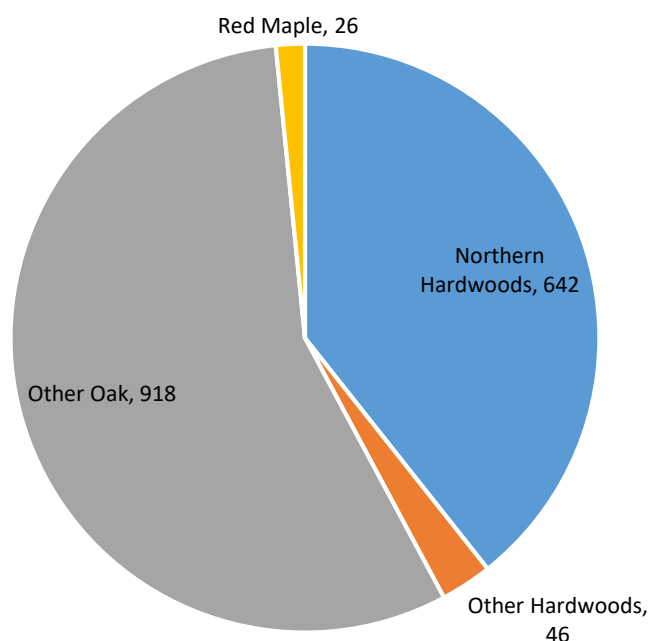
**Table 2.** Miles of roads by category on state forest land in this LMU. Road categories are described on p. 199 of the 2016 SFRMP.



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

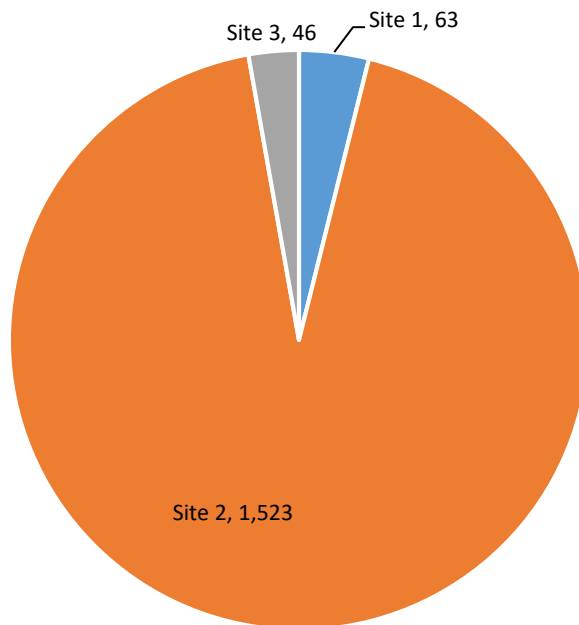
**Table 3.** Miles of trails on state forest land in this LMU open to various types of recreational use. Note that miles are not additive, and a single trail may be open to multiple use types. Shared-use trails, which make up the majority of trails on state forest land, are open to hiking, biking, horseback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

Most of the trails are located on the Allegrippis Ridge on the west side of Raystown Corp of Engineers land.



