Program Report
April 2025

SINCE LAST MEETING

- Butler County Probation Red Cross First Aid/CPR/AED Classes - 3/25 and 4/1
- SafeSitter Baby Sitting Class @ Slippery Rock 4/5
- BCPR Easter Egg Hunts - Over 150 participants - 04/11
- Adapted Egg Hunt - 04/11 - (New)

BEFORE NEXT MEETING

- Start of Glow in the Dark Disc Golf 04/25
  - Now taking online registration
- Community Trunk sale 05/03
- SafeSitter Baby Sitting Class 5/10
- Alameda Waterpark lifeguard certification - 05/19 - 05/23

UPCOMING SPRING EVENTS

- Second Round of Glow in the Dark Disc Golf 05/23
- Community Trunk Sale - 05/11
- Youth Mountain Bike Clinics - 5/31 - 6/7 (New)
- Co-ed sand volleyball league 06/09
- Co-ed Softball league - 06/10

ALAMEDA WATERPARK

- Majority Rentention for seasonal waterpark staff
  - 90% full
- Lifeguard In-service training starting in May
- Alameda Waterpark member night 05/30
- Alameda Waterpark opening 05/31!

ALAMEDA PARK
FOREST MANAGEMENT PLAN
BUTLER COUNTY, PA

Plan Submitted by: Anundson & O'Barto, Consulting Foresters
Plan Author/Editor: Patrick Hulle, CF, Consulting Forester
Thomas D. Anundson, Consulting Forester

Developed for: Butler County Community Parks
Date Prepared: 2/22/2025

Contents

Overall Management Goals

1. To improve forest health and resilience
2. To set reasonable harvest objectives
3. To maintain recreational values and aesthetics
4. To improve wildlife habitat
5. To maintain or improve water and soil quality
6. To maintain multi-use forest values

NOTE: ALL MAPS CAN BE FOUND IN THE APPENDIX IN LARGER FORM

General Location Map

Alameda Park Location Map

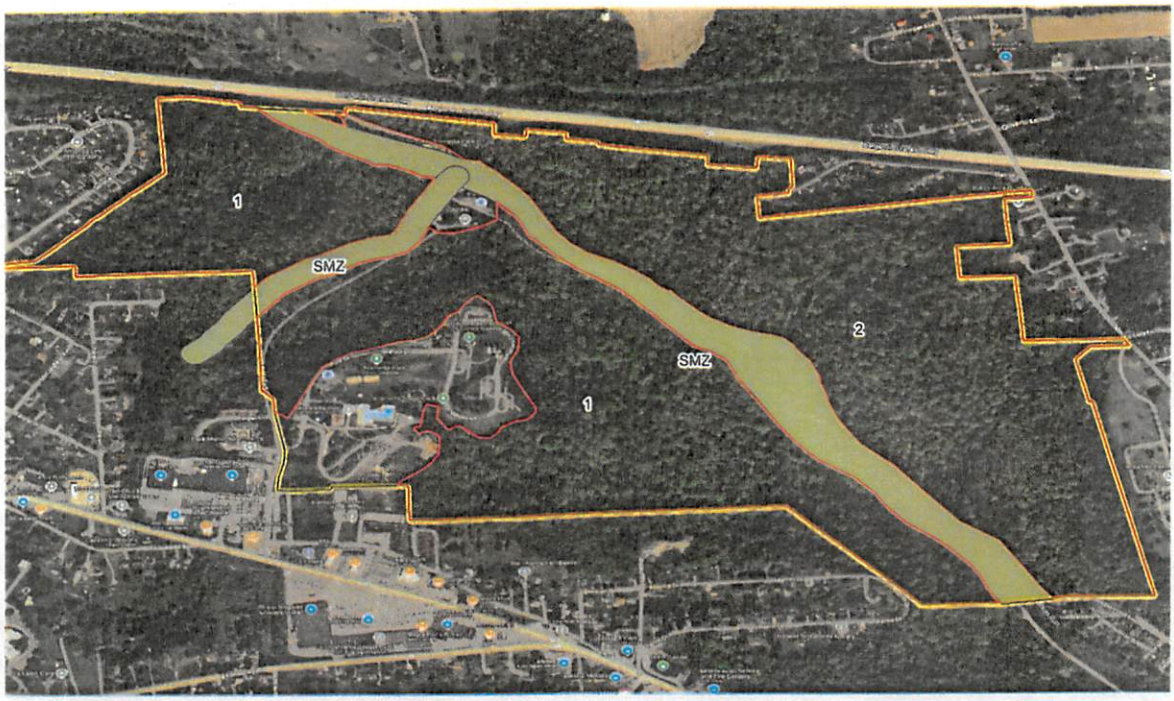
1:15,000

Location: Alameda Park, Butler County, PA
Lat: 40.87301 Long: -79.93132
Total Acres: 362 Wooded Acres: 322

Alameda Park Boundary

Prepared by Patrick Hulle, CF
Date: 2-21-2025 Datum: NAD 83 PA South, Google BaseMaps

Forest Management Stand Map



Alameda Park Management Stands

1:5,500

Location: Alameda Park, Butler County, PA
Lat: 40.87301 Long: -79.93132
Total Acres: 362 Wooded Acres: 322

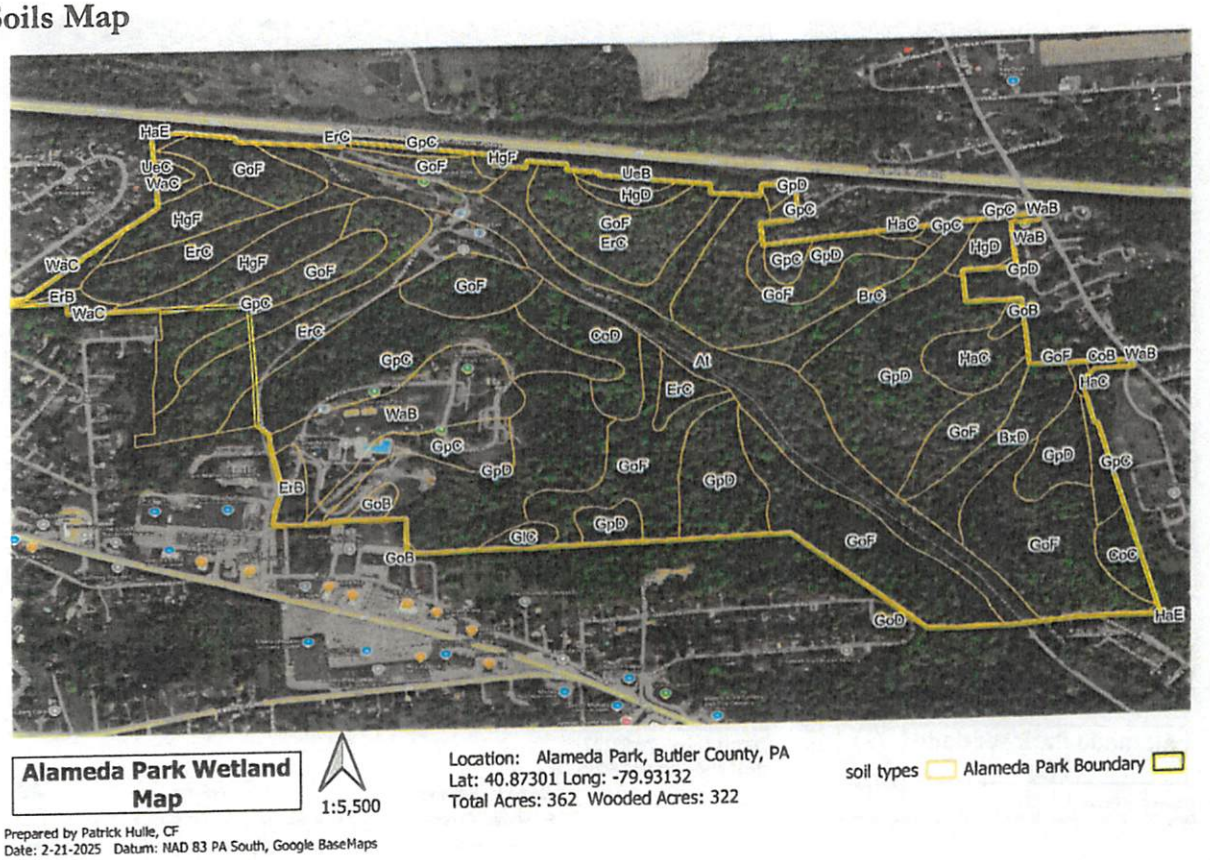
Prepared by Patrick Hulle, CF
Date: 2-21-2025 Datum: NAD 83 PA South, Google BaseMaps

Legend

Alameda Park Stands
1: 153 ac
2: 136 ac

Alameda Park Boundary
Alameda SMZ

Soils Map



A comprehensive soils map can be found in the appendix.

