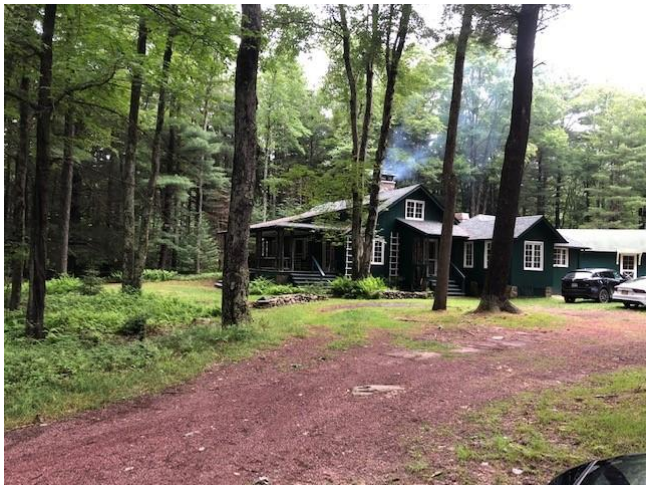
PLP LEASEHOLD FOREST STEWARDSHIP PLAN

LOTS 50 (PLP), 51/52 (RITCHIE/RUFFA CAMP), 14.5 ACRES (LOTS 51/52)



Property Location:

Tobyhanna Township, Monroe County

590 South Shore Drive,

Pocono Lake, PA 18347

<u>Forest Stewardship Plan Prepared by:</u>

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Table of Contents

Landowners Forest Management Goals:

- Maintaining/Improving overall Forest Health and Native Plant Diversity
- Reducing hazards of dangerous trees throughout the property, especially near trails and the cabin.
- Enhancement of recreational opportunities for hiking and family use.
- Maintaining the aesthetics and privacy of the land, especially lake frontage.
- Passing the land to children in good condition for the future.

Directions to the Property: The property is located within Pocono Lake Preserve along South Shore Drive, roughly midway between the Pocono Lake dam and State Route 940. Specifically, the property is located at 590 South Shore Drive on a slight curve. The driveway extends east from South Shore Drive through a tall planting of Norway Spruce along with several native conifers and deciduous trees.

The Property Within the Landscape:

The Ritchie/Ruffa camp consists of two parcels of land east of South Shore Drive. Recently these two parcels were evaluated by the author for possible acreage discrepancy. An original Forest Stewardship Plan was prepared by Richard Cary in 2004 that showed the entirety of Lot 52, though most of what is considered as Lot 51 was included as part of a parcel (Lot 50) owned by Pocono Lake Preserve. This plan covers activities on both lots 52 and 51, and adds approximately 4.5 acres of land (Lot 51) into the leasehold. The approximate property lines have been flagged with pink flagging by the author. The author is not a licensed surveyor, which prohibits establishing marked corners or blazes on trees. A licensed surveyor should be obtained to properly establish the leaseholds if so desired. The pink flagged boundaries are estimated to be fairly close to the actual boundaries. The leasehold parcels are bounded by Pocono Lake Preserve property to the west, south, and east, along with the Amick leasehold property to the north. It appears that the boundary for Lot 52 shared with the Amick property does pass across the Amick driveway and onto the north side of the driveway to its intersection with South Shore Drive.

The leasehold is included as part of the larger ownership of Pocono Lake Preserve. The property is located within the Pocono Plateau region of Pennsylvania. This region is characterized by broad flat ridges with lower elevation riparian stream areas and glacial bogs and swamps. Some steeper slope areas periodically are found on various properties. Where steeper areas are encountered, the hillsides typically have exposed bedrock ledges and boulders, providing habitat for many animal and reptile species that utilize these habitats.

An aerial view of the landscape within 5 miles of the Ritchie/Ruffa property shows large blocks of land protected from development by the PA Game Commission, DCNR Forestry, Natural Lands Trust, Wildlands Conservancy, and The Nature Conservancy. Scattered between the protected lands are a few large residential developments and smaller blocks of private forest lands. Pocono Lake Preserve itself is a developed area, though not as extensive as nearby Lake Naomi community. Pocono Lake Preserve authorizes 142 leaseholds throughout the roughly 5,000-acre property. This western portion of the Poconos has not seen the significance of housing development as witnessed further east, primarily due to solid cooperative work by agencies and private partners to conserve and protect the large blocks of forest. Having a wealth of protected forest lands and private woodlots nearby allows for excellent

outdoor recreation and a strong diversity of wildlife habitats to be explored and managed. The aerial view of the surrounding forest exhibits large blocks of mature mixed oak and conifer/deciduous forest. Wet bogs and swamps also dot the landscape at lower elevations along with serpentine stream bottomlands. From an aesthetical perspective, the maturing forest with large towering trees provides a beautiful backdrop to forest experience seekers. Ecologically speaking, wildlife and plant species diversity is better balanced when there is a mix of various age classes of forest vegetation ranging from grasses, shrubs, small tree saplings and on up through older, longer-lived trees. Activities by conservation partners mentioned above to increase acres of forest towards younger age classes, shrub lands, and grass lands will add greater diversity to the natural landscape and improve upon a variety of recreational opportunities by users.

Much of the conserved forest lands in this landscape constitute maturing deciduous hardwood forest with conifer component. The highest elevation ridgetops contain shallow soils and consist of stunted oak species and scrub oak barrens. Broad, flat ridge tops east of the Lehigh River intermix oak, Hemlock, and pine with Northern Hardwood type forest (beech, birch, maple, cherry). Coniferous swamps, bogs, and riparian stream corridors dot the landscape at high and low elevations, providing richness in diversity of wildlife and plant habitat structure and species compositions. These areas tend to be dominated by tree species like Hemlock, Red Spruce, Balsam Fir, Beech, Red Maple, and White Pine.

OVERALL PROPERTY RESOURCE CONDITIONS

This section of the plan describes an overall perspective of the property prior to resource descriptions and professional recommendations for the management of each individual unit. This section touches on common themes across the entire property, with background forest conservation education provided to answer the questions of what is important in forest conservation principles in the face of certain challenges of the day.

Lots 51 and 52 contain 7 distinct classified units of land as shown on the Forest Management Map. One of these units (Unit 5) consists of the actual camp structure and immediate surrounding parking areas and outbuildings, along with several landscape trees. The remaining units each consist of separate forest vegetation “types”. By definition, a forest type is a unit area of vegetation that maintains similar tree and shrub species, overall canopy level tree diameter classes, and growing site conditions for a diversity of plants. More on the specifics of each type present on the property will be discussed in the Unit Description and Recommendations section.

The camp is located on the highest point of the property, with an east facing slope leading back and across the powerline behind the camp. A West facing slope gradually drops down to South Shore Drive to a lower flat down by the lake. Soil conditions throughout most of the area east of South Shore drive are fairly dry, though one small wetland is located near South Shore Drive on the southern boundary with PLP Lot 50 and the Barnum property. The forest wetland community has the greatest presence of younger trees and shrubs with an open canopy given multiple tree falls on these wet soils over the past decades. The combination of wet soils and standing water yield root systems of trees that are generally more prone to falling in wind and snow events. The upland areas have a mix of conifer (White Pine, Hemlock, and Red Spruce) throughout, with scattered groups of deciduous (Black Cherry, Red Maple, Serviceberry, and Yellow Birch) trees.

