

EASTERN REGION
STATE FOREST LANDS
ANNUAL WORK PLAN

FISCAL YEAR 2013



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5/10/12
Date

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5/15/12
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Citizens Advisory Committee



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ANNUAL WORK PLAN SUMMARY

This document summarizes the proposed activities that will occur on all public forest lands (84,752 acres) managed by the Maryland Forest Service within the Eastern Region during the 2013 fiscal year. These lands include the Chesapeake Forest, Pocomoke State Forest, Wicomico Demonstration Forest and the Seth Demonstration Forest. The fiscal year runs from July 1, 2012 to June 30, 2013. The following proposed activities are the results of a multi-agency effort. The multi-agency approach has ensured that all aspects of these lands have been addressed within the development of this plan.

Plan Activities

Network with Maryland DNR agencies:

- Wildlife & Heritage – Identify and develop restoration projects, report and map potential Ecological Significant Areas (ESA) as found during fieldwork, release programs for game and non-game species. Mapping will be done with Global Positioning Systems (GPS). Participates on the Inter-Disciplinary Team (ID Team) and assists in the development of a forest monitoring program.
- Natural Resource Police – Enforcement of natural resource laws on the forest.
- Public Lands Policy & Planning – Provides assistance in the development of plans, facilitates meetings with various management groups, develops Geographic Information System (GIS) maps for public review, and conducts deed research and boundary recovery. Also participates on the ID Team.
- Maryland Conservation Corps (MCC) – Assists in painting boundary lines, installing gates and trash removal.
- State Forest & Park Service – Participates on the ID Team.
- Chesapeake & Coastal Watershed Service – Develops watershed improvement projects, assists in the development of a forest monitoring programs and participates on the ID Team.

Network with other agencies:

- DNR Contract Manager – Assists the Forest Manager in the designs and implementation of management activities on the donated portion of the forest. Also participates on the ID Team.
- Sustainable Forestry Initiative (SFI) – Provides third party forest certification by conducting annual audits.

- Forest Stewardship Council (FSC) – Provides third party forest certification by conducting annual audits.
- The Chesapeake Bay Foundation – Identifies sites for future water quality improvement projects and assists in the implementation by providing volunteers for reforestation.
- National Wild Turkey Federation – Establishes and maintains handicap-hunting opportunities within the forest and provides funding for habitat protection and restoration.
- US Fish & Wildlife Service – Assists in prescribed burns for Delmarva Fox Squirrel (DFS) habitat. Also assists in maintaining open forest road conditions as fire breaks.
- Maryland Forest Association - Master Loggers Program provides training in Advanced Best Management Practices for Forest Product Operators (i.e. Foresters & Loggers) workshops on the forest.

Network with Universities and Colleges:

- Maryland Environmental Lab, Horn Point – Conducts water quality monitoring on a first order stream not influenced by agriculture. These samples will serve as a local base line for other samples taken on other Delmarva streams.
- Allegany College – Conduct annual field tour for forestry school student’s showcasing Sustainable Forest Management practices on the forest under dual third party certification.

Maintenance:

- Forest roads will undergo general maintenance to maintain access for forest management activities (i.e. logging, prescribed burning and wildfire control). Interior roads within each complex will be brush hogged where possible by the MFS & the WHS. Many of the roads have grown shut and require special heavy equipment to remove the larger trees. Brushing of these roads will improve access for the public and help maintain firebreaks for communities at risk from wildfire.
- Forest boundary lines will continue to be converted from the old Chesapeake Corporation white square markings to the DNR yellow band markings. Signs will be placed along the boundary lines designating they type of public access to the property.
- Illegal trash dumps will continue to be removed off the forest as they are discovered. The average amount of trash removed from the forest each year has been 36 tons.

Recreation:

- Develop, improve and post public parking areas for the 46,000 acres designated for public use.
- Host the annual Chesapeake Forest lottery for vacant tracts designated for hunt club access only. Vacant tracts are those that existing clubs opted not to continue to lease or land that has recently become available due to acquisition or right-of-ways being opened.
- Continue to explore additional Resource Based Recreational (RBR) opportunities on the forest. This may include hunting, horseback riding; water trails, hiking trails, bird watching opportunities, Geocaching, etc.

Special Projects:

- Maintain dual forest certification from the Forest Stewardship Council (FSC) and the Sustainable Forest Initiative (SFI).
- Conduct information and educational opportunities on the forest.
- Update and maintain forest information in a GIS database, which will result in a new updated forest wide field map.
- Continue the effort to inventory and protect historic sites (i.e. cemeteries, old home sites, Native American Indian sites) using GPS and GIS technology.
- Collect native genotype pond pine (*Pinus serotina*) and short-leaf pine (*Pinus echinata*) on the forest in an effort to aid future management objectives on the Pocomoke and Chesapeake Forests.
- Provide assistance to the State Tree Nursery with maintenance of Seed Orchards on the Pocomoke State Forest.

Silvicultural Activity Overview

Table 2 summarizes the proposed silvicultural activities for the 2013 annual work plan on approximately 1,434 acres (1.7%) of the Regional State Forests.

Table 2. 2013 Silvicultural Activity Overview.

Activity	Acres
Final Harvest	230.4
Variable Retention Harvest	38.4
Seed Tree Harvest	22.4
1st Commercial Thinning	739.5
2nd Commercial Thinning	174.6
Pre-Commercial Thinning	203.6
Invasive Spray	24.9
Total	1433.8

The following is a list of definitions of proposed management activities that occur within this plan:

Reforestation – Reforestation reestablishes forest cover either naturally or artificially (hand planting), and is usually accompanied by some kind of site preparation during the same fiscal year. The nature of the site preparation will be determined by field examination. It is almost always followed, in the same fiscal year, with grass control in the form of chemicals (hand-applied by ground crews). Site conditions will dictate application rates, etc., in each case.

Site Preparation/Regeneration - While natural regeneration is the preferred method of reforesting harvested areas, alternative plans should be in place in case natural regeneration is unsuccessful. Alternatives include prescribed burning, herbicide, light mechanical disturbance, or a combination thereof followed by planting of native pines or hardwoods as the management zone dictates.

Pre-Commercial Thinning – Pre-commercial thinning is the removal of trees to reduce overcrowded conditions within a stand. This type of thinning concentrates growth on more desirable trees while improving the health of the stand. This treatment is usually done on stands 5 to 10 years of age. The number of trees retained will depend on growth, tree species present, and site productivity. This activity is conducted with hand held power tools and not heavy equipment, thereby reducing adverse impact to the soil.

First Commercial Thinning – Usually performed on plantations 15-20 years old. The objective is to facilitate forest health and promote development of larger trees over a shorter period of time. This is accomplished in plantations by removing every 5th row of trees and selectively thinning (poor form & unhealthy trees) between rows. In naturally regenerated stands, thinning corridors will be established every 50 feet and the stand will be selectively

thinned along both sides of the corridor. Approximately 30-35% of the total stand volume will be removed in this process.

Second Commercial Thinning - Usually performed on stands 30-40 years old. The objective is to lengthen the rotation age of the stand and produce larger healthier trees. In some cases, this technique is used to improve habitat for the Delmarva Fox Squirrel (DFS) and Forest Interior Dwelling Species (FIDS). Approximately 30-35% of the total stand volume will be removed in this process.

Selection Harvest – This includes the removal of single trees and groups of trees within a given stand. This method will be used to distribute age classes and to adjust species composition within a given stand (i.e. riparian buffers, ESA's, DFS & FID areas).

Shelterwood Harvest – The shelterwood method involves the gradual removal of the entire stand in a series of partial cuttings that extend over a fraction of the rotation (Smith 1986). The number of trees retained during the first stage of the harvest depends on the average tree size (diameter at breast height) on the site. As with seed tree regeneration, the shelterwood method works best when overstory trees are more than 30 years old and in their prime period of seed production potential (Schultz 1997).

Seed Tree Harvest – This type of harvest is designed to regenerate pine on the site by leaving 12 to 14 healthy dominant trees per acre as a seed source. The seed trees are typically left on the site for another rotation. The seed tree method regenerates loblolly pine effectively and inexpensively in the Coastal Plain, where seed crops are consistently heavy (Schultz 1997).

Variable Retention Harvest – This harvest type focuses on the removal of approximately 80 percent of a given stand in one cutting, while retaining approximately 20 percent as wildlife corridors/islands, visual buffers and legacy trees. The preferred method of regeneration is by natural seeding from adjacent stands, or from trees cut in the clearing operation. Coarse woody debris (slash/tree tops) is left evenly across the site to decompose. A Variable Retention Harvests (VRH) is prescribed to help regulate the forest growth over the entire forest, ensuring a healthy and vigorous forest condition. Harvesting of young loblolly pine stands is done to help balance the age class distribution across the forest. Currently, 50% of the forest is 19 years of age or younger. VRH are also used to regenerate mixed natural stands within ESA's, DFS & Core FIDS areas. If adequate natural regeneration is not obtained within 3 years of the harvest, hand planting of the site is typically required (not required for certain restoration projects, such as bay restoration).

Aerial Release Spraying - An aerial spray of herbicide is used to reduce undesirable hardwood species (i.e. sweet gum & red maple) within the stand. In many cases, a reduced rate (well below the manufactures recommendation) is used. A reduced rate has been used on the CF successfully to kill the undesirable species while maintaining the desirable ones (yellow poplar & oaks). All forms of aerial spraying are based on precision GPS mapping and accompanied by on-board flight GPS controls. GPS-generated maps shows each pass of the aircraft and are provided by the contractor to demonstrate precision application. Aerial applications are not

allowed over High Conservation Value Forest (HCVF) areas, riparian buffers or wetland areas on the forest.

Prescribed Fire – Prescribed fires are set deliberately by MFS personnel, under proper weather conditions, to achieve a specific management objective. Prescribed fires are used to enhancing wildlife habitat, encouraging fire-dependent plant species, reducing fuel loads that feed wildfires, and prepare sites for planting.

Riparian Buffer Zone Establishment – Riparian buffer zones are vegetated areas adjacent to or influenced by a perennial or intermittent bodies of water. These buffers are established and managed to protect aquatic, wetland, shoreline, and/or terrestrial environments and ultimately the Chesapeake Bay. Boundaries of riparian buffer zones will be marked, surveyed (GPS) and mapped (GIS). Selective harvesting and/or thinnings may occur in these areas to encourage a mixed hardwood-pine composition.

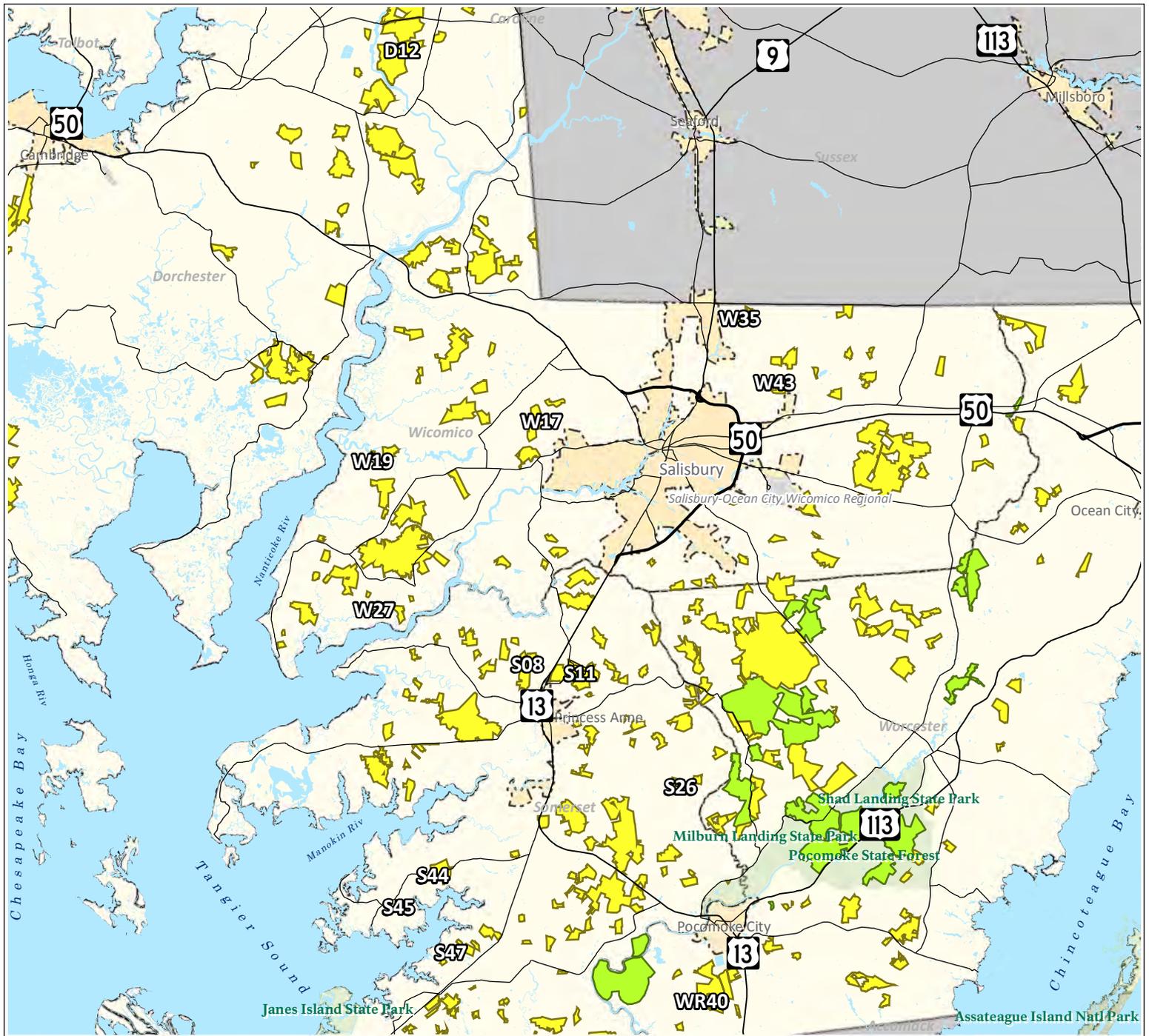
Literature Cited

Schulz, Robert P. 1997. The Ecology and Culture of Loblolly Pine, Loblolly Pine, U.S. Gov. Printing Office, Washington, D.C. 5-13, 5-14 pp.

Smith, David M. 1986. The Practice of Silviculture. Wiley, New York. 403 pp.

Wenger, Karl F. 1984, Forestry Handbook, For the Society of American Foresters, Wiley, New York. 418 pp.

**Locations & Descriptions
Of
Silvicultural Activities**



Chesapeake Forest

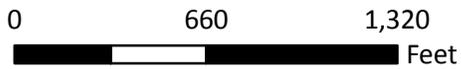
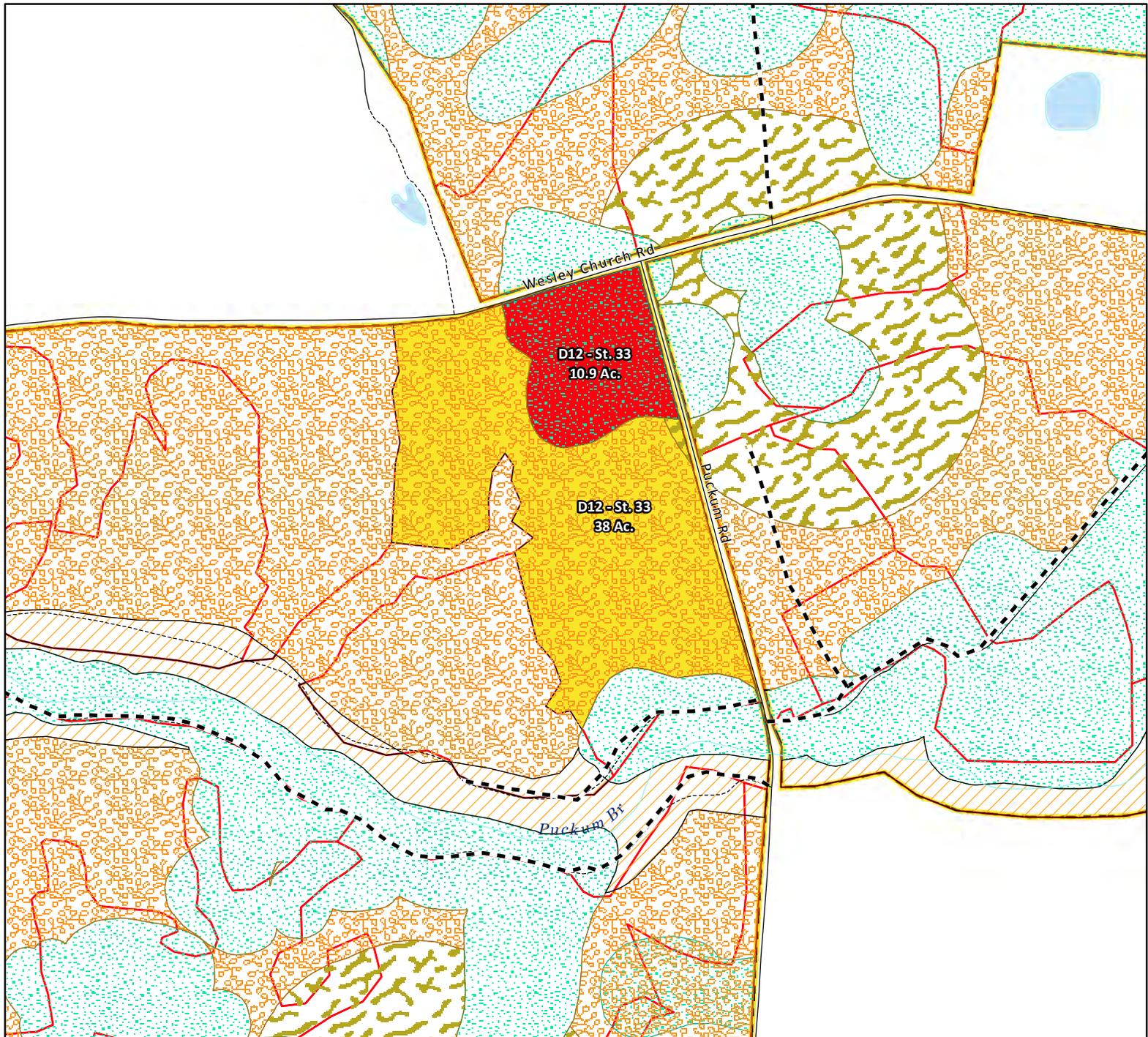
FY2013 Annual Work Plan Sites

Description of 2013 Activities – Dorchester County

Complex D12 – Marshy Hope

A final harvest is proposed for a portion of stand 33. The final harvest area is 10.9 acres and is located within an ESA Zone 1 Management Area. This stand was planted in 1991.

A first thinning is proposed for a portion of stand 33. The thinning area is a 53.2 acre loblolly pine plantation that was planted in 1991. This stand is located within an ESA Zone 3 Sawtimber Management Area.



2013 AWP Stands

-  Final Harvest
-  Seed Tree
-  Pre-Commercial Thinning
-  1st Thinning
-  2nd Thinning
-  Invasive Spray

Management Zones

-  DFS
-  ESA Zone 1
-  ESA Zone 2
-  ESA Zone 3 Pulpwood
-  ESA Zone 3 Saw Timber
-  FIDS
-  G3
-  Stream Buffer

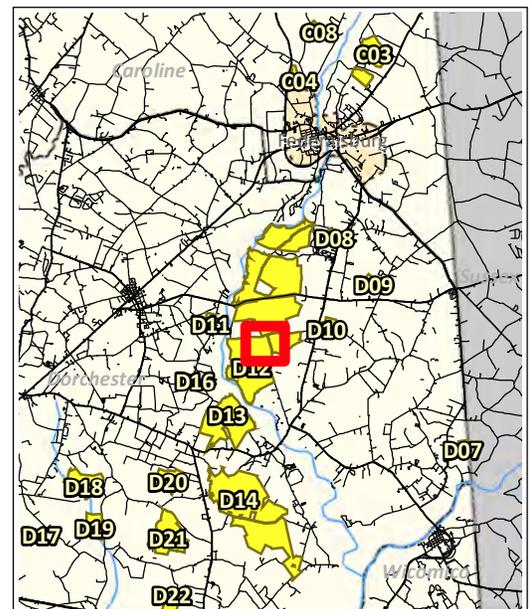
Cheapeake Forest

D12 - Marshy Hope Complex

Final Harvest - 10.9 Acres

First Thinning - 38.0 Acres

ASC-DNR Forest Service 5/2011



Description of 2013 Activities – Wicomico County

Complex W17 – R.F. Richardson

A final harvest is proposed for stand 1. Stand 1 is a 23 acre loblolly pine plantation, established in 1970, first thinned in 1994, and second thinned in 1999. This stand is located within the General Management Area. Planting and site prep will occur if the site fails to regenerate naturally.

Complex W19 – Kings Misfortune

A pre-commercial thinning is proposed for stand 7. Stand 7 is a 48.1 acre loblolly pine stand that naturally regenerated in 2004. This stand is located in a DFS Future Core Management Area. Any oak regeneration will be retained.