Wetland Map

Alameda Park Wetland Map

1:7,500

Location: Alameda Park, Butler County, PA
Lat: 40.87301 Long: -79.93132
Total Acres: 362 Wooded Acres: 322

Prepared by Patrick Hulle, CF
Date: 2-21-2025 Datum: NAD 83 PA South, Google BaseMaps

Alameda Wetlands
Freshwater Forested/Shrub Wetland
Freshwater Pond
Riverine
Alameda Park Boundary
Alameda SMZ

This plan is developed as requested by the board of commissioners of Butler County in reference to the Forest Management of Alameda Park located off Route 356 in Butler Township, on Alameda Park Road. Based on a comprehensive inventory of the property portions of the Park would benefit from a timber harvest, and it is recommended that a more comprehensive management approach be taken to improve the forest health and resilience of the Park. A mixture of management techniques should be utilized to improve the forest quality including understory cleaning techniques, chemical application, forestry mulching, taking a no-cut approach where appropriate, and proper silvicultural timber harvests. All these methods should be considered when developing a plan for future forest management.

Property Resource Inventory

Past management, harvesting, natural disturbances, and/or other land use history that has affected Stand condition and/or growth potential:

This property has a rich history. This property has been harvested in the past which left the forest with an abundance of timber resources. This property was harvested roughly 12-15 years ago and in most areas has responded well to this managed harvest. There are some areas that unfortunately had additional canopy openings due to the emerald ash borer, likely after the time of harvest that enabled invasive species to take hold in the property. These areas that were affected by the emerald ash borer are areas that will need more rehabilitation before a harvest is recommended. There are also some areas that responded very well to the harvest and have superb regeneration. These areas should be released and allowed to grow to ensure the tree regeneration does not get suppressed and lose vigor. If this happens, when there is another canopy disturbance, it is possible the trees will not respond to the added sunlight or could even die off before that

overstory disturbance occurs. More will be discussed on this topic in the Stand prescription section of the plan.

Protected species and cultural resources:

Using the US Fish and Wildlife Service Information for Planning and Consultation website preliminary to check for threats to wildlife species of concern, there are no critical habitats to threatened and endangered species at this location. Specific details to Pennsylvania can be sought out via a PNDI report through the Pennsylvania Natural Heritage Program. Voluntary conservation measures to aid wildlife species like threatened and endangered bats issued by the US Fish and Wildlife service are as follows:

Conservation Measure: Voluntary implementation of the following recommendation(s) will contribute to the conservation and recovery of endangered and threatened species. To conserve foraging and roosting habitat for endangered bats, while also carrying out the proposed conservation, restoration, or stewardship project/activity, conserve and protect forested areas. Emphasis should be placed on retaining (or restoring, if not already present) mature forests with at least 60% canopy closure. Also, retain all hickory trees, and large diameter (>12 inches d.b.h.) snags, dying, and injured trees to ensure a continuing supply of potential roost trees for bats. If agricultural lands are proposed for inclusion in the conservation project/activity, use Integrated Pest Management, with an emphasis on avoiding or minimizing the use of chemical pesticides, and review this project under the appropriate "Agriculture/Farming" project categories. If any timber harvesting or tree cutting is proposed, review this project under the category "Timber harvesting and Vegetation Management" -- "Timber harvest."

There are many trees on the property that are suitable to these voluntary conservation measures currently that are beyond merchantable value. Maintaining old den trees and seeking out potential new den trees to replace these old den trees as they deteriorate and become unusable will be important to maintain a healthy structure for wildlife. It is important to consider

that working forests can be sustainable, support key wildlife species, regenerate naturally, and still provide a valuable timber resource to the end user.

Adjacent Properties:

One of the neighbors to Alameda Park is the Western Pennsylvania Conservancy. There are many opportunities that are being realized currently but also could be utilized in the future. Current recreational benefits are already being used. There are bike trails and hiking trails that get used frequently, even during the winter. This is a phenomenal resource for the public.

Another opportunity to consider is the different management techniques that can be used to manipulate the forest structure. There are many wildlife species and songbird species that thrive in young forests. Young forests typically have hundreds or even thousands of trees per acre that help to provide cover and escape routes from predators, food in the way of insect species attracted to this forest type, and in some cases, the buds of the trees themselves. Ruffed grouse is a great example of a species that requires multiple different habitat types. Ruffed grouse require older mature forests, young vigorous forests, and a middle stage, stem exclusion phase forest. With properties like the Western PA Conservancy adjacent to the park that will likely be managing for these older mature forests, Alameda Park has an opportunity to provide other forest structures that wildlife can take advantage of for their habitat. When managing a forested landscape, these are some of the opportunities that need to be taken into consideration. It is possible to have these multiple forest structures within the property of the Park itself without relying on neighboring properties.

Recreation:

This property has many recreational uses and should be considered a "multi-use working forest." Aside from all the resources this park provides in the non-forested areas like the dog park, pool, numerous pavilions and picnic areas, and playgrounds, it is common for the forest to welcome dozens of recreational patrons daily throughout the year.

One of the main draws throughout this forest is the abundant network of trails. Many of

these trails originated from past timber harvests. These trails have been adapted for specific uses in some areas, but it is important to remember that these trails provide access to harvesting timber as well. In some cases, these trails can provide necessary fuel or fire breaks in case of wildfires. Trails are critical to the infrastructure and recreational value that this forest provides.

Some of the recreational uses and potential uses are listed below:

- Bikers and Mountain bikers
- Birders, wildlife observers
- Hikers
- Runners, trail runners
- Dog walkers
- Ecologists
- Potential for educational tours

With recreation being a primary use of this property, it is important to recognize that forestry plays a vital role in maintaining these resources we desire. Forest health and resilience is a major component to how the forest is enjoyed and observed by all. As forests age, their resilience diminishes. Old forests provide some of the highest value for recreation and it is important to have these areas. Old forests also slowly deteriorate and require some level of management to foster quality forest health. One of the major obstacles for a forest's ability to thrive is the invasion of exotic invasive species. These invasive species slowly take over the natural forest and pose the biggest threat to a forest's ability to regenerate without human intervention. Quality forest management requires intervention of some kind. The goal for quality forest management is to improve timber resources, forest health, resilience, wildlife habitat, and recreational opportunities. Previous quality forest management has already paved the way for forest recreation, and it should continue to provide enjoyment for future generations.

Access to the Stand and condition of roads, trails, landings, and stream crossings:

As mentioned in the recreation section, there is an abundance of trails for access to this property. There are several gates for access points, and there are trails that extend into neighboring properties. There is gate access on either side of 'Sullivan Run' so future stream crossings should be limited. Various bike trails and hiking trails have small bridges to cross intermittent streams and drainages. During any logging or timber management activities, these areas can be easily bridged with temporary bridges to minimize erosion and disturbance.

While conditions to trespass in a public park are limited, there are posted 'No Hunting' signs on various locations throughout the property. At the time of the inventory, 3 hunting stands were located on the property. If property line maintenance is not currently part of the management schedule for the Park, it may be wise to include property line maintenance to remind neighbors where the park boundaries are if the 'No Hunting' rules are desired to be enforced. With hunting in mind, it may be wise to consider deer management techniques to improve tree regeneration throughout the property. Deer can have a major impact to forest health. If hunting is not permitted, the use of deer fences should be considered to protect highly valuable seedlings from over browsing. The success of a timber harvest in some circumstances can be determined by the quality of regeneration present several years post-harvest. Deer herds with large numbers can easily wipe out a successful regeneration event like a well-planned and timed timber harvest.

