An Inventory of the Trees of Cricket Holler

By Rob Hook, in partial completion of his Wood Badge ticket, August 2002.

Forward

It is fitting that my Wood Badge ticket would incorporate an inventory of trees. As Fred Dudding, a staff member in my Wood Badge Troop, suggested, I chose something "that made my heart sing." When I was in Scouting as a boy, the one thing I really wanted to learn was how to tell the trees apart. It seems that I never found or asked the right person to show me. Many years and several false starts and diversions later, I decided to pursue a master's degree in biology, particularly plant biology. A large part of that decision rested on that desire planted during my scouting experience. I finally learned how to recognize the trees (well, a lot of them anyway) and I am lucky enough to use that skill in my profession today. So, even though I didn't learn how to tell trees apart while I was a scout, my Scouting experience in the outdoors did show me something about myself that I later put to use. That makes me a Scouting success story!

Hopefully this document will help you along your journey toward learning more about the trees, other plants, and animals that you find in your outdoor adventures.

A Natural History of Cricket Holler

Montgomery County was covered with ice during the last (Wisconsin) ice age, some 10,000 years ago. This is a significant event in the natural history of the area, because it greatly affected the type of soils, drainage, and, as a result, the type of vegetation of the area.

The *Soil Survey of Montgomery County, Ohio* contains maps of the various soil types throughout the county, based on extensive field work conducted during the 1960s. The soils of the Cricket Holler area are mapped as Miamian silt loam, Miamian clay loam, or Hennepin silt loam, on slopes from 2 to 50%. The slopes allow all of these soil types to typically drain well. However, their composition of clay, particularly below the topsoil, will cause these soils to retain water in areas where there is not enough slope. A small part of the camp is mapped as Brookston soil, which is typically a poorly drained soil type. Any persons who have been to Cricket during the spring rains can attest to that fact. Soils.PDF

The original forest communities in the Cricket Holler area were classified by Braun (1950) as part of the Beech-Maple Forest Region, based on her widespread research of forest types throughout Ohio and the eastern US. Dominant species in this community were beech, sugar maple, yellow poplar, white ash, and oaks. Gordon (1969) classified the area as the Oak-Sugar Maple Community based on review of surveyors' notes from the original land surveys. In his description of the Oak-Sugar Maple Community, Gordon lists he dominant trees as white oak, red oak, black walnut, black maple, sugar maple, white ash, red elm, basswood, black cherry, bitternut hickory, and shagbark hickory. The two descriptions are comparable, although Gordon lists neither beech nor yellow poplar as dominant trees in this area. These latter trees tend to occupy somewhat more mesic (moist) areas.

The influence of man on the natural history of the camp may have begun with the earliest white settlers, because it is likely that the original settlers or those that came soon after cleared most of the land for building materials and farming. We know from historical articles, aerial photos, and the current condition of the forest that Cricket Holler was mostly cleared within the past 100 years, except for the original 11 acres and a small amount of the camp adjacent to them.

Newspaper articles discuss the reforestation efforts at Cricket Holler between 1926 and the 1940s. A February 1945 article discusses the planting of 5000 trees during National Scout Week, with plans for 5000 more. To facilitate this massive undertaking, individual scouts agreed to plant at least 50 trees and then maintain them for a year. For following through on their commitment, scouts received the "Cricket Holler

Forest Builders Award". (For you patch collectors, the patch is described as a picture of Kit Cricket with shovel over his shoulder.) The article mentions that 76 acres were reforested with white and red pine, hemlock, tulip (yellow) poplar and walnut.

Aerial photos dating back to 1956 (on file with the Natural Resources Conservation Service, also known as the County soil and Water Conservation District) show the area that was wooded at that time, which I have chosen to refer to as the "old woods," areas that are regrowing (perhaps already planted at that time), and open field areas. The old woods includes the 11 acres, as well as portions of the camp adjacent to the north and east, and some narrow areas along the major streams to the southeast. Much of property was open field at that time, perhaps already planted with seedlings that are not yet visible from the air. Later photos show the areas of developing pines in several locations in the camp, and developing hardwoods (non-evergreen or deciduous woods) in other areas. Some of the hardwoods were probably planted, and some portions were allowed to regrow naturally. These three types of woods, the old woods, the pine plantations, and the successional hardwoods, form the current forest communities of Cricket Holler. 1956.PDF 1994.PDF

