



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

This practice is used to accomplish one or more of the following purposes—

- 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, forages, and shrubs, where desired) that are adapted to the climate, soil, and biological conditions of the site and compatible with its planned use and management.

Do not plant species on the federal or state invasive species or noxious weeds lists. For additional requirements concerning species selection, planting dates, rates, methods, and care in handling and planting of the seed or planting stock, refer to the applicable sections of the Maryland Conservation Planting Guide.

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

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 cropland, perform site preparation and tree/shrub planting as needed based on existing vegetation and soil conditions. Conduct site preparation using the Maryland conservation practice standard for Tree/Shrub Site Preparation (490), and establish trees/shrubs using criteria in Maryland conservation practice standard for Tree/Shrub Establishment (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 Maryland conservation practice standards for Tree/Shrub Establishment (612) and Prescribed Grazing (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 the NRCS conservation practice standard for Tree/Shrub Pruning (660). For establishment of forage species, use criteria in the Maryland conservation practice standard for Forage and Biomass Planting (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 the Maryland conservation practice standard for Grassed Waterway (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 the Maryland conservation practice standard for Upland Wildlife Habitat Management (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.

Note: Specific programs may dictate criteria in addition to, or more restrictive than, those specified in this standard.

CONSIDERATIONS

General

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 the Maryland conservation practice standard for Prescribed Burning (338), as needed for habitat maintenance and reduction of fuel loads, provided that 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 also be used.

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

PLANS AND SPECIFICATIONS

Plans and specifications for establishment and operation of this practice shall be prepared for each field according to the selected conservation practice purposes, criteria and conditions, and considerations in this conservation practice standard. Plans and specifications shall contain sufficient detail to ensure successful implementation of this practice and may be recorded in narrative form, on Implementation Requirements (IR) sheets, or other approved forms.

The following items shall be addressed, as appropriate:

- Purpose(s) of the practice (e.g., resource concern to be treated);
- Soil map unit(s);

- Species selected for establishment, seeding/planting rates, and planting dates;
- Mitigation measures, if needed, to reduce wildfire hazard or the potential for pest damage.

Supporting Data and Documentation

The following is a list of the minimum data and documentation to be recorded in the case file:

- Location of the practice on the conservation plan map;
- Assistance notes. The notes shall include dates of site visits, name or initials of the person who made the visit, specifics as to alternatives discussed, decisions made, and by whom;
- Completed IR sheet, and copy of the appropriate fact sheet(s) or other specifications and management plans.

OPERATION AND MAINTENANCE

An Operation and Management (O&M) plan shall be prepared and is the responsibility of the client to implement. The appropriate fact sheet(s) and IR sheet may serve as the management plan, as well as supporting documentation, and shall be reviewed with and provided to the client.

At a minimum, the following components shall be addressed in the O&M plan, as applicable:

- 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, based on soil test results, 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, do not conduct maintenance practices (such as mowing) that disturb vegetative cover during the primary reproductive period (e.g., nesting season) of wildlife. For Maryland, the primary nesting season is generally from April 15 through August 15. Exceptions can be considered for periodic burning or mowing when necessary to maintain the health of the plant community.

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