

FOREST STEWARDSHIP PLAN

for

**Maryland Department of Natural Resources
Forest Service
Doncaster Demonstration Forest
Box 653, Carter Building
Leonardtown, MD 20650**

Location

North side of Port Tobacco Road due east of Gilroy Road, and the west side of Gilroy Road south of Gilroy Road and Port Tobacco Road intersection

MD Grid 740,000/240,000

in

Charles County

on

**1458.2 acres Woodland
3.2 acres Field
2.9 acres Food Plots
Total 1464.3 acres**

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INTRODUCTION

Doncaster Demonstration Forest is located in western Charles County bordering Port Tobacco Road to the North and South within the vicinity of Gilroy Road. The land for this forest was acquired by the State in the 1930's and was designated as a Civilian Conservation Corps (CCC) Camp. At that time the areas that are currently pine were cultivated. A small two story wood frame house on the forest served as the headquarters for the CCC Camp and eventually housed local forest rangers.

HISTORY

Forest management did not occur on the Doncaster property until 1973, prior to that the only harvesting of trees was on less than twenty one acres for pulpwood products. In 1973 a thirty- five acre regeneration harvest for pulpwood products was initiated in a stand of mature Virginia pine. Approximately twenty five acres of this first managed sale was replanted with Loblolly pine, using a mechanized woodland machine planter. This twenty five acre plantation was thinned in 2000 for pulpwood products.

In the summer of 1974 a forest inventory was completed on the property and a Forest Management Plan was prepared. From 1973 to 1984 286 acres of mature Virginia pine were harvested and reforested with Loblolly pine provided by the State Tree Nursery. In 1984 a second inventory of the forest was completed to monitor growth, establish new forest stands, determine stand volumes and monitor the overall health and forest stand dynamics. In 1992 a new Forest Management Plan was prepared following a third inventory of the forest. The most recent forest inventory was completed in the winter of 2006/2007 for this plan.

FOREST MANAGEMENT

Approximately 48% of the forest at Doncaster is comprised of hardwood species; specifically oak, yellow pine, beech and maple. Pine stands occupy 38% of the forest at Doncaster, dominated primarily with plantations of loblolly pine and scattered pockets of native Virginia pine. Mixed oak/pine stands dominated with white oak and Virginia pine complete the forest composition occupying 15% of the species composition.

In 1984 a Demonstration Forest was created in each of Maryland's four forested geographic regions. These forests were established to educate the citizens of Maryland by demonstrating sound forest management practices to help assist landowners in the decision making process in managing their own woodland.

Doncaster Demonstration Forest shall be managed using Sustainable Forestry techniques that respect the full range of environmental, social, and economic values of the forest, and seek to meet today's needs without losing any of those values. Sustainable forests maintain all components (trees, shrubs, flowers, birds, fish, wildlife, etc.) as well as ecological processes (nutrient recycling, water and air purification,

ground water recharge, etc.) so they can remain healthy and vibrant into the future. A basic part of sustainable forestry is adaptive management, which means that forest managers watch and monitor the forest carefully so that, if future conditions change and the forest shows signs of stress or decline, new management actions can help restore sustainable conditions. The management of this property is reviewed through a regional interdisciplinary team consisting of biologists, ecologists, foresters and land use planners.

A variety of silvicultural treatments has occurred on Doncaster following the second forest inventory in 1984. A detailed summary of each harvest is attached at the end of this plan.

PRESCRIBED FIRE

Prescribed fire will be used to manage stands of pine on Doncaster Demonstration Forest. Site preparation burns will be initiated as needed to prepare regenerating harvest areas for tree planting. Understory burns will be initiated in Loblolly pine stands to control hardwood.

RECREATION

Recreational opportunities on the property include hunting, hiking, horseback riding and mountain biking. There are approximately thirteen miles of trails and woods roads at Doncaster Demonstration Forest.

NATURAL AREA

A 242 acre Natural Area has been delineated on Doncaster Demonstration Forest. The conservation of biological diversity and watershed protection are issues of importance in this area. Commercial timber harvesting will not occur in this area. This area has been managed in the past and contains areas with large diameter yellow poplar trees.

This Natural Area will be protected from fire, invasive species, insects and disease. Access roads and trails will be maintained and equestrian use will be limited to designated trails.

STAND DESCRIPTION AND RECOMMENDED PRACTICES

STAND NUMBER: 1

AREA ACRES: 245.6

DOMINANT OVERSTORY SPECIES: Loblolly Pine

DOMINANT UNDERSTORY SPECIES: Sweetgum & Red Oak

TIMBER SIZE: Pole & Saw timber

AGE: Even (30 years old)

STOCKING: Adequate

BASAL AREA: 80 – 90 square feet per acre

DESIRABLE TREES: 95 % UNDESIRABLE TREES: 5%

GROWTH POTENTIAL: Good

SITE INDEX: Loblolly Pine 80

DOMINANT SOIL TYPE: Beltsville & Rumford

RECOMMENDATIONS/PRACTICES

These stands of Loblolly Pine have been mechanically thinned for pulpwood products within the past seven years. The objective of this thinning operation was to reduce the stocking level by approximately 50% in order to create the needed growing space for improved growth. Pole size trees dominate the stand with a growth rate of two inches in diameter every seven years under current conditions.