One potential issue for timber harvests in relation to current land use may be with the abundance of bike trails. Many of the old skid trails used in previous timber harvests have been taken for use as bike trails. While it is perfectly acceptable for use as bike trails, these trails were optimally placed for timber extraction. Moving trails purely for timber use so bike trails will not be impacted may have damaging effects to the surrounding ecosystems. It will be important to work with organizations like Trail Pittsburgh who maintain these bike trails and be sure to identify special use bike only trails and facilitate multi-use trails that do not preclude the use of other forest activities. It is important to have trails that are for timber extraction. Creating ramps and jumps on old skid trails may make it difficult for future timber harvests. An extensive

inventory of the conditions of these trails has not been done at the time of this inventory. Generally, many trails are still open for timber harvesting and bike use to coexist in harmony. It may also be important, in an effort to mitigate erosion, that the bike trails are temporarily closed post timber harvest to allow proper settling of the soils prior to heavy bike use.

A winter harvest schedule with bike paths closed until June may be a good solution. This way the trails will not be used in the early mud season. Winter harvests can also supplement deer and other wildlife's diet in the form of browse from cut tree tops. This is another added benefit to a well-timed timber harvest. A summer harvest with minimal trail disturbance in dry weather would also allow bike trails to reopen at a faster rate. All trails will need to be cleared and opened post timber harvest for recreational use.

Soil and site descriptions, including relevant soil interpretations, slope, topography, and aspect:

Understanding soil types is critical for effective management of forest resources. There are various soil reports included in the appendix with associated maps that can help identify problem areas. It is important to recognize that these soil maps are based on general soil conditions and should be used as a guide and not represented as the law. One of the most valuable soil reports is the 'Potential for Seedling Mortality' report. Regeneration data was collected during the field inventory. Many of the plots that contain viable tree regeneration from the last timber harvest correspond with the areas indicated on the map for low seedling mortality. These areas with the highest potential for seedling viability and survivability are great candidates for timber harvest success. It should be noted that the areas with the highest likelihood for mortality are the wet soil types that frequently flood, are saturated, or are generally not suited for timber harvesting anyway. These areas should also be noted and possibly have a higher tree density reserved.

Aspect and position of the sun will also have different effects for vitality and growth of understory species. It was observed that many of the north facing slopes had higher hay-scented fern populations, while the south facing slopes had higher invasive species populations. This generalization is certainly not true across the entire property, but there are management implications to consider. The south facing slopes receive more sunlight and are more likely to see songbird traffic as they are warming up using the sun. Songbirds often move seed from these

invasive plants and can help concentrate these invasive populations. These invasive species also have longer growing seasons, so any time they are exposed to longer growing conditions, they will thrive. Conservation efforts to control invasive species will often have a greater impact on these south facing slopes.

Other soil reports that may be of value include 'Construction Limitations for Haul Roads and Log Landings." Most trails that were used for the previous timber harvest should be used again to extract trees. Where this map can come in handy is finding areas where bike trails have taken over exclusive use of hauling trails. If these trails are in areas where there is high potential for erosion, the skid trails should not be moved to suit the bike trails. These are the areas where it will be important to co-exist. Areas that can tolerate trail construction will have more flexibility for single use trails. *It is recommended that all trails be considered multi-use trails.*

Lastly, there are soil reports for suitability for hand planting and site index for viable tree species. These two reports will help facilitate what trees should be planted and where they should be planted. In most areas on this property, artificial planting should not be needed to regenerate a stand, however, artificial regeneration can help re-establish areas that have heavy invasive species problems at a faster rate. Tree planting should be considered in conjunction with deer management techniques like fencing or tree shelters.

Streams, wetlands, ponds, and lakes:

First, it will be important to recognize the septic and sewer lines that run through the property. Areas where these lines run through the forested acreages need to be well delineated to avoid destruction.

According to the US Fish and Wildlife service's wetlands mapper, there are associated wetlands in Alameda Park. These wetlands are primarily contained in the rivers and streams as shown on the wetlands map provided in this plan. A small section of the stream is also classified as Freshwater forested shrub and wetland, although this delineation from the wetlands mapper is defined by the stream called 'Sullivan Run'.

A Stream Stats report was generated along with a wetland map for this property (see Appendix). The 'Sullivan Run' watershed basin that drains to the southeast of Alameda Park is roughly 2.41 square miles with approximately 41% of those lands being forested. So, 2.41 sq

miles equates to 1,542 acres. Roughly 632 acres of this drainage basin are forested lands. This means that about 51% of the forested property represented in this drainage basin is part of Alameda Park. 51% of the water that gets filtered in this 1,542-acre drainage basin gets filtered by the forest lands of Alameda Park. This shows how important maintaining a healthy and resilient forest is for the health of this watershed basin.

For this reason, two stream management zones have been suggested to be observed. The larger SMZ has been delineated by using the Atkins soils data classification. These soils are frequently flooded and this part of the riparian zone is unlikely to be harvested. Trees that need to be salvaged can easily be pulled by a cable skidder, however, in some cases it may be best to leave downed trees for habitat for wildlife and amphibious species in these areas. The larger SMZ has a lot of alder species and old snags that will be great for wildlife. These SMZs are both based off of federally delineated wetlands and are a reasonable buffer to protect the stream and water resources.

Extended riparian zones and timber harvest buffers beyond the SMZ should be up to the discretion and expertise of the forester. Sometimes trees falling on riparian zone hillsides can disrupt more soil than simply harvesting the tree and leaving the soil intact. Tree roots can live for another 5 years after a tree is harvested and if the tree has stump sprouts that regenerate from the cut stump, the roots will continue to hold soil and stabilize a hillside.

Risk of insect and disease infestation:

This property currently has threats from a few different insects and diseases. The predominant threat was the emerald ash borer and it has largely run its course. There are still white ash seedlings that can attract insects and potentially continue to perpetuate the species. There are unfortunately not many management techniques to get rid of this problem.

The most common threat to forest health in the form of insects is currently the spotted lantern fly (SLF). While not much evidence has been observed throughout the property, SLF is on the property. Evidence can be found easily on the main road along 'Sullivan Run'. The black mold that forms on their honeydew excrement can be easily spotted in a particular grape vine infestation located along this road. Near this area there are also trees of heaven, the preferred

host tree for SLF. SLF can be a nuisance but will largely not have devastating effects to the landscape like the emerald ash borer.

One of the common diseases infecting trees on this property is called 'black knot of cherry'. This disease infects young trees and smaller limbs of larger trees for the most part. This disease can stress out and kill regeneration that is already competing for light resources. This can be seen in several areas in Stand 2. Many of the seedlings and saplings that started growing post harvesting activities 15 years ago are succumbing to black knot of cherry and lack of light. These saplings should have been released sooner to take full effect of the regeneration efforts. These areas still have potential to produce more saplings, but there is not enough sunlight at this time, and an abundance of this disease that is helping to kill these trees.

Another disease to watch out for in this area is Oak wilt. No oak wilt has been observed on this property but it is prevalent in some areas of the county. This disease will need to be monitored and if the disease finds its way into this forest, immediate action will need to take place in an effort to save trees. This is a disease where it is imperative to take out or kill infected trees in an effort to stop the spread of the disease. A worst-case scenario would be the need to cut all of the oak trees on the property as a salvage effort from a public safety perspective. It is very important to stay on top of this disease if it were to show up.

Reforestation and afforestation opportunities

As described in the soil resources section, this property has soils that will support regeneration efforts. For the most part, the goal should be to regenerate trees naturally through proper forest management. In some areas, it may be faster to re-plant by hand after invasive species control efforts are performed. In large part, it is recommended to allow natural regeneration to take place. To help facilitate this natural regeneration it may be wise to consider deer fencing to prevent browsing of these seedlings and allow the trees to grow. Deer fencing can also be an educational opportunity that could attract curious patrons to the park and surrounding areas.

Prescribed burning opportunities

Prescribed burning is a phenomenal tool, especially for oak regeneration. Burning can be a good alternative to using herbicide. Fire can be healthy for the landscape and help control some of the invasive species found on the property.

Unfortunately, it can be very costly and requires a lot of planning and there are permits to acquire. This practice is not necessarily recommended currently. Coordination and gaining public support may be challenging. Fire can damage timber quality, can be costly, and smoke management may be challenging in a heavily populated area. Burn plans written by a qualified 'burn boss' is a necessity.