Forest Health and Diversity

Stiltgrass Seedlings

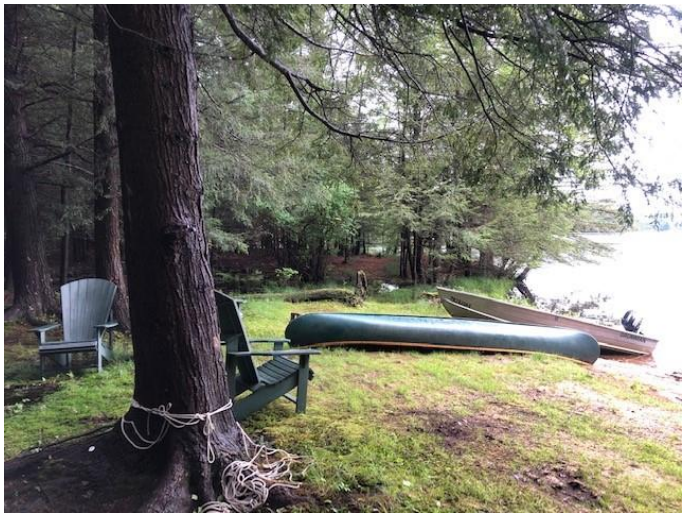
Invasive plant species, both exotic and native, and overabundant white-tailed deer are the primary threats to forest biodiversity and health on the greater PLP property and leaseholds. Oftentimes areas that have seen overabundant deer herds for decades become ripe for invasion of plants on the forest floor that deer do not prefer or find palatable. One such example is the native Hayscented Fern. This species spreads by a large interconnected underground root system. Fern does not grow well in the shade of conifer forest, but will readily absorb sunlight and spread in sunny deciduous forests. Deer will browse the desirable deciduous and conifer seedlings that would naturally fill in here, and the fern will establish and spread. Once present, these "fern flats" will occupy the land for many years until either deer are controlled or the fern itself is controlled with chemical means. Invasive exotic plants, like Japanese Stiltgrass and Japanese Barberry, both present on PLP properties, often find their way into these zones and establish colonies. The Ritchie Ruffa property fortunately does not have Japanese Barberry, however Japanese Stiltgrass is found near in Unit 5 in the lawn (treated in 2022), and near the corridor with South Shore Road. Most of the lease holds within PLP have some presence of this destructive weed. Invasive plants are not generally favored by deer, and displace native plant diversity, leading to a loss of the capacity of the forest to regenerate native plants and feed or shelter a host of native wildlife. Stiltgrass spreads easily by seed attaching to deer, car tires, and travelling in water through culverts and nearby road corridors. Left unchecked, it can even outcompete fern in the forest. Once Stiltgrass has been present for 5 years or more on a site, it is very difficult to control without constant intervention. Japanese Barberry is a larger seed encapsulated in a red fleshy fruit that typically is spread by birds (eating the fruit, wasting the seed) throughout forested properties. Japanese Barberry has the added danger of providing ideal habitat for deer ticks that spread Deer Tick Virus, Lyme Disease, and a host of other human illnesses. Broad thickets of Barberry often will hold hundreds of ticks waiting for forest users to pass by and latch onto. Native Hay-scented and New York Ferns are well established in the sunny deciduous tree units, preventing growth of tree and shrub seedlings in many places. Moving towards the conifer dominated units, the fern is less abundant, and small seedlings of Hemlock, Red Spruce, and White Pine are present in some areas. Lycopodium, or ground pine as some call it, is present in small patches of deciduous forest where fern has not dominated. Wild Lowbush Huckleberry

is present in deciduous forest areas, especially near the driveway to the south of the cabin. Beech brush (the sucker sprouts developing from dying Beech trees overtop) is an invasive native tree that is present throughout PLP and on the Ritchie property. Beech brush is less preferred by deer as a food source, and can become problematic in outcompeting more desirable Black Cherry, Red and Sugar Maple, and Serviceberry trees that will regenerate and provide wildlife value. Historically, Beech Brush had a higher presence on the Ritchie property. Past management recommendations detailed curbing the influx of Beech Brush to favor development of more desirable saplings mentioned above. Much of the Beech Brush has been controlled, but will likely continue to sprout and compete for sunlight. Where Beech Brush is found in the future, stems can be cut and stacked to form brushpiles that attract nesting songbirds and small mammals. Highbush blueberry and Rhododendron groves are found nearest to the wet soil areas on the border with Lot 50. Other common plants on the forest floor, especially in the conifer dominated forest where fern is light, are Indian Cucumber, Starflower, and Canada Mayflower. Each of these plants is favored by deer, but are surviving in small groups, suggesting that deer pressure on the forest is not as widespread as it once was. This gives rise to the opportunity that certain management strategies could be used to reduce fern presence and lead to more tree, shrub, and small plant diversity, increasing wildlife diversity and usage of the property. Fern establishes well in areas where deer browsing on desirable seedlings has been heavy in the past. Deer populations can be reduced to low numbers to allow for young seedlings to establish, however, if the fern has inundated forest units in the past, it will thrive and stay intact for decades, limiting the ability of the forest to regenerate to desirable trees and shrubs.

Overall, the forest units are fairly healthy and contain a nice mix of conifer and deciduous species in the canopy, well above the impact zone of deer. Most of the Hemlocks are being impacted by Hemlock Woolly Adelgid and Elongate Hemlock Scale. Priority has been placed by the lease holders on Hemlock treatments with insecticide to stave off these insects. The Black Cherry trees throughout are showing signs of stress with Black Knot fungus and natural aging. Black Cherry is a highly valuable tree for wildlife, but also one that has a shorter natural life span than the Maple and conifers. As other trees grow up around the canopy of Black Cherry, less sunlight is available and the Cherry begins to lose its grip. This is happening in several areas. One Red Oak was found on the property as well. The opportunity exists to expand the sunlight zone around the canopy of this Red Oak by felling nearby trees. Providing more sunlight will increase this tree's longevity and vigor. Few Red Oaks exist on the PLP property. Where identified, they should be protected and allowed to thrive, as they are a stately tree, can live for 300 years, and provide excellent wildlife food sources.

The greatest concern for forest health and diversity at this point is the slight presence of Stiltgrass, and the inability of the deciduous forest to replace itself with tree and shrub diversity given the density of fern.

Recreation and Aesthetics



Lake Mooring/Tent Spot

Forest Recreation is a high value of lease holder interest throughout Pocono Lake Preserve. The Ritchie/Ruffa families place much interest on the recreation and aesthetic value of the leasehold, wishing to maintain and enhance recreational opportunities, and preserve the pleasing aesthetic nature of the property, especially with big trees of diverse species, native shrubs, and the colors these species bring as the seasons change. Currently on the property (see Recreation Map) there are several existing trails that serve as walking and biking paths for the family. The main usage area is the driveway leading to the camp as well as the walking path down to Pocono Lake. A flat mooring spot is located down by the lake for kayaks, rafts, and a small boat. Boating equipment is stored nearby on land during the summer months. Another trail section is located behind the camp (pink lines) in the southeast corner on Lot 52. This trail leads from the powerline trail off into a tall White Pine Forest and connects with a small trail on PLP ownership. The trails are wide enough to accommodate both hikers and mountain biking. An old right of way connects the existing powerline trail near to the back end of the parking lot of the camp. A small path could be cleared of fern and logs to accommodate mountain bikes here (yellow trail section).

