

EASTERN REGION  
STATE FOREST LANDS  
ANNUAL WORK PLAN  
FISCAL YEAR 2022

Prepared: \_\_\_\_\_  
(Forest Manager)

\_\_\_\_\_  
Date

Reviewed: \_\_\_\_\_  
(Regional Manager)

\_\_\_\_\_  
Date

Approved: \_\_\_\_\_  
(Environmental Specialist)

\_\_\_\_\_  
Date

***Prepared By:***

Michael G. Schofield, MFS – Chesapeake Forest Manager

Alexander Clark, MFS – Assistant Forest Manager

***Contributors:***

Skip Jones, Parker Forestry Services Inc.

DNR Interdisciplinary Team

Citizens Advisory Committee

## CONTENTS

A. Forest Overview .....	4
Chesapeake Forest and Pocomoke State Forest .....	4
Historic Forest Conditions and the Role of Fire .....	4
Forest Types and Size Classes .....	5
Unique Community Types .....	6
Soils .....	9
B. Annual Work Plan Summary .....	10
Introduction .....	10
Networking with DNR and other agencies .....	10
C. Maintenance Projects .....	11
D. Recreation Projects .....	11
E. Special Projects .....	12
F. Watershed Improvement Projects .....	12
G. Special Wildlife Habitat Projects .....	12
H. Ecosystem Restoration Projects .....	12
Xeric Habitat Treatment and Monitoring Plan (Abstract) .....	13
I. Monitoring Projects .....	18
J. Review Process .....	18
Interdisciplinary Team Comments .....	18
Citizen's Advisory Committee Comments .....	30
Public Comments .....	34
K. Silvicultural Projects .....	34
Silvicultural Activity Overview .....	34
Definitions of Silvicultural Activities .....	34
Silvicultural Prescriptions & Stand Data .....	36
Caroline County .....	36
Dorchester County .....	36
Somerset County .....	37
Wicomico County .....	38
Worcester County .....	39
Pocomoke State Forest .....	41
Silvicultural Site Maps .....	43
L. Budget .....	71
Appendix A – Soil Series Management Groups, Abbreviations, and Symbols .....	73
Chesapeake Forest/Pocomoke State Forest: Soil Management Groups .....	75
Appendix B – Audit Summaries – 2020 .....	77
Works Cited .....	77

## A. FOREST OVERVIEW

### CHESAPEAKE FOREST AND POCOMOKE STATE FOREST

The Chesapeake Forest which is owned by the State of Maryland and managed by the Maryland Forest Service through the Department of Natural Resources originally consisted of 58,000 acres of forest land. These lands were part of a 1999 divestment by the Chesapeake Forest Products Corporation. At that time, a partnership between the State of Maryland, The Conservation Fund, and Hancock Timber Resources Group moved to purchase the forests. The original 1999 plan was prepared by a 10-person technical team assembled by The Sampson Group, Inc. Oversight and decision making for the technical team was provided by a Steering Committee composed of representatives from Maryland Department of Natural Resources, The Conservation Fund, the Chesapeake Bay Foundation, and the local forest industry.

The Chesapeake Forest currently consists of 75,530 acres divided into 186 Management Units distributed across six counties. Chesapeake Forest also includes the Seth Demonstration Forest in Talbot County, Wicomico Demonstration Forest in Wicomico County, and Fred W. Besley Demonstration Forest in Dorchester County. In spite of this scattered character, the forests include some of the last large segments of unbroken forest in a region that is largely agricultural in nature. Chesapeake Forest Lands include more than 6,000 acres of wetlands or swamps and comprise portions of 23 separate watersheds, many of which have been given a high priority for conservation action under the Maryland Clean Water Action Plan. They contain established populations of threatened and endangered species, including the Delmarva fox squirrel (*Sciurus niger cinereus*), bald eagle, and some 150 other species that have been identified as rare, threatened, or endangered in the region. Abundant populations of deer, turkey, and waterfowl create the basis for extensive hunting opportunities and other recreational activities on the land.

The 18,492-acre Pocomoke State Forest is almost entirely contained within Worcester County, except for 388 acres in Somerset County and 154 acres in Wicomico County. The Chesapeake Forest has 19,978 acres within Worcester County, and several tracts from both Chesapeake Forest and Pocomoke State Forest adjoin each other offering greater habitat and recreational management opportunities. In addition, since both forests contain similar forest types, many of the same management guidelines and principles are used. There are differences between the two forests, however. Pocomoke State Forest contains many older tracts of forestland still in their natural state, nearly 5,000 acres of cypress and hardwood forest that borders a state scenic river, and areas of state designated Wildlands.

For additional information about Chesapeake Forest and Pocomoke State Forest please visit their respective web pages located at: <http://dnr.maryland.gov/forests/Pages/mdforests.aspx>.

### HISTORIC FOREST CONDITIONS AND THE ROLE OF FIRE

The average pre-European-settlement fire frequency was on the order of 7-12 years for forests of the Eastern Shore of Maryland, with higher frequencies of 4-6 years in the southeastern Maryland counties of Wicomico, Worcester, Somerset, and Dorchester (Frost, 1998). These frequencies are high compared to most areas of the Northeast. Since it is unlikely that lightning was a significant contributor to these fires, Native American populations must have been. A conclusion is that fire in the Northeast was predominantly a phenomenon associated with human activity (Pyne, 1982).

The forest that covered the Eastern Shore in Indian times was primarily a hardwood one, though increasingly mixed with pine to the southward (Rountree & Davidson, 1997). The large patches of pine-dominated woods today are largely second growth, the result of extensive clearing in historic times. In aboriginal times, the woods of the Eastern Shore were likely to be oak-hickory, oak-gum, or oak-pine types, all of which still exist in second-growth form.

Captain John Smith said in the early seventeenth century, “A man may gallop a horse amongst these woods any waie, but where the creekes or Rivers shall hinder”. Father Andrew White wrote that the woods around St. Mary’s were so free of underbrush that a “coach and fower horses” could be driven through them (Rountree & Davidson, 1997). The open conditions could be partly attributed to the closed canopies of these mature forests, which shaded out undergrowth, but it is also likely that periodic fire helped to maintain the park-like conditions.

It is reasonable to assume that Eastern Shore tribes also used fire to periodically burn the marshes that were important sources of mollusks, fish, furbearers, waterfowl, edible tubers, and reeds for housing. Fire would have been useful for herding game, enhancing visibility or access, or retarding invasion of woody growth. More often than not, these fires would have spread into adjacent woodlands and, if of sufficient intensity, created the open seedbed conditions conducive to establishment of loblolly pine. Even today the pattern of loblolly pine “islands” and “stringers” in and adjacent to marshes of the lower Eastern Shore is common.

If, as Rountree and Davidson suggest, oaks were the most prevalent species in pre-settlement times, then the possible role of fire in maintaining these forest types must also be considered. Frost stated, “Light, understory fires may have been the norm for millions of hectares of eastern hardwood forest...” (Frost, 1998). Oak species range from slightly tolerant to intolerant of shade, indicating that disturbance is desirable to promote regeneration and growth. Furthermore, acorn germination and initial seedling establishment are most successful where light understory burns have scarified the seedbed and reduced competition (Burns & Honkala, 1990). The extensive presence of oaks on the Shore was an indicator that low-intensity understory fires were common, either intentionally set by Indians to create “open woods” or drive game, or the incidental result of land-clearing.

Natural stands of loblolly pine (*Pinus taeda*) became much more widespread around the turn of the 20th Century, particularly in the counties south of the Choptank River, largely due to the influence of economic factors. First was the abandonment of agricultural fields as farmers moved to more lucrative jobs in the towns and cities. Loblolly pine is an opportunistic species, which found the recently abandoned fields prime sites for reproduction by natural seeding. The second factor was the rise of large-scale commercial lumbering. Steam locomotives, often used to haul logs from the woods, were notorious for throwing sparks along the tracks and starting fires. Both the clearing of the forests by large-scale logging and the subsequent fires resulted in large areas of open, scarified land suitable for pine regeneration. By the middle of the twentieth century, loblolly pine had become the predominant forest cover type in the lower counties of the Eastern Shore.

## FOREST TYPES AND SIZE CLASSES

Young loblolly pine forests mostly established since the early 1980’s are what characterize a high proportion of the Chesapeake Forest. Mixed pine and hardwood forests still occupy some of the lands, and many riparian areas and flood plains contain stands of mixed hardwoods. In general, the mixed pine-hardwood and hardwood stands are older, mature forests.

Mature mixed pine-hardwood, bottomland hardwood, and bald-cypress forests comprise the majority of the Pocomoke State Forest. In general, the mixed pine-hardwood, hardwood, and bald cypress stands are older, mature forests, while loblolly pine stands are more evenly distributed across all age classes.

Table 1 provides a habitat diversity matrix of both Eastern Region State Forests that provides a current baseline from which future changes in age structure or forest type diversity can be assessed for potential habitat or biodiversity effects.

**Table 1. Forest Diversity Analysis**

Acres of forest type and forest structure by structural groups, with percent of total area in each forest type/structure group combination.

Forest type	Structure Stage							Total Area
	Open 0 - 5 yrs	Sapling 6 - 15 yrs	Growing 16 - 25 yrs	Maturing 26 - 40 yrs	Mature 41 - 60 yrs	Big Trees 61+ yrs	Uneven Aged	
Loblolly Pine	331	3,186	14,719	29,067	8,871	1,452	259	<b>57,886</b>
(Percent)	0.36%	3.47%	16.01%	31.62%	9.65%	1.58%	0.28%	62.97%
Shortleaf Pine	2	10	0	0	0	265	17	<b>295</b>
(Percent)	0.00%	0.01%	0.00%	0.00%	0.00%	0.29%	0.02%	0.32%
Mixed Pine (Pond, Pitch, Virginia, etc.)	20	0	0	0	0	102	75	<b>197</b>
(Percent)	0.02%	0.00%	0.00%	0.00%	0.00%	0.11%	0.08%	0.21%
Atlantic White Cedar	8	2	1	0	0	0	0	<b>12</b>
(Percent)	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.01%
Mixed Pine/Hardwood	41	1,324	1,958	1,099	1,955	8,179	14	<b>14,570</b>
(Percent)	0.04%	1.44%	2.13%	1.20%	2.13%	8.90%	0.02%	15.85%
Bottomland/Mixed Hardwoods	0	221	370	388	2,046	8,241	6	<b>11,273</b>
(Percent)	0.00%	0.24%	0.40%	0.42%	2.23%	8.97%	0.01%	12.26%
Bottomland Hardwoods/Bald Cypress	0	0	0	0	18	3,691	0	<b>3,708</b>
(Percent)	0.00%	0.00%	0.00%	0.00%	0.02%	4.02%	0.00%	4.03%
Cut/Marsh/Field/Powerline/Road	3,980	0	0	0	0	0	0	<b>3,980</b>
(Percent)	4.33%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	4.33%
<b>Total</b>	<b>4,383</b>	<b>4,744</b>	<b>17,048</b>	<b>30,554</b>	<b>12,890</b>	<b>21,930</b>	<b>372</b>	<b>91,921</b>
<b>(Percent)</b>	<b>4.77%</b>	<b>5.16%</b>	<b>18.55%</b>	<b>33.24%</b>	<b>14.02%</b>	<b>23.86%</b>	<b>0.40%</b>	<b>100.00%</b>

## UNIQUE COMMUNITY TYPES

### INLAND SAND DUNE AND RIDGE WOODLANDS

This natural community occurs on dry, sandy dunes and ridges of the coastal plain. These landforms developed during the late Pleistocene when colder climate processes associated with Wisconsin glaciation influenced much of the region. At the time, prevailing northwest winds transported surficial sands across the Delmarva and deposited them on the east sides of the Nanticoke, Wicomico, and Pocomoke rivers and formed “dune fields” on uplands in the central part of the peninsula. Today, these landforms support woodland vegetation of pine and oak, as well as a variety of rare and threatened plant and animal species. Currently, there are two globally rare natural community types associated with inland sand dunes and ridges. One characterized by shortleaf pine (*Pinus*

*echinata*) and another dominated by a mixture of hardwoods such as white oak (*Quercus alba*), black oak (*Quercus velutina*), and southern red oak (*Quercus falcata*). Both community types share many common associates such as Pitch pine (*Pinus rigida*), post oak (*Quercus stellata*), sand hickory (*Carya pallida*), and a variety of ericaceous shrubs. In general, the herbaceous layer is sparse and consists primarily of light-demanding species tolerant of dry, sandy conditions. Examples of these species include yellow false indigo (*Baptisia tinctoria*) and the State threatened sundial lupine (*Lupinus perennis*). Frequent low-intensity fire is important in maintaining these natural communities and the distribution of species that depend upon them.

## NON-RIVERINE SWAMPS

This natural community includes seasonally flooded “flatwoods” and depressions of the coastal plain. These habitats develop on flat, ancient estuarine terraces and shallow depressions with seasonally perched water tables. This results in standing water throughout the early part of the growing season followed by a period of drawdown. Hydroperiods are variable between swamps and largely dependent on rainfall and drought cycles. The forested canopy structure of flatwoods and depression swamps range from open to closed with composition ranging from hardwood dominated to a mixtures of hardwoods and pines. Swamps dominated by oak species such as willow oak (*Quercus phellos*), pin oak (*Quercus palustris*), swamp chestnut oak (*Quercus michauxii*), and cherrybark oak (*Quercus pagoda*) are considered highly rare because most have been logged and subsequently invaded by successional hardwoods such as red maple (*Acer rubrum*), sweetgum (*Liquidambar styraciflua*), and black gum (*Nyssa sylvatica*). Pond pine (*Pinus serotina*) and loblolly pine (*Pinus taeda*) are prominent components of many flatwoods on the lower Coastal Plain. Nonriverine Swamps have been greatly reduced in Maryland through ditching, draining, logging, and conversion to agriculture.

## ATLANTIC WHITE CEDAR SWAMPS

Atlantic white cedar (*Chamaecyparis thyoides*) swamps occur discontinuously along the Nanticoke, Wicomico, and Pocomoke Rivers. They are best developed above regular tidal influence between tidal swamp forests and sandy uplands where groundwater discharge and the accumulation peat over time provide favorable growing conditions. A few examples have also been documented from seasonally saturated to flooded basin wetlands associated with ancient estuarine terraces in the Pocomoke River watershed. Atlantic white cedar (*Chamaecyparis thyoides*), swamp tupelo (*Nyssa biflora*), pond pine (*Pinus serotina*), and sweetbay magnolia (*Magnolia virginiana*) often comprise the tree canopy. In the understory, shrubs and vines are common but variable, often including an abundance of common greenbrier (*Smilax rotundifolia*). The herbaceous layer is often sparse and may include species of sedges, manna-grasses, and rushes. Slightly elevated hummocks of sphagnum mosses (*Sphagnum* spp.) frequently form large patches. The extent of Atlantic white cedar has been greatly reduced over the past 200 years by logging. Today, remaining stands exist as patches representing only a fraction of historical estimates. All natural community types classified as Atlantic white cedar swamps are considered globally and state rare.

## DELMARVA BAYS

Delmarva Bays are seasonally flooded wetland depressions on Maryland’s coastal plain. They developed from ancient interdunal depressions approximately 16,000 years ago when the climate of the Coastal Plain was very cold and windy and supported an extensive sand dune ecosystem. The majority of Delmarva Bays have been shaped by these wind and erosional processes into circular depressions up to one meter in depth with prominent sand rims. A perched water table and seasonal fluctuations in groundwater recharge and precipitation cause these wetlands to be irregularly flooded or seasonally inundated. During very dry seasons, surface water may be absent or limited

to the deepest point within the bay. Likewise, during very wet years when rainfall is abundant, bays may retain water throughout the entire growing season. Depth and duration of seasonal inundation are apparently the most important factors influencing plant communities and the degree to which woody species become established. Dry-season fires in adjacent uplands may spread into Bays and may be another factor limiting the invasion of woody species, although fire frequencies throughout the region have been much reduced in recent decades. The vegetation of Delmarva Bays is closely linked to its hydrologic regime. As water levels draw down or recede during the growing season, plant communities typically develop concentric rings from the outer edge towards the center or deepest point in the bay. Outer rings of a bay may include shrubs of buttonbush (*Cephalanthus occidentalis*), fetterbush (*Leucothoe racemosa*), swamp loosestrife (*Lysimachia terrestris*), and sweet pepper-bush (*Clethra alnifolia*) or nearly monospecific stands of Walter's sedge (*Carex striata*), maidencane (*Panicum hemitomon*), and Virginia chain fern (*Woodwardia virginica*). Interior portions of Bays may include species such as Eaton's panic-grass (*Dichanthelium spretum*), warty panicgrass (*Panicum verrucosum*), and Virginia meadow-beauty (*Rhexia virginica*). Many of these species grade into the "draw down pocket" or lowest portion of a bay, which is the last to desiccate during the growing season. Common to this zone are slender fimbry (*Fimbristylis autumnalis*) and flood tolerant shrubs like buttonbush (*Cephalanthus occidentalis*). Many plants and animals considered rare in Maryland are known to occur in Delmarva Bays. Delmarva bays and their associated life zones have their own ESA designations identified and mapped.

## BALD CYPRESS SWAMPS

Bald cypress swamps are forested wetlands that contain bald cypress (*Taxodium distichum*) as a dominant species in the canopy. In addition to bald cypress, swamp tupelo (*Nyssa biflora*) and pumpkin ash (*Fraxinus profunda*) are also characteristic in the canopy. Bald cypress swamps occur in the tidal and upper non-tidal reaches of the Pocomoke River in Maryland. These habitats are mostly freshwater and are periodically flooded by lunar tides. Stands are found in low floodplains, forming a corridor between open tidal marsh and non-tidal habitats. Due to flooding, these stands typically contain hummocks and hollows where the hollows are frequently flooded and hummocks are occasionally flooded. Due to the "drier" nature of the hummocks, they often support a diversity of woody and herbaceous species.

## VERNAL POOLS

Vernal pools are small (~0.1-2 ha), non-tidal palustrine forested wetlands. They exhibit a well-defined, discrete basin and lack a permanent, above-ground outlet. The basin overlies a clay hardpan or some other impermeable soil or rock layer that impedes drainage. As the water table rises in fall and winter, the basin fills forming a shallow pool. By spring, the pool typically reaches maximum depth (~0.5-2.5 m) following snowmelt and the onset of spring rains. By mid- to late summer, the pool usually dries up completely, although some surface water may persist in relatively deep basins, especially in years with above average precipitation. This periodic seasonal drying prevents fish populations from becoming established, an important biotic feature of vernal pools. Many species have evolved to use these temporary, fish-free wetlands. Some are obligate vernal pool species, so-called because they require a vernal pool to complete all or part of their life cycle. vernal pools occur throughout the state as scattered, isolated habitats. They are most numerous on the lower coastal plain, especially on the mid to upper eastern shore, and uncommon west of the fall line. They are typically situated in low areas or depressions in a forest, but they can also occur in floodplain forests as isolated floodwaters, among backwaters of old beaver impoundments, old sinkholes, or as perched spring- or seep-fed basins along mountain slope benches, or at the base of slopes. vernal pools may persist in cleared areas such as cropland, pastures, and clearcuts, but usually in a highly degraded ecological state. Because vernal pools occur throughout the state in a variety of forest types and

settings, the vegetation in and around these habitats varies considerably. However, many vernal pools exhibit similar vegetative structure. For example, pools tend to have a semi-open to closed forest canopy around them and the degree of canopy closure generally decreases with increasing pool size. The basin substrate consists of dense mats of submerged leaf litter and scattered, coarse woody debris. Herbaceous vegetation is usually absent to sparse in and around the basin, although small mossy patches frequently occur along the basin edge. A dense shrub layer may occur along the shoreline or in small patches within the basin, especially on the coastal plain, but many pools also lack a well-developed shrub layer.

## SOILS

The region features flat topography, near-sea level elevations, and poorly drained soils. Soils are naturally low in fertility, but soil erosion and sediment runoff for forestry activities is seldom a problem, given reasonable management care. Seasonally wet conditions affect the timing and type of forest management activities. For management activities on the Forest, the soils in the region were classified into 5 Soil Management Groups (SMG), based on soil characteristics. See Appendix A for a listing of soil types by soil management group and a listing by county of symbols used by soil survey reports.

### **The Five (5) Groups (SMG's) were defined as follows:**

- SMG 1 - wet soils with firm sub-soils that can physically support machines when wet.
- SMG 2 - wet soils with non-firm sub-soils that cannot support machines when wet.
- SMG 3 - soils that are less wet than either 1 or 2; highly productive forest sites.
- SMG 4 - very sandy, often dry soils that are generally not highly productive forest sites.
- SMG 5 - very wet, low-lying soils that are too wet for forestry operations.

To facilitate plan development and future management, digital soils data was utilized from the USDA Natural Resources Conservation Service for, Caroline, Dorchester, Somerset, Talbot, Wicomico, and Worcester Counties.

## B. ANNUAL WORK PLAN SUMMARY

### INTRODUCTION

This section summarizes the proposed activities that will occur on all public forest lands (91,922 acres) managed by the Maryland Forest Service within the Eastern Region during the 2022 fiscal year. These lands include the Chesapeake Forest, Pocomoke State Forest, Wicomico Demonstration Forest, Seth Demonstration Forest, and Fred W. Besley Demonstration Forest. The fiscal year runs from July 1, 2021 to June 30, 2022. 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.

All projects and proposals within this Plan have been developed to meet one or more of the Land Management Guidelines and Objectives as seen in the Chesapeake Forest and Pocomoke State Forest Sustainable Forest Management Plans including:

- **Forest Economy** - management activities with a purpose to maintain an economically sustainable forest and contribute to the local economy through providing forest-related employment and products.
- **Forest Conservation** - management activities with a purpose to protect significant or unique natural communities and elements of biological diversity, including Ecologically Significant Areas, High Conservation Value Forests and old growth Forests. Old growth forest management serves to restore and/or enhance old growth forest structure and function.
- **Water Quality** - management activities designed to protect or improve ecological functions in protecting or enhancing water quality.
- **Wildlife Habitat** - management activities with a purpose to maintain and enhance the ecological needs of the diversity of wildlife species and habitat types.
- **Recreation and Cultural Heritage** - management activities with a purpose to maintain and enhance areas that serve as visual, public camping, designated trails, and other high public use areas.

### NETWORKING WITH DNR AND OTHER AGENCIES

#### 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.
- Land Acquisition & 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 Service – Develops watershed improvement projects, assists in the development of a forest monitoring programs and participates on the ID Team.

## 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.
- Third party forest certification via 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.

## C. MAINTENANCE PROJECTS

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. Recreational trails will be mowed and cleared to meet the requirements of the specific user group(s).

Forest boundary lines will be maintained using the DNR yellow band markings. Signs will be placed along the boundary lines designating the type of public access to the property. New acquisitions will be converted from their previous ownership markings to the DNR yellow band markings.

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. In our efforts to control and eradicate this issue, we will continue to coordinate with Natural Resources Police (NRP), local sheriff departments, the State Highway Administration, and County Roads departments.

## D. RECREATION PROJECTS

- 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 acquisitions or right-of-ways being opened.
- Sign new leases for existing hunt clubs using the revised Board of Public Works delegated authority (<https://bpw.maryland.gov/Pages/adv-2006-2.aspx>).
- Host the Annual Ultra-Marathon “Algonquin 50K” race on Chesapeake Forest and Pocomoke State Forest.

- Host the Fat Tire Bike event with the Eastern Shore IMBA on Chesapeake Forest and Pocomoke State Forest.
- 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.
- Continue work on active Recreational Trails Grants
  - Algonquin Cross County Trail Extension
  - Mattaponi Pond Trails and Camping Project
  - Pusey Branch Trail Extension and Enhancement Project
  - Seth Demonstration Forest Trail Enhancement Project
- Perform general maintenance on the existing trail system

## E. SPECIAL PROJECTS

- Maintain dual forest certification. Summaries of the previous year's audit findings can be found in Appendix B.
- 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.

## F. WATERSHED IMPROVEMENT PROJECTS

- Work continues on the Indiantown/Brookview Ponds watershed improvement project from the FY2013 AWP. Currently the project is in Phase IV, which deals with restoring the natural hydrology of the site through the use of ditch plugs.
- Monitoring of hydrologic, terrain, and vegetation conditions on the Foster Estate pond restoration continues. Response to invasive species, primarily Phragmites, will be taken as needed.

## G. SPECIAL WILDLIFE HABITAT PROJECTS

- Initial site review and selection for possible quail management and habitat restoration.
- Planning and execution of the early successional habitat project on the Foster tract with prescribed burning and targeted herbicide applications continues.

## H. ECOSYSTEM RESTORATION PROJECTS

Various ecosystem restoration projects continue to proceed, including the Brookview Ponds ESA restoration and management of the Furnace Tract lupine site. In general, site preparation of high priority ESA sites and prescribed burning was performed when and where possible.

## XERIC HABITAT TREATMENT AND MONITORING PLAN (ABSTRACT)

## SITE NAME:

Pocomoke State Forest – Furnace, Foster and Warren Tracts

## CONTACT INFORMATION:

Project Contact: Jen Selfridge, Maryland Dept. of Natural Resources, Wildlife and Heritage Service, P.O. Box 68, 909 Wye Mills Road, Wye Mills, MD 21679. Office: 410-827-8612 x102 Email: [jennifer.selfridge@maryland.gov](mailto:jennifer.selfridge@maryland.gov)

Pocomoke Forest Manager: Mike Schofield, Maryland Dept. of Natural Resources, Forest Service, 3461 Worcester Hwy, Snow Hill, MD 21863. Office: 410-632-3732 Email: [mike.schofield@maryland.gov](mailto:mike.schofield@maryland.gov)

## EXPERIMENTAL DESIGN:

Number of plots or treatment units: Furnace (6), Foster (3), Warren (3)

Size of plots/units: The Furnace Tract comprises roughly 350 acres and the 6 treatment plots range from 43-85 acres each. The Foster Tract comprises 4800 acres and the main unit where the treatment plots will be located is 23.6 acres (the rest of the tract is heavily forested). This 23.6 acre area will be divided into 3 plots of different sizes. The Warren Tract is approximately 120 acres and the main unit we will work in is 30 acres. There will be 3 treatment plots within the 30 acre unit and each will be approximately 3 acres.

Please provide a brief explanation of the treatment plan for each plot/unit including a description of existing vegetation, the proposed work, timing, objectives, and rationale. Use the attached spreadsheet for estimated costs. Please include a site plan or sketch plan.

FURNACE: Most of the plots will be burned on a rotational basis and the cost of this work will be used for match. We are interested in the response of pollinators and vegetation on plots that are burned every 1-2 years versus every 3-4 years. Ideally we will burn 3 of the plots every year and 3 of the plots every 3<sup>rd</sup> year but this is heavily dependent on available fuel and on weather conditions. Of the 6 plots, 4 were burned in 2017, 1 was burned in 2018, and one has not yet been burned although a burn is scheduled for a future fall date.

