

FOREST MANAGEMENT PLAN

LANDOWNER: J. Patrick Kennedy Trustee
Patricia Kennedy Trustee
700 Cary Drive
San Leandro, CA 94577

LOCATION: Accessed from Trout Creek Road (SR 1131)
Tuckaseegee, NC 28783
Lat. 35° 13' 10" N
Long. 83° 06' 55" W
PINs: 7565-89-6522, 7575-17-5644, 7576-20-4530, 7566-90-7108,
7575-38-7176, 7566-00-3283

DATE: December 28, 2018

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PURPOSE OF A FOREST MANAGEMENT PLAN

A forest management plan is a short-range planning guide (typically 10 years) that provides the information necessary for forest landowners to make sound management decisions for their land. A management plan should be based upon your objectives and the current forest and environmental conditions of your land, and can serve as a directive during future management activities and when working with natural resource professionals.

Over 78% of North Carolina's forestland is owned by private landowners, who just like you, value the direct and indirect benefits (recreation, privacy, income, investment, ecological protection, etc.) that owning and managing their land provides. Through these forest management activities landowner's can have a positive impact on the overall health and quality of our State's forest resources and economy.

For additional information about forest management planning on private lands please visit: <https://content.ces.ncsu.edu/a-family-forest-a-planning-guide-to-protect-enhance-and-manage-private-forestland>.

Forestry Industry, and State and Federal agencies, have long realized the important role private landowners play in the conservation of our state's forest resources, and have

developed landowner assistance programs, cost share monies, and tax incentives to keep privately owned forest lands, in forests, lessening economic pressures that land use and taxation play on the conversion and fragmentation of forest land. Please see the cost share portion of this plan for additional information about these programs, including the use of this plan to qualify for North Carolina's Present Use Valuation Program for Forestland (<https://content.ces.ncsu.edu/north-carolinas-forestry-present-use-valuation-puv-property-tax-program>), allowing landowners a significant county property tax deferment for managing their land as commercial forest.

Your management plan has been broken into two sections. The first section provides descriptive and qualitative information about the current condition (geography, slope, soils, vegetation types, etc.) of your forest and forest-wide considerations for your property. The second section of the plan, divides the property into management units, and makes specific recommendations in these units. A timeline is also included for planning and keeping track of your activities.

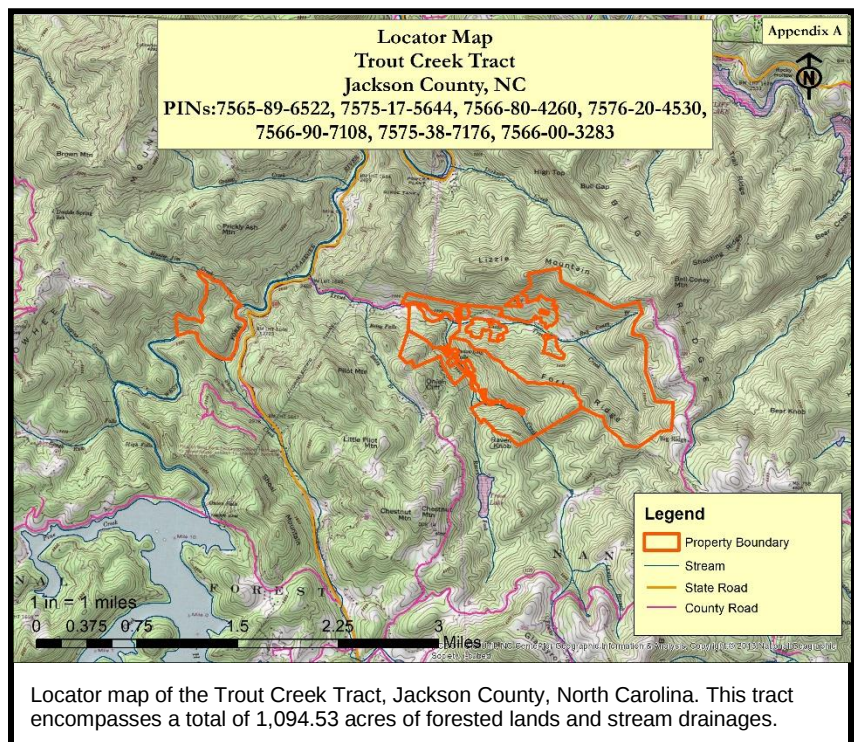
There are many opportunities to make a difference in your land – so make it the best that you can, for the land, your betterment and enjoyment of it, and for future generations.

PROPERTY DESCRIPTION

Location and Geography

The property owned by J. Patrick Kennedy (Trustee) and Patricia Kennedy (Trustee), and hereafter referred to as the Trout Creek Tract, is a tract of approximately 1,094.53 acres, located in Jackson County, North Carolina (Lat. 35° 13' 10" N and Long. 83° 06' 55" W). Of that acreage, approximately 1,000 acres is in forest land and with the remaining acreage (20 acres) in cleared and grassy areas along the internal road access.

Access to the property can be made from State Road 1131, Trout Creek Road reached by Highway 107. Internal to the property is an excellent, maintained road network allowing for ease of access for future forest management activities. Please see Appendix A for the property locator map.



The Trout Creek Tract consists of an elongated cove valley surrounded by ridges, as well as an additional parcel located by the West Fork of the Tuckaseegee River. The property contains drainages, fields, and ridgetops. Slopes are gradual to moderate along the valley floor and property's lower elevation areas, to steep along the property's upper side slopes along the rock outcrops. Elevation ranges from approximately 2,800 feet to 3,960 feet at the top of both Lizzie Mountain and Fork Ridge (1,160 vertical feet of elevation change).



A view of the Trout Creek Tract with Lizzie Mountain (Right) and Fork Ridge (Left). Jackson County, NC.

The soils found on the Trout Creek Tract are deep and well drained, and are moderately to highly erodible. This varies by percent slope across the property, with steeper slopes being more susceptible. Soils are drier and contain lower organic matter on southerly aspects. Several portions of the property's acreage are comprised of acidic and rich coves. In these places, soil moisture is readily available and can be attributed to the dense understory of woody and herbaceous plants.

The property lies within a portion of the Southern Appalachians that is

significant for its bio-diversity and diverse forest ecosystems. Forests of recognized importance adjoin or are in close proximity of this land and include the Nantahala National Forest and Pisgah National Forest.

In proximity to the Trout Creek Tract, Lake Glenville, is the highest elevation lake (approximately 3,500 feet) located east of the Mississippi River. Other high elevation mountain lakes nearby include Bear Lake, Cedar Cliff Lake, Wolf Lake, Balsam Lake, Tannasee Lake, and Trout Lake.

Natural Communities

Natural communities were identified on the property using the "Guide to the Natural Communities of North Carolina Fourth Approximation" published by the North Carolina Natural Heritage Program and now the NC Department of Environmental Quality (March 2012 <http://cvs.bio.unc.edu/pubs/4thApproximationGuideFinalMarch2012.pdf>). A natural community is defined as a distinct and reoccurring assemblage of populations of plants, animals, bacteria, and fungi naturally associated with each other and their physical environment (Schafale 2012). The communities found on the property are as follows:

High Elevation Red Oak Forest - Typic Herb Subtype (Units 1A and 2B): covers mid to high mountain forests dominated by red oak (*Quercus rubra*) (more than 50 percent of canopy cover in natural condition). Subtype covers typical forests with limited cover of predominately deciduous shrubs, and with the herb layer not dominated by a dense lawn

of *Carex* spp. Or high elevation forbs. The High Elevation Red Oak Forest type is distinguished from Northern Hardwood Forests and Red Spruce-Fraser Fir Forests by having *Quercus rubra* var. *ambigua* making up more than 50 percent of the canopy cover under natural conditions. It is distinguished from high elevation occurrences of Montane Oak-Hickory Forest by having less than 10 percent *Quercus alba* canopy cover. The Herb Subtype is distinguished by having a primarily deciduous shrub layer (greater than 50 percent of shrub cover) and lacking a dense lawn of *Carex* spp. It is distinguished from the Stunted Heath Subtype by having a full stature canopy, more than 8 meters tall unless very young. It is distinguished from the Rich Subtype by lacking any substantial presence of the species indicative of less acid soils, in any stratum. *Fraxinus Americana*, *Tilia Americana* var. *heterophylla*, *Actaea racemosa*, *Caulophyllum thalictroides*, *Prosartes lanuginosa*, *Collinsonia Canadensis*, and *Sanguinaria Canadensis* are absent or nearly so. Ericaceous shrubs and other acid-tolerant species are generally abundant. Many, perhaps most, examples of High Elevation Red Oak Forest, particularly of this subtype, have a dense understory of mesophytic trees characteristics of Northern Hardwood Forest canopies (*Betula alleghaniensis*, *Aesculus flava*, *Acer saccharum*, and others). *Quercus rubra* is often scarce or absent from the understory, and the forests appear to be succeeding to Northern Hardwood Forest.

