United States Department of Agriculture

Natural Resources Conservation Service

CONSERVATION PRACTICE STANDARD

TREE-SHRUB ESTABLISHMENT

CODE 612

(ac)

DEFINITION

Establishing woody plants by planting, by direct seeding, or through natural regeneration.

PURPOSE

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

- Maintain or improve desirable plant diversity, productivity, and health by establishing woody plants
- Improve water quality by reducing excess nutrients and other pollutants in runoff and ground water
- Restore or maintain native plant communities
- Control erosion
- Create or improve habitat for target wildlife species, beneficial organisms, or pollinator species compatible with ecological characteristics of the site
- Sequester and store carbon
- Conserve energy
- Provide livestock shelter

CONDITIONS WHERE PRACTICE APPLIES

Tree-shrub establishment can be applied on any site capable of growing woody plants.

CRITERIA

General Criteria Applicable to All Purposes

Select one or more species that are suited to site conditions, appropriate for the planned purpose(s). Utilize ecological site descriptions, natural plant communities, conservation tree and shrub guides, or comparable reference sites to guide species selection.

Determine desired stocking levels for trees and/or shrubs based on landowner objectives and ecological characteristics of the site and species. Plant, seed, or naturally regenerate at densities and rates that reflect anticipated seedling mortality to achieve desired stocking levels in the established stand.

Use NRCS Conservation Practice Standard (CPS) Tree-Shrub Site Preparation (Code 490) to prepare sites for planting, seeding, or natural regeneration if conditions are not suitable for establishing the desired plants. Use NRCS CPSs Brush Management (Code 314), Herbaceous Weed Treatment (Code 315), or Prescribed Burning (Code 338) after planting, as needed, to create desirable conditions for establishing the desired plants.

When utilizing natural regeneration to establish trees and/or shrubs, an adequate source of seed, vegetative propagules, or advanced regeneration must be present or planned at a level sufficient to

achieve objectives. Where natural regeneration relies on seed sources, apply any needed stand treatments and site preparation at appropriate times to facilitate germination and establishment of seeds from desired species. Modify forest stand conditions prior to initiating natural regeneration to obtain the desired species composition, density, and arrangement of trees and shrubs as needed, using supporting conservation practices.

Implement coppice regeneration (originating from root shoots or stump sprouts) based on suitability of tree species, age, diameter, and site conditions. Determine the correct timing for coppice regeneration based on species characteristics.

Select only viable, high-quality, and adapted plant materials. Do not establish species on the Federal or State invasive species or noxious weed lists. Select planting stock that conforms to established seed transfer protocols within the State and complies with minimum standards accepted by the American National Standards Institute (ANSI). Choose planting dates, techniques, and handling methods appropriate for the site conditions to increase rates of survival. Select species and adjust timing of establishment to minimize potential effects of known residual herbicides, as needed.

Evaluate the site to determine if mulching, supplemental water, or other cultural treatments (e.g., tree protection devices, shade cards, brush mats, etc.) are needed to ensure adequate survival and establishment, then utilize the appropriate supporting conservation practice. Minimize the need for supplemental water and/or nutrients by choosing site-adapted plant materials, planting methods, and planting seasons.

Protect tree and shrub plantings, seeded areas, and naturally regenerated areas from unacceptable adverse impacts from insects, disease, wildlife, livestock, and fire. Apply supporting practices and treatments as necessary to protect establishing trees and shrubs.

Use tree and shrub planting to supplement natural forest regeneration in locations where additional species or stem densities are desired to meet management objectives. Do not plant trees and shrubs under an overstory scheduled for harvest before seedlings have become established.

Additional Criteria for Reducing Nutrients and Pollutants

When plantings are used to remove excess nutrients from runoff or ground water, select species that have fast-growth characteristics, extensive root systems, and a high-nutrient uptake capacity. Use tree and shrub species that are tolerant of the types of pollutants contained in effluent or soils at the site.

Additional Criteria for Restoring or Maintaining Native Plant Communities

Species selected for planting, seeding, or those favored in natural regeneration that are native to the site and will create a successional state that progresses toward the identified target plant community.

Additional Criteria for Wildlife Habitat

Select tree and shrub species that provide food, cover, or connectivity to target wildlife species, including pollinators and beneficial organisms, as supported by a State approved wildlife habitat assessment, a specialist's (e.g., biologist) report, or wildlife habitat management plan.

Additional Criteria for Sequestering and Storing Carbon

Maximize carbon storage by selecting tree and shrub species that have longer life spans, the ability to reach a large size, high wood density, and the potential for use in long-lived wood products. To meet both short and long-term objectives of a site, establish fully stocked stands for the selected rotation to sustain growth and vigor potential. Build forest resilience by favoring community composition and structural diversity of a site.

Additional Criteria to Conserve Energy

Increase energy efficiency by planting trees to provide shade for buildings. Use proper plant densities to optimize the shade produced. Select plants with a potential height growth that will be taller than the

structure or facility being protected. Design tree and shrub plantings to avoid damage to structures and to allow adequate space for maintenance access to walls and windows. Plant at a distance that is greater than mature crown spread, and select species that develop deep root systems. To protect structures from heat loss due to wind, use NRCS CPS Windbreak/Shelterbelt Establishment and Renovation (Code 380).