Complex W27 – Cox

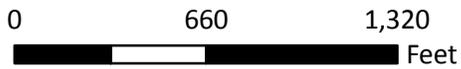
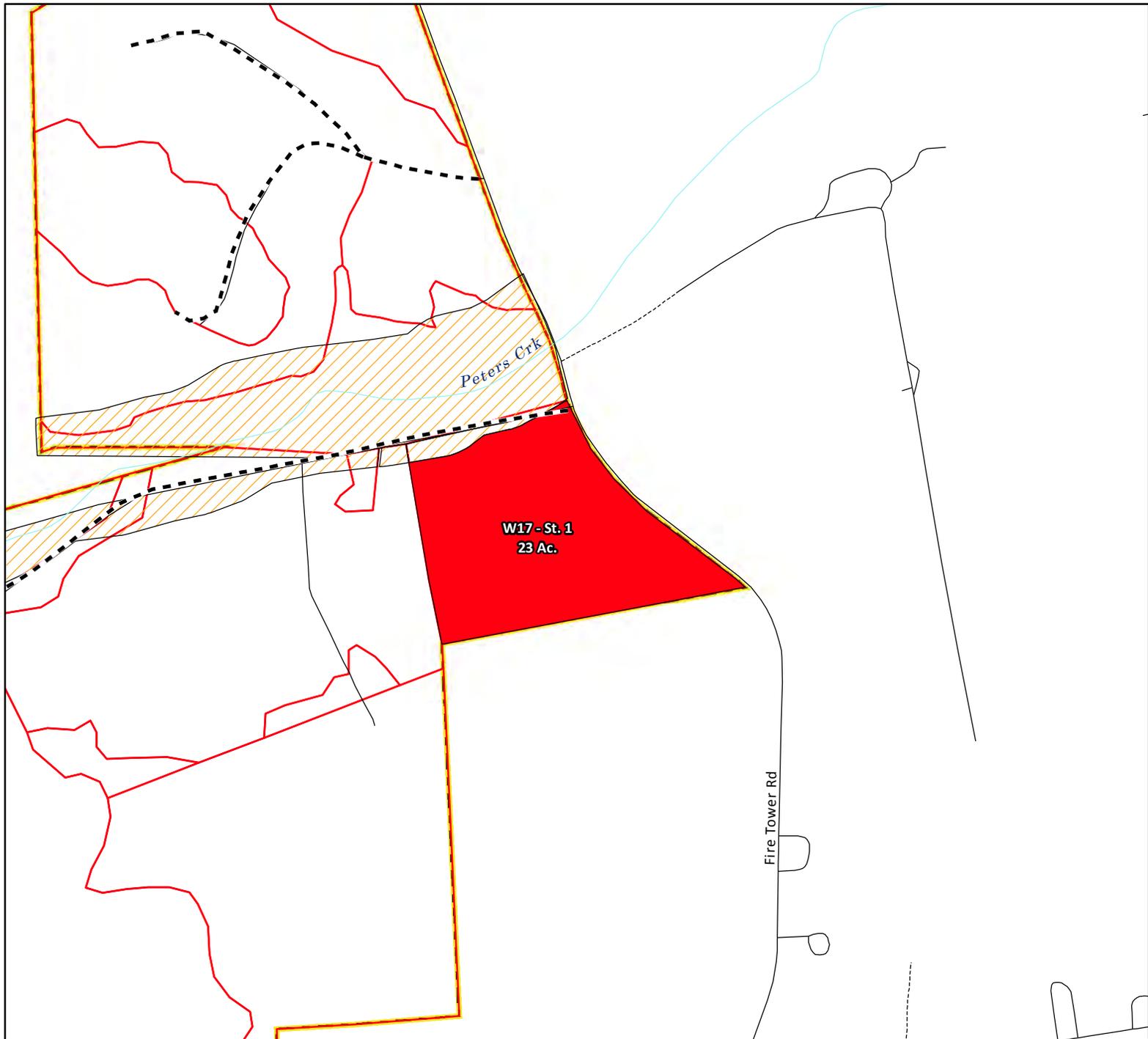
A pre-commercial thinning is proposed for stand 1. Stand 1 is a 24.1 acre loblolly pine stand that naturally regenerated in 2002. This stand is located within a General Management Area.

Complex W35 – Messick

A pre-commercial thinning is proposed for stand 8. Stand 8 is a 37.8 acre loblolly pine stand that naturally regenerated in 2006. This stand is located within a General Management Area.

Complex W43 – Long

A final harvest is proposed for stands 2 and 8. Both stands (32 acres total) are loblolly pine plantations established in 1979 and first thinned in 2004. Planting and site prep will occur on the site if it fails to regenerate adequately. The stands are located within a General Management Area.



1 inch = 660 feet



2013 AWP Stands

- Final Harvest
- Seed Tree
- Pre-Commercial Thinning
- 1st Thinning
- 2nd Thinning
- Invasive Spray

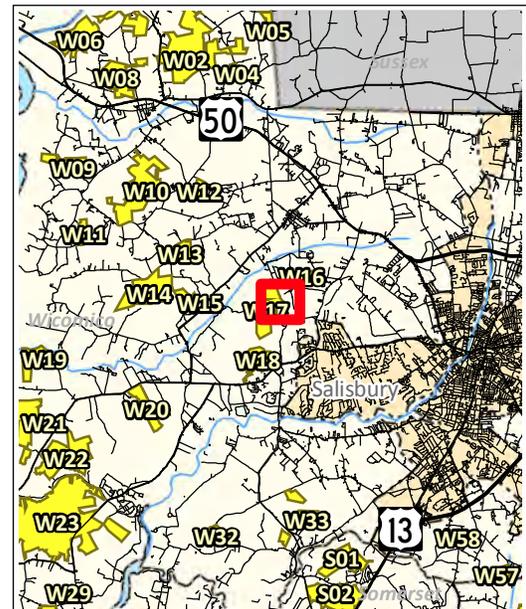
Management Zones

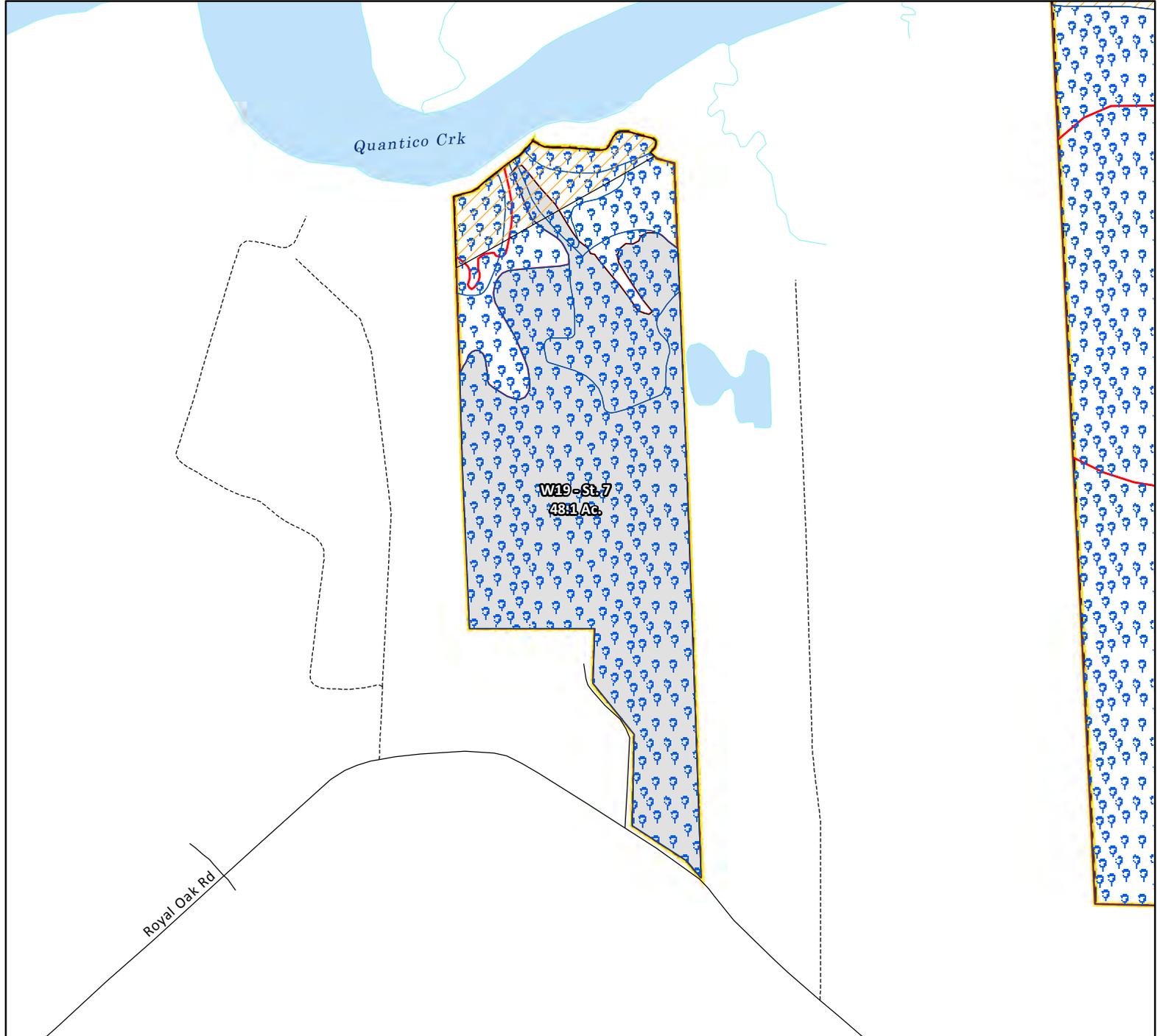
- DFS
- ESA Zone 1
- ESA Zone 2
- ESA Zone 3 Pulpwood
- ESA Zone 3 Saw Timber
- FIDS
- G3
- Stream Buffer

Cheapeake Forest

W17 - R.F. Richardson Complex
Final Harvest - 23.0 Acres

ASC-DNR Forest Service 5/2011





1 inch = 660 feet



2013 AWP Stands

- Final Harvest
- Seed Tree
- Pre-Commercial Thinning
- 1st Thinning
- 2nd Thinning
- Invasive Spray

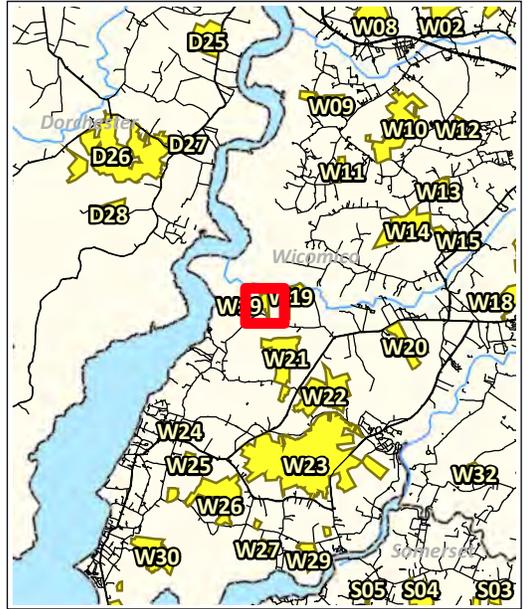
Management Zones

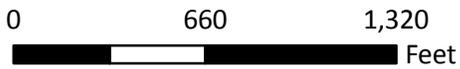
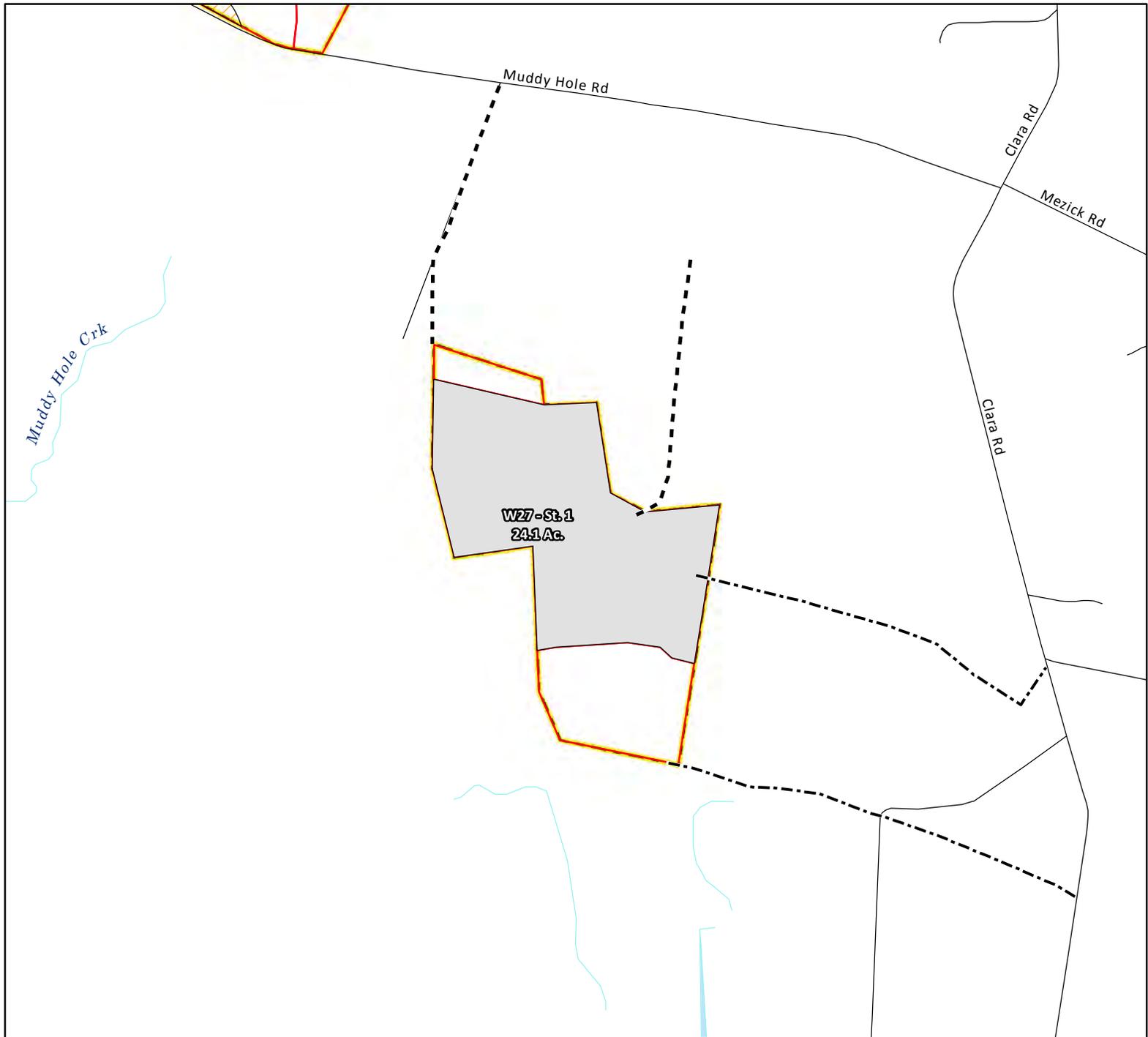
- DFS
- ESA Zone 1
- ESA Zone 2
- ESA Zone 3 Pulpwood
- ESA Zone 3 Saw Timber
- FIDS
- G3
- Stream Buffer

Cheapeake Forest

W19 - King's Misfortune Complex
Pre-Commercial Thinning - 48.1 Acres

ASC-DNR Forest Service 5/2011





1 inch = 660 feet



2013 AWP Stands

- Final Harvest
- Seed Tree
- Pre-Commercial Thinning
- 1st Thinning
- 2nd Thinning
- Invasive Spray

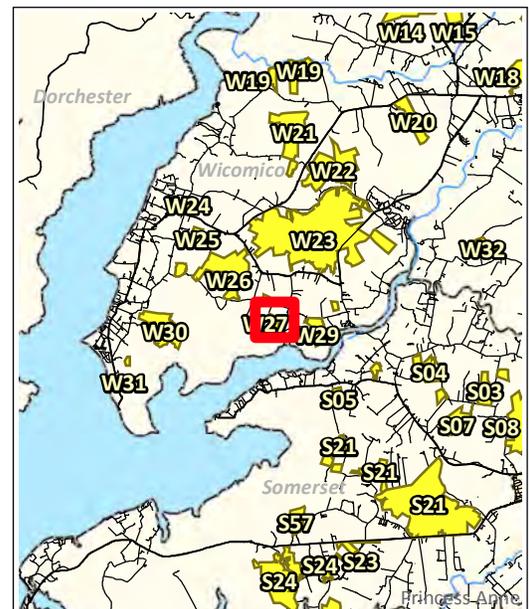
Management Zones

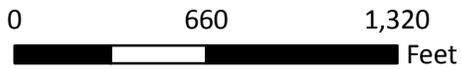
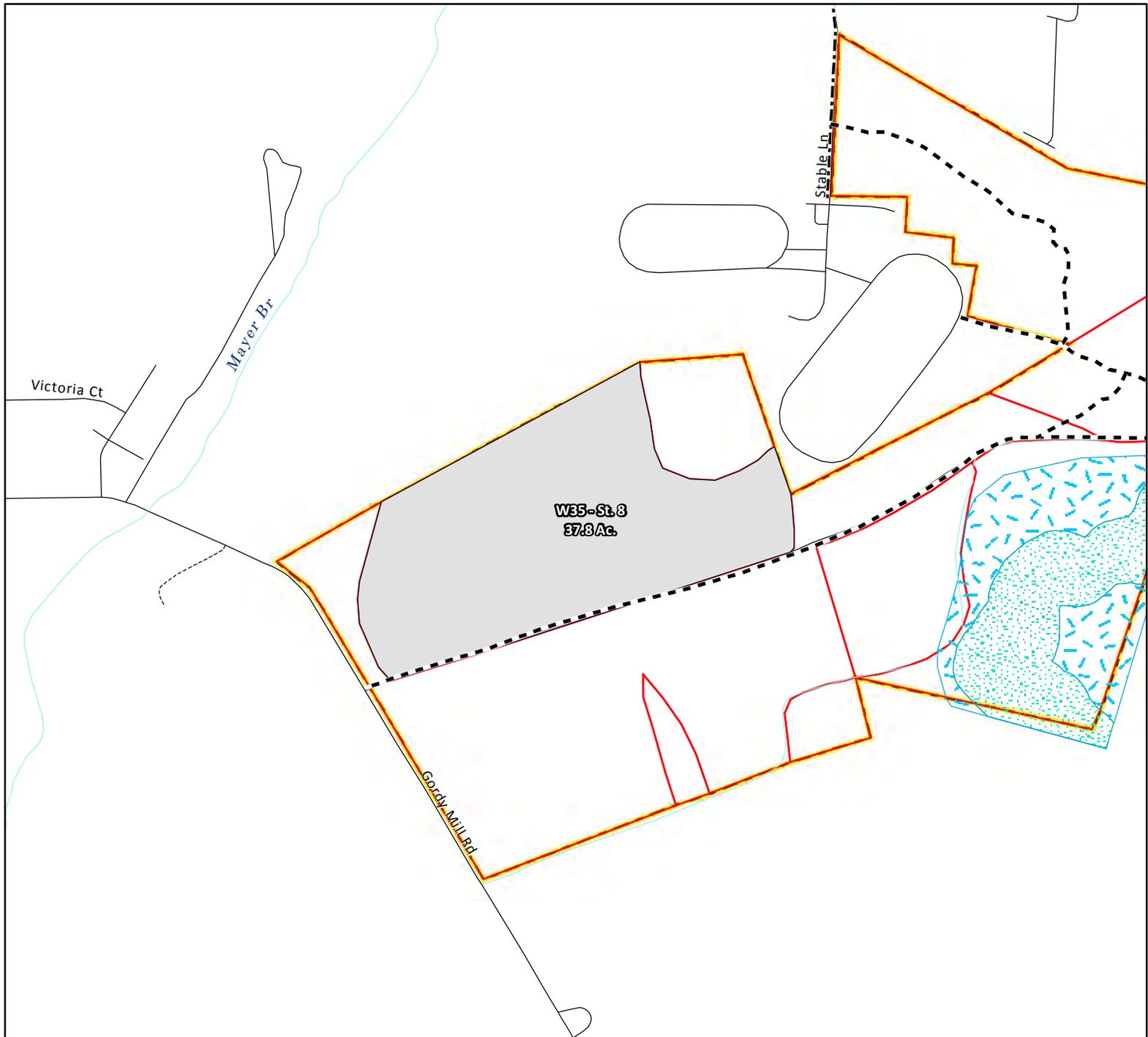
- DFS
- ESA Zone 1
- ESA Zone 2
- ESA Zone 3 Pulpwood
- ESA Zone 3 Saw Timber
- FIDS
- G3
- Stream Buffer

Cheapeake Forest

W27 - Cox Complex
Pre-Commercial Thinning - 24.1 Acres

ASC-DNR Forest Service 5/2011





1 inch = 660 feet



2013 AWP Stands

- Final Harvest
- Seed Tree
- Pre-Commercial Thinning
- 1st Thinning
- 2nd Thinning
- Invasive Spray