Montane Oak-Hickory Forest - White Pine Subtype (Units 2A and 1B): covers oak-hickory forests with a significant component of white pine (*Pinus strobus*). Most resemble the Acidic Subtype except for the pine, or have dense shrub layers of mountain laurel (*Kalmia latifolia*) or rhododendron (*Rhododendron maximum*). The White Pine Subtype is distinguished from the other subtypes of montane oak-hickory forest by having *Pinus strobus* as a significant natural component, generally providing 25 percent to 75 percent of the canopy cover. It is distinguished from the White Pine Forest by having no more than 75 percent of the canopy cover being *Pinus strobus*

White Pine Forest (1A): covers natural forests dominated by *Pinus strobus*. Plantations and stands that have invaded old fields or clearcuts on sites that would not otherwise support white pines are excluded. White Pine Forest is distinguished from the White Pine Subtype of Chestnut Oak Forest, the White Pine Subtype of Montane Oak-Hickory Forest, and all other forests which may contain a mixture of *Pinus strobus* by having *Pinus strobus* naturally making up more than 66 percent of the canopy over an area more than 1 acre. Distinguishing natural from unnatural successional white pine forests can be difficult. In general, natural White Pine Forests are on slopes of gorges or on ridges, while successional white pine forests are on valley flats or gentle lower slopes. However, clearcutting may white pine to become dominant in Montane Oak-Hickory Forests or Chestnut Oak Forests in some parts of the state.



Shown above is the typical understory found in more productive Acidic Cove portions of Management Unit 1B.

The Acidic Cove - Typic Subtype (Unit 1B): covers mesic forests dominated by combinations of acid-tolerant mesophytic trees, primarily yellow-poplar (*Liriodendron tulipifera*), black birch (*Betula lenta*), eastern hemlock (*Tsuga canadensis*), red maple (*Acer rubrum*), or yellow birch (*Betula alleghaniensis*) with acid-tolerant undergrowth generally dominated by rosebay rhododendron (*Rhododendron maximum*) or highland doghobble (*Leucothoe fontanesiana*). These communities occur at low to mid elevations in the mountain region and foothills, generally in coves, gorges, or sheltered slopes. This subtype covers the common examples in most of the Blue Ridge of North Carolina, where Carolina silverbell (*Halesia tetraptera*) is not a significant component. Acidic Cove Forests are distinguished from the closely related Canada Hemlock Forest type by having a mixed canopy in which *Tsuga canadensis* does not dominate. They are distinguished from Rich Cove Forests by the absence or

near absence of plants that require richer or less acidic soils. Trees such as yellow buckeye (*Aesculus flava*), white basswood (*Tilia americana* var. *heterophylla*), sugar maple (*Acer saccharum*), are present in only minor quantities if at all. Likewise, rich cove herbs such as black cohosh (*Actaea racemosa*) (*Cimicifuga racemosa*), blue cohosh (*Caulophyllum thalictroides*), doll's-eyes (*Actaea pachypoda*), and maidenhair fern (*Adiantum pedatum*) are absent or nearly so. All species of Acidic Cove Forests also occur in Rich Forests, though not as abundantly. Acidic Cove Forests are distinguished from Northern Hardwood Forests by the presence of low elevation species such as black birch (*Betula lenta*) and *Liriodendron tulipifera* and generally by a more depauperate herb layer.

Rich Cove Forest – Montane Intermediate Subtype (Unit 1A and 2B):

Type covers mesic forests of low to middle elevations, containing a rich montane herbaceous flora. They generally occur on concave land surfaces, which may include north-facing and lower slopes as well as cove bottoms. Subtype covers examples of middle elevations, generally 2000 to 4500 feet, lacking a significant component of high pH, rich-site flora.

The Rich Cove Forest type is distinguished by dominance of some mixture of mesophytic trees and a fairly rich to very rich herb layer. Trees common in Rich Cove Forest and scarce to absent in Acidic Cove Forest include yellow buckeye (*Aesculus flava*), (Fraxinus americana), white basswood (*Tilia americana* var. *heterophylla*), and Cucumber tree (*Magnolia acuminata*). Less common trees absent in Acidic Cove Forests include black walnut (*Juglans nigra*), shagbark hickory (*Carya ovata*), and Kentucky yellowwood (*Cladrastis kentukea*), yellow-poplar (*Liriodendron tulipifera*), red maple (*Acer rubrum*), eastern hemlock (*Tsuga canadensis*), and *Betula* spp. are shared by Rich Cove Forest and Acidic Cove Forest. Herbs present in Rich Cove Forest and absent or scarce in Acidic Cove Forest include black cohosh (*Actaea racemosa* *Cimicifuga racemosa*), blue cohosh (*Caulophyllum thalictroides*), yellow mandarin (*Prosartes lanuginosa*), goats beard (*Aruncus dioicus*) maiden hair fern (*Adiantum pedatum*), horsetweed (*Collinsonia Canadensis*), Clayton sweetroot (*Osmorhiza claytonia*), and stinging nettle (*Laportea Canadensis*). Acidic Cove Forests generally have a better developed shrub layer dominated by rosebay rhododendron (*Rhododendron maximum*) or doghobble (*Leucothoe fontanesiana*), which is often present but not abundant in Rich Cove Forests.



Shown above is a granitic rock outcropping located within the Trout Creek Tract and represented as Management Unit 3 in this plan. Jackson County, NC.

Rich Cove Forest is distinguished from Northern Hardwood Forest, with which it shares a similar vegetation structure and many species, by containing lower elevation species in addition to the common species. Tree species found in Rich Cove Forests but generally absent in Northern Hardwood Forests include yellow-poplar (*Liriodendron tulipifera*), Cucumber tree (*Magnolia acuminata*), black walnut (*Juglans nigra*), and elm (*Ulmus* spp.) white ash (*Fraxinus Americana*) and white basswood (*Tilia americana* var. *heterophylla*) are also absent from most Northern Hardwood Forests. Rich Cove Forests are distinguished from the Mesic Mixed Hardwood Forests and Basic Mesic.

Streams and Waterways

The large tract of property has three perennial streams, Trout Creek, Little Trout Creek, and Bell Coney Branch. In addition to these, there are multiple intermittent and ephemeral stream drainages located throughout the property. These stream drainages



Shown above is the Little Branch of Turkey Creek. The property forms a large portion of the headwaters of this stream basin before flowing in to the Tuckaseegee River. Jackson, County NC.

flow into Trout Creek and Little Trout Creek. The smaller tract is located adjacent to the West Fork of the Tuckaseegee River and contains an ephemeral stream. All of the stream corridors are heavily vegetated and surrounded by vegetation commonly found in acidic and rich coves, and in many portions covered with a dense understory of Rhododendron. The protection of water quality and resources is of great importance to the landowners to maintain. All forest management activities implemented on the property must comply with NC Forest Practices Guidelines to maintain exemption of the NC Sedimentation Pollution Control Act of 1973.

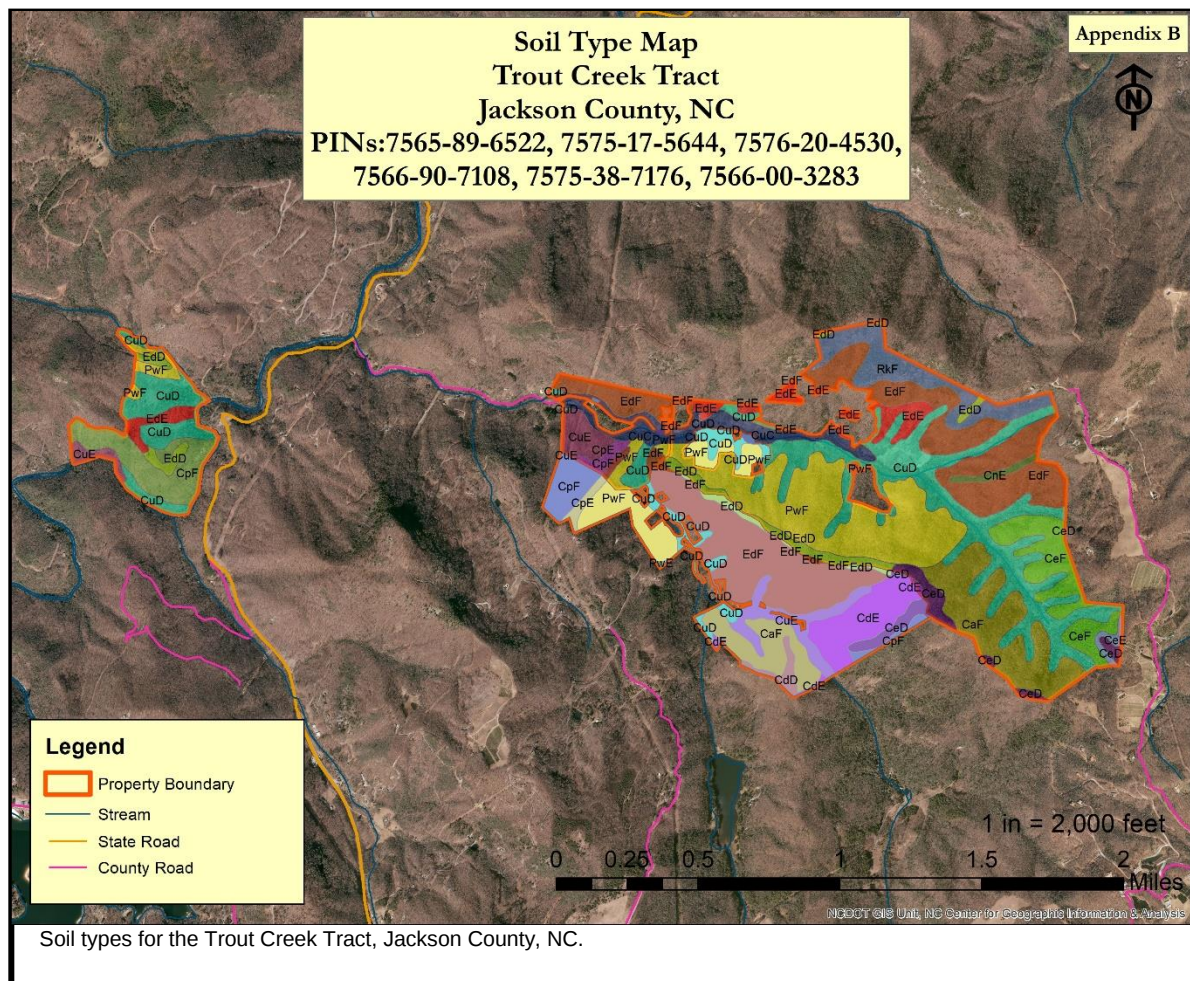
The continued use of vegetative buffers, reliance on existing roads and tractor trails during any timber harvest, and the exclusion of equipment in the SMZ, will allow for the protection of water quality. Currently, the property's streams have ample vegetative buffers to mitigate stream water temperature, nutrients, and sediment.