Methods of the inventory

To describe the composition of the forest, I located several circular "plots" in the various forest types. The plots were each one tenth of an acre, that is, a circle approximately 37.5 feet in radius. Within each plot, I recorded the species and diameter at breast height (known as "dbh") of each of the trees with a dbh greater than 5 inches. Five inches is sometimes used as the cutoff point for the "dominant" trees, although some trees with smaller diameters may reach canopy height. I placed 6 plots in the older woods, because I wanted a good profile of this woodland type. I placed 3 plots in pine plantations, and a single plot in the successional hardwoods south of the utility line.

From these measurements, I was able to calculate the relative amounts, or "dominance," of the different species in each forest type. I calculated the density (number of trees per acre) and basal area by species and for all trees together. The basal area of a tree is the area of the ground that the trunk of the tree covers. A few large trees can have a greater basal area than a large number of small trees. Using both the density (number) and the basal area (sizes) of the trees of each species gives a mo re complete picture of which species are more abundant in the woods. The "relative dominance" number calculated for each species reflects both the density and basal area.

Results and Discussion

The results of the tree inventory and analysis are shown below for the three forest types that I identified: the old woods, the regrowing or "successional' hardwoods, and the pine "plantation" woods. Forest.PDF

First notice that most of the species listed in the old woods are the same species listed by Gordon (as described in the beginning of this document) as dominant in the woods of the area during the first land surveys. That is a good indication that if the old woods at Cricket Holler may have been only selectively cut, and that if they were cut in the past, they have recovered to point that is comparable to the original forests.

Summary of Trees in the Old Woods
Cricket Holler, July 2002

Species	Density (trees/acre)	Average Diameter (inches)	Maximum Diameter (in)	Relative Density (%)	Total BA (sq. ft./acre)	Relative BA (%)	Relative Dominance
American elm	10	9.0	11.6	5.5	3.5	2.1	7.5
Ash (white and blue)	43	15.9	26.0	23.6	48.7	28.5	52.1
Black walnut	3	20.8	24.3	1.8	8.0	4.7	6.5
Buckeye	2	17.0	17.0	0.9	2.6	1.5	2.4
Chinquapin oak	5	9.7	14.0	2.7	2.8	1.6	4.4
Hackberry	3	9.9	12.5	1.8	1.9	1.1	2.9
Hickories	5	10.4	14.6	3.6	3.9	2.4	6.0
Northern red oak	21	23.8	34.9	11.8	70.5	41.3	53.1
Sugar maple	84	7.7	12.0	46.4	22.8	13.4	59.7
White oak	3	18.6	19.2	1.8	6.2	3.6	5.4
Total	181	12.3	34.9	100.0	170.9	100.0	200.0

Summary of Trees in the Successional Hardwoods
Cricket Holler, July 2002

Species	Density (trees/acre)	Average Diameter (inches)	Maximum Diameter (in)	Relative Density (%)	Total BA (sq. ft./acre)	Relative BA (%)	Relative Dominance
American elm	30	8.4	10.0	13.6	11.7	8.5	22.1
Ash	39	13.8	16.4	18.2	41.6	30.1	48.3
Basswood	30	7.9	8.3	13.6	10.0	7.3	20.9
Black cherry	39	6.6	8.1	18.2	9.6	7.0	25.1
Chinquapin oak	30	13.3	14.4	13.6	28.6	20.7	34.3
Hickories	20	8.1	8.1	9.0	6.9	5.1	14.1
Northern red oak	10	16.5	16.5	4.5	14.6	10.6	15.1
Osage orange	20	11.6	14.0	9.1	15.1	10.9	20.0
Total	217	10.3	16.5	100.0	138.1	100.0	200.0