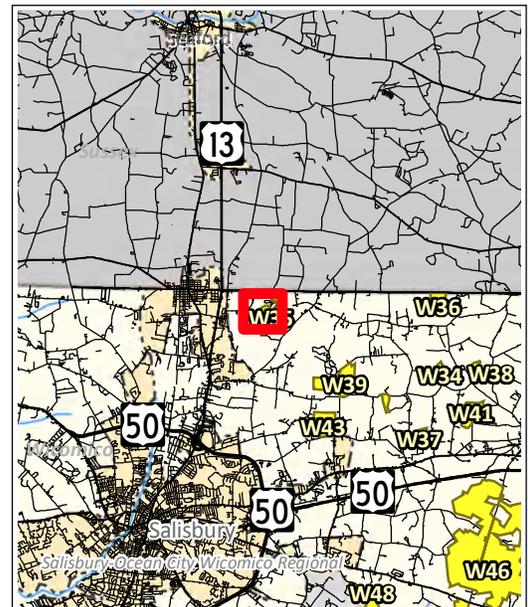
Management Zones

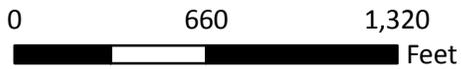
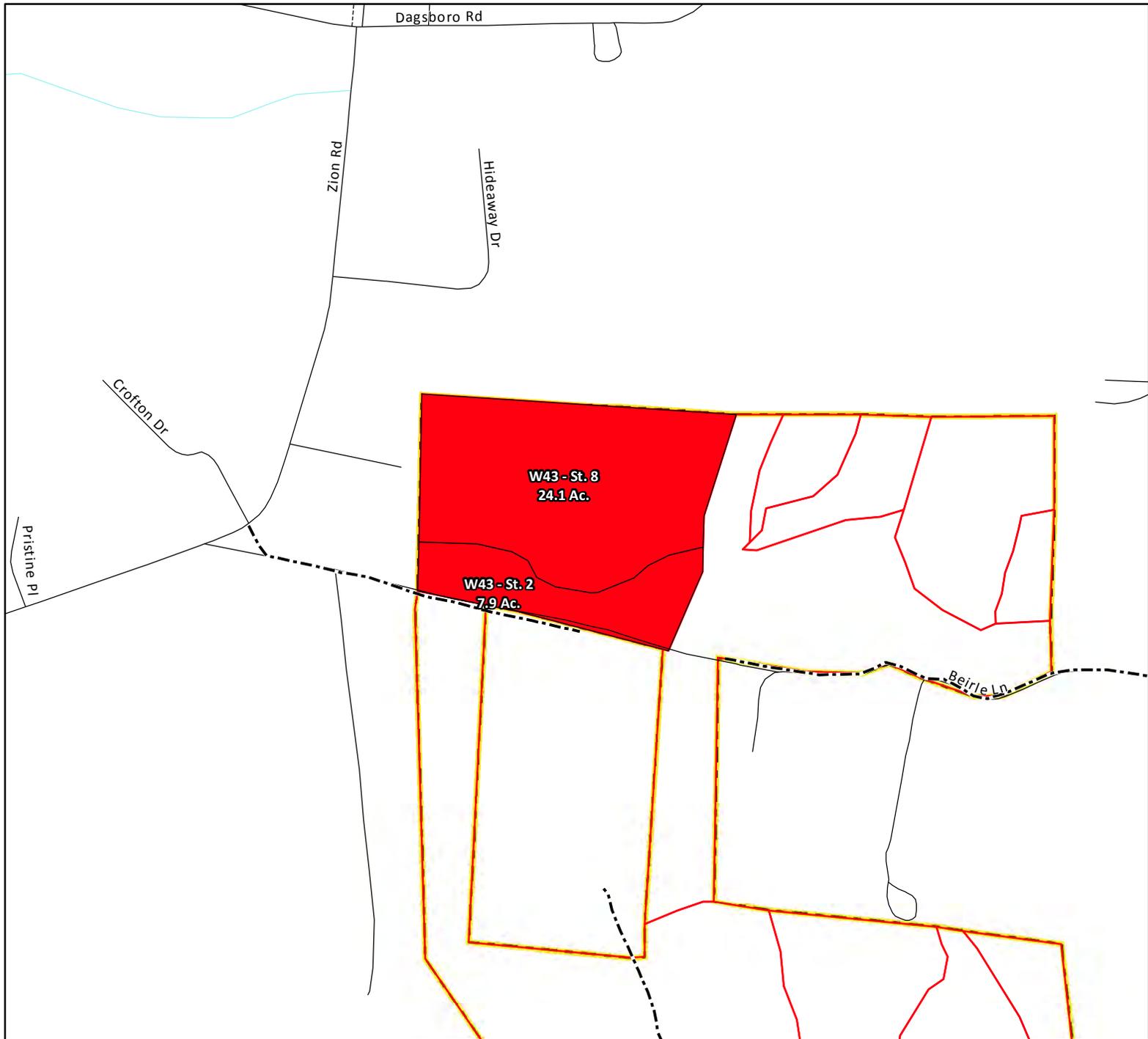
- DFS
- ESA Zone 1
- ESA Zone 2
- ESA Zone 3 Pulpwood
- ESA Zone 3 Saw Timber
- FIDS
- G3
- Stream Buffer

Cheapeake Forest

W35 - Messick Complex
Pre-Commercial Thinning - 37.8 Acres

ASC-DNR Forest Service 5/2011





1 inch = 660 feet



2013 AWP Stands

- Final Harvest
- Seed Tree
- Pre-Commercial Thinning
- 1st Thinning
- 2nd Thinning
- Invasive Spray

Management Zones

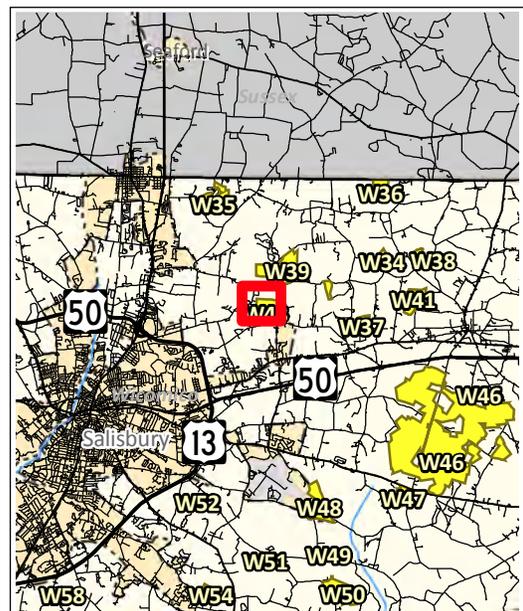
- DFS
- ESA Zone 1
- ESA Zone 2
- ESA Zone 3 Pulpwood
- ESA Zone 3 Saw Timber
- FIDS
- G3
- Stream Buffer

Cheapeake Forest

W43 - Long Complex

Final Harvest - 32.0 Acres

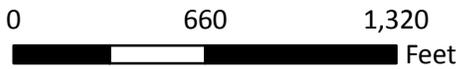
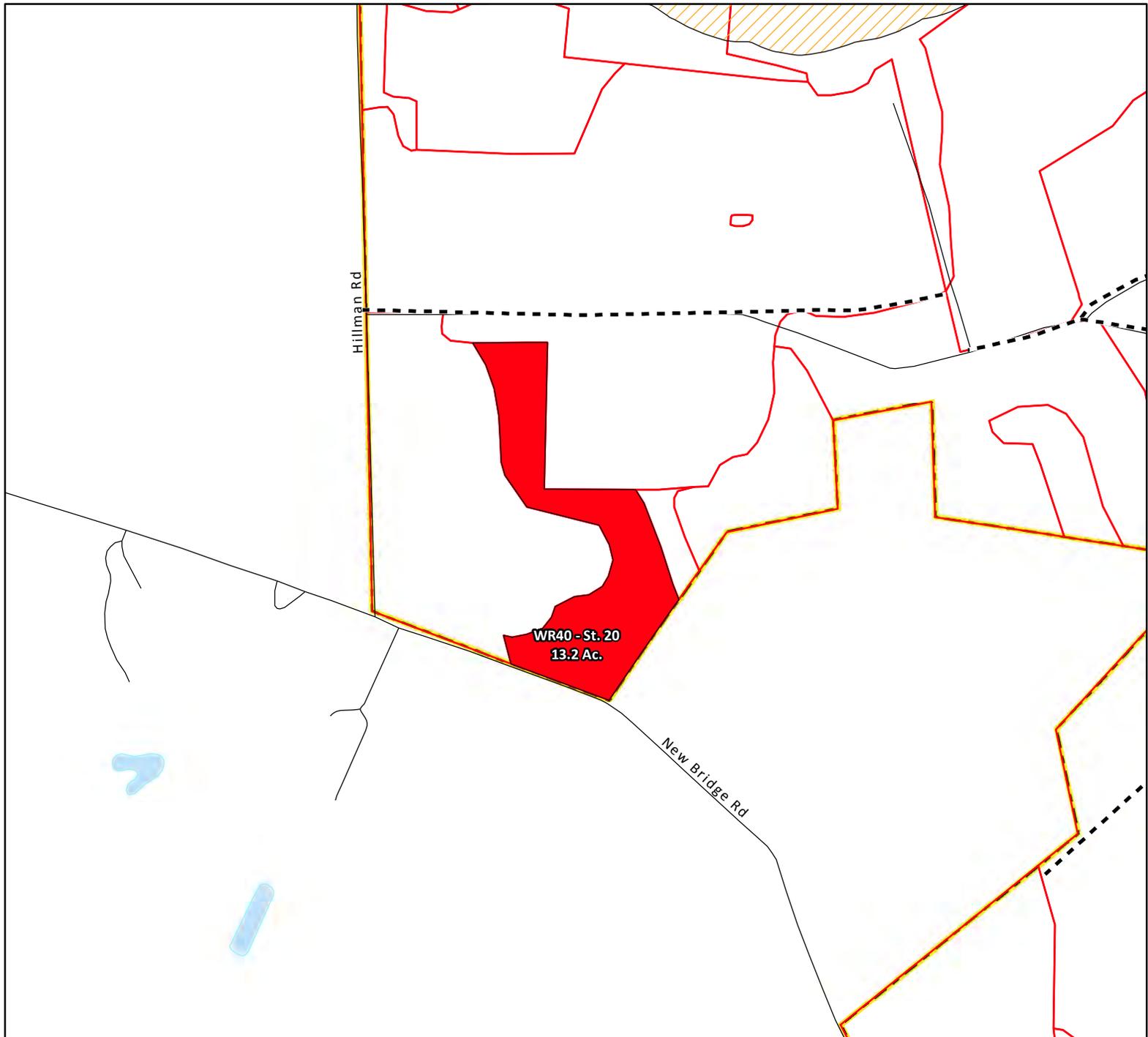
ASC-DNR Forest Service 5/2011



Description of 2013 Activities – Worcester County

Complex WR40 – Dunn Swamp

A final harvest is proposed for stand 20. Stand 20 is a 13.2 acre pine/hardwood stand that naturally regenerated in 1971. Planting and site prep will occur on this site if the site fails to adequately regenerate. This stand is located within the General Management Area.



1 inch = 660 feet



2013 AWP Stands

- Final Harvest
- Seed Tree
- Pre-Commercial Thinning
- 1st Thinning
- 2nd Thinning
- Invasive Spray

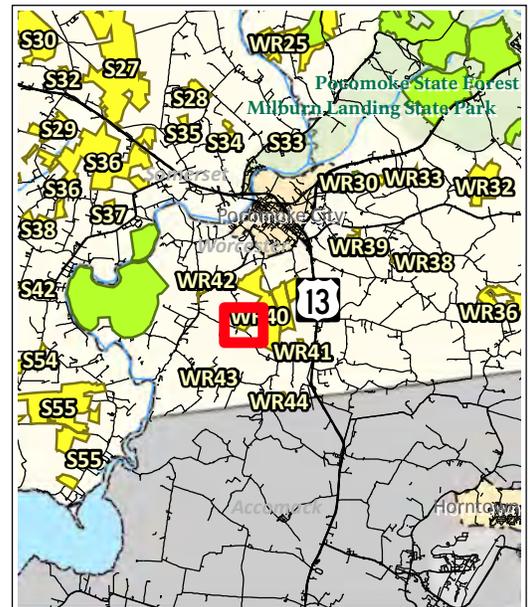
Management Zones

- DFS
- ESA Zone 1
- ESA Zone 2
- ESA Zone 3 Pulpwood
- ESA Zone 3 Saw Timber
- FIDS
- G3
- Stream Buffer

Cheapeake Forest

WR40 - Dunn Swamp Complex
Final Harvest - 13.2 Acres

ASC-DNR Forest Service 5/2011



Description of 2013 Activities - Pocomoke State Forest

P02 – Nazareth Church

Tract 4

A first thinning is proposed for stand 1. Stand 1 is a 37.1 acre loblolly pine plantation that was established in 1978. This stand is located within a DFS Future Core Management Area.

Tract 5

A final harvest is proposed for stand 14. Stand 14 is a 35.4 acre loblolly pine plantation that was established in 1960. This stand is located within a DFS Future Core Management Area and a G3 Community.

A pre-commercial thinning is proposed for stands 1 and 15. Both stands make up a 17.8 acre loblolly pine plantation that was established in 2005. Oaks will be retained per DFS guidelines in the SFMP. This site is located within a DFS Future Core Management Area.

A first thinning is proposed in stand 10. Stand 10 is a 15.2 acre loblolly pine plantation that was established in 1991. This stand is located within a DFS Future Core Management Area.

P04 – Dividing Creek

Tract 13

A second thinning is proposed in stand 10. Stand 10 is a 40.6 acre loblolly pine plantation that was established in 1970. The stand was pre-commercially thinned in 1977 and first thinned in 1998. This stand is located within a DFS Future Core Management Area.

A first thinning is proposed for stand 11. Stand 11 is a 26 acre loblolly pine plantation that was established in 1974 and pre-commercially thinned in 1979. This stand is located within a DFS Future Core Management Area.

P05 – Milburn Landing

Tract 15

A first thinning is proposed for stand 4. Stand 4 is a 3.8 acre loblolly pine stand that regenerated naturally in 1986. This stand is located within a DFS Future Core Management Area.

A first thinning is proposed for stand 5. Stand 5 is a 34.2 acre loblolly pine stand regenerated naturally in 1993 and pre-commercially thinned in 1999. This stand is located within a DFS Future Core Management Area and a Stream Buffer Area.

A final harvest is proposed for stand 19. Stand 19 is a 7.6 acre loblolly pine stand that regenerated naturally in 1936. This stand is located within a DFS Future Core and an ESA Zone 1 Management Area.

Tract 16

A second thinning is proposed for stand 1. Stand 1 is a 79.3 acre loblolly pine plantation that was established in 1971, pre-commercially thinned in 1979 and first thinned in 1998. This stand is located within a DFS Future Core Management Area, a Stream Buffer Area and an ESA Zone 3 Management Area.

A first thinning is proposed for a portion of stand 4. The portion of stand 4 to be thinned is 46.3 acres. Stand 4 is a pine/hardwood stand that regenerated naturally in 1987. This stand is located within a DFS Future Core Management Area and a Stream Buffer Area.

A first thinning is proposed for stand 8. Stand 8 is a 7.3 acre loblolly pine plantation that was established in 1965. This stand is located within a DFS Future Core Managed Area and a Stream Buffer Area.

Tract 17

A first thinning is proposed for stand 4. Stand 4 is a 16.5 acre loblolly pine stand that regenerated naturally in 1984 and pre-commercially thinned in 1992. This stand is located within a DFS Future Core Management Area and an ESA Zone 1 Management Area.

A first thinning is proposed for stands 5 and 6. Both stands total 24.9 acres and are a loblolly pine plantation that was established in 1979. Both stands are located within a DFS Future Core and an ESA Zone 3 Management Area.

A final harvest is proposed for stand 11. Stand 11 is a 15.3 acre loblolly pine plantation that was established in 1940. A 100 foot road side buffer will be retained for aesthetics along Nassawango road. This stand is located within a DFS Future Core, ESA Zone 1, and ESA Zone 3 Management Area.

Tract 18

A first thinning is proposed for a portion of stand 4. The thinning portion of stand 4 is a 41.6 acre natural loblolly pine stand that was established in 1972 and was pre-commercially thinned in 1979. This stand is located within a DFS Future Core, Core FIDS, and ESA Zone 1 Management Area.

P06 – Hudson and Tarr

Tract 19

A first thinning is proposed for stands 19, 20, 21 and 30. All stands to be thinned make up a 43.1 acre loblolly pine plantation that was established in 1980. These stands are located within a DFS Future Core, Core FIDS, ESA Zone 1 Management Area, WSSC and a Stream Buffer Area.

Tract 20

A variable retention harvest is proposed for stand 1. Stand 1 is a 38.4 acre loblolly pine stand that naturally regenerated in 1969. This stand is located within a DFS Future Core, Core FIDS, G3, ESA Zone 1, ESA Zone 3 Management Area.

A first thinning is proposed for stands 3 and 7. Both stands are a 35 acre loblolly pine stand that naturally regenerated in 1970 and was pre-commercially thinned in 1981. This stand is located within a Core FIDS, ESA Zone 1, and ESA Zone 3 Management Area.

A first thinning is proposed for stand 6. Stand 6 is an 18.2 acre loblolly pine plantation that was established in 1983. This stand is located within a Core FIDS Management Area.

A final harvest is proposed for stand 10. Stand 10 is a 13.3 acre loblolly pine stand planted in 1983. This stand is located within a DFS Future Core, G3, ESA Zone 1 Management Area and a Stream Buffer Area.

A final harvest is proposed for stand 13. Stand 13 is a 3.5 acre loblolly pine plantation that was established in 1988. This stand is located in a DFS Future Core, G3, ESA Zone 1 Management Area.

P07 – Chandler Tract

Tract 21

A first thinning is proposed for stand 9. Stand 9 is a 12.8 acre loblolly pine plantation that was established in 1984 and pre-commercially thinned in 1992. This stand is located within a DFS Future Core Management Area.

A first thinning is proposed for stand 10. Stand 10 is an 18.4 acre loblolly pine plantation established in 1984. This stand is located within a DFS Future Core Management Area and a G3 Community.

Tract 22

A first thinning is proposed for stand 5. Stand 5 is an 11.5 acre loblolly pine plantation that was established in 1965. This stand is located within a DFS Future Core Management Area.

A first thinning is proposed in stand 12. Stand 12 is a 24.9 acre loblolly pine stand that naturally regenerated in 1972. This stand is located within a DFS Future Core Management Area, Stream Buffer and a G3 Community.

Tract 23

A first thinning is proposed for stand 13. Stand 13 is a 59.8 acre loblolly pine plantation that was established in 1969 and pre-commercially thinned in 1977. This stand is located in a DFS Future Core Management.

A first thinning is proposed for stand 14. Stand 14 is a 96.1 acre loblolly pine plantation that was established in 1971 and pre-commercially thinned in 1988. This stand is located within a DFS Future Core Management Area.

A first thinning is proposed for stand 18. Stand 18 is a 36.4 acre loblolly pine stand that naturally regenerated in 1972. This stand is located within a DFS Future Core Management Area.