In addition to burning we would like to take two of the plots and mechanically clear them in addition to burning. Finally, one plot (the one scheduled to burn in the future) is a site for frosted elfins and cannot be burned in its entirety. This plot will be divided into 3 sub-plots, one of which will be burned in combination with herbicide treatments, while the other two will be managed by mechanical clearing and herbicides.

FOSTER: The 23.6 acre area was burned in 2018. We have not yet determined when or if it will be burned again during the course of this project. Of the burned area, a portion of it is targeted for herbicide treatments of gum and pine; the initial treatment was done in September 2018. A second portion will also be targeted for herbicide treatment as well as mowing where feasible (there are many stumps that need to be avoided). A third portion will serve as a control and will be treated only with prescribed fire.

WARREN: The 30 acre unit was burned in the spring of 2018. We will take 9 of the acres and divide them into three adjacent units. One will be burn only, one will be burn and mow, and the third will be burn and disc.

Maps of all three properties with sketches of the management units are attached.

---

## MONITORING PLAN:

---

### VEGETATION

Outline your vegetation monitoring protocol. If you are using the project protocol or something similar, please explain how you will locate your transects in relation to your treatment plots, number of transects, and the timing of your sampling. If you are using a different method, please briefly explain the differences.

We are using the line-point intercept sampling outlined as the preferred method for this study. We have no recent vegetation data for any of these plots. We did not collect any vegetation data this year but plan to start next year.

---

### BEEES

Do you intend to continue or begin bee surveys in future years?

We did conduct bee surveys at both the Foster and Furnace Tracts in 2018. We did not (and cannot) put out bee bowls at the Furnace Tract during the spring survey because of the potential to kill frosted elfin butterflies. However we will still hand collect. We can do bee surveys at the Warren Tract if there is someone able to identify them. Our understanding was that each state could only submit 3 transects per season. This is hard for us because we are also working at Green Ridge State Forest, and have to this point been submitting 2 samples from Pocomoke and 1 from Green Ridge, but that will need to be revisited.

---

### BUTTERFLIES AND MOTHS

Do you have an interest in surveying for butterflies and moths in future years?

It would be relatively easy to add butterfly surveys if they could overlap the time spent netting for bees or be added onto that time. It would be incredibly expensive and time consuming to add moth surveys. It would be great to have the data but it would probably not be feasible to trap, pin and identify moths without hiring someone to do this at a private contractor rate. Additionally, all of our locations are fairly remote with no light sources nearby; we may be attracting moths to lights from fair distances and could not confidently tie their presence to any of our management techniques.







## I. MONITORING PROJECTS

- Maryland Wood Duck Initiative – D03 – Little Blackwater – Cliff Brown
- Lupine and Frosted Elfin – Furnace Tract – WHS – Jennifer Selfridge
- Bat Study – Bats and Prescribed Burning – WHS – Dana Limpert
- Delmarva Fox Squirrel – Hunt Club Monitoring Project – USF&WS – Cherry Keller
- Trail Monitoring – Recreation Trail Grant trail counters
- Maryland Biological Stream Survey – Stream Sampling on Pocomoke State Forest – DNR Resource Assessment Service – Matt Ashton

## J. REVIEW PROCESS

### INTERDISCIPLINARY TEAM COMMENTS

#### NHP Comments on the Annual Work Plan for 2022 Chesapeake Forests December 2020

##### Overall Comments and Questions:

1. NHP would prefer to receive the AWP for review in the spring of each year so that if site visits are necessary, they can be accomplished during the growing season in order to adequately assess RTE impacts and habitat conditions for a given area. Is this doable?
2. Chandini Balram Montgomery (nee Narang)'s thesis results should be included in the monitoring section of this plan because bats are mentioned in the monitoring section and bat detectors were purchased for her project through MD DNR Forest Service and Parker Forestry. Included in these comments is her thesis title, abstract, and supporting figures and an appendix.
3. What's the best way to suggest restoration priorities in future AWP's on primarily new acquisitions that weren't addressed in the restoration priorities written by Scott Smith and Wes Knapp.
4. Stream buffers should be 300 ft width from the edge of a stream bank with HCVF.
5. Is there a report Forest Service could provide to NHP that details what of the proposed logging was accomplished in a given calendar year?
6. It's our understanding that the overall goal for Chesapeake Forest Lands in Eastern Region is to transform loblolly pine plantations into mixed hardwood/pine forests over time. Is there a time frame for that and are we on track to accomplish that?

##### Stand-specific Comments:

**CF-22-S-01** - The ESA is Marshyhope Creek North Tier 1 and 300 ft. stream buffer shown on map. FIDS habitat indicated but not a FIDS Core. No other comments.

**CF-22-S-02** - Stream buffer 300' is indicated and just clips a small portion of the area to be thinned. The ESA is Rhodesdale Powerline and is also a WSSC but is not affected by thinning as it is located to the southeast of the stand. No comments.

**CF-22-S-03 - Stand 15 (38.8 ac)** is within Brookview Ponds ESA and WSSC Tier 1. Brookview Ponds is a high priority statewide restoration area for NHP. NHP requests a site visit with forestry to delineate cut

management zones and wetland buffers in Stands 15 and 16 in June 2021. While we support the removal of loblolly pine in this complex of Delmarva bays and flatwoods, we request that all logging activities be reviewed and approved onsite by our state restoration ecologist. This, to preclude further degradation to soils and hydrology of these fragile wetland systems and assisting us in meeting restoration goals. Stand 15 contains two Delmarva bays that support State endangered plants Harper beakrush (*Rhynchospora harperi*) and capitate beakrush (*Rhynchospora cephalantha*) as well as the state rare reticulated nutrush (*Scleria reticularis*). We support a first thinning in stand 15 around the perimeters of the two Delmarva bays including a 200 ft. no cut buffer to minimize disturbance. Post-harvest, dry season burns are necessary encourage native oak regeneration in flatwoods habitat and expansion of RTE plants from dry, roadside habitats (e.g., Stand 16).

**Stand 16 (31.3 ac)** scheduled for first thinning should be expanded to the west (joining the access road) with a linear clearcut extending 40 feet from the road edge into the stand for approximately 1600 feet to the eastern access road nearest the sharp bend in Jones Thicket Road. This additional treatment will serve to safeguard rare species that are at present entirely restricted to the small powerline rights-of-way paralleling Jones Thicket Road. A post-harvest, dry season burn aimed at maximizing understory fuel consumption is recommended in order to provide additional habitat for these species. In planning these activities, please work with the state restoration ecologist.

**Stand 12 (6.9 ac)** no comments.

**Stand 12 (10.8 ac)** no comments.

**Stand 15 (6.4 ac)** and **Stand 16 (5.1 ac)** no comments.

**CF-22-S-04** - This stand is in a FIDS Core and the final harvest is located along the edge of this Core. NHP supports this location for a final harvest. This forest should be naturally regenerated to become a mixed hardwood pine.

**CF-22-S-05** – Stand is in a FIDS Core but located along the edge of the Core polygon. In the Pocomoke Nassawango Important Bird Area. No comments.

**CF-22-S-06** – Stand is in a FIDS Core polygon but located along the edge of the polygon. No comments.

**CF-22-S-07** - Stand 5 is in one Core FIDS polygon but is along the edge. The rest of the stands are in an adjacent FIDS Core that is more linear but thinning should still be ok. No comments.

**CF-22-S-08** - Stands 25 and 26 are in a Core FIDS polygon along the edge. Stand 43 overlaps Upper Nanticoke River Macrosite Tier 1 but no known rare species present. Stream buffer is there. Stand 28 is also in the Core FIDS polygon but overlaps Snethen Church Road Powerline Tier 2 (Delmarva Bays) Zone 2. No comments.

**CF-22-S-09** - Stand 1 is in a Core FIDS polygon but on the edge. The rest of the stands are no comment.

**CF-22-S-10** - In a FIDS Core and is on the edge. Should be 300 ft. stream buffers.

**CF-22-S-11** - Stand 1 overlaps slightly with Spearin Road Powerlines Tier 2 but not in ROW. Rest of the stands border or overlap with Sturges Creek Tier 3. Stands 15, 16 have major inland dunes so prescription

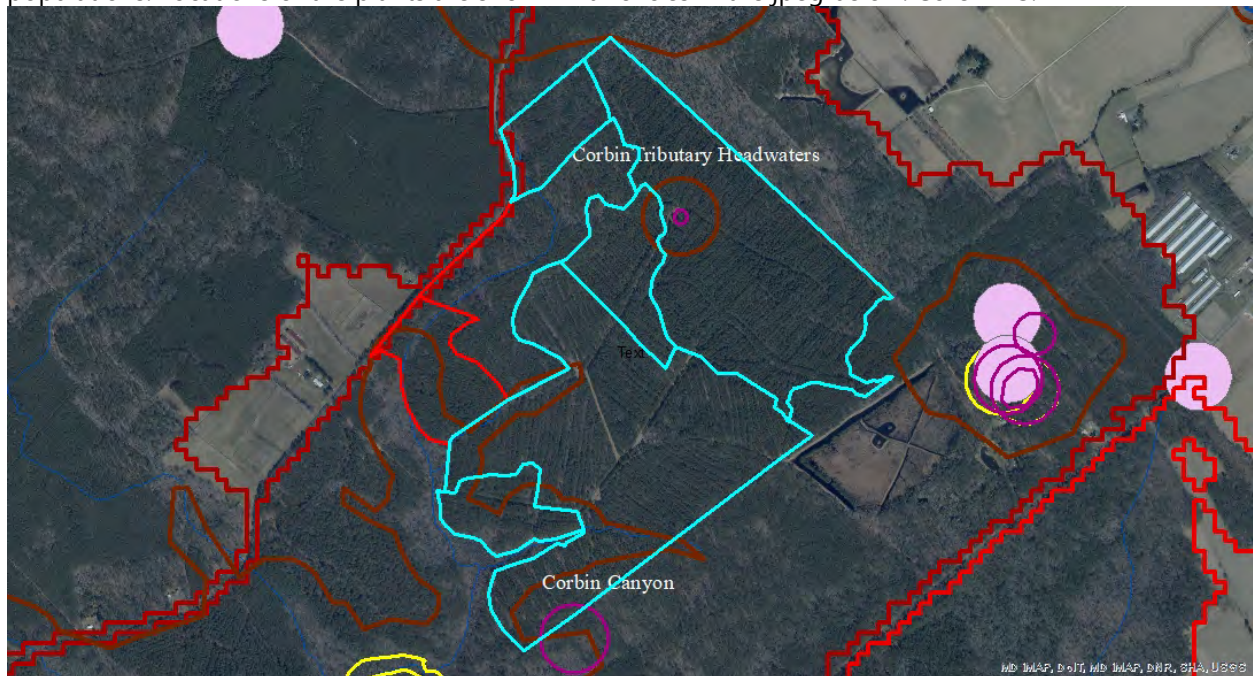
for inland dune restoration is indicated and pitch, pond, and shortleaf pine should be retained, and it is a candidate for prescribed fire. Stream buffers should be 300 ft. FIDS Core.

**CF-22-S-12** - Stands surround Beech Swamp Sand Pits Tier 2 and is within a FIDS Core but thinnings are along the edge. Also in the Pocomoke Nassawango IBA. No comments.

**CF-22-S-13** – A Watch List plant is located on the northeast side of the road but off of CF land. This plant could benefit from the thinnings. There does not appear to be a sand ridge within these stands according to lidar (and we do not have an ESA here) but it is adjacent to stand boundary. Core FIDS but stands are on the edge. We support management for the sand dunes if they occurs within the stand and pitch, shortleaf, pond pines should be retained. Prescribed fire would be beneficial.

**CF-22-S-14** – A Watch List plant is on the southwest side of the road. Silvicultural treatment may benefit this plant. Core FIDS.

**CF-22-S-15** – Stand 28 overlaps with Corbin Tributary Headwaters Tier 3 and Torrey's Beakrush population (purple and brown circles) and Stand 23 overlaps slightly with Corbin Canyon Tier 2 and Sandplain Flax (purple circle). Both populations could be improved with sensitive management. We support the thinnings but request to avoid disturbance i.e. logging deck in the areas of these plant populations. Locations of the plants are shown with circles in the jpeg below. Core FIDS.

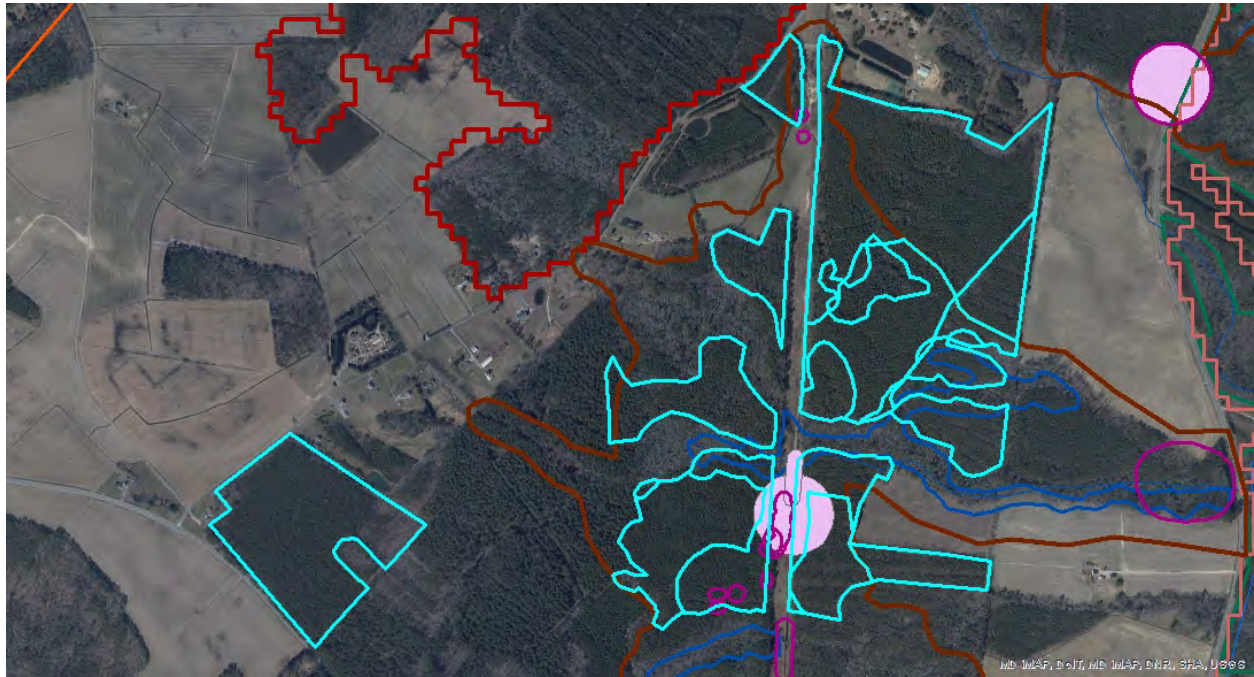


**CF-22-S-16** – Final harvest ok. Forest should be allowed to revert to mixed hardwood/pine forest after final harvest. The 300' stream buffer should remain undisturbed. Core FIDS.

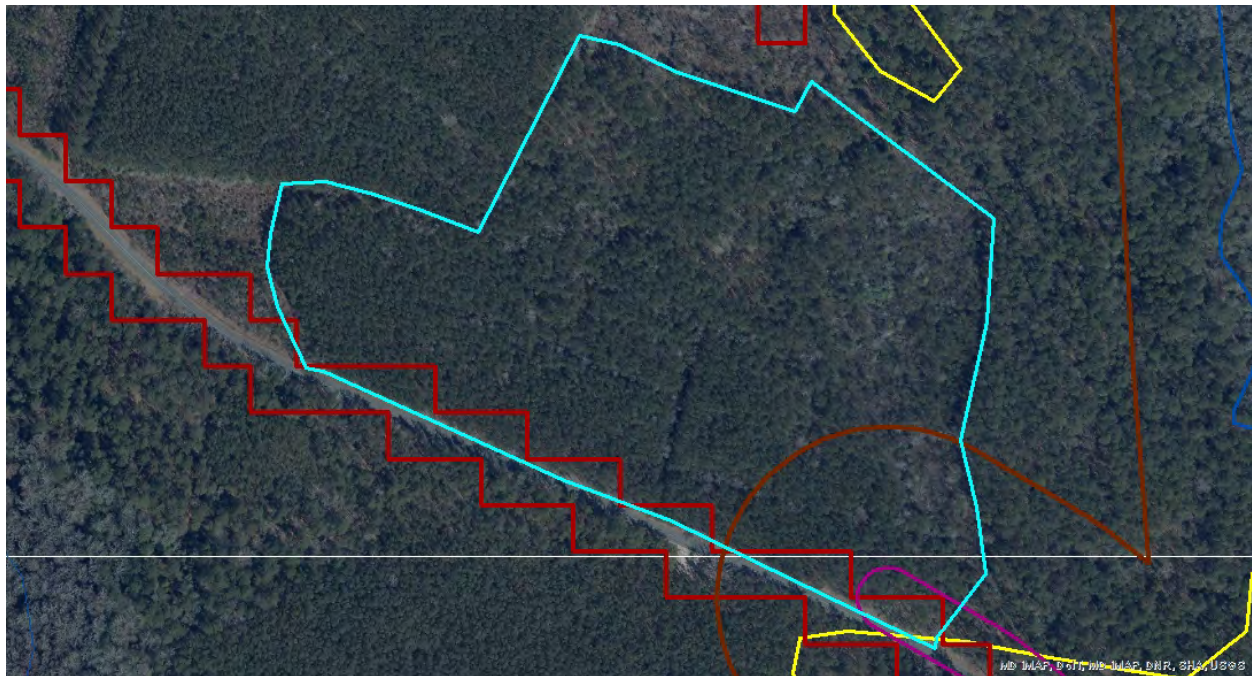
**CF-22-S-17** - These stands are largely within the Tier 1 Pikes Creek. These stands are on both sides of the ROW and road and include rare plant populations as well as a small portion of the WSSC. NHP would like to meet with forestry on site in late July to August 2021 before work begins to review management zones and plant populations. Core FIDS.

**CF-22-S-18** - These stands also are found within Pikes Creek but will not impact any rare species.

**CF-22-S-19** - These stands are found within Pikes Creek and could impact the WSSC and rare species. Because there are numerous rare species and a final harvest is proposed, NHP would like to arrange a meeting on site with forestry to outline management zones. The site visit should occur on late July 2021.



**P-22-S-01** - This stand overlaps slightly with Furnace Road Powerlines Tier 1, and the State Rare rough dropseed (*Sporobolus clandestinus*) is located along Old Furnace Roadside in the southeast corner of the stand. Logging would create sunny, open habitat that would benefit that species as well as the sand dune habitat that occurs in this stand. Avoid major disturbance and placement of the logging deck where the purple polygon is located as indicated in the jpeg below.



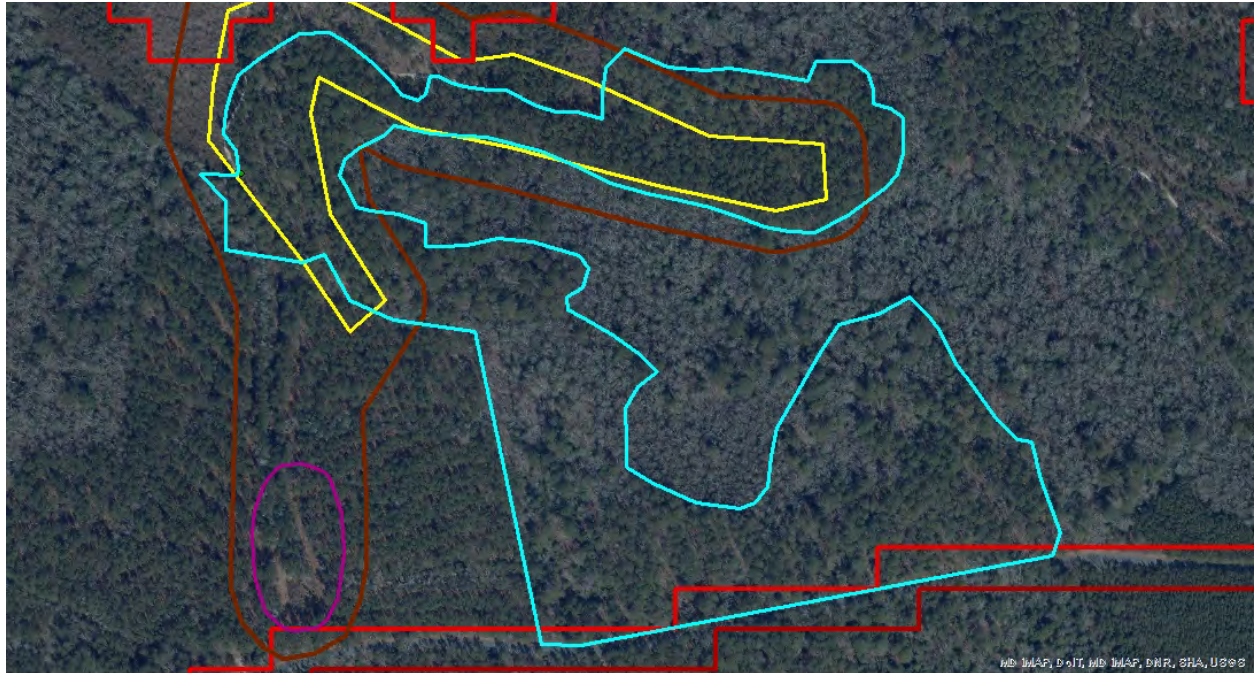
**P-22-S-02** - No overlaps with anything except FIDS core. No comments.

**P-22-S-03** - No overlaps other than Core FIDS though on the edge.

**P-22-S-04** - No overlap except with FIDS Core. Large trees of other hardwood species should be retained in addition to pitch, pond, shortleaf pine. Emphasis should be returning the stand to a more natural mixed hardwood/pine forest community. NHP would like to visit site in 2021 to make sure the stand does not contain any rare forest communities.

**P-22-S-05** - No overlap except with FIDS Core. No comments.

**P-22-S-06** - Top part of stand overlaps with Fishhook Dune Tier 3. This is a shortleaf pine dune. We request residual BA of shortleaf pine to be a minimum of 30-45 ft<sup>2</sup>/ac. to achieve savanna physiognomy. A patchwork of savanna (residual BA of 30-45 ft<sup>2</sup>/ac.) and woodland (residual BA of 45-65 ft<sup>2</sup>/ac.) would also be desirable for greater habitat complexity. Post-harvest burn treatments are necessary to promote new cohorts of native oaks/pines and increase native plant diversity while maintaining targeted physiognomy. Small-headed beakrush (*Rhynchospora microcephala*, State Rare) grows along a trailside in the vicinity of the pink oval at the southeast corner of the image below. NHP would like to visit this site in summer 2021 to fine-tune our recommendations.



**P-22-S-07** - This stand should be managed as FIDS Core habitat. It is in the center of the FIDS CORE polygon more than 1,300 ft. from the edge. NHP would like to visit this site in 2021 to fine-tune recommendations.

**P-22-S-08** - A small overlap with Route 113 Dunes but not the dune itself. Lies within a FIDS Core but along an edge relatively speaking. No other comments.

**Chandini Balram Montgomery (nee Narang)'s thesis**

**Thesis title:** Impact of prescribed burns on bat populations in the coastal plain forests of the eastern United States

**Abstract:** Bats provide many benefits to humans such as predation on insect vectors and agricultural pests. However, in the Eastern United States, bats are facing a growing array of serious threats, including White-Nose Syndrome (WNS), habitat disturbance, and wind turbines. Since these threats show little sign of abating, and as the human population continues to expand and exert ever more pressures on bats and other wildlife in the region, it is important to investigate habitat management strategies that are beneficial to existing and future populations. Specifically, our study focuses on whether prescribed burns in Loblolly pine forests are correlated with elevated bat activity compared to unburned controls. In our study, we focused on Chesapeake Forests and The Nature Conservancy lands with burned sites that also had comparable unburned counterparts in Eastern Maryland. Two site types were accounted for: forest corridor-edges and interior forests. We set up SM4BAT detectors simultaneously in burned forests and their unburned pairs for 10-day time periods. If SonoBat 4.3.0 North America confirmed high pass numbers by the genus *Myotis* or *Lasionycteris noctivagans*, mist-netting was conducted at least once during the field season to attempt to catch these call ambiguous species. We also collected 44 additional variables that we suspected could influence bat activity. We found no significant difference in overall bat activity between burned and unburned sites. We did find, however, that higher average ambient temperatures and larger areas of emergent herbaceous wetlands in a 5 km radius contributed to predicting higher bat activity while longer distances to the closest water body predicted lower bat activity in corridor-edge sites. We report that the interior forest site model predicts that higher average canopy cover, higher average vegetation density, larger areas of developed open space in a 3 km radius, and larger areas of barren land in a 3 km radius are negatively associated with bat activity whereas larger areas of shrub/scrub in 3 km and 5 km radii were positively associated with bat activity. This research provides valuable information to guide conservation organizations and natural resource agencies in future decision-making over silviculture and management practices.