Summary of Trees in the Pine Plantations
Cricket Holler, July 2002

Species	Density (trees/acre)	Average Diameter (inches)	Maximum Diameter (in)	Relative Density (%)	Total BA (sq. ft./acre)	Relative BA (%)	Relative Dominance
American elm	7	6.6	6.7	4.0	1.5	1.2	5.2
Ash (white)	13	13.6	21.5	8.0	15.4	11.6	19.6
Black cherry	13	9.6	13.8	8.0	7.0	5.3	13.3
Black locust	13	11.3	13.4	8.0	9.6	7.2	15.2
Osage orange	7	14.8	14.8	4.0	7.9	5.9	9.9
Scotch pine	16	9.9	12.2	10.0	9.0	6.8	16.8
Silver maple	3	5.5	5.5	2.0	0.5	0.4	2.4
Sugar maple	16	7.0	8.0	10.0	4.4	3.3	13.3
White pine	76	12.9	21.4	46.0	77.0	58.2	104.2
Total	164	11.3	21.5	100.0	132.4	100.0	200.0

The inventory shows that there are substantial differences between the woodland types. First, look only at the totals in each summary. Of course, the older woods have larger trees, as can be seen comparing the "maximum diameter" column of the three summaries. Although the total average diameter doesn't appear to change much between the woods types, it does vary considerably between species. Also, notice the "density" (number of trees per acre) is different between the old woods and the successional hardwoods. The succesional hardwoods is made up of many more smaller trees than the old woods. Despite the number of trees, the "total basal area" in the old woods is greater because the trees are so much larger.

Interestingly, the density between the old woods and the pine woods is comparable. That may be by plan, that is, the planting was done at a certain density on purpose. But the pine woods has a smaller total basal area because the trees are generally smaller in diameter. This limited sample essentially shows the pine woods about midway between the successional woods and the old woods. That is also interesting, because the successional hardwoods are perhaps a bit older than the pine woods. Pines, as a general rule, grow faster than many hardwoods, so they gain a lot more size in the same period of time. That is why pines are often the preferred type of tree for forest planting for timber or pulp production. It is also the reason that much of the lumber and pulp comes from those parts of the country where pines are abundant: the northwest and southeast. On the other hand, in the Daniel Boone National Forest in Kentucky, the US Forest Service manages their forest for yellow poplar, which is also a fast growing tree but also a useful wood.

Also note the differences in the species between the woodland types. Look at the "relative dominance" column in each summary. The old woods are clearly dominated by ash, northern red oak, and sugar maple. Notice that the sugar maple in these woods is mostly made up of many smaller trees compared the oaks. This might suggest that the forest, over time as the oaks get older and fall, will become dominated by sugar maples.

In the successional woods, we see that the dominance of the woods is shared by a number of species, in a race, as it were, to see which will dominate. Note particularly that ash is near the top. Put that information together with the old woods data, and we may conclude that ash is a type of tree that will establish early in an area, and long-lived and large enough to remain a key component of the forest for some time thereafter.

Basswood and chinquapin oak will also likely remain important parts of the forest, even though they are not represented in the old woods samples. The same might be said for American elm, except that a nasty disease called “Dutch elm disease” will kill the American elm before its time. The somewhat slow growing northern red oak is trailing, but may outlive many of the other trees (such as black cherry and osage orange), to become a dominant tree in the future in this woods. Although not in the canopy of the successional hardwoods sample, sugar maple is present in the understory of that woods as well. It is slow growing and very shade tolerant. You might say it is a “patient” tree, waiting for its time. It will remain a common species at Cricket Holler for many years to come.

Notice that there are some species in the successional hardwoods are not present in the old growth canopy, namely black cherry and osage orange. These species are prone to move into an area early in its regrowth. While black cherry will likely remain a small component of the forest, the osage orange is definitely a tree species that is limited to open areas. It will only gro w to about 30 or 40 tall, and once it is shaded by larger trees, it will disappear from the forest. Curiously, the hackberry, which shares habitat with osage orange, is present in the old woods but not in the successional woods sample. That is probably an error of taking only a small sample of the successional woods. But, it also indicates that some of the successional species may remain in old growth woods by invading open areas created by large gaps in the forest canopy where several trees fall from blow down. Before man cleared the forest on a large scale, this is the “niche” these species occupied in the forest landscape.

Obviously, white pine (and some scotch pine) clearly dominates the planted pine woods. But notice that several of the “unplanted,” invading species in the pine plantations are co-dominant, such as black locust, black cherry, ash and sugar maple. Silver maple is a fast growing tree that will invade an area if it is moist enough, but will not outlive other trees. Notice that this tree is often planted in yards, because it grows so quickly and will provide quick shade. They are not very tolerant of the shade of other trees, however. Notice that the sugar maple, the tree that may eventually dominate the old woods, has begun to grow in the pine woods.

