

Draft

Forest Stewardship Plan 2005-2015

City of Middletown, Conservation Commission

Wilcox I & II Properties

Middletown, Connecticut



**T.DEGNAN LAND MANAGEMENT
CONSULTING, LLC**
Old Lyme, Connecticut

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Landowner Information

Landowner name: City of Middletown, Conservation Commission

Mailing address: 245 deKoven Drive, PO Box 1300, Middletown, CT 06457

Phone number: William Warner, Director of Planning, Conservation and Development, 344-3425

E-mail address

Total acreage: 146

Forested acreage: 146

USGA quad names: Meriden and Middletown

Plan preparer: Tom Degnan, *T.DEGNAN Land Management Consulting, LLC*

Address: 22 Caulkins Road, Old Lyme, Connecticut 06371

Phone number: 860-434-3497

Fax number: 860-434-3497

Mobile phone: 860-304-1893

E-mail address: tdegnan67@yahoo.com

Introduction

This *Forest Stewardship Plan* is designed to provide you with detailed information about your property's current condition and recommendations for the next 10 years. Long term, this plan should provide knowledge and general guidance to help you enjoy your property to its fullest extent.

Whether it is forest health, recreation, wildlife, water quality or timber growth, a management plan should educate and help guide a landowner toward their goals. This plan is not designed to be stagnant. It should grow as your knowledge base grows. It should include observations about forest activities. Whether we have success or failure, we should learn from our actions. It should grow as the science of forest management grows and it should adapt to the new objectives of the people who enjoy the land.

Much of the narrative within this plan refers to maps or information within an appendix. Please use this information to clarify points within your Stewardship Plan. Also, please refer to the 'Definitions of Forestry Terms' section for explanations of any terms that are unfamiliar or confusing.

Goals

1. Improve and enhance recreation
2. Education
3. Protect historic features
4. Control invasive species
5. Improve and diversify wildlife habitat
6. Protect native flora and fauna
7. Timber management

Cultural Importance

Frequently forestland is described as areas “untouched by man”. Considering that many of the trees that are growing in the forest were there before our grandparents were born, you can understand why such comments are often made. Nothing can be further from the truth throughout most of Connecticut and certainly on this property.

Activities such as agriculture or timber and fuel wood harvesting became part of this property’s human-influenced past. Stone walls and barbed wire fence are found throughout the property. Until about 60 years ago a golf course could be found on this site. Reminders of the old course are still present in the forest. The evidence is generally covered with trees, but with a little imagination many of the features of the old course can be seen. Both planted conifers and natural hardwood trees have covered most of the evidence and without some previous insight to the past land use, many visitors would likely just speculate as to the unusual land features found in the woods.



Currently, human influences on the property are primarily in the form of hiking trails. As residential development has closed in on some of the boundaries of the property, hiking has increased. An extensive hiking trail network is present on the property, which also gets use from horse back riders, mountain bikers and ATV users.



Most recently and less obvious examples of human influence are invasive, exotic species such as multiflora rose, oriental bittersweet, burning bush (euonymus), honeysuckle, privet and Japanese barberry that have become established on the site. These plants have migrated in from neighboring residential land by way of wind and wildlife and over time will have a large influence on the native vegetation of the site.

Currently, the invasive plants are not having a major impact on the natural vegetation of the site, but considering some options for reducing their numbers will likely cost much less and be a lot easier now than after they have taken over the site

Three options are available for reducing invasive plants from the property.

1. Mechanical. Cut the stems or pull plants up by the roots.
2. Mechanical and chemical. Cut the stems and apply a systemic herbicide.
3. Chemical. A folient spray applied from a mist blower.

The third option is likely to be the most cost effective, but at this stage mechanical removal by cutting and a small amount of herbicide treatment to the stump would be very effective.

Property Description

The Wilcox I and II properties are bordered by Meriden's Guiffrida Park on the west, Atkins Road on the east, residential development on the south, and mostly open space on the north. The property totals 146 acres, which is comprised of 42% conifers, 27% hardwoods, 22% hemlock/hardwoods and 9% forested wetlands. Most of the current forest originated following the abandonment of a golf course and subsequent planting of conifers about 60 years ago. Some portions of the golf course were allowed to revert back naturally to hardwoods. Other parts of the property, in particular parts of Stand 4, were never part of the golf course likely due to the difficult terrain.

The health of the forest varies. Stands 1 and 2 are over-crowded and the health and vigor has been declining for the last 20 years, while healthy, vigorous hardwood trees occupy most of Stand 3, which failed as a spruce plantation. In Stand 4, dead and dying hemlock trees are evidence of the negative impact of the hemlock woolly adelgid, but at the same time, have naturally thinned the stand releasing many of the hardwood trees and improving their health and vigor.

Recreation appears to be the primary use of the property. Hiking trails provide access throughout the entire property and appear to get frequent use.

The highest point on the property is a north/south running trap rock ridge on the western end of the property in Stand 4.

Typical of protected open space throughout Connecticut, the Wilcox property is becoming an island surrounded by development. Luckily, Meriden's Guiffrida Park to the west provides a 505 acre undeveloped block of land that is contiguous to the Wilcox property. The open pastureland of the undeveloped open space to the north provides an excellent contrast between the forestland on the Wilcox and Guiffrida Park properties.



Access

Access to the property is excellent. There are trail heads off of both Atkins Street and Footit Drive. Some of these trails are unimproved roads that could easily accommodate a four-wheel drive truck. Some effort has been made to block some of the entrances, but unauthorized trespassing and dumping have still been a problem over the years.

Although the property is bisected by several wetlands and the East Spruce Brook and West Spruce Brook, access points are available along roads that reduce the need to cross these areas.

An old road also provides good access to an old hunting lodge site.

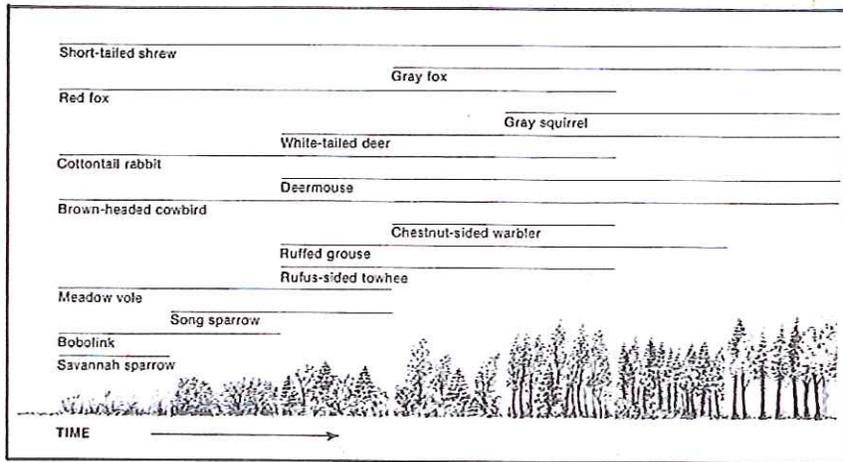
Recommendations:

It is recommended that some of these trails be marked with either paint or some other type of permanent marker. Dumping and ATV use appear to be a small problem on this property and I would recommend installing new gates or improving any damaged ones. This is recommended primarily where an old woods road meets a town road rather than where every hiking trail enters the property.

It is also recommended that the property lines be located, blazed and painted and posted to let visitors know when they are entering or leaving the preserve.

Wildlife Habitat

Wildlife habitat is the basis for the existence of wildlife. Although this sounds obvious, we seldom think about the specific landscape features that draw in the various species we observe on our properties.



Four primary factors determine the species of wildlife you will encounter on your property: food, cover, water and space.

The picture to the left shows the forest successional stages certain species are most likely to use during their life cycle. As forests mature, many species are left to find preferred habitat

elsewhere. The natural succession of forestland can have a dramatic effect on many wildlife species. As Connecticut's landscape has grown back from its former agricultural heritage, grassland species such as the savannah sparrow or grasshopper sparrow decline. Grassland is lost to shrub land and species such as the golden-winged warbler or yellow-breasted chat move in. Nothing is more telling of this than the reemergence of the white-tailed deer, once practically extinct in Connecticut. The overwhelming population increase of deer is primarily due to the dominance of a mature forested habitat again.



A critical part of the forest habitat is dead wood. Coarse woody debris (CWD) has become a topic of some note in the management of New England forests in recent years. Dead wood on the ground serves important habitat benefits. Many of the wildlife species that can potentially inhabit this property require dead wood, hollow trees, or rotten wood for some part of their life cycle. Dead wood provides cover, moisture, nest sites, and den sites as well as a place to forage for food.

CWD is considered to be any downed or suspended woody material that is greater than 3 inches in diameter. This definition for CWD would include such items as logging debris, fallen logs, wind blown trees and large branches.

Management guidelines for coarse woody debris include the following generalities:

(<http://www.massforesters.org/coarse.htm>)

1. Larger pieces of CWD are more valuable than smaller pieces.
2. CWD scattered across a site is more valuable than if it is concentrated (although it is good to have some piles).
3. It is important to maintain a full range of CWD decay classes (from hard to crumbling).
4. Coniferous CWD is generally more long lasting than deciduous wood.

A long-term approach to CWD management needs to consider the distribution and quantity of future sources.

