Natural Resources Conservation Service

CONSERVATION PRACTICE STANDARD

SILVOPASTURE

Code 381

(Ac)

DEFINITION

Establishment and/or management of desired trees and forages on the same land unit.

PURPOSE

- Provide forage, shade, and/or shelter for livestock.
- Improve the productivity and health of trees/shrubs and forages.
- Improve water quality.
- Reduce erosion.
- Enhance wildlife habitat.
- Improve biological diversity.
- Improve soil quality.
- Increase carbon sequestration and storage.
- Provide for beneficial organisms and pollinators.

CONDITIONS WHERE PRACTICE APPLIES

This practice may be applied on any area that is suitable for the desired forages, trees, and livestock.

CRITERIA

General Criteria Applicable to All Purposes

Use plant species (i.e., trees and forages; shrubs where desired) that are adapted to the climate, soil, and biological conditions of the site and compatible with its planned use and management.

Establish and maintain silvopasture in a forested condition that is at least 10-percent stocked by single-stemmed woody species of any size that will be at least 4 meters (13 feet) tall at maturity.

Do not plant species on the Federal or State invasive species or noxious weeds lists.

Manage grazing at appropriate levels to establish and maintain silvopasture productivity and function. Facilities for providing water, minerals, or supplemental feed will be located and distributed such that livestock will properly utilize forages in the silvopasture. Control livestock access to areas with sensitive soils (e.g., wetlands, riparian zones, habitats of concern, karst areas, etc.). Use NRCS Conservation Practice Standard (CPS) Prescribed Grazing (Code 528).

Where trees, or a combination of trees and shrubs, are added to existing pasture or crop land, perform site preparation and tree/shrub planting as needed based on existing vegetation and soil conditions.

NRCS reviews and periodically updates conservation practice standards. To obtain the current version of this standard, contact your Natural Resources Conservation Service State office or visit the Field Office Technical Guide.
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Conduct site preparation using NRCS CPS Tree/Shrub Site Preparation (Code 490), and establish trees/shrubs using criteria in NRCS CPS Tree/Shrub Establishment (Code 612), as needed. Plant trees according to design specifications for the desired tree species and configuration (e.g., rows, clumps, or single trees). Design the tree planting based on site factors (e.g., climate, topography, aspect, wind, etc.) to optimize the amount of sunlight reaching the ground to maintain desired forages, while providing the desired shelter and/or shade for livestock.

Protect plantings from unacceptable adverse impacts from pests, wildlife, livestock, and/or fire. Refer to plant protection criteria in NRCS CPS Tree/Shrub Establishment (Code 612), and Prescribed Grazing (Code 528).

When establishing silvopasture in existing forestland, remove a sufficient number of trees, and/or prune existing trees, to allow adequate light penetration for forage establishment and growth. For tree pruning, use criteria in NRCS CPS Tree/Shrub Pruning (Code 660). For establishment of forage species, use criteria in NRCS CPS Forage and Biomass Planting (Code 512). Removal of products (e.g., trees, medicinal herbs, nuts, and fruits) is allowed, provided that silvopasture conservation purpose(s) are not compromised by the loss of vegetation or by harvesting disturbance.

Additional Criteria to Provide Forage, Shade, and/or Shelter for Livestock

Use forage species that are suitable for the targeted livestock and compatible with the tree species.

Additional Criteria to Improve Water Quality

Select trees and forages that have growth characteristics conducive to high nutrient uptake.

Additional Criteria to Reduce Erosion

Plant trees on or near the contour and use supporting erosion control practices as needed, such as NRCS CPS Grassed Waterway (Code 412).

Additional Criteria to Enhance Wildlife Habitat

Establish plant species that will provide forage, browse, seed, cover, or nesting habitat for the desired wildlife species. Refer to species selection and establishment criteria in NRCS CPS Upland Wildlife Habitat Management (Code 645).

Select diverse seed mixes that include native forbs and/or legumes to benefit wildlife.

