

This photo was taken at James Madison's Montpelier, in Virginia. This home of our fourth president is also home to an historic Landmark Forest, rich with examples of how trees and wood products were used in Madison's time.

Humans have had a long history of impacting land in Virginia. Our forestlands have many examples of historical land uses such as agriculture and natural resource extraction. They contain evidence of historical events, such as the Civil War.

The history of a particular piece of land may be very interesting to prospective land buyers. In this presentation, we will discuss land use history in Virginia. I will then discuss features to look for on a property which may help you piece together the history of the property.

This presentation was created, in part, by Matt Yancey Extension Agent, Agriculture and Natural Resources Virginia Cooperative Extension

Land Use History in Virginia

When did land management start in Virginia?

- Prior to European settlement
- Frequent use of prescribed fire
- Trees harvested



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Generally, when we discuss land use history, we start with 1608, when European settlers arrived in Virginia. But the forests these people saw when they arrived were far from unmanaged.

So, when did land management start in Virginia?

It started with native Americans between 12,000 to 20,000 years ago.

Native Americans harvested trees to make canoes and build structures. If you visit Jamestown, there are examples of how canoes were crafted out of large trees.

They also used fire quite frequently.

Fire was used to keep understories clear for hunting and protection (clear to see approaching friends and foes), clear land for growing crops, ease travel, and reduce insect pests.

This historic use of fire had a large impact on the types of forests we find throughout the Southeast. I'll talk more about this in a bit.

Land Use History in Virginia

- 1600's
 - Europeans displaced Native Americans
 - Declining number of people reduced use of forests
 - Fewer forests were converted to cropland



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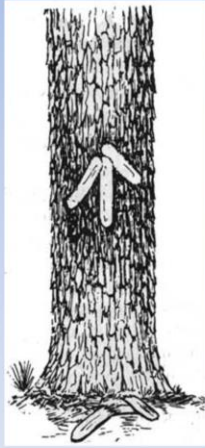
With European expansion and settlement, Native Americans were displaced; In fact, native American populations declined from about 50 million in 1492 to 8 million in 1650 as a result of the introduction of European diseases, massacres and forced labor.

There still weren't high numbers of Europeans here at that time, so the overall human population was significantly lowered, resulting in reduced use of forest resources.

So for a while, use of the forests declined significantly; and old agricultural fields abandoned by Native Americans reverted back to forestlands.

This reversion process is called succession. I will talk more about this process in just a few minutes. The main point here is that the amount of forestland was increasing during this time period.

Land Use History in Virginia



- 1700's
 - European populations grew
 - Use of forests increased
 - Broad Arrow Act
 - Land cleared for agriculture

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However, after the initial decline of populations following the arrival of the Europeans, the use of the forests rose once again as European populations grew.

The Broad Arrow Act – all white pine over 2' in diameter were marked with the symbol of the broad arrow

(shown in photo); these trees were designated for exclusive use by the king as ship's masts for the royal navy. Europeans cleared forests for tobacco, tomatoes, corn and housing.

While not strictly historically accurate, James Michener does a wonderful job describing these land use changes on the Eastern Shore in his novel "Chesapeake".

Land Use History in Virginia

- 1800's
 - Population expansion across the country
 - Wood used for building and heat
 - Fuel for iron ore production
 - Land cleared for farming



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This increased forest use eventually led to what we now refer to as the Era of Exploitation in the 1800's.

In the 1800's, the U.S. population began expanding across the country

Wood was used for building and heat

Wood also was used as fuel for iron ore production – particularly on the Ridges ...this photo from Frederick County shows an iron ore smelter used in the 1800's.

Land was cleared for farming – particularly in the Valley... and piedmont in the 1800s
A photo of the Shenandoah Valley in the 1800's would show very few forested areas.

Total annual wood production increased by 500% during this century – millions of acres of forests were cleared

From 1850 until 1910, 190 million acres were cleared of forests (13.5 square miles a day).

Trees seemed inexhaustible, so little effort was made to regenerate forests.

Soil erosion was widespread, streams were filled with sediment, and wildlife populations were decimated.

Land Use History in Virginia

- 1900's
 - 1920 end of exploitation era
 - First forestry schools founded
 - State Forestry Agencies
 - Society of American Foresters
 - USDA Forest Service
 - National Forest/Park Systems



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The 1920's are considered to be the end of the exploitation era; however, even before then the situation was beginning to improve.

In the late 1800's, populations in the S. Appalachians began to decline, as the farmland wore out. WWI drew many folks out of the mountains, and the Great Depression and WWII finished the job. So, once again, we saw an increase in reversion from farmlands back to forestlands.

Many of America's first forestry schools were founded in the early 1900's, including Yale, Cornell, and the Biltmore School.