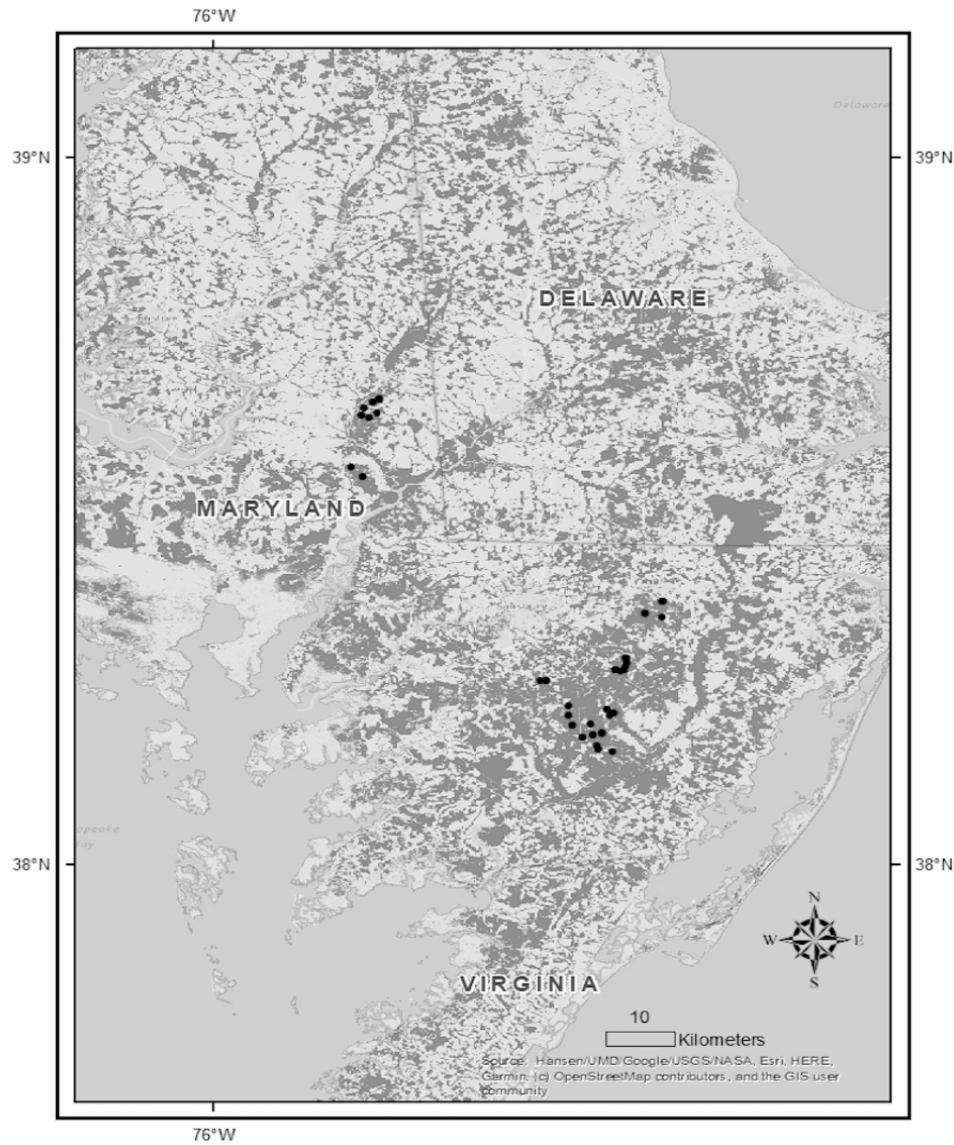


Fig. 1. Map of all 24 site pairs. Sites are represented by black circular markers. Dark gray areas represent forest cover.

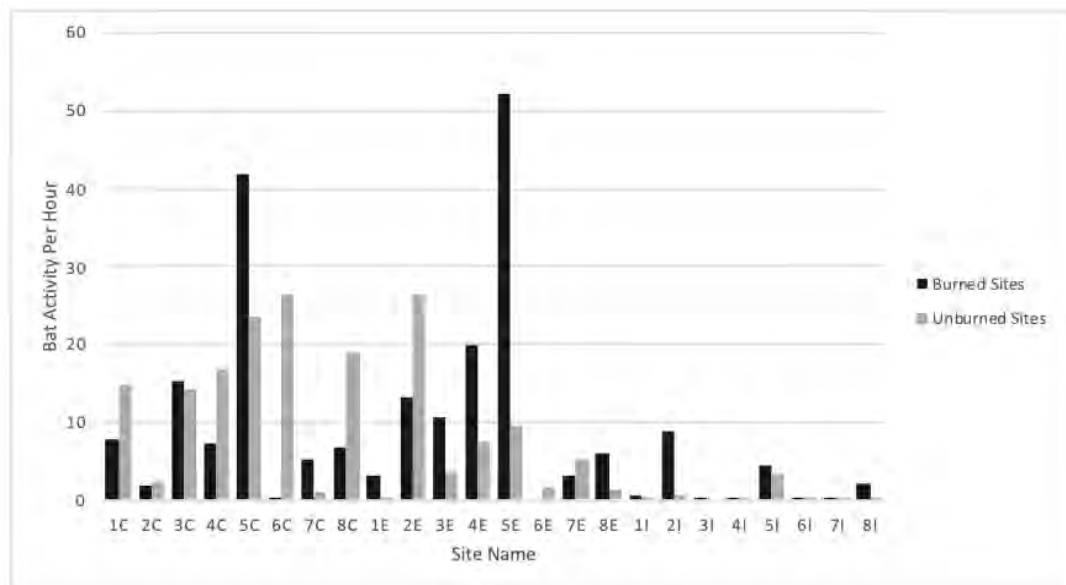


Fig. 2. Bat activity per hour between burned and unburned matched pairs. Site names end in a C if a corridor pair, E if an edge pair, or I if an interior pair.

**Appendix A: Site Pairs**

Table A1. Data recorded on corridor site pairs, including.... Information acquired through resources (shapefiles, maps, documents, etc.) given by land managers and through personal communication land managers.

<i>Pair<sup>1</sup></i>	<i>Complex</i>	<i>Burn Unit</i>	<i>Tract</i>	<i>Stand</i>	<i>Cover<sup>2</sup></i>	<i>Est_Year</i>	<i>Thinned?</i>	<i>Burn Year(s)</i>
<i>1BC</i>	D12	None	4232	39	L	1974	Yes	2016
<i>1UC</i>	D12	None	4209	8 and 1	L	1994 and 1993	Yes	None
<i>2BC</i>	None	22	None	7 and 10	L	1985 and 1993	Yes	2018, 2016, 2013, 2009
<i>2UC</i>	P02	None	32	2	L	1986	Yes	None
<i>3BC</i>	None	10a	None	5	L	1983	Yes	2019
<i>3UC</i>	WR18	None	3738	9	L	1983	Yes	None
<i>4BC</i>	None	21	None	4	L	1977	Yes	2018, 2016, 2014, 2009
<i>4UC</i>	P02	None	6	1	L	1979	Yes	None
<i>5BC</i>	WR24	None	3714	7	L	1966	Yes	2016
<i>5UC</i>	WR24	None	3709	18	L	1969	Yes	None
<i>6BC</i>	D12	None	4227	45 and 64	L	1965 and 1971	Yes	2017
<i>6UC</i>	D14	None	100	27	L	1987	Yes	None
<i>7BC</i>	P02	None	126	8	L	1978	Yes	2017
<i>7UC</i>	P02	None	27	1	L	1990	Yes	None
<i>8BC</i>	None	10a	None	7	L	1985	No	2019
<i>8UC</i>	W46	None	3560	28	L	1993	No	None

---

<sup>1</sup> B = Burned Sites, U = Unburned Sites, C = Corridor Sites

<sup>2</sup> L = Loblolly pine

Table A2. Data recorded on edge site pairs, including.... Information acquired through resources (shapefiles, maps, documents, etc.) given by land managers and through personal communication land managers.

<i>Pair</i> <sup>3</sup>	<i>Complex</i>	<i>Burn Unit</i>	<i>Tract</i>	<i>Stand</i>	<i>Cover</i> <sup>4</sup>	<i>Est _Year</i>	<i>Thinned?</i>	<i>Burn Year(s)</i>
<i>1BE</i>	None	8	None	9a	L	1987	Yes	2018
<i>1UE</i>	W46	None	7159	25	L	1988	Yes	None
<i>2BE</i>	None	13	None	7e	L	1985	Yes	2017, 2013, 2011
<i>2UE</i>	P02	None	10	7	L	1990	Yes	None
<i>3BE</i>	P02	None	126	7	L	1999	No	2017
<i>3UE</i>	WR10	None	3714	11	L	1999	No	None
<i>4BE</i>	WR18	None	3738	7	L	1984	Yes	2014
<i>4UE</i>	P02	None	33	1	L	1985	Yes	None
<i>5BE</i>	D12	None	4236	32	L	1999	Yes	2018
<i>5UE</i>	D12	None	4233	1	L	1994	Yes	None
<i>6BE</i>	P02	None	126	9	PH	2005	No	2018
<i>6UE</i>	P02	None	5	22	PH	2008	No	None
<i>7BE</i>	D12	None	4236	1	L	1994	Yes	2016
<i>7UE</i>	D14	None	4217	8	L	1991	Yes	None
<i>8BE</i>	WR24	None	3714	3	L	1966	Yes	2015
<i>8UE</i>	W46	None	7128	42	L	1976	Yes	None

<sup>3</sup> B = Burned Sites, U = Unburned Sites, E = Edge Sites

<sup>4</sup> L = Loblolly pine, PH = Pine/Hardwood (Pine is 50-75% basal area)

Table A3. Data recorded on interior site pairs, including.... Information acquired through resources (shapefiles, maps, documents, etc.) given by land managers and through personal communication land managers.

<i>Pair</i> <sup>5</sup>	<i>Complex</i>	<i>Burn Unit</i>	<i>Tract</i>	<i>Stand</i>	<i>Cover</i> <sup>6</sup>	<i>Est _Year</i>	<i>Thinned?</i>	<i>Burn Year(s)</i>
<i>1BI</i>	None	8	None	9a	L	1987	Yes	2018
<i>1UI</i>	W46	None	7159	25	L	1988	Yes	None
<i>2BI</i>	None	13	None	7e	L	1985	Yes	2017, 2013, 2011
<i>2UI</i>	P02	None	10	7	L	1990	Yes	None
<i>3BI</i>	P02	None	126	7	L	1999	No	2017
<i>3UI</i>	WR10	None	3714	11	L	1999	No	None
<i>4BI</i>	WR18	None	3738	7	L	1984	Yes	2014
<i>4UI</i>	P02	None	33	1	L	1985	Yes	None
<i>5BI</i>	D12	None	4236	32	L	1999	Yes	2018
<i>5UI</i>	D12	None	4233	1	L	1994	Yes	None
<i>6BI</i>	P02	None	126	9	PH	2005	No	2018
<i>6UI</i>	P02	None	5	22	PH	2008	No	None
<i>7BI</i>	D12	None	4236	1	L	1994	Yes	2016
<i>7UI</i>	D14	None	4217	8	L	1991	Yes	None
<i>8BI</i>	WR24	None	3714	3	L	1966	Yes	2015
<i>8UI</i>	W46	None	7128	42	L	1976	Yes	None

<sup>5</sup> B = Burned Sites, U = Unburned Sites, I = Interior Sites

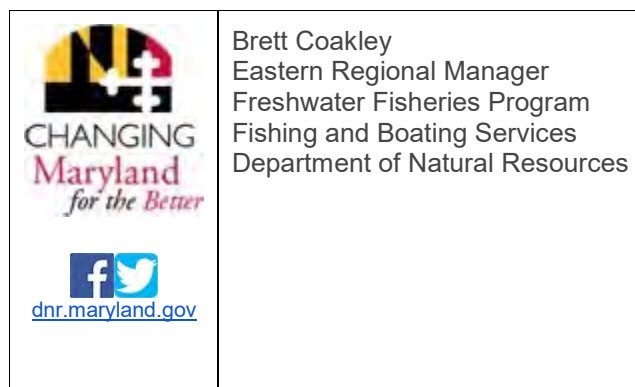
<sup>6</sup> L = Loblolly pine, PH = Pine/Hardwood (Pine is 50-75% basal area)

Mike/Jack- Freshwater Fisheries has a few general and specific comments regarding the 2022 Pocomoke/Chesapeake workplan. As usual, it seems your staff has done a good job mapping and excluding/buffering needed areas to protect aquatic resources. Generally, thinning or harvest within the 300'-50' stream buffer areas, but not within 50' is appropriate if done with minimal ground disturbance to prevent sediment transport off site. Thinning can play an important part in increasing stand diversity, which is usually a good thing for water quality long term.

Specific comments are included as an attachment.

Thanks for the opportunity to comment. Let me know if you have any questions.

Brett



#### 2022 Chesapeake/Pocomoke Forest Reviews from Freshwater Fisheries Staff

Freshwater Fisheries is providing additional comments on some of the proposed FY2022 Chesapeake Forest work.

CF22-01- No additional comments.

CF22-02- No additional comments.

CF22-03- If Delmarva bays are present, they should be appropriately buffered. Will yield BMP's for management of areas surrounding Delmarva bays to Heritage staff.

CF22-04- No additional comments.

CF22-05- No additional comments.

CF22-06- No additional comments.

CF22-07- There is a drainage ditch located on the eastern edge of the stand. It should be buffered accordingly.

CF22-08- No additional comments.

CF22-09- No additional comments.

CF22-10- The actual location of the stream should be mapped and buffered accordingly.

CF22-11- No additional comments.

CF22-12- The man-made ponds located within the stands should be buffered accordingly.

CF22-13- No additional comments.

CF22-14- No additional comments.

CF22-15 and 16- Within the Corbin Branch watershed. There appears to be several streams (perennial or intermittent) that are not buffered. Freshwater Fisheries would like to visit the area, but we were informed the property is leased for hunting. A visit after hunting season would be best.

CF22-17-19- No additional comments.

Freshwater Fisheries has no additional comments on the Pocomoke State Forest projects.

---

Thank you for the opportunity to review the Eastern Region State Forest Lands FY2022 Annual Work Plan. Twenty of the proposed stands are within stronghold watersheds or adjacent to tributaries that support rare aquatic fishes and/or freshwater mussels. Two stands are also within Tier II High Quality waters (see details below). To minimize impacts to these important aquatic resources, the proposed harvest efforts should aim to maintain stream buffers – leaving trees that provide direct canopy cover to the stream channel to maintain cooler water temperatures and minimize potential stream bank erosion. Additionally, movement of equipment through the stream or buffer zone should be avoided when possible during these harvest activities. Please contact the Natural Heritage Program for other BMP guidelines and recommendations associated with these rare aquatic species. Please also see the link below and contact Maryland Department of Environment (Angel Valdez) for more information on protection of Maryland's Tier II waters. [https://mde.state.md.us/programs/Water/TMDL/WaterQualityStandards/Pages/Antidegradati on\\_Policy.aspx](https://mde.state.md.us/programs/Water/TMDL/WaterQualityStandards/Pages/Antidegradati on_Policy.aspx)

Let me know if you have any questions.  
Jay

WR34-3765006: This stand is located within the Lower Pocomoke River watershed – a stronghold watershed that supports populations of the rare Banded Sunfish (S2) and Swamp Darter (S2).

WR22-3788004/ WR22-3788008/WR22-3788003: These stands are within the Dividing Creek watershed – a stronghold watershed that supports populations of the rare Banded Sunfish (S2) and Swamp Darter (S2). These stands are also adjacent to a Tier II High Quality stream reach designated by Maryland Department of Environment.

W53-3597001/W53-3801016/W53-3786015/ W53-720915/W53-7209016: These stands are within Nassawango Creek watershed – a stronghold watershed that supports populations of the rare

Banded Sunfish (S2) and Swamp Darter (S2). These stands are also upstream of two Tier II High Quality stream reaches designated by Maryland Department of Environment.

CO3-6410007/CO3-6401001/CO3-6450010: These stands are located within the Marshyhope Creek watershed – a stronghold watershed that supports rare fishes including the endangered Blackbanded Sunfish (S1) and populations of rare freshwater mussels.

S13-4822001: This stand is located within the Manokin River watershed – a stronghold watershed that supports populations of Banded Sunfish (S2) and Mud Sunfish (S2).

WO2-3534027/WO2-3534030/WO2-3534012: These stands are located within the Nanticoke River watershed – a stronghold watershed that supports populations of rare freshwater mussels.

WR03-3728004/WR03-3728005/WR03-3728006: These stands are located in the Upper Pocomoke River watershed – a stronghold watershed that supports populations of Banded Sunfish (S2), Mud Sunfish (S2) and Swamp Darter (S2).

WO2-7200043: This stand is located near Reconow Creek - a tributary to the Nanticoke River that supports a population of Mud Sunfish (S2).



Alexander S Clark -DNR- &lt;alexander.clark@maryland.gov&gt;

---

**Fwd: MHT review of Eastern Region State Forest Lands Annual Work Plan**

---

**Mike Schofield -DNR-** <mike.schofield@maryland.gov>  
To: Alex Clark <alexander.clark@maryland.gov>

Please include the MHT comments in the final document.

----- Forwarded message -----

From: **Dixie Henry -MDP-** <dixie.henry@maryland.gov>  
Date: Mon, Jan 11, 2021 at 1:58 PM  
Subject: MHT review of Eastern Region State Forest Lands Annual Work Plan  
To: Mike Schofield -DNR- <mike.schofield@maryland.gov>

Mike -- MHT staff have reviewed the above-referenced work plan (FY 2022) and concur that the proposed activities would have no adverse effect on historic properties. Please let us know if

- Dixie Henry



**Dixie L. Henry, Ph.D.**

Preservation Officer, Project Review and Compliance

Maryland Historical Trust

Maryland Department of Planning

100 Community Place

Crownsville, MD 21032

dixie.henry@maryland.gov/ 410-697-9553

mht.maryland.gov

Please take our customer service survey.

**\*Please note that email is currently the best means of contact, as MHT's Project Review and Compliance staff are largely teleworking at this time. To check on the status of a project submittal, please use our online search: <https://mht.maryland.gov/compliancelog/ComplianceLogSearch.aspx>.**

## CITIZEN'S ADVISORY COMMITTEE COMMENTS

Date: Mon, Feb 1, 2021 at 9:25 AM

Subject: Annual Work Plan

To: Mike Schofield -DNR- <[mike.schofield@maryland.gov](mailto:mike.schofield@maryland.gov)>

I have reviewed the plan and have no issues with it as written.

Be safe

Bill Giese

## PUBLIC COMMENTS

## K. SILVICULTURAL PROJECTS

## SILVICULTURAL ACTIVITY OVERVIEW

Tables 2 and 3 summarize the proposed silvicultural activities for the 2022 annual work plan on approximately 2,135.4 acres (2.8%) of the Chesapeake Forest and 264.2 acres (1.4%) of Pocomoke State Forest, for a total of 2,399.6 acres (2.6%) on both forests.

**Table 2. 2022 Chesapeake Forest Silvicultural Activity Overview. (CF-22-S-1 – CF-22-S-19)**

Activity	Acres
First thinning	1,653.9
Second thinning	330.6
Final Harvest	150.9
<b>Total</b>	<b>2,135.4</b>

**Table 3. 2022 Pocomoke State Forest Silvicultural Activity Overview. (P-22-S-1 – P-22-S-8)**

Activity	Acres
First Thinning	143.2
Final Harvest	121.0
<b>Total</b>	<b>264.2</b>

## DEFINITIONS OF SILVICULTURAL ACTIVITIES

- **Reforestation** – Reforestation reestablishes forest cover either naturally or artificially (hand planting), and may be 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 occasionally 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 and/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 6 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 20-25 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 30-40% of the total stand volume will be removed in this process. Stocking levels are determined using a loblolly pine stocking chart based on the basal area, DBH, and trees per acre of the stand (USDA Forest Service, 1986). Crown ratio and site index are other factors that are used to decide whether to thin or not.
- **Second Commercial Thinning** – Usually performed on stands 35-40 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 25-30% 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, DFS & FIDS 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 (Schulz, 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, but can be removed once sufficient pine regeneration is achieved. The seed tree method regenerates loblolly pine effectively and inexpensively in the Coastal Plain, where seed crops are consistently heavy (Schulz, 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/or 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 Harvest (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, about 20% of the two forests 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 in specially designated wetland areas or within 150 feet of riparian 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 for 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.

## SILVICULTURAL PRESCRIPTIONS & STAND DATA

### CAROLINE COUNTY

#### CF-22-S-01

**Proposal Name:** C03 – Messenger Branch – Stands 1, 7 & 10

**Harvest Area:** 204.3 acres

**Forest Community Types and Development:** Stands 1 and 7 are overstocked loblolly pine plantations established in 1998. Stand 10 is an overstocked loblolly pine plantation established in 2000.

**Habitats and Species of Management Concern:** ESA Zone 1, FIDS, General Management

**Water Resources:** Twiford Meadow Ditch, Marshyhope Creek watershed

**Soil Resources:** CdA, CoA, EwA, EwB, FaA, GaA, GaB, IaA, and RoA

**Historic Conditions:** No known historic features

**Silvicultural Prescription:** First thinning, retain significant hard mast species

### DORCHESTER COUNTY

#### [CF-22-S-02]

**Proposal Name:** D13 – Rhodesdale – Stand 2

**Harvest Area:** 24.4 acres

**Forest Community Types and Development:** Stand 2 is an overstocked loblolly pine plantation established in 1999 and pre-commercially thinned in 2009.

**Habitats and Species of Management Concern:** Stream Buffer and DFS Core

**Water Resources:** Marshyhope Creek watershed

**Soil Resources:** FmA, HnA, HvA, PnA, and Za

**Historic Conditions:** No known historic features

**Silvicultural Prescription:** First thinning, retain significant hard mast species

[CF-22-S-03]

**Proposal Name:** D14 – Indiantown – Stands 3, 12, 15 & 16

**Harvest Area:** 117.7 acres

**Forest Community Types and Development:** Stand 3 is an overstocked loblolly pine plantation established in 1989. Stand 12 is an overstocked loblolly pine plantation established in 1999. Stand 15 is an overstocked loblolly pine plantation established in 1988. Stand 16 is an overstocked loblolly pine plantation established in 1996.

**Habitats and Species of Management Concern:** ESA Zone 1, ESA Zone 2, ESA Zone 3 Pulpwood, ESA Zone 3 Sawtimber, and DFS Core

**Water Resources:** Marshyhope Creek and Nanticoke River watersheds

**Soil Resources:** FaA, FmA, HnA, HvA, KgB, PnA, and WdA

**Historic Conditions:** No known historic features

**Silvicultural Prescription:** First thinning, retain significant hard mast species, 200' no-cut buffer around Delmarva bays; Final harvest in ESA Zone 1 area adjacent to Jones Thicket Road

SOMERSET COUNTY

[CF-22-S-04]

**Proposal Name:** S03 – Covington – Stand 1

**Harvest Area:** 30.1 acres

**Forest Community Types and Development:** Mature loblolly pine plantation established in 1968, first thinned in 1989, second thinned in 1995, sprayed in 1996, and fertilized in 1997.

**Habitats and Species of Management Concern:** General Management

**Water Resources:** Monie Bay watersheds

**Soil Resources:** QuA

**Historic Conditions:** No known historic features

**Silvicultural Prescription:** Final harvest

[CF-22-S-05]

**Proposal Name:** S13 – Hradowsky – Stand 1

**Harvest Area:** 75.8 acres

**Forest Community Types and Development:** Overstocked loblolly pine plantation established in 1999 and released in 2001.

**Habitats and Species of Management Concern:** General Management

**Water Resources:** Manokin Creek watershed

**Soil Resources:** CRA, FhA, HvA, IgB, KgB, and MuA

**Historic Conditions:** No known historic features

**Silvicultural Prescription:** First thinning

[CF-22-S-06]

**Proposal Name:** S32 – Haislip Greenhill – Stands 1 & 3

**Harvest Area:** 43.9 acres

**Forest Community Types and Development:** Stand 1 is overstocked loblolly pine naturally regenerated in 1997 and pre-commercially thinned in 2003. Stand 3 is overstocked loblolly pine naturally regenerated in 1994 and pre-commercially thinned in 2001.

**Habitats and Species of Management Concern:** DFS Core

**Water Resources:** Big Annemessex River, Manokin River, and Pocomoke Sound watersheds

**Soil Resources:** FgA and OKA

**Historic Conditions:** No known historic features

**Sivilcultural Prescription:** First thinning, retain significant hard mast species

[CF-22-S-07]

**Proposal Name:** S44 – Phillips – Stands 1, 3, 5 & 9

**Harvest Area:** 131.8 acres

**Forest Community Types and Development:** Stand 1 is an overstocked loblolly pine plantation established in 2001. Stand 3 is an overstocked loblolly pine plantation established in 2000, sprayed in 2001, and pre-commercially thinned in 2009. Stand 5 is overstocked loblolly pine naturally regenerated in 1996 and pre-commercially thinned in 2001. Stand 9 is an overstocked loblolly pine plantation established in 2000 and sprayed in 2001.

**Habitats and Species of Management Concern:** General Management, Stream Buffer

**Water Resources:** Big Annemessex River and Manokin River watersheds

**Soil Resources:** FgA, OKA, OtA, and QuA

**Historic Conditions:** No known historic features

**Sivilcultural Prescription:** First thinning, 50' no-cut stream buffer on east side of the harvest area

## WICOMICO COUNTY

[CF-22-S-08]

**Proposal Name:** W02 – Aughty Naughty – Stands 25, 26, 28 & 43

**Harvest Area:** 114.3 acres

**Forest Community Types and Development:** Stand 25 is overstocked loblolly pine naturally regenerated in 1993. Stands 26 & 28 are overstocked loblolly pine plantations established in 1996. Stand 43 is an overstocked loblolly pine plantation established in 1995.

**Habitats and Species of Management Concern:** ESA Zone 2, ESA Zone 3 Pulpwood, Stream Buffer, and DFS Future

**Water Resources:** Nanticoke River watershed

**Soil Resources:** AsA, HvA, IaA, KgB, Ma, MuA, RsB, RuB, and RwB

**Historic Conditions:** No known historic features

**Sivilcultural Prescription:** First thinning, retain significant hard mast species

[CF-22-S-09]

**Proposal Name:** W02 – Aughty Naughty – Stands 1, 12, 27, 30 & 31

**Harvest Area:** 136.8 acres

**Forest Community Types and Development:** Stand 1 is an overstocked loblolly pine plantation established in 1997. Stand 12 is an overstocked loblolly pine plantation established in 1983. Stand 27 is overstocked loblolly pine naturally regenerated in 1996 and pre-commercially thinned in 2003. Stand 30 is overstocked loblolly pine naturally regenerated in 1997 and pre-commercially thinned in 2003. Stand 31 is an overstocked loblolly pine plantation established in 1998.

**Habitats and Species of Management Concern:** Stream Buffer and DFS Future

**Water Resources:** Bratten Creek, Nanticoke River watershed

**Soil Resources:** AsA, BhA, HbA, HnA, HvA, IaB, KgB, MuA, RsB, and RwB

**Historic Conditions:** No known historic features

**Sivilcultural Prescription:** First thinning, retain significant hard mast species

[CF-22-S-10]

**Proposal Name:** W39 – Jesse Bratten – Stand 1

**Harvest Area:** 102.2 acres

**Forest Community Types and Development:** Overstocked loblolly pine plantation established in 1996.

**Habitats and Species of Management Concern:** Stream Buffer and General Management

**Water Resources:** Wicomico River Head watershed

**Soil Resources:** CoA, EwC, HvA, KgB, LgA, RkA, and RsB

**Historic Conditions:** No known historic features

**Silvicultural Prescription:** First thinning

[CF-22-S-11]

**Proposal Name:** W53 – Twigg-Fooks – Stands 1, 15, 16 & 20

**Harvest Area:** 320.1 acres

**Forest Community Types and Development:** Stand 1 is an overstocked loblolly pine plantation established in 1999. Stand 15 is an overstocked loblolly pine plantation established in 1994, stand 16 is an overstocked loblolly pine plantation established in 1990. Stand 20 is an overstocked loblolly pine plantation established in 2002.