For additional information about the use of Best Management Practices and the State of North Carolina's mandatory water quality Forest Practice Guidelines, please visit the following link: http://ncforestservice.gov/water_quality/fpg_bmp_differences.htm

Soils

The soils found on the property are Edneyville-Chestnut complex, Cashiers gravelly fine sandy loam, Cullasaja-Tuckaseegee complex, Plott fine sandy loam, Cleveland-Chestnut Rock Outcrop complex, and Chandler gravelly fine sandy loam. As previously mentioned, these soils are very deep and well-drained, and on steeper slopes are highly susceptible to erosion. Care must be taken in these areas, during any future harvest activities, to ensure minimal disruption. Their location can be seen in Appendix B that includes soil maps and descriptions. The information (including reported site indices) was summarized from the Natural Resources Conservation Service (NRCS) Soil Survey of Jackson County. For more detailed information regarding the soils on your property you can go to the Jackson County Public Library or request a free copy of the survey from the Jackson County Soil and Water Conservation District. If you would like to read about the soils on your property online, please visit the following link:

<http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm>

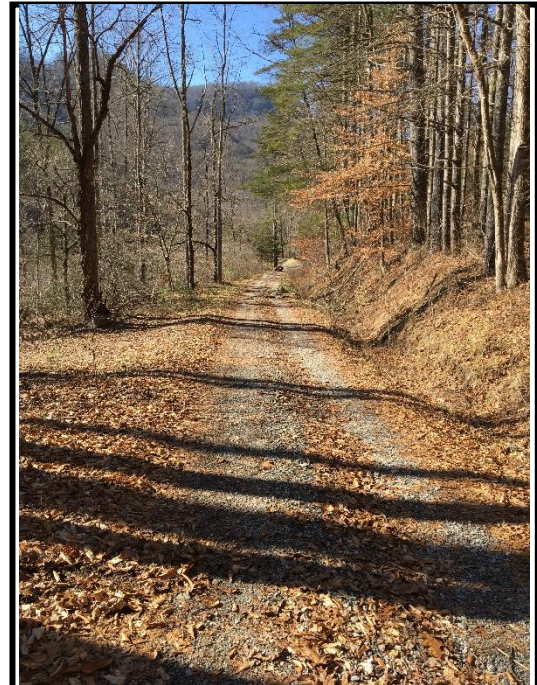


Roads and Trails

There is a large network of roads located throughout the property, most of which were created and developed during timber harvesting which occurred across all pins 40 to 50 years ago as all PINs were extensively harvested at that time. The landowners maintain a large portion of the current network of trails for their continued access and use of the property. The current road and trail system will allow for continued management of the land and further management of the property's forest resources.

Water quality issues related to current forest management activities were not documented during data collection. However, there are a few road grades that could use additional stabilization and/or drainage work to improve accessibility and proper road surface drainage.

Continued maintenance and erosion control measures should be a priority, given the property's proximity to streams and in effort to prevent soil loss. Maintenance measures should include keeping drain tiles, ditches, and cross drains clear of debris. Following new construction or routine maintenance, disturbed areas should be sowed back with native grasses and vegetation, and further stabilizing with silt fence and other erosion control measures as needed. As aforementioned, all future road and trail construction should be done in a manner to protect soil productivity and water quality, while following Forestry Best Management Practices and North Carolina Forest Practice Guidelines.



The trout creek property has good road access and the landowner has worked hard and invested in gravel and machine work to keep roads open. Old skid trails have been maintained (some with gravel) and will assist in future management of the property.

Please visit the following links regarding these practices and do not hesitate to contact me for further discussion regarding them.

For information on how to protect water quality, and the state forest practice guidelines to maintain the forestry exemption of the North Carolina Sedimentation Pollution Control Act, please see the North Carolina Division of Forest Resources "*Forestry Best Management Practices Manual*", pages 12-16. This document may be downloaded at the following web address: http://www.dfr.state.nc.us/water_quality/pdf/bmpmanual.pdf .

A link to "*The Layman's Guide to Private Road Construction*". This is a great resource and reference for landowners on the correct way to construct and maintain roads. This document also can be accessed online through the North Carolina Division of Forest Resources website at the following address http://www.dfr.state.nc.us/stewardship/roadguide/stew_roadguideintro.htm.

Forest Health

Invasive Plants



Shown above are two of the most prevalent invasive plants on the property, honeysuckle and multi-flora rose. These two species should continue to be controlled through the use of broadleaf herbicides.

The following invasive plant species were found while on the property: multiflora rose, honeysuckle, and Kudzu. These species were found along the road network and in edges of forests and open areas that were once disturbed and reestablished with vegetation. This is particularly true for the large Kudzu patch found near Bowlen's Branch. Kudzu in this area while it appears to have been mowed and controlled to a certain extent could also be grazed using goats to help reduce this species distribution and further propagation.

For an excellent document on identifying invasive plants, please visit the following

link: http://www.srs.fs.fed.us/pubs/gtr/gtr_srs119.pdf

Monitoring and controlling the population and density of invasive plants across the property will be important over the next ten years, to foster the establishment of desirable species composition and growth in the forest. The control and eradication of invasive plants and pathogens is a long-term commitment.

There are several chemical treatment methods that could be employed for treating invasive plants on the property. The following recommendations have been summarized from the Southeast Exotic Pest Council (<http://www.se-eppc.org/manual>).

As a licensed commercial herbicide applicator, should I be hired to conduct the control of invasive plants, I would use the following as a general guide for my work*:

Foliar Spray Method - This method should be considered for large thickets... where risk to non-target species is minimal. Air temperature should be above 65°F to ensure absorption of herbicides.

When using glyphosate, make a 2% solution of glyphosate and water plus a 0.5% non-ionic surfactant thoroughly wetting all leaves. Use a low pressure and coarse spray pattern to reduce spray drift damage to non-target species. Glyphosate is a non-selective systemic herbicide that may kill non-target partially-sprayed plants.

When using triclopyr make a 2% solution of triclopyr and water plus a 0.5% non-ionic surfactant to thoroughly wet all leaves. Use a low pressure and coarse spray pattern to reduce spray-drift damage to non-target species. Triclopyr is a selective herbicide for broadleaf species. In areas where desirable grasses are growing under or around multiflora rose, triclopyr can be used without non-target damage.

Cut Stump Method - This control method should be considered when treating individual invasive plants or where the presence of desirable species precludes foliar application. This treatment remains effective at low temperatures if the ground is not frozen.

Horizontally cut stems at or near ground level. Immediately apply a 25% solution of glyphosate and water to the cut stump making sure to cover the entire surface or use a 25% solution of triclopyr and water or 75% horticultural oil to the cut stump making sure the entire surface is covered.

Basal Bark Method - This method is effective throughout the year if the ground is not frozen. Apply a mixture of 25% triclopyr and 75% horticultural oil to the basal parts of the invasive plant to a height of 12 to 15 inches from the ground. Thorough wetting is necessary for good control; spray until run-off is noticeable at the ground line.

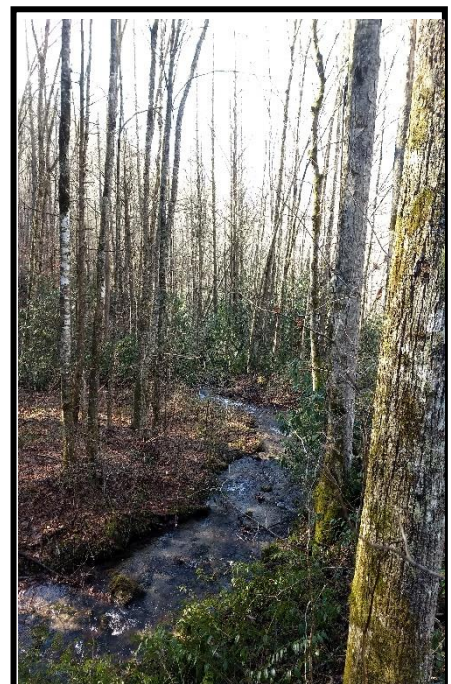
Forest Pests and Pathogens

The following forest pests or pathogens (either native or non-native) were found on the property* (Species information was summarized from USFS Northern Research Stations website and publications

http://www.nrs.fs.fed.us/disturbance/invasive_species/):

Hemlock woolly adelgid (*Adelges tsugae*) (HWA) is a non-native tiny sap-sucking insect related to aphids, and is causing widespread death and decline of hemlock trees in the eastern United States. HWA can be identified by small white “egg sacs” found on the bottom of the needles, particularly evident in during early spring. Biological and chemical treatments include the use of predator beetles and systemic pesticides. For more information please visit the following link:

http://www.nrs.fs.fed.us/disturbance/invasive_species/hwa/



Remnant eastern hemlocks that have succumbed to the Hemlock Woolly Adelgid can be seen in the background of this photo. Treatment of desirable hemlocks near places of interest should be considered by the landowners.

