United States Department of Agriculture

Natural Resources Conservation Service

CONSERVATION PRACTICE STANDARD

TREE/SHRUB ESTABLISHMENT

CODE 612

(ac)

DEFINITION

Establishing woody plants by planting seedlings or cuttings, by direct seeding, and/or through natural regeneration.

PURPOSE

Establish woody plants to—

- Maintain or improve desirable plant diversity, productivity, and health by establishing woody plants
- Create or improve habitat for desired wildlife species compatible with ecological characteristics of the site
- Control erosion
- Improve water quality. Reduce excess nutrients and other pollutants in runoff and groundwater
- Sequester and store carbon
- Restore or maintain native plant communities
- Develop renewable energy systems
- Conserve energy
- Provide for beneficial organisms and pollinators

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 soil and site conditions, and appropriate for the planned purpose(s). Use the PIA Vegetative Specification to generate initial recommendations for planting lists.

Determine desired stocking levels for trees and/or shrubs based on ecological characteristics of the site and species, and landowner objectives. Plant or seed at densities/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) as the initial practice to prepare sites for planting or seeding, if conditions are not suitable for establishing the desired plants.

Use tree/shrub planting to accomplish or supplement forest stand regeneration in locations where natural regeneration of desired species is not possible, or will not meet objectives.

Select only viable, high-quality, and adapted plant materials. 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). Do not plant any species on the Federal or State invasive species or noxious weed lists.

Choose appropriate planting dates and handling methods to increase rates of survival. Select planting techniques and timing appropriate for soil and site conditions.

Alter species selection and/or timing of planting/seeding to minimize potential effects of residual chemical carryover, as needed.

Evaluate the site to determine if mulching, supplemental water or other cultural treatments (e.g., tree protection devices, shade cards, fertilizer, brush mats, etc.) are needed to assure adequate survival and establishment. Minimize the need for supplemental water and/or nutrients by choosing site-adapted plant materials, planting methods, and planting seasons. Where supplemental moisture is needed to achieve tree/shrub establishment use NRCS CPS Irrigation System, Microirrigation (Code 441).

Protect tree and shrub plantings, seeded areas, and naturally regenerated areas, from unacceptable adverse impacts of pests, wildlife, livestock, and/or fire. Protect from pests, as necessary, by applying integrated pest management techniques for pest prevention, avoidance, monitoring, and suppression.

Removal of products (e.g., trees, biomass, medicinal herbs, nuts, fruits, etc.) is allowed, provided that conservation purpose(s) are not compromised by the loss of vegetation or by harvesting disturbance.

Additional Criteria to Create or Improve Habitat for Desired Wildlife Species

Specify site-appropriate target wildlife species, identify and establish plant species that will provide forage, browse, seed, cover, and/or nesting habitat for the desired wildlife species. High plant species diversity is desirable. Refer to species selection and establishment criteria in NRCS CPS Upland Wildlife Habitat Management (Code 645).

Additional Criteria for Reducing Nutrients and Pollutants

When plantings are used to remove excess nutrients from runoff or groundwater, select species that have fast-growth characteristics, extensive root systems, and a high-nutrient uptake capacity. Trees and shrubs used to reduce pollutants must be 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, or those favored in natural regeneration, will be native to the site and will create a successional state that progresses toward the identified target plant community.

Additional Criteria for Sequestering and Storing Carbon

For shorter term, rapid carbon sequestration, select species that have high-growth rates, recognizing that they are typically short-lived. For longer term storage of carbon, select plants with a long life span, the ability to reach a large size, high-wood density, and potential for use in long-lived products. Establish and maintain a fully stocked stand.

Additional Criteria for Developing Renewable Energy Systems

Select plants that can provide adequate types and amounts of plant biomass to supply identified bioenergy needs.

Manage the intensity and frequency of energy biomass removals to prevent long-term negative impacts to the site. Harvest biomass for energy in a manner that will not compromise other intended purpose(s) and functions of the site.

Additional Criteria to Conserve Energy

Increase energy efficiency by planting trees to provide shade for buildings. Select plants with a potential height growth that will be taller than the structure or facility being protected.

Use proper plant densities to optimize the shade produced.

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 Establishment (Code 380).

Additional Criteria for Habitat for Beneficial Organisms

Plant trees and shrubs that provide habitat and food sources for beneficial organisms, such as pollinators, predatory and parasitic insects, spiders, insectivorous birds and bats, raptors, and terrestrial rodent predators. Select plant species that meet dietary, nesting, and cover requirements for the intended beneficial organisms during the critical period for control of target pests and, if possible, for the entire year. Protect beneficial organisms from harmful pesticides.

CONSIDERATIONS

Consider utilizing plant materials that have been selected and tested in the Plant Materials Program or in similar tree/shrub improvement programs.

Consider using diverse tree and shrub species combinations which best meet the needs of desired wildlife and pollinator species.

When selecting plant materials, consider whether the species, variety, or cultivar possesses aggressive traits, and whether it poses a potential threat to the existing or desired plant community.

Consider the potential impacts of extreme weather events (e.g., drought, flooding, wind) when selecting plant species and sites for planting.

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

Tree/shrub arrangement and spacing should allow for and anticipate the need for future access lanes for purposes of stand management and fire control.

Consider establishing species with growth rates and at densities that make them competitive with weeds and undesirable plants.

Consider using species that provide subsistence and cultural values, (e.g., as used by Tribes).

Considerations for Organic Systems During Vegetation Establishment

Natural or fully biodegradable mulches such as wood chips, cardboard or hay, can be used to support tree/shrub establishment by controlling competing vegetation. Certified weed-free mulches are preferred. Use NRCS CPS Mulching (Code 484).

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.

Invasive plant species may be controlled through: mulching; mowing; livestock grazing with protection for plantings; hand weeding and mechanical cultivation.

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 the Pacific Islands Area Vegetative Specification to record the implementation requirements. At a minimum, provide:

- Objective(s) for establishment.
- Sketches, drawings, and detail drawings.
- Map showing the location of plantings and/or natural regeneration areas.
- Soils map, and description of soils and Ecological Sites (if available).
- Establishment method by species or vegetation type.
- Number of trees/shrubs per acre to be planted, by species.
- Timing of planting and/or natural regeneration relative to considerations for seasonal factors, plant physiology, disease, insects, and wildlife impacts.
- Mitigation measures, if needed, to reduce wildfire hazard or the potential for disease and insect pests.

OPERATION AND MAINTENANCE

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

- Do not conduct maintenance practices and activities during the primary reproductive period of wildlife. Exceptions can be considered to maintain the health of the vegetative community if such exceptions do not conflict with agency requirements.
- Mow the area periodically if practical and needed to maintain the health of the plant community.
- Control access by vehicles and/or equipment during or after tree/shrub establishment to protect new plants and minimize erosion, compaction and other site impacts.
- Inspect the site at an appropriate time following planting, seeding, and/or natural regeneration to determine whether the survival rate for tree and shrubs meets practice and client objectives. Replant or provide supplemental planting when survival is not adequate.
- Inspect the trees and shrubs periodically, and protect them from adverse impacts of insects, diseases, competing vegetation, fire, livestock, wildlife, non-functioning tree shelters and/or weed barriers, etc.
- If needed, control competing vegetation until the desired trees/shrubs are established. Control plant species on the Federal or State invasive species and noxious weed lists.
- If needed, apply nutrients to maintain vigor of desirable trees/shrubs.

REFERENCES

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