

## **Purpose and Need for Action**

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There is a need to change forest conditions from evenly-spaced white pine dominated plantations to more diverse mixed species stands that are ecologically suited to the site. There is also a need to increase the variety of forest structure. The purpose of this project is to implement silviculture treatments to that end. This change in condition would improve ecosystem health and increase the diversity of habitat for native plants and wildlife. A more diverse structure and species composition would be more resilient to disturbance.

Although white pine is native to the District, it has been planted in locations where it is not well adapted because the site productivity is relatively low and fire is historically more frequent. On these upland sites, white pine is more susceptible to pressures from forest insects and disease such as Annosus root rot, Ips and Southern pine beetles, and white pine decline. These sites are more suitable for native yellow pines such as shortleaf, pitch, and Table mountain pine, along with dry site hardwoods such as chestnut and scarlet oak. White pine was planted on these sites primarily for wood production, and in the absence of fire, was able to establish itself and eventually dominate the overstory on these sites. In a natural disturbance regime, however, white pine would usually not be a prominent canopy species on these sites. The purpose and need for management on these sites is to replace the white pine plantations with a young mixed species forest (primarily shortleaf pine and upland oak species), that are better suited to these sites.

On lower slopes and in acidic coves where conditions are wetter and fire is less frequent, white pine is well-suited. The purpose and need for management on these sites is to move conditions away from single-species composition and plantation structure to a more diverse species mix with a more irregular forest structure. Early successional and woodlands habitats are important for a variety of native wildlife and plant communities but only available in limited amounts on the Andrew Pickens. The disturbance inherent in forest management activities would benefit these species that generally have been restricted to roadsides and utility right-of-ways (ROWS) because of the disturbance frequency on these sites.

### Existing Condition

The overstory (upper canopy) of stands proposed for treatment is comprised mostly of white pine. Hardwood species are common in the midstory and understory, but their growth is restricted by the white pine overstory. White pine tree density in the overstory of most project stands is high, ranging from 130 to 170 square feet of basal area per acre. The dense white pine-dominated overstory inhibits the growth of other tree species and non-woody understory vegetation, resulting in a forest that is relatively low in species and structure diversity compared with natural conditions. These stands are susceptible to insect and disease damage due to declining tree vigor.

### Desired Condition

On drier upland sites where white pine is less suited, white pine plantations would be replaced by mixed native yellow pine / upland hardwood forest communities resulting in a more diverse forest in terms of species composition and structure over time.

In acidic coves and lower mesic slopes, canopy gaps ranging from 1/10<sup>th</sup> to 1 acre in size would be present. These gaps provide increased vertical structure diversity and are allowing for other tree species to regenerate in the stand in addition to white pine. Tree density would be reduced to 70 to 90 square feet of basal area per acre between canopy gaps; remaining (residual) white pine trees in these thinned areas would improve in vigor from increased light, water, and nutrient availability following thinning. There would be an increase in understory plant abundance and diversity resulting from more sunlight reaching the forest floor.

### **Proposed Action**

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The Andrew Pickens Ranger District (District) of the Sumter National Forest proposes to implement silviculture treatments on approximately 2,148 acres in 66 stands of Eastern white pine (white pine; *Pinus strobus*) plantations in Oconee County, South Carolina. White pine stands of natural origin (not planted) are not included in this project proposal. These treatments would include even-aged and uneven-aged regeneration treatments to restore diverse species composition and forest structure. This acreage is broken up into 66 different locations (stands) that are scattered across mostly the middle portion of the district. These treatments would include timber harvest along with a variety of follow-up treatments in each of the harvested stands that may include herbicide, prescribed burning, mastication, and/or planting in order to increase forest species diversity and habitat structural variety across the District landscape.

This project would be included in the overall timber management program for the District. Implementation of the project would take several years. Per year, timber harvest is typically between 300 and 600 acres (less than 1% of the total 85,000 acre of national forest area on the District).