**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.

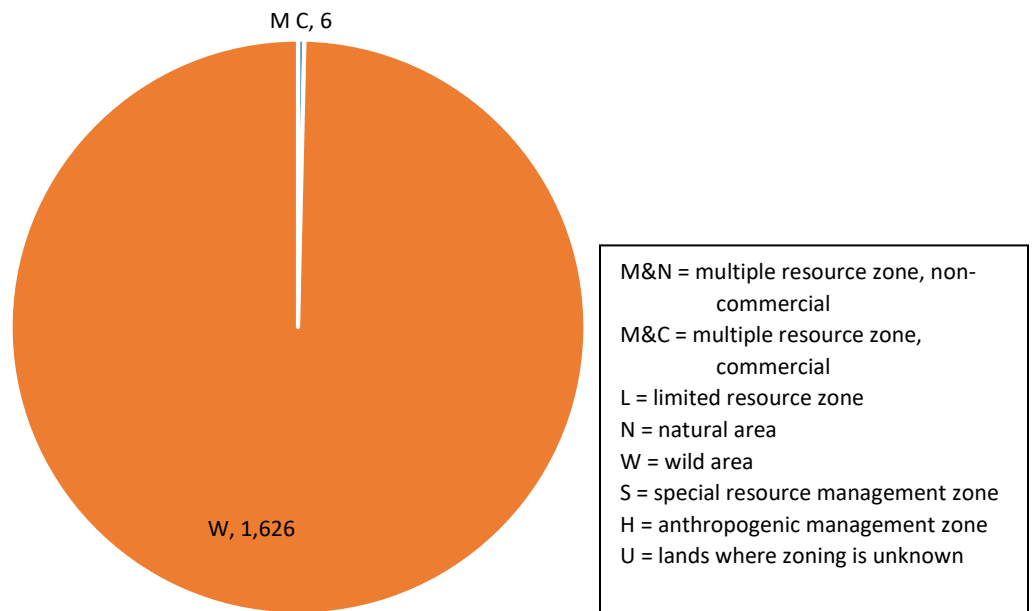
This is a typical mixed oak forest within the Ridge and Valley landscape.



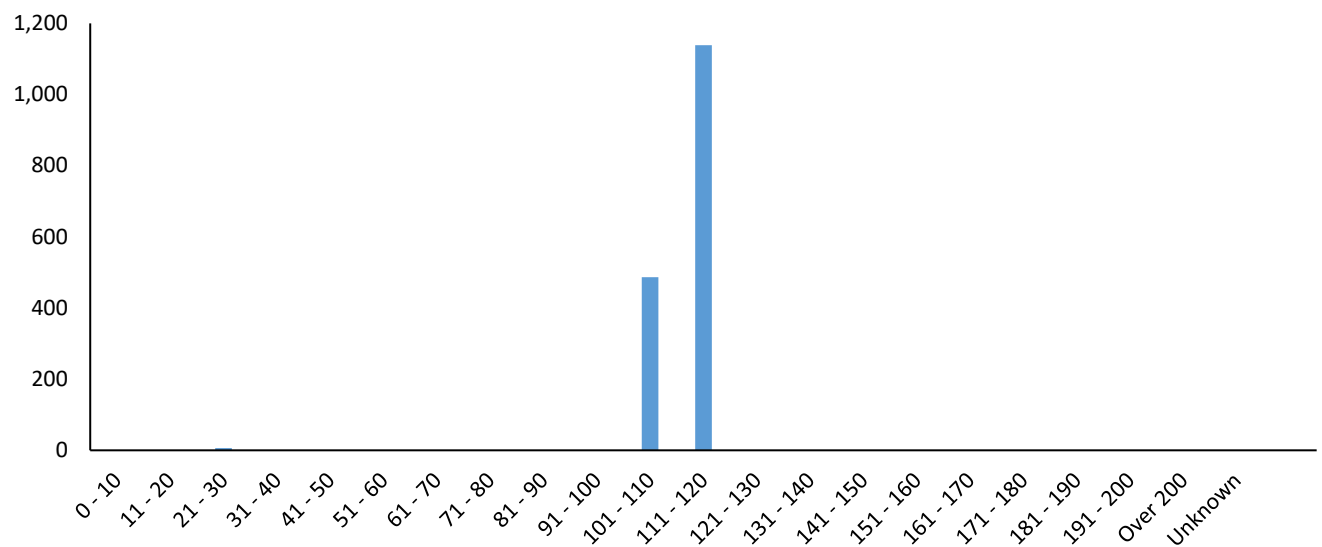
**Figure 3.** Acreage of state forest land in this LMU by site class. Site classes denote the potential quality of the growing site. “Site 0” indicates non-forested lands or forested lands where the vegetation has not yet been typed. Other site classes are described on p. 53 of 2016 SFRMP.

The vast majority of acreage for this LMU falls within Site 2 classification. Some of the rocky ridgetop acres are likely the site 3 classification, along with some lower slope site 1 before the forest stands give way to the shore of Lake Raystown. Prior to flooding the lands for the lake, there would have likely been more site class 1 which is now underwater.