Endangered Species

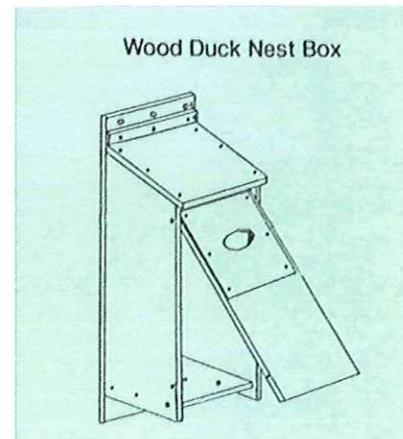
The State of Connecticut's Natural Diversity Data Base does not list any species of wildlife that is state or federally endangered, threatened, or of concern on the property. Additional wildlife information can be found at the Department of Environmental Protection website www.dep.state.us.com.



Wildlife Management

Wildlife management can be approached from several angles. First, is there a specific species you want to manage for? Certain game species or endangered species may have specific needs that can be addressed to improve their habitat. Second, is there a specific habitat that you would want to manage for? It may be early-successional forest or old growth forest, open field or open marshland. It may be the creation of more snags and coarse woody debris. Finally, a generalist approach would be to just increase biodiversity. You may want to thin the forest to help create a diversity of age classes and species. Although our forestlands are not stagnant and “mother nature” provides her own form of management to increase biodiversity with hurricanes, the impacts from insects, disease, fire and drought, you may want to help things along with a more active approach. Some management recommendations for your property are as follows:

1. Maintain coarse woody debris on the forest floor. Resist the need to “clean up” the forest. Dead material on the forest floor is vital to the health of a forest ecosystem.
2. By maintaining at least 70% forest cover, the habitat for forest interior birds will remain intact.
3. At least 3 to 7 “high-quality” (larger than 16” in diameter) snags and/or den trees should be maintained per acre. Snags and den trees provide food and homes for many birds and insects.
4. Nest boxes can be installed to provide habitat for wood duck adjacent to open water wetlands. Boxes can be placed on a pole in standing water or within ¼ mile of standing water or a stream. They can be placed 4 to 20 above the ground or water. Nest boxes should not be located within site of each other. It is important to imitate densities found in nature to reduce fighting over territory, which will reduce reproduction success. Nest should be protected with a metal predator shield over the opening and wood ducks do not carry nest material to the nest, so some straw or sawdust should be added to the box. The box should have a bottom that is about 12” x 12” and a hole that is 3” x 4”.
5. Some of the existing conifers plantations should be maintained rather than allowing them to convert to hardwoods. Conifers provide protection for wildlife against harsh winter weather.
6. A variety of hard and soft mast (seed) producing tree species should be maintained and encouraged to provide food and insurance against a seed failure of any one species. Important mast producing trees include oak, hickory, cherry, beech, black gum and dogwood.

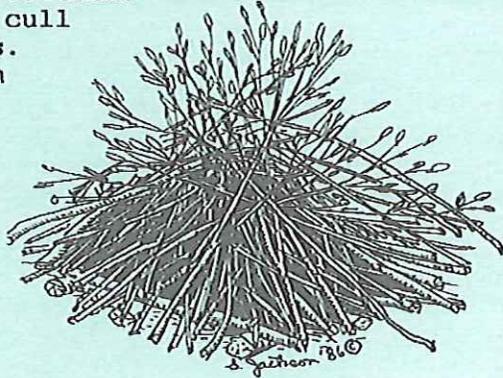
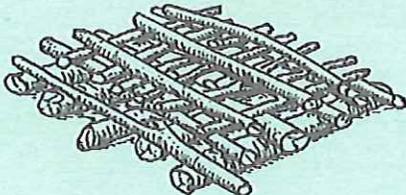


7. Brush piles could be created to provide additional wildlife cover. Small mammals will use such piles for cover and bears will use them to den. Such piles are particularly beneficial if located near water.
8. Watercourses, wetlands, and their associated habitat should be protected by using practices designed to minimize soil disturbance, erosion, and sedimentation.

1

Construction

Materials used in brush piles will depend largely on what is available. Oak, locust and other hardwoods which are rot resistant make durable bases. Other suitable materials include large stumps, cull logs, old fence posts and stones. The largest material should form the base and layers of smaller limbs and branches added as filler.



Brush piles are usually mound or tepee shaped. Ideally, they should be six to eight feet high and 15 feet in diameter. An alternate method of providing cover is to windrow the brush along a stone wall or woods' edge. In this case, brush should be piled in one direction with the tops facing the edge of the woods. Covering brush piles and windrowed brush with evergreen boughs will provide wildlife with additional cover.

Brush piles are short lived (six to eight years). In order to provide continual cover, new ones should be developed periodically.

Forest Development

In order to fully understand how and why we manipulate forest development through timber harvesting, we need to understand the natural process of forest development and growth. In other words, how a forest matures and changes over time.

As a forest ages, the trees grow to large sizes and in that process become fewer in number. A young forest of newly established seedlings may have more than 5,000 trees per acre. Twenty years later, there are 500 trees per acre. After 50 years, there are 200-300 six to eight inch diameter trees per acre and in another fifty years, there are 50 sawtimber trees per acre. After 100 years, approximately 97% of the original 5000 seedlings per acre have died leaving the remaining 3% of the trees to mature into the trees you see today.



The exact numbers vary from forest to forest, but the process of forest maturation is the same. What is happening here? The other 4,950 trees died and rotted away because they lost the competition for limited growing space. This process continues until the mature trees die from old age or disease, blow over, burn in a forest fire, or are cut.

Each time a tree dies, the surrounding tree crowns expand to fill in the canopy opening. When a large tree dies, or a group of trees die, the opening is too large for the surrounding trees to fill. When this happens, the understory trees will fill the gap. Eventually all the trees we see today will die and will be replaced by their progeny in the understory. These processes can be interrupted and altered. White-tailed deer are having a major impact on the

development of new trees in the understory on many properties throughout Connecticut.

You can accelerate and improve upon forest development by selecting the trees that would likely dominate the stand. You may favor the healthiest and most vigorous trees. You may favor a tree for its value to wildlife, like red cedar or pine. You may favor a tree for its products, like sugar maple for syrup. You may favor a tree for its longevity, like oak or hemlock. You can take much of the chance out of the development process by personally guiding how the forest develops, based on your goals.

You can favor a tree's survival and vigor by opening up growing space around its crown. This allows the tree to expand its crown and receive more sunlight. In turn, this increases the tree's photosynthetic capability, which will make the tree more resistant to insect and disease problems.

Forestry mimics and manipulates natural forest development to produce a healthier and more valuable forest. This scientific manipulation can produce wood products, improve wildlife habitat, create more recreational opportunities, and form a more attractive forest.

Silviculture and Forest Management

Silviculture can simply be defined as “*the art, science, and practice of producing and tending a forest*”. There are many silvicultural techniques that a forester can use to achieve the desired effects. Silviculture can be used to produce the highest quality wood in the shortest amount of time or it can be used to improve habitat for game species or neo-tropical migrant songbirds.

Two silvicultural systems frequently used in southern New England forests are:

- Shelterwood
- Selection

Shelterwood is an even-aged system that generally takes place during the later portion of the rotation (a rotation is a stand's progression from seedling to final harvest time and in Connecticut can vary based on species and landowner objectives, but is generally between 75 to 100 years long). The design is to leave evenly distributed numbers of stems throughout the stand to promote regeneration. Once regeneration has been established the remaining trees are harvested. By choosing the most desirable species and genotypes to leave behind, growth and value of the stand increases while providing for the new regeneration.

This process generally takes place over 2 or 3 commercial timber harvests.

The first harvest is considered a preparatory cut and generally occurs as the stand reaches the small sawtimber size class (<16” in diameter). The goal is to remove low quality stems and undesirable species while providing additional growing space to the crowns of the best trees. Over the next 10 years or so, additional growth and value is added to the remaining trees while the crowns expand and the overall health improves. Preparing the crowns for better seed production is the primary goal of this initial harvest.

The second harvest is called a shelterwood seed harvest. This harvest is a heavy cut removing about 50 to 60 % of the remaining trees and leaving behind the best quality trees for seed. This harvest has to open up the stand enough to allow sufficient light onto the forest floor to regenerate species that require a lot of light to become established, such as oak, cherry or pine.

The third and final harvest is the removal cut and if the seed tree harvest was successful, the final cut will release the many thousands of desirable tree seedlings established following the seed harvest. A new, even-aged forest is then allowed to develop.

When applying shelterwood cutting over three stages it is important to avoid opening up the stand in the preparatory harvest to a degree that would allow undesirable, shade tolerant species (beech, hemlock, musclewood or hophornbeam) to become established. Shelterwood is often applied over two harvests to help reduce the impact of undesirable regeneration that can occur following a preparatory cut.

Selection is considered an uneven-aged silvicultural system. Selection cutting is not as uniform as shelterwood. The technique occurs generally over a longer cycle than shelterwood and has more harvests and longer intervals between harvests.

Individual or small groups of trees are selected for cutting with the idea of removing undesirable stems while allowing some additional light to reach the forest floor. This system does not allow as much light to reach the forest floor and as a result will primarily regenerate species that can

become established with less light such as sugar maple, hemlock or American beech. Every time an entry is made into a stand for harvesting, any regeneration that has become established is released by cutting some of the mature trees around it.

Although this method was not designed to effectively regenerate species that need a lot of sun, it can be adapted for our oak/hardwood or pine forest types in southern New England by increasing the size of the openings.

It is important to note that the word “selection” harvesting has taken on more than one meaning. Many loggers and foresters over the years have adopted the word “selection” to be synonymous with “high-grading”. Landowners are frequently told that they are getting a “selection” harvest, when what they are getting is a high-grading of their forest that removes the most valuable trees and leaves behind an unhealthy forest. It is very important to understand the different techniques and the impacts they can have on your forest.