**Habitats and Species of Management Concern:** ESA Zone 1, ESA Zone 3 Sawtimber, Stream Buffer, and DFS Future

**Water Resources:** Sturges Creek; Dividing Creek and Nassawango Creek watersheds

**Soil Resources:** AsA, CoA, EkA, FgA, HuA, HvA, KfA, KgB, KsA, KsB, LfA, LgA, LO, Ma, MuA, PrA, RoB, RuB, WdB, and Za

**Historic Conditions:** No known historic features

**Silvicultural Prescription:** First thinning, retain significant hard mast species and pitch, shortleaf, or pond pines

## WORCESTER COUNTY

[CF-22-S-12]

**Proposal Name:** WR03 – WM Carter – Stands 4, 5 & 6

**Harvest Area:** 96.1 acres

**Forest Community Types and Development:** Stand 4 is an overstocked loblolly pine plantation established in 2000, and sprayed in 2000 and 2001. Stand 5 is an overstocked loblolly pine plantation established in 1998. Stand 6 is an overstocked loblolly pine plantation established in 1994 and sprayed in 2000.

**Habitats and Species of Management Concern:** ESA Zone 1, ESA Zone 3 Sawtimber, Stream Buffer, Core FIDS, and General Management

**Water Resources:** Upper Pocomoke River watershed

**Soil Resources:** AsA, HmA, HuA, KsB, Ma, MuA, RuA, RuB, and W

**Historic Conditions:** No known historic features

**Silvicultural Prescription:** First thinning, retain significant hard mast species

[CF-22-S-13]

**Proposal Name:** WR22 – Whitesburg – Stands 2, 3 & 8

**Harvest Area:** 147.8 acres

**Forest Community Types and Development:** Stand 2 is overstocked loblolly pine naturally regenerated in 1996. Stand 3 is an overstocked loblolly pine plantation established in 1998 and pre-commercially thinned in 2009. Stand 8 is overstocked loblolly pine naturally regenerated in 1998 and pre-commercially thinned in 2009.

**Habitats and Species of Management Concern:** ESA Zone 1 Sand Ridge, ESA Zone 3 Sawtimber, and DFS Future

**Water Resources:** Dividing Creek watershed

**Soil Resources:** AsA, BhA, CeB, EvB, FaA, HuA KsA, KsB, MuA, RuA, RuB, and WdA

**Historic Conditions:** No known historic features

**Silvicultural Prescription:** First thinning, retain significant hard mast species and pitch, shortleaf, or pond pines

[CF-22-S-14]

**Proposal Name:** WR22 – Whitesburg – Stand 4

**Harvest Area:** 22.3 acres

**Forest Community Types and Development:** Overstocked loblolly pine plantation established in 1979 and first thinned in 1999.

**Habitats and Species of Management Concern:** DFS Future

**Water Resources:** Dividing Creek watershed

**Soil Resources:** AsA, BhA, FaA, MuA, and WdA

**Historic Conditions:** No known historic features

**Silvicultural Prescription:** Second thinning, retain significant hard mast species

---

[CF-22-S-15]

**Proposal Name:** WR24 – Johnson & Johnson – Stands 23, 25, 27, 28 & 29

**Harvest Area:** 286.1 acres

**Forest Community Types and Development:** Stand 23 is an overstocked loblolly pine plantation established in 1985, first thinned in 2002, and burned in 2006. Stand 25 is an overstocked loblolly pine plantation established in 1987 and first thinned in 2009. Stand 27 is an overstocked loblolly pine plantation established in 1983 and first thinned in 2002. Stand 28 is an overstocked loblolly pine plantation established in 1988 and first thinned in 2009. Stand 29 is an overstocked loblolly pine plantation established in 1975, first thinned in 1993, and burned in 2006.

**Habitats and Species of Management Concern:** ESA Zone 1, ESA Zone 3 Pulpwood, ESA Zone 3 Sawtimber, Stream Buffer, and DFS Future

**Water Resources:** Lower Pocomoke River watershed

**Soil Resources:** AsA, BhA, CeA, CeB, EkA, EvB, EvD, FaA, GaC, HmA, HmB, HuA, KeA, LO, MpA, MpB, MuA, OtA, WdA, and WdB

**Historic Conditions:** No known historic features

**Silvicultural Prescription:** Second thinning, retain significant hard mast species; refer to the Heritage comments for areas to avoid for logging decks

---

[CF-22-S-16]

**Proposal Name:** WR24 – Johnson & Johnson – Stands 19 & 20

**Harvest Area:** 66.5 acres

**Forest Community Types and Development:** Stand 19 is a mature loblolly pine plantation established in 1969 and first thinned in 1995. Stand 20 is a mature loblolly pine plantation established in 1969, first thinned in 1995, and second thinned in 2001.

**Habitats and Species of Management Concern:** ESA Zone 3 Sawtimber, Stream Buffer, and DFS Future

**Water Resources:** Lower Pocomoke River watershed

**Soil Resources:** CeA, FaA, HmA, HmB, HuA, KeA, MpA, MpB, OtA, and WdB

**Historic Conditions:** No known historic features

**Silvicultural Prescription:** Final harvest, retain any significant hard mast species, no harvest in ground-verified stream buffer areas

---

[CF-22-S-17]

**Proposal Name:** WR34 – Selby – Stands 5, 6, 7, 15 & 16

**Harvest Area:** 142.4 acres

**Forest Community Types and Development:** Stand 5 is an overstocked loblolly pine plantation established in 1985. Stand 6 is an overstocked loblolly pine plantation established in 2000 and sprayed in 2001. Stand 7 is an overstocked loblolly pine plantation established in 1999 and sprayed in 2001. Stand 15 is an overstocked loblolly pine plantation established in 2000 and sprayed in 2001. Stand 16 is an overstocked loblolly pine plantation established in 1999.

**Habitats and Species of Management Concern:** ESA Zone 1, ESA Zone 1 Sand Ridge, ESA Zone 3 Pulpwood, Stream Buffer, and DFS Core

**Water Resources:** Chincoteague Bay and Lower Pocomoke River watersheds

**Soil Resources:** AsA, BhA, CeA, CeB, EvB, EvD, FaA, FmA, FmB, GaC, HbA, HmA, HmB, HuA, KsA, MuA, OtA, RoB, RuA, RuB, SaB, WdA, WdB, and Za

**Historic Conditions:** MHT Grid – C506\_R266, C508\_R265, C509\_R265, C509\_R266

**Silvicultural Prescription:** First thinning, retain significant hard mast species

[CF-22-S-18]

**Proposal Name:** WR34 – Selby – Stands 2 & 3

**Harvest Area:** 22.2 acres

**Forest Community Types and Development:** Stand 2 is overstocked loblolly pine naturally regenerated in 1977 and first thinned in 1999. Stand 3 is overstocked loblolly pine naturally regenerated in 1975 and first thinned in 1993.

**Habitats and Species of Management Concern:** ESA Zone 1, ESA Zone 1 Sand Ridge, ESA Zone 3 Pulpwood, and DFS Core

**Water Resources:** Chincoteague Bay watershed

**Soil Resources:** BhA, CeB, EvB, FaA, HbA, HmB, KsA, RoB, RuB, and Za

**Historic Conditions:** MHT Grid – C508\_R265

**Silvicultural Prescription:** Second thinning, retain significant hard mast species

[CF-22-S-19]

**Proposal Name:** WR34 – Selby – Stands 7, 15 & 16

**Harvest Area:** 51.5 acres

**Forest Community Types and Development:** Stand 7 is an overstocked loblolly pine plantation established in 1999 and sprayed in 2001. Stand 15 is an overstocked loblolly pine plantation established in 2000 and sprayed in 2001. Stand 16 is an overstocked loblolly pine plantation established in 1999.

**Habitats and Species of Management Concern:** ESA Zone 3 Pulpwood

**Water Resources:** Chincoteague Bay watershed

**Soil Resources:** AsA, BhA, FaA, FmA, FmB, HmA, HuA, KsA, MuA, RoB, RuA, RuB, WdA, WdB, and Za

**Historic Conditions:** MHT Grid – C508\_R265, C509\_R266

**Silvicultural Prescription:** Final harvest, retain significant hard mast species

## POCOMOKE STATE FOREST

[P-22-S-01]

**Proposal Name:** P02 – Nazareth Church – Tract 3 – Stand 1

**Harvest Area:** 26.9 acres

**Forest Community Types and Development:** Overstocked pine/hardwood naturally regenerated in 1994.

**Habitats and Species of Management Concern:** ESA Zone 1 and DFS Future Core

**Water Resources:** Dividing Creek watershed

**Soil Resources:** AsA, BhA, Ma, MuA, and RuB

**Historic Conditions:** No known historic features

**Silvicultural Prescription:** First thinning, retain significant hard mast species; refer to the Heritage comments for areas to avoid for logging decks

[P-22-S-02]

**Proposal Name:** P02 – Nazareth Church – Tract 3 – Stand 4

**Harvest Area:** 22.6 acres

**Forest Community Types and Development:** Overstocked pine/hardwood naturally regenerated in 1998.

**Habitats and Species of Management Concern:** DFS Future Core

**Water Resources:** Dividing Creek watershed

**Soil Resources:** AsA, HuA, KsB, and MuA

**Historic Conditions:** No known historic features

**Sivilcultural Prescription:** First thinning, retain significant hard mast species

---

[P-22-S-03]

**Proposal Name:** P02 – Nazareth Church – Tract 6 – Stand 3

**Harvest Area:** 17.9 acres

**Forest Community Types and Development:** Overstocked pine/hardwood plantation established in 1999.

**Habitats and Species of Management Concern:** DFS Future Core

**Water Resources:** Dividing Creek watershed

**Soil Resources:** AsA, BhA, and MuA

**Historic Conditions:** No known historic features

**Sivilcultural Prescription:** First thinning, retain significant hard mast species

---

[P-22-S-04]

**Proposal Name:** P02 – Nazareth Church – Tract 6 – Stand 6

**Harvest Area:** 63.7 acres

**Forest Community Types and Development:** Mature loblolly pine naturally regenerated in 1923.

**Habitats and Species of Management Concern:** DFS Future Core

**Water Resources:** Dividing Creek watershed

**Soil Resources:** AsA, BhA, HmA, KsA, MuA, RuA, and RuB

**Historic Conditions:** No known historic features

**Sivilcultural Prescription:** Final harvest, retain significant hard mast species, pond pine, shortleaf pine

---

[P-22-S-05]

**Proposal Name:** P02 – Nazareth Church – Tract 8 – Stand 3

**Harvest Area:** 23.1 acres

**Forest Community Types and Development:** Overstocked pine/hardwood naturally regenerated in 1996.

**Habitats and Species of Management Concern:** DFS Future Core

**Water Resources:** Dividing Creek watershed

**Soil Resources:** EvB, KsA, MuA, RuA, and RuB

**Historic Conditions:** No known historic features

**Sivilcultural Prescription:** First thinning, retain significant hard mast species

---

[P-22-S-06]

**Proposal Name:** P02 – Nazareth Church – Tract 10 – Stand 26

**Harvest Area:** 29.6 acres

**Forest Community Types and Development:** Mature pine/hardwood naturally regenerated in 1922.

**Habitats and Species of Management Concern:** ESA Zone 1 and DFS Future Core

**Water Resources:** Dividing Creek watershed

**Soil Resources:** AsA, BhA, EvB, EvD, GaB, KsA, KsB, MuA, and RuB

**Historic Conditions:** No known historic features

**Sivilcultural Prescription:** Final harvest, retain significant hard mast species, pond pine, shortleaf pine; if possible, maintain a minimum residual BA of shortleaf pine of 30-45 ft<sup>2</sup>/ac

[P-22-S-07]

**Proposal Name:** P02 – Ralph Pusey – Tract 34 – Stand 3

**Harvest Area:** 27.7 acres

**Forest Community Types and Development:** Mature pine/hardwood naturally regenerated in 1926.

**Habitats and Species of Management Concern:** DFS Future Core

**Water Resources:** Dividing Creek watershed

**Soil Resources:** AsA, BhA, HuA, and KsB

**Historic Conditions:** No known historic features

**Silvicultural Prescription:** Final harvest, retain significant hard mast species, pond pine, shortleaf pine

[P-22-S-08]

**Proposal Name:** P07 – Chandler – Tract 21 – Stands 5 & 6

**Harvest Area:** 52.7 acres

**Forest Community Types and Development:** Stand 5 is an overstocked loblolly pine plantation established in 1999. Stand 6 is overstocked pine/hardwood naturally regenerated in 2001.

**Habitats and Species of Management Concern:** ESA Zone 1, Stream Buffer, and DFS Future Core

**Water Resources:** Hardship Branch and Lower Pocomoke River watershed

**Soil Resources:** CeB, FaA, GaA, GaB, GaC, HmB, HuA, KsA, KsB, WdA, WdB, and Za

**Historic Conditions:** No known historic features

**Silvicultural Prescription:** First thinning, retain significant hard mast species

SILVICULTURAL SITE MAPS



## CF-22-S-01

Scale: 1" = 1,320'  
Date: 06/2020

### Legend

#### CF AWP Activity

2022 First Thinning

#### CF Management

Core FIDS  
ESA Zone 1



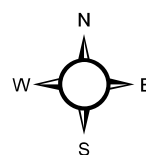
General

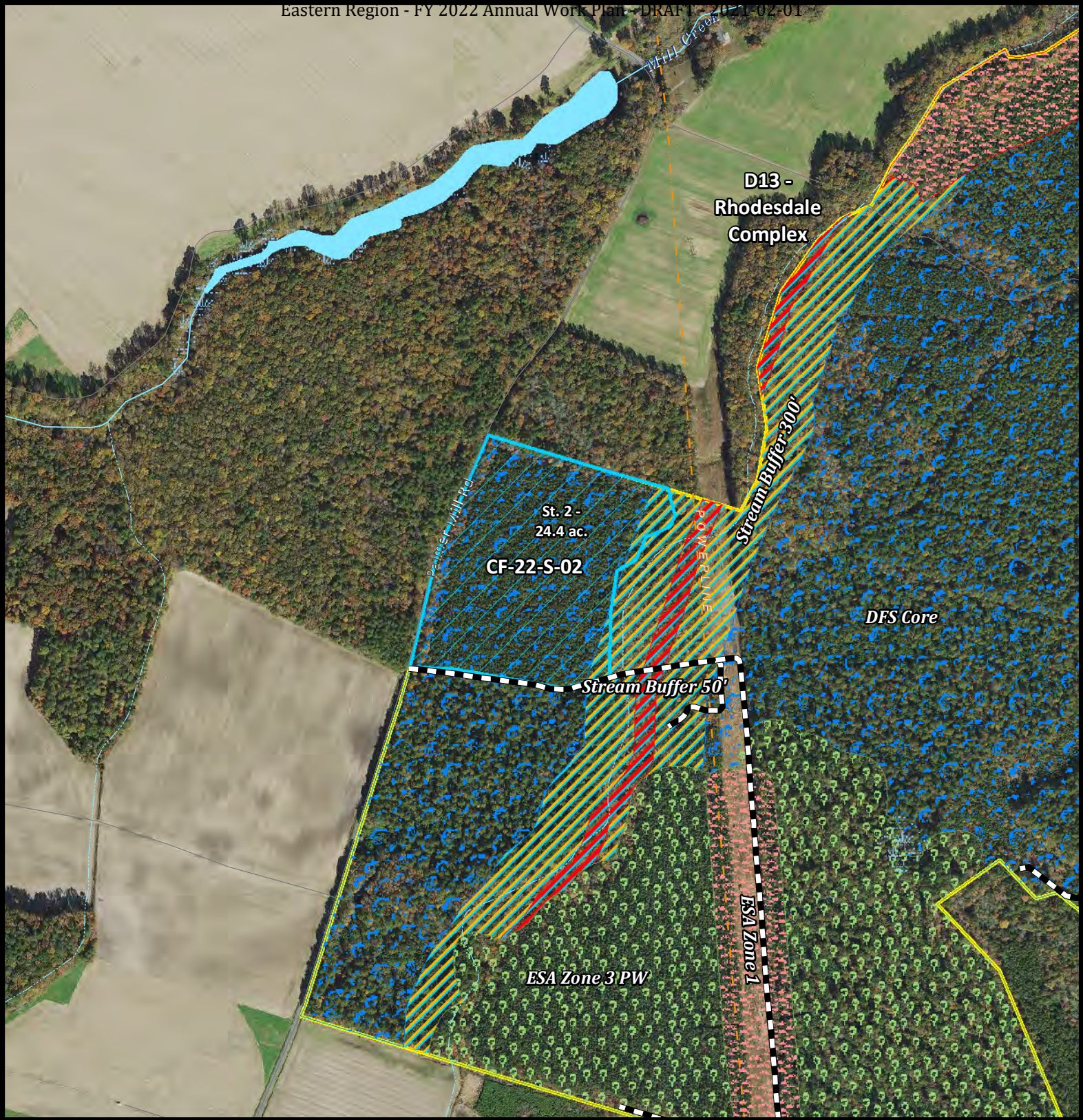


Stream Buffer 300'

660 0 660 1,320 1,980 2,640 3,300  
Feet

This map is for planning purposes only.  
This map is not a boundary survey






## CF-22-S-02

Scale: 1" = 660'  
Date: 06/2020

### Legend

#### CF AWP Activity


 2022 First Thinning


#### CF Management

 DFS Core

 ESA Zone 1

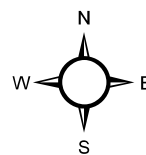
 ESA Zone 3 PW

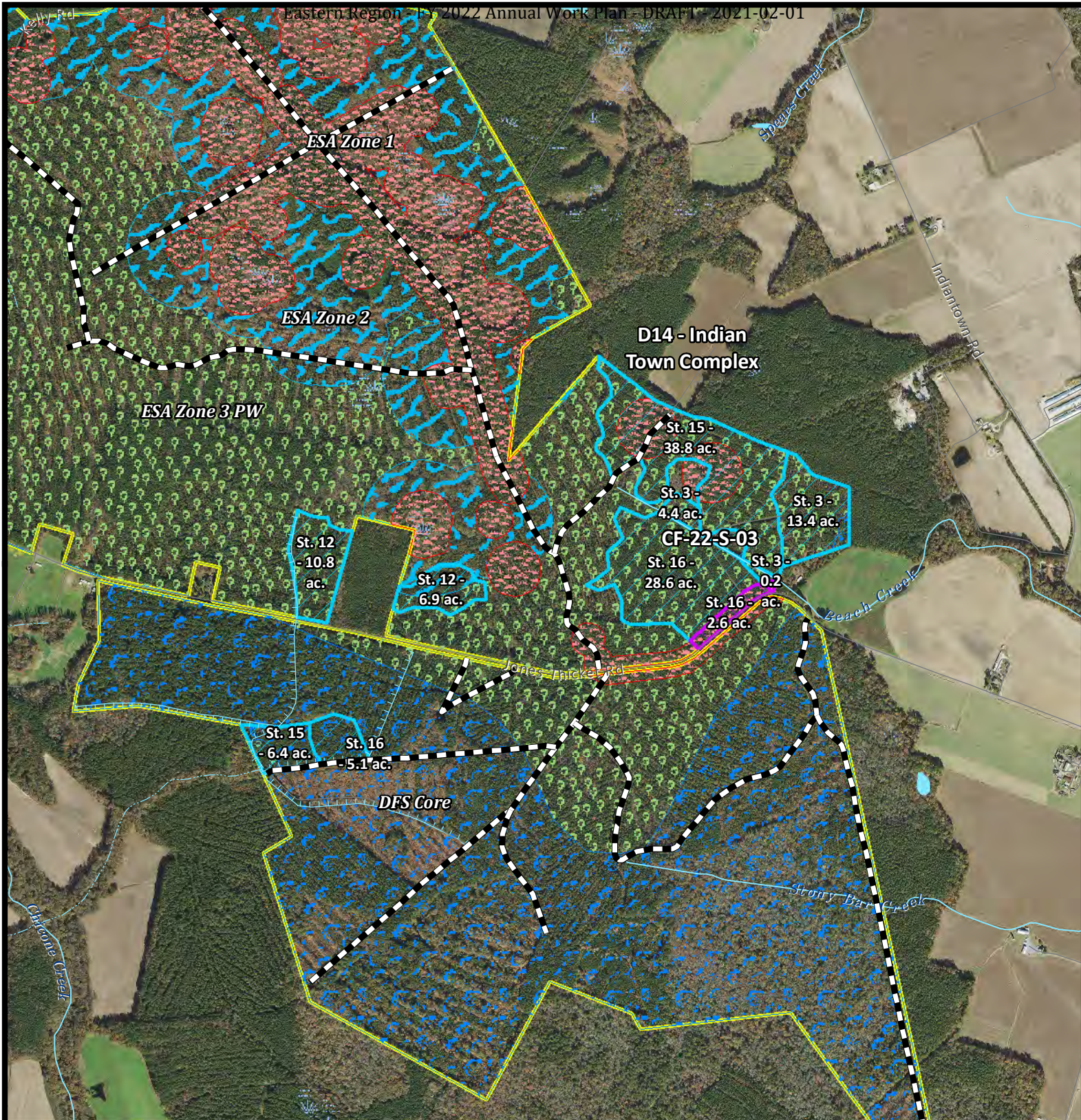
 Stream Buffer 50'

 Stream Buffer 300'



This map is for planning purposes only.  
This map is not a boundary survey



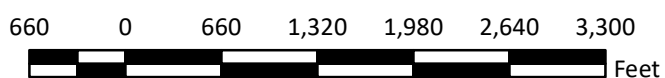


**CF-22-S-03**

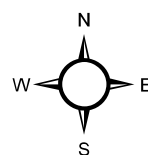
Scale: 1" = 1,320'  
Date: 12/2020

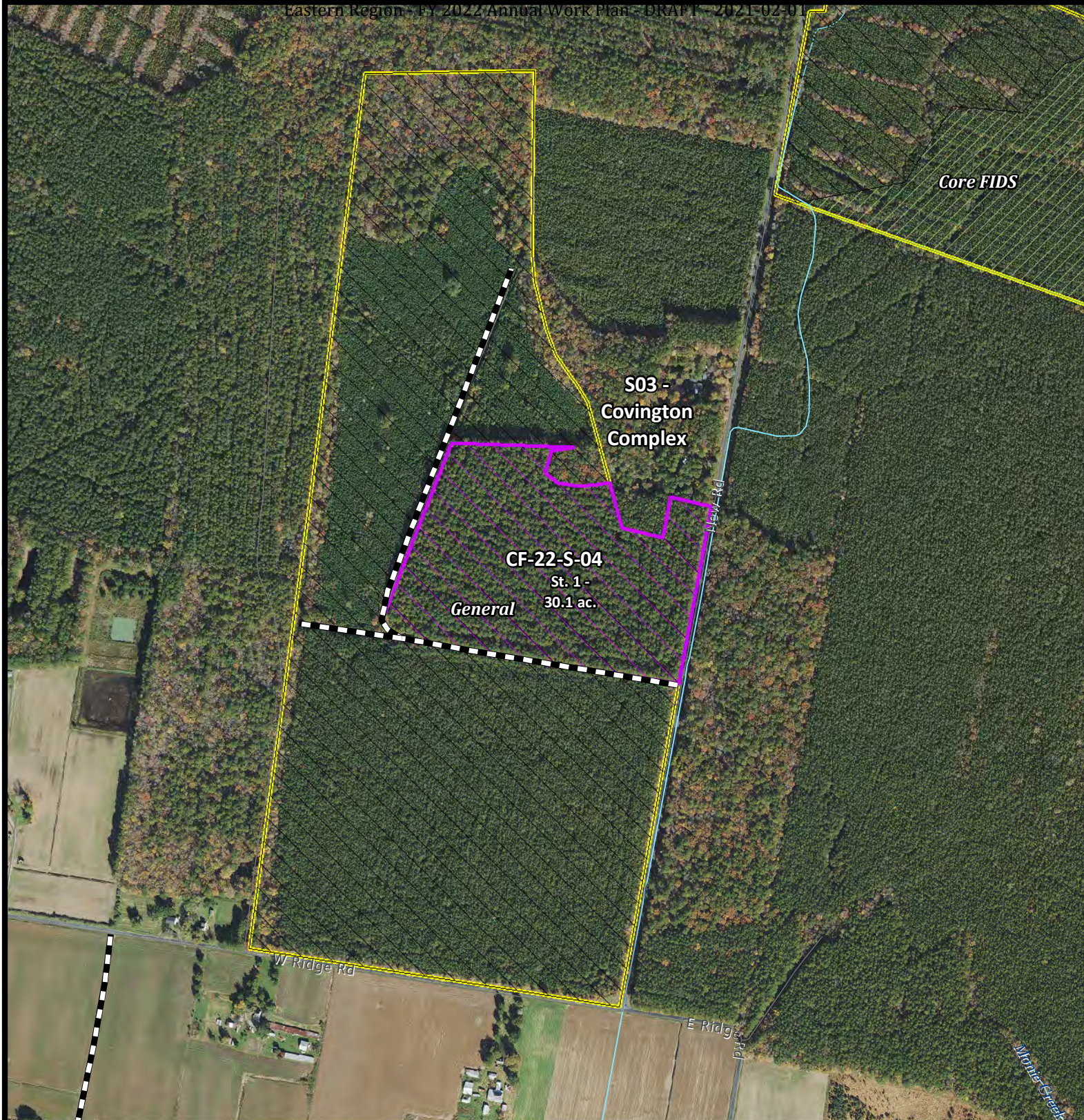
**Legend**

CF AWP Activity	CF Management	
2022 First Thinning	DFS Core	ESA Zone 2
2022 Final Harvest	ESA Zone 1	ESA Zone 3 PW
		ESA Zone 3 ST