Sugar maple and yellow poplar, as two of the species that were systematically planted at Cricket in the 1940s, are quite abundant in the northeastern part of the camp. Obviously, this was one of the places that was planted. Also, in the area of the camp just south of the entrance road, there are many of the species that were planted. The abundance of scotch pines suggests that it was also once of the species supplied by the Forest Service.

Conclusion

This little study is a just a sample of some of the studies that scouts and scouters can do at Cricket Holler or other places. Now that you know a little bit about the Cricket forest, go look for yourself. What patterns can you see? You don’t need to measure any trees to see some simple patterns in trees composition from one part of the woods to another. For example, can you see patterns in the types of trees that grow in drier sites compared to wetter sites?

You are encouraged to use the **Cricket Holler tree key**, and go learn some trees for yourself. It is a basic list, and there are many more in Ohio and around the country to learn, but you can learn to tell the trees apart. Once you do, you will be awed by the diversity of plant life. You will appreciate the outdoors more, recognizing the plants that you see around you. You will become a better steward of the land. This is our common mission as members of the brotherhood of Scouting.

ENJOY THE OUTDOORS!

References

Braun, E.Lucy. 1950. *Deciduous Forests of Eastern North America*. Hafner Publishing, New York.

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A KEY TO IDENTIFYING TREES AT CRICKET HOLLER

By Rob Hook, in partial completion of his Wood Badge ticket, August 2002.

Forward

As is every Wood Badge ticket, this project was intended to further my leadership skills. I must admit that, although I had fully intended to recruit a few scouts to help out as their opportunity to learn, I did the work by myself to gather the information. The way I now hope to stretch my leadership muscle is to link this document to the Miami Valley Council homepage on the internet, so that scouts and scouters can freely access it and use it. The key narrows down the possibilities to only those species at Cricket Holler, so that it simplifies the process for the beginner. I hope that this work can be used by scouters for instruction or by the scouts themselves, so that some one – *if only just one* -- will complete their scouting adventure knowing how to tell the trees apart.

Before you begin, read this first:

Be aware. This key is written just for Cricket Holler, and it is intended as an introduction to tree identification. So, be careful about using this key anywhere else.

Most of the trees at Cricket are common in Ohio, and therefore learning them there will be useful in other places in Ohio and throughout the eastern US. However, only the trees common to the woods at Cricket Holler are included. It is possible that other species occur at Cricket that are not included; for example, not all of the trees planted as landscaping are included.

Be patient. Some of the trees have characteristics that you will quickly learn and remember easily. Many take some effort to get to know. Once you learn to tell two trees apart, you begin to recognize how many different species of tree there are.

Look around. The leaves, twigs, nuts and seeds on the forest floor also probably came from a big tree near you. And, as you know, the small trees start out as seeds from big trees. So also look at the little seedlings and shrub-sized trees around the larger ones for clues. They may be of the same species as the big tree you are trying to identify. Even for experts, it can take some time to get all of the information (nuts, leaves, bark) that is needed to make a positive identification of an individual tree (for example, some of the oaks and hickories). Take your time and enjoy it. It is worth the effort.

Be prepared. Sometimes you will need to look way up at a large tree to see its branching pattern or leaf shape. A pair of binoculars can be mighty handy. Also, if you have any tree identification books, take them with you. This key will hopefully get you close to the identity of a tree, and you can use the other books to be sure.

Some important definitions

Compound and simple leaves. Compound leaves have more than one leaflet on each stem. **Simple leaves** have one leaf on each stem. To tell the difference, look for the buds along the twig, where the leaf stem attaches. If there is more than one "leaf" on the stem that attaches at a bud, then the tree has compound leaves. Otherwise, the leaves are simple.

Branching patterns. Look to the smaller branches, and look at more than one. For **opposite branching**, the smaller branches extend out from the larger branches to the left and to the right across from one another, like raised arms. **Alternate branches** will extend out from the larger branch, the left ones separated by some distance from the right ones.

Leaf Lobe. A leaf has lobes if it is divided into distinct parts, but not divided all the way to the base (if they are separated to the base, they are usually called compound leaves). The lobes may be the same or have different sizes and shapes on the same leaf, but usually, the leaves look about the same for a species.