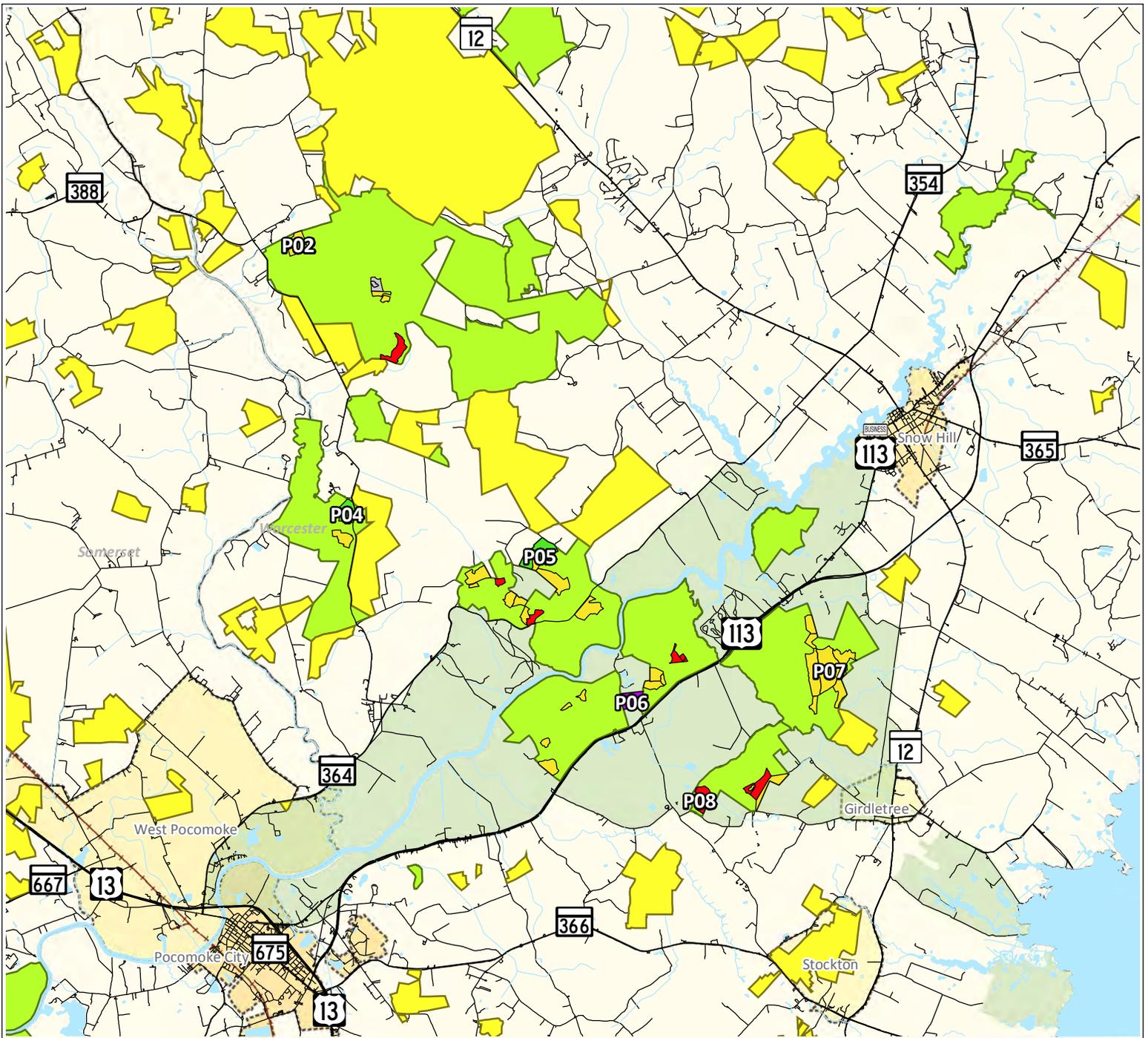
P08 – Colburne Tract

Tract 24

A first thinning is proposed for stand 1. Stand 1 is a 27.1 acre loblolly pine plantation established in 1973. This stand is located within a DFS Future Core Management Area.

A final harvest is proposed for stand 2 and part of stand 6. The final harvest is a 36.2 acre pine/hardwood stand that was planted in 1972. This stand is located in a DFS Future Core Management Area.

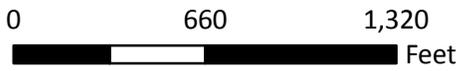
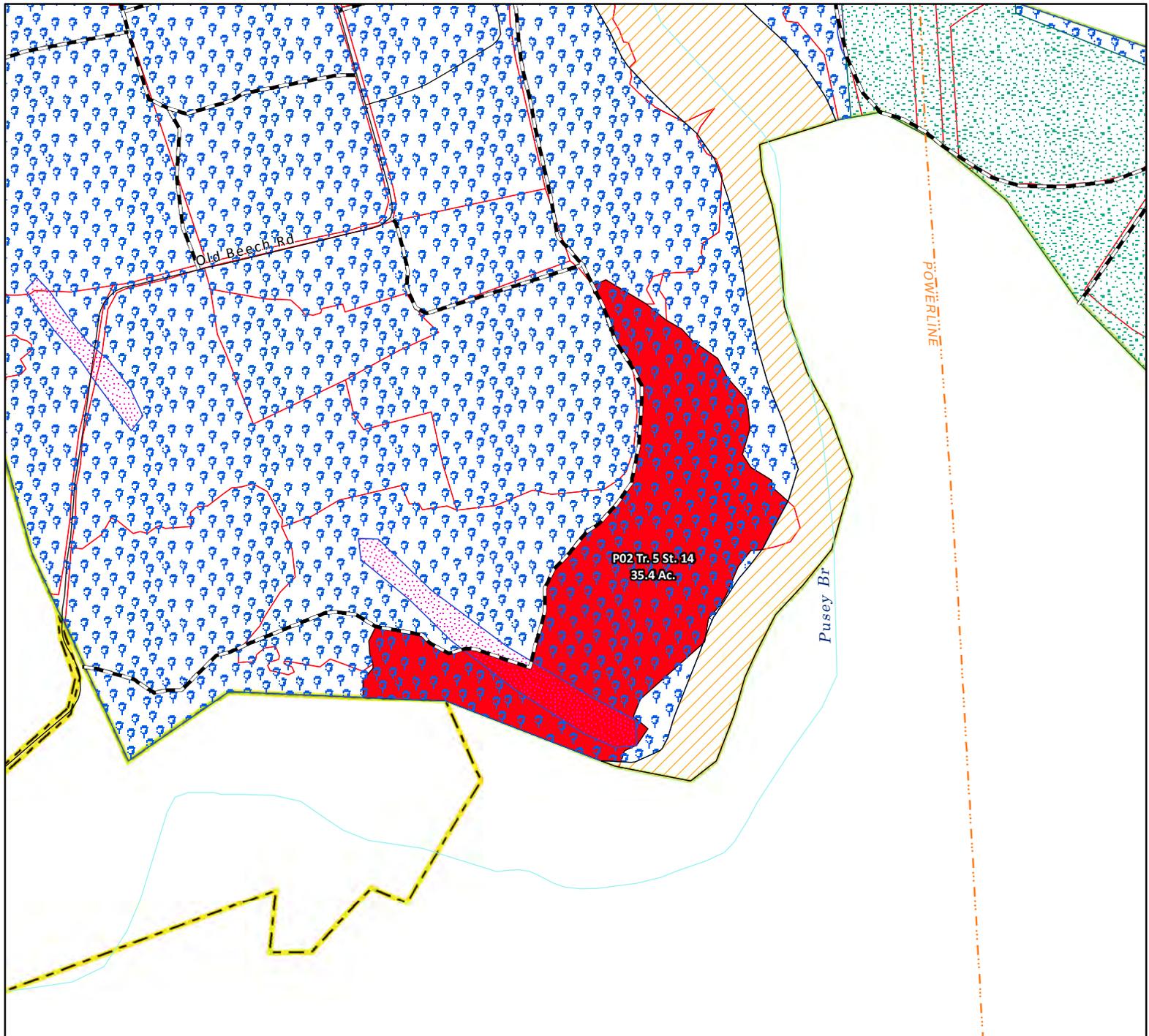
A final harvest is proposed for a portion of stand 6 along Onley road. Stand 6 is a pine/hardwood stand that naturally regenerated in 1971. A 200 foot road side buffer will be retained along Onley road for aesthetics. This stand is located in a DFS Future Core Management Area and a Stream Buffer Area.



Pocomoke State Forest

FY2013 Annual Work Plan Sites





1 inch = 660 feet

Legend

2013 AWP Stands

- Final Harvest
- Pre-Commercial Thinning
- 1st Thinning
- 2nd Thinning
- Variable Retention

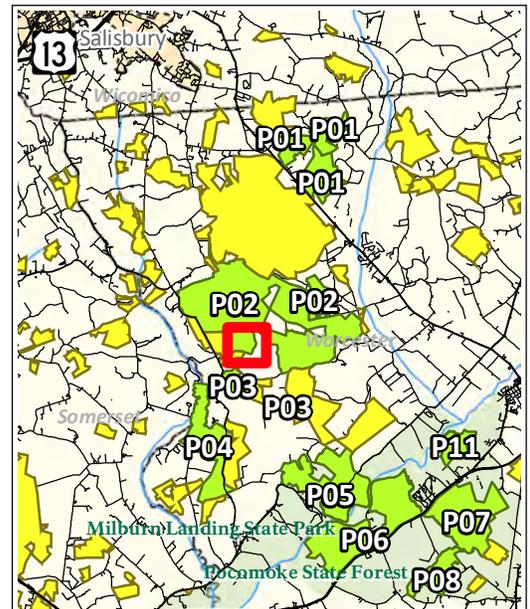
Management Zones

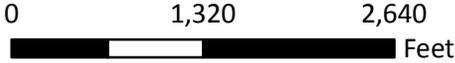
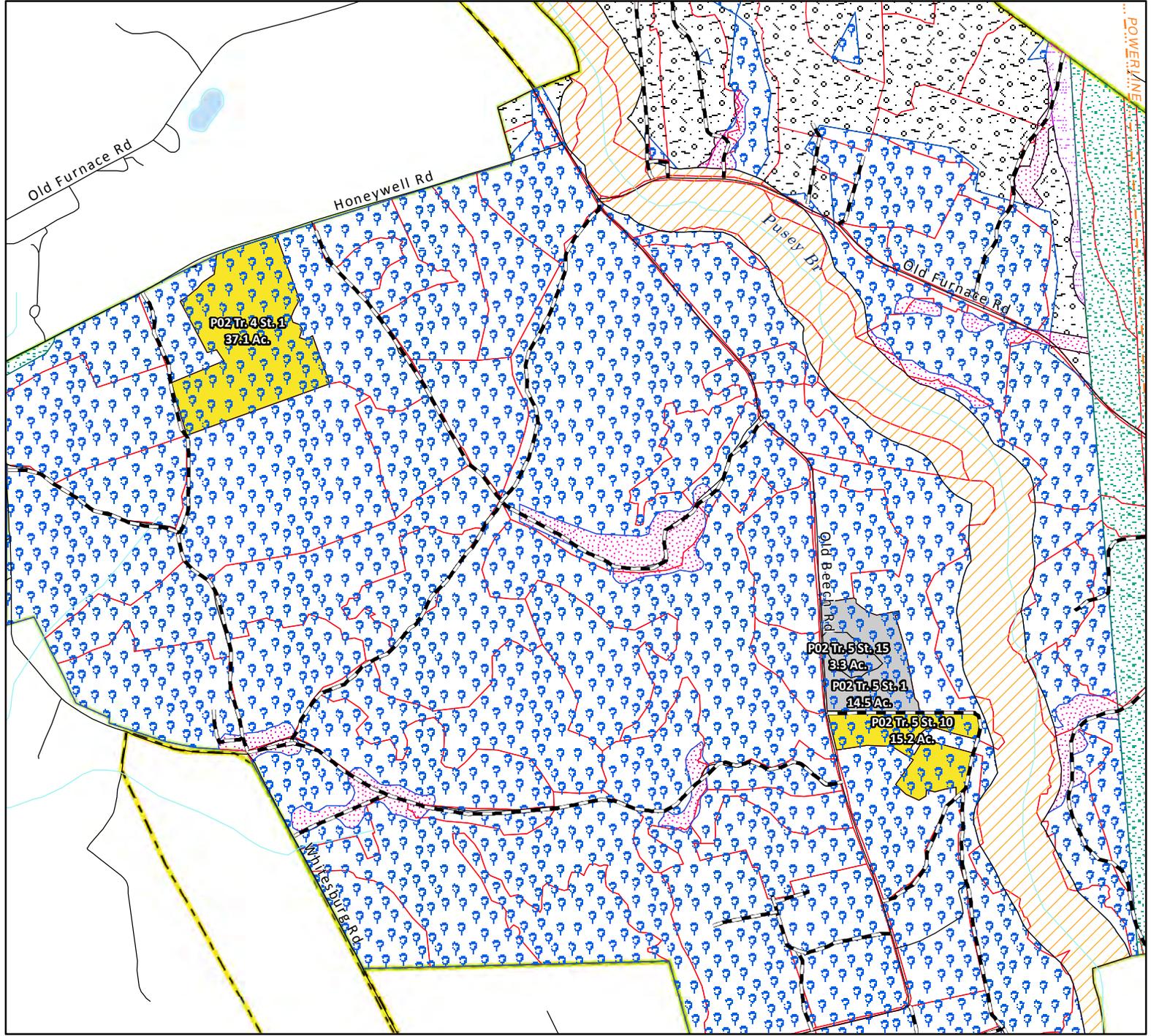
- Core FIDS
- DFS
- G3
- Stream
- WSSC
- ESA Zone 1
- ESA Zone 2
- ESA Zone 3

Pocomoke State Forest

P02 - Nazareth Church Tract
Final Harvest - 35.4 Acres

ASC-DNR Forest Service 5/2011





1 inch = 1,320 feet



Legend

2013 AWP Stands

- Final Harvest
- Pre-Commercial Thinning
- 1st Thinning
- 2nd Thinning
- Variable Retention

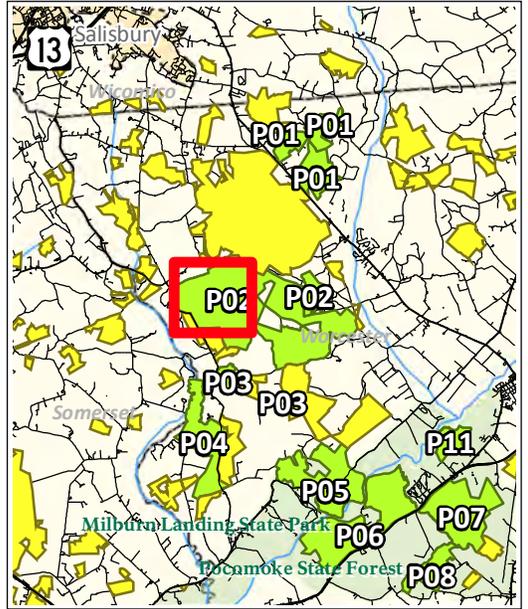
Management Zones

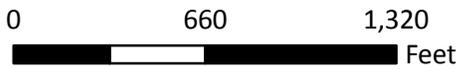
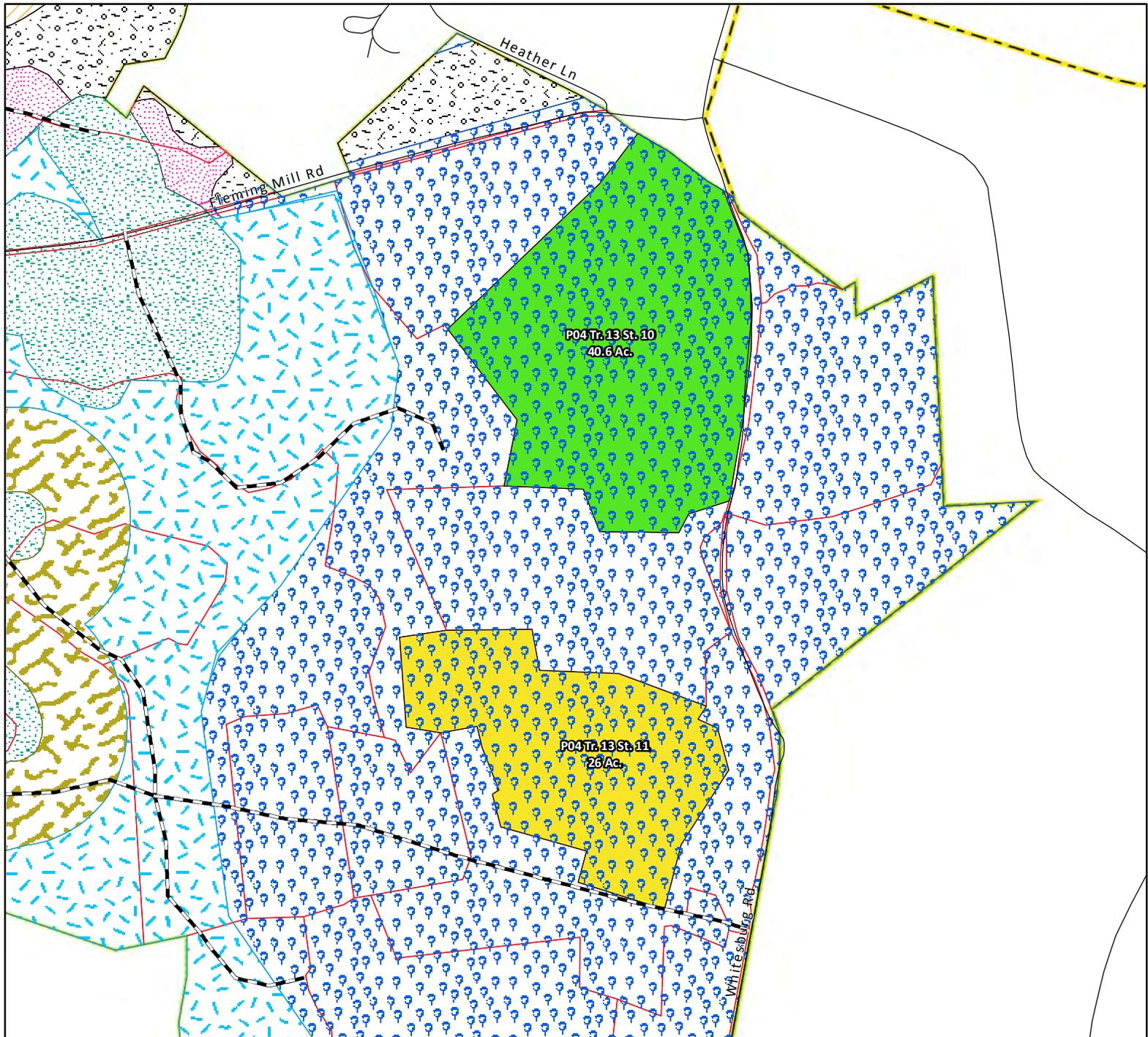
- Core FIDS
- DFS
- G3
- Stream
- WSSC
- ESA Zone 1
- ESA Zone 2
- ESA Zone 3

Pocomoke State Forest

P02 - Nazareth Church Tract
 First Thinning - 52.3 Acres
 Pre-Commercial Thinning - 17.8 Acres

ASC-DNR Forest Service 5/2011





Legend

2013 AWP Stands

- Final Harvest
- Pre-Commercial Thinning
- 1st Thinning
- 2nd Thinning
- Variable Retention

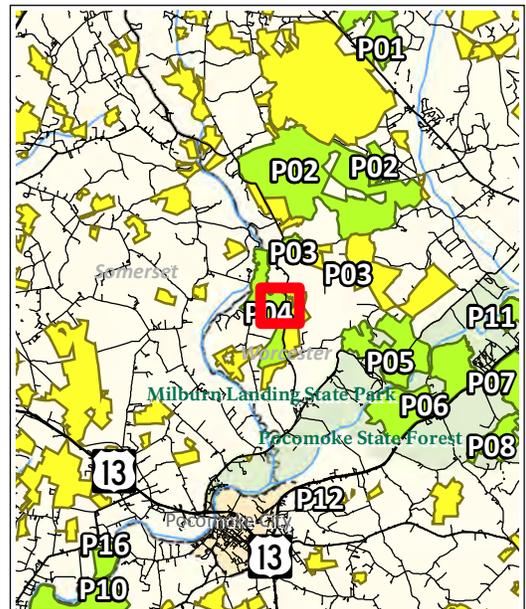
Management Zones

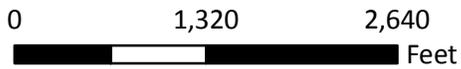
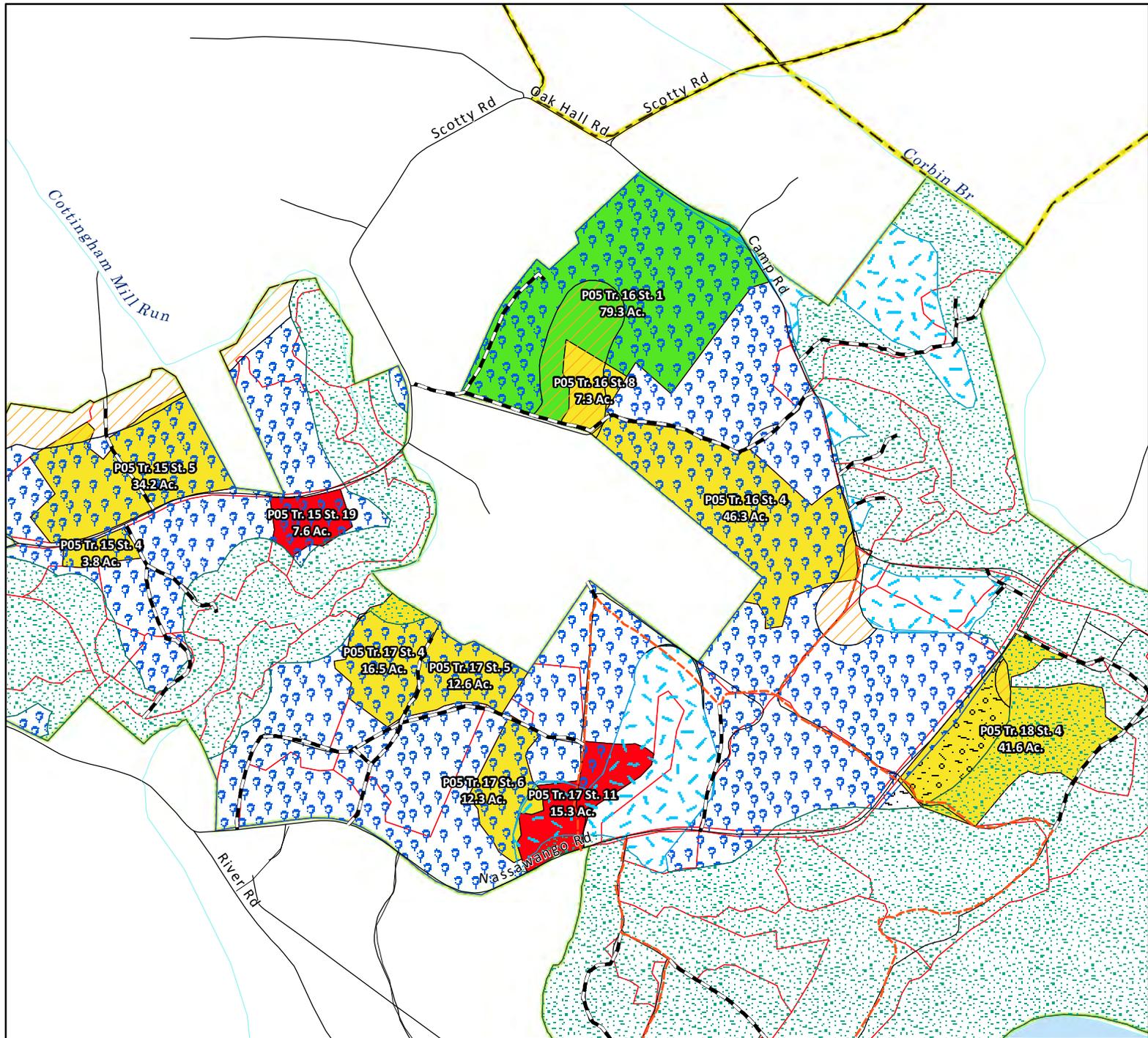
- Core FIDS
- DFS
- G3
- Stream
- WSSC
- ESA Zone 1
- ESA Zone 2
- ESA Zone 3