A second thinning should be initiated ten to fifteen years following the first thinning. The goal of the second thinning will be to promote the growth of saw timber size trees for the final stand. A final harvest should be initiated at when the stand is 50 – 60 years old.

STAND DESCRIPTION AND RECOMMENDED PRACTICES

STAND NUMBERS: 2

AREA ACRES: 15.7

DOMINANT OVERSTORY SPECIES: Yellow Poplar & Sweetgum

DOMINANT UNDERSTORY: American Holly

TIMBER SIZE: Pole & Small tree

AGE: Even

STOCKING: Adequate

BASAL AREA: 91 square feet per acre

DESIRABLE TREES: 75 % UNDESIRABLE TREES: 25 %

GROWTH POTENTIAL: Good

SITE INDEX: Yellow Polar 85

DOMINANT SOIL TYPES: Beltsville, Gravel, Croom & Rumford

RECOMMENDATIONS/PRACTICES

This stand of mixed poles and small trees was harvested in 1987 by the clear cut method. All trees greater than two inches at dbh were removed in order to naturally regenerate the stand. Future management activities in this stand should be to maintain or improve the pole size Yellow Poplar trees.

Sweetgum is also prevalent in this stand and should be eradicated as feasible; however, noncommercial timber stand improvement operations are expensive and time consuming. This stand would serve as an excellent demonstration area for a "crop tree release" operation favoring Yellow Poplar as the future crop tree. Allow this stand to grow another 20 – 25 years at which time an inspection should be done to assess the feasibility of initiating a commercial thinning operation.

STAND DESCRIPTION AND RECOMMENDED PRACTICES

STAND NUMBER: 3

AREA ACRES: 340.4

DOMINANT OVERSTORY SPECIES: White Oak and Red Oak

DOMINANT UNDERSTORY SPECIES: American Holly & American Beech

TIMBER SIZE: Saw timber

AGE: Even (70 - 100 years old)

STOCKING: Overstocked

BASAL AREA: 130 square feet per acre

DESIRABLE TREES: 80 % UNDESIRABLE TREES: 20 %

GROWTH POTENTIAL: Fair

SITE INDEX: 70 White Oak 65 Red Oak

DOMINANT SOIL TYPES: Beltsville & Evesboro

RECOMMENDATIONS/PRACTICES

White Oak and Red Oak occupy approximately 46 % of the species composition in this stand. Other associated species present include American Beech, Yellow Poplar, Sweetgum, Blackgum, Hickory and Red Maple. American Holly dominates a large majority of the understory with mixtures of American Beech, Red Maple, mountain laurel and Sweetgum present. Natural oak regeneration is lacking.

Approximately 71 percent of the trees in this stand are in the saw timber size class (dbh of 11.0 inches and greater measured at breast height). Approximately one fourth of the saw timber size trees are mature, greater than 24 inches at dbh. White and Red oaks sampled for growth increments showed a growth rate of two inches in diameter every twelve to thirteen years.

In order to establish advanced Oak regeneration to maintain a healthy Oak stand for the future a series of single tree selection and group selection harvests shall be initiated in this stand. Harvest areas of approximately 40 acres in size should be targeted. The goal of the harvest will be to increase advanced Oak regeneration and improve the health and vigor of the stand.

STAND DESCRIPTION AND RECOMMENDED PRACTICES

STAND NUMBER: 4

AREA ACRES: 402.8

DOMINANT OVERSTORY SPECIES: Virginia pine, White Oak & Red Oak

DOMINANT UNDERSTORY: American Holly and American Beech

TIMBER SIZE: Saw timber & Pole

AGE: Even (50 – 70 years old)

STOCKING: Adequate - Overstocked

BASAL AREA: 120 square feet per acre

DESIRABLE TREES: 85 % UNDESIRABLE TREES: 15 %

GROWTH POTENTIAL: Good

SITE INDEX: White Oak 72

DOMINANT SOIL TYPES: Croom gravelly sandy loam, Sassafras sandy loam, Elkton silt loam and Beltsville silt loam

RECOMMENDATIONS/PRACTICES

This stand of mixed pine and hardwood species is typical of Southern Maryland woodlots. The Oaks are succeeding the pines as the stand matures from a pine stand to an Oak dominated stand. White Oak and Red Oak species occupy approximately 35 percent of the species present in this stand, with Virginia pine comprising 31 % of the species composition. Other tree species present include Yellow Poplar, Sweetgum, Blackgum, Hickory, Loblolly Pine, American Beech and Red Maple.

