

## Forest Component

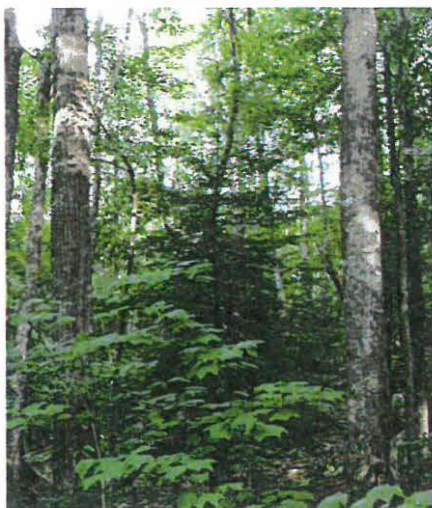
This Forest Component draws from two forest stewardship plans: *Foresters Inc., 2000* & *Rickert, 2010* and input from the two professional foresters who wrote the plans. These plans provide a wealth of information about the Mountain Lake Conservancy and Lodge property's (the property) forests and general ecological conditions. The References section includes full citations for both plans.

The property is naturally forested with a mix of upland hardwoods and pine. There is little evidence of harvesting in the past 70 years, and the average age of the mature trees present is greater than 90 years old. Species composition varies according to site conditions, but the majority of the forest is an upland hardwood species mix of oaks and maples—Northern Red oak (*Quercus rubra*), Chestnut oak (*Q. prinus*), White oak (*Q. alba*), Black oak (*Q. velutina*), Scarlet oak (*Q. coccinea*), Red maple (*Acer rubrum*), Sugar maple (*A. saccharum*), and Striped maple (*A. pensylvanicum*).