Pocomoke State Forest

P04 - Dividing Creek Tract
 First Thinning - 26.0 Acres
 Second Thinning - 40.6 Acres

ASC-DNR Forest Service 5/2011





1 inch = 1,320 feet

Legend

2013 AWP Stands

- Final Harvest
- Pre-Commercial Thinning
- 1st Thinning
- 2nd Thinning
- Variable Retention

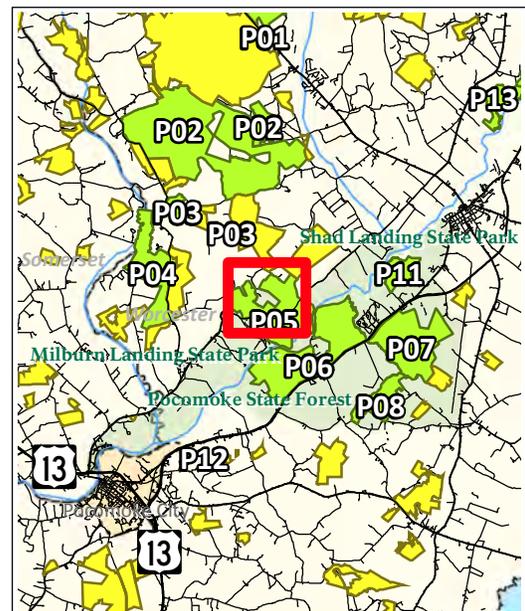
Management Zones

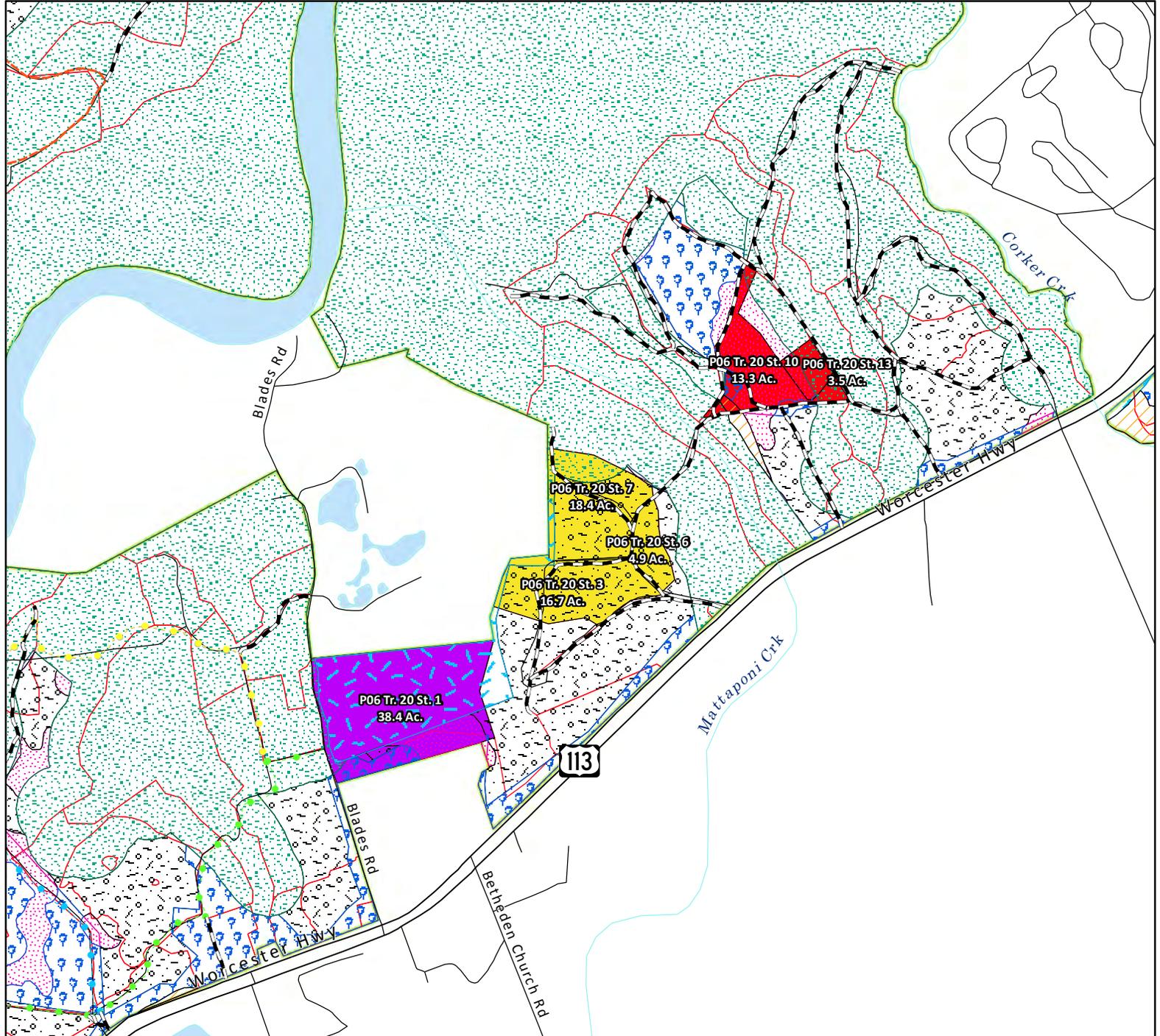
- Core FIDS
- DFS
- G3
- Stream
- WSSC
- ESA Zone 1
- ESA Zone 2
- ESA Zone 3

Pocomoke State Forest

P05 - Milburn Landing Tract
 Final Harvest - 22.9 Acres
 First Thinning - 174.5 Acres
 Second Thinning - 79.3 Acres

ASC-DNR Forest Service 5/2011





1 inch = 1,320 feet

Legend

2013 AWP Stands

- Final Harvest
- Pre-Commercial Thinning
- 1st Thinning
- 2nd Thinning
- Variable Retention

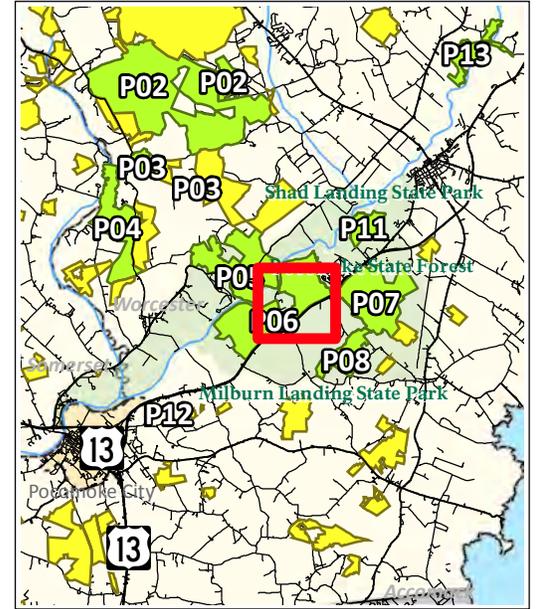
Management Zones

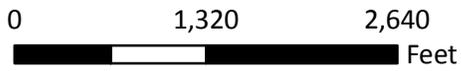
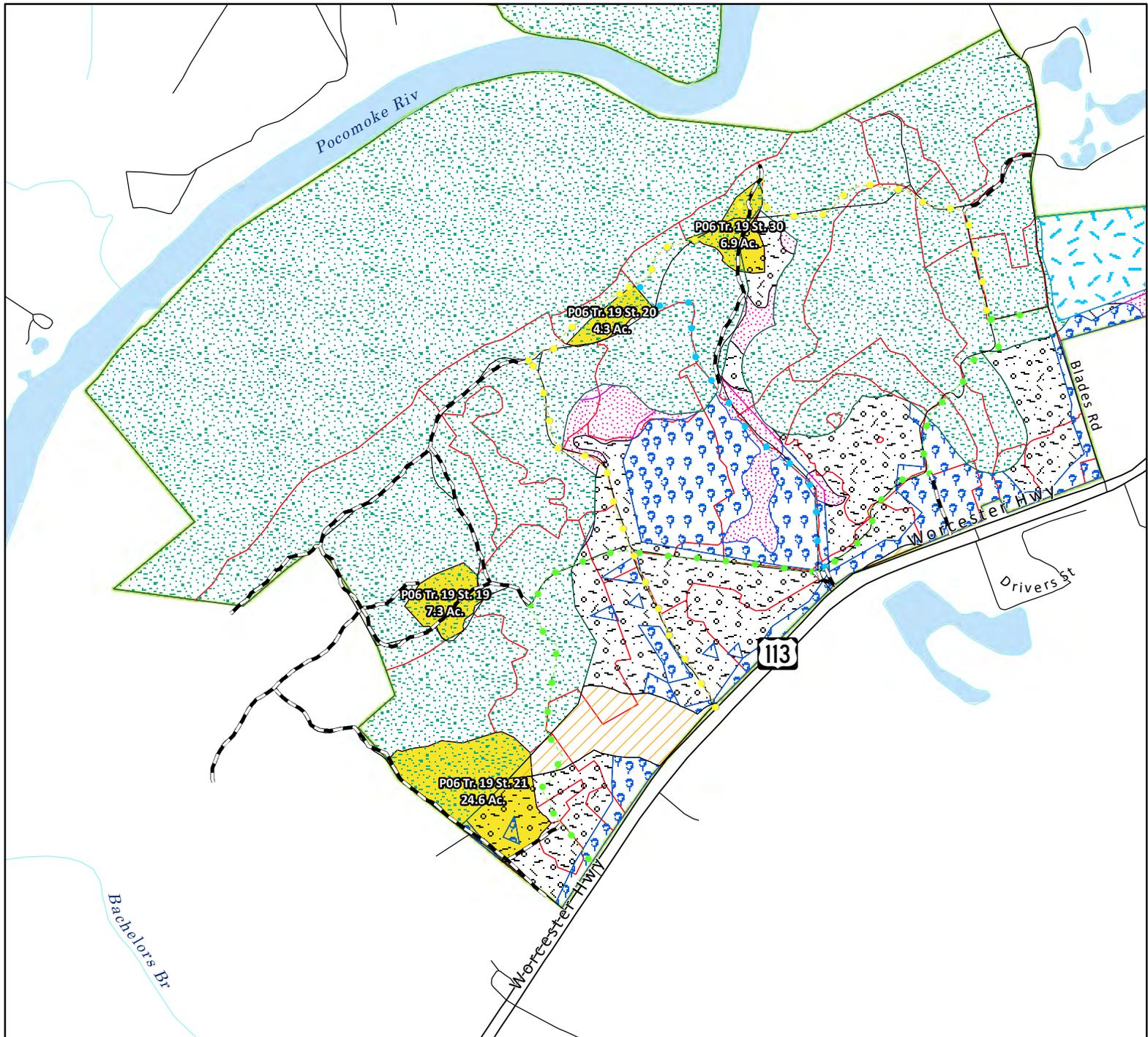
- Core FIDS
- DFS
- G3
- Stream
- WSSC
- ESA Zone 1
- ESA Zone 2
- ESA Zone 3

Pocomoke State Forest

P06 - Hudson Tract
 Final Harvest - 16.8 Acres
 First Thinning - 39.9 Acres
 Second Thinning - 38.4 Acres

ASC-DNR Forest Service 5/2011





Legend

2013 AWP Stands

- Final Harvest
- Pre-Commercial Thinning
- 1st Thinning
- 2nd Thinning
- Variable Retention

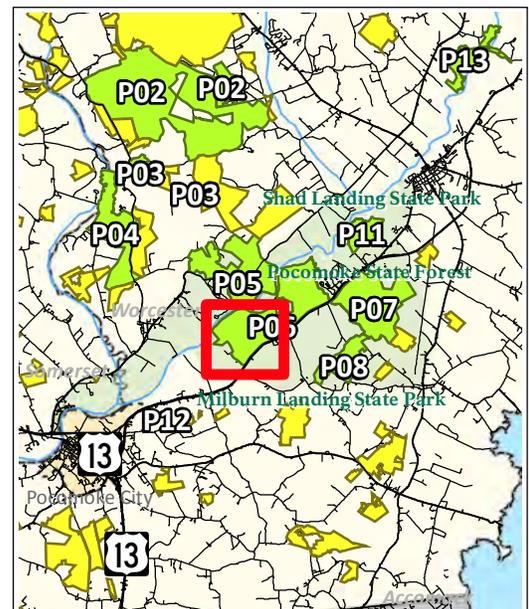
Management Zones

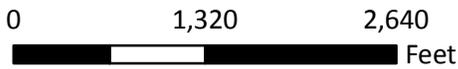
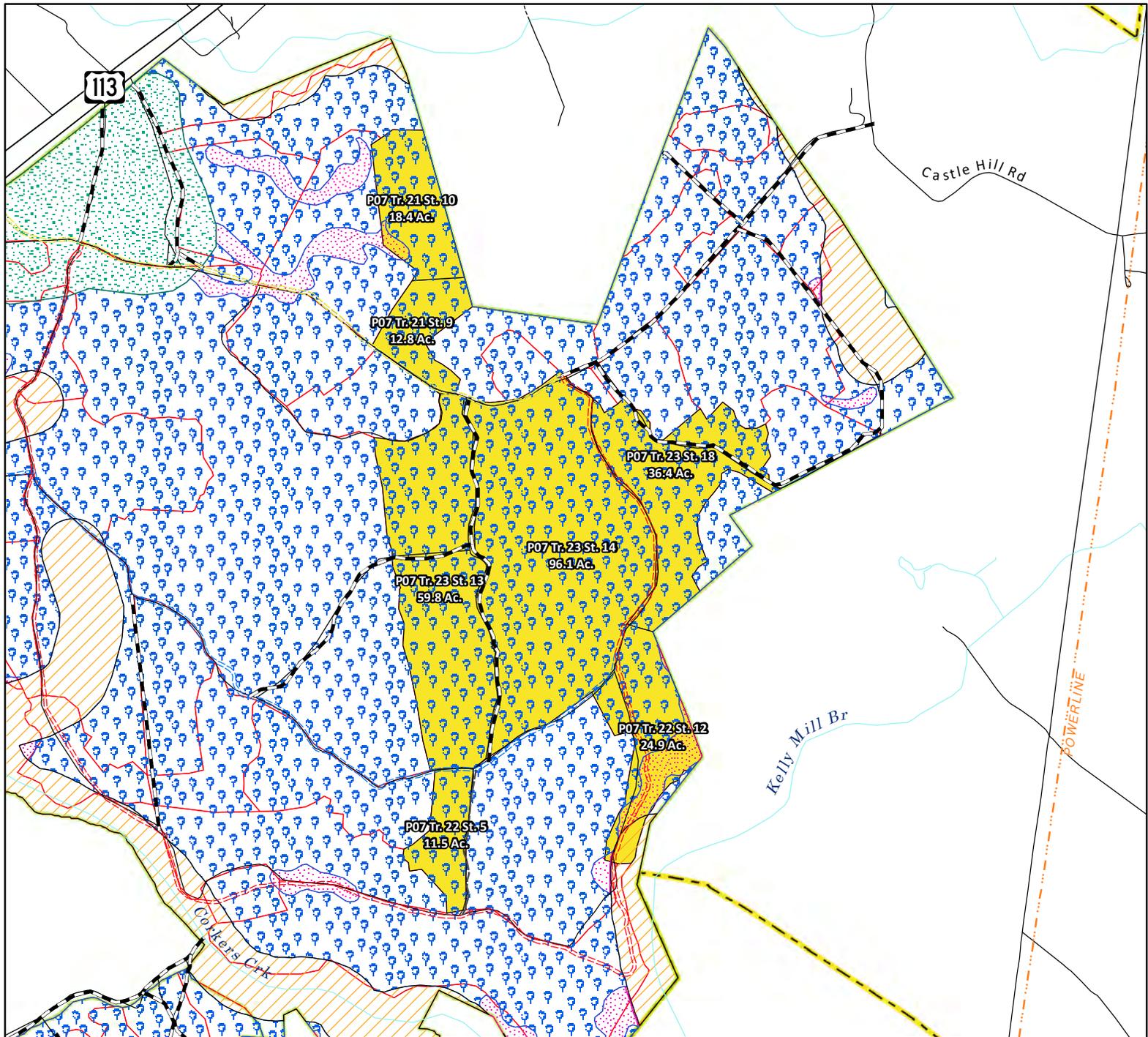
- Core FIDS
- DFS
- G3
- Stream
- WSSC
- ESA Zone 1
- ESA Zone 2
- ESA Zone 3

Pocomoke State Forest

P06 - Tarr Tract
 First Thinning - 43.1 Acres

ASC-DNR Forest Service 5/2011





1 inch = 1,320 feet



Legend

2013 AWP Stands

- Final Harvest
- Pre-Commercial Thinning
- 1st Thinning
- 2nd Thinning
- Variable Retention

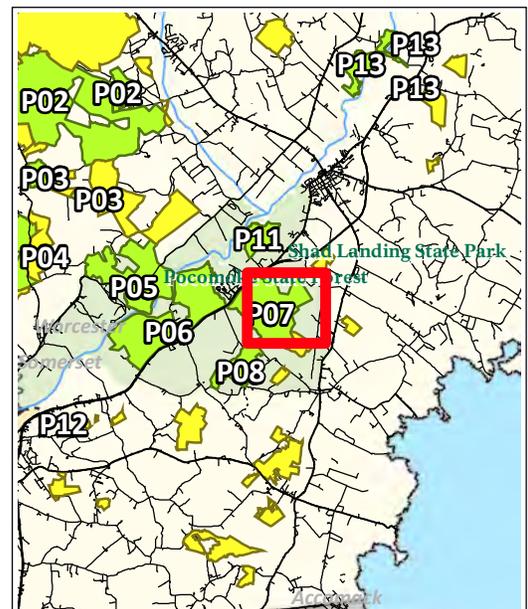
Management Zones

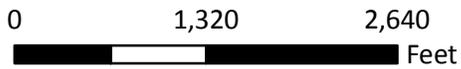
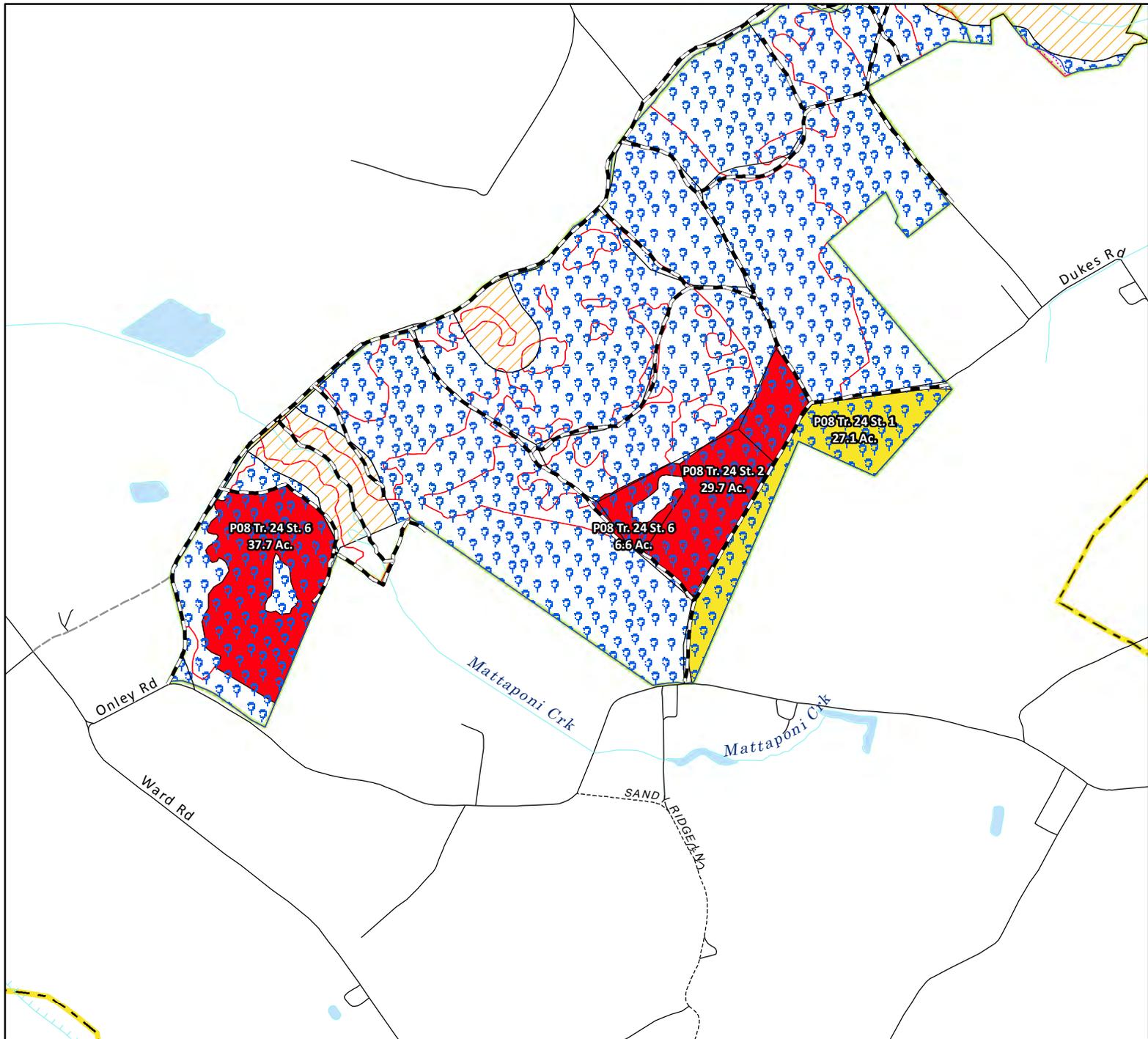
- Core FIDS
- DFS
- G3
- Stream
- WSSC
- ESA Zone 1
- ESA Zone 2
- ESA Zone 3