Both of these silvicultural techniques come with many variations and adaptations that a skilled forester will know how to use to best accomplish the objectives of the landowner. This is why forestry is often referred to as an art as much as it is a science.

Harvesting

Selecting the trees to be removed is the first step. The second is actually removing them. The practical application of Best Management Practices (BMP's) is essential to achieving the ultimate goal of improving the forest. A timber harvest must be laid out correctly and a good logging contractor selected. This will ensure that the job goes as planned.

Preventing erosion and keeping the soil and its nutrients in the forest and out of the streams is one of the primary goals of a good timber harvest. This means using erosion control methods during and after a harvest. Such methods include installing water bars, spreading mulch, and growing grass where erodable soils exist. It means controlling when, where, and how the timber is removed. Timbersale contracts, sale planning, and sale inspections are the tools to ensure that soil erosion is prevented.

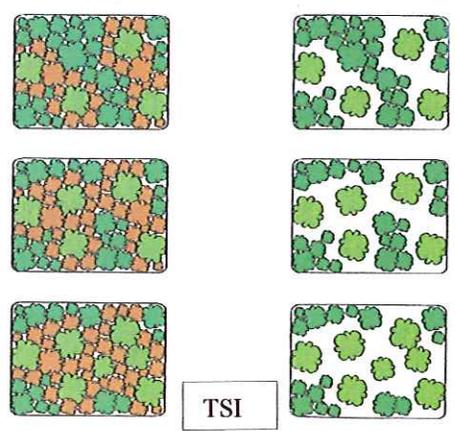
Preventing damage to the residual trees is also a key component to a successful job. Well laid out skid trails by the forester and directional felling on the part of the logger is crucial. There are many different types of machines used for harvesting timber, but the determining factor between a good harvest and a poor one is usually the logger driving the machine. The red oak in this photo was damaged during a timber harvest. This wound opens the door for fungal decay and can greatly reduce the long-term value and health of the tree.



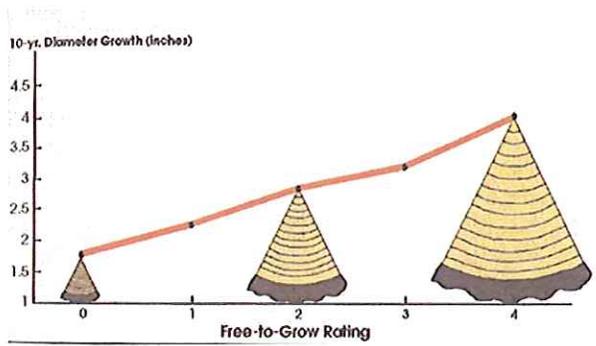
The time of the year is also an important consideration when logging. The spring and late fall can be difficult times to work in Connecticut's woods. The amount of moisture in the ground can provide for some muddy conditions, but what you will most likely find is that any time of the year can generate both good and bad results. You need to look at the individual site and the weather that we are getting at that moment.

Timber Stand Improvement:

In a timber stand improvement ("TSI") operation, silvicultural prescriptions are carried out non-commercially. This activity is designed to improve the health and vigor of pre-merchantable trees by releasing them from some or all of the competing trees adjacent to them. The diagrams show three different intensities of complete, four sided crop tree release. The top diagram shows four crop trees being released while the bottom diagram shows seven crop trees being released. As the number of crop trees per acre increases, the number of competing trees that are cut will also increase. The intensity will depend on the goals of the landowner and the number of high-quality crop trees that are present.



By investing in TSI when the trees are young the growth rate and value can be increased dramatically. The TSI chart in the figure below shows the dramatic difference a complete crown-touching release makes in the growth of a crop tree. This example shows a 130% increase in the growth of a crop tree that was released on 4 sides versus a tree that was not thinned.



Trees selected for removal are girdled or felled with a chainsaw. Girdled trees become snags that serve as valuable habitat for birds and other wildlife. Trees that are felled are lopped to lie close to the ground. The resulting coarse woody debris provides habitat for small mammals, and may protect tree seedlings from browsing by white-tailed deer. This work can be done 12 months of the year because there is no heavy

equipment involved.

Crop trees can be selected to meet a variety of objectives including timber production, maple syrup production, wildlife, aesthetics and water quality.

Stand Descriptions and Recommendations

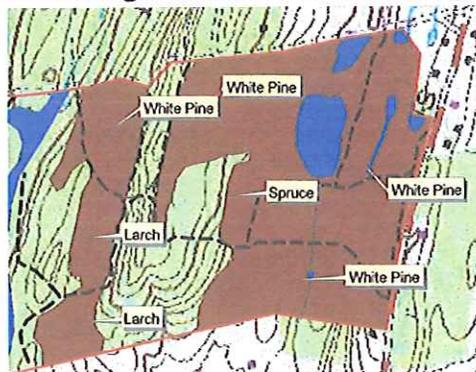
Stands or cover types are separate natural communities that are distinct from each other. Dividing a property into stands makes it easier to correctly describe the property and to make appropriate recommendations. Once identified, each stand is treated separately and uniquely based on its characteristics.

Stand 1: Conifer Plantations

(61 Acres)

Description:

This stand is the largest on the property. It was established following the abandonment of the golf course about 60 years ago. The trees were found to be between 57 and 60 years old. While a little mixing of species has occurred in a few areas, most of the plantations are monocultures of white pine, larch (tamarack), or white and Norway spruce. White pine is the most dominant species on the property. Red pine, Scotch pine and Douglas fir were also identified, but were not planted in large numbers or did not survive.



The understory plants help to clue you in to the natural progression of these artificial forests. Abundant regeneration in the form of hardwood seedlings and saplings, which include sugar maple, white ash, hickory, black cherry and black birch, are naturally seeding in when gaps occur in the overstory. As many as 4000 sugar maple seedlings per acre were counted in a few places.

The general health of the overstory trees is poor throughout much of this stand. Dense crowding of trees that were planted on a 6' x 6' spacing has had a major impact on tree health. Most of the trees have a live crown ratio of 10% to 20%, which is very low. All of the trees that were cored to determine age showed very slow growth. In fact, one white pine that was sampled had grown 2.6" in diameter between 1965 and 1975 and only 1.9" in diameter between 1975 and 2005.



Timber quality is generally poor in the white pine sections and very good in the larch and spruce areas. Many of the white pine trees that have a large enough diameter to be considered sawtimber are too crooked to be used for commercial sawtimber. In contrast, the larch and spruce trees tend to be very straight and have much better timber quality.

CWD and snags are scarce throughout most of this stand. Although tree growth has slowed dramatically, mortality has been low. This stand was found to only have 7 snags per acre in contrast to 28, 27 and 180 snags found in stands 2, 3 and 4 respectively.

Recommendations:

Initially, a thinning is recommended to improve the health of this stand. Long-term a deferred shelterwood system is recommended that will provide more growing room for the healthiest trees and release established regeneration. This method follows the normal shelterwood system, but rather than removing all of the overstory in the final harvest, 5 to 10 trees per acre are retained to add structure and diversity to the stand. These are generally very healthy trees, but other important characteristics should also be considered such as cavities or branching patterns that will allow for raptor nesting. These trees will be left at least until the next rotation at which time they will be about 150 years old.

Although hardwoods will eventually take over most of this stand, it is important to maintain the conifer component on the property to some extent. Therefore, conifer regeneration should be encouraged wherever possible.

Den trees and large snags (>18" dbh) should be protected during the harvest. Girdling can be used to create some large cull, but only in areas where there are no trails.

This stand contains about 15,919 board feet per acre with an approximate value of \$1,100 per acre. In total this 61 acre stand contains about 955,000 board feet with an approximate value of \$67,100. Buffer areas around wetlands and hiking trails reduce the amount that is accessible at any one time. The initial harvest that is recommended will likely remove between 180,000 and 240,000 board feet with a value of \$15,500 to \$18,000.

Long-term, another harvest would be recommended for 10 years from the initial harvest. Similar silviculture should be used, but adapted to the changes that take place in the forest following the first harvest. Any regeneration that becomes established during the initial harvest should be released from overstory competition.

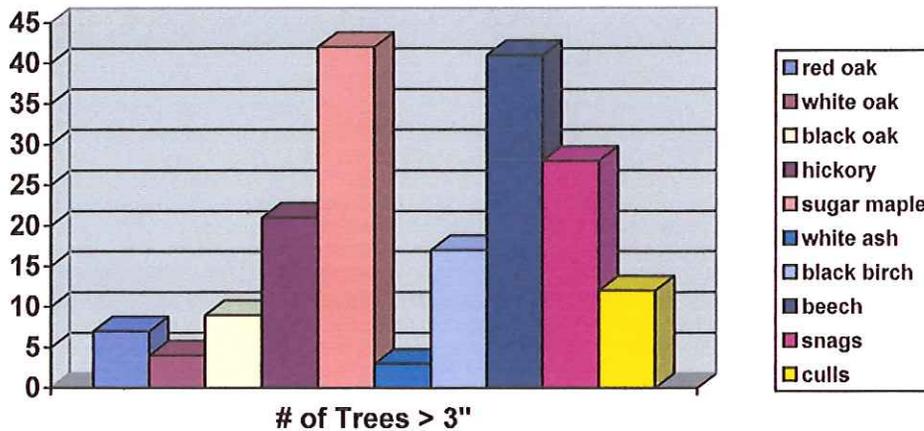
Stand 2: Mixed Hardwood

(34 Acres)

Description:

The overstory of this stand contains a variety of hardwood species that include black birch, sugar maple, red, white and black oak, yellow poplar, hickory, white ash and American beech.