**Mixed Hardwoods**



**Red Oak**



**Sugar Maple**

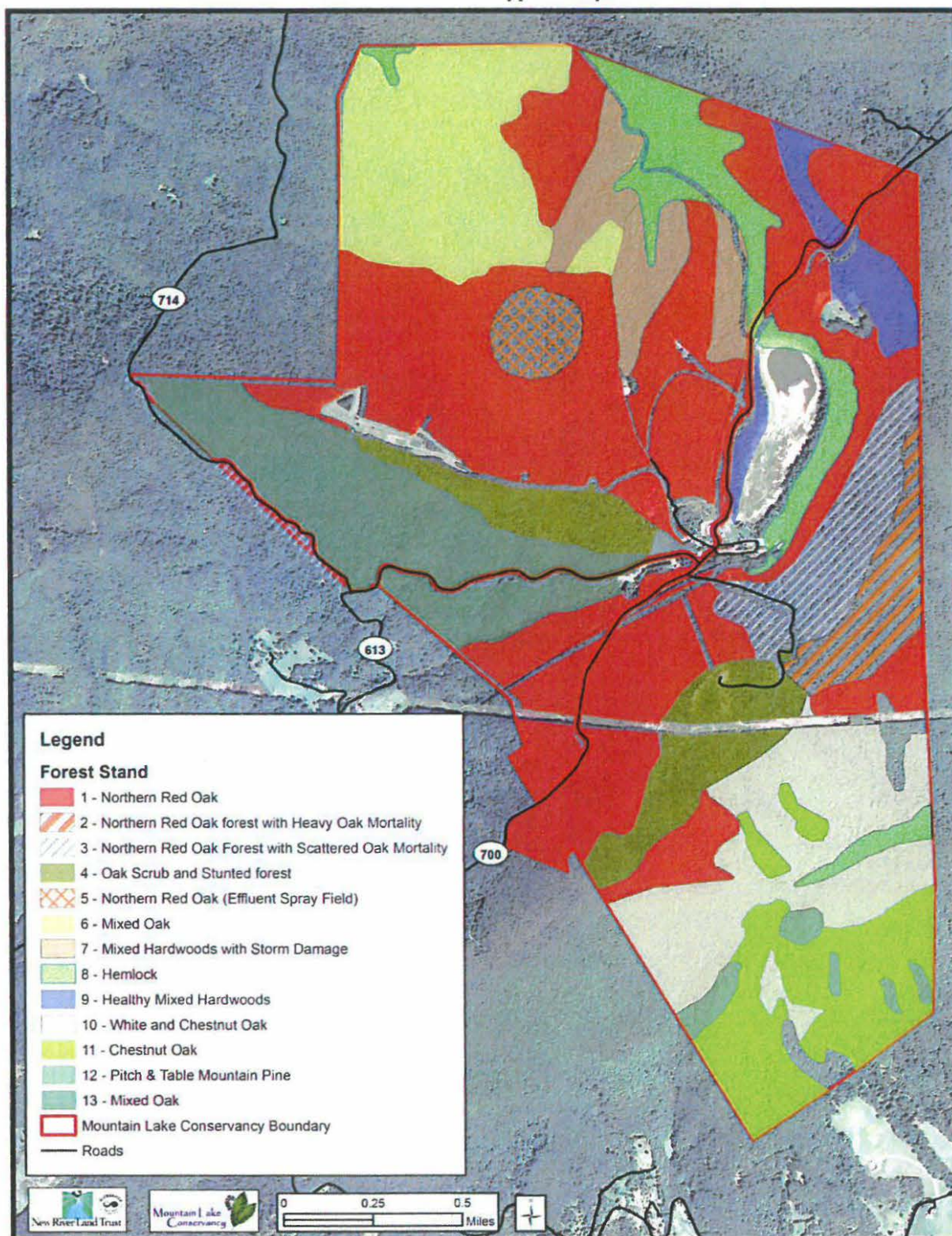


(All Foresters Inc., 2000)



The Forest Stand Types Map below delineates the thirteen different stand types found on the property. Detailed descriptions of each stand type shown on the map can be found in the Foresters Inc., 2000 Forest Stewardship Plan and in the Maps and Tables Appendix.

**Forest Stand Types Map**



(NRLT, 2014)



## **Highest Priority**

The property's forest conservation resources are as critical, if not more so, than the defining feature of Mountain Lake itself. The diversity of stand types, the different habitats they each provide, and the unique experiences they offer visitors make it difficult to prioritize one stand type over another. Thus, for the purposes of this component, no individual highest priority resource element is selected. ***Instead, it is the conclusion of this plan that the property's forests as a whole are the conservation resource of highest priority.*** This conclusion is based on review of the two stewardship plans, input from the two professional foresters who wrote the plans and have extensive experience with the property, input from the majority of the stakeholders engaged in reviewing the draft plan, and the vital connection between the property's forests and all but one of the other conservation resources covered in this plan. Each of these stand types support all other conservation resources documented in this plan with the exception of historic resources.

For Example:

- Many of the documented bird species are heavily dependent on forest habitats.
- Many of the natural heritage species are heavily dependent on forest habitats.
- Trails and other recreational activities would cease to provide a "backcountry" environment were the stands to be altered or lost.
- Water quality could be greatly impacted by changes to the forest, including the potential loss of cold water streams.
- Research areas shown in the Scientific Research Areas Map are largely based on the forest environment.

The property's forests provide the walking visitor a constantly changing picture of forest types and wildlife habitats. A variety of forest types have developed on the mountains surrounding the Lake due to the range of elevations (2800'-4361'), local geology and soils, and the various exposures to sun, wind, and weather that the unique mountain topography provides.

## **Management Recommendations**

As a whole, the property has healthy forests; however, some areas of the property are overstocked with trees and would benefit from active management to promote forest health. There is also a diversity of understory vegetation. Although in many areas there is an abundance of shrubs, herbs, and grasses present, ***there are indicators of prolonged heavy deer herbivory which would indicate a need for more intensive deer management.*** Individual stand type management recommendations can be found along with the full stand type descriptions in both forest stewardship plans. These management recommendations cover a wide range of considerations including forest health, timber production, recreation, aesthetics, wildlife, and other ecological factors. Regarding the potential for harvesting timber, the following stewardship plan statements summarize the situation.

"The forests have not been managed or manipulated for more than 70 years. The last harvest on the property was the salvage of dead American chestnuts in 1940 for use at the hotel. The variety of forest stand types on the property all are fully stocked with trees. As these stands continue to mature, more trees will decline and die as natural dynamics keep the number of trees in balance with what the site can support. Forest management can manipulate these natural processes—harvesting allows people to utilize some of the wood that otherwise would cycle back to the soil, and releasing crop trees allows the promotion of those trees most wanted on a site to meet long term objectives."  
(Foresters Inc., 2000)

***It is the strong recommendation of this plan that forest management focus on forest health so as to avoid negatively impacting other conservation resources found on the property. At the very least, any timber harvests should be limited and done in the most sensitive manner to minimize negative impacts to the surrounding ecosystem.*** The Maps and Tables Appendix includes a management map showing suggested management areas and potential harvest zones. This map is a combination of recommendations from the 2000 and 2010 forest stewardship plans.

The use of fire as a management tool is discussed in both forest stewardship plans. The plans indicate that it could be used as part of a larger management effort geared toward forest health especially on portions of the property such as the Bold Knob and the Johns Creek Drainage areas. It is beyond the scope of this plan and the expertise of the New River Land Trust to evaluate the use of fire to manage the property's forests stands; however, ***it is recommended that any consideration of fire be done in consultation with neighboring landowners including the United States Forest Service.***

### **Forest Threats**

This additional component section is included for two reasons. First, it is the conclusion of this plan that the property's forests are the conservation resource of highest priority. Second, the property's forests are under threat from a variety of insects and diseases. Some of these threats are outlined below. More detailed threat information can also be found in both forest stewardship plans.