American Holly dominates a large majority of the understory with mixtures of American Beech, Flowering Dogwood, Sweetgum and Red Maple present. Natural oak regeneration is lacking.

The timber size is predominantly saw timber and poles. Approximately 60 percent of the trees in this stand are in the saw timber size class (dbh of 11.0 inches and greater measured at breast height). The pine and oaks in this stand are increasing two inches in diameter every eighteen years under current conditions, which is poor for the species and site conditions. Pockets of mature Virginia pine are scattered throughout this stand. These pockets of pine should be harvested by removing all trees greater than two

inches at diameter breast height. These patches of pine should be reforested with Loblolly pine following a prescribed burn for site preparation purposes.

A single tree/group selection harvest should be applied in the hardwood portions of this stand to remove mature trees, culls and undesirable species. The stand stocking should not be reduced below 70 percent of the current stocking (leaving a residual basal area of 80 – 90 square feet per acre). Caution should be taken to not make any large holes in the canopy because of possible adverse effects on quality of residual stems due to epicormic branching. These guidelines will also conserve FID habitat and help decrease the regeneration of invasive exotic species in the understory by minimizing the canopy opening after the harvest. Following the initial thinning operation a firewood sale should be implemented in order to utilize the top wood.

Following the harvest the stand should be left to grow for 15 years, at which time the management recommendations should be updated.

STAND DESCRIPTION AND RECOMMENDED PRACTICES

STAND NUMBER: 5

AREA ACRES: 105.8

DOMINANT OVERSTORY SPECIES: Virginia Pine

DOMINANT UNDERSTORY SPECIES: American Holly, Sweetgum & Red Oak

TIMBER SIZE: Pole

AGE: Even (40 years old)

STOCKING: Overstocked

BASAL AREA: 145 square feet per acre

DESIRABLE TREES: 80% UNDESIRABLE TREES: 20%

GROWTH POTENTIAL: Good

SITE INDEX: Virginia Pine 80 - 85

DOMINANT SOIL TYPES: Evesboro, Beltsville, Sassafras, Rumford & Croom

RECOMMENDATIONS/PRACTICES

This stand is typical of abandoned farm land in Southern Maryland. A large majority of this stand contains areas of pure Virginia Pine, with smaller pockets of oak regeneration scattered throughout the stand. The Virginia Pine trees are stagnating in growth, increasing only two inches in diameter every fourteen years under current conditions. Approximately 75% of the stand is comprised of pole size trees (5.0 - 10.9 inches at dbh).

Virginia Pine is a short lived; shallow rooted pioneer tree species, that consistently establishes on abandoned agricultural fields. Virginia Pine is a fast growing pioneer tree species that establishes itself fairly quickly. As the stand develops into pole size trees crowding occurs which results in reduced growth rates.

Virginia Pine also has a tendency to develop Red Heart Rot (*fomes pini*) that weakens the heartwood of the tree, increasing wind throwing and breakage of the main stem.

Virginia pine also has a shallow root system that makes the species prone to wind throwing when exposed, thus eliminating thinning as a management option. In order to utilize the wood products in this stand prior to its economic demise a series of regeneration harvests should be initiated until the entire stand is treated. Harvest areas of 40 acres should be initiated.

Following the harvest the site should be prepared for planting by initiating a prescribed burn in order to eliminate the slash and Virginia Pine seed source. The site should be reforested with Loblolly pine, which is well suited for these soils.

STAND DESCRIPTION AND RECOMMENDED PRACTICES

STAND NUMBER: 6

AREA ACRES: 13.8

DOMINANT OVERSTORY SPECIES: Sweetgum, Red Maple, Red Oak and Big Tooth Aspen

DOMINANT UNDERSTORY SPECIES: Sweetgum

TIMBER SIZE: Small trees & Poles

AGE: Even (6 – 20 years old)

STOCKING: Adequate / Overstocked

BASAL AREA: 50 - 120 square feet per acre

DESIRABLE TREES: 65 % UNDESIRABLE TREES: 35 %

GROWTH POTENTIAL: Fair /Good

SITE INDEX: Yellow Poplar 80

DOMINANT SOIL TYPE: Bourne, Beltsville, Rumford & Croom

RECOMMENDATIONS/PRACTICES

This stand is made up of a variety of units scattered across the forest that include areas that have been harvested and were unsuccessfully regenerated into Loblolly Pine stands or oak stands. A few areas are the result of Gypsy Moth salvage operations

Big Tooth Aspens is prevalent in this stand. Other species present include Sweetgum, Red Oak, White Oak, Red Maple and Hickory. Allow the stand to grow undisturbed another fifteen years at which time an inspection should be done to update the management recommendations. In the past stands such as this were harvested and converted to Loblolly Pine with intense mechanical treatment, burning and herbicide treatments. It is not economically practical to peruse intense management in this stand.