Chestnut blight (*Cryphonectria parasitica*) is a fungal disease that forms cankers on the trunk and root collar, that over time girdles the trees species, effecting the vascular cambium. It was introduced in the united states in 1904 and is now wide spread. It can be identified in the field (usually at the base of the tree) by its orange sometimes oozing cankers. Treatment is not an option; efforts are underway for reforesting areas with blight resistant chestnut trees. For more information please visit the following link: http://www.nrs.fs.fed.us/disturbance/climate_change/american_chestnut/

The following forest pests or pathogens were not found on the property, but may be on adjoining lands, or are projected to become an issue in your region in the near future. (Species information was summarized from USFS Northern Research Stations website and publications http://www.nrs.fs.fed.us/disturbance/invasive_species/):

Emerald ash borer (EAB), *Agrilus planipennis* (Coleoptera: Buprestidae), which causes extensive ash tree (*Fraxinus* spp.) decline and mortality. It can be identified early by D shaped exit holes in upper portions of ash trees. However, detections usually occurs later, once the borer has done significant damage (signs included stump or root sprouting, and peeling bark with EAB borer galleries). EAB is very hard to treat in a forested environment. For more information about this species please visit the following link: http://www.nrs.fs.fed.us/disturbance/invasive_species/eab/

The gypsy moth (GM) is non-native insect with larvae that feed voraciously on the foliage of many North American plants. GM was first recorded in the United States in 1869 and has spread approximately 20 km a year. Gypsy moth has yet to have a significant outbreak in WNC but may likely happen in the next 10 to 15 years as it moves its way down the Appalachians. Large state and federal initiatives have been aimed at slowing and stopping the spread, but the species is very hard to control for individual landowners. For more information about this species please visit the following link: http://www.nrs.fs.fed.us/disturbance/invasive_species/gm/

Thousand cankers disease (TCD) is a recently discovered disease of *Juglans* species in the United States, and is transferred to walnut trees by the hickory twig beetle. Walnut trees that have succumbed to thousand cankers will have branch die back, atypical sprouting along the trunk and branches of trees, also twig beetle galleries may be present within the trees enter bark. Treatment is not practical now. For more information about this species please visit the following link: http://www.nrs.fs.fed.us/disturbance/invasive_species/tcd/

Forest pests and pathogens are a growing concern, as we continue to see increases in these threats in our region, and a loss of commercially and ecologically important tree species. Casually monitor your land for the presence of possible forest pest and pathogens. Look for die-back in trees (particularly during the growing season), fungal bodies growing at the trees base, browning needles, and wood borer holes in trees. While many pest and pathogens may be too costly for a landowner to treat, you should discuss any pest or pathogen outbreak with their consulting forester, as well as the Jackson County Ranger, as there may be cost share programs, or other efforts to minimize their impacts.

The Southern Pine Beetle (SPB) is a destructive bark beetle that is found throughout the southeastern United States. The beetle is smaller than a grain of rice and only approximately 1/8 inch long. While loblolly pines are preferred host trees, any pine species can be affected. The most obvious symptom of a southern pine beetle infestation is the discoloration of the needles in the tree crown. Needles fade from green to dull green, yellow, and finish being reddish-brown before falling off of the limbs. Small, light yellow to white pitch tubes usually form where the beetles enter the tree along the entire tree trunk length. Good forest management can minimize the risk of southern pine beetle attacks.

Should the landowner decide to use a pesticide they must follow all applicable state and federal laws. For more information about applying pesticides correctly please visit the following link: <https://pesticidesafety.ces.ncsu.edu/> Remember the label is the law and if using a private applicator, they must hold a NC commercial ground applicators license with proper endorsement.

The Lisenbys, with the help of their consulting forester and/or NC Forest Service, should explore the development of a basic monitoring program to watch for forest pest and pathogen outbreaks and the deterioration of healthy stands of trees.

Wildlife

The property provides excellent habitat for both game and non-game species found in both terrestrial and aquatic environments. The property's forestland is comprised with early and mid-successional forests lands. In addition to the forest lands, open grassy fields, rock outcrops, and streams provide habitat and food and water resources for many wildlife species including but not limited to: Black bear, white-tailed deer, wild turkey, ruffed grouse, grey squirrel, raccoon, opossum, and pileated woodpeckers. When on the property, the following species were observed (identified by the sign): black bear, white-tail deer, wild turkey, and grey squirrel.

The forest management activities recommended in this plan, including the use prescribed fire, timber harvests, and/or crop tree management will foster the development of a beneficial mix of habitat conditions. When implementing these activities, consideration should be given to the existing habitats and species occupying them. The North Carolina Wildlife Resources (NCWRC) commission has wildlife biologist that are committed solely to working with private landowners. For most matters regarding the



Shown above is wild boar sign found near Bolen's branch. Habitat is excellent for many game and non-game species and their presence and sign can be seen across the property.

Forest Management Plan



management of your forest land is would be my suggestion to contact one of the technical assistance biologist for your region. Currently, in Jackson County Mr. Patrick Farrell would be a good point of contact. For a complete list of NCWRC staff that work with private landowners please visit the following link: http://ncforestservice.gov/Managing_your_forest/pdf/NCWRCPrivateLandsBrochure.pdf

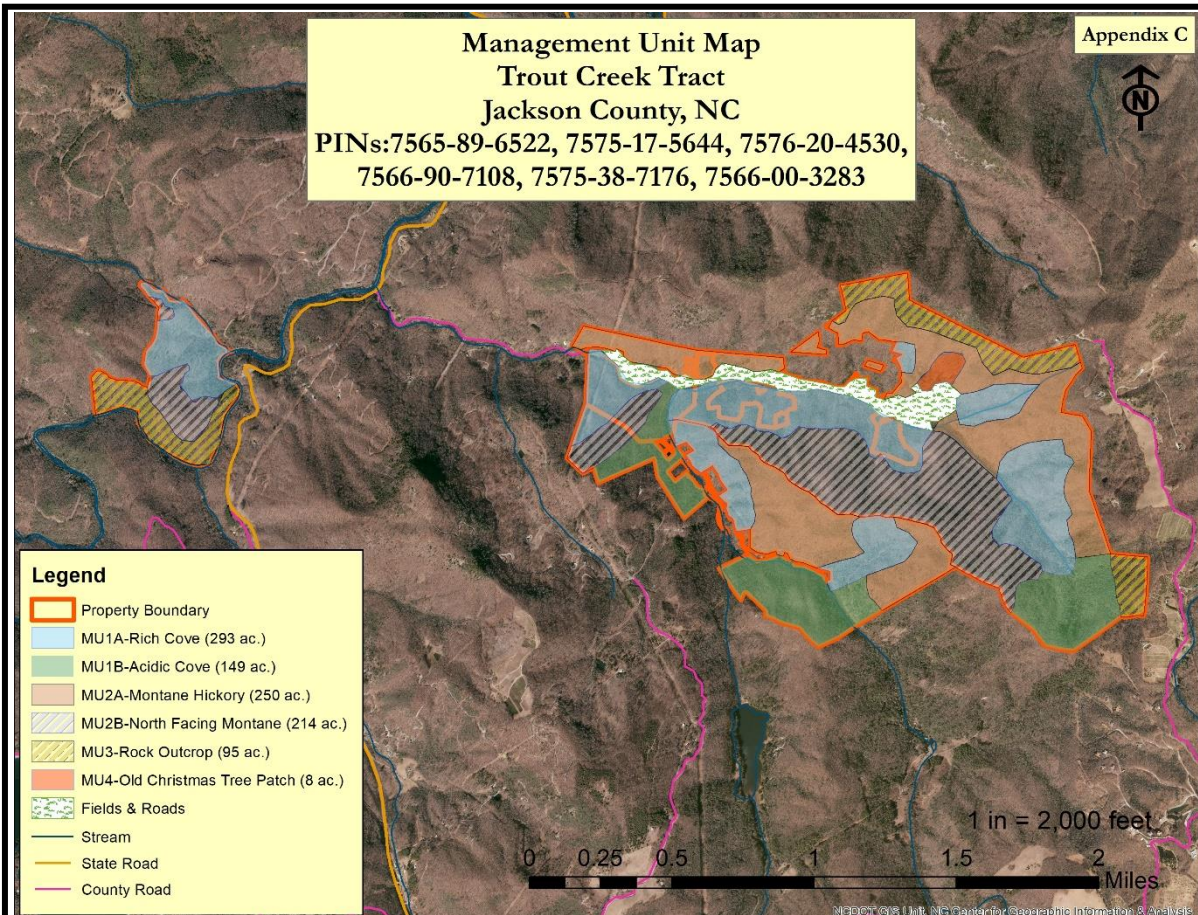
The landowners should consider the use of supplemental wildlife food plantings or food plots to provide additional feed sources for both game and non-game species. These food plots could be established in relatively sunny areas along road edges, fields, and the edges of fields. There is a large amount of area on the property in the bottom of the valley that would support these recommended food plots. These areas would need to be cultivated (ground lightly disturbed) to promote seed germination and limed based upon soil test recommendations. Planting recommendations would include: Red and white clover, annual rye, brown top millet, sorghum, sunflowers, and milkweed (for pollinators). For an excellent publication on plantings and proper food plot management please visit the following UTK publication: <https://extension.tennessee.edu/publications/documents/PB1-769.pdf>

There are many excellent federal and state wildlife programs that landowner's can participate in based on their current management goals and habitat conditions. Many of these programs provide cost share funding. Please see the cost share section of this plan for additional information about these programs. Also, private lands qualifying for tax deferment through the current Present Use Valuation program that meet one of six priority habitats (longleaf pine forest, early successional habitat, small wetland community, stream and riparian zone, rock outcrop, and bat cave) with a completed wildlife habitat conservation agreement, can qualify for tax deferment for up 100 acres.