Two dense groves of older Hemlocks (green lines) are located west of the camp on Lots 51 and 50. Hemlock is the dominant tree in these groves, along with White Pine, Red Spruce, and a few deciduous trees. While Hemlock exists elsewhere throughout the property, it's presence is less uniform and dense as compared to these groves. The shade and cooling effect of Hemlock groves is second to none in summer. These would be nice areas to establish a small camp site for tents (flat ground) or a picnic bench for nature study.

Several large tree specimens of various species were gps located and mapped on the recreation map. A number of these trees are located within or near to the Hemlock groves. Pocono Lake Preserve has a

wealth of large trees in the residential leaseholds, providing wildlife habitat, food, and cover sources, and also a glimpse of what William Penn first saw upon coming to Pennsylvania centuries ago. Large diameter specimens of Black Cherry, Red Maple, Red Spruce, White Pine, and Hemlock are noted on the map. One smaller diameter Red Oak is also noted, the only Oak located on the property. Given the very slow growth demonstrated by trees like Hemlock and Red Spruce, it's likely the larger specimens by diameter on the property are pressing at least 200 years old. This may be true of the White Pines over 30" diameter as well. Red Maple and Black Cherry are faster growing trees and rarely exceed 150-200 years old in a natural forest. Red Oak can live to be 300 years old in good conditions, but it's likely the one present on the property is less than 80 years old. The only sure way of aging a tree is to cut it down and count the rings. Approximations can be made by taking a small core sample with an instrument called an increment borer. The author has one if interested, and can be used to fairly accurately age trees up to 24" diameter.

Wildfire Risk/Prescribed Fire Opportunity

Hemlock Down Woody Debris

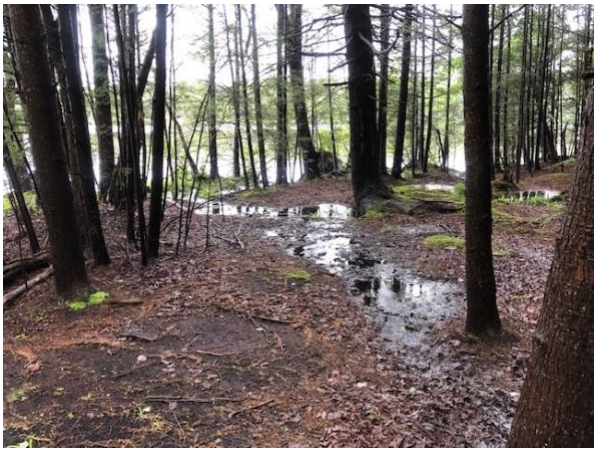
The risk for wildfire in eastern U.S. Forests, especially in the northeast, pales in comparison to that seen on TV occurring in the west. Our climate has evolved over time to be less prone to the type of drought seen in the western states. Higher atmospheric humidity, a larger diversity of less flammable vegetation, and more frequent moisture events *generally* reduce our risks of wildfire in the east. While summer months are typically most active for wildfire in the west, given dry, hot weather and mostly pine forest in the west, our eastern hardwood and conifer forests have the greatest potential for wildfire in the spring and fall before and after the forest floor greens up with non-flammable plants like fern, grasses, and leafy green seedlings and shrubs. In Spring and Fall, bright sun and a lack of leaves on deciduous trees allow sunlight to penetrate to the forest floor, drying out the fallen leaves of last year and the soil surface. Combined with wind events and some drought, our forests can indeed become prone to moderate fire if careless activities are undertaken. Careful attention should be paid to campfires by the family or trash burning. Campfires should be contained within a permanent stone fire ring. Trash burning if done so should be in a steel barrel with at least 30 feet of green grass around the

perimeter, and no leaves or pine needles nearby. Being present with a hose or several buckets of water while burning at all times is essential, especially in spring and fall. As our climate continues to change, wildfire potential in eastern forests could increase, especially if we experience prolonged summer droughts.

Archeological, Cultural, Historical Resources

PLP was established in 1904. Much of the surrounding area, including on many of the leaseholds, was harvested of mature trees. The tremendous logging slash left in place, combined with activities of man at the time created dense young forest prone to large wildfires. These fires burned many areas in the Pocono Region. In particular, at least a portion of the camp was burned and re-planted with Norway Spruce (Unit 7), along with natural seeding of conifers and deciduous trees over time. The views from the lakeshore depict structures on the far side of the lake that once served as storage bunkers for ice harvested off the lake and shipped to markets further east and south.

Water Resources



Spring Seep on PLP property

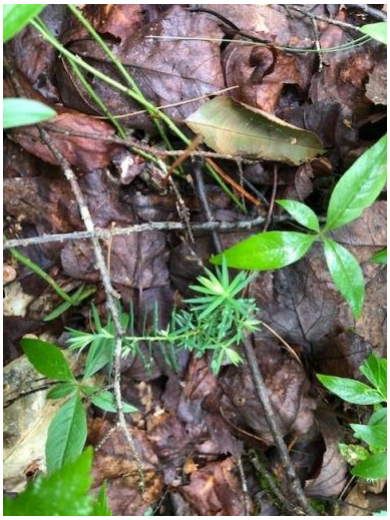
Pocono Lake is one of the larger bodies of water in the Pocono Region, holding great historical value to the area as a popular destination for family leaseholders, a getaway from urban life, the once thriving ice industry, and currently a fine boating and fishing experience. The family has one small mooring area for unpowered and low powered boats from which to launch at the end of the lake path. The lake itself has multiple coves spanning its perimeter, with a quality fishery for trout, bass, pickerel, perch, and crappie fish. No permanent streams are located on the property, though once small spring seep is identified in the northern portion (PLP ground) that feeds into the lake. Spring seeps supply critical wildlife habitat for amphibians and reptiles, along with vegetative food sources for mammals and birds early in the spring. The underground water that bubbles at the source maintains a constant temperature of 60 degrees at the source. When most plants are still dormant in late winter, oftentimes green grasses and forbs will grow around these spring sources due to warmer waters emanating from the spring. Protection of springs by limiting human activities is a key value to PA wildlife and the quality

of the water present. This water in turn provides nutrient rich cool inflows to the lake, helping to keep the quality of the water high for fish and valued recreation by users.

Forest Soils Information

A soil map and description were prepared by Dick Cary in the last forest plan and will continue to serve the purpose of identifying soil types per unit in this plan. Soil types and structure do indeed change over time, but not much in 20 years, therefore using the soil maps previously prepared is accurate for current conditions. Soils information is highly valuable where activities such as commercial timber harvesting, planning of infrastructure additions, or design of recreational trails is desirable by the landowner.