Pocomoke State Forest

P07 - Chandler Tract
 First Thinning - 259.9 Acres

ASC-DNR Forest Service 5/2011





1 inch = 1,320 feet



Legend

2013 AWP Stands

- Final Harvest
- Pre-Commercial Thinning
- 1st Thinning
- 2nd Thinning
- Variable Retention

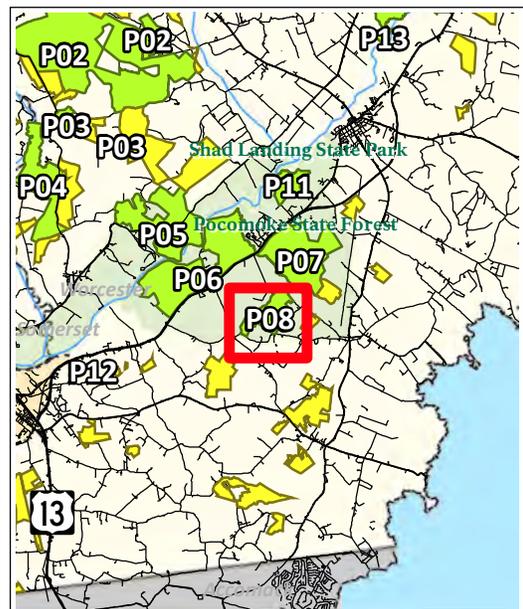
Management Zones

- Core FIDS
- DFS
- G3
- Stream
- WSSC
- ESA Zone 1
- ESA Zone 2
- ESA Zone 3

Pocomoke State Forest

P08 - Colburne Tract
 Final Harvest - 74.0 Acres
 First Thinning - 27.1 Acres

ASC-DNR Forest Service 5/2011



Description of 2013 Activities – Somerset County

Complex S08 – White Pusey

A seed tree harvest is proposed for stand 6. Stand 6 is a 22.4 acre loblolly pine plantation that was planted in 1979 and first thinned in 1995. This stand is located within the General Management Area.

Complex S11 – Peters McAllen

A final harvest is proposed for stand 25. Stand 25 is a 2.2 acre loblolly pine plantation that was planted in 1975 and first thinned in 1999. This stand is located within the General Management Area.

A first thinning is proposed for stand 28. Stand 28 is a 54.7 acre loblolly pine plantation that was planted in 1993. This stand is located within an ESA Zone 1 and a Stream Buffer Area.

Complex S11 – Peters McAllen

A second thinning is proposed for stands 6 and 19. Both stands make up a 54.7 acre loblolly pine plantation that was planted in 1986 and first thinned in 2002. These stands are located within an ESA Zone 1 and Stream Buffer Area.

Complex S26 – Bonneville

A first thinning is proposed for stands 2 and 3. Both stands make up a 24 acre loblolly pine plantation. Stand 2 was naturally regenerated in 1975 and stand 3 was planted in 1991. Both stands are located within a DFS Core Management Area.

Complex S44 – Phillips

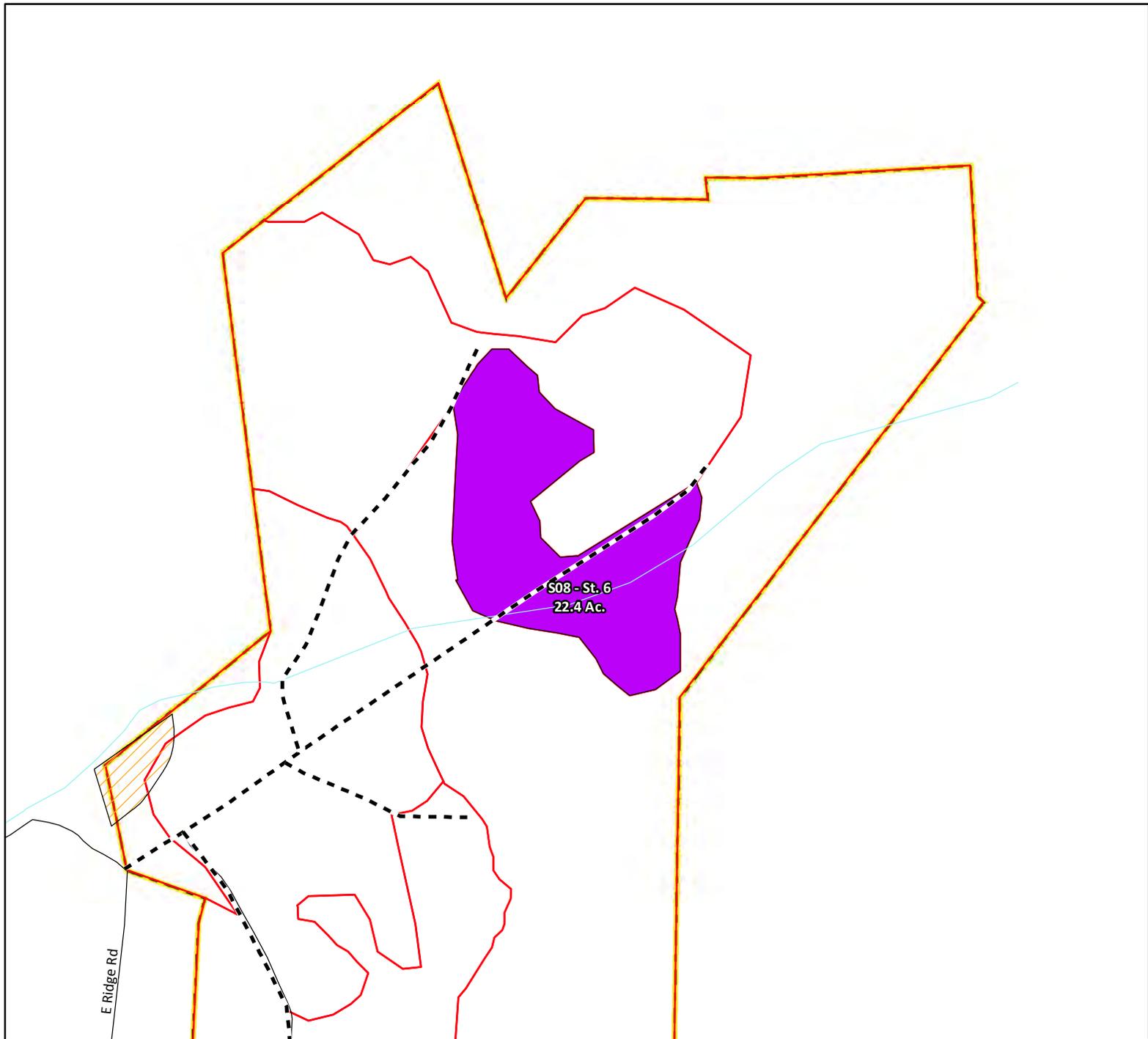
A pre-commercial thinning is proposed for stand 2. Stand 2 is a 41.3 acre loblolly pine plantation that was planted in 2001. This stand is located within a General Management Area.

Complex S45 – Marshall Hill

A pre-commercial thinning is proposed for stand 1. Stand 1 is a 34.5 acre loblolly pine plantation that was planted in 2000. This stand is located within the General Management Area.

Complex S47 – Haislip Savannah

An aerial herbicide application is proposed for stand 5. Stand 5 is a 24.9 acre loblolly pine plantation that was established in 1990 and first thinned in 2006. Wisteria has escaped from an old home site within this stand and is killing the mature trees present. This stand is located within the General Management Area.



0 660 1,320
Feet

1 inch = 660 feet



2013 AWP Stands

- Final Harvest
- Seed Tree
- Pre-Commercial Thinning
- 1st Thinning
- 2nd Thinning
- Invasive Spray

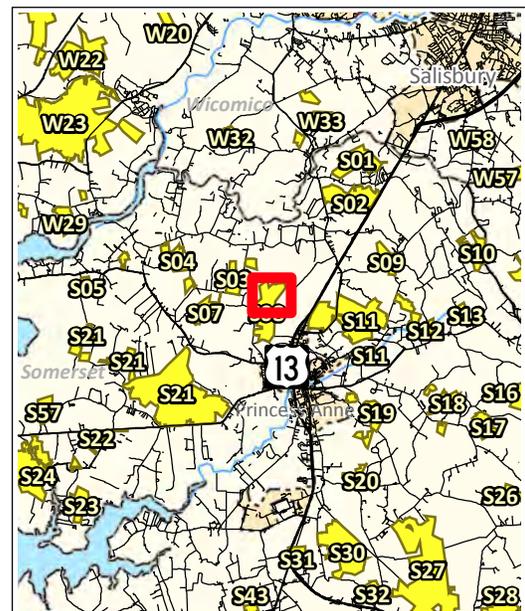
Management Zones

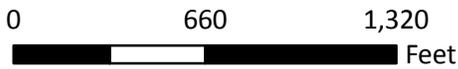
- DFS
- ESA Zone 1
- ESA Zone 2
- ESA Zone 3 Pulpwood
- ESA Zone 3 Saw Timber
- FIDS
- G3
- Stream Buffer

Cheapeake Forest

S08 - White Pusey Complex
Seed Tree - 22.4 Acres

ASC-DNR Forest Service 5/2011





1 inch = 660 feet



2013 AWP Stands

- Final Harvest
- Seed Tree
- Pre-Commercial Thinning
- 1st Thinning
- 2nd Thinning
- Invasive Spray

Management Zones

- DFS
- ESA Zone 1
- ESA Zone 2
- ESA Zone 3 Pulpwood
- ESA Zone 3 Saw Timber
- FIDS
- G3
- Stream Buffer

Cheapeake Forest

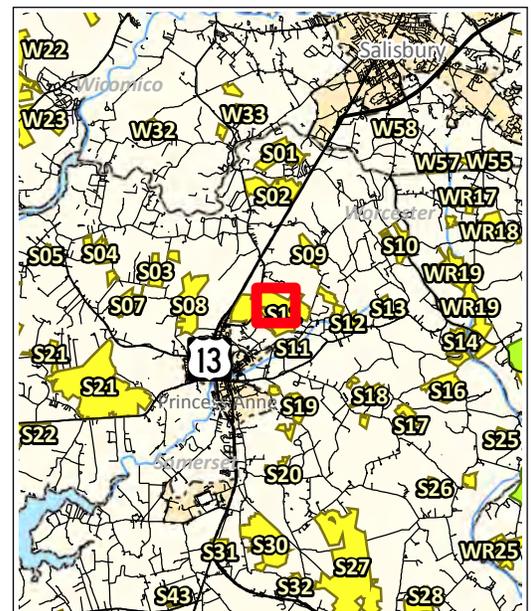
S11 - Peters McAllen Complex

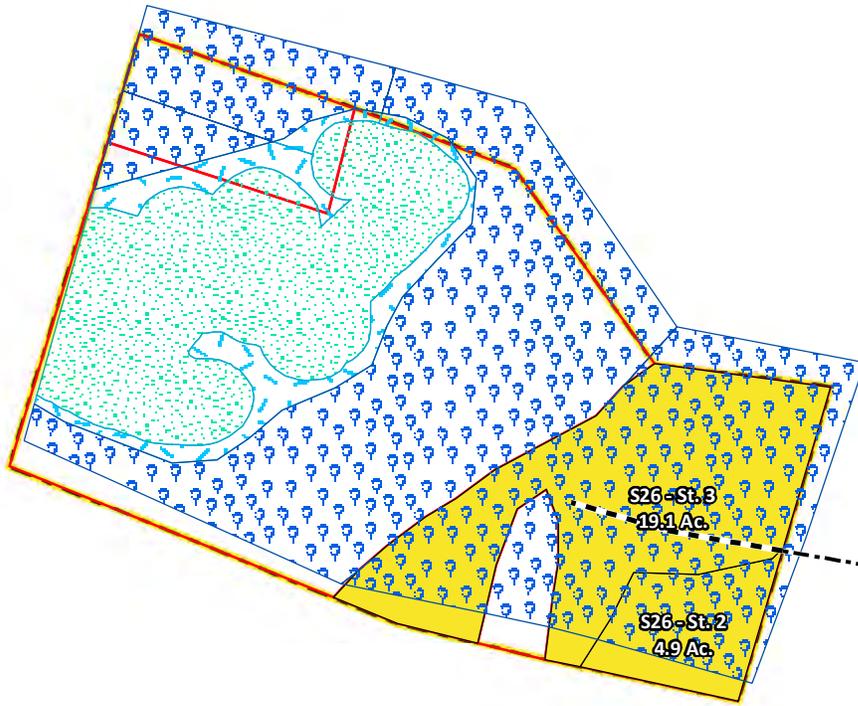
Final Harvest - 2.2 Acres

First Thinning - 54.7 Acres

Second Thinning - 54.7 Acres

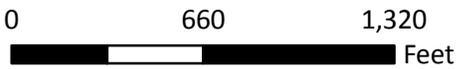
ASC-DNR Forest Service 5/2011





Perryhawkin Rd

Dublin Rd



1 inch = 660 feet



2013 AWP Stands

- Final Harvest
- Seed Tree
- Pre-Commercial Thinning
- 1st Thinning
- 2nd Thinning
- Invasive Spray

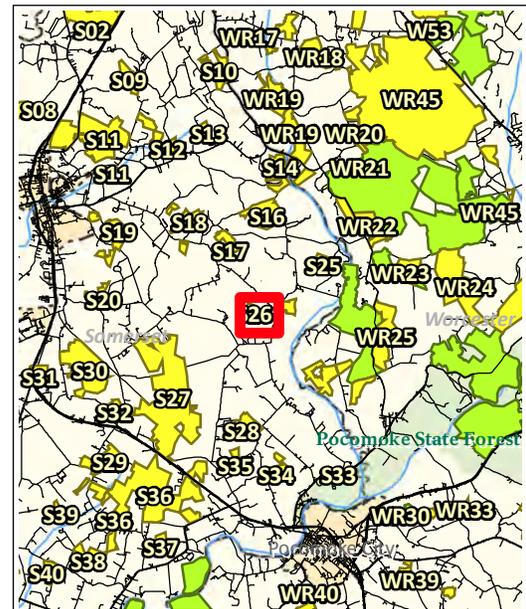
Management Zones

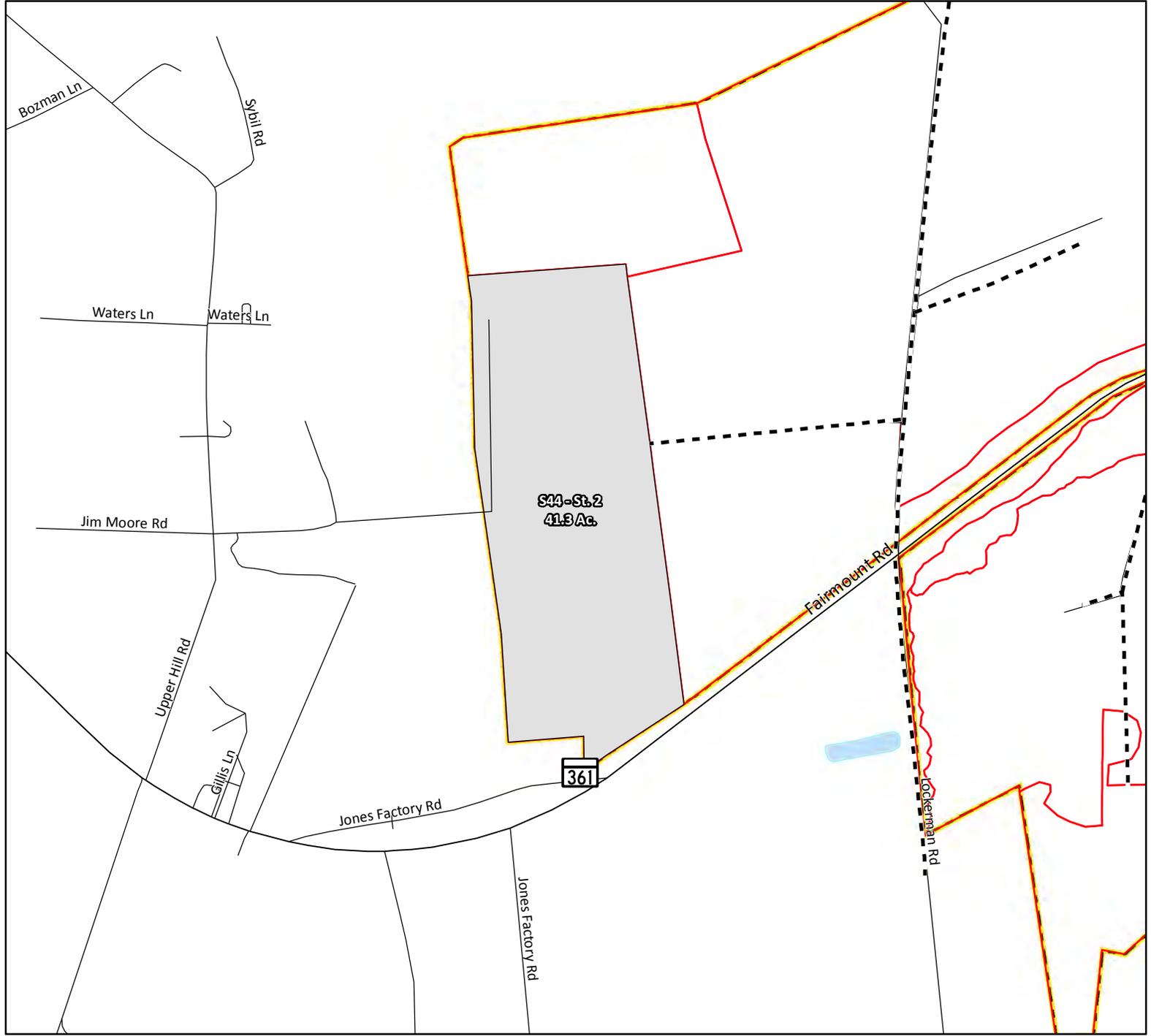
- DFS
- ESA Zone 1
- ESA Zone 2
- ESA Zone 3 Pulpwood
- ESA Zone 3 Saw Timber
- FIDS
- G3
- Stream Buffer

Cheapeake Forest

S26 - Bonneville Complex
First Thinning - 24.0 Acres

ASC-DNR Forest Service 5/2011





0 660 1,320 Feet

1 inch = 660 feet



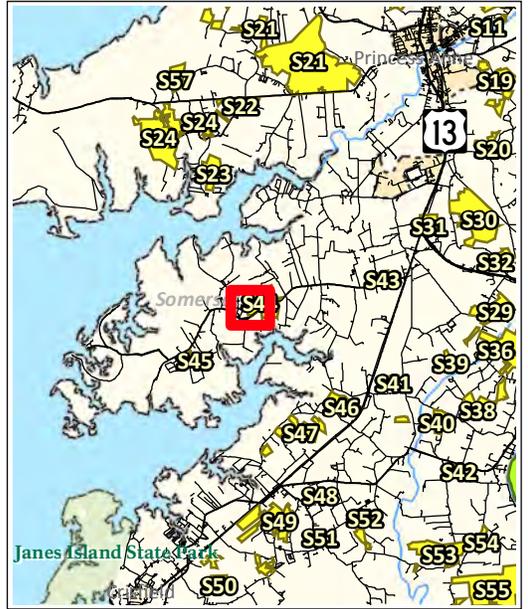
- 2013 AWP Stands**
- Final Harvest
 - Seed Tree
 - Pre-Commercial Thinning
 - 1st Thinning
 - 2nd Thinning
 - Invasive Spray

