

FORT NECESSITY
NATIONAL BATTLEFIELD
REPORTS
ON
VEGETATION
FOREST REGENERATION
PINE PLANTATIONS
AGE OF WHITE OAKS
WILDLIFE

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VEGETATION LIST
FORT NECESSITY
NATIONAL BATTLEFIELD

1. Alder	<i>Alnus</i>
2. Apple	<i>Malus</i>
3. Ash, White	<i>Fraxinus americana</i>
4. Aspen, Big-toothed	<i>Populus grandidentata</i>
5. Beech, American	<i>Fagus grandifolia</i>
6. Birch, Black	<i>Betula lenta</i>
7. Birch, Yellow	<i>Betula alleghaniensis</i>
8. Blackgum	<i>Nyssa sylvatica</i>
9. Cherry, Black	<i>Prunus serotina</i>
10. Chestnut, American	<i>Castanea dentata</i>
11. Crabapple	<i>Pyrus coronaria</i>
12. Dogwood, Flowering	<i>Cornus florida</i>
13. Hackberry	<i>Celtis occidentalis</i>
14. Hawthorne	<i>Crataegus</i>
15. Hickory, Bitternut	<i>Carya cordiformis</i>
16. Hickory, Pignut	<i>Carya glabra</i>
17. Hickory, Shagbark	<i>Carya ovata</i>
18. Locust, Black	<i>Robinia pseudoacacia</i>
19. Magnolia, Cucumber	<i>Magnolia acuminata</i>
20. Maple, Red	<i>Acer rubrum</i>
21. Maple, Sugar	<i>Acer saccharum</i>
22. Mulberry	<i>Morus</i>
23. Oak, Black	<i>Quercus velutina</i>
24. Oak, Chestnut	<i>Quercus prinus</i>
25. Oak, Red	<i>Quercus rubra</i>
26. Oak, Scarlet	<i>Quercus coccinea</i>
27. Oak, White	<i>Quercus alba</i>

VEGETATION LIST

(continued)

28. Paw paw	<i>Asimina triloba</i>
29. Poplar, Yellow	<i>Liriodendron tulipifera</i>
30. Sassafras	<i>Sassafras albidum</i>
31. Walnut, Black	<i>Juglans nigra</i>
32. Walnut, White	<i>Juglans cinerea</i>

CONIFERS

1. Cedar	<i>Chamaecyparis</i>
2. Fir, White	<i>Abies concolor</i>
3. Hemlock, Eastern	<i>Tsuga canadensis</i>
4. Larch, Eastern	<i>Larix laricina</i>
5. Pine, Austrian	<i>Pinus nigra</i>
6. Pine, Red	<i>Pinus resinosa</i>
7. Pine, Scotch	<i>Pinus sylvestris</i>
8. Pine, White	<i>Pinus strobus</i>
9. Spruce, Colorado Blue	<i>Picea pungens</i>
10. Spruce, Colorado Blue	<i>Picea pungens</i> var. <i>glauca</i>
11. Spruce, Norway	<i>Picea abies</i>
12. Yew, Pacific	<i>Taxus brevifolia</i>

WOODY PLANTS AND VINES

1. Grape vine	6. Rhododendron
2. Greenbrier	7. Serviceberry
3. Groundpine	8. Spicebush
4. Elderberry	9. Sumac, Staghorn
5. Poison Ivy	10. Virginia Creeper
	11. Witchhazel

SECTIONAL BREAKDOWN
OF TREE SPECIES

SECTION ONE

- | | |
|----------------------|---------------------------------|
| 1. Black cherry* | 1. Red pine* |
| 2. Apple* | 2. White pine |
| 3. Crabapple* | 3. Eastern hemlock |
| 4. Red oak | 4. Colorado blue spruce* |
| 5. Black locust | 5. Colorado spruce var. glauca* |
| 6. Flowering dogwood | 6. Norway spruce* |
| 7. Hawthorne* | |
| 8. Sugar maple | |
| 9. Red maple | |
| 10. Black birch | |
| 11. White walnut | |

Section one contains approximately 62½ acres of mixed hardwoods and mixed conifers. There are two conifer plantations in section one. Plantation No. 5 is a 90% pure red pine stand which measures nearly 14 acres. The second plantation No. 4 is a mixed conifer stand containing red pine, white pine, hemlock, and spruces. This stand is mixed in some areas with hardwoods but I measure the area to affected by a cut as 24 acres.

Combined conifer acreage totals nearly 38 acres.

Regeneration in Section one is rather sparce. The majority of regeneration is red maple, white oak, aspen, hawthorne and black locust. White oak seedlings have come up in the red-white pine plantations.