STAND DESCRIPTION AND RECOMMENDED PRACTICES

STAND NUMBER: 7

AREA ACRES: 82.7

DOMINANT OVERSTORY SPECIES: Loblolly Pine

DOMINANT UNDERSTORY SPECIES: Sweetgum

TIMBER SIZE: Pole

AGE: Even (15 - 20 years old)

STOCKING: Adequate to Overstocked

BASAL AREA: 90 - 140 square feet per acre

DESIRABLE TREES: 75 % UNDESIRABLE TREES: 20 %

GROWTH POTENTIAL: Good

SITE INDEX: Loblolly Pine 98

DOMINANT SOIL TYPES: Bibb, Evesboro & Beltsville

RECOMMENDATIONS/PRACTICES

This stand consists of Loblolly Pine plantations that were planted 15 to 20 years ago. Most of these areas were previously mature stands of Virginia Pine that were harvested and reforested with seedling stock from the State Nursery.

The principles of pine plantation management are not greatly different from those affecting other agricultural crops. Trees, like other crops, require light, water, nutrients, space, and protection from insects and diseases. The major difference is the length of time required to reach maturity. It has been determined that the greatest period of height growth is between ages 10 and 30. Foresters try to maximize this growth through thinning.

The rate of diameter growth on individual stems and of stand development differs considerably with spacing. Both the rate of diameter growth and stocking (basal area) are greater at wider spacing than at narrow spacing.

It is generally accepted that the first thinning should be delayed until revenue received from the trees removed will pay the cost of the operation, in order to eliminate a deficit timber sale. Hence, the first thinning is usually made when the trees reach pulpwood

size, about 6 - 10 inches in diameter at breast height. The trees will normally be between 25 - 30 years old when they reach this size.

The result of any thinning operation should be to provide more growing space for the well formed, fast growing trees; while harvesting trees that are diseased, damaged or poorly formed and those that are not anticipated to live until the next scheduled harvest.

In pine plantations a method known as a Modified Row Thinning should be initiated in which every third or fourth row is removed to provide access to the stand and intermediate rows are thinned by individual tree selection. The intermediate rows of pine that have an average total height of 55-65 feet at the time of thinning should be selectively thinned to a residual basal area of 90 -100 square feet per acre. All trees to be removed must be selected and marked by a forester prior to harvesting.

Insect problems intensify as stands become crowded and vigor declines. Southern pine beetle infestations have long been associated with high stand density. Research indicates that silvicultural techniques such as thinning offer the most promising and lasting means of preventing this situation. These pine plantations should be managed for pulpwood and saw log products. Silvicultural treatments are recommended to achieve maximum growth and utilization of the stand.

At this time a thinning program should be initiated in each unit as it becomes economically viable. Thinning units should be at least 50 acres in size to be economically viable.

STAND DESCRIPTION AND RECOMMENDED PRACTICES

STAND NUMBER: 8

AREA ACRES: 3.5

DOMINANT OVERSTORY SPECIES: Loblolly Pine

DOMINANT UNDERSTORY SPECIES: American Beech

TIMBER SIZE: Pole

AGE: Even (20 years old)

STOCKING: Overstocked

BASAL AREA: 200 - 240 square feet per acre

DESIRABLE TREES: 80 % UNDESIRABLE TREES: 20%

GROWTH POTENTIAL: Good

SITE INDEX: Loblolly Pine 90

DOMINANT SOIL TYPE: Beltsville & Rumford

RECOMMENDATIONS/PRACTICES

This Loblolly Pine Seed Tree area was harvested in 1987. Eight to fourteen trees per acre were left as seed trees. Several of the Seed trees have blown down over the years and the new stand of Loblolly Pine is severely overstocked and stagnant in growth. The trees are increasing two inches in diameter every thirteen years under current conditions

In order to improve the growing conditions of the new stand the Seed trees should be harvested and the new stand thinned as recommended in stand number seven. The poles are small diameter and may be difficult to market; however, a thinning is necessary to revive the stand. This operation should be initiated as soon as possible.