LANDOWNER OBJECTIVES AND MANAGEMENT UNITS

The landowners wish to continue to sustainably manage their land has been further defined for the property through the development of the following management areas and objectives:

1. Timber: Maintain and/or improve timber stocking and forest health. Promote the growth and establishment of desirable hardwood species that are commercially and ecologically important. Continue to develop multi-cohort or even-aged/two aged stands that will provide for future “crops” of timber in ten years.
2. Soil and Water Quality: Guard against soil erosion and protect water quality by applying appropriate soil and water conservation practices when needed, especially those associated with road maintenance throughout the property, trail construction for landowner recreation, and other forest management activities. Implement riparian corridors around Trout Creek, Little Branch of Trout Creek, and Bolen’s Branch.



The Trout Creek Tract forest management units, Jackson County, NC.

3. Wildlife: Develop diverse wildlife habits that sustain the property's game and non-game species in perpetuity, by the implementation of sound forest management practices. Plant food plots to continue to provide resources for the abundance of wildlife. Generated brush piles for wildlife habitat from brush and trees generated from timber stand improvement.
4. Forest Health and Protection: Guard against, monitor, and control the establishment of invasive, non-native, plants, pests, and pathogens. If stands have been impacted by pests and pathogens, implement activities that will reestablish forest stands and their ecological integrity.

Sampling of Management Units

The Trout Creek Tract has been broken into three management units with several units being further divided into subunits. Each unit is distinct, varying in species composition, aspect, topography, soils, and current and past land use. See Appendix C for a map of the location of management units.

All tree species for pulpwood (5 - 9 inch dbh) and sawtimber (10 + inches in DBH) were sampled using a 20 BAF prism. For basic estimates of current (marketable) timber, that is from 5 inches dbh and up, standard timber cruise software was used (PLOTBOUND, SILVIATERRA). All stems that were 5 inches to 9 inches dbh were entered as "pulpwood" and 10+ inches dbh were entered as "saw timber". Pulpwood estimates lumped together all species while sawtimber estimates broke down volumes by species. The results generated give per acre and total volume for the management unit as well as the basal area / acre estimates.

It is important to keep in mind that the productive, growth, and volume estimates in this inventory are **not** very reliable given the relatively small number of the samples taken for the property. In addition to this, volumes are calculated to reflect the entire forested acreage, when in fact some species are only found in a portion of the property. The data collected should be viewed as providing volume and growth trends, but additional data and inventory work should be performed prior to a timber sale or other activity requiring further information.

For this plan, all management activities are made at the management unit level. However, activities can occur across management unit boundaries when necessary. For additional information about the measurements and terms used to describe your property, please see the Management unit terms descriptions section of this plan.

Management Unit 1A-Rich Cove & Management Unit 1B-Acidic Cove



Shown above is a portion of management unit 1A which is an acidic cove, comprised predominately of yellow-poplar. Crop tree release in these areas may be conducive to improve residual stand growth

Size: MU1A = 293 ac. MU1B = 149 ac.

Age: Both subunits are approximately 45 to 50 years old that were regenerated during the last timber harvest which occurred on the property, and also from the exclusion cattle in lower cove portions. Stand is currently immature.

Site Index: Varies across unit. Site index in 1A is approximately 95 to 100 for yellow-poplar. In 1B Site index is slightly less and approximately 90 to 95 (base age 50) for yellow-poplar.

Diameter

Growth Rate: Varies based on site 1A is more productive with estimated growth rates at approximately 2.5 to 3% with growth rates slower for 1B.

Aspect: Southwest to Northwest

Vegetation: These subunits are comprised predominately of pure, even-aged, stand of yellow-poplar that regenerated

following the last timber harvest which occurred on the property approximately 45 years ago. Portions of 1A were also regenerated following the exclusion of cattle which occurred approximately 25 to 30 years ago. Small pockets of eastern white pine can also be found growing interspersed and where likely natural seeded in after the last harvest. Both subunits are in the later stages of stem exclusion and at the begin of understory re initiation as crown closure has occurred and density related mortality do to competition is evident in stands.

Current basal area varies within these units with some productive portions of MU1A approaching 140 sqft/acre with pole size timber growing in overstocked conditions to fully-stocked stands ranging from 80 to 100 sqft/acre. Presently, the stand structure of these two subunits is very uniform with little differentiation in crown classes.

Given the age of these subunits and time since last harvest they are still immature and need additional time to grow so to maximize timber value. The timber quality is excellent in these subunits and should be revisited in harvesting during the next plan review as these stands will likely be ready for the application of thinning treatments to further improve timber quality, while providing income to the landowner. In the interim

Forest Management Plan

the landowner should implement crop tree release treatments to redistribute growth to trees that ecologically and economically valuable to the landowner and wildlife.

Wildlife: These units provide excellent early successional wildlife habitat for both game and non-game species. Rhododendron found growing in acidic coves 1B provides good thermal cover for wildlife and the protection of water quality by shading Turkey and Little Turkey Creek mediating stream water temperature. Hard and soft mast producing trees are abundant in this management unit. Turkey sign was noted in this unit.

Timber volume, average stand diameter by species, and basal area can be found for this management unit can be found in Table 1.

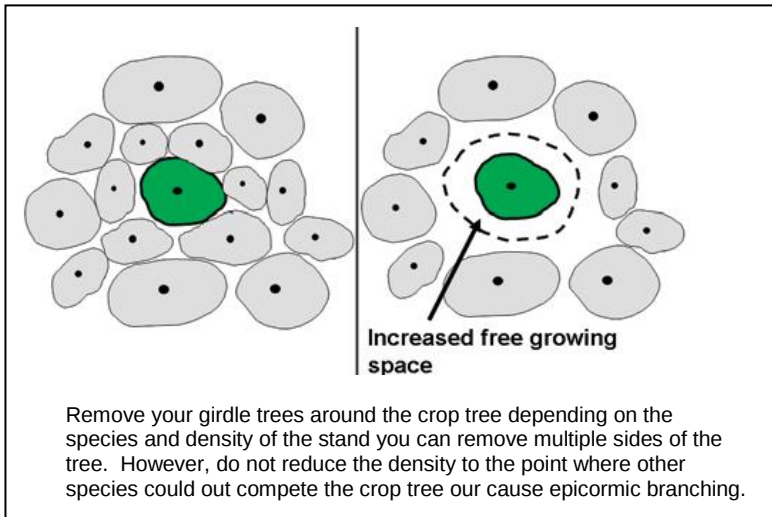
FORI, and Natural and Cultural Heritage: A small rock wall was noted in PIN### along an old road grade found in subunit 1A. This is likely not of any cultural value, and rather indicative of the old farm's and settlements that once occupied the lands 50 to 100 years ago.

No T&E species were observed while in this unit. See page 12 for NC Natural Heritage Data regarding this and other units. Forest management activities pursued do not impact FORI lands and mimic management activities applied on the FORI land base.

Trout Creek Prism Cruise Volume Summary 12/28/2018

Product	Per Acre			1089 - Acres		Ave Tree		Cruise		
	Volume	Trees	BA	Volume	Trees	Volume	DBH	Pits	Size	%Cr
Sawtimber	BDFT									
Yellow Poplar	806.72	19.3	15.5	878518	21018	41.80	12.1	73	0.08	0.5
Red Oak	356.78	5.0	5.3	388533	5445	71.36	13.9	73	0.11	0.7
Red Maple	43.63	1.3	0.9	47513	1416	33.56	11.3	73	0.07	0.5
American	48.18	0.5	0.6	52468	545	96.36	14.8	73	0.12	0.8
Black Birch	56.50	1.7	1.3	61529	1851	33.24	11.8	73	0.08	0.5
Chestnut Oak	221.72	3.8	3.6	241453	4138	58.35	13.2	73	0.09	0.6
Eastern White	122.34	1.6	1.5	133228	1742	76.46	13.1	73	0.09	0.6
Hickory	105.27	1.5	1.6	114639	1634	70.18	14.0	73	0.11	0.7
White	13.18	0.7	0.4	14353	762	18.83	10.2	73	0.06	0.4
White Oak	106.27	2.9	2.3	115728	3158	36.64	12.1	73	0.08	0.5
Scarlet Oak	92.36	1.5	1.3	100580	1634	61.57	12.6	73	0.09	0.6
Virginia Pine	28.06	0.2	0.2	30557	218	140.30	13.5	73	0.10	0.7
Yellow Birch	0.00	0.0	0.0	0	0			73	0.10	0.7
Sweet Birch	0.00	0.0	0.0	0	0			73	0.10	0.7
Black Oak	10.46	0.3	0.3	11391	327	34.87	13.5	73	0.10	0.7
Black Locust	16.66	0.4	0.2	18143	436	41.65	9.6	73	0.05	0.3
Sawtimber	2028.13	40.7	35.0	2208634	44322	49.83	12.6	73	0.09	0.6
Pulpwood	CUFT									
All Pulpwood	495.83	138.9	40.2	539959	151262	3.57	7.3	73	0.03	0.2
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STAND		179.6	75.2		195584		8.8	73	0.04	0.3

Management Assessment and Decisions:



Given the age and composition of this management unit, it would be my recommendation that the landowner implement intermediate treatments to improve the overall quality of the forest. A crop tree release is designed to remove undesirable species (trees that show poor form) allowing growth to be redistributed to the existing canopy trees. In essence crop tree release

mimics natural competition that occurs within a stand, and allows the landowner to select species, rather than Mother Nature. For this management unit this treatment should be applied to generate additional growing space for the property's black cherries. Also, this treatment could be applied in areas where sugar maple and white and green ash show good growth and form.