**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.



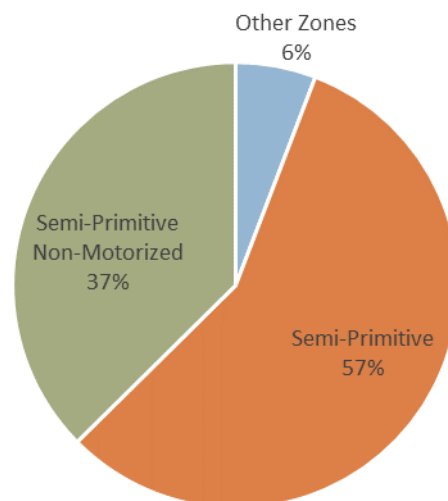
**Figure 5.** Acres of state forest land in this LMU by forest age classes.

The age class distribution of this LMU is within the 101 to 120 years. This makes sense as nearly every acre is within the Trough Creek Wild Area directly above Lake Raystown and on steep slopes. Since the majority of these stands are within the wild area and under the specific management for that land designation the age classes will not be balanced through man-made means.

Class	Total (miles)
Undesignated	220
High Quality Waters	8
Human-made Impoundment/ Pond	57
<b>Total</b>	<b>285</b>

**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.

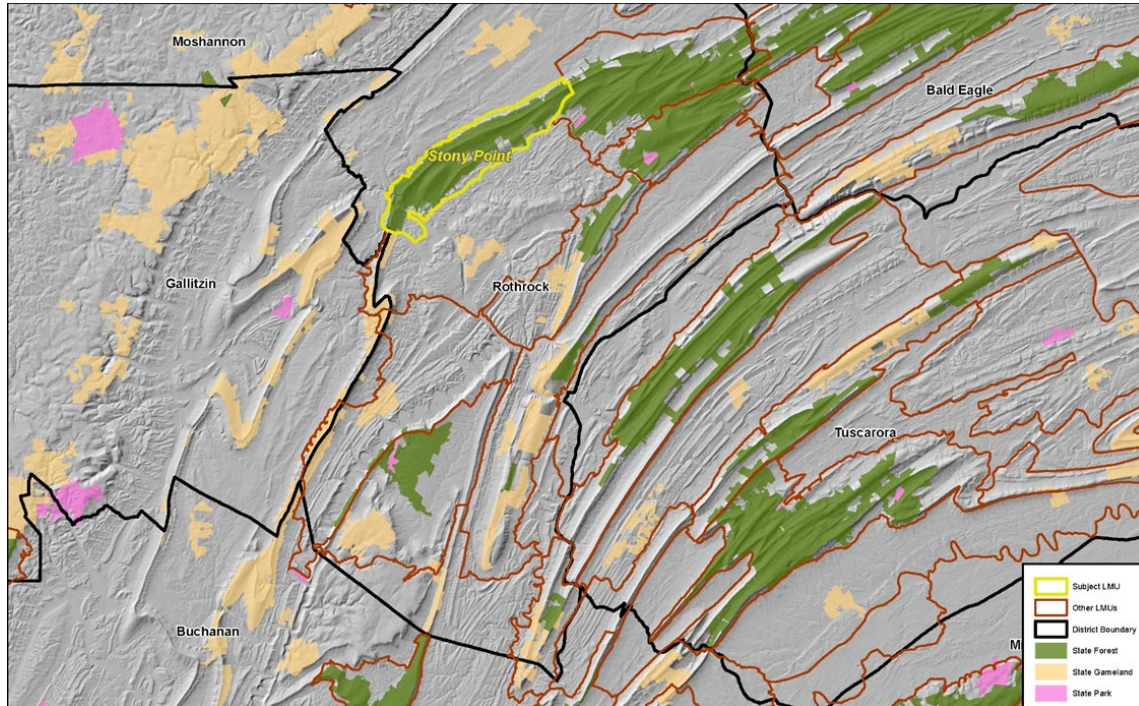
Key waterways for this LMU are the Raystown branch of the Juniata River, Juniata River, Lake Raystown, and Great Trough Creek.