Hophornbeam was the most dominant understory species with lesser amounts of beech seedlings,



dogwood and witchhazel also present. The dense overstory keeps sunlight from reaching the forest floor and reduces understory growth.

The parts of this stand that are found where the old golf course was located are 57 to 60 years old, while other areas are dominated by trees that are 100 years old. Forest vegetation and health is similar throughout all parts of this stand. The health is generally fair and while most of the trees have healthy looking crowns, all of the trees that were sampled with increment cores had very slow growth over the last 20 or so years. This is likely due to overcrowding.

Old pasture trees can also be found on the property. Although these trees are too large to get an increment core from, it is likely that they are well over 125 years old. Large red oak such as the one in the photo provided the acorns for the 58 year old stand of trees growing around it.

Nectria Canker

Nectria canker was found on some of the black birch in this stand as seen in the picture below. Nectria canker is a fungus



that infects a tree when spores are washed into open wounds in the bark by rainwater. The spores of the fungus arrive on healthy trees via the wind from other infected trees. Once infected, the fungus spreads in the cambium (inner bark) and kills the living tissue underneath the bark. Black birch is the dominant pole sized tree within this stand. Healthy trees can live with the fungus, but timber value can be greatly diminished or lost altogether. An unhealthy tree has a more difficult time fighting the invader and can be girdled as the living tissue under the bark is killed.

Recommendations:

A variety of silvicultural techniques are recommended for this stand to help achieve some of the landowner objectives mentioned at the beginning of the plan such as:

- Diversify and improve the wildlife habitat.
- Protect recreational component of property.
- Maintain the forest in a healthy condition.
- Protect and enhance the historic features of the property such as unique trees and stone walls.



Although group and uniform shelterwood silviculture is recommended as the primary technique, individual selection silviculture is recommended to enhance the structural diversity and health within this stand by encouraging multiple age classes in areas suited for that type of forest structure. This will improve the biological diversity of the stand and provide habitat for a wider range of wildlife species.

Individual tree selection should be used to diversify areas of the stand where multiple-age classes are desired. In particular, areas that have more shade tolerant species such as sugar maple or beech are well suited to this method of harvesting. Also, in areas adjacent to hiking trails individual tree selection should be used to highlight unique trees and remove unhealthy or hazardous trees. Lastly, this method should also be used adjacent to wetlands to encourage unique trees to benefit wildlife. Large trees that provide high-quality habitat should be released. This will also stimulate shade tolerant shrubs and trees providing multiple levels of vegetation.

Trees found to have unique value to wildlife such as den trees should be protected during this harvest.

Some of the historic pasture trees should be released from competition during the timber harvest. This will improve the health and aesthetics of these trees. This will require an investment in removing un-merchantable trees, but if done in conjunction with a timber harvest, the costs will be minimal.

This harvest would remove approximately 2,000 board feet per acre or about 33% of the total volume. This thinning would remove unhealthy and generally lower value trees, while leaving the healthiest trees to continue to improve in growth. Some un-merchantable trees, which are trees less than 12" in diameter or trees not capable of making it to sawtimber size due to health or form, will also be marked during this harvest.

In total, about 68,000 board feet is recommended to be removed during the initial timber harvest with a value of \$10,000 to \$12,000.

Long-term, another harvest would be recommended for 10 to 15 years from the initial harvest. Similar silviculture should be used, but adapted to the changes that take place in the forest following the first harvest. Any regeneration that becomes established during the initial harvest should be released from overstory competition.

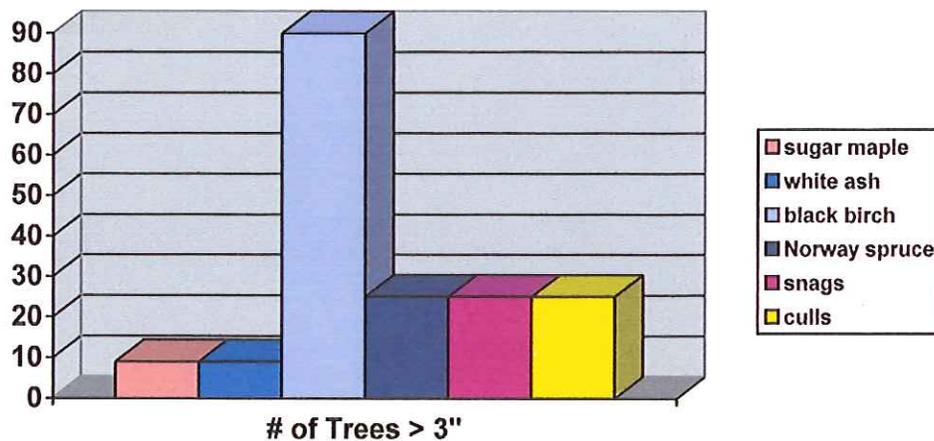
Stand 3: Mixed Hardwoods and Conifers

(6 Acres)

Description:

Stand 3 is located in 2 small patches and is the result of failed conifer plantations. The original planting of white spruce and red pine occurred at the same time as the rest of the planting on the property, about 58 years ago. An insect called red pine scale may be the reason for the decline of most of the red pine, but it is unclear why most of the spruce died. It is safe to say that the site was more suited to the hardwood trees that quickly filled in as the spruce and pine were declining.

When the Wilcox properties were planted, it's clear that the goal was to include a variety of species. While white pine is the only native species and is likely the reason most of the property was planted with it, red pine, which is more adapted to more northerly climates, was frequently substituted for white pine throughout southern New England for two reasons. It is not susceptible to the white pine weevil and tends to shed its lower branches better than white pine, leaving lumber with less knots. Unfortunately the red pine scale has decimated red pine plantations throughout the region.



A positive result from the loss of the conifers is the large amount of snags and CWD found in the stand. Also, the current stand of hardwood trees is healthy and vigorous. The trees are about 44 years old and have had no trouble filling in the gaps left by the declining conifers. Black birch, black oak, white ash, sugar maple, red maple and aspen are all present. Scotch pine and Douglas fir were also noticed in this stand, but in very small amounts. There is very little understory vegetation growing in the shade of the young hardwood trees.



Recommendations:

This stand would benefit from a pre-

commercial thinning. TSI is recommended to maintain the best quality, healthiest trees in a vigorous condition. Black birch found to have nectria canker will be cut during the thinning. Also, unique conifers such as Scotch pine, Douglas fir, red pine or spruce should be released during the thinning. Hazardous trees adjacent to trails should be felled while the TSI work is being done.

Long-term, this stand will be ready for a commercial thinning in about 20 years. The shelterwood silvicultural system will likely be a good technique for managing the hardwoods as they reach maturity.

Stand 4: Mixed Hardwood and Hemlock

(32 Acres)

Description:

Most of this stand is found along the trap rock ridge on the western end of the property. Although all forestland changes over time, as you look at Stand 4 you get the feeling that there have been more changes here than in other parts of the property in recent years. The hemlock woolly adelgid has had a major impact on this stand.

Hemlock Woolly Adelgid

The woolly adelgid is native to Asia and is said to have made its way into Connecticut during hurricane Gloria in 1985. It attacks hemlock by sucking fluids from the base of needles, which in many cases, causes mortality of the entire tree in four to ten years. The insect is carried throughout hemlock stands by the wind, birds, deer, contact between branches, and sometimes by movement of logging equipment or infected logs. Infected trees develop a thin, brownish crown, and the white woolly covering of the insect's eggs is visible on branches and bark. Hemlock trees growing on dry sites, such as upper slopes with southwestern aspect, are liable to suffer the worst damage.

Hemlock is a particularly important habitat tree because it is the only native shade-tolerant conifer in the area. When it is lost, a unique habitat will be lost to the forest. Hemlock is used by numerous species, particularly deer, in winter because its dense and low foliage provides protection from snow and high winds. Thus hemlock stands are often called deer yards. Orwig and Foster (1998) suggest that hemlock stands decimated by the adelgid will be replaced by native hardwoods including black birch, red maple, and oak species. The net effect of adelgid activity, then, will likely be an increase in the homogeneity of Southern New England forests.

Fortunately the Wilcox properties do not have a shortage of conifer cover and although they are not natural stands, they will serve many of the same wildlife needs.

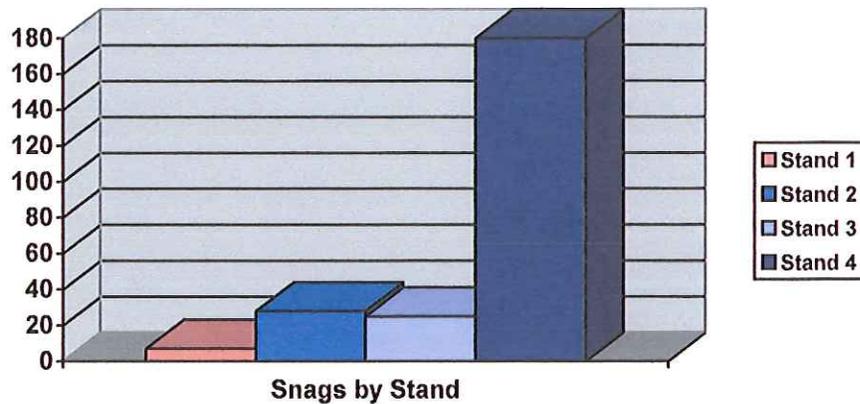
While the loss of hemlock from many of Connecticut's forests is generally not seen as a good thing, nature has a way of finding something positive in events such as this. As seen in this photo, hardwood tree seedlings such as sugar maple, black birch and cherry are quickly filling in the gaps left by dead hemlock trees. Also,



several large red oak trees, one in excess of 125 years old, exhibited a large increase in growth about 15 years ago. In each case there were several large, dead hemlock trees adjacent to the newly revived and vigorous oak trees. One large red oak was found to have grown 3.8" in

diameter over the last 10 years. This is a far better growth rate than any other trees sampled on the property.