Wildfire risk

The risk for wildfire on this property is generally low, but never zero. In times of drought, the most likely cause for wildfire to take place on this property would be from a fire that got out of control nearby or on the property. The benefits to having an extensive trail system are having natural fire breaks. Fire breaks help to slow or stop the progression of the fire. These trails can also be utilized by firefighting personnel to help fight the fires. It is very important to keep all trails open for many reasons, including fire suppression.

Other important features

As previously mentioned, sewer lines, bridges on trails that cross creeks, benches, pavilions, and trail signs are all features throughout the forest that could be impacted by forest management activities. These special features should be either mapped out prior to a timber harvest or they need to be pointed out to the necessary parties prior to forest management. In some cases it may be wise to create buffers to help protect these areas. Creating buffers to maintain perceived aesthetics surrounding heavily used areas should also be considered.

Effects to unique resources

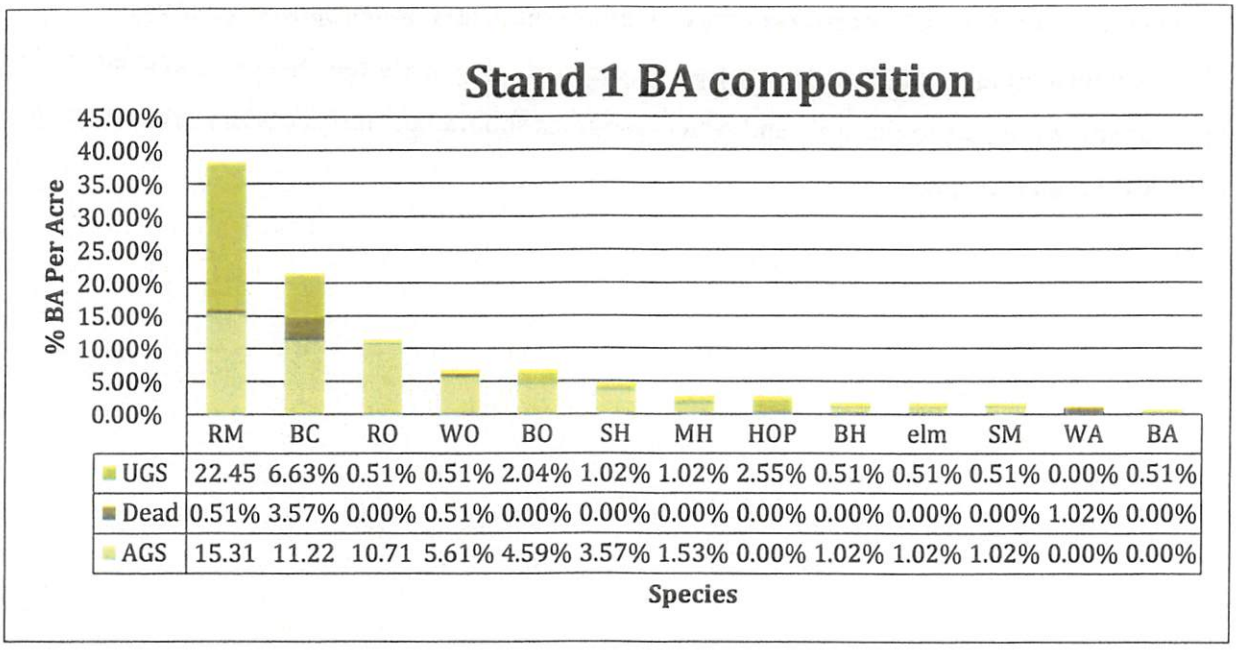
All management activities should employ the specific Best Management Practices associated with those activities. Not only should all personal protective equipment be worn, guidelines in the Erosion and Sediment control plans associated with timber harvests should be strictly adhered. These guidelines and practices are set in place to prevent soil erosion and damage from water to our forest resources. Trails should have water bars or other water diversion techniques installed after the trail is regraded. Any activities that can create erosion or have negative impacts to the soils and water resources should take the necessary precautions to limit disturbance to special sites.

Stand 1: Resource Inventory and Assessment

Forest Type:

This Stand resembles a mix between a Red Maple cover type and a Red Oak-Mixed hardwoods cover type