STAND DESCRIPTION AND RECOMMENDED PRACTICES

STAND NUMBER: 9

AREA ACRES: 51.9

DOMINANT OVERSTORY SPECIES: Sweetgum and Yellow Poplar

DOMINANT UNDERSTORY SPECIES: American Holly & Sweetbay Magnolia

TIMBER SIZE: Saw timber

AGE: Even (70 – 100 years old)

STOCKING: Adequate - Overstocked

DESIRABLE TREES: 80% UNDESIRABLE TREES: 20%

GROWTH POTENTIAL: Good

SITE INDEX: Yellow Poplar 90

DOMINANT SOIL TYPE: Bibb silt loam and Croom sandy loam

RECOMMENDATIONS/PRACTICES

This stand encompasses the riparian areas within the Reeder Run and Beaver Dam Creek watersheds at Doncaster. Sweetgum and Yellow Poplar dominate the stand with mixtures of Red Maple, Swamp Chestnut Oak, White Oak and American Beech present. Non-tidal wetlands and hydric solis are also present in these watersheds. The Beaver Dam drainage area portion of this stand lies upstream from the Natural Area on South Doncaster. Access to this stand with heavy equipment should be minimized in order to avoid soil compaction and damage to the hydrology of the stream drainage areas.

In order to protect the water quality of the sub watersheds on Doncaster this stand should be maintained in its undisturbed condition as a forest buffer. The forest floor within and adjacent to the riparian areas remove sediments, nutrients and potentially harmful or toxic substances in runoff entering the watershed. Best Management Practices shall be incorporated into all forest harvest operations that encompass hydric soils or non tidal wetlands.

Allow this stand to grow undisturbed another fifteen years to function as a forest buffer that will provide riparian wildlife habitat and filter overland run off. Re-examine the entire stand in fifteen years to update the management recommendations.

STAND DESCRIPTION AND RECOMMENDED PRACTICES

STAND NUMBER: 10

AREA ACRES: 64.7

DOMINANT OVERSTORY SPECIES: Virginia Pine & Loblolly Pine

DOMINANT UNDERSTORY SPECIES: American Holly & Sweetgum

TIMBER SIZE: Pole

AGE: Even (25 years old)

STOCKING: Overstocked

BASAL AREA: 175 square feet per acre

DESIRABLE TREES: 80% UNDESIRABLE TREES: 20%

GROWTH POTENTIAL: Good

SITE INDEX: Loblolly Pine 85

DOMINANT SOIL TYPES: Beltsville silt loam and Mattapeake fine sandy loam

RECOMMENDATIONS/PRACTICES

The units that make up this stand were harvested 30 years ago and reforested with Loblolly pine. Virginia Pine and Loblolly pine are evenly distributed throughout this stand with pockets of pure Loblolly pine present as well. The pine in this stand is increasing two inches in diameter every twelve years under current conditions.

The best management for this stand will be a combination of thinning the Loblolly pine and regenerating the mixed pine areas. Following the harvest if feasible the regeneration areas should be planted with Loblolly Pine after a prescribed burn is completed to eliminate the slash and Virginia Pine seed source.

STAND DESCRIPTION AND RECOMMENDED PRACTICES

STAND NUMBERS: 11

AREA ACRES: 23.4

DOMINANT OVERSTORY SPECIES: Sweetgum, Yellow Poplar and Red Maple

DOMINANT UNDERSTORY: American Holly

TIMBER SIZE: Pole

AGE:

STOCKING:

BASAL AREA: 70 square feet per acre

DESIRABLE TREES: 75 % UNDESIRABLE TREES: 25 %

GROWTH POTENTIAL: Fair/Good

SITE INDEX: 68 White Oak

DOMINANT SOIL TYPES: Beltsville, Gravel, Croom & Rumford

RECOMMENDATIONS/PRACTICES

This stand of mixed hardwoods has experienced mortality from Gypsy Moth infestation. Several standing dead Oaks remain in the stand. The dead Oaks in this stand are not salvageable at this time and shall be left to decompose naturally. Red Oak and White Oak comprise ten percent of the stand at this time. This stand shall be left to develop naturally to monitor the long term effects of Gypsy Moth defoliation.

NATURAL RESOURCE PROTECTION

GYPSY MOTH

The Gypsy Moth has been a major problem in the Northeastern U.S. since 1869. Over the years it has become a primary defoliator of hardwood trees in Maryland. Several factors determine the likelihood of a woodlot being infested by the Gypsy Moth. The type of trees present is one factor. Oak are among the most preferred species, also favorable are Sweetgum, Blackgum, Dogwood, Hickory, Maple and Pine. Least preferred species include American Holly, American Sycamore, Ash, Black Locust, and Yellow Poplar.

The condition of the woodland is also important. Areas with a considerable percentage of cull, damaged and deformed trees are highly susceptible. These conditions provide structural refuges which provide hiding places for larvae, pupae and eggs.

If a stand is attacked by Gypsy Moth, its vulnerability will determine the amount of mortality. Trees in stress conditions, (overcrowded, over-mature, overtopped, damaged), are highly vulnerable.

