NATURAL RESOURCES CONSERVATION SERVICE

RESTORATION AND MANAGEMENT OF DECLINING HABITATS

(acre)

CODE 643

GENERAL PRACTICE SPECIFICATIONS

FOR

LONGLEAF PINE ECOSYSTEM

DEFINITION

Restoring and conserving the longleaf pine ecosystem, and associated wildlife species.

PURPOSE

- Restore the longleaf pine ecosystem degraded by human activity
- Provide habitat for red-cockaded woodpeckers, gopher tortoises, and other rare and declining wildlife species by restoring and conserving the native longleaf pine ecosystem.
- Increase or restore native plant community diversity; especially herbaceous groundcover species.
- Management of unique or declining native habitats.

CONDITIONS WHERE PRACTICE APPLIES

On land within the Sandhills, Coastal Plain and Lower Peidmont with the appropriate soil types that are suitable and which historically supported or currently support the longleaf pine ecosystem.

CRITERIA

General Criteria Applicable to All Purposes

- Methods used will be designed to protect the soil resource from erosion.
- Vegetative manipulations to restore plant and/or animal diversity can be accomplished by prescribed burning or mechanical, biological or chemical methods, or a combination of the four.
- Management measures must be provided to control invasive species and noxious weeds in order to comply with state noxious weed laws.
- To benefit insect food sources for grass land nesting birds and protect other wildlife species, spraying or other control of noxious weeds will be done on a “spot” basis to protect forbs and legumes that benefit native pollinators and other wildlife.
- Management practices and activities are not to disturb cover during the primary nesting period (April 1 – September 1) in South Carolina. Exceptions could be granted for periodic burning or mowing when necessary to maintain the health of the plant community. Mowing may be needed during the establishment period to control weeds.
- Rotate periodic planned management or other treatments throughout the restored/managed area. A rotation of treating one-third of the managed acreage yearly is suggested.
- Where feasible prescribed burning will be utilized instead of light disking or mowing.
- Disking as a management tool within longleaf pine habitats is discouraged because it is detrimental to the native seed

bank, may encourage or introduce exotic invasive plants, and is detrimental to rare and declining species of amphibians and reptiles.

- Planted or encouraged species such as longleaf pine, native hardwood trees and shrubs, wiregrass, and other native grasses and forbs will be adapted to soil-site conditions.
- Planted or encouraged species will be suitable for the planned purpose.
- Seeding rates will be adequate to accomplish the planned purpose.
- Only certified, high quality, and ecologically adapted native seed and plant material will be used. Use local and regional ecotype seed (SC, NC, VA, and GA) or seed hand collected near the site.
- Containerized herbaceous plants or plugs grown from local hand collected seed may be used. Wiregrass plants are often available as plugs.
- Site preparation shall be sufficient for establishment and growth of selected species.
- Timing and use of equipment will be appropriate for the site and soil conditions.
- When the plan includes establishing a native herbaceous plant community, this practice must be planned in conjunction with the application of Conservation Cover (327) to establish native warm season grasses and forbs. Contact an NRCS biologist for planning assistance. Planting dates, and care in handling and planting of the seed or plant material will ensure that established vegetation will have an acceptable rate of survival.

CONSIDERATIONS

Confer with other agencies and organizations to develop guidelines and specifications for conserving declining habitats. Survey the site to determine what species need to be planted as part of the restoration. If a site has only been in planted pines, the native herbaceous groundcover plants should still be present in the seed bank and planting may not be needed for groundcover. If the site has been intensively cropped, planting of herbaceous plant species and native shrubs along with the longleaf pine will be beneficial to the restoration.

Local ecotype varieties are suitably adapted to precipitation, elevation, temperature, fitness and general environmental conditions found in the Southeast. Native warm season grass and forb establishment using local ecotype seed helps to maintain genetic integrity and fitness of herbaceous vegetation, as well as enhance overall quality of natural plant communities. This practice can include planting wiregrass plugs in suitable areas.

A pretreatment assessment of the targeted habitat will be documented to provide a baseline for comparison with post-treatment habitat assessment.

In many cases threatened and endangered species or species of concern will benefit from conservation of declining habitats. Follow-up habitat assessments shall be performed on a regular basis to ensure that the proper canopy and understory is being maintained for red-cockaded woodpeckers, gopher tortoises, or other species of concern.

All habitat manipulations will be planned and managed according to soil capabilities and recommendations for management will avoid excessive soil loss.

Plant materials centers and commercial growers should be encouraged to develop plant materials for habitat restorations.

PLANS AND SPECIFICATIONS

Specifications for this practice shall be prepared for each habitat type. Specifications shall be recorded using approved specifications sheets, job sheets, narrative statements in the conservation plan, or other acceptable documentation. Contact a SC NRCS Biologist for assistance in restoration planning if needed.

There are several alternatives available for establishing longleaf pines in suitable habitat – planting and seeding. The two methods of planting are bare-root and containerized. There are also two alternatives in seeding – direct seeding and natural regeneration. Each of these alternatives has advantages and disadvantages associated with it.

Bare-root seedlings: Longleaf seedlings remain in the grass stage (no stem, only roots and needles visible) until the root collar diameter reaches one inch. Once this size is attained, the seedlings begin to grow rapidly, comparable to loblolly and slash pine.

- Minimize competing vegetation for at least two years.

- Root collar diameter for bare-root seedlings should be 0.3 to 0.6 inches, and should have a stout tap root at least eight inches long or longer with many well-developed lateral roots.

- Protect the roots between packaging at the nursery and planting and keep root exposure to a minimum.