**Figure 6.** Acres of state forest land in this LMU by Recreation Opportunity Spectrum (ROS) classifications in 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.

# Stony Point

## Landscape Management Unit



**Stony Point LMU**





## Overview

The Stony Point LMU is a unique landscape in the western portion of Rothrock State Forest. Located within the Ridge and Valley Ecoregion, this LMU is 33,591 total acres in size. Of the total LMU, 23,429 acres or 70% is state forest land. The majority of this LMU is in Huntingdon County with only a small area of the northeast corner being in Centre County. The Stony Point LMU encompasses both Tussey Mountain, which spans the length of the northwest portion of this LMU, and Leading Ridge, which covers the southeast portion. Elevations within this LMU range from the valley floor up to 2,300'. Though most of public land within this LMU is state forest land, Pennsylvania State University owns tracts of land around the edges of this LMU with Rock Springs to the north and Shavers Creek Experimental Forest in the southeast. The 682-acre Little Juniata Natural Area, part of the Rothrock State Forest, is located within the southwest area of this LMU. The Stony Point Maintenance Headquarters is also within this LMU in the southwest area.

Forests within the area are primarily dry oak heath forest types with other diverse hardwood stands present on better soils and growing sites. Many of the forest stands along the ridge tops and slopes are poor quality with better quality stands present on ridge benches, along waterways, and in the valleys. The conifer component consisting of mostly white pine and hemlock is present throughout the LMU in both the overstory and understory. Much of the forests in this LMU were logged by the early 1900s. Other drastic changes to the forest composition included the elimination of the American chestnut in the 1930s, Gypsy Moth infestations beginning in the late 1970s and 1980s, and Hemlock Woolly Adelgid (HWA) infestations significantly stressing hemlock stands throughout the LMU.

This LMU is within the Audubon's designated Tussey Mountain Important Bird Area (IBA). This Landscape represents older growth habitats and unfragmented forest tracts. Tussey Mountain also serves as an important spring golden eagle migration route.

There are a variety of recreational opportunities available in this LMU. Some of the more common activities include hiking, mountain biking, equestrian, snowmobiling, scenic driving, canoeing/kayaking, camping, hunting, and fishing. The Mid State Trail, one of the nine State Forest Hiking Trails in Pennsylvania and part of the National Great Eastern Trail System, traverses Tussey Mountain along the entire length of this LMU. Although a shared-use trail system is lacking, development of this type of trail will occur, especially in the northeast portion. Scenic driving and several vistas atop Tussey Mountain provide visitors with views of the Ridge and Valley topography. Two of the better-known vistas include the Indian Overlook, which offers a view of Spruce Creek Valley and the Appalachian Plateau, and Jo Hays Vista, which offers a view of the nearby town of State College and Penn State University. Canoeing and kayaking opportunities are available in the southeast portion of this LMU as the Little Juniata River flows through the Little Juniata Natural Area. This river is part of the Juniata River Water Trail and five designated primitive waterway campsites are located within the Natural Area. Great trout fishing opportunities are available within this LMU as there are many high-quality tributaries present. The Little Juniata River and Spruce Creek, the world-renowned trout stream frequently visited by former President Jimmy Carter, are located within this landscape. However, public access to Spruce Creek is limited because most of the stream is privately owned by clubs and individuals. Picnicking opportunities within the State Forest is available at Pine Hill Picnic Area.

Camp Blue Diamond is a 238-acre private inholding surrounded by state forest land within the LMU. This is a year-round Christian camp and retreat center that offers a wide range of recreational activities and rental amenities. Several private buildings and cabins are located at the camp.

The southwest region of this LMU was home to the historic Diamond Valley Railroad of the late 1880s. This was a 14-mile narrow-gauge line operating between the towns of Barree and Mooresville used to extract lumber from the forest and transport it to the main line of the Pennsylvania Railroad. Remnants of the old narrow-gauge line can still be seen across the landscape in this region.

The Civilian Conservation Corps (CCC) Camp-61 “Diamond Valley” was located in the south-central region of this LMU just outside of the town of Petersburg. This camp was active during the 1930s and many of the buildings, masonry work, and pine plantations can still be seen today throughout this area.