Good forest management can reduce the susceptibility of your woodlot to attacks by Gypsy Moth. Thinning can be used to reduce the amount of structural refuges and the percentage of preferred food species present in your woodland. Maintaining a healthy, vigorous forest is the best tool in controlling susceptibility and reducing vulnerability.

SOUTHERN PINE BARK BEETLE

The Southern Pine Bark Beetle attacks live trees by boring through the bark where eggs are laid. Trees attacked by the Pine Bark Beetle are girdled as the beetle constructs its egg galleries in the phloem layer of the inner bark.

As a general rule, pine bark beetles attack trees that are dying or in a state of decline due to a variety of stress factors such as drought, mechanical injury, compaction of soil in the root zone, smog, root rot, etc. Damage from the beetle can be identified by the red needles from the dying crown, reddish brown particles of boring dust at the base of the tree, pitch tubes in boring holes and S-shaped galleries on the inner side of the bark.

Prompt salvage of infested trees is the cheapest and often the most practical method of control. If infested trees remain in the stand an even greater number of trees may be destroyed by the next generation of beetles. Salvage will help reduce losses until natural factors supplemented by forestry treatments, such as thinning; improve the health and vigor of trees.

WILDFIRE PROTECTION

Doncaster Demonstration Forest has an established road system and several hiking trails that are accessible for fire suppression equipment by the Forest Service. The boundary lines are also fairly accessible for fire suppression activities. The continued maintenance of roads and fire lines is a timely and costly chore on the forest; however, access is essential for suppression of wildfires. A Fire Suppression Plan has been prepared for this tract in order to provide additional details for direct and indirect attack methods of fire suppression.

FOREST INTERIOR DWELLING BIRDS TIMBER HARVEST GUIDELINES FOR FIDS HABITAT

The forested area on the project site contains Forest Interior Dwelling Bird habitat. Populations of many Forest Interior Dwelling Bird species (FIDS) are declining in Maryland and throughout the eastern United States. The conservation of this habitat is strongly encouraged by the Department of Natural Resources. The following guidelines give highest priority and the greatest protection to the following habitats: riparian forests (including floodplain or bottomland forests), mature to over mature forests in coves and ravines, and over mature forests in upland areas not associated with coves and ravines.

1. Timber harvesting should not result in the creation of any new permanent forest openings (e.g. as a result of logging roads, landing areas, wildlife food plots, etc.)
2. No timber harvesting should occur within the buffer of any perennial tidal or non-tidal streams, as indicated on USGS 7.5 minute topographic maps.
3. Encourage the use of single-tree selection with the retention of 70% or greater forest canopy closure in the following areas:
 - a. Mature to over mature upland hardwood and mixed hardwood-pine forests
 - b. Within 150 feet of intermittent streams if high quality FIDS habitat is present
 - c. Forested coves and ravines containing high quality FIDS habitat
4. Avoid timber harvesting between April 1-July 31, the breeding season for most FIDS.
5. Encourage the retention of at least 8 snags per acre (each 8 inches dbh or greater) in timber harvest areas. The largest snags possible should be selected for retention. Groups of snags should be favored over scattered isolated snags. In clear cuts where insufficient densities of size classes of snags are present, live trees (e.g. such as trees with relatively little merchantable value) of a similar minimum size and density should be frilled or girdled and left standing.
6. Encourage the retention of dead and downed woody debris on the forest floor. Slash should be left lying and not placed in windows or brush piles. Clean, park-like conditions should be avoided.

7. Regarding logging roads and trails:

- a. Woods road maintenance should be kept to the minimum that will allow access for fire suppression and future management activities.
- b. Maintain forest canopy closure over roads (i.e. do not daylight).
- c. Road widths should be less than 15 feet.
- d. Avoid maintaining grassy roadbeds and berms.
- e. If '12d' is unavoidable, maintain at least 10 inches of grass height throughout the FIDS breeding season (April 1-July 31).
- f. Where possible, allow logging roads to succeed to native forest vegetation.

NON-TIDAL WETLANDS/ BEST MANAGEMENT PRACTICES

Non-tidal wetlands (wetlands not adjacent to tidal waters) are found all across the state. These wetlands include marshes, bogs, and swamps, and may include other areas that are only flooded or saturated for fairly short periods of time. Non-tidal wetlands are delineated on the ground by the presence of wetland hydrology, wetland soils, and wetland vegetation. Many of these wetlands are forested.

These wetland areas often provide important benefits such as water quality improvement, flood control, natural products for human use, forest products and aesthetic and recreational opportunities. They also provide habitat for a wide variety of plants and animals, many of which depend on wetlands for all or part of their life cycle.

Activities in non-tidal wetlands, such as excavation, filling, draining, or other activities which may change the water level will require a permit issued by the Maryland DNR - Water Resources Administration. Forestry practices do not require a non-tidal wetlands permit from the Department of Natural Resources if the land use remains as forestry. Forestry activities are planting, cultivating, thinning, harvesting or any other activity undertaken to use the forest resources or to improve their quality or productivity. Activities that change non-tidal wetlands to another land use, including but not limited to agriculture or development, are not forestry activities.