Pennsylvania Natural Diversity Index

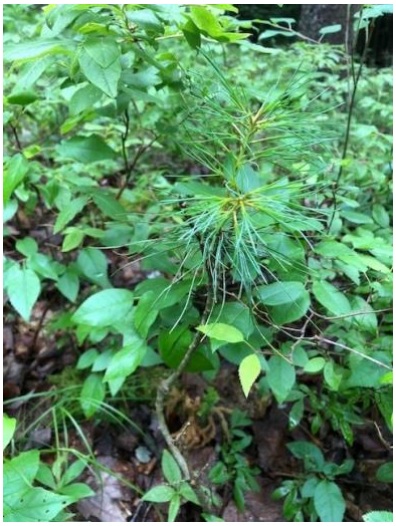


Young Hemlock Seedling and Starflower

A review of the PA Natural Diversity Index was done in 2020 for a forest area similar to the Ritchie/Ruffa property about 1 mile east on Tunkhannock Creek Property. This review indicated that one plant species of special concern was known to exist in the area, especially on wet soils in and around forested wetlands. The plant species is known as Myrica Gale (Sweet Gale), is native to PA, and has greatly declined in presence due primarily to habitat loss. Given that it is restricted to very wet soils, if it does exist on the Ritchie/Ruffa property (perhaps in Unit 6), recreational trail or other activities where soil disturbance would be considered should be avoided to allow the plant to perpetuate and thrive. Northern Flying Squirrel is a species of concern in Pocono Forests. This species has been known to exist at PLP. It uses forest types for habitat and food sources found in the Ritchie property, specifically Units 1, 2, and 3, where Hemlock and Red Spruce are commonly found. Nest box surveys have been in place at PLP for a number of years, trying to determine if Northern Flying Squirrels are still present and

whether their populations are thriving. Competition for food sources from the more common Southern Flying Squirrels, loss of habitat, and climate change are pushing the Northern species further north. The PA Game Commission is working on a set of recommendations to allow forest owners to attempt to maintain and improve habitats for Northern Flying Squirrels.

Wildlife Resources



Native Plant Diversity

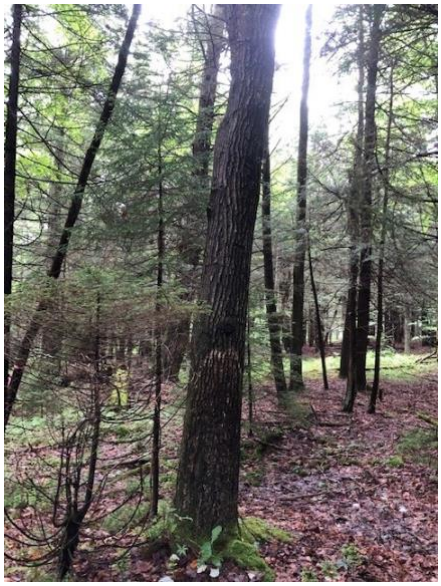
Pocono Lake Preserve is home to quite a variety of wildlife species and types. As a rule, there are wildlife species generalists and specialists. The generalists (White Tailed Deer, Black Bear, Eastern Coyote, Blue Jay, American Robin, Wild Turkey) will use a broad range of habitats throughout their life cycle to sustain their populations. These species can thrive in older forests, younger forests, wetland areas, edge habitats (field/forest transitions), and even suburban woodlots. They typically are not heavily disturbed or stressed by the constant presence of man near their habitats. Some of these species do prefer specific habitats to forage or rear young in, such as young forest habitat, or to see out food sources during certain times of the year. White Tailed deer are a good example. They can be found virtually anywhere there is protection from wooded cover, be it young forest saplings or tall old growth forest. However, when the females drop their fawns in spring, they prefer to do so in young forest cover or heavy grass/sapling thickets to hide their young from predators. Doing such in open old woodlands would certainly increase predation rates from bears, coyote, and Bobcats on their young.

Other wildlife types are habitat specialists. They seek out certain types of habitat for foraging, raising young, and thriving. Some use old forest with towering trees. Others use grasslands, grassy wetlands, woody shrub wetlands, woody shrub ridgetops, conifer dominated forest, deciduous dominated forest, mixed species forest. Some prefer low elevation forest to higher elevations. Much of Pocono Lake Preserve and the leaseholds is dominated by older growth mixed conifer/deciduous tree cover. Scattered across the preserve are small kettle bogs and wetlands with young spruce, fir, Hemlock and blueberry. Higher elevation hilltop areas are dominated with maturing units of deciduous Beech, Black

Cherry, Yellow Birch, Red Maple, and Sugar Maple. Each of these habitat types attracts and holds both generalist and specialist species.

Mammals noted on the Ritchie Ruffa property during field work was evidence of White-Tailed Deer, Black Bear, Eastern Coyote, Red Squirrel, and Raccoon. Bird species noted were Blue Jay, Dark eyed Junco, Wood Thrush (a songbird species in decline), American Crow, Barred Owl, Screech Owl, and Raven. Given the amount of downed woody debris (downed logs, limbs) on the ground, it's likely the leasehold provides ideal habitat for a variety of reptiles and amphibian, especially salamander species, Wood Frogs, Spring Peepers (near wet areas), and Eastern Toads. It's likely that other species noted on PLP such as Bobcat, Fisher, Bald Eagle, Southern and Northern Flying Squirrel, Snowshoe Hare, and a suite of songbird species pass through or utilize the Ritchie Ruffa property at some point as well. Even the smallest manipulations of habitat, such as conducting planned tree felling, planting seedlings, reducing invasive plant species, and creating small clearings can create opportunities to diversify both habitats and the species they attract. Options to conduct such activities will be touched on further in this plan.

Timber Resources



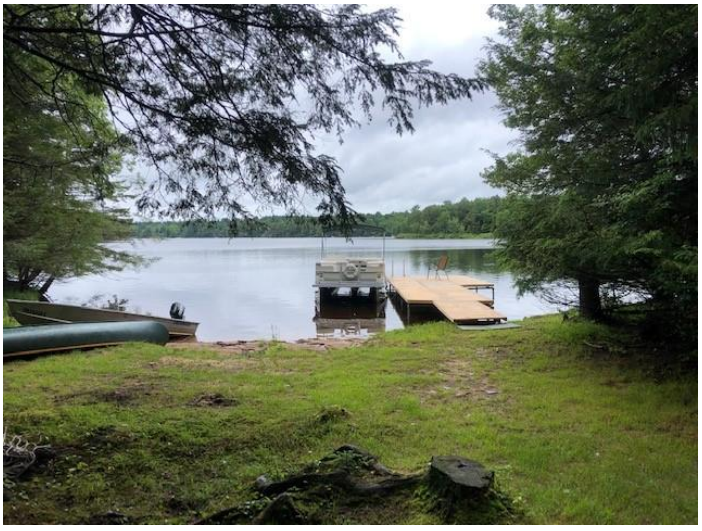
Unit 3 Red Oak

The once cut over area of Pocono Lake Preserve has grown back naturally to a landscape dense with older maturing forest of Hemlock, Red Spruce, White Pine, Balsam Fir, and some Black Spruce. The highest elevation areas are dominated by canopy level deciduous hardwoods of Beech, Black Cherry, Red Maple, Sugar Maple, Yellow Birch, Serviceberry, and widely scattered Northern Red Oak. The lower strata of these forests are dominated by dense Beech Brush, Hayscented Fern in openings, and sparse Serviceberry Seedlings. Moving downslope, the forests change to a mix of Hardwoods and conifers mentioned above, especially Hemlock and White Pine. At the bottom of the slopes, wet soils accumulate and provide growing conditions for dense stands of Hemlock, Red Spruce, Balsam Fir, and Rhododendron.