Another historical aspect of this LMU is the Alexandria Brickyard which was located in the area known as Short Mountain, the southwestern reaches of this LMU. This brickyard was active in the mid-1940s and was owned by Stowe-Fuller Refractories based in Akron, Ohio. A stone quarry at the summit of the mountain and several remnant rail lines leading from this quarry can still be seen on the landscape today.

## Priority Goals

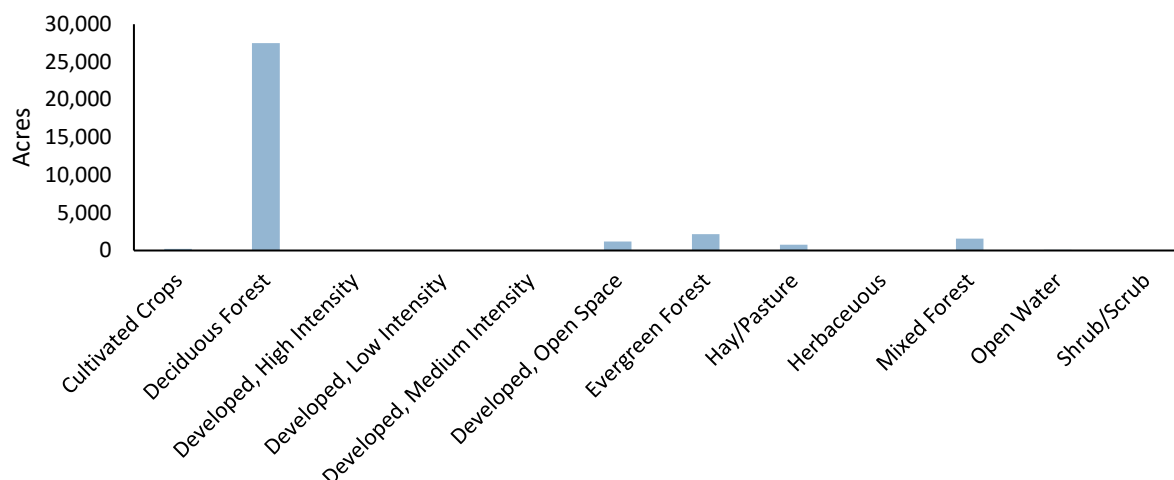
- a) Work to balance forest age classes across the LMU and create early successional young forests by implementing management activities through silvicultural prescriptions in forested stands that are manageable. Continue coordination with the Ruffed Grouse Society on implementation of the ruffed grouse habitat improvement project along Kepler Road within the state forest.
- b) Continue to foster and build a good working relationship with the Mid State Trail Association to help guide routine maintenance of this long-distance hiking trail and provide assistance when necessary.
- c) Continue to foster and build a working relationship with all user communities/groups (hikers, bikers, equestrians, etc.) and further develop Shared-Use Trail opportunities around the northeast area of the LMU.
- d) Monitor forest health issues and implement Integrated Pest Management strategies as needed. Continue with the district’s EDRR (Early Detection Rapid Response) program of identification and immediate treatment of key invasive species such as: Japanese knotweed, poison hemlock, phragmites, glossy buckthorn, and Japanese angelica tree to work to ensure they are not permitted to colonize and become established on State Forest Land within this LMU.
- e) Continue to manage the Little Juniata Natural Area and the five primitive waterway campsites along the Juniata River Water Trail. Implement the guidelines set aside for management of Natural Areas while providing primitive-type camping in designated areas only.
- f) Continue to maintain and conduct brush removal as needed at the several scenic vistas along our state forest roads.

## Profile

	Acres
State Forest Land	8,146
LMU Total	16,456

**Ecoregion:** Ridge and Valley

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



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

The graph above is representative of the LMU as a whole. Most of the total acreage of the Stony Point LMU is forested State Forest Land. The Deciduous Forest Cover Class in this LMU is mostly composed of a mixed oak forest community type. The Evergreen Forest Cover Class represents the lower valleys and streams/waterways that are lined by the conifer component within the LMU. Open Space and Hay/Pasture Cover Classes can be observed in the agricultural valleys which surround the outer edges of the LMU.