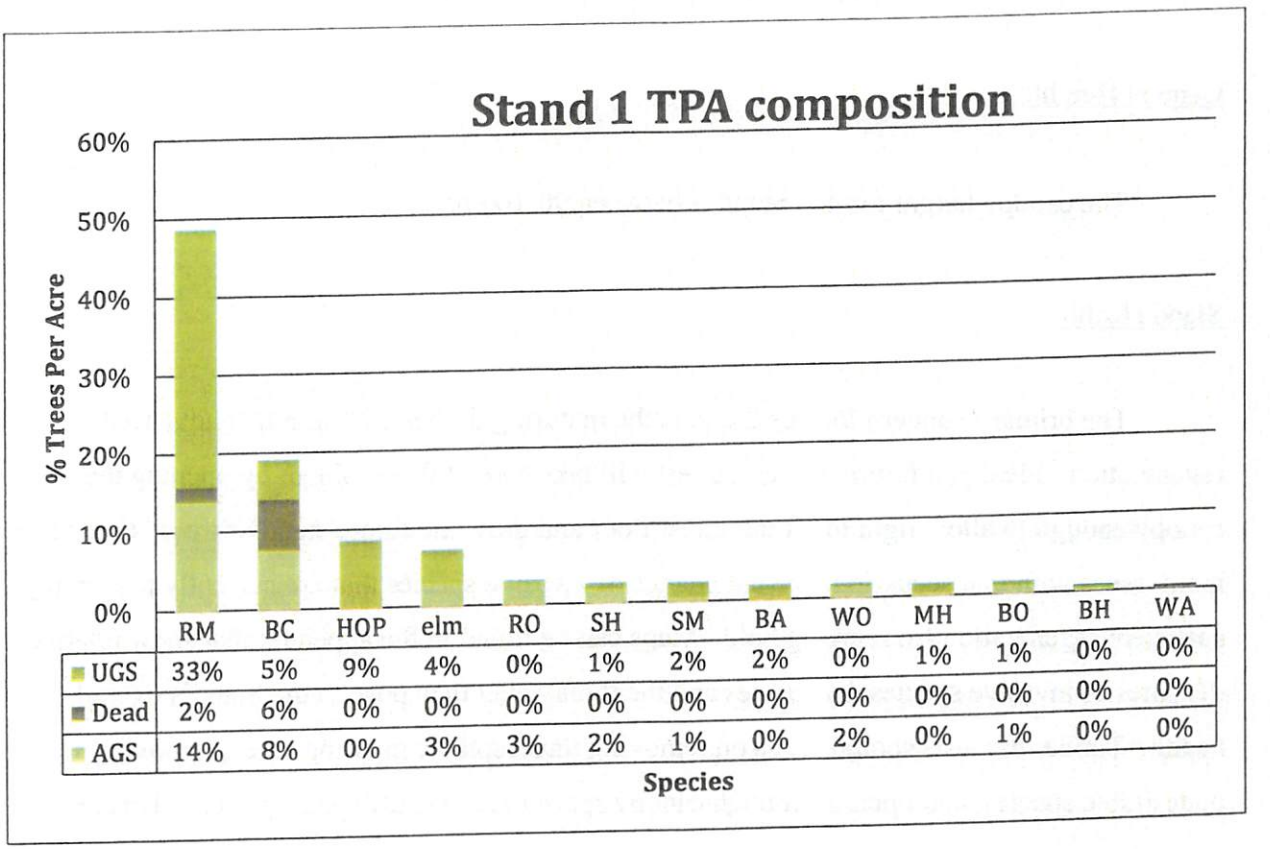
Basal Area:
97 sq. ft/ acre



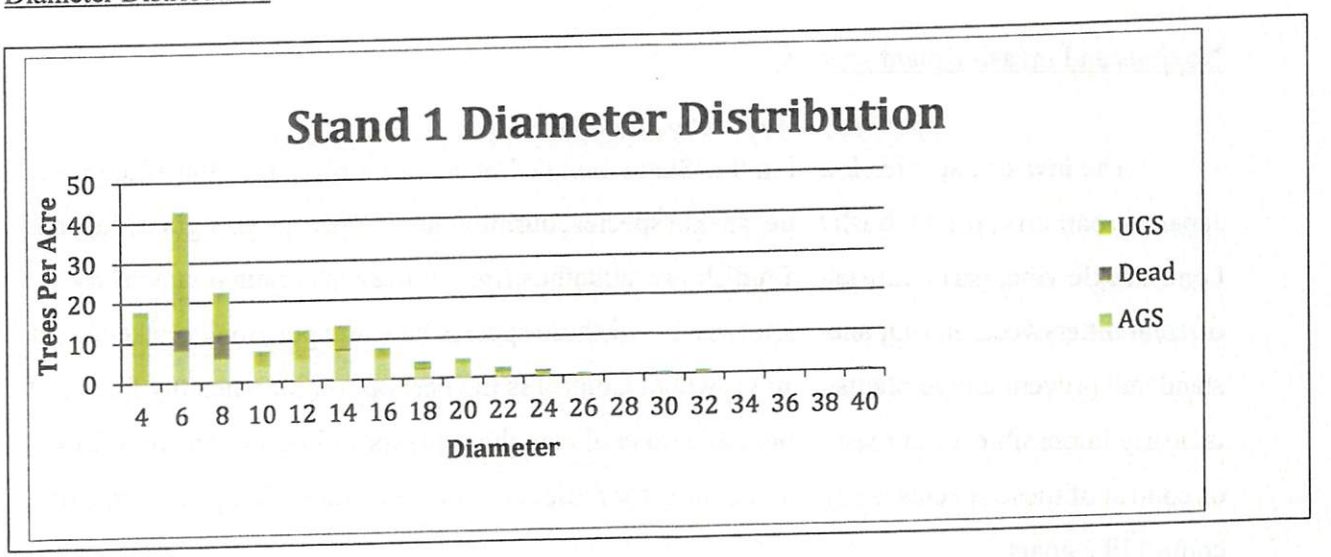
RM	red maple
BC	black cherry
RO	Red Oak
WO	White oak
BO	black oak
SH	shagbark hickory
MH	m-nut hickory
HOP	hophornbeam
BH	bitternut hickory
Elm	Elm
SM	Sugar Maple
WA	white ash
BA	bigtooth aspen

Trees Per Acre:

129 TPA



Diameter Distribution:



The quadratic mean diameter for this Stand is 11.6".

Stand Age:

This is an even aged Stand meaning most of the trees in the Stand are within 15-20 years in age to each other. This Stand is approaching the rotation age maturity.

Canopy Height:

The canopy height for this Stand is between 90-100 feet.

Stand Health:

The primary concern for this Stand is the maturing timber with minimal advanced regeneration. Ideally, a future timber harvest will take care of this problem by opening the canopy enough to allow light to hit the forest floor and grow the future stand of trees. One of the main issues with that scenario is the abundance of invasive species that are currently preventing sufficient regeneration from taking hold. Maps can be found in the appendix that show relative densities of invasive species, by species and the threat level they pose to the Stand's overall health. Timber harvests should focus on removing unacceptable growing stock, removing undesirable species, and opening enough canopy space to allow sufficient light for advanced regeneration.

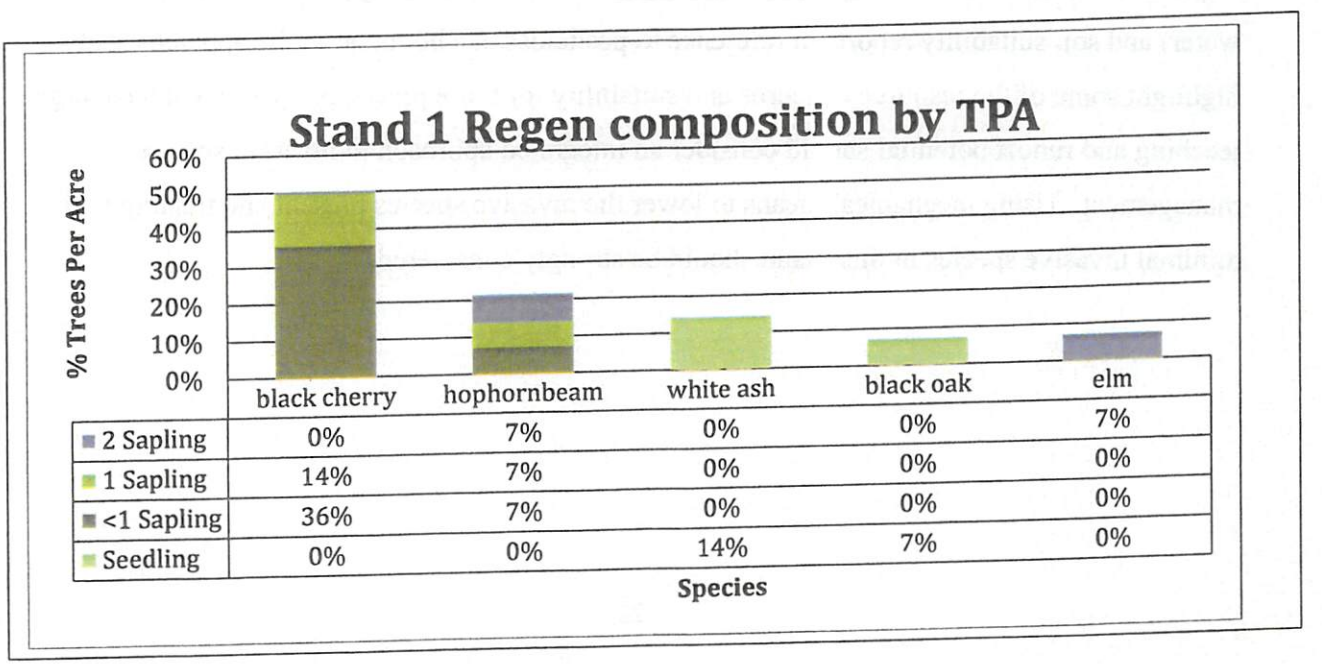
Noxious and invasive plant species:

The invasive species found in this Stand include but are not limited to: Multi-flora rose, Japanese barberry, privet, bush honeysuckle species, burning bush, Japanese stilt grass, Japanese honeysuckle vine, garlic mustard, English ivy, ailanthus (tree of heaven), spotted lantern fly, oriental bittersweet, and Japanese knotweed. All these species have the potential to take over a stand and prevent native plants from growing. Control is the best option for a healthy forest. It is nearly impossible, or at least improbable, to eradicate these plants and pests. The best forms of control of these species are herbicide, forestry mulchers, fire, and some biological forms of control like goats.

Presence of regeneration:

The presence of regeneration in this Stand is largely unimpressive. There are some areas that have better regeneration than others, however most of the regeneration represented in the graph are few species and in some cases species that are undesirable. A large factor in this is the level of overstory trees in the canopy that shade the understory, invasive species, and mostly having a north facing slope. Areas with a south facing aspect generally have more regeneration. A graph representing a minor faction of regeneration in the Stand can be found below.

TPA	Size Class				
Species	Seedling	<1 Sapling	1 Sapling	2 Sapling	Stand Total
black cherry	-	263	105	-	368
hophornbeam	-	53	53	53	158
white ash	105	-	-	-	105
black oak	53	-	-	-	53
elm	-	-	-	53	53
Stand Total	**158**	**316**	**158**	**105**	**737**



Resource Concerns:

Species diversity is a general concern when considering forest health and resilience. This Stand has many different tree species but a low level of diversity in tree regeneration. Timber harvests should focus on improving ratios of desirable species like oak, hickory, and other hard to regenerate species.

Seeps, wet areas, and ephemeral drainages should be recognized in this Stand and on the adjacent property. All management activities on this property and in this Stand have the potential to affect the water quality on this property and those further down the creek and watershed. Heavy machinery should not be driven through seeps or wet areas. Trails that are steep should have water diversion measures like water bars that slow water down and removes water from the trail quickly to minimize soil erosion. All chemical applications should be administered according to the label in low wind conditions to minimize drift and dangerous use of the chemicals. Riparian labeled chemicals that are less toxic to use are also recommended in this Stand and on the entire property.

This Stand also has a riverine wetland going through it and a riparian zone should be observed and maintained to help protect the wetland. Any management activities that occur in this Stand should be carefully administered using best management practices (BMPs). In some cases, it may be wise to adhere to a stream management zone for future timber harvests.