Toothed leaf edges refer to the small, jagged edges of some leaves. The teeth are often about the same size. **If the leaf edges are smooth, without teeth, they are called entire**.

A quick guide to some fruits of the trees

If the tree has **acorns** it is an **oak** (go to 5B in the key).

If the tree has seeds with a large, **rounded wing attached to each seed**, usually in pairs on the tree (they twirl when they fall), the tree is a **maple** (if it has simple leaves, go to 4A in the key) or **box elder** (if it has compound leaves, go to 2A in the key).

It the tree has **seeds with a narrow, flat wing attached**, it is an **ash** (go to 2A in the key).

If the tree has berries with a **long flat wing that is attached along the stem of the berry**, it is a **basswood** (go to 5A in the key).

If the tree has a fruit that looks like a **pea pod**, it is probably either a **locust** (go to 2A in the key) or **red bud** (5B in the key).

If the tree has a **nut with a shell with 4 parts**, it is probably a **hickory**. If it has a **shell with no distinct parts**, then it may be a **walnut** or a **buckeye** (all of these are in 2A in the key).

Some interesting websites for tree identification

There are many websites that can help in identifying plants. Most of the photos used in the key that follows have been taken from these particular websites. They are generally easy to use and contain good photos of leaves, bark, and fruits.

http://forestry.about.com/cs/treeid/index.htm

http://forestry.about.com/library/tree/bltredex.htm?PM=ss11_forestry

http://ohioline.osu.edu/b865/

http://www.cnr.vt.edu/dendro/wwwmain.html

http://www.fw.vt.edu/dendro/

http://www.hort.uconn.edu/plants/

http://www.botany.wisc.edu/wisflora/

http://project.bio.iastate.edu/trees/campustrees/ISU_trees.html

http://www.ecologik.net/v_forest/treekey1.html

A KEY TO THE TREES OF CRICKET HOLLER

1A. Tree is evergreen

2A. Tree has needle leaves (about as long as your finger or more) attached to branches in bundles of 2 or more.

- Tree has whitish, needle leaves, usually in bundles of 5. Bark is gray, generally smooth. Long cones. **Eastern White Pine.**
- Tree has needle leaves in bunches of 2 or 3. Upper bark orange, lower bark with large "scales" or "plates." Roundish cones. **Scotch pine.**
- Tree has needle leaves in bunches of 2, 3 inches long or more. Upper bark not orange, bark generally dark and scaly throughout. **Red pine.**

2B. Tree does not have needle leaves attached in bundles.

- Tree has prickly, scale-like leaves arranged like branches. Cones look like small blue berries. **Eastern red cedar.**
- Tree has short (about as long as your thumbnail), flat leaves attached to branches singly. Small cones. **Eastern hemlock.**

White pine needles

Red cedar

Red pine bark

Scotch pine orange upper bark

Eastern hemlock

Red pine needles

1B. Tree is deciduous (not evergreen).

2A. Tree has compound leaves.

- Tree has thorns **Black locust**
- Tree without thorns.
  - Leaves are opposite branching.
    - Leaflets usually 3. **Box elder.**
    - Leaflets 5 or more.
      - Leaflets usually 5, branching out from the same point, like a hand. **Ohio buckeye.**
      - Leaflets usually 7 or more, branching along a "stem" with one at the end, the others paired.
        - Smallest twigs where leaves are attached are square. **Blue Ash.**
        - Leaf scars on the twigs are indented on the top, wrapping around the bud. **White ash.**.
        - Leaf scars are flat across the top, not wrapping around the bud. **Green ash.**
  - Leaves are alternate branching.
    - Leaflets generally 5.
      - Bark is shaggy. **Shagbark hickory.**
      - Bark is not shaggy. **Pignut hickory.**
    - Leaflets more than 5.
      - Leaflets 7-9, paired with one on the end. Yellow buds at the ends of the twigs. **Bitternut hickory.**
      - Leaflets 10 or more, usually all paired without one at the end. The leaf stem tends to curve up slightly toward the end. **Black walnut.**

(photos next page)

Buckeye

Green ash.

White ash

Blue ash

Blue ash twig

Bitternut hickory

Bitternut hickory buds

Pignut hickory bark

Pignut hickory leaf

Shagbark hickory leaf

Shagbark hickory bark

2B. Tree has simple leaves.