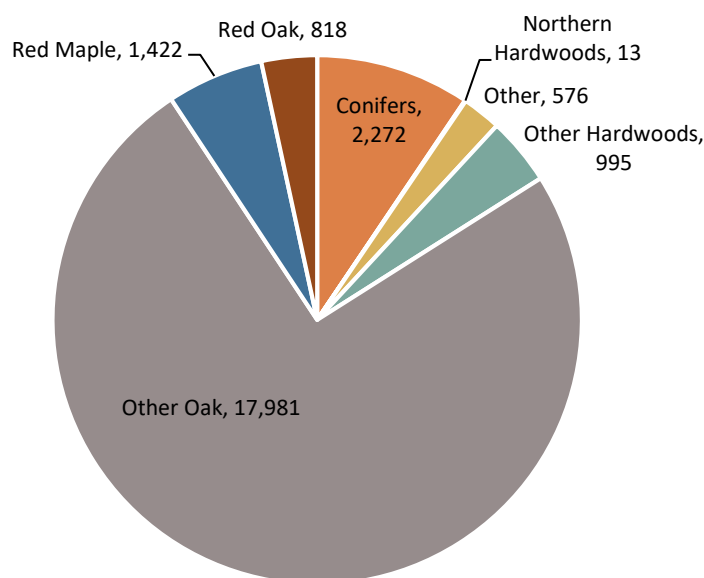
Road Category	Total Miles
Z1 - Public Use Road	55
Z2 - Drivable Trail	5
Z3 - Administrative Road	17
<b>Total</b>	<b>78</b>

**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.

Trail Category	Total Miles
Hiking	47
Biking	14
Equestrian	14
X-Skiing	14
ATV I	0
ATV II	0
Snowmobile/ Joint Use Road	50

**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.

Within this LMU, there is a total of 78 miles of roads consisting of 55 miles of Public Use Roads, 17 miles of gated Administrative Roads, and 5 miles of Drivable Trails. The majority of trail mileage within this LMU is made up of hiking trails (foot-traffic only). This is representative of the terrain limitations consisting of steep slopes and rocky soils along the length of Tussey Mountain which spans the entire LMU.

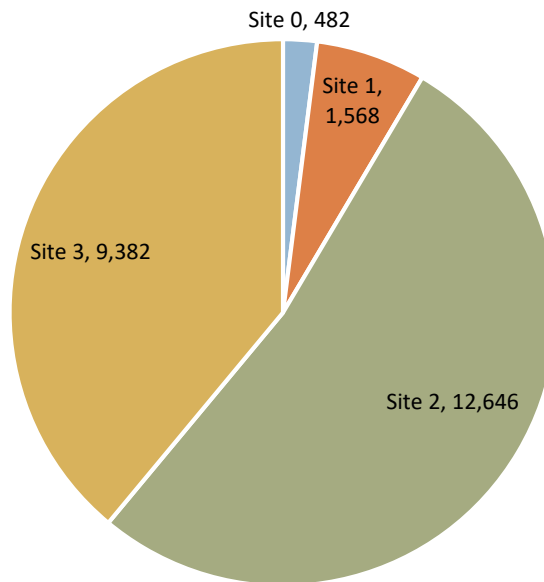


**Figure 2.** Acreage of state forest land in this LMU by aggregated forest type. The forest types are described on p. 108 of the 2016 SFRMP.