The following caption is from (for additional information about crop tree release see or <http://www.utextension.utk.edu/publications/pbfiles/PB1774.pdf>). *By favoring the development of selected crop trees within a hardwood stand, the landowner can meet a variety of area-wide management objectives such as wildlife habitat, recreation, timber value, aesthetic beauty and species diversity. CTR can be applied at various stages of development, including sapling, pole and sawtimber stands, depending on the specific opportunities to improve stand conditions. CTR is an intermediate silvicultural treatment intended to provide increased growing space to selected trees through the removal of crown competition from adjacent trees (Figure 1). Although CTR is relatively simple to apply, two key concepts are important to consider for optimal use of the technique. These concepts are understanding how crop trees help meet management objectives and how reducing competition for site resources around crop trees enhances their vigor and development. Species is the main factor that defines a crop tree's capacity to meet management objectives. Crop trees have relatively high value in local markets. They also provide suitable seed production for future regeneration and wildlife food. Other factors include vigor, origin, canopy position, etc. Trees growing in forest communities compete for sunlight, water and soil nutrients. As resources become limiting due to competition from adjacent trees, the vigor and growth of the tree can be diminished. Crop tree release allows for the relocation of nutrients and other resources that would be redistributed due to the effect of mortality related to competition. Once released, crop trees respond with faster growth in first root and crown expansion, then faster dbh and volume growth. Once released, crop trees respond with faster growth in first root and crown expansion, then faster dbh and volume growth. CTR is applied by increasing the growing space around the crowns of desirable trees (Lamson et al.1990). The treatment*

entails eliminating trees that are limiting the horizontal crown expansion of the crop tree, thus increasing its free growing space. A “crown-touching” release is applied to deaden or fell adjacent competing trees whose crowns touch that of the crop tree (Figure 7). CTR can be used to provide various degrees of release based on the proportion of the crown that is left free to grow (Figure 8). It is not necessary to remove or deaden adjacent trees whose crowns are beneath the crop tree, because they are not significantly interfering with the crown of the crop tree. Finally when selecting the trees the landowner should only select about 60 to 70 croptrees per acre.

Wildlife management

Additional wildlife habitat can be created by constructing brush piles. These piles can be built from leftover tops, limbs, and branches of felled trees, generated from harvesting and crop tree release operations. The following documentation describes the benefits of developing wildlife cover and concealment for both game and non-game animals, and is from *Working with Wildlife*, bulletin number 18, published by North Carolina Cooperative Extension.

Providing Protective Cover

Animals depend on dense cover throughout the year for concealment, protection from predators and severe weather, and for resting and loafing. Construct brush piles on your land to provide cover for ground-nesting birds, rabbits, and other small mammals. Here's how:

- *Stack layers of 6" diameter logs at right angles to each other to make a base for the pile. Space logs within each layer 6-10 inches apart.*
- *Place tree tops, old Christmas trees, limbs, stones, or stumps on top of the base to complete the pile.*
- *Ideal piles are 4 to 8 feet tall and from 10 to 20 feet in diameter. Well-constructed brush piles can supplement natural cover for 10-15 years.*
- *Construct up to four piles per acre. On woods edges, one brushpile every 200 to 300 feet will provide adequate cover and travel lanes between food sources.*
- *Place piles along forest edges and in openings, field corners, or along streams and marshes.*
- *Situate brush piles in close proximity to food sources and other natural cover. Isolated piles will receive little use and may be detrimental to some wildlife species.*

In addition to constructing brush piles, take the following steps to improve and create wildlife habitat:

- *Thin unwanted trees and/or control burn to "restart" woody vegetation in fence lines and hedgerows. Periodic renewal maintains optimal wildlife cover.*
- *Construct and properly place artificial nest structures for birds, bats, and small mammals (see No. 16 - Building Songbird Boxes, No. 17 - Woodland Wildlife Nest Boxes, No. 21 - Bats, and No. 22 - Owls).*
- *Manage for new snags by mechanically girdling or injecting selected trees with herbicide (see No. 15 - Managing Edges for Wildlife).*
- *Create temporary pools for breeding frogs and salamanders, songbirds, and other wildlife by digging out springs and potholes or by placing logs in low areas to pond flowing water. (see No. 19 - Pools for Amphibians).*

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- *Open dense forest canopies with annual firewood cuttings or "daylight" logging and access roads.*

Living Brush Piles

- *Choose wide-crowned trees that are 6 to 8 feet tall; red cedar and holly provide excellent cover.*
- *In the spring of the year, make a cut in the tree with a hand or chainsaw 3-4 feet above the ground opposite the intended location of the pile.*
- *Cut deep enough so that you can push the top over, leaving a connecting strip of bark and wood (hinge) to nourish the tree. Use a stake or stone to tie the top of the tree to the ground.*
- *Rework old piles every 5 or 6 years.*
- *Select trees with grape or honeysuckle vines nearby that will grow and cover the pile.*

**Management Unit 2A – Montane Oak-Hickory Forest – Including Pine Subtype Typic,
Management Unit 2B – Montane Oak Hickory – Rich Subtype and Northern Forest
Type.**



Shown above is a more productive portion of MU2A. Pole to some sawtimber sized white and red oak is maturing in this unit but not ready to harvest. The property should be reevaluated following the implementation of this plan for thinning in 2028.

Size: MU2A= 250 ac. MU2B= 214Ac.

Age: Management unit 2a and 2B is comprised of even-aged stands that where regenerated following a clearcut and are approximately 45 to 65 years in age. Older remnant trees were likely too young to harvest and therefore left, representing the oldest age class of trees on the property.

Site Index*:

MU2A = 70 for chestnut oak, MU2B = 75 to 80 for Northern red oak

**Estimated from field observations.*

Diameter Growth Rate: Varies based on site and past disturbances. MU2A is predominate south to southwest facing, soils are drier, and there is less available moisture to support plant growth. Growth is less than 2%. In 2B soil moisture is more readily available for tree growth as can be reflected in both height and diameter growth. Rates in this unit are currently rate is less than 3%.

Aspect: MU2A is south to southwest facing.

MU2B is north to northwest facing.

Vegetation: Both subunits are even-aged with some older canopy trees making portions two-aged. This age structure can be attributed to timber harvesting which occurred across both subunits approximately 45 to 50 years ago. This harvest regenerated large portions of the forest establishing new age classes of red and white oak species with minor species including hickory, red maple, yellow-polar and American beech. In the driest locals in MU2A and near the property's rock outcroppings, pitch and Virginia pine can be found growing. Exposed rock and boulders are not uncommon to be found in these areas and the understory is relatively open and established with woody and herbaceous plants. In MU2B the north facing aspect allows for cooler growing conditions and more soil moisture available for tree growth. This can be reflected in better tree form, taller heights, and larger diameter growth when compared to 2A. Species composition is comprised of northern red oak, chestnut oak, black birch, basswood, American beech and yellow-poplar.

Forest Management Plan

Basal area ranges from approximately 90 to 140 sqft/acre and stands range from fully to overstocked and both units are in the understory reinitiation stage of stand development. Both subunits exhibit the establishment of advance oak regeneration and the development of a diverse understory of herbaceous and wood plants. Given the past timber harvest in the last 50 years, trees are still immature but showing excellent growth and form for the future production of timber. Harvesting timber at this time from this unit would be economically premature and therefore future management should focus on the tending of the forest by using the crop tree management as described in management unit 1A and 1B and should also include the use of prescribe fire particularly in and around MU2A to help control undesirable species like red maple, American beech, and eastern white pine.

Wildlife: This unit provides fantastic habitat for wildlife. The mountain provides excellent habitat through the abundance of hard mast producing trees and cover. Game trails and sign were noted for: wild boar, coyote, turkey, deer, and bear. Food plots could be implemented in the lower elevation areas and along the edges of the grassy fields. Fire would help with the establishment of herbaceous plants and grasses for browse for both game and non-game species.

Trout Creek			Prism Cruise Volume Summary							12/28/2018	
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Pulpwood	CUFT										
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STAND		179.6	75.2		195584		8.8	73	0.04	0.3	

Management Assessment and Decision

Given the current forest conditions the landowner should conduct a series of intermediate and regeneration treatments (timber harvest, crop tree release, thinning) designed to foster the establishment of ecologically diverse stands, varying in composition and age.

Prescribed fire

The historical use and frequency of fire is well known in the southern Appalachians. Over the last century, fire suppression techniques, and the continued decline in use by humans, has altered forest conditions from their pre-settlement state. Fire could be implemented in MU 2A, MU3, and immediately surrounding areas where site conditions are favorable for the establishment of oak seedlings and ecological conditions more typical to the southern Appalachians prior to “settlement”. Also, varying successional, structural, and habitat conditions would be developed that would meet the landowner’s timber and wildlife objectives through the use of fire. The intensity and frequency of fire will have diverse and lasting effects on this and other management units, therefore its implementation of must be carefully planned.

When planning each burn the following areas and rationale should be addressed:

- **Fuel reduction:** A series of low intensity fall and/or spring burns could be used to reduce fuel loading that has occurred do to the lack of fire and past land use of the property. Fuel reduction burns could be implemented on a 2 year to 3 years’ basis until fuels are at desired level. These burns would also meet other management objectives particularly in portions of MU3 where fire was once more prevalent given site and slope characteristics.
- **Hardwood and Ericaceous vegetation control:** Given the lack of fire in portions of 1B, 2A, 3, the amount of ericaceous vegetation will continue to grow and expand across the forest. Also, with the absence of fire, non-adapted species like red maple have become prolific.