3A. Tree has thorns. Bark is orangish brown and furrowed. **Osage orange.**

3B. Tree without thorns.

4A. Leaves are opposite branching.

- **Leaves are lobed.**
  - Lobes usually 5, the two at the base of the leaf smaller. Leaf edges generally not toothed, although the larger middle lobes have three large "teeth." **Sugar maple.**
  - Leaves deeply divided into usually 3 to 5 lobes, each one having many teeth along the edges. **Silver Maple.**
- **Leaves are not lobed.**
  - Leaves have small teeth. Leaf stem often reddish. **Black Haw.**
  - Leaves without small teeth. Leaf veins tend to follow the edges of the leaf. **Flowering Dogwood.**

Osage orange leaf

Osage orange fruit

Sugar maple

Silver maple

Silver maple with seeds

Black haw flowers

Black haw leaf

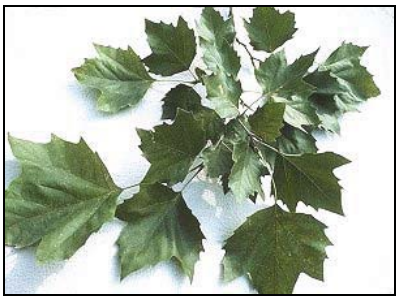
Flowering dogwood

Flowering dogwood flower

4B. Leaves are alternate branching.

5A. Leaves edges are toothed.

- ❖ Leaves are lobed as well as have large teeth. Bark is brown and scaly at the bottom of the tree, white and smooth toward the top. **Sycamore.**
- ❖ Leaves are not lobed.
  - Leaves are triangular in shape with large, blunt teeth**. Cottonwood.**
  - Leaves are not triangular. Teeth are small and pointed
    - o Teeth look "doubled". Bark can be broken off, and the broken piece has dark and light layers. **American elm.**
    - o Teeth are single.
      - ➢ Leaf is broad and heart shaped, the base uneven. Tree may have a berry fruit with a flat "wing" in the stem. Bark is furrowed. **Basswood.**
      - ➢ Leaves somewhat narrow, rough and long pointed. Bark is gray and bumpy. **Hackberry.**
      - ➢ Leaves smooth and oval. Usually, there are 2 small bumps (glands) on the leaf stem just below the leaf. Bark is dark and scaly. **Black cherry.**



Sycamore

Hackberry

Black cherry

Cottonwood

Basswood (Linden)

American elm

American elm seeds

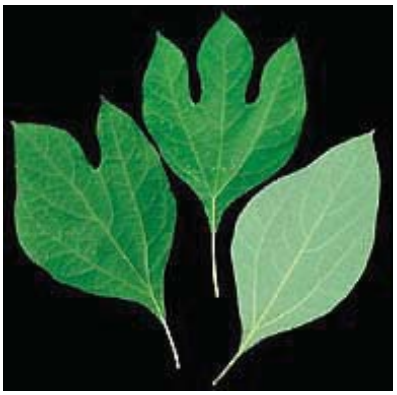
5B. Leaves edges are entire (no teeth).

- ❖ Leaves are lobed.
  - Lobes are rounded
    - o Leaf has small, numerous, equal sized lobes. The leaf is often wider toward the end. **Chinquapin oak.**
    - o Leaf lobes are large, usually 8 or less.
      - ➢ Usually 6 to 8 lobes. Lobes are all about the same size. **White oak.**
      - ➢ Usually 5 lobes. Lobe at the end of the leaf is large with a wavy edge, other lobes smaller. **Bur oak.**
      - ➢ Usually 2 lobes, making the leaves look like a mitten. Sometimes 3 lobes, the side lobes about the same size. Tree trunk is often curvy, not straight. **Sassafras.**
  - Lobes are pointed.
    - o Lobes have a small bristle at the tip of each lobe.
      - ➢ Lobes are narrow. Lower branches hang toward the ground. **Pin oak.**
      - ➢ Lobes are wide. Lower branches upright. **Northern red oak.**
    - o Lobes do not have a bristle tip.
      - ➢ Leaf has the shape of a tulip. **Yellow or "tulip" poplar.**
      - ➢ Leaf is star shaped, with 5 lobes. **Sweet gum.**
- ❖ Leaves are not lobed. **Red bud.**


