NATURAL RESOURCES CONSERVATION SERVICE

CONSERVATION PRACTICE STANDARD

SILVOPASTURE ESTABLISHMENT

(Ac.)

CODE 381

DEFINITION

An application establishing a combination of trees or shrubs and compatible forages on the same acreage.

PURPOSE

- Provide forage for livestock and the production of wood products.
- Increase carbon sequestration.
- Improve water quality.
- Reduce erosion.
- Enhance wildlife habitat.
- Reduce fire hazard.
- Provide shade for livestock.
- Develop renewable energy systems.

CONDITIONS WHERE PRACTICE APPLIES

Situations where silvopasture establishment applies includes: 1) pasture where trees or shrubs can be added; 2) forest where forages can be added; 3) Land on which neither the desired trees nor forages exist in sufficient quantity to meet the land user's objectives.

This practice may be applied on any area that is suitable for the desired plants.

CRITERIA

General Criteria Applicable to All Purposes

Oregon's Forest Practices Act regulates all activities on forest land. All activities will comply with the established rules.

Tree species must be adapted to the site and compatible with planned livestock management.

Forage species must be adapted to the site and compatible with the planned management of the site.

Where trees will be added to existing pasture, site preparation should be based on existing vegetation and soil conditions. (See Tree/Shrub Site Preparation Standard 490.) Trees will be planted at the recommended tree density. (See Tree and Shrub Establishment Standard 612.)

For existing forests remove a sufficient number of trees and/or prune existing trees to allow adequate light penetration for forage establishment. Establishment of forage species will be in accordance with Forage and Biomass Planting Standard 512 or Range Planting Standard 550.

If pesticides are used, follow label recommendations. Refer to Integrated Pest Management Standard 595 for guidance on pest prevention, avoidance, monitoring and suppression strategies.

Only viable, high quality, and adapted planting stock or seed will be used.

The planting shall be done at a time and manner to insure survival and growth of selected species.

Tree/shrub spacing needs to exceed width of equipment to be used in management.

Additional Criteria to Provide Forage for Livestock and the Production of Forest.

The forage species must be identified as suitable for the targeted livestock.

Livestock grazing shall be deferred until the average height of the tree's terminal bud exceeds the browsing height of the livestock or of sufficient size to resist breakage or until suitable use exclusion measures for the protection of the woody plants are established. A forage crop (hay, silage, etc.) may be harvested during this period.

Plant trees at an appropriate density to allow acceptable forage production and wood products.

The tree or shrub species must have potential to yield wood products.

Additional Criteria to Increase Carbon Sequestration

For optimal carbon sequestration, select plants that have higher rates of sequestration and are adapted to the site to assure strong health and vigor.

Plant and manage the appropriate stocking rate for the site to maximize biomass production.

Additional Criteria to Improve Water Quality

Favor trees, shrubs and forages that have growth characteristics conducive to high nutrient uptake.

Additional Criteria to Reduce Erosion

Place linear woody plantings on or near the contour when water erosion is a concern.

Additional Criteria to Enhance Wildlife Habitat

Establish forage species and understory shrubs that will provide forage, browse, seed, cover, or nesting habitat for the wildlife species of concern. For additional guidance refer to Wildlife Upland Habitat Management (645).

Favor herbaceous seed mixes that include a diverse mix of native forbs and/or legumes to benefit wildlife including pollinators.

Additional Criteria to Develop Renewable Energy Systems

Select plants that provide adequate kinds and amounts of plant material needed to produce bioenergy feedstocks.

Intensity and frequency of energy biomass removals will be managed to prevent long-term negative impacts on the soil and water resources.

The harvesting of energy biomass shall be accomplished in a manner that will not compromise the other intended purpose(s) and functions.

CONSIDERATIONS

Failure to maintain adequate forage for livestock may result in excessive tree damage and/or loss.

Location and distribution of facilities for water, minerals, or supplemental feed should be such that livestock are not encouraged to over-utilize areas of silvopasture.