Crabapple, hawthorne and locust are sprouting along the small creek adjacent to the plantations. In the hardwood stand, the majority of the regeneration is aspen, red maple and white oak.

SECTION TWO

- | | |
|-----------------------|--------------------------------------|
| 1. Yellow poplar* | 1. Eastern hemlock* |
| 2. Red maple* | 2. Colorado Blue Spruce var. glauca* |
| 3. Flowering dogwood* | 3. White pine* |
| 4. Black cherry* | 4. Red pine* |
| 5. White oak | 5. Cedar |
| 6. Red oak | 6. White fir |
| 7. White ash | 7. Pacific yew |
| 8. Blackgum | |
| 9. Sassafras | |
| 10. Shagbark hickory | |

Section No. 2 contains approximately 57 acres, mostly open meadow. There are three plantations in this section. Plantation No. 1 is basically a white pine stand. This stand is surrounded by a mixed hardwood stand which is seeding into the plantation. Plantation No. 1 is approximately $3\frac{1}{2}$ acres. Plantation No. 2 is nearly pure red pine which was planted in the parking circle at the visitor center. This small stand is almost 2 acres. Plantation No. 3 is a mixed red pine and hardwood stand. This small plantation is approximately 3 acres.

The regeneration in Section two is mainly yellow poplar, white ash, cherry, mulberry and elderberry. In most areas between Route 40 and the Visitor Center, the undergrowth is extremely thick which may account for the lack of abundant regeneration. Heavy undergrowth hinders natural regeneration and should be thinned or removed in order to establish hardwoods.

*dominant species

SECTION THREE

- | | |
|----------------------|------------------------|
| 1. Black walnut | 13. Red oak* |
| 2. Yellow poplar* | 14. Black cherry |
| 3. Sassafras | 15. Apple |
| 4. Red maple* | 16. Cucumber magnolia* |
| 5. Black oak* | 17. American chestnut |
| 6. White oak* | 18. Black locust |
| 7. Flowering dogwood | 19. American beech* |
| 8. Hawthorne | |
| 9. Bitternut hickory | 1. Red pine* |
| 10. Pignut hickory* | 2. Eastern hemlock |
| 11. White ash | 3. Norway spruce |
| 12. Chestnut oak* | 4. Scotch pine |

Section three has approximately 63 acres. The only conifers in this section are found along the main road to the picnic area. Norway spruce was planted along both sides of the road. Scotch pine, red pine and hemlock were planted near the maintenance garage. I have made no estimation of the acreage. I feel that these conifers buffer the garage from the road. The Norway spruce can be cut with very little difficulty but they add to the pleasure of the drive to the picnic area.

Hardwood regeneration consists of red maple, flowering dogwood, pignut hickory, red oak, cucumber magnolia and sassafras. Regeneration and existing trees indicate that this area has come closer to the climax stage than the previous two section. Left alone this area will reach the desired climax stage in time.

*dominant species

SECTION FOUR

- | | |
|-----------------------|-----------------------|
| 1. Black cherry | 14. Black birch* |
| 2. American beech* | 15. Black locust |
| 3. Yellow poplar | 16. Big-toothed Aspen |
| 4. White oak* | 17. Apple |
| 5. Red oak* | 18. Sugar maple |
| 6. Red maple* | 19. Yellow birch* |
| 7. Flowering dogwood | |
| 8. White ash* | 1. White pine* |
| 9. Cucumber magnolia | 2. Red pine* |
| 10. American chestnut | 3. Norway spruce |
| 11. Pignut hickory* | 4. Eastern hemlock |
| 12. Shagbark hickory | 5. Eastern larch |
| 13. Sassafras | |

Section Four is the largest of the five sections covering over 83 acres. There are two plantations in this section. Plantation No. 7 is the larger of the two with 11 acres, consisting of 90% white pine with red pine, spruce, hemlock and larch. Plantation No. 8 is another stand which is at least 90% pure red pine. This stand is approximately 7 acres.

Hardwood regeneration in this section is mainly dogwood, yellow poplar, cucumber magnolia, red maple, sassafras, white oak, American beech and white ash. This section is also approaching the climax stage of development. When the picnic areas and the camping areas are moved the ground should be loosened on each site. Hardwoods can then be planted or natural seeding can be used as the regeneration tool.

