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**Minimum Impact Pine Straw Raking**

# BACKGROUND

Pine straw (fresh, undecomposed pine needles that have fallen to the forest floor) is a valuable resource in the southern pine region of the US. An excellent mulch, pine straw is much in demand for landscaping. Commercial operators bale pine straw and sell it to contractors and garden centers who, in turn, sell it to homeowners. Pine straw can be a valuable source of income for forest landowners, providing an opportunity to cover some of the costs of plantation establishment early in the life of a forested tract. Longleaf pine and slash pine are the favored species because of their long needles. Pine straw raking can begin at about age 8 and production peaks at about age 18, with longleaf stands typically yielding 50-100 bales per acre. Peak needle fall occurs between September and November. Landowners may rake pine straw themselves but more often raking, baling and marketing is done by a contractor who pays the landowner on a per acre basis.

Pine needles on the forest floor also provide many important environmental benefits. Soil nutrients and soil organic matter, both of which are essential for site productivity and soil quality, are contributed by decaying pine needles. Decomposing pine needles are essential for soil microorganisms as well as insects and earthworms which in turn are food for birds, frogs and turtles. Pine needles also insulate the soil from temperature extremes, help retain soil moisture and protect the soil surface from erosion. Prescribed fire in pine forests is essential in maintaining native understory plants and associated insects and wildlife. Pine needles are an important source of fine fuels necessary to carry prescribed fire across a pine stand.

**Balancing Economic and Environmental Benefits of Pine Straw**

1.) Identify specific sites with the greatest potential for pine straw. Natural pine stands with unusually high quality native understory vegetation, sites that support rare plants and sites that support Threatened & Endangered species should not be raked for pine straw.

2.) Do not rake straw on erodible soils with slopes greater than 8%.

3.) Divide the acreage to be raked into several units and rotate the raking regime so that only a portion of the area is raked each year.

4.) Hand raking will minimize the risk of soil disturbance, soil compaction and damage to trees and understory plants. Where high quality or delicate understory plants occur pitch forks can be used to lift straw to locations where it can be raked. Low impact mechanical raking machines are being developed that may allow for higher productivity while still protecting the site.

5.) Rake only “red needles” which are the undecomposed, recently fallen needles. Leave undisturbed the “gray needles” which are the partially decomposed older needles.

6.) Rake needles in the middle of the peak needle fall period, typically October. Subsequent needle fall in November will contribute a small amount of new needles to the forest floor even in years when raking occurs.

7.) Raking frequency will depend upon landowner goals and objectives and site resilience. Productive soils, such as those found on fertile flatwoods, can be managed on a 3-year “rest-rake-burn” rotation. Needles accumulate the first year, raking occurs the second year and the third year

needle fall is used as fuel to carry a prescribed burn. Burns can be conducted either in late winter (December-February) or during the growing season (April-July). Other sources recommend a 4-year raking interval. This interval may be suitable for less productive or more environmentally sensitive sites. Prescribed burns could also be applied on a 4 year interval. Decisions about when to rake and when to burn will be based upon the condition of the understory; whether fire is called for to set back woody species encroachment.

8.) Monitor fertility levels by periodic soil testing and pine needle nutrient analysis and, if indicated, be prepared to add fertilizer at recommended rates. Careful fertilization will increase needle fall volumes but over-fertilization can damage or kill longleaf pine trees.

# REFERENCES

Dickens, D.E., D.J. Moorhead, L.A. Morris and B.C. McElvany, 2003. Straw raking in Southern Pine Stands and Fertilization Recommendations. Warnell School of Forest Resources, Univ. of GA, Athens, GA. <http://www.forestproductivity.net/pdfs/Pine%20straw%20ext%20pub%2003-04.pdf>

Duryea, Mary, 2003. Pine Straw Management in Florida’s Forests. Univ. of FL, IFAS Extension Circular 831. <http://edis.ifas.ufl.edu/fr030>

Franklin, R.M., 2008. Stewardship of Longleaf Pine Forests: A Guide for Landowners. Clemson CES., Clemson, SC <http://www.sref.info/resources/publications/print_pubs/pub_2958/?searchterm=None>

Morris, L.A., Jokela, E.J. and J.B. O’Connor, 1992. Silvicultural Guidelines for Pinestraw Management in the Southeastern United States. GA Forestry Comm., GA For. Res. Paper No. 88. <http://www.gfc.state.ga.us/Resources/Publications/ForestMarketing/GFRP88.pdf>

Pote, D. H. and Daniel, T.C., 2008. Managing Pine Straw Harvests to Minimize Soil and Water Losses. Journal of Soil and Water Cons. Vol. 63, No.1. <http://ddr.nal.usda.gov/bitstream/10113/11953/1/IND44019280.pdf>

Taylor, E.L. and C.D. Foster, 2003. Managing Your East Texas Forest for the Production of Pine Straw. TX A&M CES Pub 805-113. <http://texaspinestraw.tamu.edu/pdfs/Pinestraw805-113.pdf>