By implementing moderate to hot fires, and possibly in conjunction with the chemical control of competing vegetation, additional light and growing space for grasses, woody and herbaceous plants could be established.

- **Establishment of oak and pine regeneration:** These fires will allowed for the scarification of the forest floor, clearing organic matter allowing for acorns and pine seed to germinate on bare mineral soil.

Cost share monies for fuel reduction burns and burning to establish wildlife habitat can be received from both the NCFS and NRCS. I would encourage the landowner to discuss these options with Pat Farrell a District Wildlife Biologist who works for the wildlife resources commission (patrick.farrell@nc.usda.gov or at 586-8116). Pat is an excellent resource in planning and implementing prescribed fire in the southern Appalachians.

I would not recommend the landowner conducting the burn on their own and should a private contractor be used, they should have all required insurance, be an NC certified

burner, and have the equipment to insure the fires containment. Given the rough, steep terrain of the mountains, and the proximity of neighboring homes, I would only recommend that the NCFS perform all aspects of a prescribed burn.

In areas that exhibit both good form and growth of red oak and white oak species the landowner should consider implementing the same crop tree management techniques as described for 1A and 2A. It is important to pick areas that look the most productive as this timber type and growing conditions are slower growing and take longer to reach economic maturity.

Habitat management

Food plots for wildlife can be implemented and planted in areas along the edges of the fields or in other areas nearby the road grades near or adjoining subunit 2A. By planting food plots, the population of wildlife on the property will increase. Supplemental plantings including red and white clover, millet, milkweed, sorghum, and corn would also be excellent picks depending on the season.

Fantastic wildlife habitat is found throughout these units as a result of the abundance of rhododendron and mountain lower in the lower elevations. Additional wildlife habitat can be created in both units by constructing brush piles. These piles can be built from leftover tops, limbs, and branches of felled trees, generated from harvesting and crop tree release operations. The following documentation describes the benefits of developing wildlife cover and concealment for both game and non-game animals, and is from *Working with Wildlife*, bulletin number 18, published by North Carolina Cooperative Extension.

Management Unit 3 – Rock Outcroppings, Windswept, Oak-Pine Heath



Shown above is a portion of management unit 3 which has large areas of exposed rock. Trees like pitch pine which was found growing in this unit are fire adapted species which are typical in dry rocky areas that support tree growth.

Size: 95 ac.

Age: Given harsh growing conditions, frequent natural disturbances, and lack of soil medium. Tree ages vary in age with young species to species greater than 100 years in age.

Site Index: None taken given site.

Diameter

Growth Rate: Extremely slow less than 1.5%

Aspect: South to southwest

Vegetation: Management unit 3 is comprised primarily of upland white oak species (particularly chestnut oak and white oak), red maple, and pure stands of pitch pine. Vertical areas of exposed rock are present, and lack of soil medium for plant growth was noted, during data location. Large exposed rock and sheer vertical rock faces are present and are covered with lichen, fungi, mosses, and ferns. Many trees species particularly pitch pine are fire adapted and future management practices should focus on the use of fire to perpetuate these forest conditions, as timber production from this area is not viable at this time.

Wildlife: This area provides excellent roost habitat for predatory birds. Rock outcroppings provide cover and shelter for large game species including coyote and bear.

Management Assessment and Decisions

This unit's ecology and function provides excellent wildlife habitat for game and non-game species. Furthermore, the economic value for timber production is also minimal and given growing conditions, further enhancing its value and necessity to be managed for wildlife. Moderate to intense fires could be used in MU3 to establish new young vigorously growing trees including the regeneration of pitch pine, which has a semi-serotinous cone that requires fire to release the seeds from the cone and prepare the seed bed for future seedlings. As previously mentioned, it would be my recommendation that these burns be conducted by the NCFS as part of in stand burning or fuel wood reduction burns.

Management Unit 4 – Even aged Pure Poplar Cove --- Old Christmas Tree Plantation



This unit is comprised of pure poplar coves that are 28 to 35 years. These trees regenerated following the cultivation and harvesting of Christmas trees grown in plantations along upper coves and side slopes across the property.

Size: 8 ac.

Age: 25 to 30 years

Site Index: Estimated between 95 to 100 for yellow-poplar

Diameter

Growth Rate: Greater than 3.5% growth

Aspect: South to southwest

Vegetation: This unit is comprised of pure stands of yellow-poplar that regenerated following the production of Christmas trees in upper cove and side slope portions of the property. Fraser Fir can still be found growing in suppressed canopy positions across this unit among other “minor” hardwood species including red maple, black birch, ash, and northern red oak. Currently, trees are in the stand initiation stage of stand development are approaching crown closure. Presently, there are currently approximately 500 to 1200 trees per acre with early signs that the stand

will be transitioning to stem exclusion when the trees begin to self-thin. It is at this time (likely to occur in the next 5 to 10 years) when crop tree management could be used to help nature thin and better select trees species that are of suitable composition and quality.

Wildlife: Dense thickets and trees provide excellent escape and brood cover for wild turkey and roughed grouse. Sign of grouse and turkey were evident. Wild boar sign was found in the upper northwest corner of this unit.

Forest Management Plan

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STAND		179.6	75.2		195584		8.8	73	0.04	0.3

Management Assessment and Decisions

This unit will provide for an excellent future crop of yellow-poplars that could be thinned in the next 20 years. In the interim this unit's forest should be allowed to grow, with the landowner insure growth through the eradication of grape vines that could stifle species form and growth, as well as invasive plants. Should crown closure occur prior to 2029. It would be my recommendation that the landowner implement the same crop tree management techniques as recommend in Management Unit 2A, so to foster the comps=This unit's ecology and function provides excellent wildlife habitat for game and non-game species. Furthermore, the economic value for timber production is also minimal and given growing conditions, further enhancing its value and necessity to be managed for wildlife. Moderate to intense fires could be used in MU3 to establish new young vigorously growing trees including the regeneration of pitch pine, which has a semi-serotinous cone that requires fire to release the seeds from the cone and prepare the seed bed for future seedlings. As previously mentioned, it would be my recommendation that these burns be conducted by the NCFS as part of in stand burning or fuel wood reduction burns.

Forest Management Plan

Time Line of Activities					
	Year	MU	Activity	Cost Share	Date Completed
Crop tree release	Coordinated with other regeneration treatments occurring on the property	MU1A, 1B, 2A, 2B, 4	Select economically and ecologically desirable hardwoods and open growing space around them. Girdle competing trees and when needed understory vegetation.	NCFS available programs including FDP. NRCS available programs including WHIP and EQUIP	
Food plots	Annually over next 10 years	Fields near 2A and road	Use native wildlife plantings in these areas to provide supplemental food plantings for both game and non-game species.		
Road maintenance and Soil Stabilization	Ongoing over the next 10 years.	All units	Stabilize road grade embankments, field edges, haul roads, and ATV trails to reduce and prevent soil loss and erosion. Provide and continue functionality to the property's existing road system.		
Prescribed Fire	Rotational burning every 2 to 4 years. Implemented in partnership with NCFS for 2019 to 2029. Landowner should contact NCFS to inquire about wait time for burning practices.	MU1B, 2A, 3	Use prescribed fire to promote the establishment of herbaceous plants, grasses, and trees. Promote oak regeneration. Red maple weed control. Fire will also be used to reduce white pine and rhododendron competition.	NCFS available programs including FDP, Firewise. NRCS available programs including WHIP and EQUIP	
Invasive plant control	Apply over the next 10 years.	All units	Periodically monitor for invasive species and chemically control invasive plants, particularly kudzu, multiflora rose, and honeysuckle using foliar and basal spraying applications.	NCFS available programs including FDP. NRCS available programs including WHIP and EQUIP	

FOREST MANAGEMENT PLAN TERMINOLOGY

All Management units were sampled using a forest inventory to describe timber species, stocking, and growth characteristics. The descriptive terms used for these units are defined below:

Basal area per acre (BA) – a tree stem density measurement. It is defined as the cross-sectional area (in ft²) of all stems at 4.5 feet above the ground. Good stocking ranges from 90 – 150 ft² /acre depending on the timber species and the management objectives involved. I usually state the total BA for the unit and then break it down into percent BA by tree species – this helps to generate a picture of the diversity found on the unit.

Average diameter – most stem sizes range quite a bit in a stand of timber, so I give an estimate of the average diameter. Diameter is measured at 4.5 feet above the ground – also called 39dbh (diameter at breast height).

Average height – the average total tree height of the canopy trees is given.

Site index – is an estimate of the timber growth and productivity of the site. This varies by soil, tree species, and microclimate. It is estimated from the total age of a tree versus its total height. A 50-year-old oak that has grown 100 feet tall is on a much more productive site than a 50 year-old oak that has grown 65 feet tall. Site index values range from 50 (very poor) to around 120 (very good).

Percent interest rate being grown by trees – this is a rough estimate of the diameter growth rate per year as a comparison against other rates of interest. A rule of thumb is when the interest rate grown by trees drops below about 5%, the stand is not growing as well as it could and may require that some silvicultural activities take place in order to improve stand productivity.

Age of the stand –some stands of timber are “even-aged” meaning the trees are more or less the same age, while other stands are “uneven-aged” with a mix of age classes. I try to characterize the management unit as such with an approximate average age class or range in the case of uneven-aged stands.