This map is for planning purposes only.  
This map is not a boundary survey





**CF-22-S-04**


Scale: 1" = 660'  
Date: 06/2020

**Legend**

**CF AWP Activity**

 2022 Final Harvest

**CF Management**

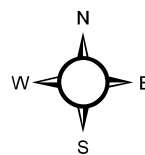
 Core FIDS

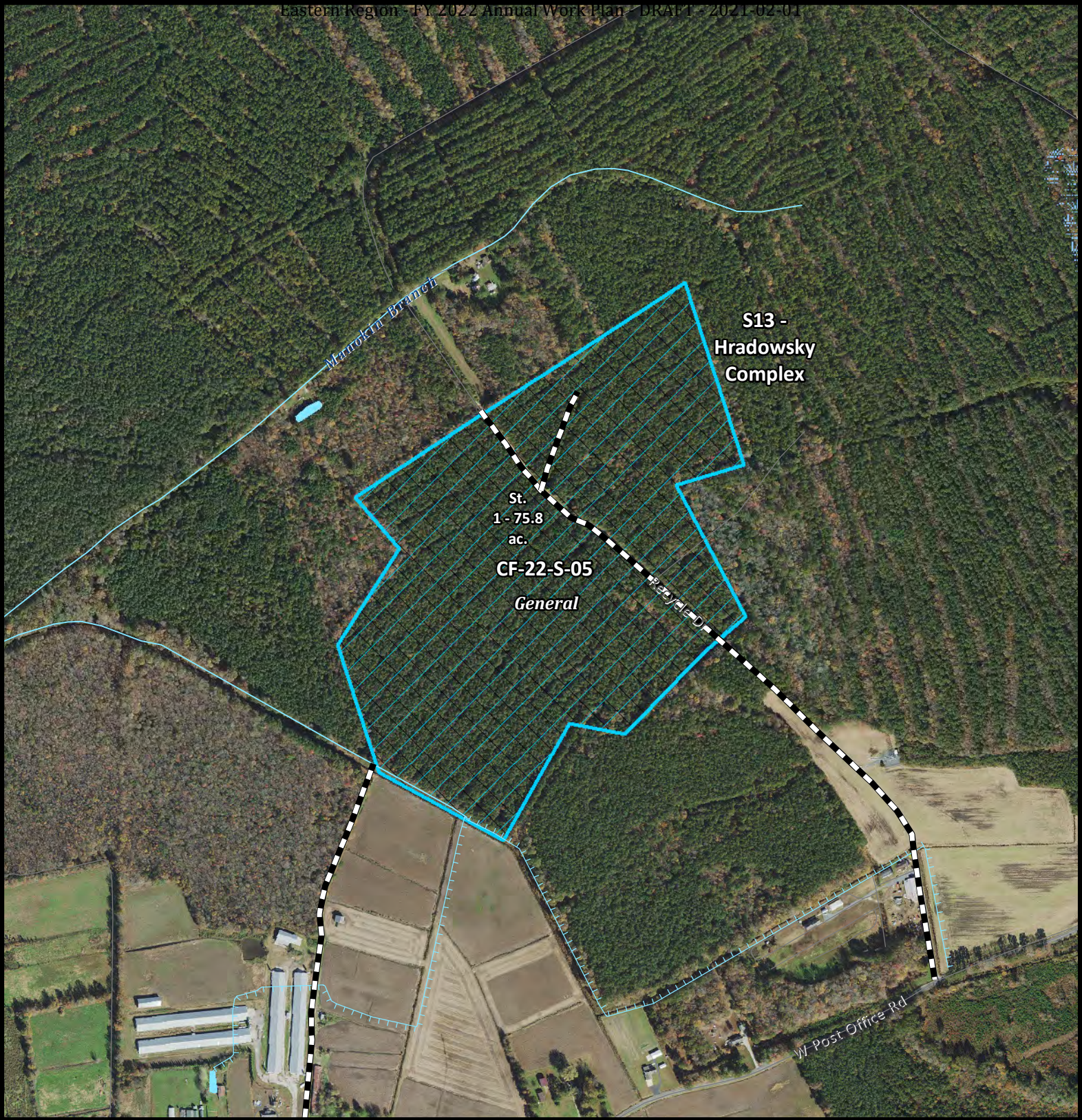


General



This map is for planning purposes only.  
This map is not a boundary survey






**CF-22-S-05**


Scale: 1" = 660'  
Date: 06/2020

**Legend**

**CF AWP Activity**

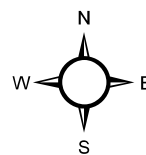
 2022 First Thinning

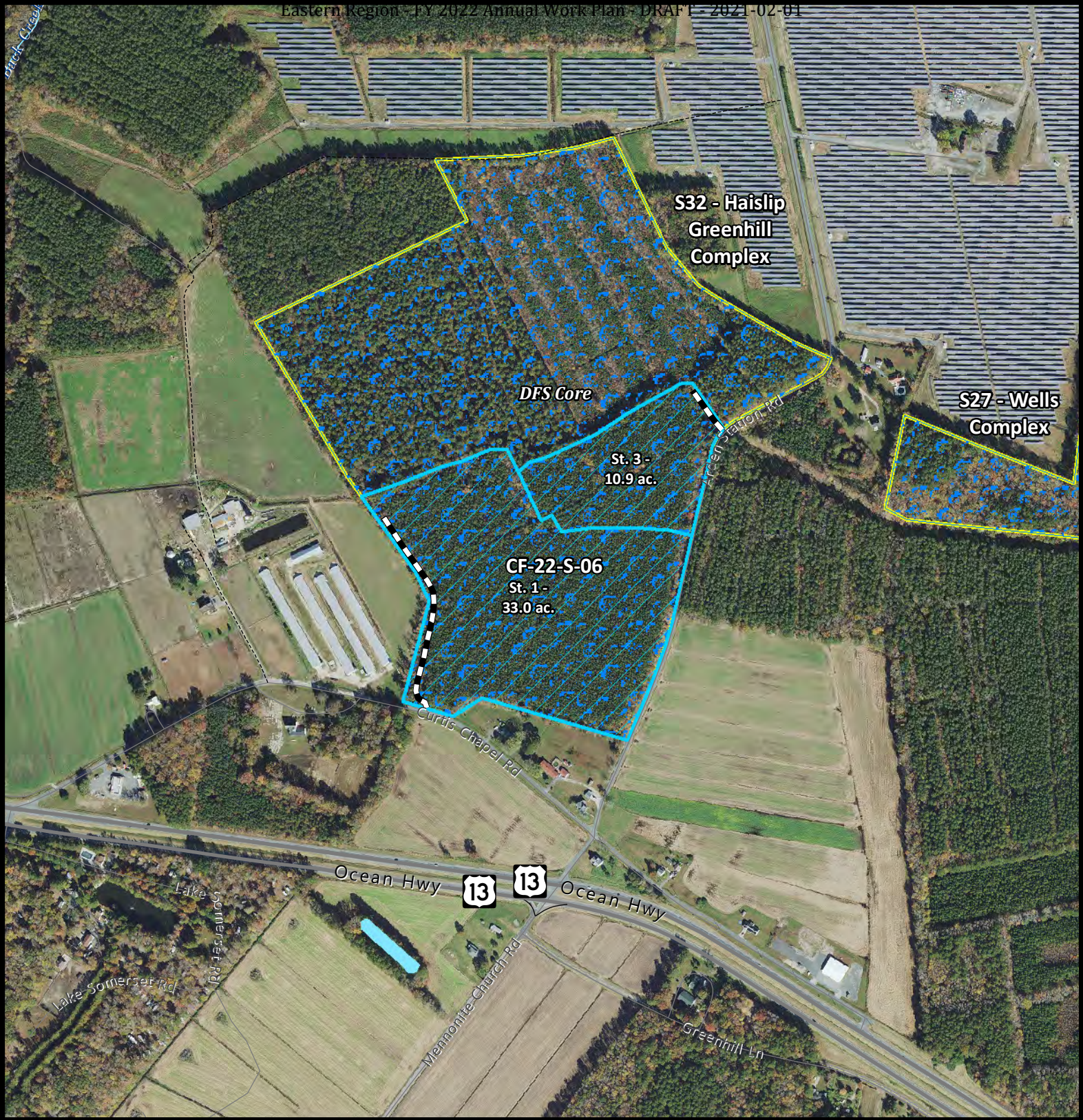
**CF Management**

 General



This map is for planning purposes only.  
This map is not a boundary survey







## CF-22-S-06

Scale: 1" = 660'  
Date: 06/2020

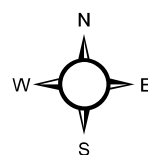
**Legend**

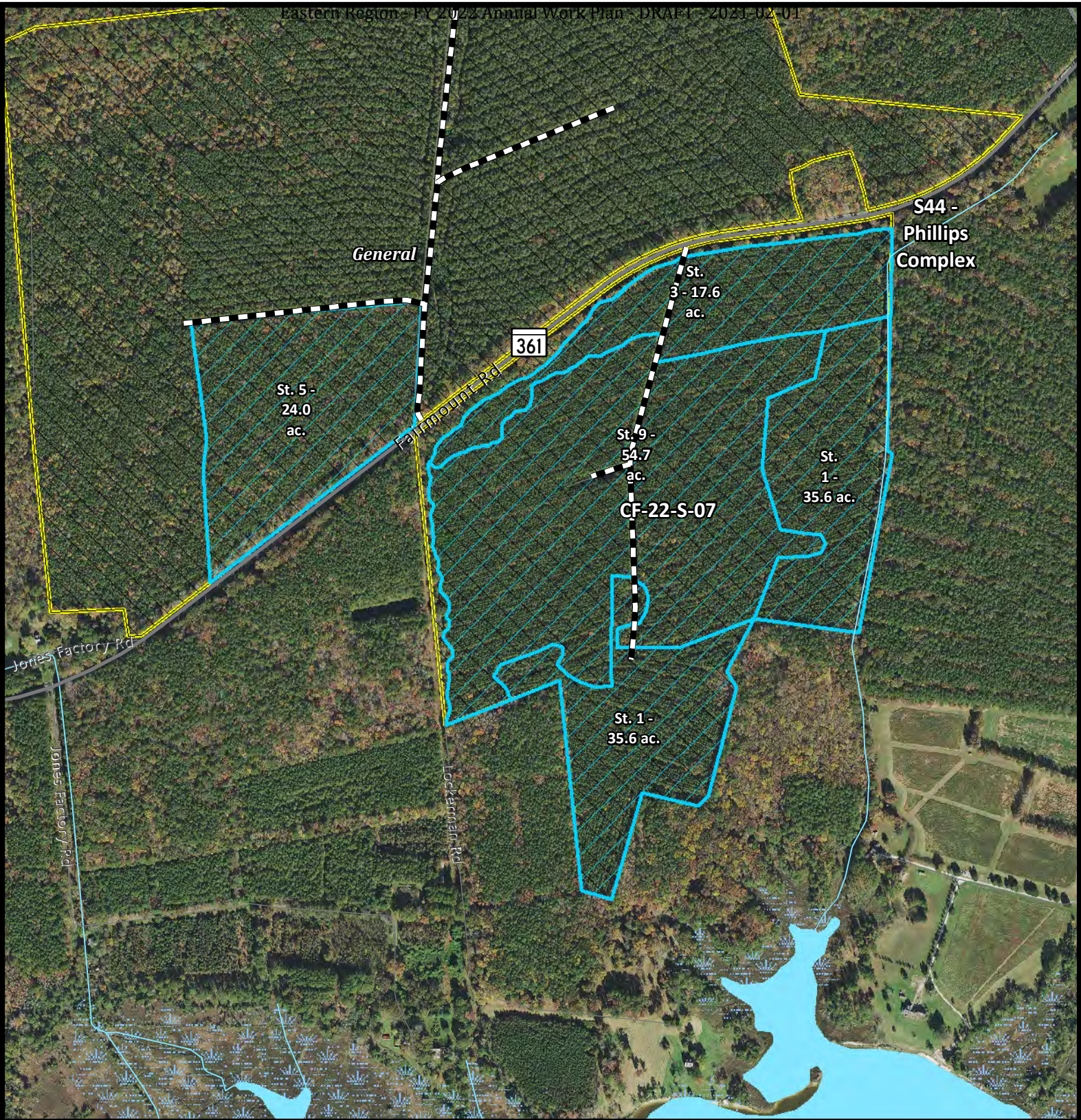
**CF AWP Activity** **CF Management**

 2022 First Thinning  DFS Core

660 0 660 1,320  
Feet

This map is for planning purposes only.  
This map is not a boundary survey






## CF-22-S-07

Scale: 1" = 660'  
Date: 06/2020

### Legend

#### CF AWP Activity

 2022 First Thinning

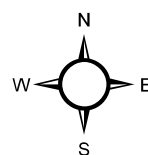
#### CF Management

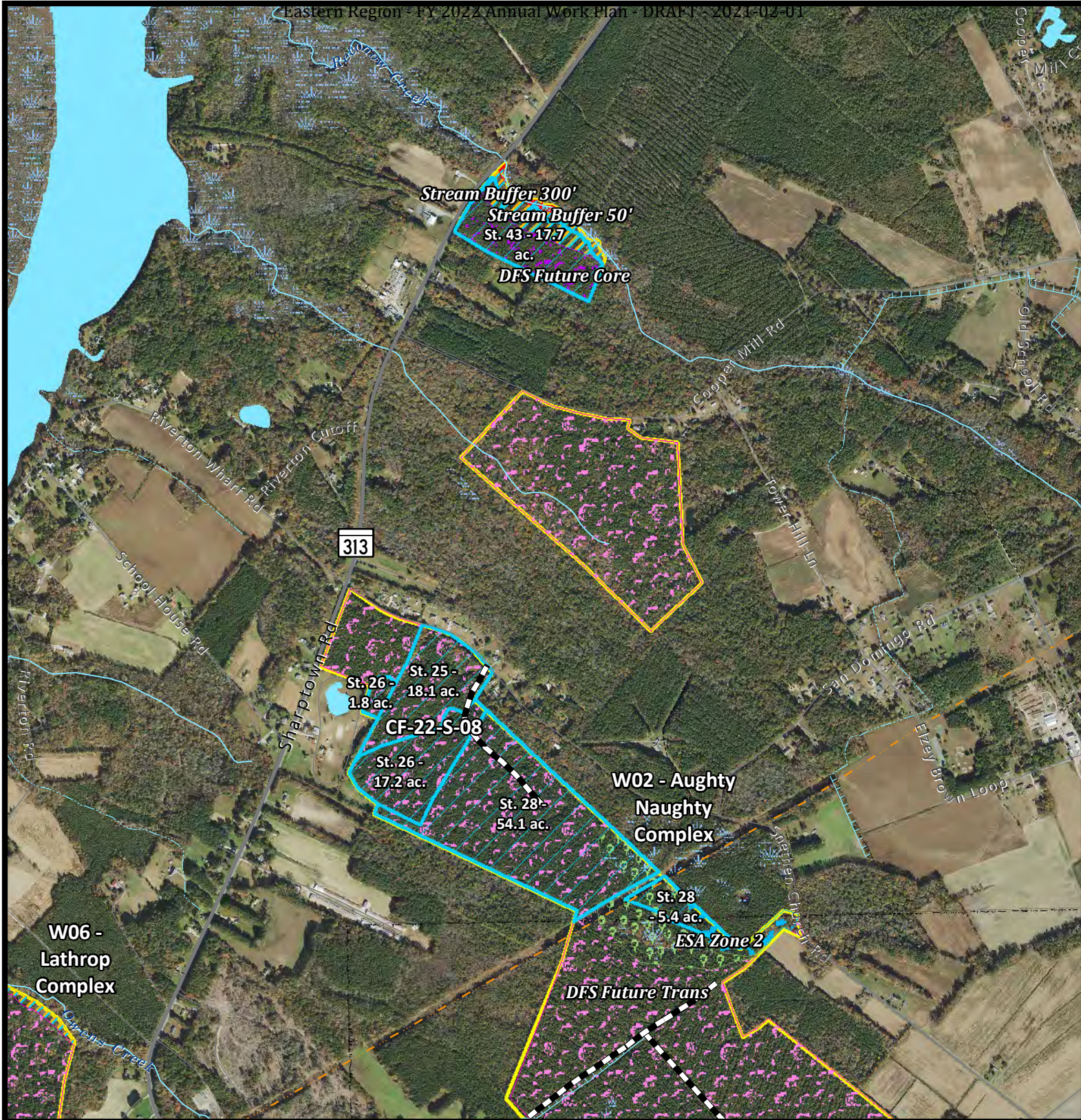


General



This map is for planning purposes only.  
This map is not a boundary survey





### Legend

#### CF AWP Activity

2022 First Thinning

#### CF Management

DFS Future Core

DFS Future Translocation

ESA Zone 2

ESA Zone 3 PW

Stream Buffer 50'

Stream Buffer 300'

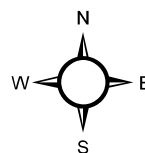
**CF-22-S-08**

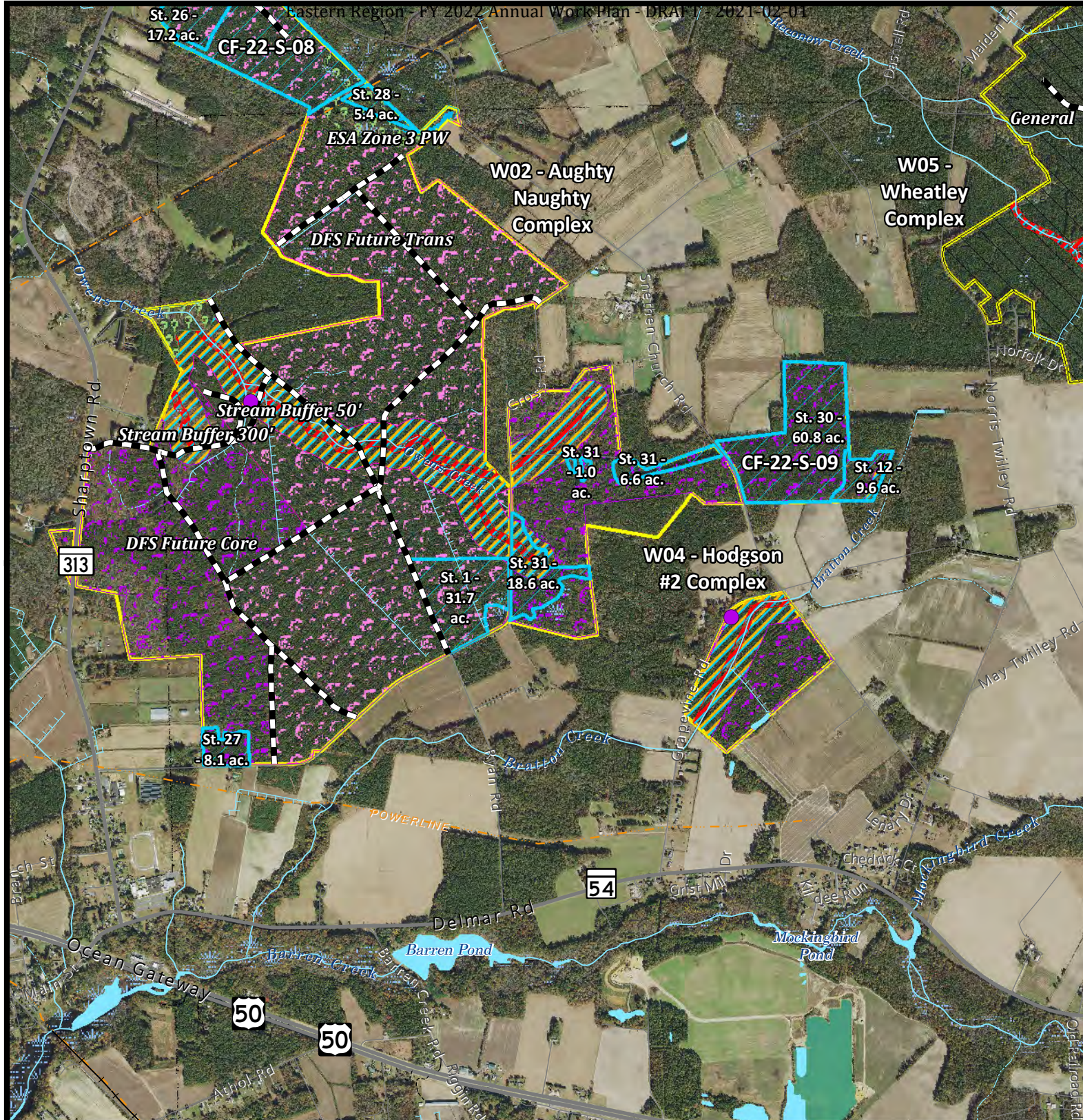
Scale: 1" = 1,320'

Date: 06/2020

660 0 660 1,320 1,980 2,640 3,300  
Feet

This map is for planning purposes only.  
This map is not a boundary survey





### Legend

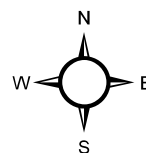
- |                        |                          |                   |
|------------------------|--------------------------|-------------------|
| ● Home Sites           | <b>CF Management</b>     | ESA Zone 3 PW     |
| <b>CF AWP Activity</b> | DFS Future Core          | General           |
| 2022 First Thinning    | DFS Future Translocation | Stream Buffer 50' |
| ESA Zone 2             | Stream Buffer 300'       |                   |

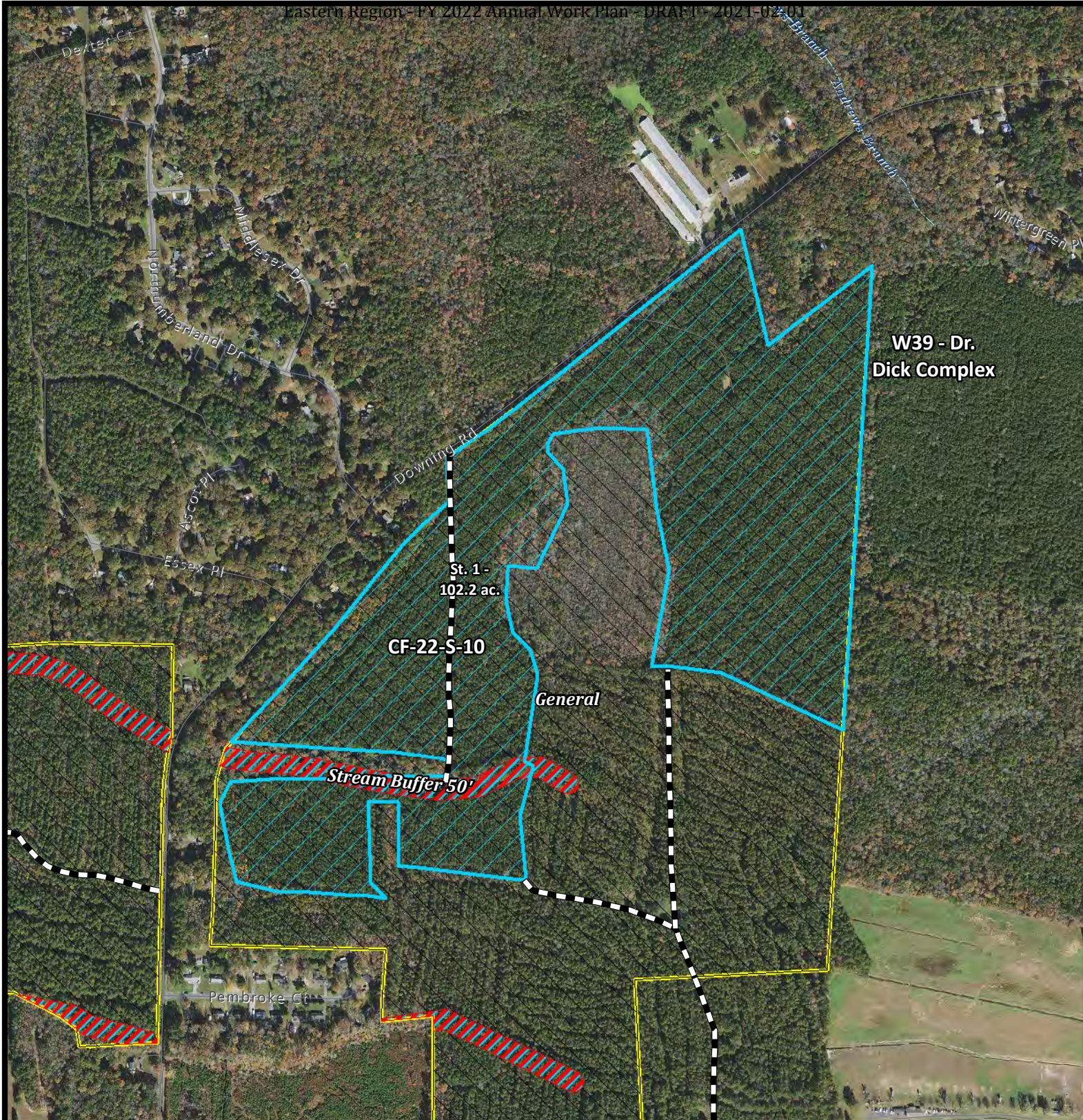
**CF-22-S-09**

Scale: 1" = 1,980'  
Date: 06/2020

660 0 660 1,320 1,980 2,640 3,300 3,960 4,620 5,280  
Feet

This map is for planning purposes only.  
This map is not a boundary survey





## CF-22-S-10

Scale: 1" = 660'  
Date: 06/2020

### Legend

#### CF AWP Activity

 2022 First Thinning

#### CF Management

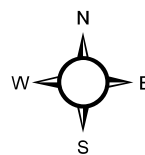
 General



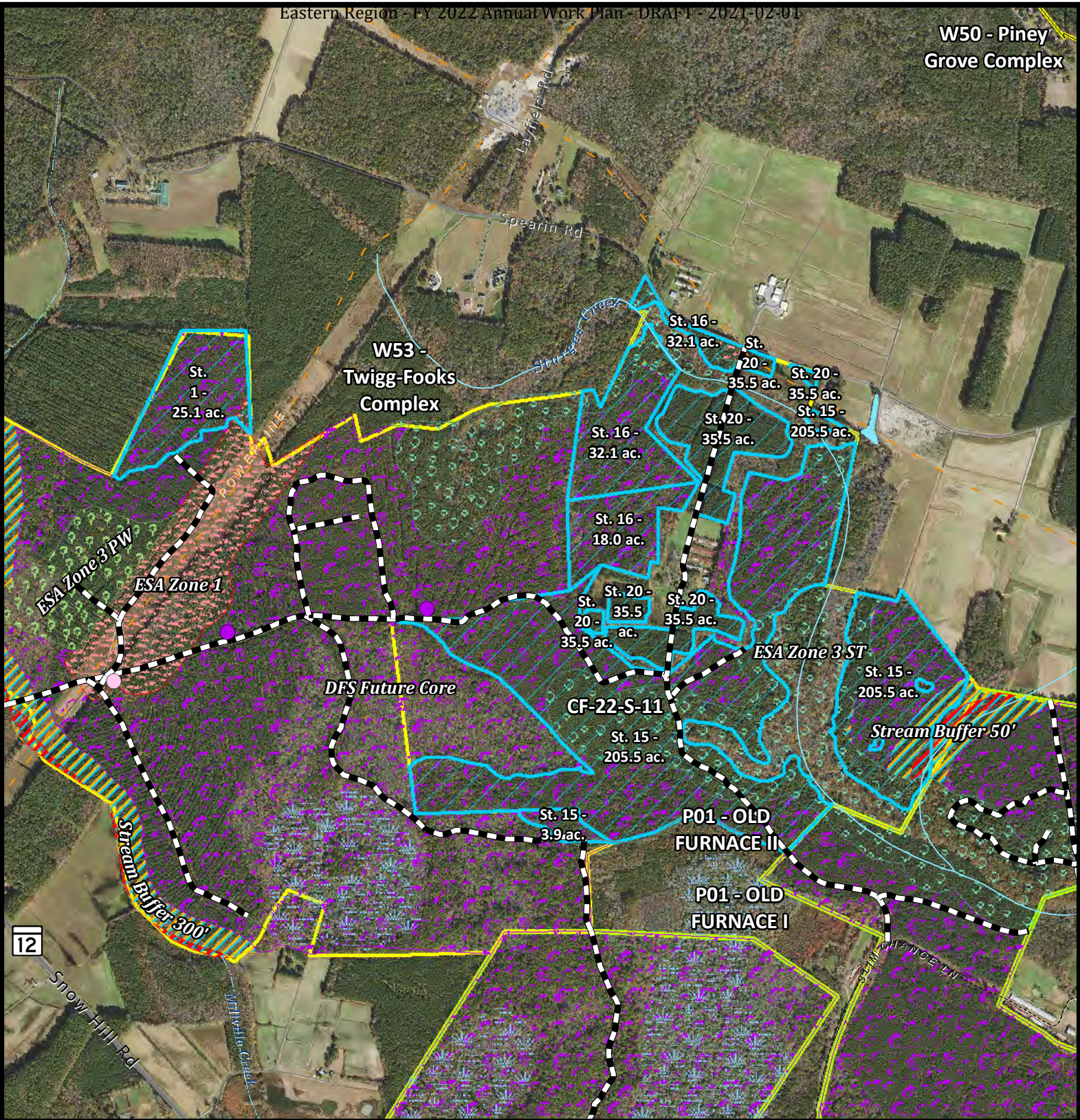
Stream Buffer 50'