Rows should be oriented in an east-west orientation where feasible and practical to allow maximum sunlight onto grass strips.

If grazing does not maintain reduced fuel loads, prescribed burning should be considered providing the woody plants are fire-adapted and will not be damaged.

Where water erosion and/or runoff from melting snow are a hazard, it should be controlled by supporting practices.

Wildlife and pollinators should be considered when selecting tree or shrub species. Species diversity, including use of native species, should be considered.

Consider using native vegetation.

Silvopasture establishment may not be feasible in some existing forest and woodland communities.

Consideration should be given to adverse offsite effects.

Plants established in cropping systems should have root systems that have minimal impact on crop growth.

PLANS AND SPECIFICATIONS

Specifications for applying this practice shall be prepared for each site and recorded using approved specification sheets, job sheets, technical notes, and narrative statements in the conservation plan, or other acceptable documentation.

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):

- Forage and forest management will follow Prescribed Grazing 528 and Forest Stand Improvement 666 Standards.
- Replanting will be required when plant survival is inadequate to meet practice and client objectives.

- Competing vegetation will be controlled until the trees are established.
- Periodic applications of nutrients may be needed for establishment and to maintain plant vigor. Refer to Nutrient Management Standard 590 for further guidance.
- Inspect trees and shrubs periodically and protect from adverse impacts including insects, diseases or competing vegetation. The trees or shrubs will also be protected from wildfire and damage from livestock and wildlife.

REFERENCES

Bendfeldt, E.S., etal. 2001. Establishing trees in an Appalachian silvopasture: response to shelters, grass control, mulch, and fertilization. Agroforestry Systems. 53:291-295.

Burner, D.M. 2003. Influence of alley crop environment on orchardgrass and tall fescue herbage. Agron. J. 95: 1163-1171.

Byrd, N.A., and C.E. Lewis. 1983. Managing pine trees and bahiagrass for timber and cattle production. USDA Forest Service, General Report R8-GR 2.

Clason, T.R. 1996. Timber-pasture management enhances productivity of loblolly pine plantations. Louisiana Agriculture 39(2): 14-16.

Clason, T.R. and S.H. Sharrow. 2000. Silvopastoral practices. Ch. 5 in *North American Agroforestry: An Integrated Science and Practice*. American Society of Agronomy, Madison, WI.

Clason, T.R. 1995. Economic implications of silvopastures on southern pine plantations. Louisiana Agricultural Experiment Station, in Agroforestry Systems 29:227-238.

Clason, T.R. 1999. Silvopastoral practices sustain timber and forage production in commercial loblolly pine plantations of northwest Louisiana USA. Agroforestry Systems 44: 293-303.

Clason, T.R. and J.L. Robinson. 2000. From a pasture to a silvopasture system. USDA - NAC. Agroforestry Note 22.

Clason, T.R. and J.L. Robinson. 2000. From a pine forest to a silvopasture system. USDA – NAC. Agroforestry Note 18.

Cutter, B.E., K. Hunt and J.D. Haywood. 1999. Tree/wood quality in slash pine following long-term cattle grazing. Agroforestry Systems 44:305-312.

Fike, J.H., etal. 2004. Considerations for establishing and managing silvopastures. Plant Management Network. 1-12.

Lehmkuhler, J.W., etal. 2003. Tree protection methods during the silvopastoral-system establishment in Midwestern USA: cattle performance and tree damage. Agroforestry Systems 59: 35-42.

Lewis, C.E., etal. 1983. Integration of pines, pastures and cattle in south Georgia, USA. Agroforestry Systems. 1:277-297.

Sharrow, S.H. and I. Syed. 2004. Carbon and nitrogen storage in agroforests, tree plantations and pastures in western Oregon, USA. Agroforestry Systems 60:123-130.

Oregon Department of Forestry. 2002. Oregon Department of Forestry Forest Practices Act. Available at http://egov.oregon.gov/ODF/lawsrules.shtml

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