The Ritchie Ruffa property is dominated by large, maturing mixed conifer hardwood forest. White Pine and Hemlock are the largest diameter dominant trees in the canopy. As one or more of these trees naturally succumbs to disease, windthrow, or insect damage, light gaps open up and provide growing space for smaller diameter Red Spruce, Red Maple, Serviceberry, and Beech. Several large Black Cherry and Red Maple trees are present on the property that likely started growing in canopy gaps created by timber harvesting or natural tree dieback nearly a century ago. The dark conifer dominated forests yield less light to the forest floor, and small saplings or seedlings are sparse, minus a few very shade tolerant Red Spruce and Beech. Where the canopy opens a bit, Red Maple, Beech, Black Cherry, Yellow Birch, and Serviceberry saplings and poles (trees 6-12" diameter) are present, along with sapling Hemlock and White Pine. The most open canopy areas along the powerline and behind the cabin have dense carpets of Hayscented fern.

While commercial timber harvesting may never be a goal on this property, periodically there may be a need to remove some trees for small scale wildlife habitat projects or hazard tree removals near infrastructure. These opportunities would provide the leaseholder with forest products to use as a firewood source, for building wildlife brushpiles, and in the case of larger trees removed as hazards, the possibility to generate a bit of revenue if the total volume of wood removed was enough to fill a logging truck load of wood. Other activities ongoing at PLP to improve wildlife habitats and create ideal conditions for a broader array of species are utilizing professional loggers to periodically remove timber. In conjunction with logger activity timing on PLP, hazard tree removals on leaseholds can work to remove felled hazard tree logs and help defray the cost of the removal, if interested.

Carbon Cycle



Climate change is occurring at an accelerated pace across the world, with impacts to human and animal life felt both globally and locally. Longer duration droughts, more frequent heavy precipitation events, displacement of native habitats by thriving invasive populations, and more severe storms capture the attention of people both on the fringes of society and within certain comfort zones. While the political battles wage on as to what should be done about it, the science behind it is very real and very much convincing. Trees are part of the answer. All green plants absorb carbon dioxide and create oxygen.

Soils and oceans also absorb large amounts of carbon. However, the growth of green plants, oceans, and soils is currently not enough to absorb past and present carbon emissions, leading to the glut of carbon emissions that fuels global warming and volatility. As a green plant grows, carbon is locked away in the fibers, roots, and surrounding soil of that plant. In the case of a blade of grass, that carbon stored in the green tissue is released in the fall as the grass dies back. In the case of a large Hemlock tree, the carbon is stored in wood fiber for the life cycle of that tree, perhaps 400 years? The older and larger the tree, the more carbon is locked inside. As a tree gets older past a certain point, carbon is absorbed at a slower rate than younger trees still growing at rapid rates. Older trees absorb less but lock more carbon permanently (until the tree dies and releases carbon back into the atmosphere or is sawn to wood products and placed in a home, trapping that carbon for as long as the wood products will last inside the home). Younger trees absorb more carbon faster but lock less over the short term given their size capacity to hold the carbon. With this in mind, having a mix of older carbon locking forest areas, with younger forest age classes to accumulate carbon faster is a key initiative to help combat climate change. Woody species tend to live longer and trap more carbon than grasslands and lawn. This doesn't mean that we should ignore native grasslands and grow trees everywhere; but simply that we should manage our forests for healthy woodlands and a density and diversity of trees where forest exists. Prioritizing forest conservation where current forests exist, and limiting fragmentation of the landscape by human populations and development that pulls forest out of the equation is of significant value.

The Ritchie Ruffa property has a wealth of large trees currently holding carbon. Retaining and improving the health of these trees is important for carbon sequestration. The forest cycle is one of winners and losers. At year 1 of a new forest, one acre of healthy stocked forest has 50,000 tree seedlings. At year 100, that reduces to about 60 trees of larger size holding space. Over time, insects, disease, wind, fire, lack of sunlight, drought, and other disturbances ensure the strongest survive. While we can't control most of these disturbances, we can manipulate sunlight, and in the short term, reduce insect impacts. Building resilience in the forest ensures that we have forests that best capture carbon, meets the needs of forest owners, and will combat the various environmental pressures of the future. Improving the health of existing trees through treatments to provide more sunlight, reduced insect damage, reducing species of invasive pressure, and retaining a diversity of plant species will ensure that the forest will continue to thrive in a changing climate, meeting the needs of wildlife and humans alike.

MANAGEMENT UNIT DESCRIPTIONS, RECOMMENDATIONS, AND MAPS INFORMATION

The following section of the plan provides an inventory breakdown of your forest into different resource management units. This classification system identifies individual resource management units on the property by majority vegetation type in the upper canopy of the forest, dominant vegetation growing on the forest floor, soil productivity for producing optimum plant diversity and growing tallest trees, and the size class range of vegetation based on diameter (trees) or overall height (shrubs, grasses, ferns, etc.) Where no trees exist, such as food plots, forest openings, water bodies, the dominant resource features are coded and described.

Each unit is assigned a unit number or letter, or combination of the two. This serves to separate each unit area on the map and within the plan. It helps to differentiate one unit from another in terms of present resources, and especially, serves the landowner and forest manager to keep track of areas where recommendations will be or have been implemented to reach ownership values and goals.

Each unit is assigned a code, plus short phrase to describe the dominant natural resource of the code. These codes are derived from the PA Bureau of Forestry vegetation classification system, and are commonly used across Pennsylvania in the public and private sector. Each code is represented by one or two letters, and one or two numbers, depending on the dominant land use and vegetation present. For example, a code of "O5" represents a "woodland", where less than 30% of the acreage is stocked with trees. A code of "O2" indicates a cultivated herbaceous area, such as a food plot or small field with row crops. A code of AD22 indicates a Dry Oak site (AD), which is a forest tree unit stocked greater than 50% with Oak, Hickory, Red Maple, Birch, etc. trees, on a medium productivity soil class (first number "2"), and size class range of dominant canopy trees of 12" diameter to 18" diameter (second number "2").

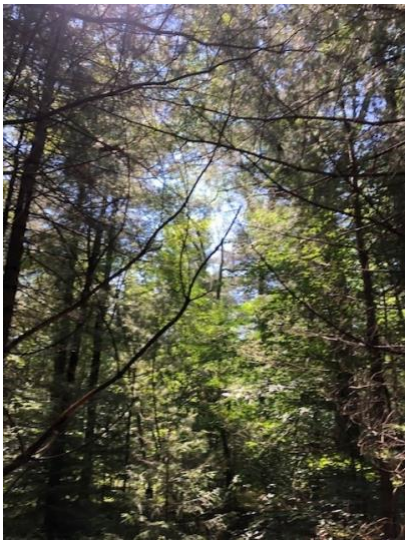
With demonstrated landowner goals and values in mind, each unit code will be described in detail per the unit breakdown, followed by professional science-based recommendations to enhance or manipulate each unit to satisfy goals and values long term. Recommendations are made based on goals and values, resource condition per unit, management options per unit, and the season or year in which operations would take place. These recommendations are then summarized for the property in an activities table at the end of the plan.

The descriptions and recommendations section per unit is a snapshot of the current condition and recommendations per unit at the time forest land field work was completed. Forests are constantly changing due to disturbances from disease, insect outbreak, weather events, invasive plant movement, deer herbivory, and human related disturbance. No plan can predict what may happen in future years with unplanned disturbance. However, establishing a baseline resource assessment of each unit with a management plan certainly provides an understanding of where your forest is currently, where you want it to go, and how we're going to get there. When unplanned events do happen, as they always

seem to do, the baseline information gathered assists greatly in determining a correct course of action to quickly shift gears to a strategy that will satisfy goals. In a nutshell, this plan is a snapshot. Following it will best meet your values and goals. If goals and values change, or the forest itself changes, flexibility in planning and implementation of activities or strategies should also follow suit.