Stand 4 also has no shortage of snags and CWD. At a 180 snags per acre, the woodpecker population has likely seen a spike.



The stand currently contains overstory species such as chestnut oak, red oak, black oak, white oak, sugar maple, red maple, black birch, hemlock, hickory, white ash and American beech. Although the timber quality is fair, almost half of the 4,945 board feet is comprised of red oak, which is one of the most desirable timber and wildlife tree species in Connecticut.

The trail system is extensive in this stand and many connect to hiking trails on Guiffredo Park in Meriden. Signs were noticed during the field work indicating that the New England Trail Rider Association (NETRA) were using some of the trails on the Wilcox Property as a motorcycle endurance course. Although this type of use can frequently lead to erosion on trails, no serious problems were noticed.

Recommendations:

A healthy multi-age class forest, wildlife habitat and safe hiking are recommended management goals for this stand. The forest is moving toward a biologically diverse multi-age class forest and should be encouraged during harvesting work. The CWD and snags that are so beneficial to wildlife also need to be looked at in terms of safety from a hikers perspective.



General Recommendations for the Management of Adelgid-Infested Stands

There are several management options for infested hemlock stands. The choice of management activity will of course affect the future development of the forest. Some management options are:

Do nothing. Let the trees die and remain standing, to be replaced naturally by other species. Standing dead wood is an important habitat component. The numerous large snags will benefit wildlife species including woodpeckers and other birds, den-dwelling mammals, amphibians and reptiles. However, a high volume of standing dead wood can allow other pests to become established and disperse into other areas of the forest.

Salvage harvest any trees or stands that are infested. Under this option hemlocks can be retained until their demise is imminent, whereupon they are harvested and the timber sold. The habitat, aesthetic, and other non-timber benefits derived from hemlock stands are maintained for as long as possible. Because the ultimate impact of the adelgid is unpredictable, it is reasonable to wait and see whether stands will be killed before harvesting them. This will avoid unnecessary removal of a desirable species. Revenues from the sale of the timber will not be foregone outright under this option although revenues could change as market prices fluctuate. To the extent that financial considerations affect the timing of the harvest, the decision of when to cut should be made with market conditions in mind. If this option is chosen, it is important to act quickly once the trees are killed. Standing hemlock timber will lose much of its market value from decomposition within a year of the death of the tree.

Preemptively harvest healthy hemlock stands. If the demise of the stands is inevitable and market conditions are favorable, immediate harvest can act as a hedge against negative price fluctuations in the future. Where financial considerations are important and hemlock prices are high, quick harvest may be the best choice. Hemlock timber from healthy trees is more valuable than that from diseased or dead trees. Also, harvesting costs are lowest when timber volume per acre is high.

I recommend a light, selection harvesting system for this stand. Hazardous trees adjacent to hiking trails should be removed. Merchantable trees can be sold and utilized, while the unmerchantable trees can be cut and left in place. The hiking trails should be inspected twice a year and cleared of debris. It is important to note that not all dead trees are hazardous. Some larger diameter dead hemlocks have already broken off at 10 to 20 feet. While these trees pose little risk to a hiker, they have a lot of habitat value to wildlife.

The management work should also encourage the growth of the oldest age class (>125 year old) and the youngest age class (seedlings and saplings – 5 to 30 years old).



This harvest would remove approximately 1,200 board feet per acre or about 25% of the volume in any one area. Not all sections of this stand are accessible and work around hiking trails will

likely be very light. This thinning would remove unhealthy and generally lower value trees, while leaving the healthiest trees to continue to improve in growth.

In total, about 25,000 board feet is recommended to be removed during the initial timber harvest with an approximate value of \$7,431.

Long-term, this stand will be ready for another harvest in 10 to 15 years. Similar silvicultural techniques can be used to accomplish the objectives outlined in this plan.

Wooded Wetlands:

(13 Acres)

Description:

Most of the wetlands on this property are forested with the exception of some open water found in the large wetland on the east side of the property. Some of these wetlands appear to be much older than the surrounding uplands, likely due to the fact that they were never cleared as part of the golf course. Large swamp white oak and pin oak in excess of 30" in diameter were noticed during the fieldwork. All of these trees are capable of withstanding seasonally flooded conditions. The waterline on the pin oaks in this photo shows how deep the water can get in this area.



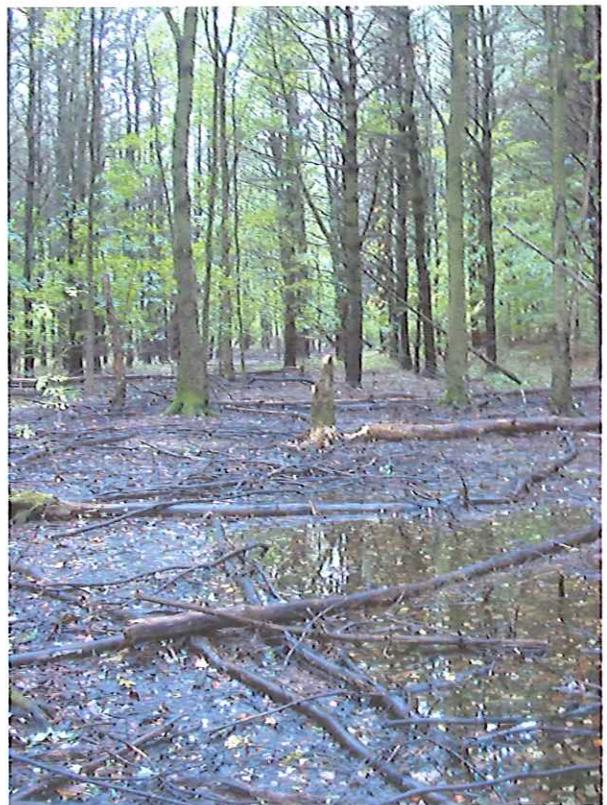
Other overstory species include red maple, white ash and cottonwood, while the understory is dominated by spicebush, buttonbush, sweet pepperbush, high-bush blueberry and vibernum.



for this stand. Wildlife habitat improvement work such as snag creation will increase the standing, dead wood in the short-term and increase the CWD component of the forest floor in the future. Installation of wood duck boxes or the creation of cavities in existing trees is also recommended.

Recommendations:

Very little management is recommended



10-Year Activity Summary

<u>Year</u>	<u>Activity</u>
2006	Locate and identify property lines with paint and signs
2006	Timber harvest and cull tree marking in Stand 1
2006	TSI in Stand 3
2006 to 2008	Install gates
Ongoing	Trail maintenance
Ongoing	Wildlife improvement as per the plan
Ongoing	Invasive species control
2008	Timber harvest and cull tree marking in Stand 2 and 4
2016	Re-inventory property and write new plan

Total Property Stumpage Values

Year	Acreage	Total Volume of Sawtimber	Approximate Stumpage Value *
1	61 Acres	955,000 board feet	\$67,100
2	34 Acres	216,892 board feet	\$38,386
3	59 Acres	12,632 board feet	\$1,931
4	32 Acres	158,336 board feet	\$38,048
Totals		1,342,860**	\$145,465**

****Accessibility, trail, property and wetland buffers will cause a reduction in total available wood at any one time.**

10-Year Silvicultural Activity Details

Year	Acreage of Thinning	Total Volume of Sawtimber	Total Value of the Sale*	Estimated Costs of Project
2006	61 Acres	180,000 to 240,000 board feet	\$15,500 to \$18,000	\$6,000 to \$9,000
2006	6 Acres	NA	NA	\$135/ac (total \$810)
2008	59 Acres	90,000 to 100,000 board feet	\$17,000 to \$20,000	\$4,000 to \$6,000

*Timber prices and stand volumes are based on 2005 prices and the 2005 inventory. Future timber harvests do not take into account increased volume due to in-growth. Timber prices are likely to fluctuate over time also.