Additional Criteria for Livestock Shelter

Select trees with growth rates and crown characteristics to provide livestock adequate shade. Protect trees from livestock. Manage livestock with NRCS CPS Prescribed Grazing Plan (Code 528).

CONSIDERATIONS

Utilize plant materials that have been selected and tested in the NRCS Plant Materials Program or in similar tree and shrub improvement programs when specific performance elements are necessary. Plant materials used for planting treatments can include bare-root stock, containerized stock, seed, stem or root cuttings, or layered bows. Consider the potential impacts of extreme weather events (e.g., drought, flooding, wind, late spring frosts) when selecting plant species and sites for planting. Select trees and shrubs adapted to the site's natural disturbance regime. If planting in existing forestland, select tree species based on the existing forest's species traits, successional status, structure, and composition.

Use diverse tree and shrub species combinations which best meet the needs of target wildlife and pollinator species. Enhance wildlife habitat structure in existing forest stands by establishing additional trees and shrubs in the understory. Select tree and shrub species that produce hard or soft mast utilized by targeted wildlife species.

When using trees and shrubs for carbon sequestration and storage, consider using modeling tools to predict carbon sequestration rates and amounts of stored carbon.

Design tree-shrub arrangement and spacing to allow for and anticipate the need for future access lanes for purposes of stand management and fire control. Establish species with growth rates and at densities that make them competitive with weeds and undesirable plants. Consider incorporating culturally significant species into establishment design.

Consider designing plantings to enhance visual quality in farmsteads, recreation areas, and along public rights-of-way, by incorporating foliage color, season and color of flowering, mature plant height, edge-feathering, and other landscaping techniques to meet client's management objectives and concerns.

Considerations for Organic Systems During Vegetation Establishment

Use NRCS CPS Mulching (Code 484) to support tree and shrub establishment by controlling competing vegetation with natural mulches, such as wood products or hay, as a viable alternative to using herbicides. Certified weed-free mulches are preferred.

Invasic plant species may be controlled through mulching with fully biodegradable materials; mowing; livestock grazing with protection for plantings; mechanical cultivation; pre-irrigation; flame, heat or electrical means. Use NRCS CPS Prescribed Burning (Code 338), as needed.

Pests may be managed through augmentation or introduction of predators or parasites and development of habitat for natural enemies of pests; non-synthetic controls such as lures, traps, and repellents may be used.

Considerations for Reducing Energy Use

When trees and shrubs are planted to reduce summer energy use in buildings, consider prioritizing their placement based on the greatest daily solar heat gain (typically the west side). Trees or shrubs planted within 30 to 50 feet of a building generally provide effective shade to windows and walls, depending on tree height potential. Evaluate tree and shrub crown and root spread characteristics before establishing near structures. Deciduous tree or shrub species planted adjacent to the south side of buildings in cool climates can provide shade in the summer yet allow sun to reach the building in winter.

PLANS AND SPECIFICATIONS

Prepare plans and specifications that describe requirements for applying the practice to achieve its intended purpose and obtain any required permits.

Use Implementation Requirements or other acceptable documentation. At a minimum, provide—

- Objective(s) for establishment.
- Drawings and details when appropriate.
- Map showing the location of tree and shrub establishment areas.
- Soils map and description of soils and ecological sites (if available).
- Establishment method by species or vegetation type.
- Number of trees and shrubs per acre to be established, by species.
- Timing of establishment treatments relative to seasonal factors, plant physiology, disease, insects, and wildlife impacts.
- Mitigation measures, if needed, to reduce damage from wildfire hazard or potential pests.

OPERATION AND MAINTENANCE

Prepare an operation and maintenance plan for the site. As a minimum, include the following activities:

- Manage competing vegetation (including Federal or State invasive species and noxious weeds), as needed, until the desired trees and shrubs are established without competing for sunlight, water, or nutrients.
- Maintain the health of the established plant community with appropriate management techniques including periodic mowing, herbicide treatments, or prescribed burning, as needed. Do not conduct maintenance practices and activities during the primary reproductive period of wildlife. Exceptions can be considered to maintain the health of the vegetation if such exceptions do not conflict with agency requirements.
- Control access by vehicles and equipment during or after tree-shrub establishment to protect new plants and minimize erosion, compaction, and other site impacts.
- Inspect the site at appropriate time intervals following planting, seeding, or natural regeneration to determine whether the survival rate for trees and shrubs meets the intended practice purposes and client objectives. When survival is not adequate to meet the intended objective, replant or supplement the planting as needed to meet the management goals.
- Periodically inspect established trees and shrubs and protect them from adverse impacts of insects, diseases, competing vegetation, fire, livestock, wildlife, nonfunctioning tree shelters, weed barriers, etc.
- Apply nutrients to maintain vigor of desirable trees-shrubs, as needed.

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