660 0 660 1,320  
Feet

This map is for planning purposes only.  
This map is not a boundary survey



W50 - Piney Grove Complex



**Legend**

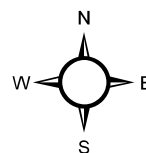
- |                        |                      |                   |               |
|------------------------|----------------------|-------------------|---------------|
| Home Sites             | <b>CF Management</b> | DFS Future Core   | ESA Zone 3 ST |
| <b>CF AWP Activity</b> | DFS Future Core      | General           |               |
| 2022 First Thinning    | ESA Zone 1           | Stream Buffer 50' |               |
| ESA Zone 3 PW          | Stream Buffer 300'   |                   |               |

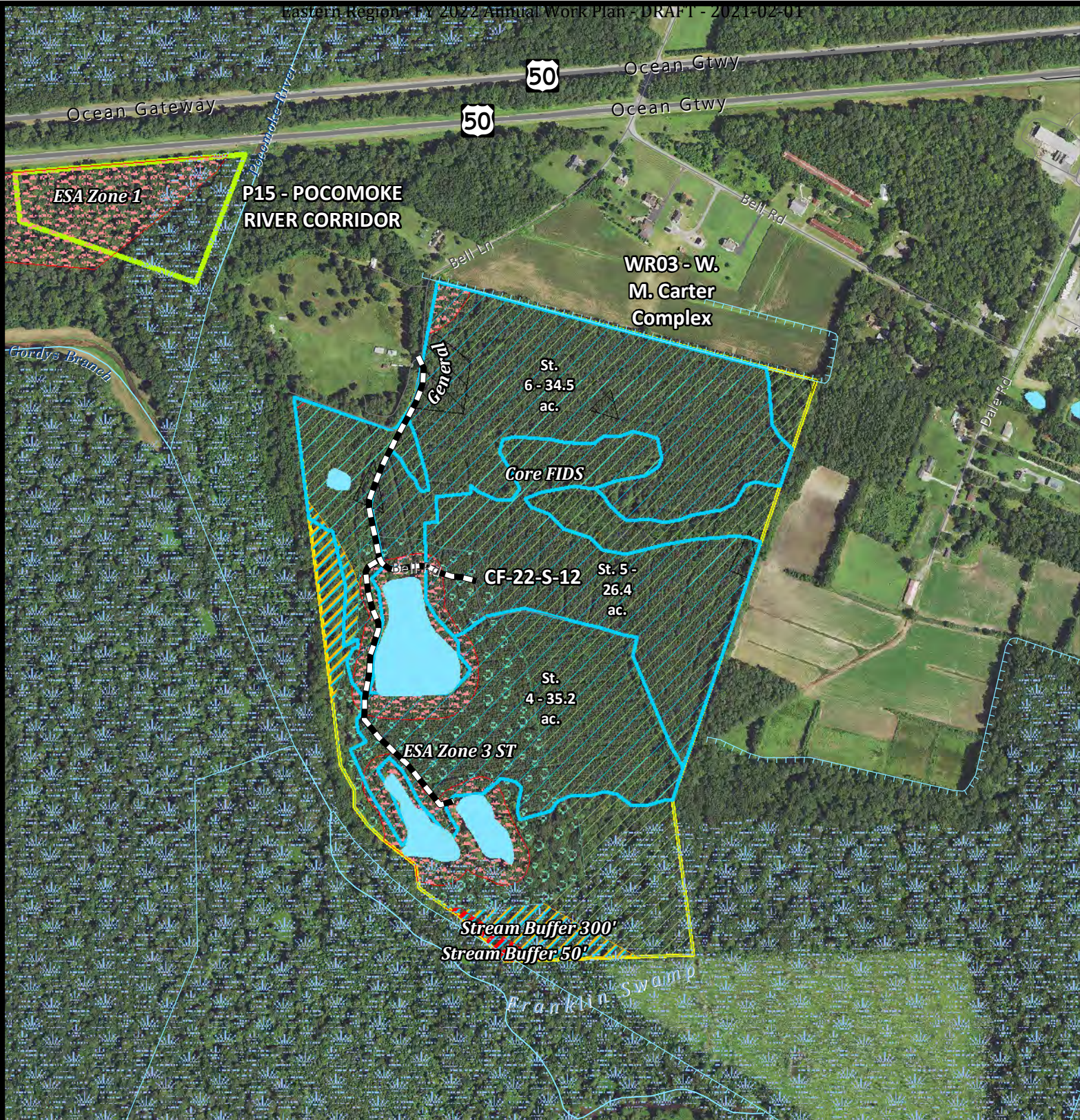
**CF-22-S-11**

Scale: 1" = 1,320'  
Date: 06/2020

660 0 660 1,320 1,980 2,640 3,300  
Feet

This map is for planning purposes only.  
This map is not a boundary survey






### Legend

#### CF AWP Activity

 2022 First Thinning

#### CF Management

 Core FIDS

 ESA Zone 1

 ESA Zone 3 ST



General



Stream Buffer 50'



Stream Buffer 300'

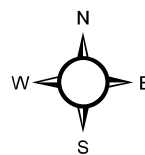
**CF-22-S-12**

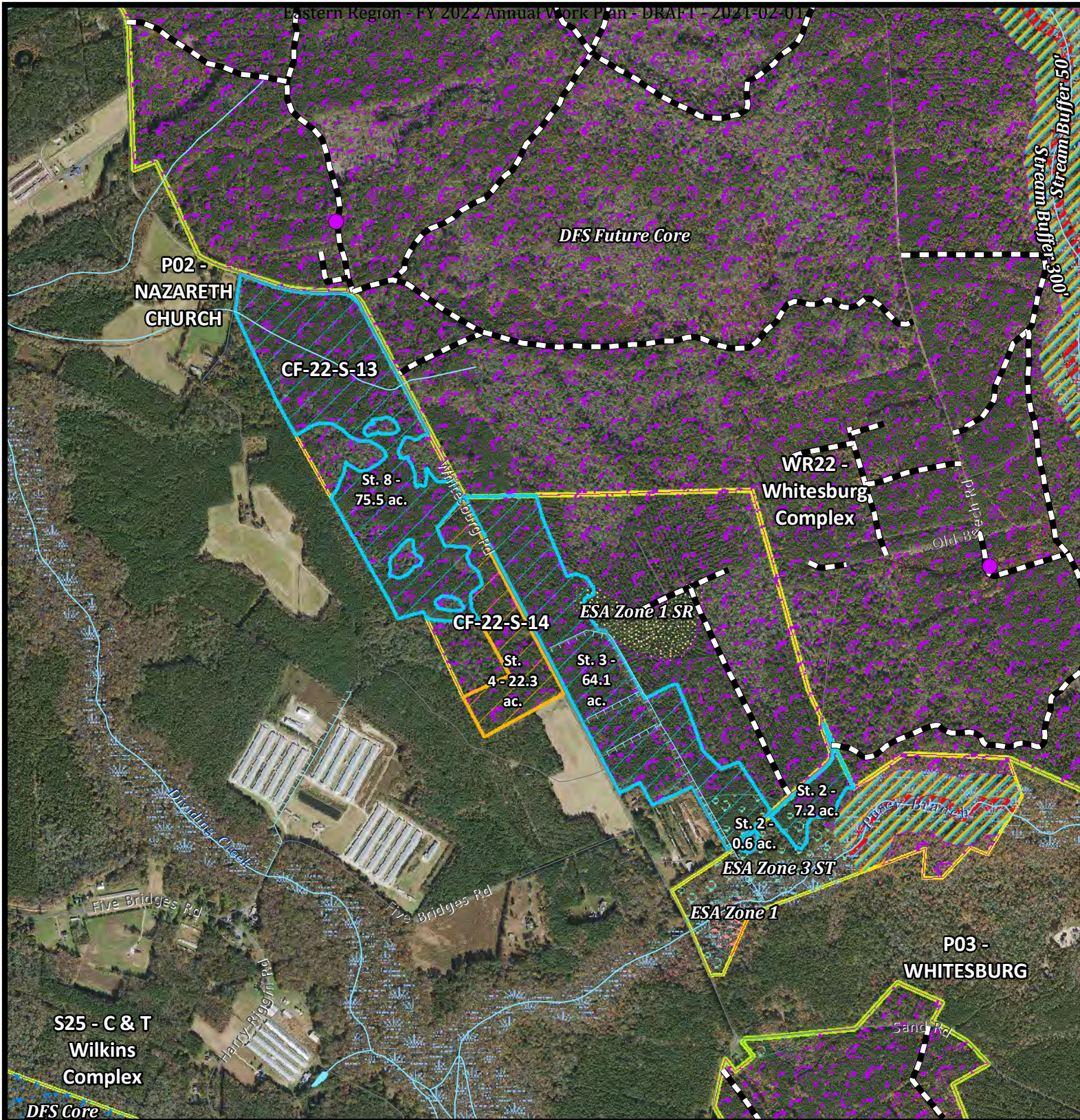
Scale: 1" = 660'

Date: 06/2020

660 0 660 1,320  
Feet



This map is for planning purposes only.  
This map is not a boundary survey





### Legend




#### CF AWP Activity

-  2022 First Thinning
-  2022 Second Thinning

#### CF Management

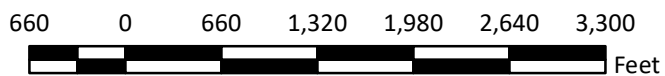
-  DFS Core
-  DFS Future Core
-  ESA Zone 1

-  ESA Zone 1 SR

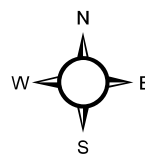
-  ESA Zone 3 ST
-  Stream Buffer 50'
-  Stream Buffer 300'

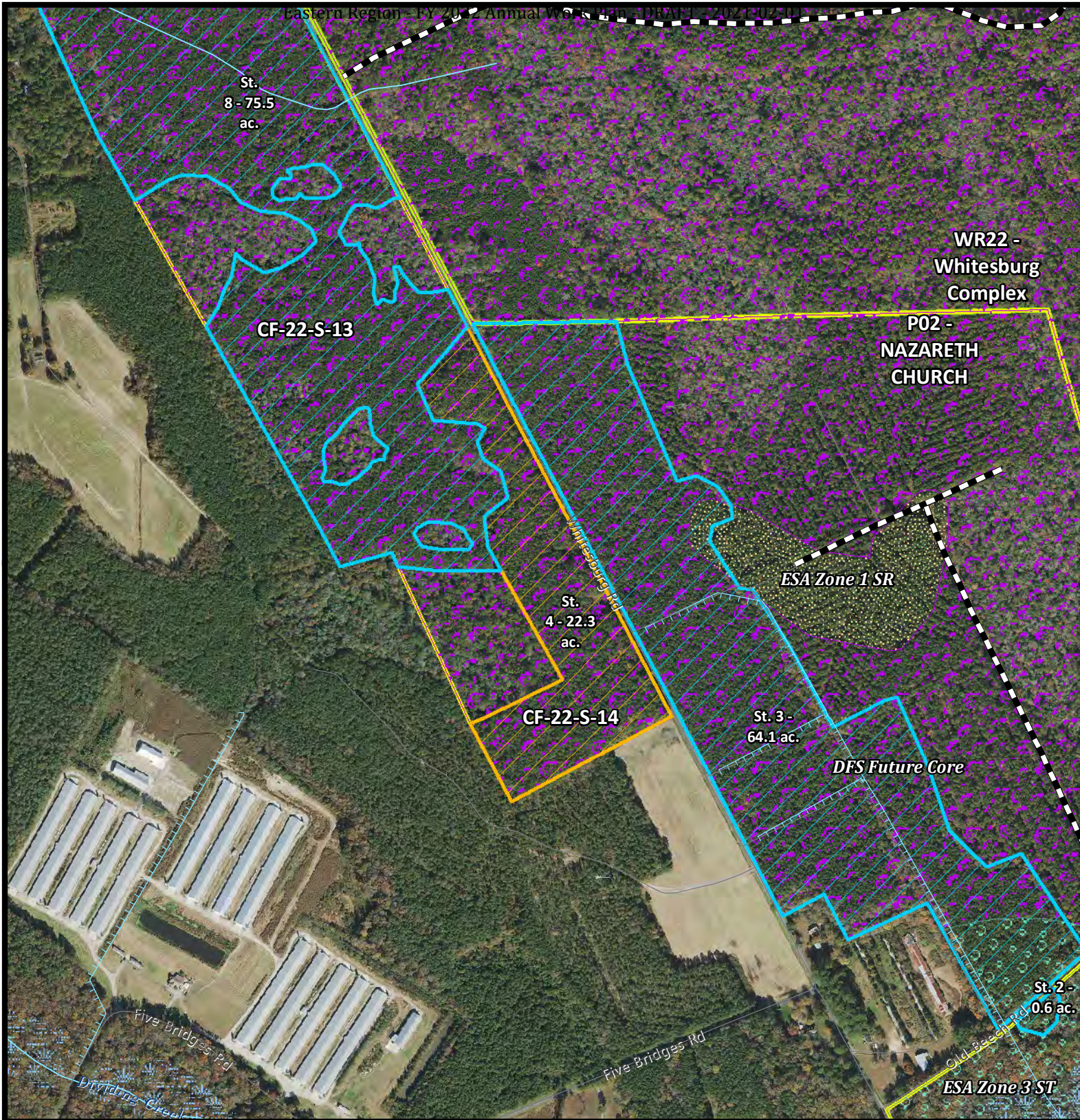
**CF-22-S-13**

Scale: 1" = 1,320'  
Date: 06/2020



This map is for planning purposes only.  
This map is not a boundary survey







## CF-22-S-14



Scale: 1" = 660'  
Date: 06/2020



### Legend

#### CF AWP Activity

-  2022 First Thinning
-  2022 Second Thinning

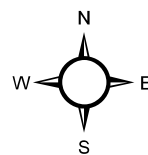
#### CF Management

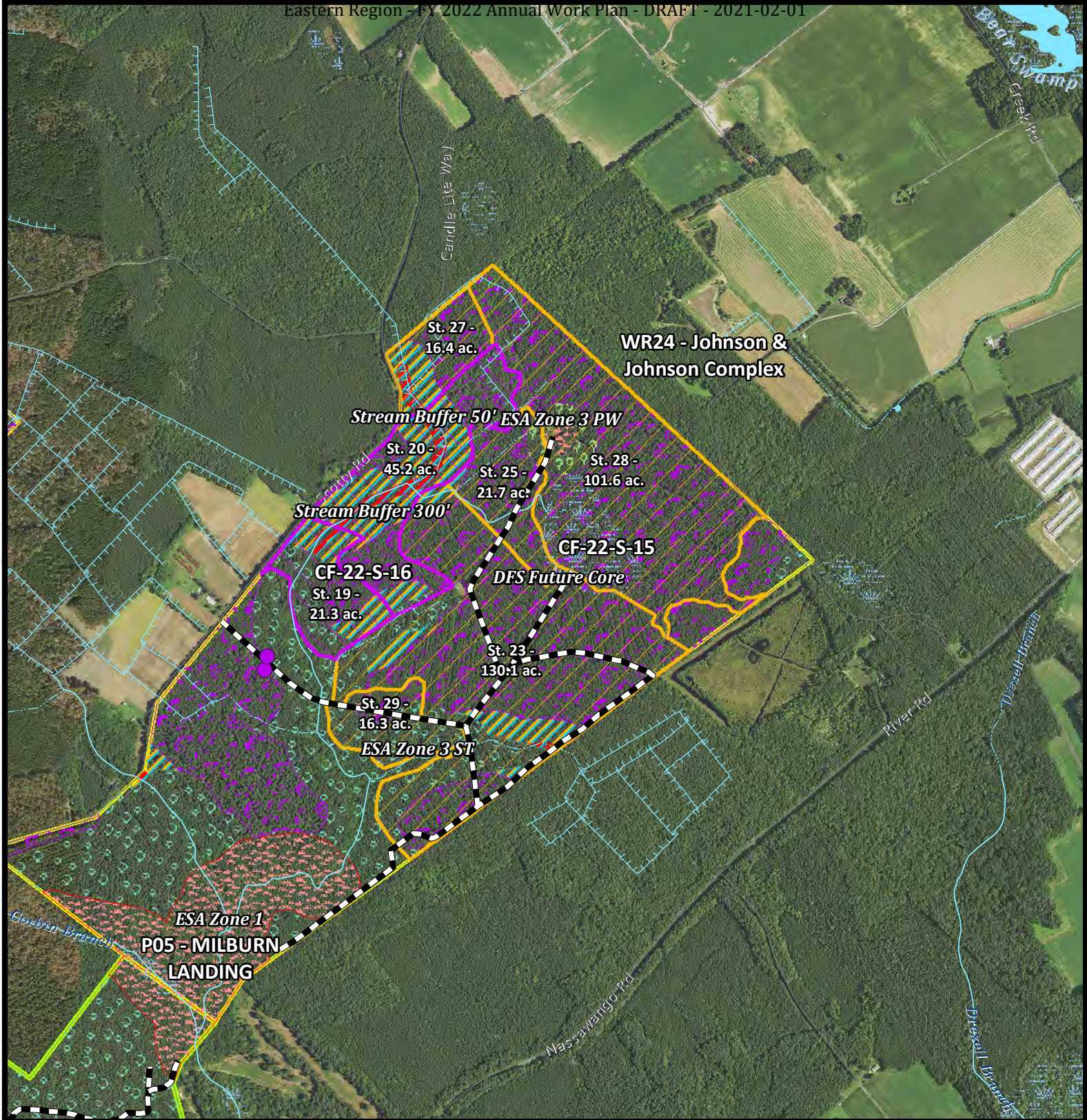
-  DFS Future Core
-  ESA Zone 1

-  ESA Zone 1 SR
-  ESA Zone 3 ST



This map is for planning purposes only.  
This map is not a boundary survey





### Legend

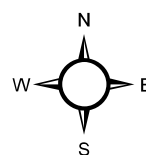
- |                        |                      |                    |
|------------------------|----------------------|--------------------|
| Home Sites             | <b>CF Management</b> | ESA Zone 3 ST      |
| <b>CF AWP Activity</b> | DFS Future Core      | Stream Buffer 50'  |
| 2022 Second Thinning   | ESA Zone 1           | Stream Buffer 300' |
| 2022 Final Harvest     | ESA Zone 3 PW        |                    |

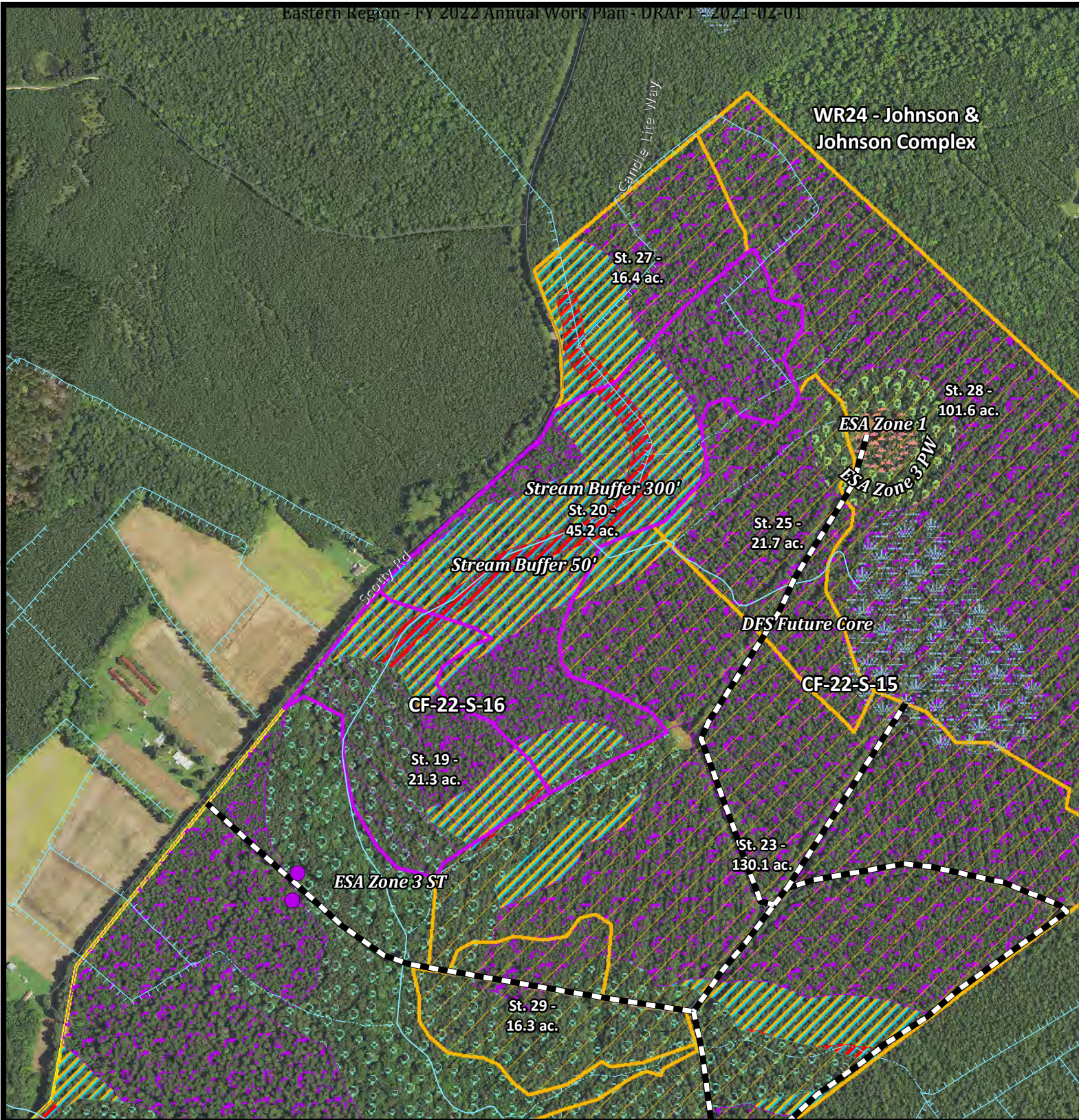
660 0 660 1,320 1,980 2,640 3,300  
 Feet

This map is for planning purposes only.  
 This map is not a boundary survey

### CF-22-S-15

Scale: 1" = 1,320'  
 Date: 06/2020





### Legend

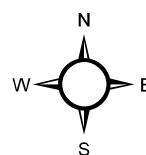
- |                        |                      |                    |
|------------------------|----------------------|--------------------|
| ● Home Sites           | <b>CF Management</b> | ESA Zone 3 ST      |
| <b>CF AWP Activity</b> | DFS Future Core      | Stream Buffer 50'  |
| 2022 Second Thinning   | ESA Zone 1           | Stream Buffer 300' |
| 2022 Final Harvest     | ESA Zone 3 PW        |                    |

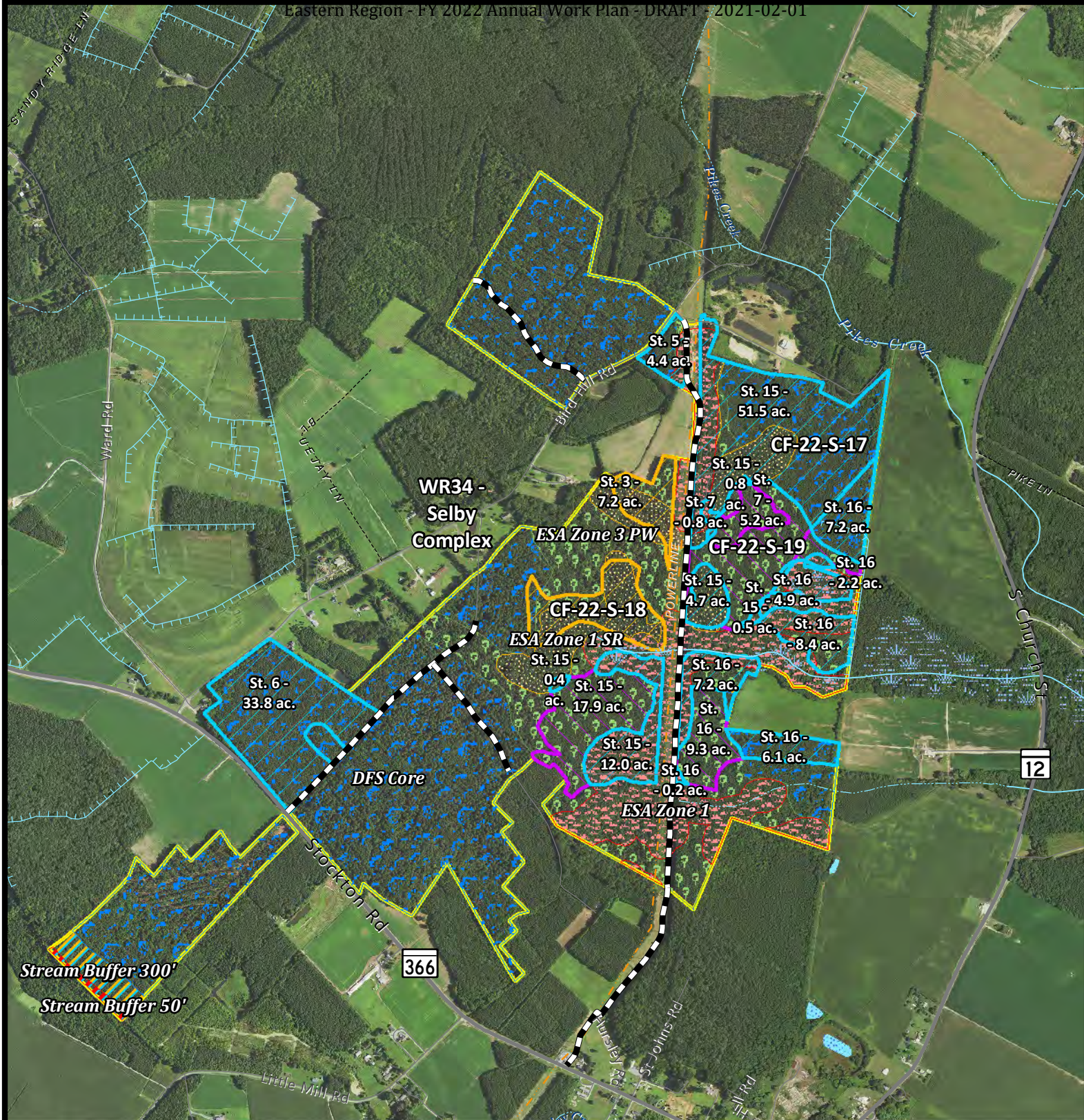
**CF-22-S-16**

Scale: 1" = 660'  
Date: 06/2020



This map is for planning purposes only.  
This map is not a boundary survey





### Legend

#### CF AWP Activity

- 2022 First Thinning
- 2022 Second Thinning
- 2022 Final Harvest

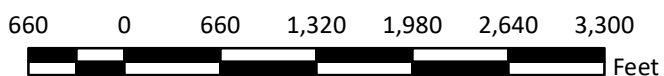
#### CF Management

- DFS Core
- ESA Zone 1
- ESA Zone 1 SR

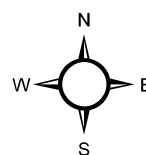
- ESA Zone 3 PW
- Stream Buffer 50'
- Stream Buffer 300'