Many states created forestry agencies for fire protection, timber preservation and water quality protection (VDOF 1914).

The professional society for foresters, the Society of American Foresters, was founded in 1900; and the USDA Forest Service (Weeks act in 1911), the National Forest System, and the National Park System (1916) were begun.

Land Use History



- American forests
 - European arrival: 950 million acres
 - 1900: 600 million acres
 - Today: 737 million acres
- Virginia forests – currently 15.8 million acres

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Other factors which contributed to increasing forest acreage in the 1900's included:
Gasoline vehicles replaced animal powered vehicles – reducing the amount of land needed to grow feed
Use of fertilizers and genetically improved materials increased crop yields – less land needed for agriculture

Virginia forests follow a similar trend to that of the nation's forests, currently around 62% forested.

In our area a large part is National forest/National Park, yet, state (and area locally) forests are predominately privately owned.

We are losing forestland in Virginia – at the rate of about 27,000 acres/year – mostly to development. As we covered earlier today, Fragmentation is causing much of this land conversion. However, the volume of trees we are growing today is increasing – we are growing more than we are harvesting, on less land. This is mostly due to improvements in growing techniques, forest management practices, and genetic improvements which increase growth and decrease health problems – mainly in loblolly pine.

Land Use History

Looking for Clues

- Man-made Structures
- Man-caused Disturbances
- Natural Disturbances



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Based on what we've talked about, it should be apparent that every forest has a history. Knowing this history can add richness and interest to a piece of land. Knowing the history can also help a new landowner make better management decisions.

Learning to read the history of a piece of property takes time and practice
Your history will probably be incomplete.

What clues can you look for to determine what's happened in a forest?

There are three major categories of land history clues:

Man made structure

Man-caused disturbances

Natural disturbance

A good resource to help you or your clients work through this process is from the Virginia Department of Historic Resources: "How to Research Your Historic Virginia Property".

http://www.dhr.virginia.gov/pdf_files/HowtoResearch.pdf

Man-made Structures

- Current Structures
- Exotic Vegetation
- Marriage Trees



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Man-made structures:
Easiest to identify

Current Structure – often houses can be dated based on their style and use of materials; the ethnicity of the builders may also be determined by the style. Remains of older structures may be evident as well. Look for old foundations, chimneys, buildings, vegetation, cemeteries, rock piles, dumps, ponds, etc. Cemeteries can provide information on the families who lived on the property.

On old farmsteads old machinery/infrastructure will show what type of farming was done (beef, dairy, poultry, swine, crops); look for concrete pads, silos, old rusty machinery, windmills, barns. Fence rows/rocks – helps imagine how an old farm was laid out; often rock piles on crop fields to allow for tillage; rock walls/ledges.

Exotic Vegetation – people generally focus their landscaping around the home, so look for vegetation that is out of place (shrubbery, daffodils, Norway spruce, fruit trees etc.). This will tell you where the original home site was.

Marriage Trees – people would plant a pair of trees when they got married and moved in.

Photo shows a chimney along the Rock Castle Gorge Trail in Floyd County, and an old home along the Appalachian Trail in Giles County (right).

Man-made Disturbances

- Crop residue
- Fence rows/rocks
- Drainage ditches
- Abandoned pastures or crop fields



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Man made disturbances:

Use current vegetation to figure out past management practices.

Crop residue – will tell at least the most recent cropping patterns (also helps with site quality) and history of farm type

Old Fence Rows – people used to run cattle and swine through woods to forage, there are often old fence rows (shown by existing posts, wire, trees in a line)

Why would there be trees in a line along fence rows? Bird planting.

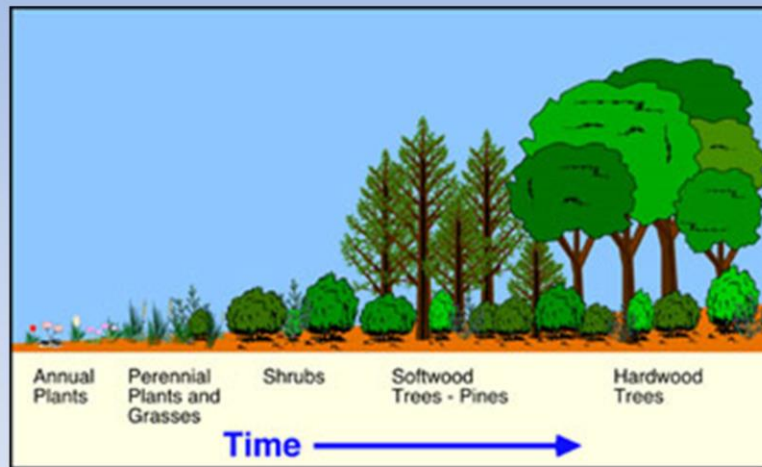
Tree and shrub species – dictates at what point in succession/a forest's maturity; there may be chestnut stumps and sprouts around! Cedars, Virginia pine indicate early successional vegetation.