For these and other forestry terms, please refer to the document “Understanding Forestry Terms – A Glossary for Private Landowners” which can be found at the following link <http://www.ces.ncsu.edu/nreos/forest/woodland/won-26.html> .

COST SHARE AND TAX INFORMATION

The list below describes current cost share programs that are available to you through the North Carolina Forest Service and other state and federal agencies. For additional information on the programs below contact the Jackson County, Ranger tel. 828-631-9316, Jackson County Soil and Water tel. 828-586-5465.

The North Carolina Forest Development Program (FDP) is a reforestation cost-sharing program administered by the North Carolina Division of Forest Resources. Under FDP, a landowner is partially reimbursed for the costs of site preparation, seedling purchases, tree planting, and release of desirable seedlings from competing vegetation, or any other work needed to establish a new forest. To qualify for this assistance, the landowner must have a forest management plan approved by the Division. FDP currently reimburses up to 40 percent of the actual cost per acre or 40 percent of the prevailing rate for management practices in that region, whichever is less. Prevailing rates vary with site preparation needed and species planted, but range from \$65 to over \$300 per acre. FDP cost share rates increase to 60 percent for the planting of longleaf pine, hardwood or wetland species.

A recent revision to the Forest Development Program legislation and rules allows for forest stand improvement work in existing stands to include cost share for prescribed burning, crop tree crown release, cull tree removal and fertilization. Any private individual, group, association or corporation may qualify on as little as one acre up to a maximum of 100 acres per year. Landowners may sign up by contacting your local [County Forest Ranger](#).

The Forest Land Enhancement Program (FLEP) replaces the Stewardship Initiatives Program (SIP) and the Forestry Incentives Program (FIP). This federally funded program is a voluntary program for non-industrial private forest (NIPF) landowner. It provides for technical, educational, and cost-share assistance to promote sustainability of non-industrial private forest lands. In North Carolina, FLEP reimburses from 40% to 60% of the cost of specific forestry practices and wildlife habitation improvements practices. It is unique from most other forestry cost share programs in that it emphasizes practices that will improve the condition of an existing forest stand. Such practices can include pre-commercial thinning, prescribed understory burning, and release of seedlings from vegetative competition. Any individual who owns at least 5 acres of forest land and is not principally engaged in the process of wood products, or engaged in fee hunting operations, is eligible to participate. Cost sharing is based on approval by the North Carolina Division of Forest Resources of a forest management plan that explains the need for the proposed practices. A maximum of \$10,000 annually may be received by any landowner. For more information, contact your local County Forest Ranger.

The Southern Pine Beetle Prevention Program (SPBPP), funded through a grant from the U.S. Forest Service, will reimburse [non-industrial private] forest landowners in North Carolina for some of the cost of pre-commercial thinning of pine stands. During a pre-commercial thinning, trees with no commercial value are removed in order to allow remaining trees to grow with less competition for food and sunlight. Such thinning improves the health of the remaining trees and reduces the stand's susceptibility to the southern pine beetle.

Environmental Quality Incentives Program (EQIP) is a voluntary conservation program that promotes agricultural production and environmental quality by allowing

farmers to receive financial and technical assistance in installing or implementing structural practices or conservation practices on eligible agricultural land. EQIP activities must be carried out according to a developed comprehensive nutrient management plan approved by a Natural Resource Conservation Service (NRCS) agent in your conservation district. The NRCS evaluates applications and high priorities are given to applicants that utilize cost-effective practices that address national conservation priorities, and that optimize environmental benefits. EQIP may pay up to 75% of the costs of certain practices, such as manure management, irrigation water management, integrated pest management, nutrient management, and wildlife habitat management. A maximum of \$450,000 per individual over the period of the 2002 Farm Bill may be received by any landowner who qualifies. Interested landowners may contact their county [NRCS office](#) for further information.

The Conservation Reserve Program (CRP) established by the 1985 Farm Bill is expected to retire up to 45 million acres of highly erodible, marginal cropland nationwide over a five- year period. Landowners may use the retired cropland to grow trees, permanent wildlife habitat, permanent introduced grasses and legumes, permanent native grasses and legumes or combinations of permanent covers. The Farm Service Agency (FSA) will reimburse up to 50 percent of the cost of establishing permanent covers and will pay an annual rental fee over a 10- 15 year period to participating landowners. Retired acreage may not be grazed, harvested or used in any commercial manner other than for hunting leases during the 10- year period. Landowners may sign up for the program during open enrollment periods at the county FSA office. Refer to Cooperative Extension Service publication AG- 370, Plant Trees and Wildlife Cover Under the Conservation Reserve Program, for more information.

The Conservation Reserve Enhancement Program (CREP) is a state-federal conservation partnership program targeted to address water quality, soil erosion, and wildlife habitat concerns in North Carolina. Currently, the program involves counties in the Chowan, Neuse, and Tar-Pamlico river basins, as well as the Jordan Lake watershed area. It is possible that the area will expand to include the Cape Fear, Roanoke, White Oak, Pasquotank and Lumber River basins as well. The CREP program offers annual rental payments, cost share payments, and other incentive payments to landowners on 10, 15 or 30 year contracts. Permanent conservation easements are also possible. To qualify, the land must be either 1) cropland that was row cropped 2 of the past 7 years, or 2) is marginal pasture land adjacent to a perennial or seasonal stream that was grazed for 2 of the past 7 years. All areas must be suitable for use as a riparian buffer planted to trees. Eligible practices include riparian buffers planted to trees, filter strips, wetland restoration, and / or hardwood tree planting. Interested landowners should contact their county NRCS office for further information.

The North Carolina Agriculture Cost- Sharing Program is intended to reduce runoff of sediment, nutrients, animal wastes, and pesticides into the state's surface waters. The program offers cost sharing for conversion of fields and pastures into permanent cover including trees, wildlife cover or both. Participating landowners are reimbursed up to 75 percent of the average cost of the control practices used. The local

Soil and Water Conservation District Office administers the program. Check with that office or the NRCS, North Carolina Forest Service, or county Cooperative Extension Service Center for information on the availability of funds in your county.

Tax Treatment –

The reforestation tax credit no longer exists. The following discussion regards amortization. Landowners amortizing under the old law should continue to do so. The American Jobs Creation Act of 2004 repealed the reforestation tax credit. However, you can now deduct outright the first \$10,000 of qualified reforestation expenses during this part of the 2004 tax year. In addition, you can amortize (deduct), over 8 tax years, all reforestation expenses in excess of \$10,000 incurred during this portion of the 2004 tax year (again, due to the half-year convention, you can only claim one-half of the amortizable portion the first tax year.)

Excluding Cost- Sharing Payments from Income

Federal and North Carolina tax laws allow a landowner to partially or totally exclude cost- sharing payments received under the FDP, FRP, and FLEP programs from taxable income. Most people will gain maximum tax advantage, however, by including the payments as income and including the payments with unreimbursed expenses that qualify for the investment credit and amortization deductions discussed in the previous section.

Annual Deductions

Part or all of the management expenses incurred each year may be deductible even if no timber income is received in that tax year. The Tax Reform Act of 1986 instituted passive loss rules that dictate how a forest landowner may deduct expenses. Three classes of ownership, based on extent of participation in management of the property, are defined:

1. Material participants in a trade or business. In this class, all management expenses and business interests are fully deductible from income from any source.
2. Materially participating investor. Property taxes are fully deductible, interest on indebtedness related to the timber is deductible only up to the amount of investment income from all sources, and all other management expenses are deductible as miscellaneous itemized deductions.
3. Passive participants in a trade, business or investment. Management expenses can be deducted only up to the amount of passive income from all sources.

Material participation requires active, regular, continuous, and substantial involvement. Accurate records and consultation with a tax expert is recommended because final IRS rules defining material participation have not yet been issued. In addition, most management expenses not claimed annually may be capitalized and recovered in future years when the timber is sold.

Calculating your Tax Basis

I highly encourage all private landowners to calculate the basis of their timber land, whether it is right after their acquisition or decades later knowing the basis of your timber will allow you to utilize your capital gains and losses, but it must be done prior to selling your timber. For more information about calculating the basis of your timber land please visit the following link: <https://content.ces.ncsu.edu/understanding-your-timber-basis>

Long- Term Capital Gains

Income from the sale of timber owned for more than 12 months may qualify as long-term capital gain for federal tax purposes, depending upon what purpose the timber was held and how the timber was disposed of.. (See chapter six, page 51 of the [Forest Landowners Guide to the Federal Income Tax](#) for a discussion of capital gains qualification (timber). An individual may wish to report timber income as long-term capital gain for several reasons:

1. Capital gains may be used to offset capital losses. Only \$3,000 of ordinary income may be offset by capital losses each year. A landowner with large capital losses may use capital gains to offset those losses in that tax year.
2. Landowners who are self-employed must pay self-employment taxes. Capital gains are exempt from self-employment taxes.
3. Capital gains from involuntary cutting, if put back into timber management within a certain time, are not recognized as taxable income and taxes are deferred.
4. The current maximum capital gains tax rate is 20% for those at our above the 39.6% bracket and 15% for those in the 25 to 35% bracket.

North Carolina income tax law does not recognize long-term capital gain income and therefore all income is ordinary.

Forestry Present- Use Valuation. For more information and for an application please visit the following links:

Qualifying North Carolina forest landowners can receive, upon approval of their application, property tax relief for managed timberland. The land must be:

- individually owned, including certain types of corporations;
- soundly managed; with the primary business being commercial timber production
- 20 acres or more in size or be any size if part of a farm that qualifies for special agricultural or horticultural present- use valuation;