*dominant species

SECTION FIVE

- | | |
|----------------------|-----------------------|
| 1. Flowering dogwood | 10. Black cherry |
| 2. Yellow poplar | 11. Pignut hickory |
| 3. Chestnut oak | 12. American beech |
| 4. White ash | 13. Crabapple |
| 5. Sassafras | 14. American chestnut |
| 6. Red oak | |
| 7. White oak | 1. White pine |
| 8. Cucumber magnolia | 2. Red pine |
| 9. Red maple | |

Section Five covers over 59 acres. This section contains only one small plantation. Plantation No. 9 is a combination white and red pine. This plantation is only about five acres.

The hardwood regeneration is similar to the regeneration in Section Four. The majority of new growth is sassafras, cucumber magnolia, white ash, white oak and flowering dogwood. American beech seedlings are very abundant in certain sections of section five. As with the last two sections, a climax stage will be reached without artificial regeneration.

BRADDOCK'S GRAVE

- | | |
|-----------------------|------------------------|
| 1. Apple | 12. Pignut hickory* |
| 2. Black cherry | 13. Cucumber magnolia* |
| 3. Red maple* | 14. Hawthorne |
| 4. White oak * | 15. Sugar maple* |
| 5. Blackgum | |
| 6. Red oak* | 1. Norway spruce |
| 7. Crabapple | 2. White pine |
| 8. Big-toothed aspen | 3. Red pine* |
| 9. Black birch | 4. Eastern larch |
| 10. Flowering dogwood | |
| 11. American chestnut | |

This site covers 25 acres. Most of the site is either hardwood forest or open field. The conifers on this area are very sparce. Removal of these conifers will be relatively simple.

Regeneration on this plot consists of white, red and chestnut oaks, red maple, pignut hickory and cucumber magnolia. Of all the areas covered in this report, this section would be the easiest to manage to a climax stage. There are very few conifers to contend with and the tree species are reaching a climax stage at the present time.

Planting can be used to bring the hardwood tree line closer to the grave site. This would spice the flavor of the 18th century layout of the land and forest.

*dominant species

AREA OF PINE PLANTATIONS

PLANTATION No.	AREAS
1	3.5
2	2.0
3	3.0
4	24.0
5	14.0
6	no estimate
7	11.0
8	7.0
9	<u>5.0</u>
Total	69.5 acres

It must be understood that these figures are only estimates. Distances were measured by pacing. Plantations were drawn on a map which was the same scale as the maps in the master plan. After each plantation was mapped, the plantations were traced onto graph paper. Each square on the graph paper was one inch on a side and each square contained 100 smaller squares 1/10 inch on a side. Using the master plan scale of 1 inch= 300feet, I calculated that each small square contained 900 square feet. An acre is equal to 43,560 square feet. Areas were figured by multiplying the number of squares by 900 feet and dividing this amount by 43,560 feet. Estimated error in calculations - $\pm 6\%$.

AGE OF WHITE OAKS

In accordance with the Fort Necessity Master Plan, I endeavored to estimate the age of two oak trees in Section 2. The purpose of this experiment was to date these trees to see if these white oaks could have been present when George Washington and his men built Fort Necessity in 1754.

One white oak was $41\frac{1}{2}$ inches in diameter and the second and larger tree was $45\frac{9}{10}$ inches diameter. After using the increment borer on the larger specimen, I discovered that it was in an advanced stage of heart rot, making the age impossible to determine.

The smaller specimen, however, was in a better state. I took a $9\frac{1}{8}$ inch bore. By counting the growth rings, found that this particular bore was 86 years old. Measuring the growth rings in increments of ten years, I found that growth was slowing down. The first ten year period measured $11\frac{1}{16}$ inches. The sixth, seventh, and eighth increments measured $1\frac{1}{4}$ inches. Calculations show that the the large white oak could be about 200 years old. Even taking into consideration a 10% error because of poor growing seasons, the tree would not be much older than 225 years old. The battle occurred 219 years ago. It is possible that this oak was alive then, but it is not probable.

OBSERVATIONS OF WILDLIFE
FORT NECESSITY
NATIONAL BATTLEFIELD

Wildlife is abundant on the park grounds. While cruising Section 1, I found several bedding areas. Many trails left these bedding spots in all directions. The pine plantations were host to many sets of tracks. Deer trails cross fields and pine plantations in all directions. I found numerous deer droppings in several locations.

I found rabbit and deer droppings in section 2. Several sets of tracks were found along the edge of the forest and the fields. Several red squirrels were spotted in the hardwood forest at the lower end of Section 2.

Sections 3, 4, and 5 yielded red squirrel, gray squirrel and chipmunks. While traveling to the campground, I nearly ran over a groundhog. He made his way safely to a drainage ditch.

Section 1 also yielded two grouse and an undetermined variety of snake. Wildlife is truly abundant in the park.