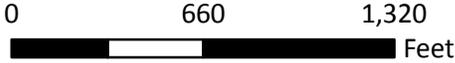
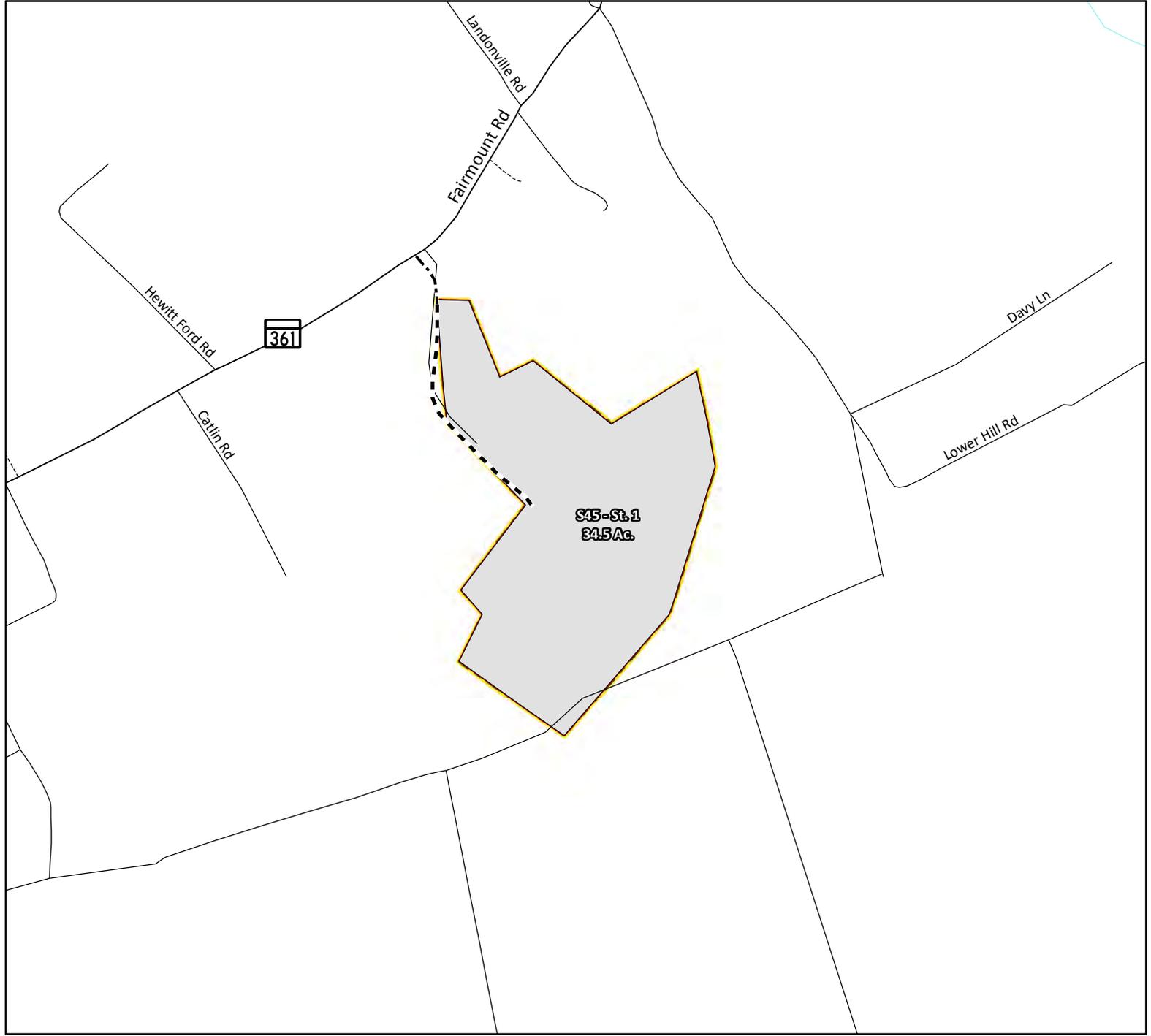
- Management Zones**
- DFS
 - ESA Zone 1
 - ESA Zone 2
 - ESA Zone 3 Pulpwood
 - ESA Zone 3 Saw Timber
 - FIDS
 - G3
 - Stream Buffer

Cheapeake Forest

S44 - Phillips Complex
Pre-Commercial Thinning - 41.3 Acres

ASC-DNR Forest Service 5/2011





1 inch = 660 feet



2013 AWP Stands

- Final Harvest
- Seed Tree
- Pre-Commercial Thinning
- 1st Thinning
- 2nd Thinning
- Invasive Spray

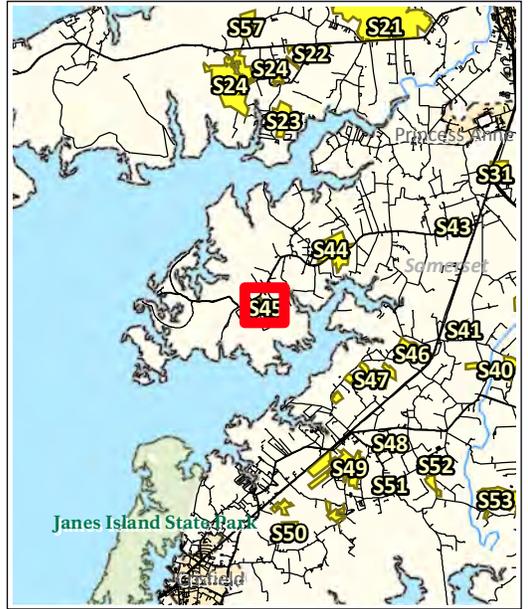
Management Zones

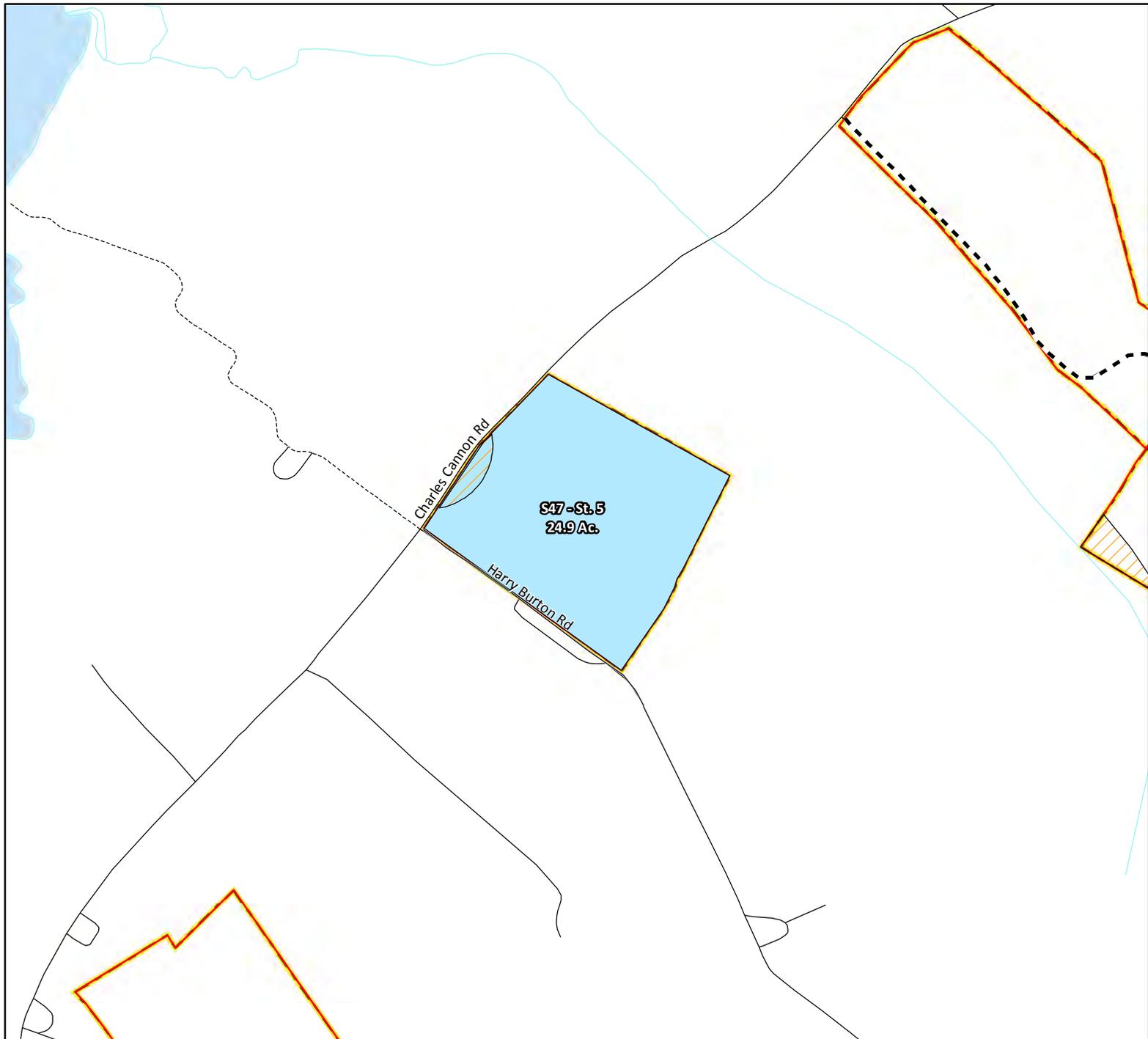
- DFS
- ESA Zone 1
- ESA Zone 2
- ESA Zone 3 Pulpwood
- ESA Zone 3 Saw Timber
- FIDS
- G3
- Stream Buffer

Cheapeake Forest

S45 - Marshall Hill Complex
Pre-Commercial Thinning - 34.5 Acres

ASC-DNR Forest Service 5/2011





0 660 1,320 Feet

1 inch = 660 feet



2013 AWP Stands

- Final Harvest
- Seed Tree
- Pre-Commercial Thinning
- 1st Thinning
- 2nd Thinning
- Invasive Spray

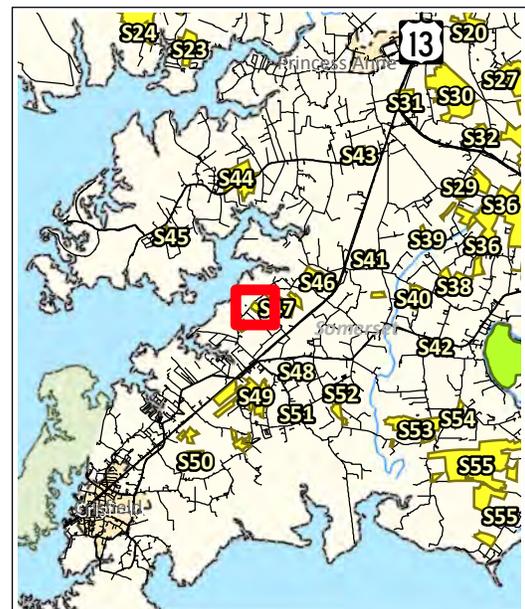
Management Zones

- DFS
- ESA Zone 1
- ESA Zone 2
- ESA Zone 3 Pulpwood
- ESA Zone 3 Saw Timber
- FIDS
- G3
- Stream Buffer

Cheapeake Forest

S47 - Haislip Savannah Complex
Invasive Spray - 24.9 Acres

ASC-DNR Forest Service 5/2011



**Locations & Descriptions
Of
Restoration Projects**

Pine Management Plan for Delmarva Bay Restoration in Brookview Ponds ESA

Submitted by: Wayne Tyndall, Restoration Ecologist,
Maryland Natural Heritage Program, Wildlife and Heritage Service

12 May 2011

Brookview Ponds ESA encompasses a large number of Carolina bays (locally referred to as Delmarva bays) rich in rare and endangered species and uncommon freshwater marsh communities. The Natural Heritage Program has ranked it as the highest restoration priority site in Chesapeake Forest Lands and as a State-wide restoration priority site.

Much of Brookview Ponds ESA was managed by Chesapeake Forest Products Corporation to maximize pulpwood production of loblolly pine (*Pinus taeda*). Silvicultural practices included windrow creation, bedding, wetland ditching, chemical hardwood control, planting of a loblolly pine monoculture, and extensive road construction. As a result, wetlands have been degraded by hydrologic changes, woody plant invasion, and loblolly pine plantings. In addition, uplands are dominated by loblolly pine, red maple, and sweet gum. Indigenous oak forest vegetation has been substantially reduced in abundance.

Restoration of Carolina bay marshes and associated oak forest will require woody plant management, periodic prescribed burning, and hydrologic remediation. Previous efforts have focused on removal of red maple, sweet gum, and loblolly pine from extant marshes and initiation of a prescribed burn program. This project will focus on the management of loblolly pine to inhibit its reestablishment in marshes, reduce hydrologic impacts, and enhance the recovery of oak dominated vegetation. A separate plan will be submitted at a later date to mitigate the hydrologic impacts of ditches and roads.

Goal: The goal of this loblolly pine management plan is to contribute to the restoration of Carolina bay marshes, rare and endangered species populations, and upland oak forest

Objective: Objectives of this plan include:

1. Remove all loblolly pine within 200 feet of each Carolina bay wetland or wetland complex
2. Reduce pine density to 50-60 square feet of basal area per acre throughout the remainder of the site
3. Retain native oak and native shrub species throughout the site
4. Control non-native invasive species throughout the site
5. Maintain a 75-foot “no-cut” forested buffer along each agricultural field, both sides of the power line, and along Jones Thicket Road and Kelly Road

6. Prepare two parking areas near the perimeter of the site for temporary parking of vehicles and hunting facilities
7. Conduct prescribed burning of wetland complexes and surrounding uplands

Methods:

Loblolly pines will be managed in two phases within the portion of Brookview Ponds ESA in the Indiantown Complex of Chesapeake Forest (Figure 1). Phase one could begin as early as September 2011. Pines will be completely removed within 200 feet of Carolina bay wetlands and wetland complexes for a total of 117 harvested acres. Beyond the 200-foot limit, pines will be thinned to a density of 50-60 square feet of basal area per acre, excluding a 75-foot “no-cut” buffer along the agricultural field and Kelly Road, for a total of 233 acres. This 75-foot “no-cut” forested (shade) buffer will help slow the spread of invasive species from adjacent cropland and roadside habitat. Timber removal/harvesting will not occur during the forest interior dwelling bird breeding season. Wetland boundaries will be marked in the field and recorded by GPS prior to harvesting. Native oak and native shrub species will be retained whenever possible. Non-native invasive species will be managed using the Early Detection and Rapid Response approach outlined in the MFS Policy and Procedure Manual. Power-washing of all harvesting equipment off-site will be done prior to the harvesting operation. A pre-harvesting meeting will be conducted between the Forest Product Operator, the CFL Forest Manager, and the State Restoration Ecologist of the Natural Heritage Program.

In phase two, pine thinning at a density of 50-60 square feet of basal area per acre will be completed throughout the remainder of the site (514 acres) with the following exceptions. Pines will be completely removed from the 200-foot perimeter of wetland 19 (Figure 1; 9 acres). A 75-foot forested “no-cut” buffer will be maintained along both sides of the power line, along Kelly Road and Jones Thicket Road, and any agricultural land. In all areas, native oak and native shrub species will be retained whenever possible. Invasive species will continue to be managed using the Early Detection and Rapid Response approach.

During phase one, two parking areas will be created for vehicular parking and for staging equipment used by hunters during deer seasons. The area where hunting facilities are currently staged is needed as a landing area for timber harvesting operations. One of the new parking areas will be near the Kelly Road entrance, and the other near the entrance off of Jones Thicket Road. Both parking areas will be beyond the 75-foot forested buffer, and special attention will be given to positioning the Jones Thicket Road parking area due to the presence of an Endangered species. The exact location and size of each parking area will be agreed upon jointly by the Maryland Forest Service and the Wildlife and Heritage Service.

Prescribed burning will inhibit reestablishment of pine and other woody plants in the wetlands and enhance recovery of upland oak forest. The frequency of prescribed burning is anticipated to be about once every four years but could vary from 3-7 years depending mainly upon the rate of oak regeneration. A fall 2010 prescribed burn for the northeastern quadrant (wetland 5 area) was cancelled because of excessive fuel moisture. Burning of this and/or other units is planned for 2011. Firebreaks will be prepared in a design to minimize pine exposure.

Prescribed burn equipment (i.e., dozer/plow, ATVs, and engines) will be power-washed prior to moving on-site to conduct burns.

Expected Results:

Removing pines within 200 feet of marshes will immediately improve hydrologic conditions, by reducing evapotranspirational water loss, as well as inhibit the reestablishment of pines in the wetlands. Pine thinning in surrounding uplands will enhance native oak forest regeneration and improve site hydrologic conditions. The two new parking areas will preclude conflicts between harvesting activities and lease hunters. Establishing parking areas near the perimeter of the site will also preclude unnecessary disturbances in the interior of the ESA and contribute to long-term efforts to reduce site fragmentation. Prescribed burning will expedite the recovery of natural communities, including rare and endangered species populations, as well as help limit the reinvasion of woody plants.

Timeline:

Phase one should begin as soon as possible; i.e., September 2011, with phase two immediately following the completion of Phase 1.

Nanticoke/Marshyhope Sand Ridge North Tara Road, Chesapeake Forest Sundial Lupine Restoration Plan

Sara Tangren, Ph.D.
University of Maryland Arboretum & Botanic Garden
Rare Plant Heritage Program

Setting:

Eighteen thousand years ago, the Delmarva peninsula was exposed to icy winds rushing down from glacier fields to the northwest. Winds racing across lightly vegetated plains sorted exposed soils according to grain size, creating a system of inland sand dunes. One such complex of dunes parallels the east bank of the Marshyhope River in what is now Dorchester County. The extreme environmental conditions currently found along the dune crests include frequent fire, low soil pH, sparse soil nutrients, excessive soil drainage, and low soil-moisture retention capacity. There are plant species adapted to such extreme conditions, and on Maryland's Eastern Shore they are found only in these inland dune crest communities. One example is the rare wildflower, sundial lupine (*Lupinus perennis*, S2).

North Tara Road traverses one of the ancient inland dune fields. The dune crests along this road parallel the Marshyhope River. A map of the dune crests was generated by using Web Soil Survey and selecting the soil drainage class overlay (Figure 1). Heritage Program records from 1995 indicate that 10 to 50 lupine plants were growing on the south bank of North Tara Road, 1.5 miles north of the intersection with Rt. 392. In 1995, as now, most of the land along North Tara Road was used for loblolly pine production. Without periodic fire to create openings, the loblollies and their undergrowth provide too much shade for lupines and other herbaceous members of the dune crest plant community. As it happened, after the 1995 observation there was a fire, and by 1999 the lupine patch had increased to include several hundred plants extending for a considerable distance both along the road and into the woods (records are unclear as to the exact yardage).

During a 2009 reconnaissance, Chris Frye and I found only one lupine patch covering 900 s.f. (Figure 1). These were crowded near the roadside where they could receive a little light. There they contend with invasives, mowing regimens, and illegal dumping.

The lupines observed in 1995 and 2009 are part of a larger metapopulation of lupines occurring along the east side of the Marshyhope River. Seed banks of lupines and other rare xerophytic and pyrophytic plant species are present in the soils along North Tara Road, waiting to be released by the next fire.

General Proposal:

We propose that woodlots along North Tara Road be cycled through a new maintenance regimen wherein some parcels are harvested and burned to create an open, savannah like condition, while other parcels are allowed to achieve forest closure and produce merchantable timber. This cycling would simulate the natural fire disturbance regime of the dune crest community.

The parcel at the site of the 2009 lupine observation contains a loblolly stand of merchantable size, so we propose that this woodlot be the first to enter the savannah maintenance regime (Figure 2). Management would begin by harvesting the loblollies and thinning out the undergrowth of red maple and sweet gum. A small number of oaks, dogwoods, sassafras and pitch pine should be retained to provide an open canopy, approximately 25% closure is ideal. The site will need to be maintained with periodic prescription burns. At some point in time, probably more than 5 years but less than 25 years in the future, it will become evident that the lupine population is losing its vigor. This is an indication that it is time to let the canopy begin closure while harvesting another woodlot and starting the cycle again. In this way, the management of the 2009 site would be the beginning of a new management approach to the xeric woods along North Tara Road. Logical candidates to include in the lupine management rotation include the woodlot immediately to the east, and the site of the 1995 lupine patch.