Seventy-eight percent of the total forest types within this LMU consists of the mixed oak forest community. This is the typical forest type located along the ridges and slopes within the Ridge and Valley

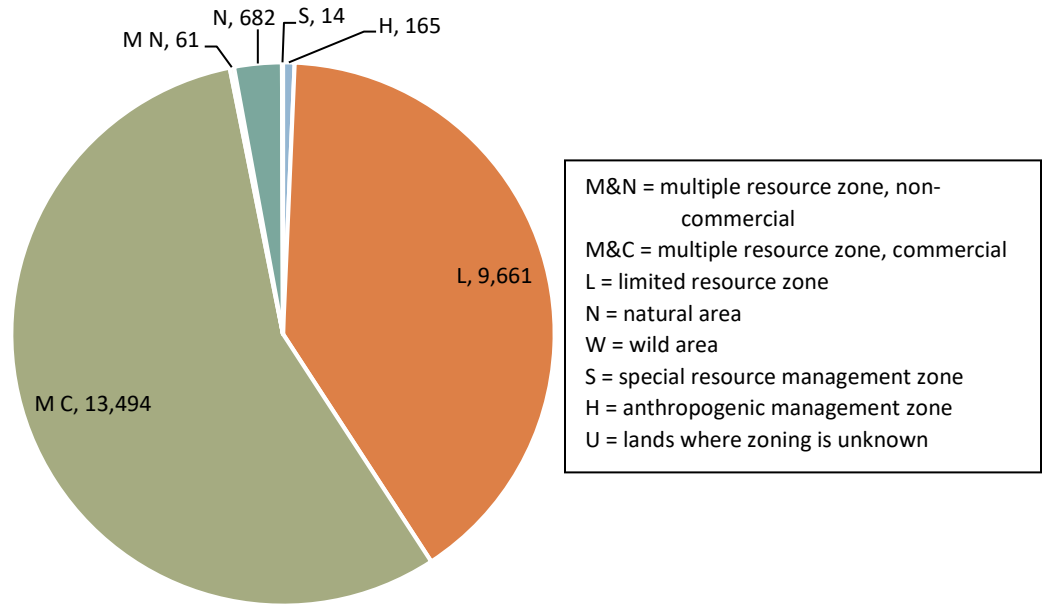


Ecoregion. The other hardwoods, red maple, and conifer forest types are present along waterways, in valleys, and other low-lying areas within the LMU.



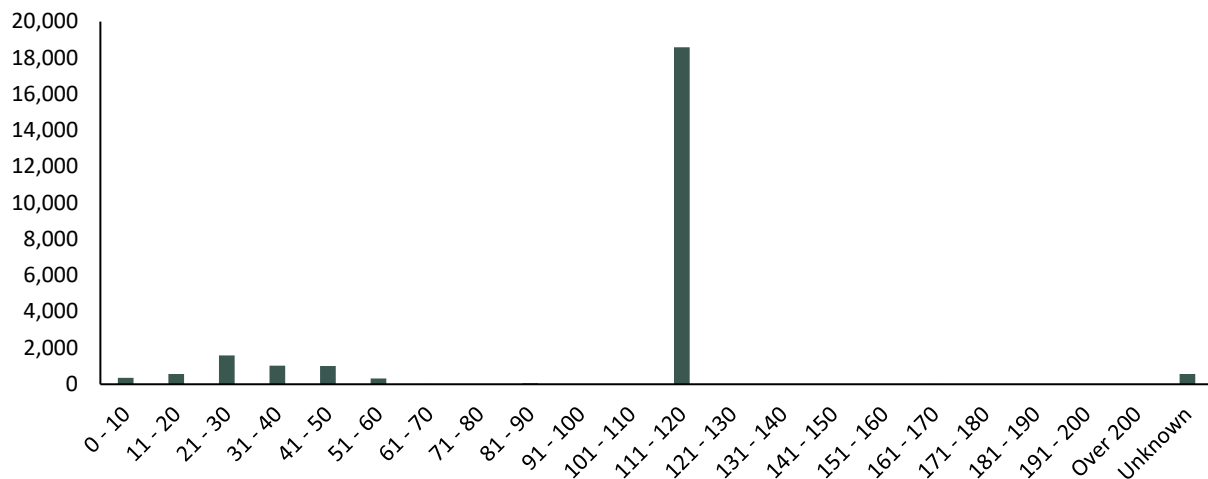
**Figure 3.** Acreage of state forest land in this LMU by site class. Site classes denote the potential quality of the growing site. “Site 0” indicates non-forested lands or forested lands where the vegetation has not yet been typed. Other site classes are described on p. 53 of 2016 SFRMP.