MANAGEMENT UNIT 1 (8.75 acres)

Forest Community Type: White Pine Northern Hardwood Forest (FB12), High Productivity, Medium Sawtimber Forest



Mixed Conifer/Deciduous Forest

Unit Description:

The largest acreage unit on the leasehold, Unit 1 is found in two distinct locations on the leasehold and up into Lot 50 as depicted on the map. Tree cover here is a mix of larger diameter White Pine and Black Cherry, with scattered larger Eastern Hemlock in the upper canopy. The density ratio is about 50/50 Deciduous to Conifer. Underneath this canopy level are second growth level trees of Red Spruce, Black Cherry, White Pine, and a few Beech. Hemlock is not overly common in this unit but does exist periodically. Beech and Red Maple occur sporadically. Several smaller diameter Serviceberry exist in the midstory, along with low density Beech brush (near diseased Beech canopy trees), and White Pine sapling thickets scattered throughout. Where the conifers dominate the canopy, the forest floor is mostly leaf litter with a few seedlings of Beech and Serviceberry. Where canopy hardwoods are more present, fern is dominant in the open patches, however small Black Cherry, Beech, Red Maple, and White Pine seedlings are common as well where fern is not dominating. The mix of large conifers and deciduous Black Cherry, Maple, Beech, and Serviceberry provide a nice diversity to this unit, likely attracting the most wildlife attention to the leasehold in these areas, and painting a backdrop of pleasing aesthetics for the family.

The White Pines appear mostly strong and healthy in the unit. Hemlock Woolly adelgid and Elongate Hemlock Scale insects are present on the Hemlock, reducing vigor and strength. Larger Black Cherry

stems are showing signs of stress from crowding. Black Cherry is a sun-loving tree with a much shorter natural life span than the conifers. As other trees cast shade on the Black Cherry crown, these trees tend to die back. Some Cherry trees here have a fungus known as Black Knot on the stems and branches. This fungus is common to Black Cherry especially as it takes stress. Most Beech trees are not in great health from Beech Bark Disease. One large 30" diameter Red Maple is present. Red Maple, like Black Cherry, has a shorter life span. Beyond 2 feet in diameter, these trees tend to slow down in growth and often develop rot in the center. These rot cavities often form holes on the outside of the tree, providing homes for small mammals and cavity dwelling birds like Woodpeckers and Wood Ducks (near water). In terms of wildlife foods, Black Cherry and Serviceberry both provide valuable berries for mammals and birds alike, along with attracting multiple types of caterpillars that feed on foliage and in turn feed many songbirds and mammals. Beech trees provide periodic hard nut crops for wildlife and some insect activity as well. Hemlock, White Pine, and Red Spruce cones all produce valuable seeds every other year for squirrels, Pine Grosbeaks, and other species.

The powerline trail cuts through the southern end of this unit. The old right of way leading from the camp back to the powerline provides a rough pathway corridor for camp users to access the powerline trail and the small trail in the southeast corner of the property.

Unit Recommendations:

Treat canopy level Hemlocks where found in this unit to perpetuate longevity in the face of insect attack. Consider thinning out some trees around the healthiest large Black Cherry stems to increase sunlight and perpetuate their mast production for wildlife and increase vigor. Retain any trees that have holes or cavities for wildlife. Conduct daylighting (thinning back tree competition) around existing larger Serviceberry trees to increase fruit production and vigor. These activities can be done with a chainsaw to fell the selected stems for removal, or with a technique called Hack N Squirt where notches are made with an axe in a tree and herbicide is squirted in the notches in summer. This kills the target tree, and will leave it standing to become a dead snag, also providing homes and perches for wildlife, especially hawks, owls, and other birds.

Reducing fern and beech brush through chemical (herbicide) control, followed by fence placement to deter deer browsing, can serve to increase forest resilience and diversity by allowing seedlings of Cherry, White Pine, Red Spruce, Red Maple, and Serviceberry to thrive and form dense young forest thickets. Alternatively, Beech Brush density can be reduced through cutting, though sprouting will occur without chemical usage. Upon establishing small fence exclosures, fern may be reduced in density if there is enough overhead sunlight on the forest floor to stimulate development of native blackberry. Deer heavily prefer to eat blackberry. If Blackberry can sprout without deer interference (inside a fence), then they can grow up through the fern, shade out the fern, and allow for native tree and shrub seedlings to seed in and grow through the Blackberry. Where fern is currently absent on the forest floor, and seedlings are trying to grow but are getting browsed by deer, small fences can be established to allow the seedlings to thrive. Fences should not focus on individual trees, but small areas instead. Fences or tree tubes that focus on individual trees will likely be more problematic to maintain and locate. Fence area will be determined by the size of the area needing protection, but in most cases should be no less than 15x15 feet.

These thickets will at first provide valuable nesting cover to many species, and later help to keep diversity and a resilient system in the forest. Your forester can assist in locating and creating these. Where moist soils exist in these cuttings, Highbush Blueberry will likely seed in and increase wildlife food. Other native seedlings can be planted in these fenced openings so long as light conditions are matched with the seedling type. Seedlings to consider planting after fern and beech are killed would be Northern Red Oak, White Oak, Pin Oak, Tulip Poplar, Sugar Maple, Black Cherry, and Sycamore.

Flag and design a more user-friendly path on the old powerline right of way connecting the camp to the existing powerline. A simple path can be created by using a weedwhacker to mow down fern and other small plants for a width of 2 feet, removing logs with a chainsaw, and getting children involved with the project to stimulate their interest in forest work.

Any hazard trees near the dwelling or South Shore should be assessed, flagged, and removed. Trees felled for hazards or other reasons can have branches and brush piled to create brushpile habitat for ground mammals and birds. Stack the largest limbs on the bottom of the pile and build up to the top with fine branches.

MANAGEMENT UNIT 2: (1.96 acres)

Forest Community Type: Wet White Pine High Productivity Medium Sawtimber Northern Hardwood Forest (FBw12)

Canopy gap in Unit 2 from dead Cherry

<u>Unit Description:</u>

This small unit in the southeast corner of Lot 52 is very similar to that of Unit 1, though the dominance of White Pine is stronger in the upper canopy than the Unit 2. White Pine contributes nearly 70% canopy dominance in this unit, with lesser density of Beech, Black Cherry, Red Maple, Serviceberry and few if any Hemlock. Serviceberry is present near some of the openings in the canopy, and Beech brush is scattered through the unit where maturing Beech trees are succumbing to Beech Bark Disease. About

10% of the unit has Beech Brush, and 70% of the unit is covered with Hayscented fern on the forest floor. White Pine has regenerated into sapling stands in portions of the unit, making it past browsing deer and through the fern. Barring deer browsing, White Pine is one of the few seedlings that can grow through fern over time. Black Cherry Health is fairly poor given a shorter life span and impacts of shade from surrounding tree competition. Soils here are wetter than further upslope in Unit 1, yielding patches of Lowbush and Highbush blueberry on the forest floor where fern hasn't yet reached. White Pine seedlings are abundant in places.

