

Tree/Shrub Establishment

Conservation Practice Job Sheet

Prepared for: _____ Date: _____

County: _____ Tract ID: _____ Field(s): _____



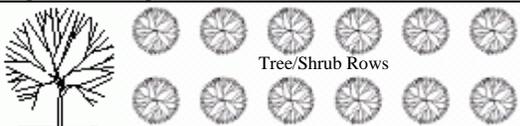
Tree and Shrub Establishment

Tree/shrub establishment is the planting, direct seeding, or natural regeneration of woody plants to produce forest or other woody plant products, restore native woody vegetation, provide wildlife habitat, reduce surface water run-off and soil erosion, improve water quality, treat waste, increase net carbon sequestration, provide renewable energy biomass, conserve energy, and/or enhance aesthetics.

Tree/shrub establishment is often done concurrently with forestry, wildlife, and other practices as part of a resource management system for a conservation management unit. When wildlife enhancement is a concurrent purpose, native or adapted tree/shrub species beneficial to the target wildlife species become part of the site-specific specifications.

Trees/shrubs selected for establishment must be adapted to soil and site conditions; spacing of plants and site preparation (prior to or at planting) must be sufficient for establishment and normal growth. Planting can be accomplished by hand (using a number of different tools/implements), or by machine. Tree/shrub establishment plans for forestry, site restoration, wildlife, and ecological purposes are usually prepared and supervised by foresters, biologists and other professionals registered/certified in North Carolina.

Tree/Shrub Establishment Specifications

Forest Management Plan/Tree Planting Plan by Registered Forester or Other Professional					
Plan by:		Additional Information:			
Purpose (check all that apply)					
Produce forest products		Improve water quality			
Produce other tree/shrub products (Christmas trees, nuts, berries, mulch, etc.)		Provide renewable energy production			
Improve or restore natural diversity and native woody vegetation		Provide renewable energy production			
		Treat waste			
Provide long term erosion control and reduce surface water runoff		Increase net carbon storage in plant biomass and soils			
		Conserve energy			
		Enhance the aesthetics of the area			
Spacing and Arrangement					
		When multiple species are planted, or when inter-planting into existing tree/ shrub stands, indicate specific spacing in Additional Notes or Requirements below.			
TREE/SHRUB MATERIALS LIST AND PLANTING SPECIFICATIONS	Kind of stock	Planting Dates	Distance (ft) between tree/ shrubs in row	Distance (ft) between rows	Estimated tree/shrubs per acre
Species/cultivar					
Additional Notes or Requirements:					

Tree/Shrub Establishment – Specifications

Planting Instructions

CAUTION: Check for any utilities (underground or overhead) before planting tree/shrubs!!!!

Site Preparation

Manage debris and control competing vegetation to allow for planting; and, maximize survivability and establishment success.

Site Preparation Method:

Note: Specific pesticide recommendations will be obtained from personnel who are licensed by the NC Department of Agriculture and Consumer Services in specialty area Agricultural Pest Plant Category O - in accordance with North Carolina Pesticide Laws and Regulations.

All pesticides must be registered for use by North Carolina and approved for use by the U. S. Environmental Protection Agency (EPA). Refer to the current issue of "North Carolina Agricultural Chemicals Manual" for guidelines, rules and regulations regarding use of pesticides.

Cultural Practices

Fertilizer, weed barrier/moisture conservation fabric, or other cultural items required at planting and specified below.

Planting Method

Type of planting (hand, machine, etc):

For container and bare root stock, plant stock to a depth even with the root collar in holes deep and wide enough to fully extend the roots. Pack the soil firmly around each plant. Cuttings are inserted in moist soil with at least 2 to 3 buds showing above ground. For burlap-balled stock, dig a hole at least 2 times the root width and depth.

Additional requirements:

Planting Specifications

Conifer Seedlings

Seedlings should be high quality and exhibit the following characteristics: disease-free; root collar diameter no less than one-eighth inch; stiff and woody with secondary needles present; maximum top length 14 inches; and, root system not less than five inches nor more than 9 inches long.

Successful plantings depend on the care of planting stock. Every effort should be made to keep seedlings in good condition. Planting stock can generally be better kept in bales/bags/boxes - as it comes from the nursery - than in field heel-in beds. This is particularly true where the stock will be planted within two to three weeks. Seedling roots must be kept moist at all times. Seedlings (especially the roots) should not be exposed to heating, drying, or freezing at any time from lifting at the nursery plant beds until being planted. Roots should not be exposed to sun or wind for more than 10 minutes. If cold storage is not available, keep seedlings packed in bales after delivery. They should not be stored in bales longer than 2 weeks.

The following additional precautions should be taken in storing bales/bags/boxes:

- Keep in a cool place. Avoid heated rooms.
- Protect bales/bags from freezing.
- Water at least once each week to keep roots and packing moss moist.
- Stack bales/bags on sloping racks to insure air circulation, easy watering, and drainage of excess water.

Stock must be kept cool (34 - 38 degrees F) and protected from "heating". Stock which is well watered, protected from direct sunlight, and properly aerated usually will not heat. Seedlings which have been subjected to heating should be discarded and not planted.