Ninety-two percent of the total forested areas within the LMU are moderate to poor growing sites consisting of Site 2 and Site 3 classification. This is typical along the slopes and ridges of Tussey Mountain which spans the entire length of this LMU. Only seven percent of the forested areas are located in the best growing sites represented by Site 1 classification. These better forested sites are typically located in the valleys, base of slopes, along waterways, and on benches along the ridge.



**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.

Fifty-six percent of the total forested areas within this LMU are zoned as Multiple Resource Commercial. These areas are present at accessible side slopes, ridge benches, and valleys. Forty percent of the total forested areas are zoned as Limited Resource Non-Commercial. These areas are located along Tussey Mountains’ steep slopes, ridgelines, and other inaccessible areas.



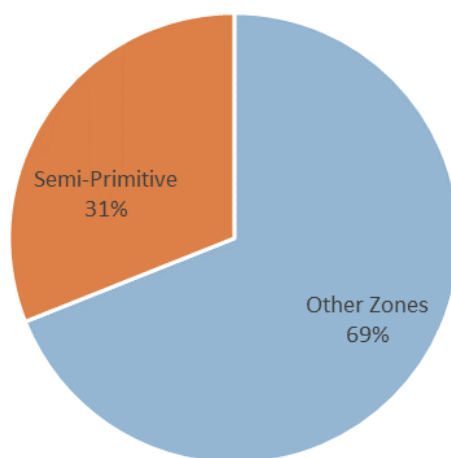
**Figure 5.** Acres of state forest land in this LMU by forest age classes.

Seventy-nine percent of forested areas on state forest land within this LMU are in the 111-120-year-old age class. This is an accurate representation of this LMU due to the high percentage of inaccessible and inoperable areas along the ridge topography. Many of these old age forests are located in areas zoned Limited Resource Non-Commercial forest stands.

Class	Total Miles
High Quality	38
<b>Total</b>	<b>38</b>

**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.

Thirty-eight miles of streams within this LMU are classified as High Quality. Spruce Creek, which delineates the northwest edge of this LMU, is a world-renowned trout stream.



**Figure 6.** Acres of state forest land in this LMU by Recreation Opportunity Spectrum (ROS) classifications in 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 used to measure and characterize land by types of recreation experience. ROS classifications range from “Primitive” to “Developed” land characteristics. Thirty-one percent of the total public land acreage within this LMU is classified as “Semi-Primitive” meaning an environment with low to moderate man-made occurrences. The remaining sixty-nine percent of the total public land acreage is classified as “Other” meaning these areas have more man-made occurrences and infrastructure.

## Glossary of Terms & Acronyms

**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 enjoys 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 2<sup>nd</sup> 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  $\geq 40$  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.

## **A**

**ACB** – Alliance for the Chesapeake Bay

**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

**BCAP** – Biomass Crop Assistance Program

**BMP** – Best Management Practice

**BOF** – Bureau of Forestry

**BRC** – Bureau of Recreation and Conservation

**BSP** – Bureau of State Parks

## **C**

**CAA** – Commercial Activities Agreement

**CAPS** – Cooperative Agriculture Pest Survey Program

**CAR** – Corrective Action Request

**CARS** – Cooperative Accomplishment Report System

**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  
**DHS** – Delaware Highlands Conservancy  
**DMAP** – Deer Management Assistance Program  
**DOI** – Department of the Interior  
**DRBC** – Delaware River Basin Commission  
**DVRPC** – Delaware Valley Regional Planning Commission

## **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  
**EPLO** – Emergency Preparedness Liaison Officer  
**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  
**FFA** – Future Farmers of America  
**FFP** – Forest Fire Protection  
**FFW** – Forest Fire Warden  
**FHM** – Forest Health Monitoring  
**FHTET** – Forest Health Technology Enterprise Team  
**FIA** – Forest Inventory and Analysis  
**FLAME act** – Federal Land Assistance Management Enhancement  
**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

**HUD** – Housing and Urban Development

**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

**K**

**KTA** – Keystone Trail Association

## 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

**MST** – Mid State Trail

**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