A small trail crafted by the family leads from the powerline through this unit to a drivable path on adjacent PLP lands. This path is used for hiking and mountain biking as well as on the powerline path.

Unit Recommendations:

To improve forest plant diversity, light daylighting can be done around existing Serviceberry and healthy Black Cherry stems as described above. In addition, removing fern patches and beech brush density to encourage development of native seedlings and shrubs, possibly with deer fencing if necessary,, would be ideal. All cavity trees should be retained. Hazard trees along the trail and powerline should be removed by professional tree trimmers. Any seedlings hand planted for diversity should be protected with fencing to deter deer. Blueberry crop production can be enhanced by felling overhead trees to increase sunlight on the bushes.

Unit 3: (2.3 acres)

Forest Community Type: Hemlock High Productivity Medium Sawtimber Forest (FF12)

Largest Known Hemlock on Property

Unit Description:

This unit lies west of the cabin and extends further into Lot 50 adjacent to the Barnum property. Essentially this is a serpentine unit on the Ritchie/Ruffa property that contains a mostly intact grove of older Hemlock dominated forest, spanning out to a broader swath well into Lot 50. Hemlock, some trees quite large in diameter and large White Pine form the dominant canopy at about 85% of tree species abundance. The remaining 15% of canopy trees are a few Black Cherry and Red Maple scattered throughout the unit, with patches of Red Spruce forming underneath the tall canopy. Fern is not overly present on the forest floor due to heavy shade. Seedlings of Beech, Hemlock, White Pine, and Red Spruce are present but not abundant. Most Hemlocks in this unit have been treated for Woolly Adelgid and Elongate Hemlock Scale insects and should respond well to treatments, holding existing needle coverage and increasing in vigor, especially on the larger trees that are receiving adequate sunlight.

These Hemlock groves are an important feature for the landowner, along with identification of specific large trees of various species to retain and protect going forward. Unique to this unit is a large 42" diameter White Pine, a 30" diameter Hemlock, a 22" diameter Red Spruce, and one 14" Red Oak (the only Red Oak observed on the property).

Unit Recommendations:

No major activity is planned for this unit. A small woodland trail could be marked on trees travelling through lots 51 and 52 on the leasehold, with stops along the way at the large specimens noted. Daylighting the Red Oak to improve growth and vigor would be ideal. Oak and Beech together, when they do produce nuts, provide a highly valuable food source for wildlife. Red Oak fall color is also quite attractive. Have your forester simply identify and remove trees that are casting shade around this Red Oak to increase its growing space. Should any invasive Stiltgrass or Barberry find itself in this unit and surrounding ones, eradicate it with help from your forester or hand pulling.

Unit 4: (1.9 acres)

Forest Community Type: High Productivity, Medium Sawtimber Northern Hardwood Forest (BB12)

Cherry Black Knot Fungus

Unit Description:

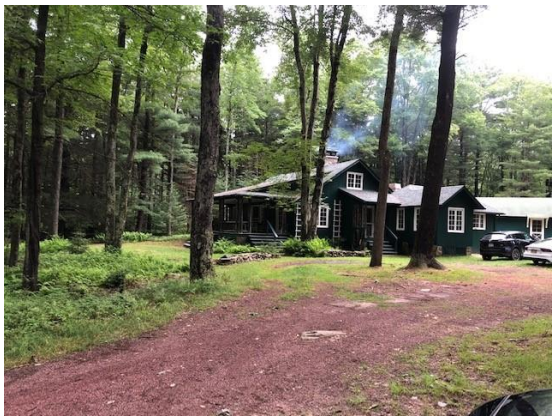
Unit 4 lies west/northwest of the cabin directly north of Unit 3. This unit is unique in that the presence of conifer species is much reduced in the top canopy as compared to other units. Black Cherry and Red Maple are the dominant canopy species, with a few scattered White Pine and Red Spruce. Black Cherry health is not good from crowding, and will likely drop out of the canopy mix, reverting to a dominance of White Pine, Red Maple, Red Spruce, and Beech in the coming decades if activities are not undertaken to keep the Cherry. Serviceberry is found in the midstory in places. Hemlock is largely absent from this unit. Fern is abundant and dense on much of the forest floor, with patchy Beech Brush present near dying Beech trees. This unit has some wet spots present where fern is dense and tree growth is heavily stunted. One 36" diameter White Pine sits in the western side of the Unit within Lot 50. This large tree likely exceeds 200 years old.

Unit Recommendations:

As stated above, allowing this unit to perpetuate untouched will see a decline in Black Cherry and Red Maple over time, and yield to a condition dominated by White Pine, scattered Hemlock, Red Spruce, and Beech sprouts. Following such natural forest succession isn't necessarily bad, but it is a change that will reduce deciduous tree diversity. One option is to conduct no activity aside from marking a hiking path through the unit. A second option is to daylight existing healthy Black Cherry, Red Maple, and Serviceberry to increase mast production and vigor for wildlife and fall foliage production. Reducing fern density in patches, fencing to protect natural regeneration of Hemlock, White Pine, and deciduous species, and planting seedlings described earlier could be done to increase diversity if interested. Thinning out Beech brush thickets to encourage other native seedlings would help as well.

Unit 5: (.8 acres)

Campsite and Yard



Unit Description:

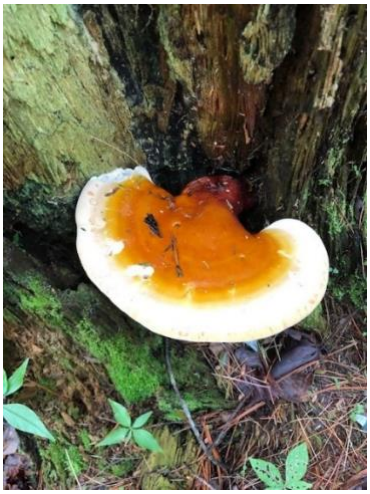
Unit 5 is the site of the Ritchie/Ruffa camp. The camp is located several hundred yards up the driveway to a hilltop surrounded by Hemlock, Large White Pine, Norway Spruce, and deciduous Red Maple and Cherry. Several trees, mostly Red Maples, are located near the camp that have been identified as hazardous trees for removal (red flagging). A small patch of Japanese Stiltgrass, a very invasive grass weed found on many PLP leaseholds, was found in the mowed lawn near the cabin.

Unit Recommendations:

Monitor trees within striking distance of the cabin every 3-5 years with assistance of your forester to determine if any should be marked for removal due to structural defects or breakage. The Japanese Stiltgrass patch should be monitored yearly and controlled with chemical means or a string trimmer (cut stems as close to the ground as possible several times after May 30th). Upon gaining control and removing the Stiltgrass, plant the site with a non-invasive cool season grass mixture such as Kentucky Bluegrass or other seed mix recommended for this area at your local garden center. It's likely the Stiltgrass will take a couple years of control until the seed source is exhausted.