- Plant seedlings within three days of pickup from the nursery. If absolutely necessary, cold storage is an option when seedlings are stored less than two weeks. Get the seedlings planted as soon as possible.

- Plant the seedlings such that the root collars will be slightly below the settle soil surface several months after planting.

- Plant seedlings between mid-December and April 1, as long as weather factors are favorable (earlier during this time range is better). Avoid planting during periods of low soil moisture and dry weather, and also during periods of low temperature, low relative humidity, and high wind.

- Control damaging influences such as livestock, brown spot disease, and competition, as needed.

- Plant seedlings to give 300-500 trees per acre surviving after one year. Plant on a spacing that best meets the landowner's objectives.

Containerized Seedlings: These seedlings can be used to extend the planting season and to replant partial regeneration failures in the year that they occur. Fall-planted and late winter-planted containerized longleaf seedlings show better survival and growth when compared to winter-planted bare-root seedlings. Containerized seedlings show greater tolerance to herbicides used in pine release operations. Containerized seedlings can cost more than three times as much as bare-root seedlings.

- Follow the planting guidelines given under bare-root planting.

Direct seeding: A third option for establishing longleaf is direct seeding. It is a much less expensive alternative than the others, but it is also susceptible to failure. Failure can result from inadequate control of competing vegetation, low seeding rates, using seed not treated with a bird or rodent repellent, seeding at the wrong time, or uncooperative weather. The advantages to direct seeding are speed and cost. The disadvantages are less control of spacing and density and a lengthy grass stage before height growth begins/

- Avoid sites that are wet during late winter and early spring. Newly germinated seedlings are intolerant of standing water. Also, avoid sites that are very dry and those susceptible to erosion.

- The best sites for longleaf planting are soils of medium moisture-holding capacity on gentle slopes.

- Longleaf pine seeds germinate naturally during October and November. If soils in the area are subject to frost-heaving, seed during late winter.

- Use the best quality seed that can be purchased, and buy only from reputable seed dealers. Seeds should come from a known or local seed source.

- Seeds should be treated with bird and rodent repellent.

- Rates for three main methods of seeding are: Broadcast – 3 lbs per acre; Row seeding – 1 1/2-2 lbs per acre; Spot seeding – ¾ lb. per acre.

- Seeds should come in contact with mineral soil. Those caught in surface litter will germinate, but they will not survive because of their exposed root system.

Natural Regeneration: This option is only available to those landowners that already have stands of longleaf on their property. A shelterwood method of natural regeneration has been developed that is low-cost and effective.

- Success depends on four factors.

- 1) Adequate seed supply – keep the largest, best-formed, and most fruitful trees. Reduce the stand to a basal area of 25-30 about 5 years before the final harvest. This is called the seed-cut.

- 2) Receptive seedbed – mineral soil should be exposed for seeds to reach the seedbed, germinate, and become well-established. A prescribed fire less than one year prior to seedfall usually creates the appropriate seedbed. Burning must be done long enough before seedfall that some litter can accumulate to prevent exposing the seed to excessive predation.

- 3) Minimum vegetative competition – If competing woody vegetation is present, remove it, preferably before the seed-cut. Removing merchantable trees, using herbicides, prescribed fire, mechanical treatments, or combinations of the operations above, are all acceptable methods of reducing hardwood competition. Once an average of 3,000-5,000 longleaf seedlings greater than one year of age per acre are present, seed trees can be harvested. When 1,000-1,500 seedlings have begun height growth, the stand is considered established.

- 4) Ample soil moisture – Removal of competing vegetation is all that can be done to maximize soil moisture from seed germination through the critical first year.

- After seed trees have been removed, monitor the stand for brown-spot disease, encroaching competition, and any livestock impacts.

A spacing of 10x10, 435 trees per acre, is recommended for planting longleaf pine to provide a canopy suitable for red-cockaded woodpeckers.

OPERATION AND MAINTENANCE

The following actions shall be carried out to insure that this practice functions as intended throughout its expected life. These actions include normal repetitive activities in the application and use of the practice (operation), and repair and upkeep of the practice (maintenance).

Proper establishment techniques (site preparation and maintenance) for longleaf pine will be used in order to best ensure the growth and survival of the trees.

Once established, sites should be maintained in such a way as to provide suitable habitat for red-cockaded woodpeckers, gopher tortoises, and other rare or declining wildlife species. Contact an NRCS biologist for assistance.

Any use of fertilizers, pesticides and other chemicals shall not compromise the intended purpose of this practice.

Prescribed burning is an essential element of the Conservation Plan of Operation in the restoration and maintenance of the longleaf pine ecosystem. Burning should be conducted on a three year cycle, burning about one-third of the acreage each year. The first burn may be conducted while the seedlings are in the grass stage, typically, the first winter after planting. Longleaf pine seedlings are fire tolerant when the root collar diameter (RCD) is one half inch in size. The root system must be established in the soil however. Do not burn when the seedlings are “candling.” Candling is

when the seedlings have begun height growth in the spring and the terminal bud is exposed. They may be burned during the dormant (winter) season however. Young plantations should be burned in the winter, January through February, with a backfire where moderate fuel is available. This can generally begin the second or third year after planting.

After trees reach a height of about twelve feet or more, the burn may be shifted to the growing season, April to June, in order to control hardwoods that are not killed during cool season burns. Growing season burns also stimulate the grass and herbaceous species that are associated with this fire adapted community, such as wiregrass. Growing season burns should continue on a three year cycle throughout the life of the stand to maintain the ecosystem.