Definitions of Forestry Terms

Basal Area: The area in square feet of the cross section of a tree or trees at DBH

Biodiversity: the variety and abundance of life forms, processes, functions, and structures of plants, animals, and other living organisms

Board foot (BF): A dimension of lumber measuring 1”x 1”x 12”. Often referred to in terms of 1000 board feet as MBF

Canopy: Where the leaves and upper branches in a tree are located

Cord: Cut and stacked wood measuring 8’x 4’x 4’ (includes the air in between logs)

DBH: Diameter at Breast Height: diameter of a tree 4.5 feet above the ground

Drainage: Ability of soil to shed excess water

Habitat: The food, water, cover, and living space wildlife needs for survival

Hardwood: Broad-leaved trees that usually shed their leaves in fall

Intermittent Stream: A small stream that does not flow year-around

Microtopography: Changes in elevation on a small scale; dips and bumps in the land

Overmature: Trees that have reached biological old age and have begun to decline in vigor

Overstory: Upper canopy of tree tops

Pole or Poletimber: Trees having a DBH of 6 to 11 inches

Regeneration: Young trees with a diameter of 1” to 3”

Sapling: Trees having a DBH of 1 to 6 inches

Sawtimber or Sawlog: Trees having a DBH 12 inches or greater

Seedling: Trees having a DBH less than 1 inch

Silviculture: The art, science, and practice of producing and tending a forest

Site Index: A species-specific measure of actual or potential forest productivity, expressed in terms of the height of the dominant trees at a specified age

Skid Trail or Road: Corridor through the woods that logs are dragged or skidded down

Snag: a dead standing tree

Stand: Separate and distinct natural communities

Stumpage: Standing timber as viewed by a commercial cutter

Understory: Vegetation layer below the upper canopy of treetops (primarily shrubs and small trees)

Water Bar: Ditches or logs placed at an angle to the slope to divert water from its downhill path

Wicox Property

DEP Owned Waterbody

State Park Scenic Reserve

Guiffrida Park

Town Of Berlin (Water Tank - Wilbur Cross Hwy)

Hunter Memorial Golf Course

Cucia Park

Kennedy Park

Woody School

2090

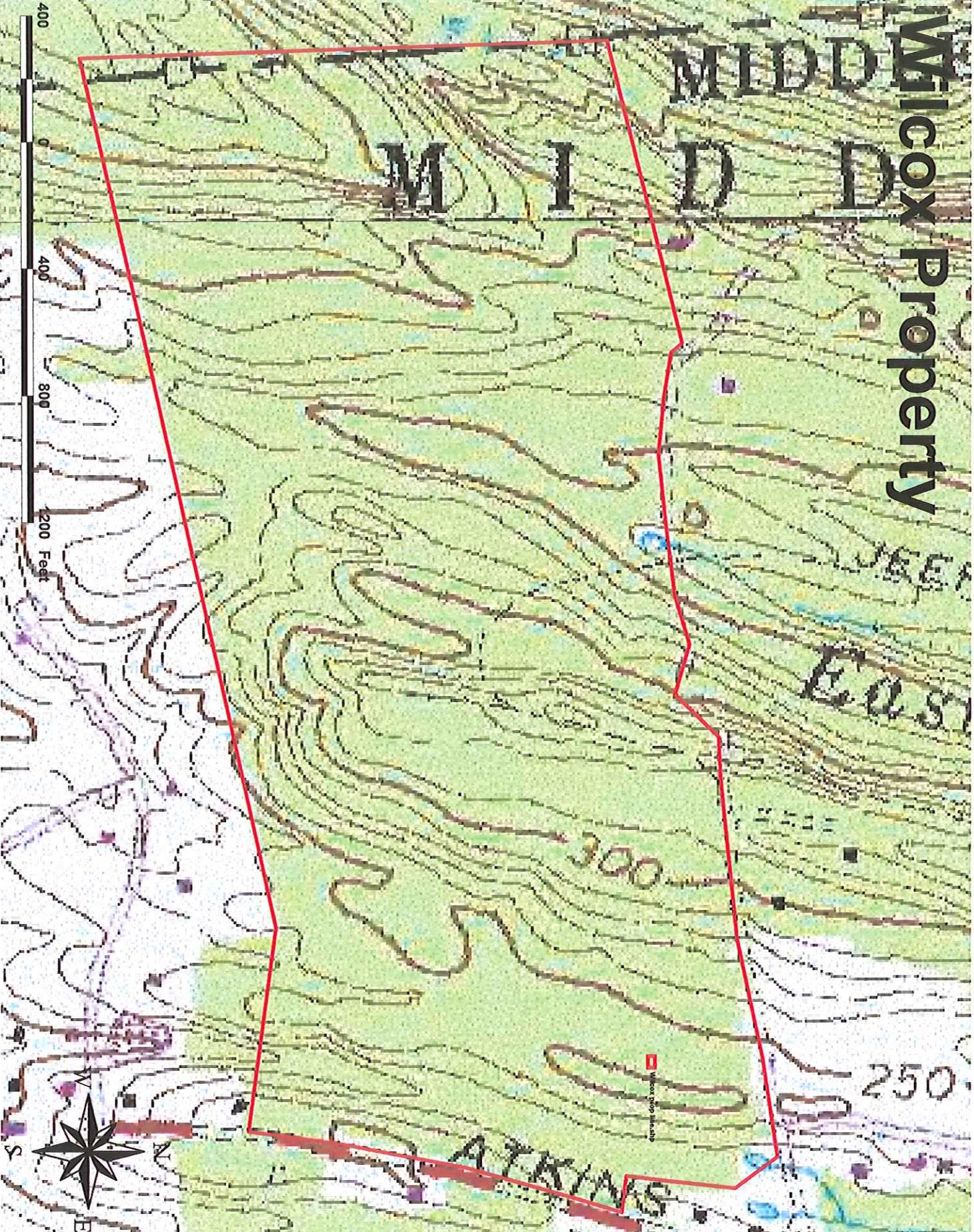
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2000 Feet

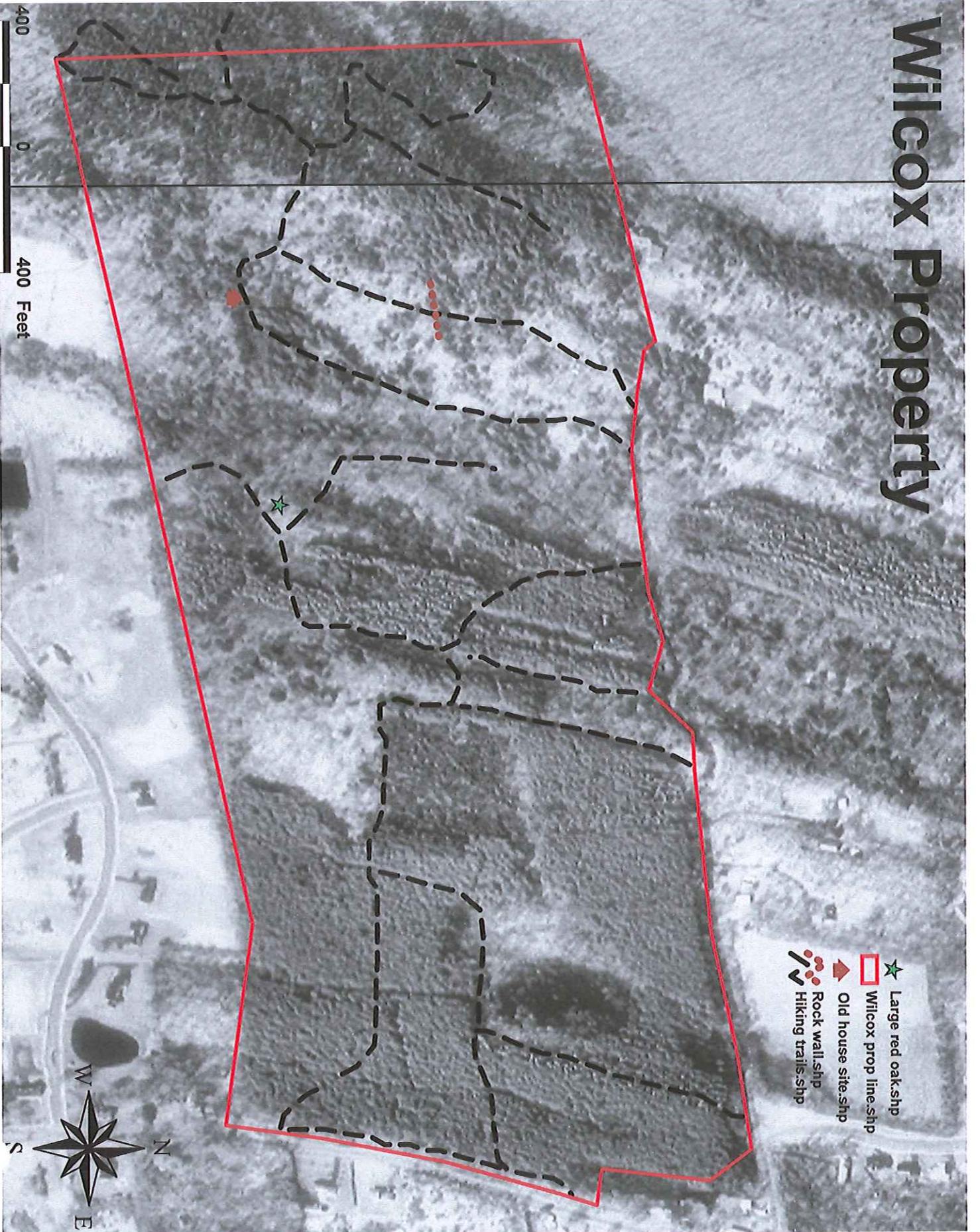


- Wicox Property
- Proprietary
- Cemetery
- Conservation
- Existing Reserved OpenSpace
- General Reservation
- Recreation
- School
- Unclassified
- Proprietary
- State Forest
- State Park Scenic Reserve
- State Park Trail
- Natural Area Preserve
- Wildlife Sanctuary
- Historic Preserve
- Road Corridor
- Utility
- Water Access
- Water
- Wetland
- Other