Essentially every forest type at Mountain Lake is subject to attack by a specific group of insects or diseases that can potentially impact a few trees or the whole stand. Insects and disease are part of a natural system of constant breakdown and renewal in the forest. Typically, insect outbreaks occur when a stand of trees is under stress due to other factors such as soil compaction, pollution, age, or overcrowding. Native insects and diseases have natural controls that typically prevent them from overtaking unstressed trees or stands.

**The fall cankerworm-linden looper-oak looper complex of inch-worms** is an example of native insects that seem to be causing the death of large, old oaks at Mountain Lake. Actually these insects are just part of a group of organisms that are naturally thinning the stands of stressed trees. In most cases, the individual trees most affected already had fire or structural damage that allowed shoestring root rot or some other disease easy entrance to the stem. This "stress" is added to that already "felt" by an aging group of large trees that require a fairly large amount of water, soil, and solar resources from a limited amount of space. The weaker trees are less able to account for the stresses of the root rot and limited resources, especially during years of drought, and begin to decline in health. The impact of a high population of feeding inch-worms for a few years then pushes the trees past the recovery point at which they can sustain themselves, and they die.

**Exotic pests and diseases** from other parts of the world do not follow the natural "rules" in place for the forest system into which they are introduced. Without natural predators or controls, their populations grow unchecked as long as their host plants are available. Groups of "healthy" trees, even whole stands, can be so heavily damaged by feeding insects or spreading disease that they are unable to survive. The Chestnut Blight that eliminated all mature American chestnuts from the Appalachian Mountains is a well-known example of the damage an introduced disease can do. Gypsy moths and hemlock woolly adelgids are two of the latest insect species causing severe and lasting detrimental impacts on our forests.



**The gypsy moth** is now an additional factor to consider when planning forest management. There are two aspects to evaluate during planning. The first is *susceptibility*, or the likelihood or probability of a stand being defoliated. This is determined by a number of factors including tree species, site characteristics, and stand history. Obviously, site cannot be manipulated, but species composition can. The second factor to consider is stand *vulnerability*, or the likelihood of a stand suffering mortality after being defoliated. Mortality usually occurs from a combination of factors including: the extent to which the tree was defoliated; its crown condition; environmental influences such as drought or a late spring frost; and/or other factors which stress the tree. Maintaining a healthy, vigorously growing forest can help to make trees less vulnerable.

The gypsy moth is here to stay and any steps taken to reduce susceptibility and vulnerability will reduce mortality. Although the government's current policy is to spray pesticides when populations are high and to share or pay for the cost of the treatment, it is doubtful that this policy will continue indefinitely. Pesticides are costly, delay the infestation, and are also indiscriminate towards which moth and butterfly larvae they kill. Therefore, it is highly suggested that silviculture be used to aid a forest in its own defense against this forest pest.

**The hemlock woolly adelgid** is a tiny insect that is thought to have been introduced to North America from Asia in the early part of this century. The adelgid feeds on the needles of hemlock trees, eventually killing the tree within a few years. There is no native predator of this insect so its population has expanded unchecked. Defoliation and mortality from woolly adelgid extends from New England to North Carolina. For individual forest trees, infestation and impact can be prevented by using a pesticide. For instance, Merit 75 WP, which must be reapplied every two years, is a pesticide that is injected into the soil around a tree and taken up by the roots. Merit 75 WP travels through the stem and basically kills any insect that bites the tree. This control method could be used to maintain a few trees until alternative adelgid controls are developed.

*It should be noted that some of the stakeholders that contributed to this plan expressed concerns about the use of pesticides adjacent to the Lake and Pond Drain. They suggest the choice and use of pesticides ought to be done with great care so as to prevent any leeching into the water in the Lake and subsequently Pond Drain.*

Besides the above listed threats, other invasive threats including plant species should be a concern on both the Conservancy and Lodge portions of the property. It is beyond the scope of this plan to assess the current status of invasives on the property. ***It is the recommendation of the plan that the property management work with local, regional, and state experts such as VA Tech, Virginia Department of Forestry, and the Virginia Department of Conservation and Recreation Division of Natural Heritage for assessment and management recommendations to minimize the threat posed by invasive species.*** The document below is an example of the resources available.

Heffernan, K.E. 1998. *Managing Invasive Alien Plants in Natural Areas, Parks, and Small Woodlands*. Natural Heritage Technical Report 98-25. Virginia Department of Conservation and Recreation, Division of Natural Heritage. Richmond, Virginia.