The sooner seedlings are planted after being lifted from nursery beds, the better the chances for survival and normal growth. Loose seedlings should be "heeled in" immediately upon arrival. Steps to follow are

- Select a well-drained and slightly sloping spot with some shade.
- Dig the trench 2 to 4 inches deeper than the seedlings' roots are long. One side of the trench should be smooth and slightly sloping.
- Place a shallow layer (less-than 3 inches) of seedlings against the sloping side of the trench and cover the roots and 1 or 2 inches of the stem with soil.
- Water the soil thoroughly and repeat as necessary in order to keep the soil moist at all times.
- Keep seedlings covered while hauling and protect them from the sun and wind and prior to planting.

During planting, take the following precautions:

- Water, wet moss, or wet burlap should be kept around the seedling roots in the field...do not allow roots to dry or be exposed to sunlight.
- When hand planting, one seedling should be selected at a time and immediately planted.
- Roots must be planted straight down, not twisted, balled or J-shaped. The opening must be deep enough to accommodate the root system in its normal position.
- Soil must be packed firmly around planted seedlings with no air pockets around roots. Test by grasping the seedling by 4-5 needle tips and pulling...if the seedling comes out of the ground, the seedling is not packed firm enough; if the needles come loose, the seedling is packed firmly.
- For Machine Planting - Check for depth of trench, tracking of packing wheels, and closure of trench. Check root placement by opening one side of the trench with a shovel to expose the seedling in place.
- At the end of each day, 'heel in' the loose seedlings or repack them in wet moss and wrap tightly with waterproof paper.

Hardwood Seedlings

Seedlings should be high quality, large (at least 3/8" root collar diameter) and healthy. Cull and discard small or weak seedlings.

Successful plantings depend on the care of planting stock. Care of hardwood seedlings is similar to care of conifer seedlings above.

Planting hardwood seedlings is similar to planting conifer seedlings. Some hardwood seedlings are larger, requiring a deeper hole or trench and more care to keep roots straight down.

Tree/Shrub Establishment – Specifications

Planting Instructions (continued)

Planting Specifications (continued)

Hardwood Seedlings (continued)

Don't plant sites that have been damaged (erosion, compaction, rutting) by site preparation or logging. Newly planted seedlings need to grow without severe competition. This requires intensive site preparation and proper post planting care to control competing vegetation. Plantings must be carefully protected - hardwoods are killed or injured by light fires; they can be destroyed by grazing cattle and deer; and they are sensitive to chemical herbicides.

Direct Seeding

Seed should be of high quality and ordered from a reliable commercial seed dealer. A local adapted seed source is crucial. Lots should contain no more than: 10% empties (by number), 10% moisture (by weight), and 2% impurities (by weight). Seed treatment including stratification and repellent coating are essential for all pines except longleaf. Stratification hastens germination. Coatings include chemicals to repel birds and rodents; and, a lubricant to help seed flow through a seeding machine.

Timing of planting seeds should generally be about the time of the last killing frost. November or February are the preferred seeding times for longleaf pines.

Planting rates for broadcast seeding should be 10,000 to 15,000 seed per acre. For hand planting use the planned spacing for the selected species and drop six seeds on exposed soil in a prepared one foot square area.

For broadcast seeding, the site must be prepared sufficiently to insure direct soil-seed contact. Hand or machine planting should prepare an 8-12 inch spot or width where the seeds are planted. Do not direct seed steep eroded slopes or deep sandy soils unless the seed can be covered with $\frac{1}{2}$ inch of soil --- a very time consuming operation. Release of direct seeded plants may be required.

Natural Regeneration

Adequate seed or advanced reproduction need to be present, or provided for, when using natural regeneration to establish a stand. Natural Regeneration from seed applies to light-seeded intolerant species with wind disseminated seed (native pines, cottonwood and yellow poplar). Heavy-seeded, tolerant hardwoods (oak and hickory) can reproduce satisfactorily from coppice (existing root stock/stumps). Refer to FOREST STAND IMPROVEMENT - Practice Standard 666 for information on managing a stand for natural regeneration.

Compliance with Federal, State and Local Laws

Installation and application of this practice MUST comply with all applicable federal, state and local laws or ordinances!

Additional requirements:

Operation and Maintenance

Planting Follow-up - Seedling stocking can be determined a year after planting by taking 1/100 (radius of 11.75 ft.) acre randomly sampled plots. Sufficient plots are needed to get a good representation of the planted area. In general, 300 or more established seedlings is considered adequate. Hardwoods are harder to evaluate in the 1st year after planting.

Replanting - Replanting will be required when survival is inadequate. Generally, replacement or interplantings should be done within 2 years of the original planting.

Release - Planted seedlings, direct seedings and cuttings should be released from any competing overtopping vegetation within 2 years after planting, if necessary.

Inspect periodically for pest (insects and weeds) and disease problems. Protect from fire, livestock grazing, and herbicide damage. Pine plantings need to be protected from grazing until trees are at least 8-10 feet tall. Domestic livestock should be excluded from all hardwood and Christmas tree plantings.

Additional requirements:

Maps and Field(s) Location

Certifications

Job Sheet	Prepared by:	Title:	Date:
	Approved by:	Title:	Date:
Installation	Meets NRCS standards and specifications? YES NO	Certification by:	Date:

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