Wilcox Property



Wilcox Property



★ Large red oak.shp

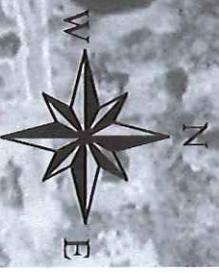
□ Wilcox prop line.shp

➔ Old house site.shp

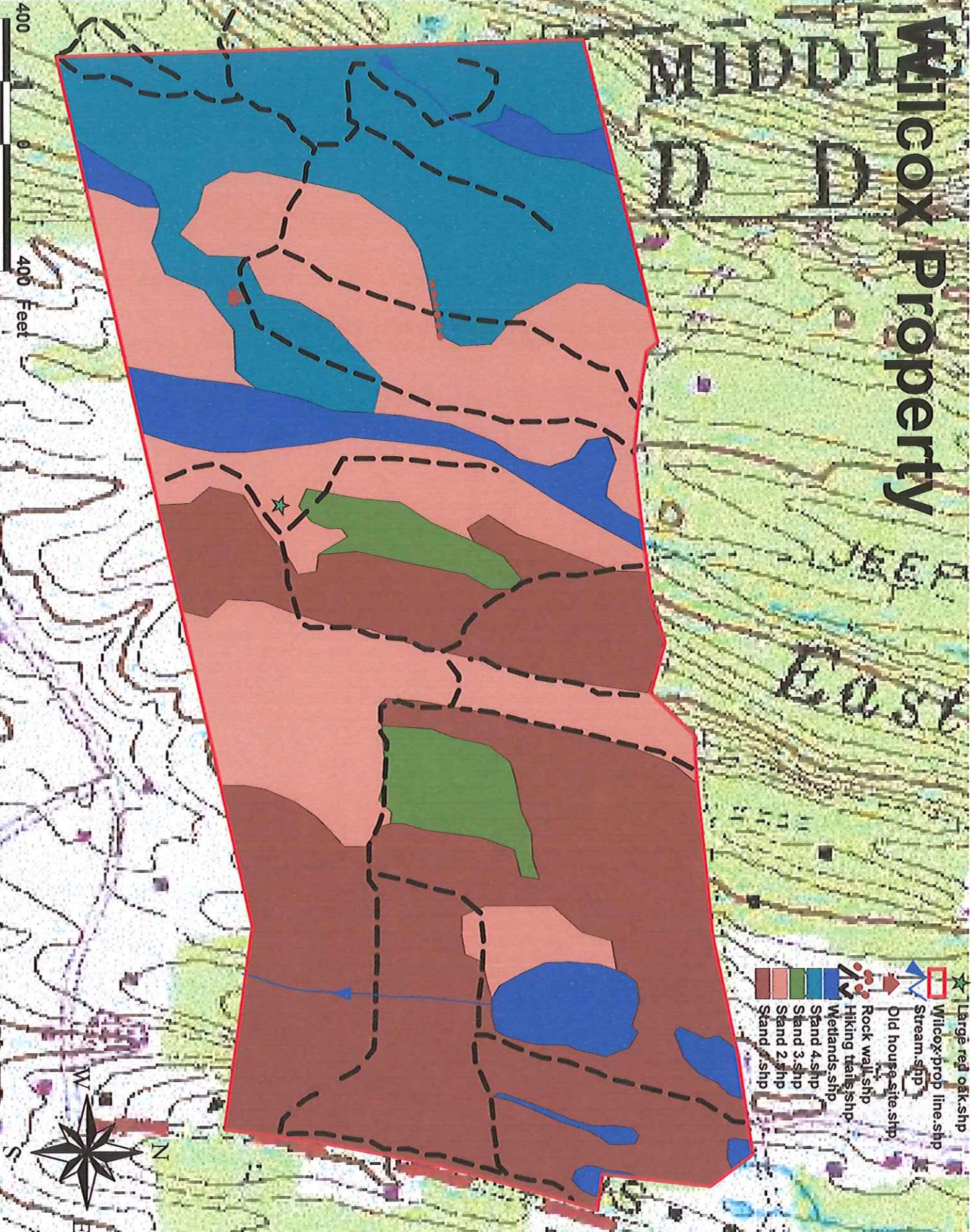
●●● Rock wall.shp

🚶 Hiking trails.shp

400 0 400 Feet



Wilcox Property



- ★ Large red oak.shp
- ▭ Wilcox-prop line.shp
- Stream.shp
- Old house.site.shp
- Rock wall.shp
- Hiking trail.shp
- Wetlands.shp
- Stand 4.shp
- Stand 3.shp
- Stand 2.shp
- Stand 1.shp

Stand Number: 1 Area (acres): 61.0
Stand ID: 0001 10/10/05

Product Group	# Trees	Volume
Softwood Sawtimber	198.0	15,919.5 Board Feet
Advanced Reproduction	107.9	0.0
Hardwood Pulp	24.9	1.3 Cords
Softwood Pulp	73.1	4.7 Cords
Snag	6.7	93.2 Cubic Feet
Cull	47.6	3.2 Cords
Stand Total	458.2	

Stand Number: 2 Area (acres): 34.0
Stand ID: 0002 10/10/05

Product Group	# Trees	Volume
Hardwood Sawtimber	55.9	6,195.5 Board Feet
Softwood Sawtimber	1.7	183.7 Board Feet
Advanced Reproduction	83.3	0.0
Hardwood Pulp	89.7	3.5 Cords
Snag	27.7	103.7 Cubic Feet
Cull	12.4	0.9 Cords
Stand Total	270.7	

Stand Number: 3 Area (acres): 6.0
Stand ID: 0003 10/10/05

Product Group	# Trees	Volume
Hardwood Sawtimber	37.5	2,105.4 Board Feet
Hardwood Pulp	69.2	3.6 Cords
Softwood Pulp	24.9	1.0 Cords
Snag	24.9	81.6 Cubic Feet
Cull	24.9	1.0 Cords
Stand Total	181.5	

Stand Number: 4		Area (acres): 32.0
Stand ID: 0004		11/7/05
Product Group	# Trees	Volume
Hardwood Sawtimber	36.8	4,245.3 <i>Board Feet</i>
Softwood Sawtimber	13.3	702.5 <i>Board Feet</i>
Advanced Reproduction	131.0	0.0
Hardwood Pulp	146.2	5.8 <i>Cords</i>
Softwood Pulp	16.4	0.7 <i>Cords</i>
Snag	180.7	347.5 <i>Cubic Feet</i>
Cull	63.9	1.7 <i>Cords</i>
Stand Total	588.3	

Stand Number: 1

Area (acres): 61.0

Stand ID: 0001

10/10/05

Product Group

Product

Trees

Volume

% Volume

Species--Volume Table

Softwood Sawtimber

Sawtimber

White Pine--Inter 78

#

Board Feet

%

Red Pine--Inter 78

153.9

9,493.6

60

Tamarack--Inter 78

2.2

237.8

1

41.9

6,188.2

39

Total

198.0

15,919.5

100

Advanced Reproduction

Premerch/Adv Reg

Black Birch--

#

%

107.9

0.0

0

Total

107.9

0.0

100

Hardwood Pulp

Pulpwood

Black Birch--RGO Cords-Logs

#

Cords

%

24.9

1.3

100

Total

24.9

1.3

100

Softwood Pulp

Pulpwood

White Pine--RGO Cords-Logs

#

Cords

%

47.2

3.0

63

Tamarack--RGO Cords-Logs

21.6

1.5

31

White Spruce--RGO Cords-Logs

4.3

0.3

6

Total

73.1

4.7

100

Snag

Class 1 Snag

Snag--RGO CubicFeet-Logs

#

Cubic Feet

%

6.7

93.2

100

Total

6.7

93.2

100

Cull

Cull

White Pine--RGO Cords-Logs

#

Cords

%

47.6

3.2

100

Total

47.6

3.2

100

Stand Total

458.2

Stand Number: 2

Area (acres): 34.0

Stand ID: 0002

10/10/05

Product Group

Product

Species--Volume Table

Trees

Volume

% Volume

Hardwood Sawtimber

Sawtimber

Northern Red Oak--Inter 78

Black Oak--Inter 78

White Oak--Inter 78

Hickory--Inter 78

Sugar Maple--Inter 78

Ash--Inter 78

Beech--Inter 78

Black Birch--Inter 78

#

Board Feet

%

6.8

734.9

12

9.2

1,175.4

19

3.9

698.0

11

11.0

1,280.7

21

7.3

625.4

10

2.7

258.6

4

5.5

696.7

11

9.5

725.8

12

Total

55.9

6,195.5

100

Softwood Sawtimber

Sawtimber

Hemlock--Inter 78

#

Board Feet

%

1.7

183.7

100

Total

1.7

183.7

100

Advanced Reproduction

Premerch/Adv Reg

Sugar Maple--

#

%

83.3

0.0

0

Total

83.3

0.0

100

Hardwood Pulp

Pulpwood

Hickory--RGO Cords-Logs

Sugar Maple--RGO Cords-Logs

Beech--RGO Cords-Logs

Black Birch--RGO Cords-Logs

#

Cords

%

10.4

0.5

14

36.2

1.3

36

36.4

1.3

37

6.7

0.5

13

Total

89.7

3.5

100

Snag

Class 1 Snag

Snag--RGO CubicFeet-Logs

#

Cubic Feet

%

27.7

103.7

100

Total

27.7

103.7

100

Stand Number: 2

Area (acres): 34.0

Stand ID: 0002

10/10/05

Product Group

Product

Trees

Volume

% Volume

Species--Volume Table

Cull

Cull

#

Cords

%

Sugar Maple--RGO Cords-Logs

3.0

0.4

47

Ash--RGO Cords-Logs

0.1

0.2

22

Black Birch--RGO Cords-Logs

9.3

0.3

31

Total

12.4

0.9

100

Stand Total

270.7

Stand Number: 3

Area (acres): 6.0

Stand ID: 0003

10/10/05

Product Group	# Trees	Volume	% Volume
Product			
Species--Volume Table			

Hardwood Sawtimber

Sawtimber	#	Board Feet	%
Sugar Maple--Inter 78	8.5	475.3	23
Ash--Inter 78	8.5	404.0	19
Black Birch--Inter 78	20.5	1,226.1	58
Total	37.5	2,105.4	100