Unit 6:(.4 acres)

Forest Community Type: Low Productivity Hemlock Mixed Hardwood Palustrine Forest (UB33)



Unit Description:

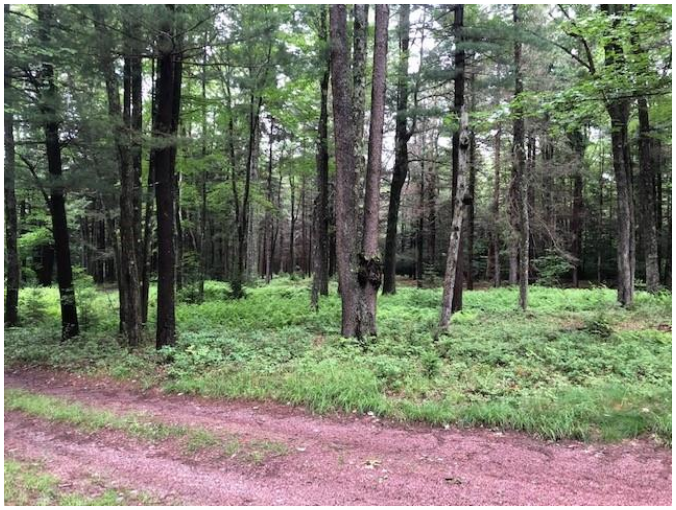
This wetland unit is located almost exclusively on Lot 50 of PLP. It is a wet soils unit with standing water in some places, dominated by Sphagnum moss (a common wet mat of green moss), floating logs, and emergent water. Highbush blueberry is common on some of the small islands of soil that are found surrounded by water, along with various sedges and wetland grasses native to acidic bogs of the Northeast. The canopy is broken by large gaps where past Hemlock, Red and Black Spruce, White Pine, and Red Maple trees have succumbed to too much water around their root zones. Few tree species can survive long term in these hydric conditions, though Black Spruce, Highbush Blueberry, and Hemlock sometimes do live a long time on the hummocks of soil and moss just above the water table. The south side of the wetland contains a nice small patch of Rhododendron, providing brilliant white flower clusters in June.

Unit Recommendations:

Barring invasion of invasive plant species like Stiltgrass, Multiflora Rose, or Japanese Barberry, this unit should be left to perpetuate on its own with no other activity. Forested wetlands provide key habitat to many sensitive amphibian and plant species, and are used by many other forms of wildlife for water and food sources throughout the year. Should any trees become hazards near the Barnum property driveway or South Shore, they can be marked for removal or felling back into the wetland to provide dead downed woody debris for wildlife. Native fruiting shrubs could be planted on the terrestrial edges of the wetland where sunlight is adequate to foster growth. Shrubs such as American Elderberry, Red Osier Dogwood, Silky Dogwood, Black Chokeberry, and Nannyberry Viburnum would be good native fruit bearing shrubs to try.

Unit 7:(2.2)

Forest Community Type: High Productivity Spruce Plantation Forest (PS12)



Unit Description:

This unit lies between South Shore Drive and the cabin, bounded on the west by the driveway and the east by a slender strip of Unit 1. Much of this unit was originally planted to Norway Spruce many years ago after a fire consumed a portion of the forest area on the leasehold. Over time, native Hemlock, Red Maple, White Pine, and Black Cherry have mixed into the canopy in competition with the dominant Norway Spruce. Hemlocks have been treated for Woolly Adelgid and should respond well to treatments for 5-7 years. White Pine and Norway Spruce health is also good, with few problems noted. As discussed previously, Black Cherry and Red Maple are shorter lived trees that decline due to shade and life span when faced with pressure from nearby conifer competition. The Black Cherry present is showing some signs of stress. Growing in the forest midstory are small saplings of White Pine, Beech, Red, and Norway Spruce seeding in from parent trees nearby. The forest floor has a mix of Hayscented Fern, Lowbush Blueberry, a few Beech seedlings, and some young Spruce. This unit, especially the southern portion nearest the cabin, has been kept fairly wide open by the family through cutting of Spruce and Beech seedlings and saplings, mostly for aesthetic appeal and visual benefits down to South Shore Drive.

Unit Recommendations:

As desired, other units of the property command more attention for creating diverse habitats for wildlife, reducing invasive pressure, and increasing resilience. This unit serves more as an open park like area for the family to enjoy the views of without being too dense or wild in character. With aesthetics and viewsheds being paramount, continue to cut small saplings, especially of Beech and Spruce that develop on the forest floor to maintain the open condition. Trees along the driveway, South Shore, and nearest to the cabin and structures should be monitored periodically for hazard condition. Hemlocks should be re-treated in year 2027 at the earliest, depending on whether or not loss of vigor is noted in an assessment.

Adjacent Pocono Lake Preserve Owned Property Recommendations

Where permissible by the management of Pocono Lake Preserve, common PLP owned areas adjacent to leaseholds could accommodate the following activities supported by leaseholders to improve recreational capacity, reduce hazards, and build forest resilience and diversity.

1. Lake Access trails should minimize root damage to adjacent trees through cutting or trenching.
2. Invasive plant species should be coordinated for control.
3. Where soils are not wet, Hemlocks can be treated with insecticide to reduce insect damage.
4. Hazard tree removal should be done in accordance with inspections by the forester and recommendations to the management.
5. Wildlife habitat improvements designed through professional forest conservation recommendations and an overall plan for the PLP owned forest should be discussed and followed by leaseholders and PLP management.
6. Wet soil areas should be protected from trail building, trash accumulation, and equipment disturbance.
7. Native tree and shrub plantings can be coordinated, with fencing established as needed, to increase diversity, build climate resilience, and add to the attractive aesthetic appeal of the property for all users to enjoy.

RITCHIE/RUFFA SCHEDULE OF ACTIVITIES

YEAR	ACTIVITY	MANAGEMENT UNITS	SEASON	NRCS COST SHARE PRACTICE	PRIORITY
2022	Forest Stewardship Plan Complete	All	Winter	NA	High
2022	Hemlock Insect treatments on trees over 6” diameter	All	Spring/Fall	NA	High
2023-2032	Monitor and control invasive plants, especially Stiltgrass, Barberry, Multiflora Rose, (not including fern)	All	Spring, Summer	NA	High
2023-2026	Patch fern/beech brush treatments with small fence exclosures	1, 2, 4	Summer	NA	Medium
2023-2026	Daylighting healthy mast trees (Cherry, Serviceberry, Red Oak)	1, 2, 3, 4	Winter	NA	Medium
2023-2032	Hazard Tree monitoring, periodic every 3-5 years	1 (powerline), 5, 7	Any	NA	High
2026-2032-2030	Fence Maintenance	1, 2, 4	Any	NA	High
2025-2028	Native tree supplemental plantings inside fence exclosures	1, 2, 4,	Spring, Fall	NA	Low
2024-2026	Create path from camp to Trail	1, 5, 2	Summer	NA	Low
2023-2032	Retain open viewshed towards South Shore	7	Anytime	NA	Medium
2028-2032	Create marked trail through Hemlock groves, highlighting large tree specimens	3	Anytime	NA	Low
2023-2032	Maintain driveway with water diversion bumps to discourage washing	7	Summer	NA	Medium
2023-2032	Involve young camp members in all activities to foster forest appreciation.	All	All	NA	High
2023-2025	Consider Hemlock treatments on Lot 50 in coordination with PLP	3	Spring/ Summer	NA	Medium
2032	Update Stewardship Plan with Addendum and Re-inventory	All	Any		High

DIGITAL ATTACHMENTS

I. FOREST MANAGEMENT/RECREATION UNIT MAPS

II. CONSERVATION EDUCATION PUBLICATIONS FROM PENN STATE UNIVERSITY