Photo shows an old field, part of which has succeeded into cedars, and the other area is primarily young hardwood trees.

Abandoned pastures or crop fields – once a field is abandoned (either the farmer moves on or the field is no longer productive) early successional plants move in.

So let's talk about succession and what this process entails.

Succession



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Old-field succession is very common in Virginia, even today.

The first stage of succession, the pioneer or stand initiation stage, begins once a field stops being plowed. Initially short-lived, shade intolerant (sun-loving) herbaceous plants (grasses) and trees invade the site. These species are called pioneer species. In Virginia, we usually see Virginia pine and Eastern red-cedar growing in recently abandoned fields.

During the stem exclusion stage, pines dominate the canopy, creating a lot of shade on the ground, preventing the growth of grasses, herbs and new pines.

In the understory re-initiation stage, the canopy pines start to die-off, creating small openings in the canopy are created, which allows some sunlight to reach the forest floor. In these small openings, we start to see longer-lived species, such as oaks, coming in.

When the area is dominated by long-lived species such as oaks, it is said to be in the climax or old-growth stage. But even in this climax stage, the area is constantly changing. Individual trees die, creating large openings in the canopy, allowing pioneer species to return to the area. Forests in Virginia don't reach a static, unchanging state.

Note, succession doesn't have to begin with Pioneer and it doesn't necessarily move stepwise through these stages – there is quite a bit of overlap among the stages. Successional changes are gradual. Also, there is no set time period for each stage to last – this will depend on the site (climate) and the species involved. And, finally, the actual species composition of each stage will depend on the site and what species will grow there.

Succession

- Succession by fire



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Succession also takes place after large disturbances such as a fire.

In fact, many pine species depend on fire.

A good example of this is in Rockbridge County.

This area was dominated by mature hardwood trees, until a wildfire burned this area in 2002, and killed all the overstory hardwood trees.

By 2007, the understory was dominated by pines; Table Mountain pine on the northwest-facing slopes; Virginia pine on the dry southeast facing slopes.

Both of these pine species are shade-intolerant, so they require large scale disturbances, such as a wildfires, to open up the canopy and allow sunlight to reach the ground.

Table Mountain pine also needs fire because it has serotinous cones. This means, the cones are sealed with resin and cannot not open and release their seeds until high heat melts the resin off. This is an ecological adaptation which ensures the seeds aren't release until this is a disturbance.

So, fire can set back succession to the pioneer stage.

Man-made Disturbances

- Timber harvest
 - Stumps/sprouts
 - Logging roads
 - Skid trails
 - Scars



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Man-made disturbances:

Previous timber harvest – evidenced by stumps, stump sprouts, logging roads, skid trails and scars on trees adjacent to old roads; little vegetation along old trails and roads – compaction.

Photos show an old stump with sprouts (left), and an old skid trail (right) indicating a prior timber harvest

Man-made Disturbances

- Timber harvest
 - Tree rings
 - Age
 - Fire
 - Weather
 - Site



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Man made disturbances:

If there are stumps you may be able to see the rings. If so, there is wealth of information you can gain.

Count the rings to determine the age of the tree when it was cut

Look for fire scars to determine how often the area burned

Wide rings indicate good growing conditions (either a low-density forest and/or favorable weather conditions)

Narrow rings indicate crowded growing conditions (a dense forest) or droughty weather

Natural Disturbances

- Hurricanes/wind
- Ice
- Wildfires
- Lightening
- Insect/disease outbreaks



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Natural disturbances can be the most difficult to identify and may be confused with man-made disturbances

Evidence of hurricanes/wind damage include blown over trees, exposed root balls, and broken limbs and tree tops

Evidence of ice damage includes broken limbs and tree tops

Fire damage may be evident if there are fire scars on trees, and for more recent fires, charcoal on the trees/ground

Lightening struck trees will have peeled back bark, long scars down the stems, blown off limbs, and be dead or in decline

Insect and disease outbreaks can result in dead or declining trees (potentially in patches)

Photos show (top) dead hemlock as a result of hemlock wooly adelgid infestation and (bottom) ice damage

Other Sources

- Current owners/Neighbors



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There are other ways to learn about the history of the property. Many neighbors will have lived near the property for many years. Talk to these folks. They may know the management history of the property (i.e., if and when it was harvested, types of crops grown) and natural disturbance history (last hurricane, ice storm, etc).