As pesticides have their own set of resource concerns and best practices, it is very important to follow the label. The label is the law. Pesticide leeching potential (into ground water) and soil suitability reports in reference to pesticides can be found in the appendix that highlight some of the resource concerns and suitability for these practices. Areas that have high leeching and runoff potential should consider an integrated approach to invasive species management. Using mechanical means to lower the invasive species present and treating with minimal invasive species in this Stand should be strongly considered.

Stand 1: Desired Future Condition

Species Composition

Ideally, the overall species composition will shift away from red maple being the dominant species. The oak species dominate the canopy and ideal future conditions will maintain this structure. A timber harvest in this Stand should focus on maintaining desirable oak species in both quantity and canopy position. Due to the lower level of regeneration in this Stand, an overstory removal is not recommended to restart the Stand. Regeneration type harvests like a shelterwood should be considered rather than a 1/3 relative density thinning or an overstory removal. This shelterwood type cut would focus on spacing of desirable species, maintaining healthy trees, and leaving desirable species composition, like oak. Reducing the species composition of invasive species is also critical.

Basal Area

Reducing the basal area in this Stand in a shelterwood cut would bring the number from 97 sqft/ acre to a more optimal number, somewhere between 40 and 50 sqft/acre.

Stocking Percent

A shelterwood is a regeneration focused cut that would reduce the relative density of the stand by 45-55% of the current density. This would take out roughly half of the current density, focusing on leaving trees of good quality and vigor as seed trees, quality wildlife trees, and overall leaving well-spaced dominant and co dominant crown class species to help regenerate the stand and maintain diverse forest structure. These residual trees should be harvested once regeneration is present and ready to take over the Stand. Residuals for wildlife and seed should be left.

Diameter Distribution

The overall diameter distribution should stay the same or decrease slightly. The goal would be to leave some larger trees as a seed source and remove undesirable smaller, but old, trees that have lost vigor. However, the number of smaller trees that would be left to help repopulate the Stand would drive this distribution slightly lower.

Forest Management Activities

The most important management activity that can happen in this Stand, prior to a timber harvest, is invasive species control. If a timber harvest occurs in this Stand prior to invasive species control, artificial regeneration will likely be necessary. The timber in this Stand is mature and ready to be harvested, however, there is not enough regeneration present to justify an overstory removal. Utilizing a forestry mulcher and or herbicide to control these invasive species is the best course of action prior to a timber harvest. If a timber harvest is not to occur in this Stand, invasive species control is still strongly recommended. Any forest health and resilience concerns can be improved by reducing competing vegetation.

Diameter limit cutting as a rule should not be used on this property. This is a non-selective approach that can deteriorate the quality of the residual forest over time. Any kind of timber harvest should be balanced through all diameter classes and age classes. In forests like this one, the overall diameter distribution will trend to a smaller size as over mature trees are harvested. It is also important to leave some of these over mature trees that provide more value to wildlife than they do for timber.

Conservation Alternative

If invasive species control is not an option for management, deer exclusion fences might be a good alternative to establish native tree regeneration. Deer seldom eat these invasive species so the desirable native counterparts are usually targeted. Areas with low invasive species should be targeted for deer exclusion fences in order to select for desirable species. Even though

deer do not eat the invasive species, there is no practical benefit to putting a fence around undesirable species. Refer to the invasive species maps to gain insight to where these places of lower invasive species density are located.

No-Action Alternative

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We can use the emerald ash borer as an example when trying to determine what a no management approach will look like. It can be argued that responding to the invasive species threat should have started several years ago. Responding to threats like the emerald ash borer while it was happening may have enabled greater control over the many invasive threats to this property.

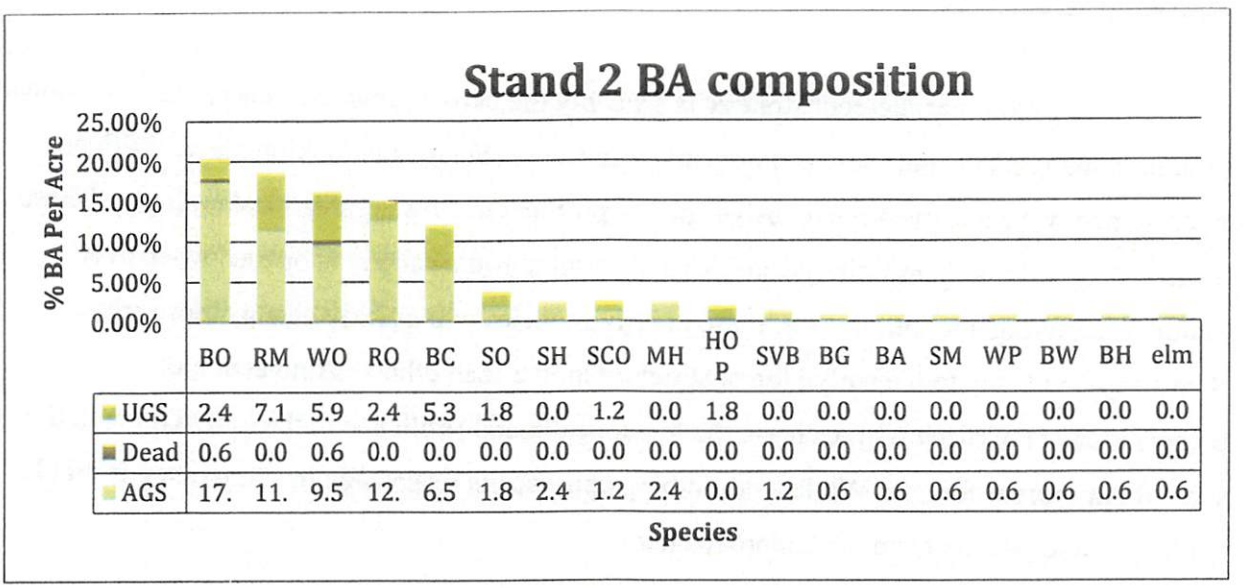
Stand 2: Resource Inventory and Assessment

Forest Type:

This Stand is more typical of a Red oak-mixed hardwoods stand, however it is moving towards a red maple dominated cover type.

Basal Area:

110 SQFT/ acre

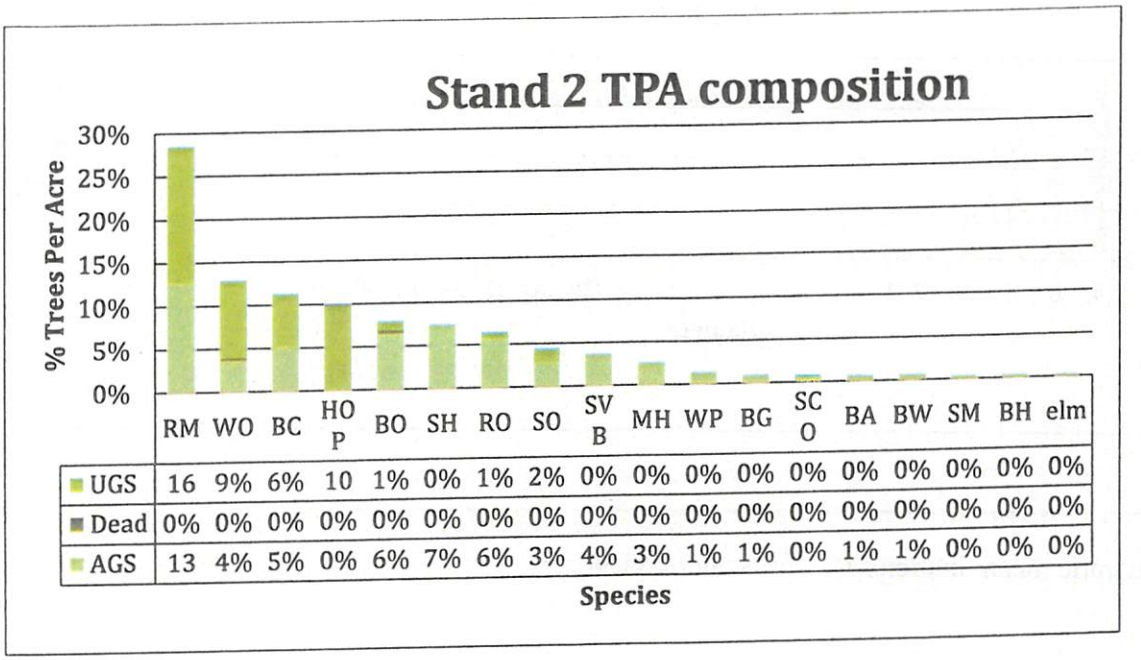


	BO	RM	WO	RO	BC	SO	SH	SCO	MH	HOP	SVB	BG	BA	SM	WP	BW	BH	elm
UGS	2.4	7.1	5.9	2.4	5.3	1.8	0.0	1.2	0.0	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dead	0.6	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AGS	17.	11.	9.5	12.	6.5	1.8	2.4	1.2	2.4	0.0	1.2	0.6	0.6	0.6	0.6	0.6	0.6	0.6