The non-tidal wetland regulations require that Best Management Practices (BMPs) to protect non-tidal wetlands be incorporated into the sediment and erosion control plan required for forest harvest operations. The sediment and erosion control plan must be prepared by a registered professional forester. These Best Management Practices or "BMPs", which describe how certain operations should be carried out, must be used to prevent or minimize any adverse impacts on water quality or the functional characteristics of the wetland.

Best Management Practices are conservation measures that:

- * Control soil loss and sediment deposition in non-tidal wetlands
- * Minimize water quality degradation caused by sediment

- * Minimize adverse impacts to circulation patterns or flow of surface water or ground water
- * Minimize any adverse impact to the chemical, physical or biological characteristics of non-tidal wetlands
- * Prevent non-tidal wetlands from being changed to upland or any other area that no longer meets the non-tidal wetland definition

Examples of BMPs include:

- * Designing stream crossings to have the shortest distance feasible
- * Locating roads and log decks on upland areas to minimize adverse wetland impacts
- * Harvesting with specialized equipment such as high flotation equipment when non-tidal wetland soils and hydrology have the potential to be adversely affected
- * Using mats or similar temporary structures to reduce compaction or rutting
- * Conduct forest harvest operations during dry seasons
- * Follow natural contours of the land, whenever feasible

Hydric Soils:

The Beltsville and Bibb series soils are classified as hydric soils. A hydric soil is a soil that, in its undrained condition, is saturated, flooded, or ponded long enough during the growing season to favor the growth and regeneration of hydrophytic vegetation. Best management practices (BMPs) should be used when a timber harvest is initiated in these soils.

STREAM SIDE MANAGEMENT ZONES

Doncaster Demonstration Forests contains several intermittent and perennial streams. In order to protect the water quality of the Potomac River watershed forest buffers shall be established according to the guidelines established by the Maryland Department of Environment under the "Standard Erosion and Sediment Control Plan for Forest Harvest Operations in Maryland."

Forest Buffers shall be established on all sides of perennial or intermittent streams, rivers, lakes, ponds, bogs or marshes. The minimum buffer zone shall be 50 feet. This applies to land with no slope. Where slope is encountered the following table shall be adhered to:

Average Percent Slope to Watercourse	Width of Buffer (feet) on each side of water course
1 – 10	75
11-20	100
21-30	150
31-40	200
41+	250

MARYLAND SEED TREE LAW

Several stands on this forest fall under the provisions of the Maryland Seed Tree Law. The seed tree law requires the reforestation of loblolly pine, pond pine, or shortleaf pine that is commercially harvested from 5 acres or more of land where these species singly or together occur and constitute 25% or more of the live trees on each acre. Before any harvesting can begin eight seed trees (cone bearing) 14 inches or larger in diameter must be marked to be retained on each acre, if trees 14 inches or larger are not present then two trees of the next largest diameter must be retained for each tree not present. If seed trees are not left a reforestation plan must be approved by the Maryland DNR- Forest Service. DNR Seed Tree Law form 362 must be submitted to the local DNR-Forest Service office with the Pine Reforestation Plan attached. The reforestation plan must provide for reforestation other than by natural seeding.

FOREST SOILS

Stand # 1: Beltsville, Gravel, Croom & Rumford

Stand #2: Beltsville & Evesboro

Stand #3: Bibb, Evesboro & Beltsville

Stand # 4: Beltsville & Rumford

Stand #5: Evesboro, Beltsville, Sassafras, Rumford & Croom

Stand # 5a: Rumford, Sassafras & Evesboro

Stand #6: Croom, Bibb, Gravel & Chillum

Stand #7: Bibb, Croom, Gravel & Evesboro

Stand #8: Bourne, Beltsville, Rumford & Croom

Stand #9: Beltsville

Stand # 10: Bibb & Swamp

Stand # 11: Beltsville

Fields: Rumford

The Beltsville and Bourne series soils are moderately well-drained. They are level to moderately sloping and have slopes of no more than 12 percent. These soils are moderately productive but have moderate to severe limitations to heavy equipment because of seasonal wetness or the presence of a high water table. Seedling mortality and plant competition for woodland species are severe on some of these soils. In a normal stand 50 years of age, the average annual growth in board feet of timber per acre is 200 for mixed Oaks, 470 (or 1 cord of pulpwood) for Loblolly Pine and 1.1 cords of pulpwood for Virginia Pine.

Yellow-Poplar is not well suited to most of these soils. Some areas have fairly good stand of Sweet Gum or Red Maple and no reliable estimates of yields on these soils are available. Although few native stands of Loblolly Pine grow on the soils, these soils are well suited for this species.