**CF-22-S-17**

Scale: 1" = 1,320'  
Date: 06/2020



This map is for planning purposes only.  
This map is not a boundary survey





### Legend

#### CF AWP Activity

- 2022 First Thinning
- 2022 Second Thinning
- 2022 Final Harvest

#### CF Management

- DFS Core
- ESA Zone 1 SR
- ESA Zone 3 PW
- ESA Zone 1
- Stream Buffer 300'

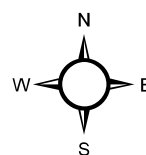
**CF-22-S-18**

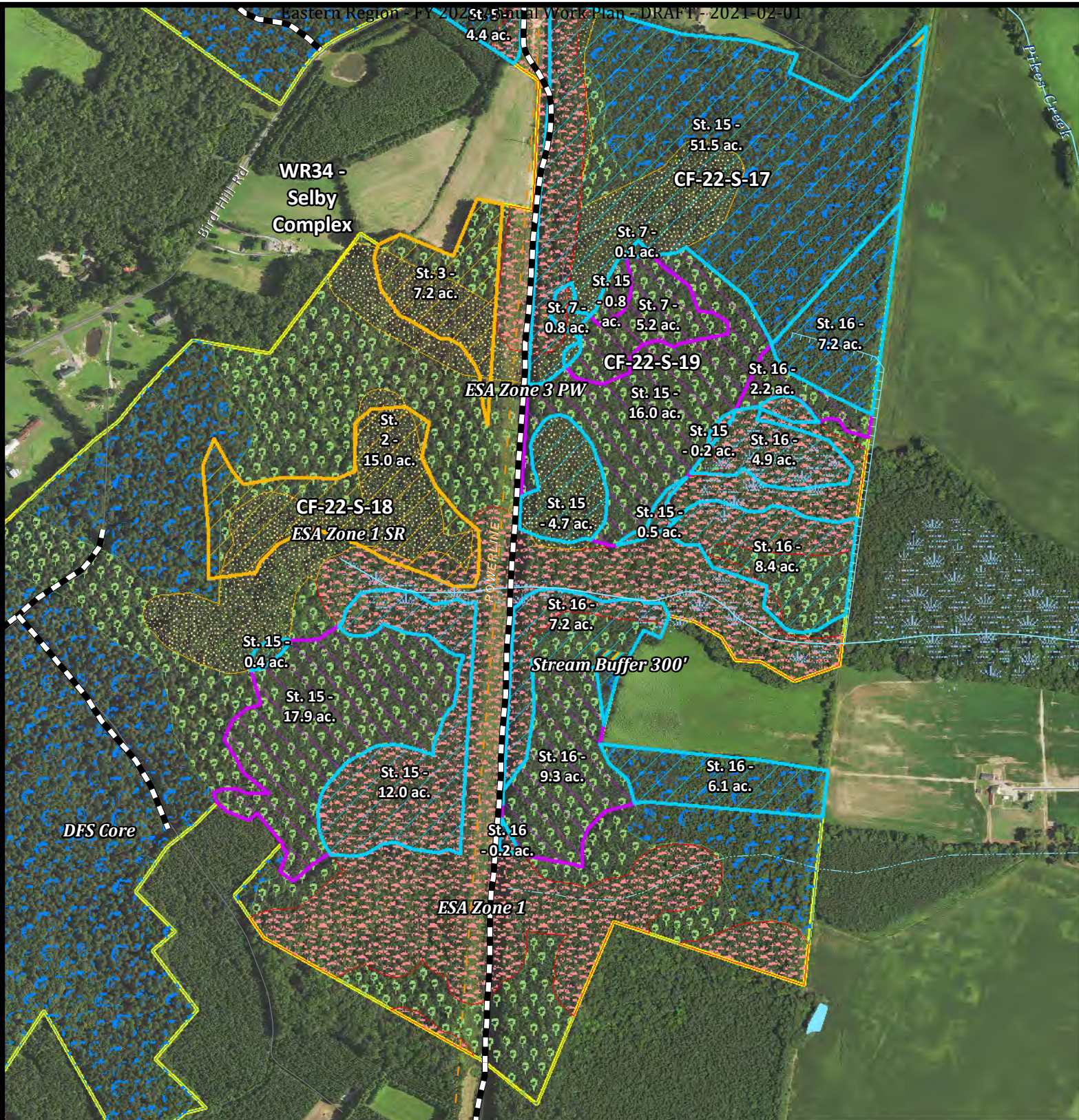
Scale: 1" = 660'

Date: 06/2020



This map is for planning purposes only.  
This map is not a boundary survey





### Legend

#### CF AWP Activity

- 2022 First Thinning
- 2022 Second Thinning
- 2022 Final Harvest

#### CF Management

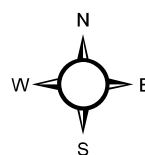
- DFS Core
- ESA Zone 1
- ESA Zone 1 SR
- ESA Zone 3 PW
- Stream Buffer 300'

**CF-22-S-19**

Scale: 1" = 660'  
Date: 06/2020

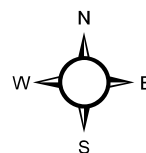
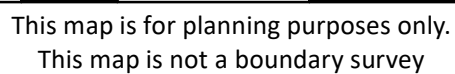


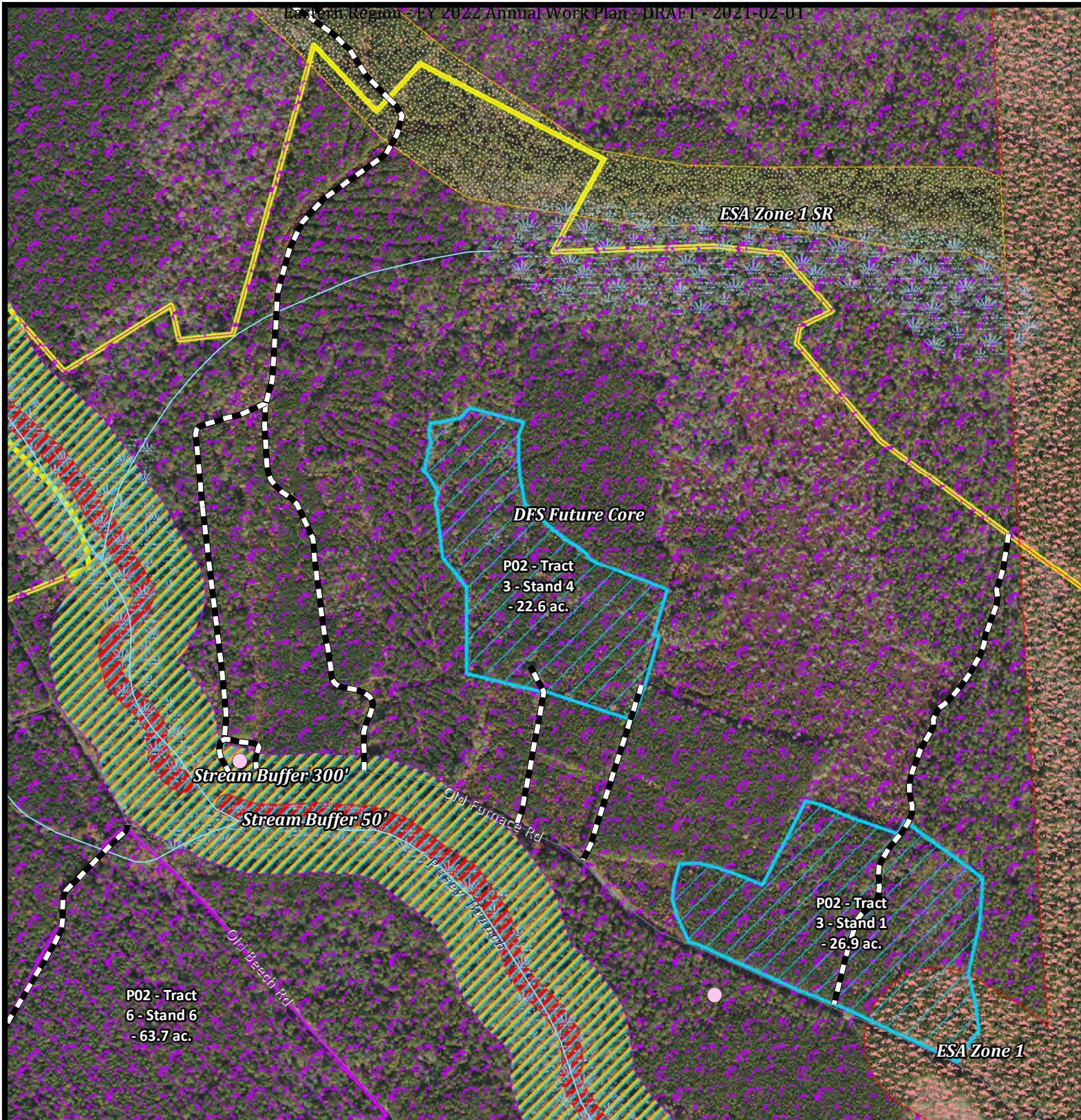
This map is for planning purposes only.  
This map is not a boundary survey



**P-22-S-01**

- Scale: 1" = 660'  
Date: 12/2019





P-22-S-02

Scale: 1" = 660'  
Date: 12/2019

**Legend**

**PSF AWP Activity**

- 2022 First Thinning
- 2022 Final Harvest

**PSF Management**

- DFS Future Core
- ESA Zone 1



ESA Zone 1 SR



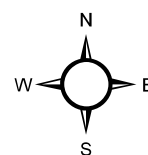
Stream Buffer 50'

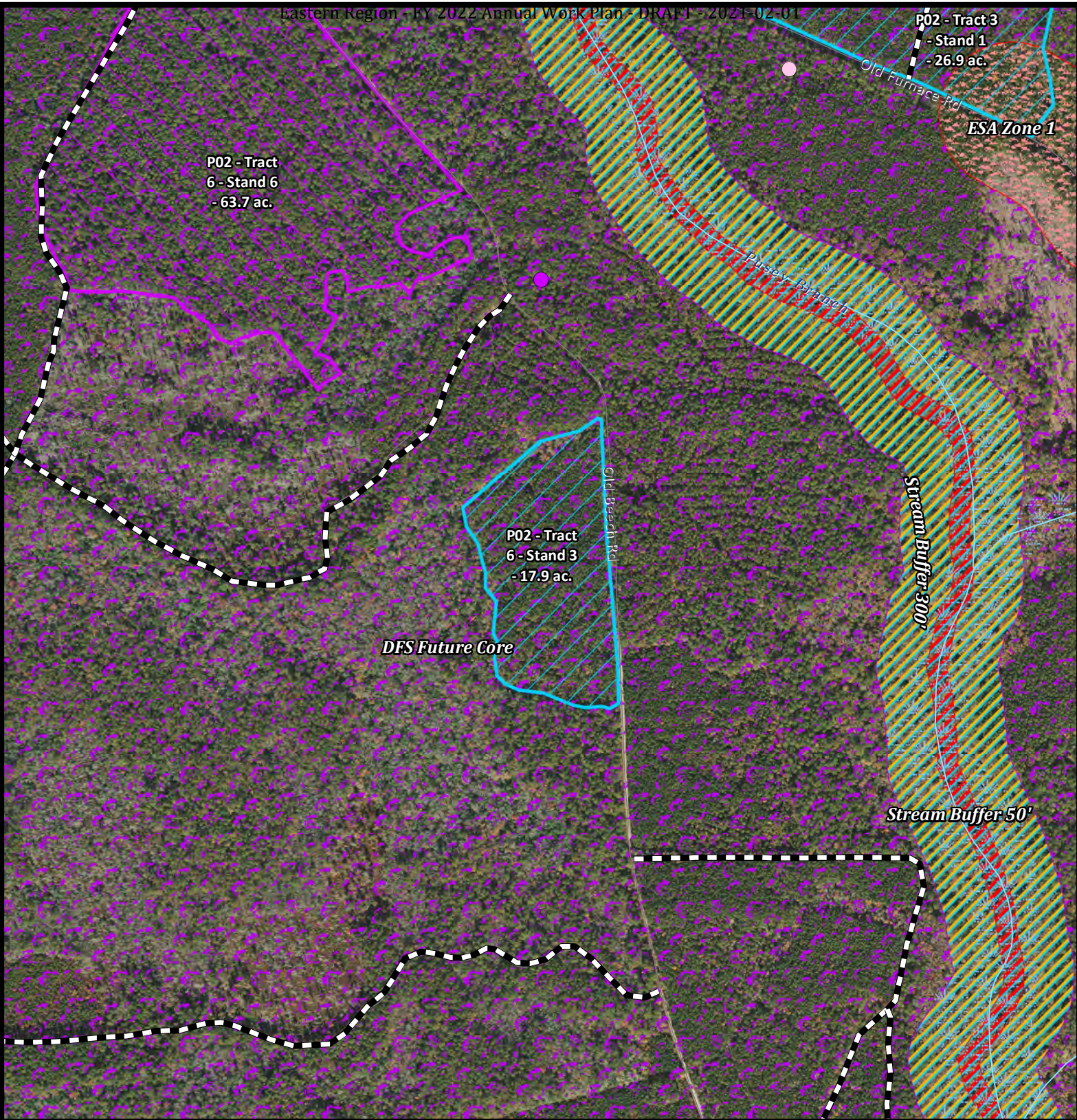


Stream Buffer 300'



This map is for planning purposes only.  
This map is not a boundary survey





P02 - Tract 3  
- Stand 1  
- 26.9 ac.

P02 - Tract 6 - Stand 6  
- 63.7 ac.

P02 - Tract 6 - Stand 3  
- 17.9 ac.

*DFS Future Core*

*ESA Zone 1*

*Stream Buffer 300'*

*Stream Buffer 50'*

### Legend

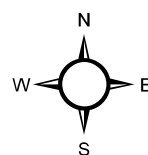
- |                         |                       |                    |
|-------------------------|-----------------------|--------------------|
| Home Sites              | <b>PSF Management</b> | Stream Buffer 50'  |
| <b>PSF AWP Activity</b> | DFS Future Core       | Stream Buffer 300' |
| 2022 First Thinning     | ESA Zone 1            |                    |
| 2022 Final Harvest      |                       |                    |

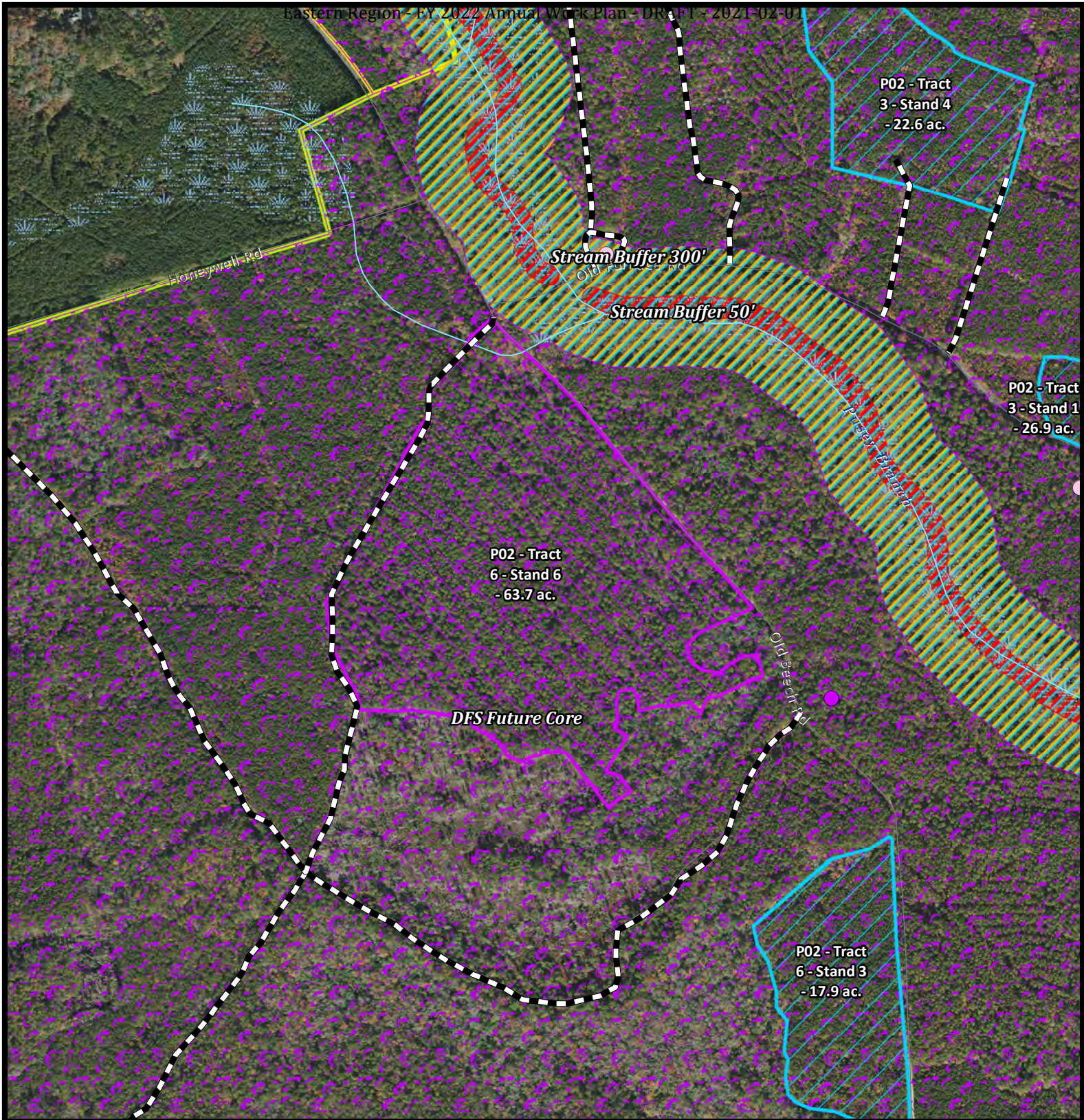
**P-22-S-03**

Scale: 1" = 660'  
Date: 12/2019



This map is for planning purposes only.  
This map is not a boundary survey





### Legend

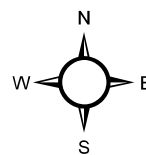
- |  |   |  |
|--|---|--|
|  Home Sites          | <b>PSF Management</b>   |  Stream Buffer 50'  |
| <b>PSF AWP Activity</b>  |  DFS Future Core |  Stream Buffer 300' |
|  2022 First Thinning |   |  |
|  2022 Final Harvest  |   |  |