Chiquapin oak


White oak


Bur oak


Sassafras

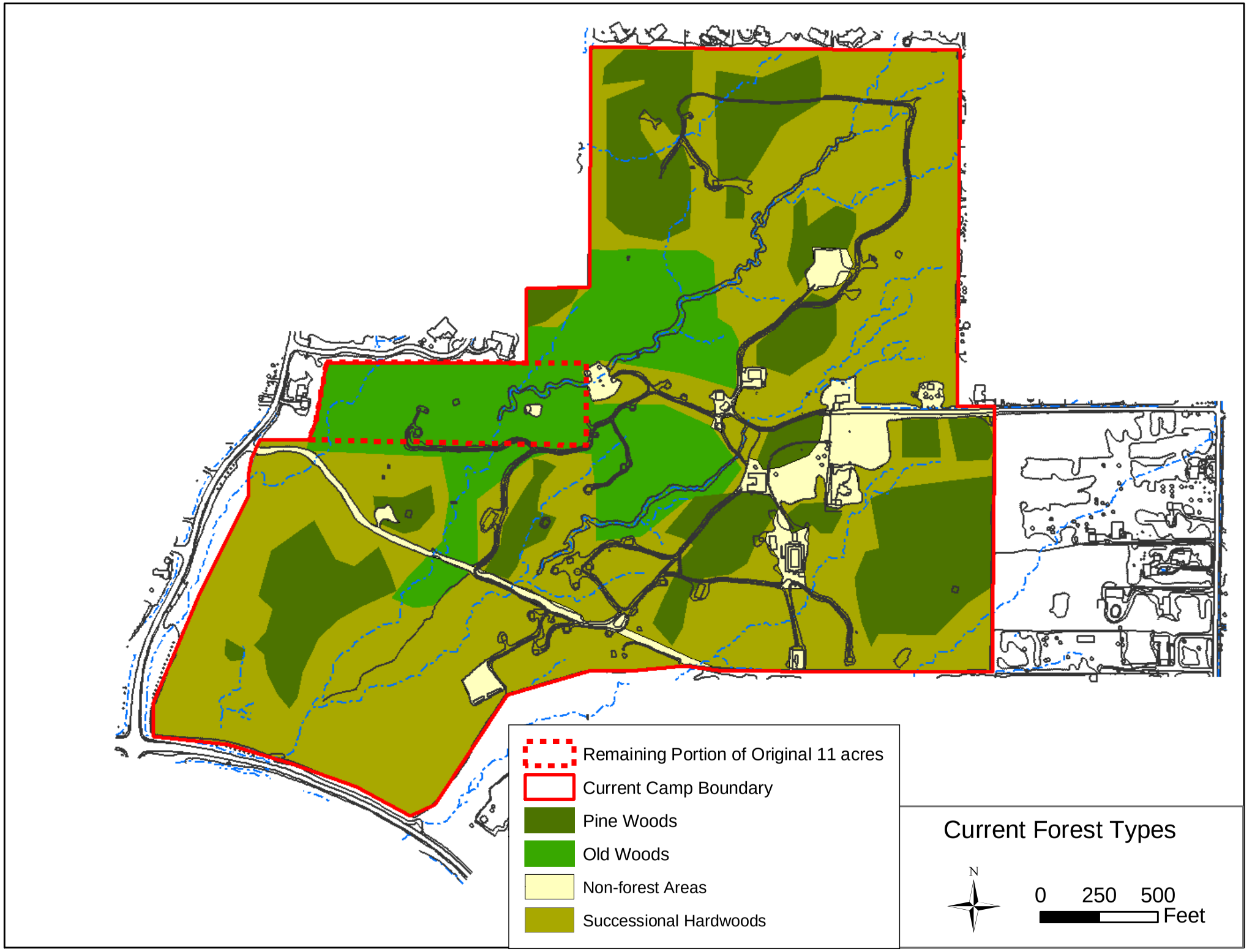

Pin oak


Red oak


Red bud


Sweet gum


Tulip (yellow) poplar


Remaining Portion of Original 11 acres
Current Camp Boundary
Pine Woods
Old Woods
Non-forest Areas
Successional Hardwoods
Current Forest Types
N
0
250
500
Feet