BO	black oak
RM	red maple
WO	white oak
RO	red oak
BC	black cherry
SO	shingle oak
SH	sh. hickory
SCO	scarlet oak
MH	m. hickory
HOP	hophornbeam
SB	serviceberry
BG	black tupelo
BA	bigtooth aspen
SM	sugar maple
WP	white pine
BW	black walnut
BH	bit. hickory
ELM	elm

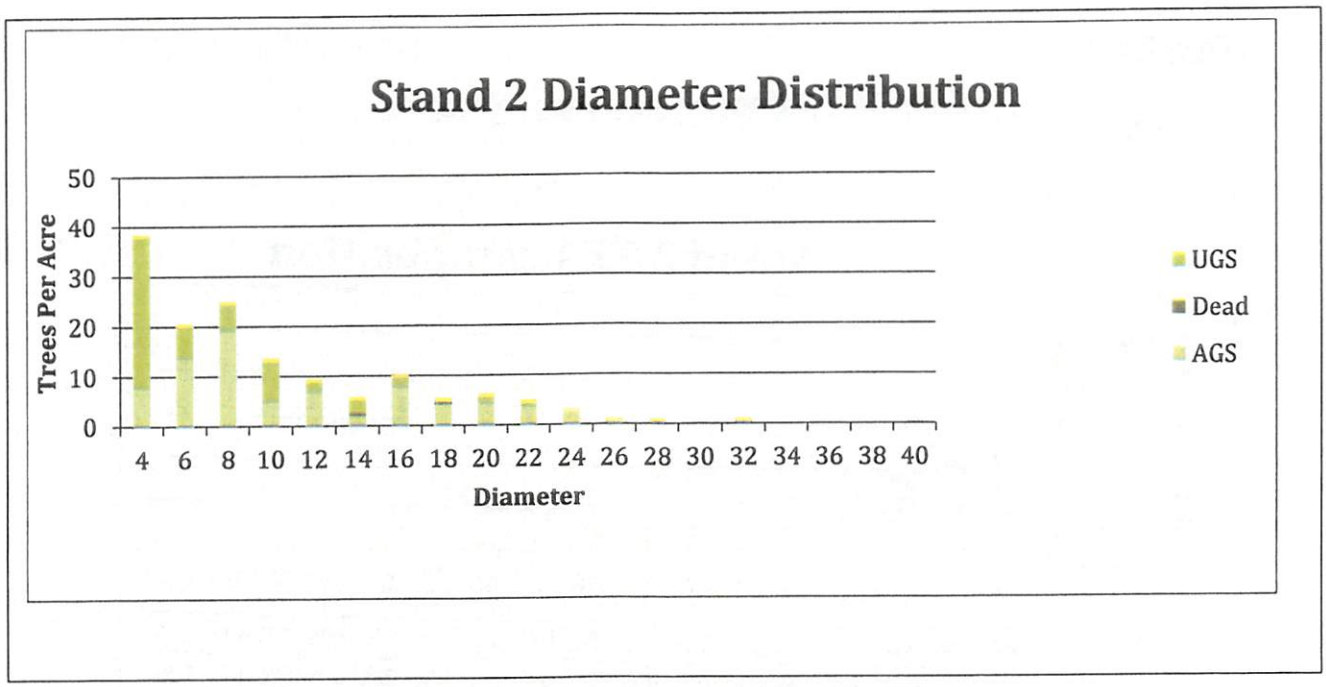
Trees Per Acre:

143 TPA



RM	red maple
WO	white oak
BC	black cherry
HOP	hophornbeam
BO	black oak
	shagbark
SH	hickory
RO	red oak
SO	shingle oak
SVB	serviceberry
MH	M. hickory
WP	white pine
BG	black tupelo
SCO	scarlet oak
BA	bigtooth aspen
BW	black walnut
SM	sugar maple
BH	B. hickory
	Elm

Diameter Distribution:



The quadratic mean diameter for this Stand is 11.9".

Stand Age:

This is an even aged stand meaning most of the trees in the Stand are within 15-20 years in age of each other. This Stand is approaching the rotation age maturity.

Canopy Height:

The canopy height for this Stand is between 90-100 feet.

Stand Health:

The primary concern for this Stand is the maturing timber with minimal advanced regeneration. This Stand has a much higher resilience factor because there is a higher quantity of advanced regeneration. Ideally, a future timber harvest will still increase the amount of advanced regeneration and help the current regeneration flourish by opening the canopy enough to allow light to hit the forest floor and grow the future stand of trees. One of the main issues with that scenario is the abundance of invasive species that are currently preventing sufficient regeneration from taking hold in some areas. Maps can be found in the appendix that show relative densities of invasive species, by species and the threat level they pose to the Stand's

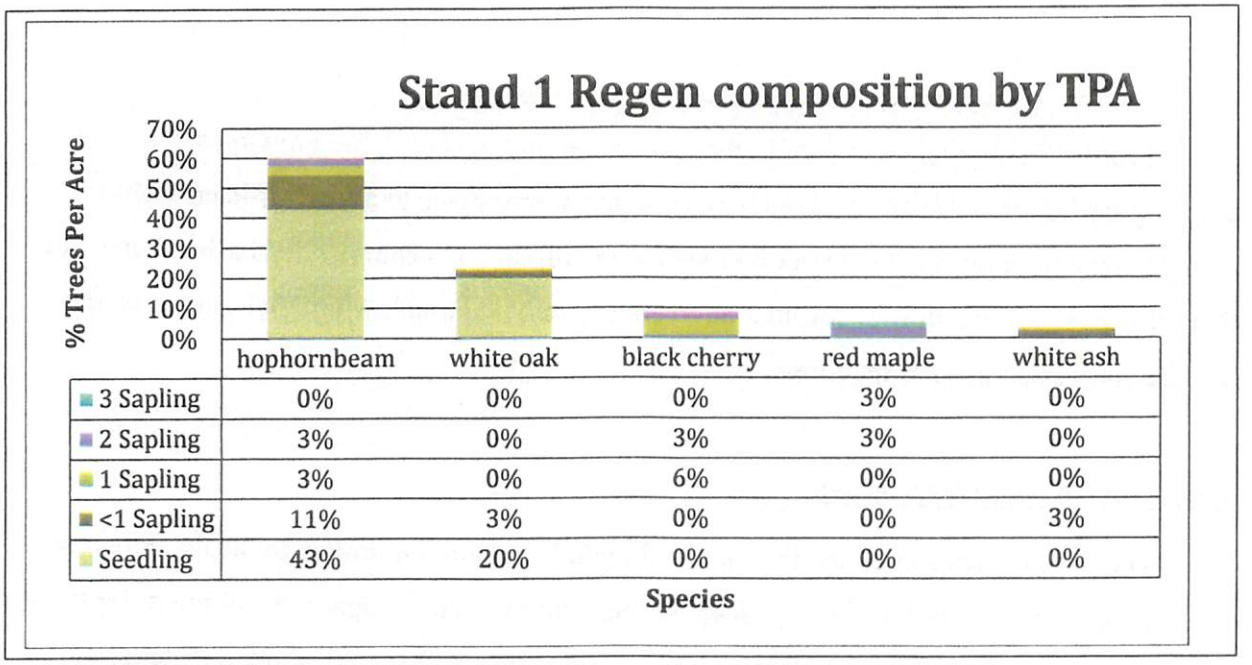
overall health. Timber harvests should focus on removing unacceptable growing stock, removing undesirable species, and opening enough canopy space to allow sufficient light for advanced regeneration. A shelterwood or selective thinning is recommended in this Stand and where the regeneration allows, consider an overstory removal to allow optimal growth on the next age class and future of the forest.