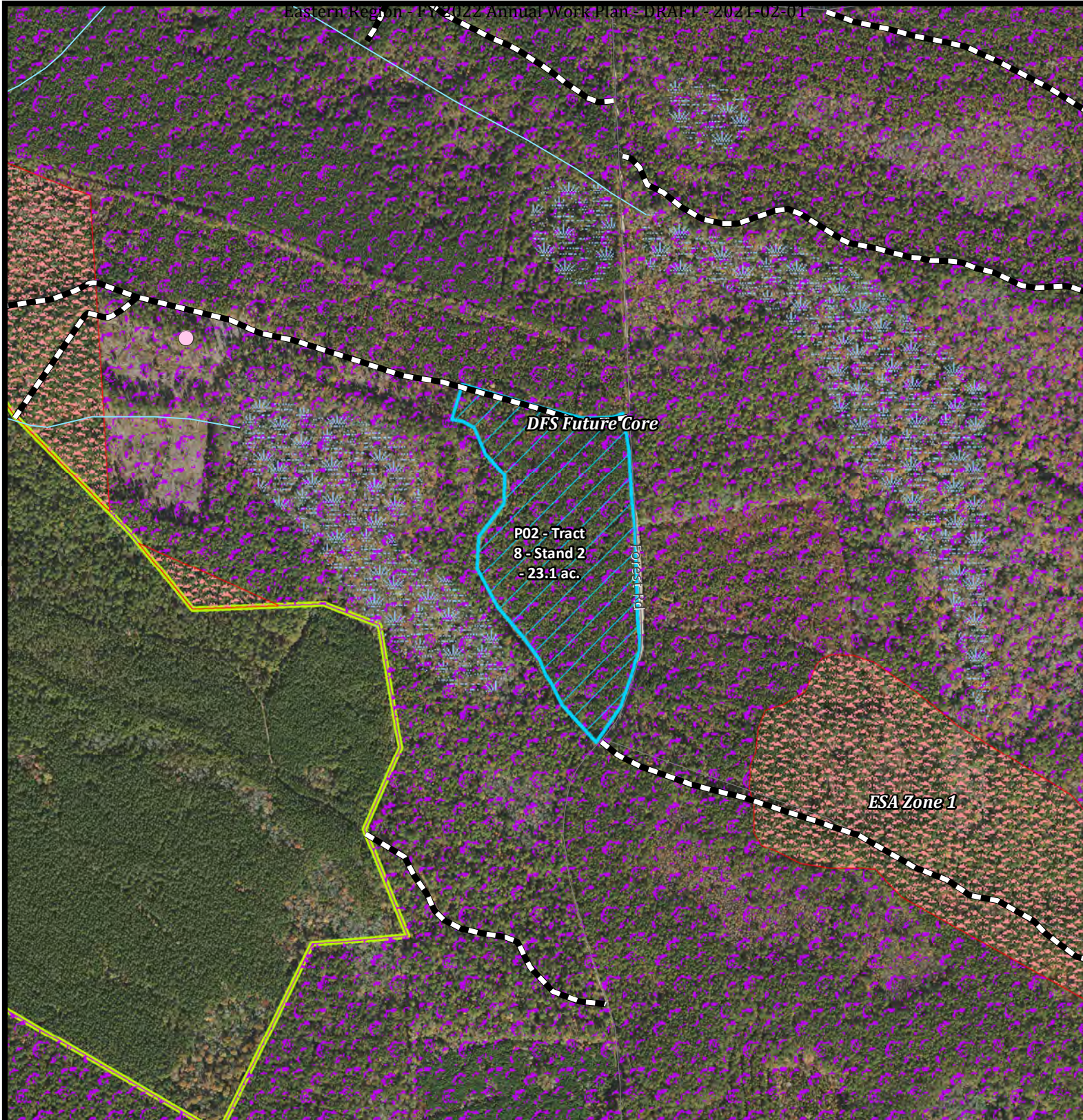
**P-22-S-04**

Scale: 1" = 660'  
Date: 12/2019



This map is for planning purposes only.  
This map is not a boundary survey





P-22-S-05


Scale: 1" = 660'  
Date: 12/2019

**Legend**

**PSF AWP Activity**

 2022 First Thinning

**PSF Management**

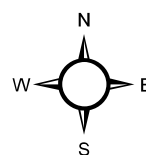
 DFS Future Core

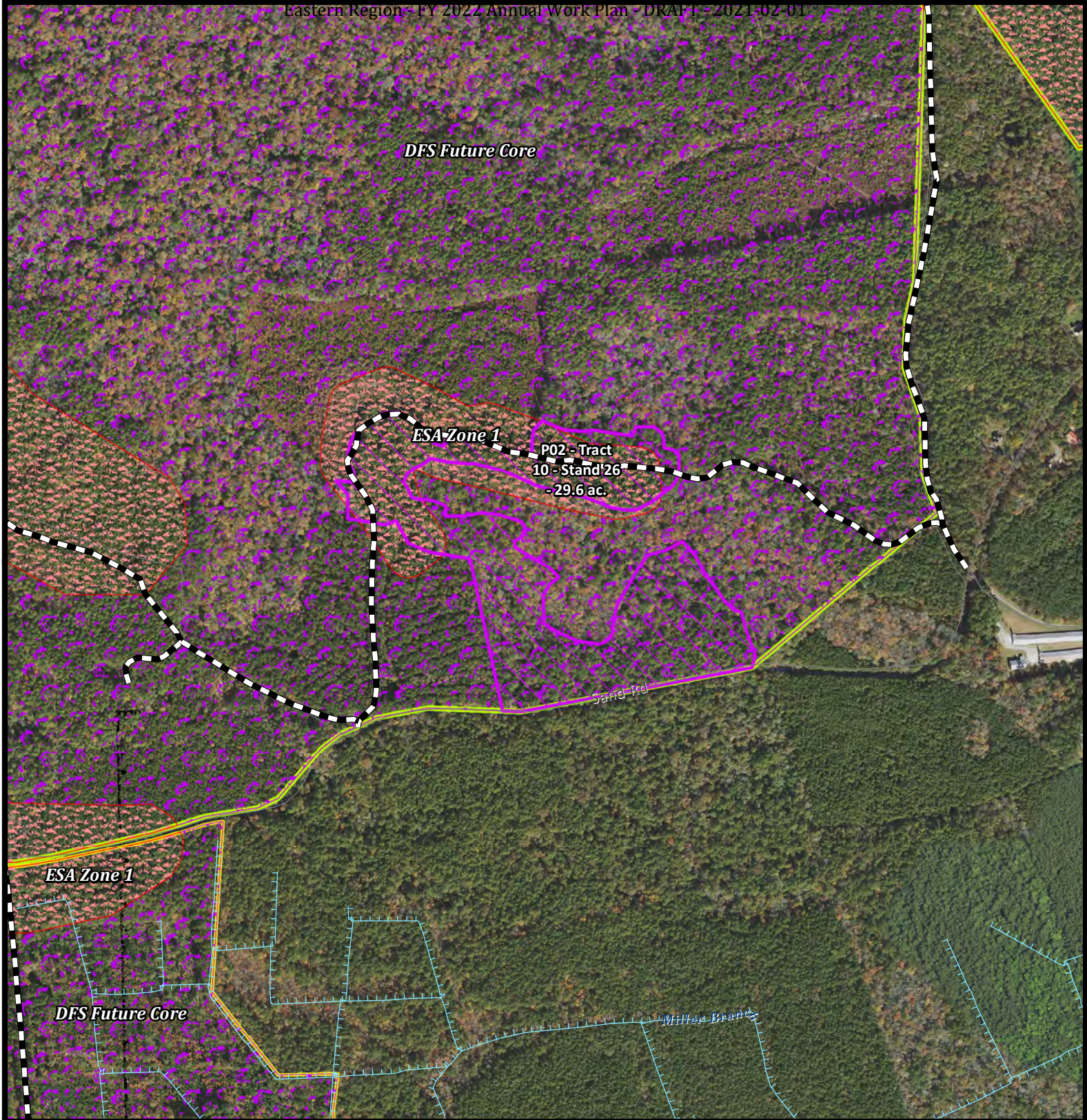


ESA Zone 1



This map is for planning purposes only.  
This map is not a boundary survey





**P-22-S-06**


Scale: 1" = 660'  
Date: 12/2019

**Legend**

**PSF AWP Activity**

 2022 Final Harvest

**PSF Management**

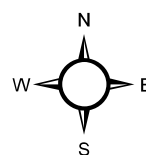
 DFS Future Core

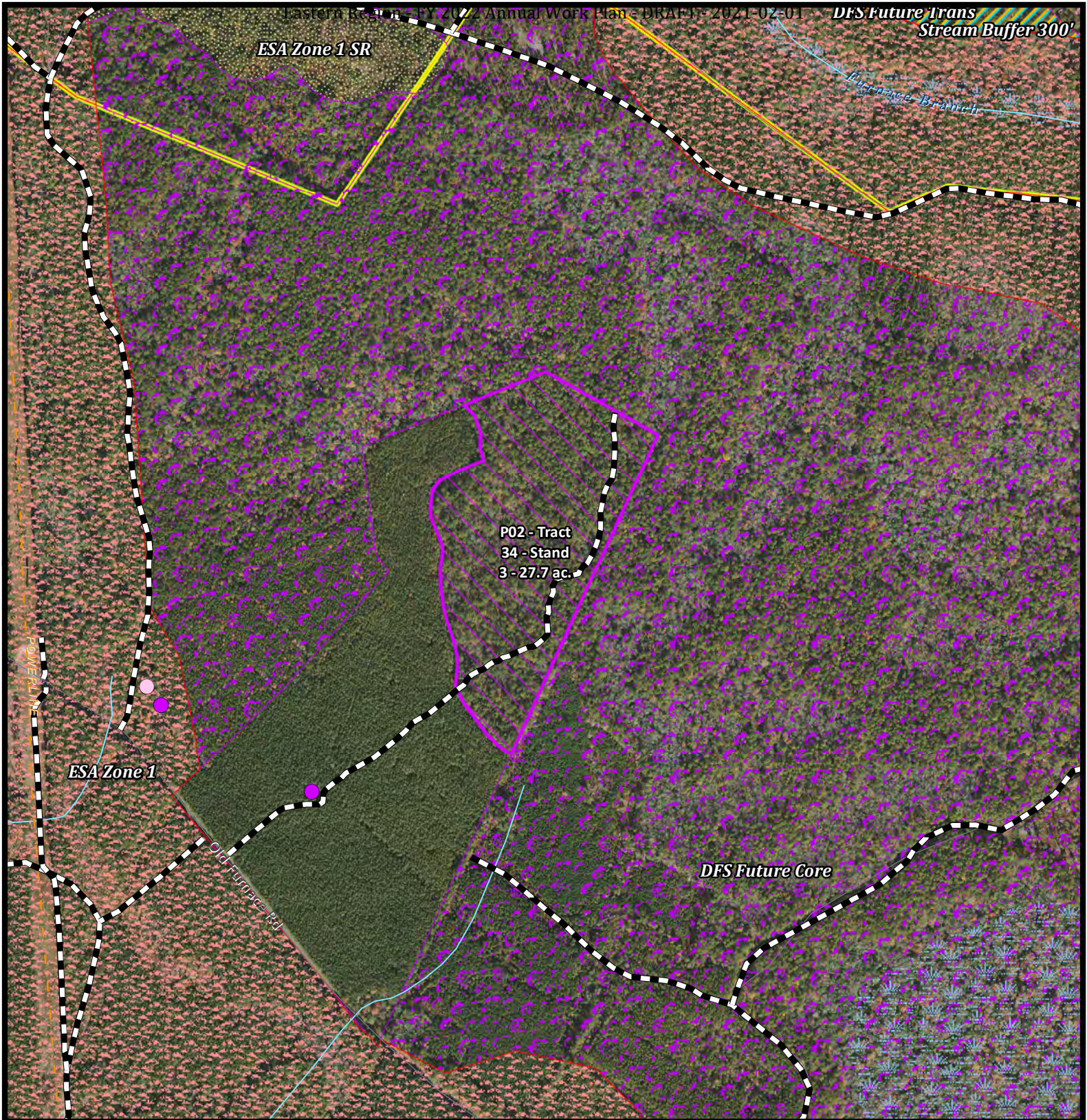


ESA Zone 1



This map is for planning purposes only.  
This map is not a boundary survey





### Legend

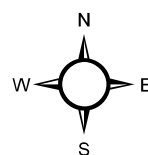
- Home Sites
- PSF Management
- ESA Zone 1
- DFS Future Core
- ESA Zone 1 SR
- 2022 Final Harvest

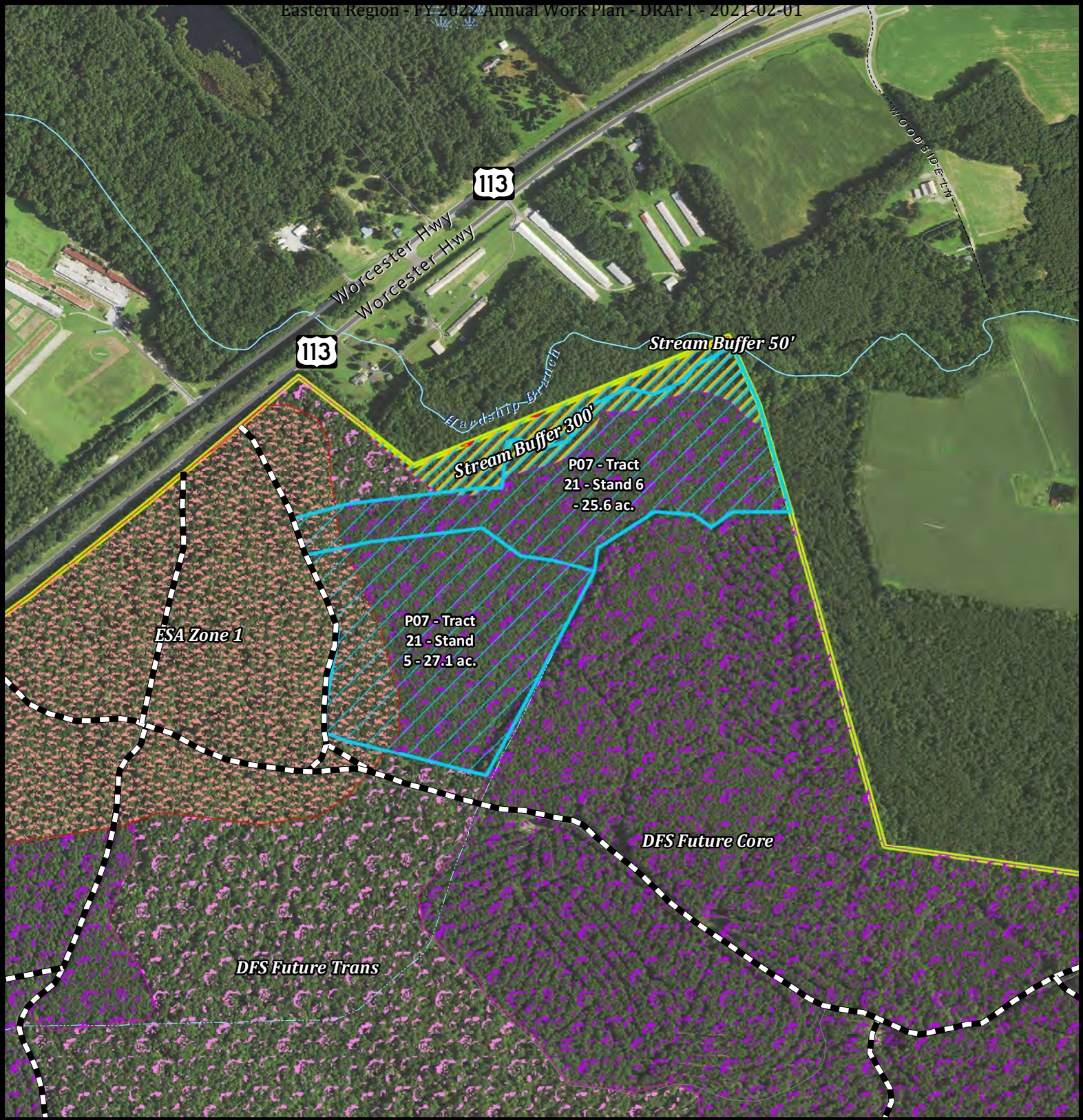


This map is for planning purposes only.  
This map is not a boundary survey

P-22-S-07

Scale: 1" = 660'  
Date: 12/2019





**Legend**

**PSF AWP Activity**

2022 First Thinning

**PSF Management**

DFS Future Core

DFS Future Translocation

ESA Zone 1

Stream Buffer 50'

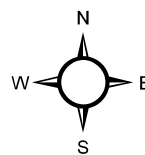
Stream Buffer 300'



This map is for planning purposes only.  
This map is not a boundary survey

**P-22-S-08**

Scale: 1" = 660'  
Date: 12/2019



## L. BUDGET

### Introduction

This section of the plan is designed to cover the annual funding sources and costs associated with the operational management of the Chesapeake Forest and the Pocomoke State Forest (CF/PSF).

The numbers expressed in this section are approximates typically found from one year to the next. Variations do occur based on management prescriptions, economic conditions, weather, certification audit year, and public use of the forest.

### Funding Sources

1. General Fund – Monies generated from Maryland State taxes. These funds are appropriated by the General Assembly through the annual state budgeting process.
2. Timber Revenue – Monies generated from the sale of forest products such as sawtimber, poles, pilings and pulpwood.
3. Hunting Leases – Monies generated by the Chesapeake Forest Hunting Lease Program.
4. Agricultural Leases – Monies generated from leasing agricultural fields on the forest to local farmers.
5. Grants – Monies generated from outside agencies/groups through a competitive grant request process.

### Operational Costs

1. State Employee Salaries – There are four classified (full time) state employees assigned to the CF/PSF: Forest Manager, GIS Forester, Forest Technician, and an Administrative Assistant.
2. Contractual Employee Salaries – There are typically four contractual employees working 10 to 12 months per year on the forest.
3. Land Management – This includes the cost of contract management services and payments to loggers for harvesting and delivering forest products to processing mills.
4. Land Operations – This includes costs for road maintenance, non-commercial harvesting, tree planting, herbicide application, monitoring, equipment purchase & maintenance, etc.
5. County Payments – All counties except for Worcester are paid at a rate of 15% of the total revenue in lieu of property taxes. In Worcester County, 25% of the revenue generated off the forest is paid to the county since the total acreage of Park and Forestry properties exceeds 10% of the total County land base.
6. Public Drainage Association (PDA) Fees – This is a fee collected for large public drainage ditches that are present on the forest. Monies are used by the PDA to maintain the ditches.
7. Forest Certification – Monies used to maintain state forest lands certification through annual third party audits. Every fifth year is a full recertification audit, which costs \$40,000. Subsequent surveillance audits cost \$20,000.

**Chesapeake Forest/Pocomoke State Forest Budget**

<b>Funding Sources</b>	
1. General	\$ 439,956
2. Timber Revenue	\$ 1,100,000
3. Hunting Leases	\$ 576,778
4. Agricultural Leases	\$ 33,202
5. Recreation Trail Grant(s)	\$ 30,000
<b>Total</b>	<b>\$ 2,179,936</b>
<b>Operational Costs</b>	
1. State Employee Salaries	\$ 285,049
2. Contractual Employee Salaries	\$ 83,062
3. Land Management	\$ 981,034
4. Land Operations	\$ 438,242
5. County Payments	\$ 171,770
6. Public Drainage Association Fees	\$ 9,647
7. Forest Certification	\$ 19,605
<b>Total</b>	<b>\$ 1,988,409</b>
<b>Net Revenue</b>	<b>\$ 191,527</b>

**APPENDIX A – SOIL SERIES MANAGEMENT GROUPS, ABBREVIATIONS, AND SYMBOLS**

Soil Series	SMG	Caroline	Dorchester	Somerset	Wicomico	Worcester
Acquango sand	4					AcB, AcC
Annessex-Manokin complex	1			AoA, AoB		
Askecksy loamy sand	1	AsA			AsA	As
Askecksy-Urban land complex	1				AtA	
Beaches	-		Be	Be	Be	Be
Berryland mucky loamy sand	2				BhA	BhA
Bestpitch and Transquaking	5		BT			
Boxiron and Broadkill soils	1			BX		BX
Broadkill mucky silt loam	1					Br
Brockatonorton sand	3					BkA, BkB
Cedartown loamy sand	4	CdA, CdB			CdA	
Cedartown-Rosedale complex	4					CeA, CeB
Chicone mucky silt loam	5		Ch			Ch
Corsica and Fallsington soils	2			CRA		
Corsica mucky loam	1	CoA			CoA	
Corsica mucky loam, Carolina Bay	1	CrA				
Downer loamy sand	3		DnC			
Downer sandy loam	3		DoA, DoB	DoA, DoB		
Elkton loam	1		EkA			
Elkton mucky silt loam	1		EoA			
Elkton sandy loam	1					EkA
Elkton silt loam	1	EmA	EmA	EmA		EmA
Endoquepts and Sulfaquepts	5			EQB	EQB	
Evesboro loamy sand	4					EvA, EvB, EvC
Evesboro sand	4	EwA, EwB	EwC, EwE		EwA, EwB, EwC	
Evesboro-Galestown complex	4			EzB		
Fallsington loam	2	FgA		FgA	FgA	
Fallsington sandy loam	2	FaA	FaA	FaA	FaA	FaA
Fallsington-Glassboro complex	2			PhA		
Fort Mott loamy sand	3		FmA, FmB		FmA, FmB	FmA, FmB
Fort Mott, Evesboro, and Downer soils	3		FNE			
Fort Mott-Urban land complex	3				FuA, FuB	
Galestown loamy sand	4	GaA, GaB	GaA, GaB	GaB	GaA, GaB	GaA, GaB, GaC
Galestown and Rosedale soils	4	GAE				
Glassboro loam	2			GlA		
Hambrook loam	3	HcA	HcA, HcB	HcA		
Hambrook sandy loam	3	HbA, HbB, HbC		HbB	HbA, HbB	HbA, HbB
Hambrook-Sassafras complex	3					
Hammonton loamy sand	3			HmA		HmA, HmB
Hammonton sandy loam	3	HnA	HnA	HnA	HnA	
Hammonton-Fallsington-Corsica complex	2	HoB				
Hammonton-Glassboro complex	3			HgB		
Honga peat	5		Ho	Ho	Ho	
Hurlock loamy sand	2			HuA		HuA
Hurlock sandy loam	2	HvA	HvA	HvA	HvA	
Ingleside loamy sand	3	IeA, IeB, IeC			IeA, IeB	
Ingleside sandy loam	3	IgA, IgB, IgC	IgA, IgB	IgA, IgB		
Ingleside-Runclint complex	3			IkC		
Kentuck silt loam	5					KeA
Keyport fine sandy loam	3				KfA, KfB	
Keyport silt loam	3		KpA	KpA		
Klej loamy sand	2					KsA, KsB
Klej-Galloway complex	2	KgB	KgB	KgB	KgB	
Lenni loam	2	LgA			LgA	
Lenni sandy loam	2	LhA			LfA	
Longmarsh and Indiantown soils	5	LO		LO	LO	LO
Manahawkin muck	5	Ma		Ma	Ma	Ma
Manokin silt loam	3			MdA, MdB		
Matapeake fine sandy loam	3					MeA, MeB

Soil Series	SMG	Caroline	Dorchester	Somerset	Wicomico	Worcester
Matapeake silt loam	3					MkA, MkB
Mattapex fine sandy loam	3		MpA		MpA	MpA, MpB
Mattapex silt loam	3	MtA, MtB	MtA, MtB		MtA, MtB	MtA, MtB
Miscellaneous water	-	M-W		M-W	M-W	
Mullica-Berryland complex	2			MuA	MuA	MuA
Nanticoke and Mannigton soils	5	NM	NM	NM	NM	NM
Nassawango fine sandy loam	3				NnA, NnB	NnA, NnB
Nassawango silt loam	3	NsA, NsB	NsA, NsB		NsA, NsB	NsA, NsB
Othello and Kentuck soils	1		OkA	OKA	OKA	
Othello silt loam	1		OtA	OtA	OtA	OtA
Othello silt loam, loamy substratum	1			OoA		
Othello-Fallsington complex	2			OvA		
Pepperbox-Rockawalkin complex	3				PrA, PrB	
Pone mucky loam	2		PmA			
Pone mucky sandy loam	2		PnA			
Puckum mucky peat	5	Pk	Pk	Pk	Pk	Pk
Purnell peat	5					Pu
Queponco loam	3			QbB		
Queponco silt loam	3			QeA, QeB		
Quindocqua silt loam	1			QuA		
Rockawalkin loamy sand	3	RkA			RkA, RkB	
Rockawalkin-Urban land complex	3				RnA, RnB	
Rosedale loamy sand	4	RoA, RoB			RoA	RoA, RoB
Runcint loamy sand	4				RuA, RuB	RuA, RuB
Runcint sand	4		RsA, RsB	RsB	RsA, RsB	
Runcint-Cedartown complex	4			RwB, RwC	RwA, RwB	
Runcint-Evesboro complex	4			RxB		
Runcint-Urban land complex	4				RzA, RzB	
Sassafras loam	3		SnA			
Sassafras sandy loam	3	SaA, SaB				SaA, SaB, SaC
Sunken mucky silt loam	5		SuA	SuA	SuA	SuA
Tangier mucky peat	5			Ta		
Transquaking and Mispillion soils	5	TP		TP	TP	TP
Udorthents	4	Ubb, Uff, UoB	UzB	Ubb, Ufb, Uff, UgB, UoB, UwB	Ubb, Ufb, UoB	UzB
Unicorn-Sassafras complex	3					
Urban Land	-	Up			Up	UpB
Urban Land-Acquango complex	-					UcB
Urban Land-Askecksy complex	-					UmA
Urban Land-Brockatonorton complex	-					UnA
Urban Land-Evesboro complex	-				UrB	
Urban Land-Fort Mott complex	-				UsB	
Urban Land-Rockawalkin complex	-				UtB	
Urban Land-Runcline complex	-				UuB	
Urban Land-Udorthents complex	-				UwB	UwB
Water	-	W	W	W	W	W
Woodstown loam	3	WoA, WoB	WoA	WoA		
Woodstown sandy loam	3	WdA, WdB	WdA, WdB	WdA, WdB	WdA	WdA, WdB
Woodstown-Glassboro complex	3			WpA		
Zekiah sandy loam	5	Za	Za			Za
Zekiah silt loam	5				Zk	Zk

## CHESAPEAKE FOREST/POCOMOKE STATE FOREST: SOIL MANAGEMENT GROUPS

This is a forest management grouping designed specifically for the Chesapeake Forest and Pocomoke State Forest Sustainable Forest Management Plans, based on the soil series descriptions contained in the six county surveys.

### Management Group 1 – Poorly and very poorly drained medium textured soils with heavy subsoils.

Soils:	Annemessex-Manokin complex	Elkton sandy loam
	Askecksy loamy sand	Elkton silt loam
	Corsica mucky loam	Othello and Kentuck soils
	Corsica mucky loam, Carolina Bay	Othello silt loam
	Crosiadore silt loam	Othello silt loam, loamy substratum
	Elkton loam	Quindocqua silt loam
	Elkton mucky silt loam	

Description: These are poor and very poorly drained, medium textured soils that have a fine-textured subsoil. They are generally found in broad upland flats, depressions, and swales. Slopes are 0 to 2%. Ponding may occur after heavy rains, and high water table may limit access from December through May. These soils may have seasonal limitations for wetness, but the firm subsoils may allow mechanical operations, particularly with low-impact equipment, that allows them to be managed with intensive forestry methods.

### Management Group 2 – Poorly and very poorly drained loam and sandy loam soils with sandy and medium textured subsoils.

Soils:	Berryland mucky loamy sand	Klej-Galloway complex
	Corsica and Fallsington soils	Klej-Hammonton complex
	Fallsington loam and sandy loam	Lenni loam and sandy loam
	Fallsington-Glassboro complex	Mullica-Berryland complex
	Glassboro loam	Othello-Fallsington complex
	Hurlock loamy sand and sandy loam	Pone mucky loam and mucky sandy loam
	Klej loamy sand	

Description: Medium and sandy-textured, poorly and very poorly drained soils on upland flats. Small areas in depressions will pond in very wet periods. Many of these soils lack firm subsoils, and when saturated may be very subject to soil rutting by equipment. This leads to shorter-season access, which may limit their use. With appropriate seasonal scheduling, these soils are suited for intensive forest management.

### Management Group 3 – Well drained and moderately well drained sandy and loamy soils that formed in sandy materials and have sandy loam to silty or sandy clay subsoils.

Soils:	Downer loamy sand and sandy loam	Matapeake fine sandy loam and silt loam
	Fort Mott loamy sand	Mattapex fine sandy loam and silt loam
	Hambrook loam and sandy loam	Nassawango fine sandy loam and silt loam
	Hambrook-Sassafras complex	Pepperbox-Rockawalkin complex
	Hammonton loamy sand and sandy loam	Queponco loam and silt loam
	Hammonton-Glassboro complex	Rockawalkin loamy sand
	Ingleside loamy sand and sandy loam	Sassafras sandy loam
	Ingleside-Runclint complex	Woodstown sandy loam
	Keyport fine sandy loam and silt loam	Woodstown-Glassboro complex
	Manokin silt loam	

Description: Well drained soils that are generally better-suited to pine than to hardwoods. These may occur on slopes of 0 to 10 percent. On the steeper slopes erosion potential needs to be addressed. Rutting and soil damage by machine operations

are minor problems and most sites will have good access and operability most of the year. These are the best suited soils for intensive forest management.

**Management Group 4 – Deep, sandy soils that are well to excessively well drained.**

Soils:	Cedartown loamy sand	Rosedale loamy sand
	Evesboro loamy sand and sand	Runclint loamy sand and sand
	Evesboro-Galestown complex	Runclint-Cedartown complex
	Galestown loamy sand	Runclint-Evesboro complex
	Galestown and Rosedale soils	Udorthents

Description: These sandy soils have few operating limitations due to soil wetness, and can provide sites for mechanical activities during wet seasons. Productivity is low, and some sites may be occupied by Virginia or shortleaf pine. Some may occur in a landscape pattern of sand ridges interspersed with low wet soils or Delmarva Bays, and provide an important habitat type, particularly for herbivores and invertebrates. Some may have slopes of up to 10-15%, which may limit management. Udorthents are soils that have been mechanically altered and may occur mainly as borrow pits, landfills, or other re-worked areas. Intensive forest management is probably limited on many of these soils.

**Management Group 5 – Low-elevation, poorly and very poorly drained soils that formed in organic materials. They may lie in flood plains, freshwater wetlands, or areas that can be affected by tidal flooding.**

Soils:	Chicone mucky silt loam	Nanticoke and Mannington soils
	Honga peat	Nanticoke silt loam
	Johnston loam	Puckum mucky peat
	Kentuck mucky silt loam	Sunken mucky silt loam
	Kentuck silt loam	Tangier mucky peat
	Longmarsh and Indiantown soils	Transquaking and Mispillion soils
	Manahawkin muck	Zekiah sandy loam and silt loam

Description: These poorly drained soils occupy flood plains and both fresh and brackish marshes. Some lie at elevations where flooding by salt water during high tides or storms is a possibility and trees may be affected by salt spray. The sites are marginal in terms of timber or pulpwood productivity, and access is often very restricted. Many of these areas will be riparian forests and other water-related areas that should be managed primarily for water quality and wildlife purposes.

**Other types without Management Groups – Other map units that are too small, are comprised of minor soil types, or are not suitable for forest management.**

Soils:	Beaches	Urban Land
	Miscellaneous water	Water

## APPENDIX B – AUDIT SUMMARIES – 2020

The 2020 Certification Audit was not held at its annually scheduled date in April 2020 due to COVID-19. A make up date is tentatively scheduled for July 2020. This section will be updated if and when the annual audit occurs.

Full reports and summaries of the 2019 and all past Forest Certification Audits can be found here:

<http://dnr.maryland.gov/forests/Pages/forestcert.aspx>

## WORKS CITED

- Burns, R. M., & Honkala, B. H. (1990). *Silvics of North America, Agriculture Handbook 654* (Vol. 2. Hardwoods). Washington, DC: U.S. Department of Agriculture, Forest Service.
- Frost, C. C. (1998). Presettlement fire frequency regimes of the United States: a first approximation. In T. L. Pruden, & L. A. Bennan (Ed.), *Fire in ecosystem management: shifting the paradigm from suppression to prescription, Tall Timbers Fire Ecology Conference Proceedings. 20*, pp. 70-81. Tallahassee, FL: Tall Timbers Research Station.
- Pyne, S. J. (1982). *Fire in America*. Princeton University Press.
- Rountree, H. C., & Davidson, T. E. (1997). *Eastern Shore Indians of Virginia and Maryland*. University Press of Virginia.
- Schulz, R. P. (1997). The Ecology and Culture of Loblolly Pine. In *Loblolly Pine* (pp. 5-14). Washington, DC: U.S. Gov. Printing Office.
- Smith, D. M. (1986). *The Practice of Silviculture*. New York: Wiley.
- USDA Forest Service. (1986). *Service Forester's Handbook*. Southern Region, State and Private Forestry. Atlanta, GA: U.S. Government Printing Office.