The type of treatment proposed depends on whether or not white pine is ecologically suited to a given stand (if that stand fits white pine's ecosystem niche). The best available ecological classification data from the research community is being used to aid in this determination. Where white pine is not ecologically best suited to a site, such as along ridges and other dry uplands, plantations are proposed to be harvested in order to establish a new more diverse forest containing a mix of native yellow pines and hardwoods that are better suited to the site than white pine from an ecological (ecosystem management) standpoint. Approximately 1,487 acres are proposed for this treatment type.

Where white pine is ecologically suited to the site, such as acidic coves and lower mountain slopes, group selection management is proposed to create uneven-aged forests. Approximately 661 acres are proposed for this treatment type.

Natural or artificial regeneration (tree planting) would be prescribed on a stand-specific basis to achieve reforestation. Prescribed burning, manual, mechanical and herbicide treatments would be used following harvest for site preparation and release treatments to help establish and maintain diverse tree species composition by reducing competition. Site preparation treatments would typically occur 1 to 2 years following harvest to prepare the site for reforestation; release treatments would typically occur 1 to 2 years following reforestation to control competition after the new stand has been established.

Portions of riparian corridors overlap with several proposed treatment stands, however, no harvest would occur inside riparian corridors except in Compartment 51, Stand 5, Compartment 47, Stand 10, and Compartment 35, Stand 35. Riparian corridors in these three stands would be thinned to no less than 50 square feet of basal area per acre to reduce the unnaturally dense white pine canopy and promote regeneration of shade tolerant species in the understory. Dominant and co-dominant healthy hardwood trees would be retained where present in the treated riparian corridors. A summary of treatment actions proposed to meet the purpose and need are summarized in table 1.

<b>TABLE 1: SUMMARY OF PROPOSED TREATMENTS</b>	
<b>PROPOSED ACTION TREATMENTS</b>	<b>QUANTITY</b>
Even-aged Regeneration Harvest with Reserves	1,487 acres
Uneven-aged regeneration harvest	661 acres
<i>Total Timber Harvest</i>	2,148 acres
Herbicide Use	1,685 acres
Reforestation by planting	1,487 acres
Prescribed burning	1,487 acres
Temporary road construction and obliteration	10 miles

**EVEN-AGED REGENERATION HARVEST WITH RESERVES**

On upland sites poorly suited for white pine, clearcut with reserves regeneration harvest is proposed to restore stands to mixed yellow pine/upland hardwood forests and woodlands. These treatments would include establishing log landings and loading areas, skid trails and temporary roads as needed for access.

Ecological zones representative for these treatments include: Shortleaf Pine-Oak, Dry Oak-Heath (evergreen and deciduous), Pine Oak-Heath, and the drier end (upper slopes) of Dry-Mesic Oak. All merchantable white pine trees would be harvested.

Unmerchantable white pine would be felled or treated with herbicide as needed to facilitate establishment of the new stand. Additional species would be cut, treated with herbicide, and/or harvested as needed to achieve a balanced species composition consistent with the ecological zone. Selected individual trees of soft mast producing and flowering species would be retained for their wildlife food or ecological benefit. Healthy dominant or co-dominant oaks, hickories, and native yellow pines of sufficient size to respond well to changed conditions resulting from harvest would be retained as reserve trees where practicable unless removal is necessary for safety or for equipment operability reasons.

### *REFORESTATION TREATMENTS*

Site preparation and release treatments would include manual or mechanical tree felling, mastication, or similar methods, prescribed burning and/or selective herbicide treatments. Re-sprouting of undesirable species would be controlled with follow-up treatments (either selective herbicide and/or burning) to manipulate the species composition consistent with the ecological zone. In some cases, site preparation treatments may occur prior to harvest, such as a mid-story herbicide treatment or pre-harvest prescribed burning.

