



Longleaf Leaflet

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North Carolina Division of Forest Resources

Natural Regeneration of Longleaf Pine

For thousands of years, longleaf pine naturally regenerated itself. Natural disturbances, such as lightning, windstorms and insect damage provided openings in the forest for seedlings to grow. Frequent fire prepared the seedbed and controlled competing hardwoods and brush. Through careful planning and timing, longleaf pine can successfully regenerate naturally. Longleaf pine has several characteristics that we must consider in selecting the right regeneration method.

Longleaf seedlings germinate and grow best in openings or gaps in the forest that allow light to the forest floor. The more light available to the young seedling, the more likely it will survive and grow. Although longleaf seed may germinate in shady conditions, the seedlings remain in the grass stage waiting for a natural disturbance to provide increased light conditions needed for height growth. Longleaf is unique among the southern pines because it can grow slowly in a suppressed state for long periods of time and then respond quickly when released.

Good cone crops for longleaf pine only occur every 5-7 years. Regeneration harvests and prescribed burns, needed to prepare the seedbed, must be timed to coincide with a good crop. Trees younger than 30 years old or smaller than 10 inches in diameter are not reliable seed producers. Trees crowded in dense stands produce fewer cones, less seeds, and cannot be relied upon to regenerate a longleaf stand.



Longleaf germinant

Longleaf pine seed is a favorite food source for a wide variety of birds and wildlife. Up to 90 percent of longleaf pine seed is lost due wildlife or birds. Longleaf pine seeds germinate soon after release from the cone in the fall. Fall germination exposes the young seedlings to droughts or damage from freezing temperatures. Longleaf has a large seed that limits its effective seeding distance to about 75 feet. The large seed wing keeps it from penetrating grass and needle litter prevents it from reaching mineral soil needed for germination. Removal of the surface litter allows the seed to contact mineral soil. Ideally soil should be moist, but not so wet that the seed will drown or rot. Natural regeneration of longleaf pine requires a sufficient number of trees to provide seed for the new forest.

To be successful, any method to naturally regenerate longleaf pine must have a suitable number of parent trees scattered evenly throughout the area with enough cones to supply an adequate number of seeds. The seedbed must be prepared and competition controlled to provide favorable conditions for seed germination and seedling survival and growth. There are two harvest methods generally used to naturally regenerate longleaf pine, the shelterwood and the group selection.

Methods of Natural Regeneration for Longleaf Pine

Shelterwood

This method retains a number of high-quality longleaf pine parent seed-trees after a harvest that provide seed to regenerate the site. When selecting trees to retain as shelterwood trees, keep about 25-to-35 of the best trees per acre. Trees should be straight, free from disease, at least 12-to-14 inches in diameter, and be the tallest ones in the stand. Retained trees should be evenly spaced and large sparse areas should be avoided.

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Shelterwood regeneration harvest leaves about 25-35 seed trees per acre

After the harvest is complete, conduct a prescribed burn during the late summer, before seedfall, to prepare the ground and expose the bare mineral soil. The burn must be timed to coincide with a good cone crop. Conelets are visible using binoculars in the spring. A minimum of 40 conelets per tree are needed to provide enough seed for successful regeneration. Longleaf seeds will fall in October to early November. The following spring or early summer, assess the number of longleaf seedlings that are established. If the number is inadequate, conduct another prescribed burn the 2nd summer, before seed fall, to prepare the soil for the 2nd year's seed crop.

After the seedlings are 1-to-2 years old and you have adequate numbers of seedlings, the remaining shelterwood parent seed-trees can be harvested and removed. Many seedlings are destroyed during

seed tree harvest, so 3,000-to-6,000 seedlings per acre should be present before overstory is removed. Their removal is important to provide the new seedlings with abundant sunlight for best growth. A successfully established stand will have 1,000 trees per acre free of overhead competition that are beginning height growth.

Group selection

Longleaf pine is well suited for the group selection natural regeneration method because of its tolerance to shade as a seedling and its ability to grow quickly once released. Selected groups of trees are harvested to create small openings, closely mimicking gaps created by natural events such as lightning, fire, insects or disease, and windthrow. Opening sizes range from about 1/10th-to-1 1/2 acres. Group selection retains most of the mature overstory trees and a stand of many ages results. This method appeals to many landowners who want to maintain a forest cover to enhance ecological, wildlife or aesthetic values.



A cluster of longleaf regeneration growing in a "gap"

Periodic fire is used to expose the seed to mineral soil and keep the openings free of unwanted pines, hardwoods and woody brush. Once the seedlings have regenerated the gaps, the mature trees on the margins may be removed to allow more light for better growth. Groups of trees are periodically removed on a cutting cycle of 10-to-20 years. Over time a stand is developed with young and old trees of various sizes.

Natural regeneration is an inexpensive option to regenerate longleaf pine forest. It is particularly attractive to landowners who are interested in wildlife or biological diversity while realizing a regular income from timber. Select the regeneration method best suited to your goals and objectives. For assistance in determining if natural regeneration is suitable for your longleaf forestland, speak with a registered forester or contact your county forest ranger office.



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