Noxious and invasive plant species:

The invasive species found in this Stand include but are not limited to: Multi-flora rose, Japanese barberry, privet, bush honeysuckle species, burning bush, Japanese stilt grass, Japanese honeysuckle vine, garlic mustard, English ivy, ailanthus (tree of heaven), spotted lantern fly, oriental bittersweet, and Japanese knotweed. All these species have the potential to take over a Stand and prevent native plants from growing. Control is the best option for a healthy forest. It is nearly impossible, or at least improbable, to eradicate these plants and pests. The best forms of control of these species are herbicide, forestry mulchers, fire, and some biological forms of control like goats.

Presence of regeneration:

This Stand has areas with incredible oak regeneration present! Due to the difficulty of these species regenerating, it is recommended that these areas open the canopy and allow this regeneration to flourish. Due to the spacing of the inventory points, not all the regeneration was captured in the sample plots, but the field observations should not be ignored.



TPA Species	Size Class Seedling	<1 Sapling	1 Sapling	2 Sapling	3 Sapling	Stand Total
hophornbeam	1,000	267	67	67	-	1,400
white oak	467	67	-	-	-	533
black cherry	-	-	133	67	-	200
red maple	-	-	-	67	67	133
white ash	-	67	-	-	-	67
Stand Total	**1,467**	**400**	**200**	**200**	**67**	**2,333**

Resource Concerns:

Species diversity is a general concern when considering forest health and resilience. This Stand has many different tree species but a low level of diversity in tree regeneration. Timber harvests should focus on improving ratios of desirable species like oak, hickory, and other hard to regenerate species.

Seeps, wet areas, and ephemeral drainages should be recognized in this Stand and on the adjacent property. All management activities on this property and in this Stand have the potential to affect the water quality on this property and those further down the creek and watershed. Heavy machinery should not be driven through seeps or wet areas. Trails that are steep should have water diversion measures like water bars that slows water down and remove water from the trail quickly to minimize soil erosion. All chemical applications should be administered according to the label in low wind conditions to minimize drift and dangerous use of the chemicals. Riparian labeled chemicals that are less toxic to use are also recommended in this Stand and on the entire property.

This Stand also has a riverine wetland going through it and a riparian zone should be observed and maintained to help protect the wetland. Any management activities that occur in this Stand should be carefully administered using best management practices. In some cases, it may be wise to adhere to a stream management zone for future timber harvests.

As pesticides have their own set of resource concerns and best practices, it is very important to follow the label. The label is the law. Pesticide leeching potential (into ground water) and soil suitability reports in reference to pesticides can be found in the appendix that highlight some of the resource concerns and suitability for these practices. Areas that have high leeching and runoff potential should consider an integrated approach to invasive species management. Using mechanical means to lower the invasive species present and treating with minimal invasive species in this Stand should be strongly considered.

Stand 2: Desired Future Condition

Species Composition

Ideally the overall species composition will shift away from red maple being a dominant species. The oak species dominate the canopy and ideal future conditions will maintain this structure. A timber harvest in this Stand should focus on maintaining desirable oak species in both quantity and canopy position. Due to a low level of regeneration throughout this Stand, an overstory removal is not recommended to restart the Stand in all places. A shelterwood style cut would benefit the overall Stand from a wildlife perspective and a timber management perspective. This cut would focus on improving the spacing of desirable species, maintaining healthy trees, and leaving desirable species composition, like oak. Reducing the species composition of invasive species is also critical.

Basal Area

Reducing the basal area in this Stand in a shelterwood cut would bring the number from 110 sqft/ acre to an ideal number somewhere between 50 and 60 sqft/acre

Stocking Percent

A shelterwood is a regeneration focused cut that would reduce the relative density of the Stand by 45-55% of the current density. This would take out roughly half of the current density, focusing on leaving trees of good quality and vigor as seed trees, quality wildlife trees, and overall leaving well-spaced dominant and co dominant crown class species to help regenerate the Stand and maintain diverse forest structure. These residual trees should be harvested once regeneration is present and ready to take over the Stand. Residuals for wildlife and seed should be left.

Diameter Distribution

The overall diameter distribution should stay the same or decrease slightly. The goal would be to leave some larger trees as a seed source and remove undesirable smaller, but old, trees that have lost vigor. However, the number of smaller trees that would be left to help repopulate the Stand would drive this distribution slightly lower.

Forest Management Activities

This Stand is suitable for a timber harvest. It is always better to control invasive species prior to a timber harvest, but there are areas with sufficient regeneration to justify a timber harvest. If a timber harvest occurs in this Stand prior to invasive species control, artificial regeneration could help supplement natural regeneration. The timber in this Stand is mature and ready to be harvested, however, there is not enough regeneration present to justify an overstory removal. Utilizing a forestry mulcher and or herbicide to control these invasive species is the best course of action prior to a timber harvest. If a timber harvest is not to occur in this Stand, invasive species control is still strongly recommended. Any forest health and resilience concerns can be improved by reducing competing vegetation.

Diameter limit cutting as a rule should not be used on this property. This is a non-selective approach that can deteriorate the quality of the residual forest over time. Any kind of timber harvest should be balanced through all diameter classes and age classes. In forests like this one, the overall diameter distribution will trend to a smaller size as over mature trees are harvested. It is also important to leave some of these over mature trees that provide more value to wildlife than they do for timber.

Conservation Alternative

Like in Stand 1, if invasive species control is not an option for management, deer exclusion fences might be a good alternative to establish native tree regeneration. Deer seldom eat these invasive species so the desirable native counterparts are usually targeted. Areas with low invasive species should be targeted for deer exclusion fences to select for desirable species. Even though deer do not eat the invasive species, there is no practical benefit to putting a fence

around undesirable species. Refer to the invasive species maps to gain insight into where these places of lower invasive species density are located.

No-Action Alternative

A no action management strategy is arguably the current practice. There are recreational practices taking place, but there is no overarching forest management taking place. With no management we can expect the invasive species problem to slowly spread and multiply. These areas will densify with undesirable species and as soon as the canopy is opened when over mature trees die and fall over, these invasive species will quickly occupy these areas. Some areas will stay to the native forest structure longer than others. A no action or preservationist approach will decrease the forest health and resilience in the long term with the state of our current forests. While a do-nothing or no-action approach is reasonable in some cases, it should not be considered a management approach.

This is a beneficial property to a wide variety of users. It is important to read this plan with an unbiased lens that recognizes the value of properly managed forests can hold. Managed forests by design have canopy manipulation of some kind; timber harvests or other means of allowing light to enable growth. Understory management is critical and often more important than overstory management. All forms of management should be considered including no cut options in some areas. No cut does not mean no management. All areas may need to be salvaged at some point in time and timber harvests should never be taken off the table. Proper Forest Management is adaptive, preventative, planned, and in some cases responsive. Doing nothing is not adaptive. Being responsive alone is viable management at the lowest level. Knowing when to take a responsive approach is challenging and not exact.

Prescription and Management Recommendations

1. Property Line Maintenance if or where appropriate.
2. Monitor and identify changes in forest health.
3. Timber harvest in Stand 2 to focus on improving forest health, wildlife habitat, improving species composition and spacing, with a focus on establishing tree regeneration. If trees do not get established, deer exclusion fencing may be required. This timber harvest should be the overstory manipulation prior to an overstory removal in the next 5 to 10 years. This future overstory removal will focus on releasing advanced regeneration that was not already released. Leaving high quality trees of good form for wildlife structure and seed production is essential.
4. Invasive species control in Stand 1, along heavily used trails that receive sunlight, anywhere that tree cutting is viable. An integrated approach to reducing the need for chemicals is strongly encouraged.
5. Invasive species control in Stand 2, mechanical or chemical. An integrated approach to reducing the need for chemicals is strongly encouraged.
6. After invasive species control in Stand 1, a timber harvest can be explored. The outlined target goals can be found in desired future conditions. Like Stand 2, this should focus on establishing regeneration, releasing any current regeneration, and should plan to harvest the residuals in the future. Leaving high quality trees of good form for wildlife structure and seed production is essential.
7. Grape vine control should be done with invasive species control to help preserve sawtimber. Areas with pure grapevine arbors can be left alone for wildlife but should be contained to that specific area if possible.

Appendix I: US Fish and Wildlife Initial Findings

Appendix II: Soil reports and Stream Stats

Appendix III: Forest Stand Analysis Data Report

Appendix IV: Reference Material