#### Prescribed Burning

Site preparation burning is proposed following harvest to control white pine regeneration typically during the first growing season following harvest. It would also be used to reduce competition to oaks, hickories, and planted pines from other species. Firelines would utilize natural features such as streams or constructed features such as roads, as practicable. Dozer and hand constructed firelines would be needed in some places to contain the prescribed fire. Stands that overlap with larger landscape prescribed burn blocks may be burned in the growing season or dormant season subject to landscape scale burning objectives. Burning would be done manually with drip torches or with aerial ignition (i.e. helicopter).

#### Herbicide

Chemical site preparation is proposed for use in stands that are not burned or where burning did not have the anticipated effect at controlling competition. These treatments would occur 1 to 2 years after harvest. Imazapyr, triclopyr, glyphosate and aminopyralid herbicides would be used to selectively control competing tree and shrub species. Foliar spray using a backpack sprayer would be used on smaller trees. Cut surface methods such as frill girdle or hack and squirt would be used on trees too large to spray. An herbicide release treatment would be applied if needed, typically one to three years after trees are planted (or naturally regenerated in stands that are not planted). The release treatment would thin out both planted and naturally regenerated trees as needed to maintain species diversity and tree vigor. The treatment would reduce competition to planted pines and other desirable hardwood regeneration from other species.

#### Tree Planting

Shortleaf pine (*Pinus echinata*), pitch pine (*Pinus resinosa*), and/or Table mountain pine (*Pinus pungens*) seedlings would be planted as needed in order to achieve a mixed

pine/hardwood species composition for the new stand. Spacing would typically be 12 feet by 12 feet, but may vary depending on stocking of seedlings/sprouts of desired hardwoods (oaks, hickories), in order to achieve a balance of pines and hardwoods.

### **UNEVEN-AGED REGENERATION HARVEST**

Uneven-aged management is proposed in stands within ecological zones where white pine is suited to the site. The silviculture system would be group selection. This would include establishing log landings and loading areas, skid trails and temporary roads as needed for access. Ecological zones suited to these treatments include: Dry-Mesic Oak (lower slopes), Acidic Cove, and other Cove types.

Group selection harvest (canopy gaps) are proposed, distributed irregularly across 1/3<sup>rd</sup> of the stand area, with harvest of all merchantable trees in groups ranging in size from 1/10<sup>th</sup> to 1 acre per group opening. Unmerchantable trees would be felled or treated with herbicide as needed to facilitate regeneration of the group opening. Commercial thinning is proposed between these canopy gaps to reduce competition and improve tree vigor. Residual density of this thinned matrix would vary between 70 and 90 square feet per acre of basal area averaged across the thinned area. Selected individual trees of soft mast producing and flowering species would be retained for their wildlife food or ecological benefit.

### *REFORESTATION TREATMENTS*

Reforestation for canopy gaps would be via natural regeneration of white pine and hardwoods from surrounding mature trees and sprouts. No site preparation burning or tree planting would typically occur for regeneration of canopy gaps, although prescribed burning may occur where this project overlaps with landscape-scale prescribed burn projects. Planting would be used if needed in the event that natural regeneration is not sufficient to reforest the regenerated area (canopy gaps). In such cases, white pine would be planted. No reforestation-related treatments are proposed in thinned areas between canopy gaps. Herbicide would be used as needed to balance species composition in the newly regenerated openings, featuring more shade tolerant species in the smaller openings and less tolerant species in larger openings. Herbicide parameters would be the same as those described in the even-aged reforestation treatments.

### **CONNECTED ACTIONS**

The following activities would be conducted in connection with vegetation management activities.

#### 1. Temporary Roads:

Log landings that have no access to existing roads would be accessed by a temporary road that connects to the forest transportation system. Temporary roads are generally under 10 percent grade and road widths less than 14 feet. Approximately 10 miles of temporary roads are needed for access. Most temporary roads would utilize existing undesignated “woods” roads that are in suitable locations and have stable cut and fill slopes that would not be disturbed. Upon completion of treatments, temporary roads would be obliterated with erosion and storm water control measures and seeding completed according to Forest Plan direction and South Carolina Best Management Practices (BMPs).