Important Details:

The woodlot immediately to the east of the 2009 site contains a patch of the invasive plant Japanese knotweed (*Fallopia japonica*, Figure 3). Control efforts for the patch should begin as soon as possible to prevent spread along the roadside, which would endanger the nearby lupines. Heavy equipment should not enter the area infested by Japanese knotweed until the seed bank has been exhausted or removed, otherwise the seed may be tracked into new areas. The process of exhausting the seed bank will take several years.

The University of Maryland Arboretum is currently monitoring 43 patches of lupine across the state. Our observations from several sites indicate that lupines are more sensitive than most plant species to drift and residual activity from the herbicides typically used to control woody vegetation. We recommend that any chemical control measures on either parcel occur between mid-July and late March, the dormant season for lupines, and that as little chemical be applied as practicable to reduce any residual activity.

Responsibilities:

If this management plan were accepted, the management responsibilities would be as follows:

- The Dorchester County Highway Department would be responsible for maintenance of the 2009 area roadside lupine habitat. They will refrain from mowing between St. Patrick's Day and Independence Day to allow the lupines to bloom and set seed.
- The Maryland Forest Service would be responsible for harvesting loblollies, burning the undergrowth, and otherwise managing the forest.
- The Heritage Program will collaborate with the Forest Service on the control of Prince's Feather.
- The UMD Arboretum would be responsible for monitoring the impact of the new management regimen on the lupines.

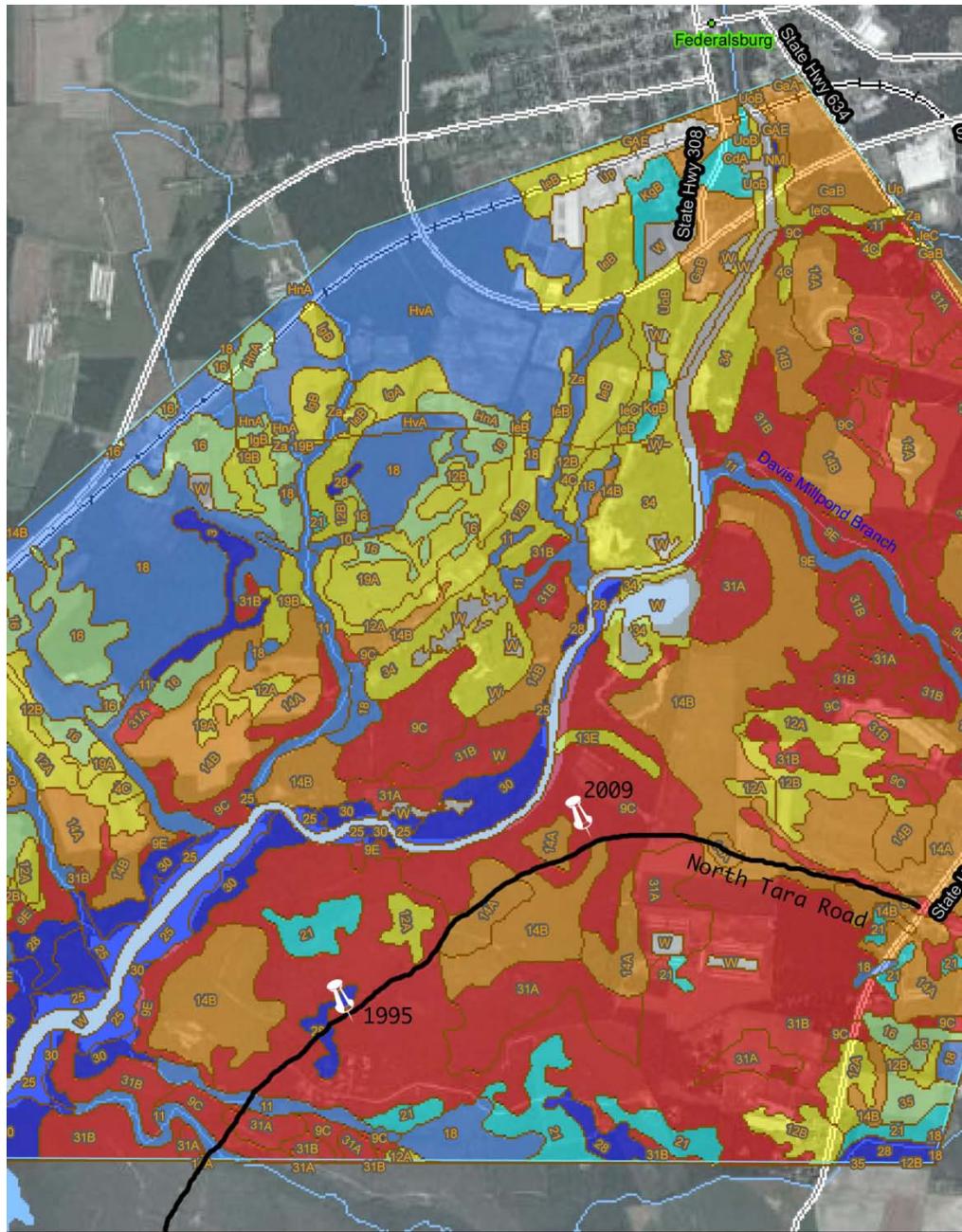


Figure 1. Base map from Web Soil Survey with Soil Drainage Class overlay. Accessed February 2011. Excessively well-drained soil class in red correlates with dune crests. Location of lupine patches and North Tara Road added by the author.



Figure 2. DRAFT: The parcel to be managed.



Figure 3. 2009 Lupine Site. Lupine Patch outlined in purple is 90 ft long. Patch of prince's feather outlined in red. North Tara Road intersects a dune crest at the yellow line. PP indicates a photo monitoring point.

Habitat Restoration Plan for Dividing Creek Pond in Pocomoke State Forest (SFY 13)

Submitted by: Wayne Tyndall, Restoration Ecologist,
Maryland Natural Heritage Program, Wildlife and Heritage Service

2 Oct 2011

Background: Dividing Creek Ponds ESA includes two Carolina bay wetlands, the larger of which (“Dividing Creek Pond”, 3.5 acres, Figure 1) has supported the only Maryland population of Southern cutgrass (*Leersia hexandra*, State Endangered). In addition, it has provided habitat conditions for one other State Endangered plant species (*Lobelia canbyi*), two State Threatened plant species (*Rhynchospora harperi* and *Sclerolepis uniflora*), and a mammalian Species of Greatest Conservation Need (Red bat). Although the Red bat still uses the larger wetland, Southern cutgrass has not been seen during surveys conducted after 1994; i.e., 1997, 2000, 2002, 2003, 2010, 2011, and the other three State listed taxa have not been seen since 1987 or sooner.

All of the rare plants are emergent marsh species, but less than 1/4 ac of marsh persists (Figure 2). The remainder of the basin is now covered by dense gum swamp (black gum and sweet gum, Figure 3). Little to no vegetation remains under the gum trees which probably eliminated marsh plants primarily by excessive shading. Swamp vegetation probably is continuing to inhibit remaining marsh vegetation by adversely affecting hydroperiod duration, increasing shade, and depositing leaves on the surface of the marsh. In addition, the surrounding upland is a dense loblolly pine forest and, therefore, is contributing to unfavorable hydrologic conditions in the wetland.

Since emergent marsh coverage is very limited, the immediate need is to increase irradiance levels by killing gums in its immediate vicinity (Phase 1). Depending upon the rate of marsh expansion and the reappearance of rare plant taxa, removal of most gums from the basin and management of loblolly pine in the surrounding upland may begin after two or more years (Phase 2).

Goal: The goal of this habitat restoration project is recovery of the freshwater emergent marsh community and associated State-listed species

Objectives:

Phase 1

1. Manage gums shading or competing with marsh vegetation for nutrients
2. Document the rate of spread of emergent marsh vegetation and survey for rare species

Phase 2

1. Quantify the desired levels of gum and pine management
2. Select and initiate methods for gum and pine removal
3. Continue documenting the rate of marsh vegetation expansion and survey for rare species

Methods:

Phase 1. Gums shading or rooted in emergent marsh will be treated with imazapyr concentrate using the drill-and-syringe method. More than one month after treatment, treated gums will be cut and stacked in piles (< 10 feet in diameter) in the basin or adjacent upland, or both. If weather conditions permit, piles may be burned after snowfall or when the ground is saturated; otherwise, piles will be left to decompose. For monitoring the rate of marsh expansion, the edge of extant vegetation will be marked with survey flags and photographed at permanent points. Rare plant surveys will be conducted during appropriate phenological periods.

Phase 2. Potential methods for low impact removal of gums and pines will be reviewed with the Maryland Forest Service, and final selection will be a balance of cost and budget constraints. Marsh and rare plant surveys will continue during gum and pine management and for an undetermined time in the future.

Timeline:

Phase 1. Gum treatment will begin in SFY13. Cutting and stacking piles will begin more than one month after treatment to allow the herbicide active ingredient to be effective. Marsh and species monitoring will begin as phenological conditions permit and continue throughout the remainder of the growing season(s).

Phase 2. Activities in this phase will be initiated after the reappearance of at least one State-listed species.

Expected Results:

The rate of marsh expansion will be dependent upon hydrologic conditions during the growing seasons, especially the timing of complete drawdown and its duration. Marsh recovery is expected to be slow in years with late or no drawdown and expedited in years when drawdown occurs before June. Since seed bank characteristics are not known for any of the rare taxa, species recovery is not predictable.

Dividing Creek Pond (3.5 acres)



Figure 1. Dividing Creek Pond surrounded by loblolly pine forest.



Figure 2. Remaining emergent marsh vegetation in Dividing Creek Pond (Pocomoke State Forest) surrounded by gum swamp. Photo taken by Jason Harrison.



Figure 3. Black gum and sweet gum swamp vegetation in Dividing Creek Pond (Pocomoke State Forest). Photo taken near edge of basin by Jason Harrison. Emergent marsh can be seen in background.

Monitoring Projects

Monitoring Proposal

In 2006 you gave us permission to install a stream gage and to sample the forested stream that crosses Tara Road and drains into the Marshy Hope in NE Dorchester Co. Since then we've developed a rating curve for the site, monitored stream depth at 30 min intervals, and sampled base flow chemistry at monthly intervals. I've attached a graphic which shows some of the baseflow chemistry results from that site.

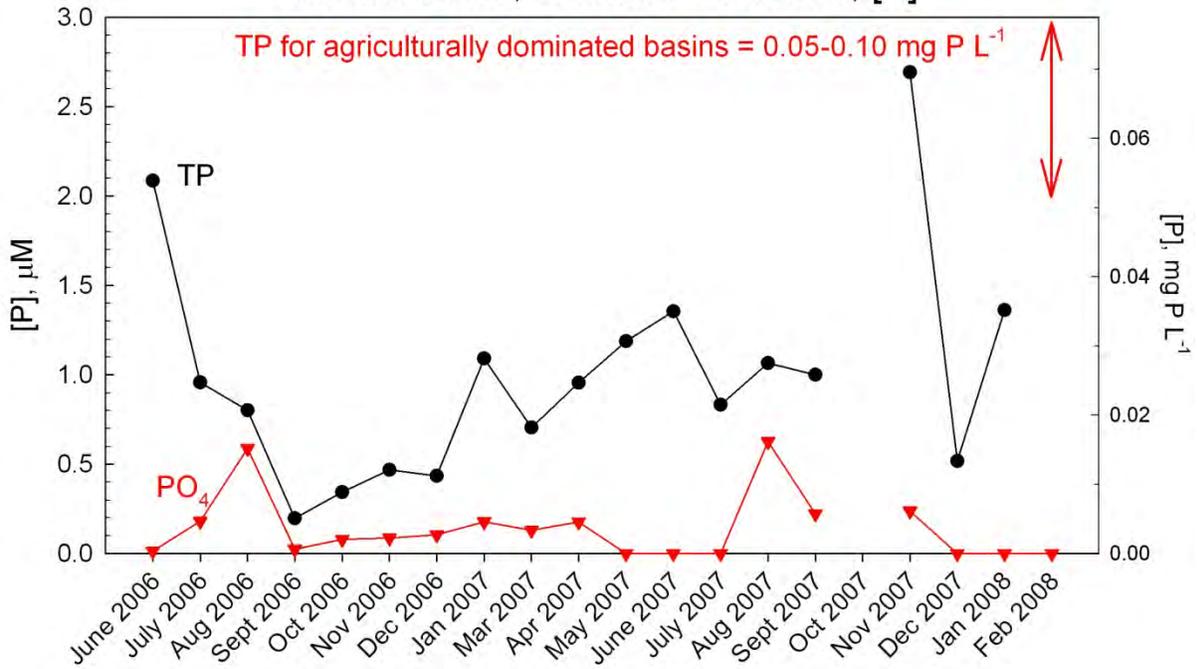
This 100% forested/marsh site is an invaluable reference site for us. Both total P (TP) and total N (TN) are quite low compared to the largely agricultural sites that we work with in Caroline, Talbot, and Queen Anne's counties (see the figure). Unlike ag-dominated watersheds with 3-8 mg NO₃-N/L, your forested site has <0.1 mg NO₃-N/L, lower than the NH₄+NO₃ in rainfall (~0.4 mg N/L), indicating net N removal, not surprising for an aggrading forest. Total N at this site ranges only over 0.2-0.8 mg N/L, a good reference number for watersheds with minimal anthropogenic influences. Total P and phosphate are only 1/3 to 1/2 of the values in baseflow of ag-dominated watersheds. If you are interested, I can send you a reprint of a paper in which some of the data from this site was used for comparison with our ag-dominated streams.

One of the things that we found recently is that the watershed of this site extends to the S side of Harrison Ferry Road. East of Tara Road there are drain pipes that cross under Harrison Ferry Road, transporting water from a wetland on the S side. We suspected this because we had too much water coming out the gaged location for the drainage area that we knew about. We hope to map the true drainage basin. Does DNR own land on that side of the road too?

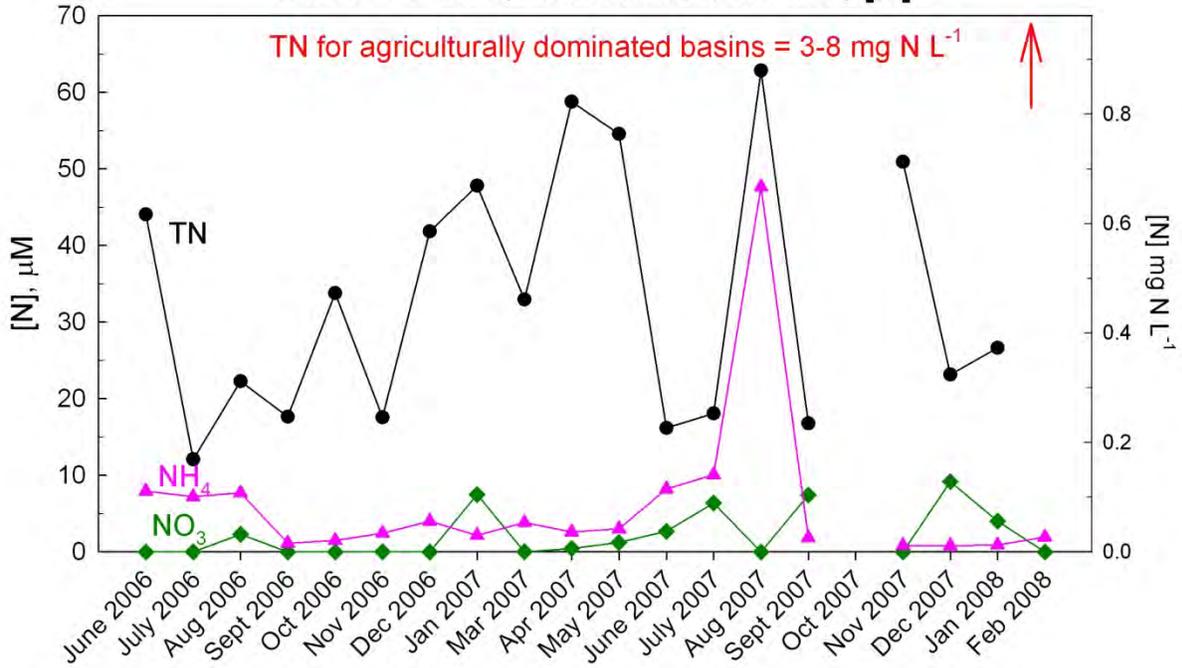
I am writing today to ask permission to install some 2" groundwater wells in the floodplain of this site near Tara Road. I have a new student, Dana Young in the cc line above, who will be working on methane and anaerobic oxidation of methane by nitrate, a process which may be an important mechanism of N removal in watersheds. The process has been detected in soil cores in the lab, but not measured in the field. From walking around the forested site at various times, I know that there is abundant methane ebullition (bubbles) in the floodplain, and we would like to make that site a reference site for natural production of methane with low amounts of available nitrate. Initially we would like to install 3 wells to sample at 1 m, 2 m, and 3 m depths, but we might want to put in more later. All that you will see will be 2" pipe with a cap sticking up about 12-18" above the ground. We will sample the groundwater weekly to monthly, and we will of course acknowledge the cooperation of MD DNR in Dana's thesis and publications. If you have questions about these shallow wells, please contact me by phone. Thanks in advance for your cooperation.

Tom Fisher
410-221-8432 (office)
Horn Point Laboratory
Center for Environmental Science
University of Maryland

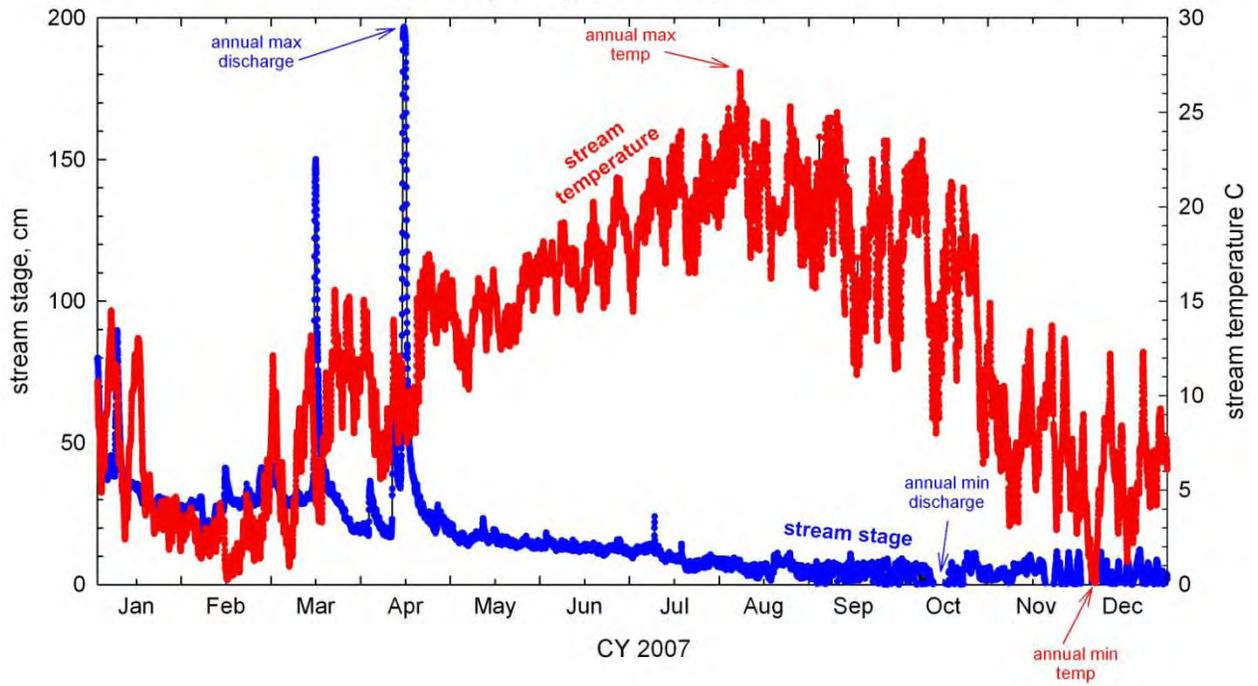
Forested Site, Baseflow Nutrients, [P]



Forested Site, Baseflow Nutrients, [N]



Marshy Hope Forested Site



Installed August 9, 2006

Projected Annual Budget

FOREST FY 2011 PROJECTED BUDGET

<i>Cost of Management</i>	
<i>(*Costs will vary from year to year)</i>	
State CF Salaries & Contract Management	\$ 500,000
Land Operation	\$ 422,000
Inventory & Monitoring Program	\$ 70,000
Sustainable Forest Certification	\$ 20,500
Watershed Improvement & Other Restoration Projects	\$ 80,000
County Payment (15% of revenues)	\$ 227,500
Fixed Cost (ditch drainage payments to counties)	\$ 8,000
TOTAL COST	\$1,328,000

<i>Operating Revenues & State Funding</i>	
Forest Product Sale Revenues	\$ 1,020,000
Hunt Club Revenues	\$ 332,000
Off Road Vehicle Funds	\$ 14,500
Recreational Trail Grants	\$ 83,700
TOTAL REVENUES & FUNDING	\$1,450,200

**Interdisciplinary Team
Comments**

**Citizen Advisory Committee
Comments**

**Public
Comments**