The Bibb series soils are highly productive but have a moderate to severe limitation to heavy equipment because of seasonal wetness or the presence of a high water table. Seedling mortality and plant competition for woodland species are severe on some of these soils. The hazard of flooding is severe on Bibb soils and on Alluvial land. In a normal stand 50 years of age, the average annual growth in board feet of timber per acre is 275 for mixed Oaks, and about 680 (or 1.3 cords of pulpwood) for Loblolly Pine

Some areas of these soils have good natural stands of Yellow-Poplar, Sweet Gum, or Red Maple, but no estimates of yields are available. Virginia Pine is seldom found on these soils.

The Gravelly Land, Steep series is well drained to excessively drained and has a slope ranging from 15-50 percent. It is low in productivity because of the very low available moisture capacity caused by the excess gravel. In a normal stand 50 years of age, the average annual growth in board feet of timber per acre is 125 for mixed Oaks and 0.6 cords of pulpwood for Virginia Pine.

In places, Yellow-Poplar thrives well. Otherwise, the soil in this series is poorly suited to the production of other timber trees.

The Evesboro series soils are excessively drained or somewhat excessively drained and in places they have slopes of more than 40 percent. They are moderately productive, but have moderate to severe limitations to heavy equipment because of sandiness or slope. Seedling mortality is moderate because of seasonal droughtiness. In a normal stand 50 years of age, the average annual growth in board feet of timber per acre is 200 for mixed Oaks, 470 (or 1 cord of pulpwood) for Loblolly Pine and 1.1 cords of pulpwood for Virginia Pine.

The Chillum, Sassafras and Rumford series soils are well-drained, moderately well-drained or somewhat excessively drained and have a slope of no more than 15 percent. The soils are moderately productive and have no significant limitations to woodland use and management. In a normal stand 50 years of age, the average annual growth in

board feet of timber per acre is 200 for mixed Oaks, 470 (or 1 cord of pulpwood) for Loblolly Pine, 350 for Yellow Poplar, and 1.1 cords of pulpwood for Virginia Pine.

The Croom series soils are well-drained and have slopes of no more than 15 percent. These soils are poor in woodland productivity and have a limited rooting zone that is underlain by extremely hard, massive, gravelly subsoil. Roots anchor well into the subsoil but do not penetrate deeply enough to utilize most of its moisture. In a normal stand 50 years of age, the average annual growth in board feet of timber per acre is 125 for mixed Oaks and 0.6 cords of pulpwood for Virginia Pine.

The Swamp series consists of a very wet land that is covered by fresh water most of the time. A few tree species grown in these soils are suitable for wood products but the trees generally have little value for commercial purposes.

The Beltsville, Swamp, Bourne and Bibb series soils are classified as hydric soils. A hydric soil is a soil that, in its undrained condition, is saturated, flooded, or ponded long enough during the growing season to favor the growth and regeneration of hydrophytic vegetation. Best management practices (BMPs) should be used when a timber harvest is initiated in these soils.

FOREST MANAGEMENT PRACTICE SCHEDULE

Completion Date	Practice	Compartment	Stand	Acres
2009 DO-1-09	Thinning	3, 5	7 & 10	42.9
2009 DO-2-09	Regeneration Harvest Site Preparation Reforestation	3	4 & 10	42.7
2010 DO-1-10	Thinning	2, 3, 4	7	45.7
2010 DO-1-10	Regeneration Harvest	3, 4	5	5.5
2011 DO-1-11	Single Tree/Group	2	3	40.0
2012 DO-1-12	Thinning	2	7	42.8
2013 DO-1-13	Thinning	6	7, 10	33.4
2013 DO-1-13	Regeneration Harvest Site Preparation Reforestation	6	5	4.2
2013 DO-2-13	Single Tree/Group	3	3	40.0
2015 DO-1-15	Single Tree/Group	1	3	40.0
2015 DO-2-15	Thinning	1, 3, 4, 5	1, 7	74.5
2018 DO-1-18	Thinning	8	1, 7	43.0
2020 DO-1-20	Thinning	4	1	48.0
2021 DO-1-21	Thinning	9, 10	1	47.4
2021 DO-2-21	Regeneration Harvest Single Tree/Group Site Preparation Reforestation	10	4	30.0
2022 DO-1-22	Thinning	9	1	30.0
2022 DO-1-22	Regeneration Harvest Site Preparation Reforestation	10	5	12.9
2027 DO-1-27	Regeneration Harvest	3	3C	20.0
2027 DO-2-27	Single Tree/Group	2	3A	20.0
2030 DO-1-30	Regeneration Harvest	3	5	25.0
Continuous	Road/Trail Maintenance Fire Protection Boundary line Maintenance	All	All	