## 2. Aquatic Organism Passage culvert installation

On roads that would be used to implement this project, six stream crossings are inadequate for aquatic organism passage. There is a need to replace these culverts with structures to facilitate aquatic organism passage. This work may include:

- a. Removing existing culverts and replacing them with culverts designed for aquatic organism passage (Such as but not limited to culvert types like embedded box, bottomless box, bottomless arch, embedded pipe arch, and an embedded round pipe);
- b. Adding compacted material to the road surface and over culverts;
- c. Adding cut-off walls, wing walls, and/or rip-rap to fill material at both ends of the culvert;
- d. Adding overflow culverts;
- e. Repairing/constructing lead-out ditches;
- f. Using temporary erosion control structures such as silt fencing and wattles; and,
- g. Stabilizing disturbed soil areas (such as stream banks, cut and fill slopes) with mulch, coir matting and seeding as needed.
- h. The stream may be diverted and/or temporary coffer dams used during culvert replacement so the construction site is dry to facilitate construction. In some cases, water may be pumped around the construction site or the stream channel may be diverted with ditching. Diversions of the stream may require obtaining a temporary construction, access and dewatering permit from the Army Corps of Engineers.

## **Forest Goals and Objectives**

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This proposal is consistent with the *Revised Land and Resource Management Plan, Sumter National Forest* (Forest Plan) that provides goals and objectives for the project area.

The project area would help meet the following goals and objectives in the Sumter Forest Plan:

Goal 4 - Maintain or restore natural aquatic and riparian communities or habitat conditions in amounts, arrangements, and conditions to provide suitable habitats for riparian dependent and migratory species, especially aquatic species including fish, amphibians, and water birds within the planning area. Perennial and intermittent streams are managed in a manner that emphasizes and recruits large woody debris (LWD).

Goal 8 - Maintain and restore natural communities and habitats in amounts, arrangements, and conditions capable of supporting viable populations of existing native and desired non-native plants, aquatics, and wildlife species within the planning area.

*Objective 8.06 Restore more diverse native communities on 1,000 to 2,000 acres currently occupied by white pine stands.*

Goal 14 - Manage forest ecosystems and associated communities to maintain or restore composition, structure, function, and productivity over time.

Goal 18 - Provide a sustainable supply of wood products

Goal 35 – Improve conditions of needed roads that are adversely affecting soil and water resources.

## **SPECIAL MANAGEMENT, OTHER SENSITIVE AREAS, AND OTHER CONSIDERATIONS**

1. No treatment is proposed in the following areas:
  - a. Ellicott Rock Wilderness
  - b. Wilderness Study Areas
  - c. Roadless areas
  - d. Floodplains or wetlands
  - e. Research Natural Areas
  - f. Chattooga Wild and Scenic River Corridor
  - g. Botanical/Zoological Areas
2. Several waterfalls occur in the vicinity of proposed treatments stands. A design element will be included in the Environmental Assessment to address potential visual effects from proposed treatments related to user experience of these features.
3. Horse trail management
  - a. A portion of trails 321A and 321B (Rocky Gap), may be used for skidding in Compartment 32, Stands 5, 11, and 12.
  - b. During logging operations, temporary closure of these trails may occur for safety reasons
  - c. These trails will be rehabilitated following logging operations as needed to restore a comfortable user experience and to ensure protection of soil and water resources, with treatments such as grading, resurfacing, seeding, ditch cleaning/pulling, etc.
  - d. Trees will be retained in varying amounts along horse trails to reduce visual impact from harvest
4. Unless there is a compelling forest health concern such as southern pine beetle, stands along Forest Road 755 (Turkey Ridge Road), Compartment 49, Stands 5, 12, 19, 35, and 36, would be deferred until at least three years following the project decision date to allow additional time for recently reforested areas along this road to grow, thereby reducing visual impacts.