Additional Criteria to Improve Biological Diversity

Select plant species/varieties that provide the desired biological diversity. Selected species may vary in attributes such as timing of flowering, production of leaves and fruit, or attractiveness to wildlife and pollinators of interest.

Additional Criteria to Increase Carbon Sequestration and Storage

Select stocking rates and tree species to optimize growth rates and lifespans, suited to site capability, to enhance and sustain carbon sequestration. Use forage species that are deeply rooted and allocate higher amounts of carbon to below-ground portions.

Additional Criteria to Provide Habitat for Beneficial Organisms and Pollinators

Manage silvopasture consistent with National Organic Program (NOP) guidelines for organic and transition-to-organic agricultural systems. Select a diverse variety of plant species that provide dietary, nesting, and cover requirements for desired beneficial organisms (e.g., soil microflora, pollinators, predatory and parasitic insects, spiders, insectivorous birds and bats, raptors, etc.), during critical periods for controlling target pests and pollinating desired plants, at a minimum, and ideally year-round.

Protect beneficial organisms from harmful pesticides and chemicals.

During vegetation establishment, natural mulches, such as wood products or hay can be used to control competing vegetation as an alternative to using herbicides.

CONSIDERATIONS

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

Failure to maintain adequate shade and shelter can lead to excessive soil compaction beneath tree canopies, damaging tree roots and leading to mortality.

Management practices such as no-till seeding, rotational grazing, and soil fertility maintenance can support greater soil biodiversity and health.

Integrated pest management techniques may be used for pest prevention, avoidance, monitoring and suppression.

Where new tree/shrub plantings are being protected through grazing deferral, forages may be harvested for hay, silage, etc.

If grazing does not maintain reduced fuel loads, consider using NRCS CPS Prescribed Burning (Code 338), as needed for habitat maintenance and reduction of fuel loads, providing the desired woody plants are fire-adapted and will not be damaged.

Silvopasture establishment is not appropriate in certain existing forest and woodland communities (e.g., sites with high conservation value, sites supporting species of concern that may be sensitive to grazing or changes in forest density, areas where soil erosion or nutrients are difficult to manage, etc.).

Considerations for Organic Agricultural Systems

If needed, pests may be managed through augmentation or introduction of predators or parasites, and development of habitat for natural enemies of pests; nonsynthetic controls such as lures, traps, and repellents may be used.

If needed, invasive plant species may be controlled through mulching with fully biodegradable materials; mowing; livestock grazing; hand weeding and mechanical cultivation or pre-irrigation.

PLANS AND SPECIFICATIONS

Prepare specifications for applying this practice using job sheets or other acceptable documentation. At a minimum, provide—

- Objective(s).
- Drawings to illustrate installation or implementation requirements.
- Map showing the location of the silvopasture and any areas planned for planting.
- Soils map, and description of soils and ecological sites (where available).
- Establishment methods.
- Number of trees/shrubs to be planted per acre, by species.
- Timing of establishment relative to considerations for seasonal factors, disease, insects, wildlife impacts, etc.
- Mitigation measures, if needed, to reduce wildfire hazard or the potential for pest damage.

OPERATION AND MAINTENANCE

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

- Manage trees, forages, and shrubs as needed to provide appropriate light conditions for forages, and shade/shelter conditions for livestock.
- Inspect the site at an appropriate time following planting to determine whether the tree and shrub survival rate meets practice and client objectives. Replant or provide supplemental planting when survival is inadequate.
- Control competing vegetation and livestock impacts until plantings are established.
- Apply nutrients as needed for establishment and to maintain plant vigor.
- Inspect trees and/or shrubs periodically following establishment, and protect them from adverse impacts including insects, diseases, competing vegetation, wildfire, livestock, wildlife, etc.
- Where wildlife habitat enhancement is an objective, maintenance practices and activities shall not disturb vegetative cover during the primary reproductive period (e.g., nesting period) of wildlife. Exceptions can be considered for periodic burning or mowing when necessary to maintain the health of the plant community.

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