Hardwood Pulp

Pulpwood	#	Cords	%
Black Birch--RGO Cords-Logs	69.2	3.6	100
Total	69.2	3.6	100

Softwood Pulp

Pulpwood	#	Cords	%
Norway Spruce--RGO Cords-Logs	24.9	1.0	100
Total	24.9	1.0	100

Snag

Class 1 Snag	#	Cubic Feet	%
Snag--RGO CubicFeet-Logs	24.9	81.6	100
Total	24.9	81.6	100

Cull

Cull	#	Cords	%
Black Birch--RGO Cords-Logs	24.9	1.0	100
Total	24.9	1.0	100

Stand Total 181.5

Stand Number: 4

Area (acres): 32.0

Stand ID: 0004

11/7/05

Product Group

Product

Species--Volume Table

Trees

Volume

% Volume

Hardwood Sawtimber

Sawtimber

Northern Red Oak--Inter 78

#

Board Feet

%

14.4

2,091.8

49

White Oak--Inter 78

4.1

585.2

14

Chestnut Oak--Inter 78

10.9

619.1

15

Yellow-Poplar--Inter 78

2.7

363.2

9

Sugar Maple--Inter 78

2.7

288.7

7

Beech--Inter 78

2.0

297.3

7

Total

36.8

4,245.3

100

Softwood Sawtimber

Sawtimber

Hemlock--Inter 78

#

Board Feet

%

13.3

702.5

100

Total

13.3

702.5

100

Advanced Reproduction

Premerch/Adv Reg

Elm--

#

%

131.0

0.0

0

Total

131.0

0.0

100

Hardwood Pulp

Pulpwood

White Oak--RGO Cords-Logs

#

Cords

%

24.6

1.1

20

Chestnut Oak--RGO Cords-Logs

10.5

0.7

12

Hickory--RGO Cords-Logs

13.4

0.7

13

Sugar Maple--RGO Cords-Logs

10.5

0.7

12

Ash--RGO Cords-Logs

72.8

2.1

35

Black Birch--RGO Cords-Logs

14.6

0.4

8

Total

146.2

5.8

100

Softwood Pulp

Pulpwood

Hemlock--RGO Cords-Logs

#

Cords

%

16.4

0.7

100

Total

16.4

0.7

100

Stand Number: 4

Area (acres): 32.0

Stand ID: 0004

11/7/05

Product Group			
Product	# Trees	Volume	% Volume
Species--Volume Table			

Snag

Class 1 Snag	#	Cubic Feet	%
Snag--RGO CubicFeet-Logs	180.7	347.5	100
Total	180.7	347.5	100

Cull

Cull	#	Cords	%
Red Maple--RGO Cords-Logs	34.8	0.8	49
Beech--RGO Cords-Logs	14.6	0.4	24
Hemlock--RGO Cords-Logs	14.6	0.4	26
Total	63.9	1.7	100

Stand Total	588.3
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Middletown, City of
Wilcox

Stand: Volume, Per Acre
By Product and Species
DBH classes by 2: 12-28+

Stand Number: 1
Stand ID: 0001

Area (acres): 61.0
10/10/05
#Points: 17

Product Group Product Species-Volume Table	Diameter Breast Height (inches)							Subtotal		
	12	14	16	18	20	22	24		26	28+
Softwood Sawtimber										
Sawtimber					<i>Board Feet</i>					
White Pine-Inter 78	3,199.8	2,593.3	2,453.7	1,246.8	0.0	0.0	0.0	0.0	0.0	9,493.6
Red Pine-Inter 78	0.0	237.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	237.8
Tamarack-Inter 78	1,663.4	4,524.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6,188.2
Total	4,863.2	7,355.9	2,453.7	1,246.8	0.0	0.0	0.0	0.0	0.0	15,919.5
Snag										
Class 1 Snag					<i>Cubic Feet</i>					
Snag-RGO CubicFeet-Logs	0.0	0.0	93.2	0.0	0.0	0.0	0.0	0.0	0.0	93.2
Total	0.0	0.0	93.2	0.0	0.0	0.0	0.0	0.0	0.0	93.2
Cull										
Cull					<i>Cords</i>					
White Pine-RGO Cords-Logs	1.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6
Total	1.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6

Middletown, City of
Wilcox

Stand: Volume, Per Acre
By Product and Species
DBH classes by 2: 12-28+

Stand Number: 2
Stand ID: 0002

Area (acres): 34.0
10/10/05
#Points: 11

Product Group Product Species--Volume Table	Diameter Breast Height (inches)										Subtotal
	12	14	16	18	20	22	24	26	28+		
Hardwood Sawtimber											
Sawtimber											
Northern Red Oak--Inter 78	0.0	734.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	734.9
Black Oak--Inter 78	129.6	570.3	213.9	0.0	0.0	0.0	0.0	261.6	0.0	0.0	1,175.4
White Oak--Inter 78	0.0	0.0	698.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	698.0
Hickory--Inter 78	0.0	726.2	554.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1,280.7
Sugar Maple--Inter 78	290.8	0.0	0.0	0.0	334.6	0.0	0.0	0.0	0.0	0.0	625.4
Ash--Inter 78	0.0	132.7	0.0	125.9	0.0	0.0	0.0	0.0	0.0	0.0	258.6
Beech--Inter 78	176.2	0.0	248.3	0.0	0.0	0.0	0.0	272.2	0.0	0.0	696.7
Black Birch--Inter 78	327.2	165.8	232.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	725.8
Total	923.8	2,329.9	1,947.4	125.9	334.6	0.0	0.0	533.8	0.0	0.0	6,195.5
Softwood Sawtimber											
Sawtimber											
Hemlock--Inter 78	0.0	183.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	183.7
Total	0.0	183.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	183.7
Snag											
Class 1 Snag											
Snag--RGO CubicFeet-Logs	23.2	0.0	22.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	45.7
Total	23.2	0.0	22.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	45.7

Middletown, City of
Wilcox

Stand: Volume, Per Acre
By Product and Species
DBH classes by 2: 12-28+

Stand Number: 2
Stand ID: 0002

Area (acres): 34.0
10/10/05
#Points: 11

Product Group Product Species--Volume Table	Diameter Breast Height (inches)							Subtotal
	12	14	16	18	20	22	24	
Cull								
Cull								
Sugar Maple--RGO Cords-Logs	0.0	0.2	0.2	0.0	0.0	0.0	0.0	0.4
Ash--RGO Cords-Logs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
Total	0.0	0.2	0.2	0.0	0.0	0.0	0.0	0.6

Stand Number: 3
Stand ID: 0003

Area (acres): 6.0
10/10/05
#Points: 3

Product Group Product Species--Volume Table	Diameter Breast Height (inches)							Subtotal
	12	14	16	18	20	22	24	
Hardwood Sawtimber								
Sawtimber								
Sugar Maple--Inter 78	475.3	0.0	0.0	0.0	0.0	0.0	0.0	475.3
Ash--Inter 78	404.0	0.0	0.0	0.0	0.0	0.0	0.0	404.0
Black Birch--Inter 78	719.9	0.0	506.1	0.0	0.0	0.0	0.0	1,226.1
Total	1,599.3	0.0	506.1	0.0	0.0	0.0	0.0	2,105.4

Middletown, City of
Wilcox

Stand: Volume, Per Acre
By Product and Species
DBH classes by 2: 12-28+

Stand Number: 4
Stand ID: 0004

Area (acres): 32.0
11/7/05
#Points: 7

Product Group Product Species--Volume Table	Diameter Breast Height (inches)							Subtotal		
	12	14	16	18	20	22	24		26	28+
Hardwood Sawtimber										
Sawtimber										
Northern Red Oak--Inter 78	0.0	704.1	522.8	312.9	552.1	0.0	0.0	0.0	0.0	2,091.8
White Oak--Inter 78	0.0	0.0	585.2	0.0	0.0	0.0	0.0	0.0	0.0	585.2
Chestnut Oak--Inter 78	619.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	619.1
Yellow-Poplar--Inter 78	0.0	363.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	363.2
Sugar Maple--Inter 78	0.0	288.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	288.7
Beech--Inter 78	0.0	0.0	297.3	0.0	0.0	0.0	0.0	0.0	0.0	297.3
Total	619.1	1,355.9	1,405.3	312.9	552.1	0.0	0.0	0.0	0.0	4,245.3

Product Group Product	Diameter Breast Height (inches)							Subtotal		
	12	14	16	18	20	22	24		26	28+
Softwood Sawtimber										
Sawtimber										
Hemlock--Inter 78	403.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	403.8
Total	403.8	0.0	403.8							

Product Group Product	Diameter Breast Height (inches)							Subtotal		
	12	14	16	18	20	22	24		26	28+
Snag										
Class 1 Snag										
Snag--RGO CubicFeet-Logs	116.8	28.5	0.0	28.0	0.0	0.0	0.0	0.0	0.0	173.3
Total	116.8	28.5	0.0	28.0	0.0	0.0	0.0	0.0	0.0	173.3

Middletown, City of
Wilcox

Stand: Volume, Per Acre
By Product and Species
DBH classes by 2: 12-28+

Stand Number: 4
Stand ID: 0004

Area (acres): 32.0
11/7/05
#Points: 7

Product Group Product Species--Volume Table	Diameter Breast Height (inches)							Subtotal		
	12	14	16	18	20	22	24		26	28+
Cull										
Cull Red Maple--RGO Cords-Logs	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.3
Total	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.3