



Natural Resources Conservation Service
CONSERVATION PRACTICE STANDARD
TREE/SHRUB SITE PREPARATION
CODE 490

(ac)

DEFINITION

Treatment of sites to enhance the success of natural or artificial regeneration of desired trees and/or shrubs.

PURPOSE

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

- Manage soil conditions, naturally available water, and seasonally high water to favor tree and shrub establishment, survival, and growth.
- Modify the habitat of weeds, pests, and diseases to reduce pressure on naturally or artificially regenerated trees and shrubs.
- Facilitate the establishment, survival, and growth of tree and shrub species.

CONDITIONS WHERE PRACTICE APPLIES

On all lands suited to growing woody plants where current site conditions are not suitable for the natural or artificial establishment of desired trees and shrubs.

CRITERIA

General Criteria Applicable to All Purposes

- Use mechanical, chemical, or prescribed burning methods either alone or in combination to alter woody residue, vegetation, ground cover, soil, or microsite conditions to prepare the site for planting, seeding, or natural regeneration of desired tree and shrub species. Where herbicides will be used, evaluate and interpret risks using the Windows Pesticide Screening Tool (WIN-PST) or other approved tools or guides, or use NRCS Conservation Practice Standard (CPS) Pest Management Conservation System (Code 595).
- Expose mineral soil as needed to achieve the desired distribution of plants to be established by seed for tree and shrub species that require mineral soil for germination and establishment.
- Determine method(s), intensity, and timing of site preparation activities depending on topography, and on soil and site conditions. Schedule site preparation activities so they are completed at the optimal time prior to the commencement of planting or seeding activities, or to the initiation of natural regeneration.
- Leave woody residue in place to provide soil protection and wildlife habitat, retain soil moisture and organic matter, and protect the soil surface from temperature extremes—except where it will pose a fire hazard, increase the risk of pest damage, or interfere with management activities.
- Use CPS Prescribed Burning (Code 338) when using fire to prepare a site.
- On soils prone to compaction or rut formation, use low ground-pressure equipment or nonmechanized site preparation methods. When preparing compacted cropland or pasture sites

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 online by going to the NRCS website at <https://www.nrcs.usda.gov/> and type FOTG in the search field.

USDA is an equal opportunity provider, employer, and lender.

NRCS, NHCP
January 2020

for tree planting, chisel, rip and/or subsoil to mitigate compacted soil layers, as needed. Use criteria in CPS Deep Tillage (Code 324).

- Retain desirable surface and canopy cover to protect soil and site conditions. Alternatively use CPS Cover Crop (Code 340) or CPS Critical Area Planting (Code 342) and/or other measures as needed to control erosion, runoff, and displacement from typical rainfall events.
- Do not use wheeled and tracked equipment on slopes where operability causes safety concerns or adverse impacts on soil conditions. Perform ground-disturbing site preparation activities on the contour where feasible. Restrict the use of wheeled and tracked equipment to periods when the soil is either frozen or unsaturated. Use designated trails or establish a trail system as appropriate and feasible. Use CPS Forest Trails and Landings (Code 655).
- Mitigate site preparation activities near wetlands, water bodies, and in or near riparian areas to reduce negative water quality impacts.
- Follow State's best management practices for water quality.

Additional Criteria for Reducing Habitat for Harmful Pests and Diseases of Woody Plants

- Remove vegetation infected with transmittable disease (e.g., mistletoe and certain root rots). Consult a professional forester to aid in identifying sanitation measures.
- Treat slash and woody debris so that it does not create habitat for, or harbor, harmful levels of pests. Refer to criteria in CPS Woody Residue Treatment (Code 384).
- Clean equipment and gear before and after site preparation activities where risk of spread and potential impact from invasive species or harmful pathogens is likely.

Additional Criteria for Ponding, Flooding, and Seasonally High Water

- On sites where a seasonal excess of surface water restricts the establishment or regeneration of desired and adapted trees or shrubs, use temporary water management techniques as needed. Site preparation activities must not convert jurisdictional wetlands to uplands.
- Where temporary water management is used, limit the depth, spacing, and number of channels to the minimum amount needed to remove excess surface water for tree/shrub establishment or regeneration.
- Temporary water management channels must empty into areas where runoff will be diffused and filtered by vegetation and soils before reaching a natural water body.
- Use alternatives to temporary water management channels where feasible. These may include mounding, bedding, or the development of shallow pools that do not connect to water bodies.
- Apply temporary water management activities, including spoil placement, in compliance with the Clean Water Act.

CONSIDERATIONS

To reduce problems associated with insects in logging debris and the reestablishment of undesirable species, consider accomplishing site preparation within one year after logging, followed promptly by planting or natural regeneration.

To reduce negative impacts on wildlife species and their habitat, minimize actions that disturb seasonal wildlife activities.

Particulates, smoke, dust, and other air pollutants generated by site preparation may have negative effects on air quality. Consider proximity to populated areas, roads, and visually sensitive areas when planning method and timing of site preparation activities.

Where site preparation requires treatment of competing vegetation, consider alternatives to chemical treatments such as thermal applications, mulching, or solarization. Use other emerging technologies when applicable.

PLANS AND SPECIFICATIONS

Prepare plans and specifications for site preparation in accordance with this standard. Clearly describe the requirements for applying the practice to achieve its intended purpose. As a minimum, include the following in the implementation requirements document:

- Maps, drawings, and narratives, showing areas to be treated, and showing details of the layout of site preparation activities relative to streams, wetlands or water bodies, underground or overhead utilities, existing access or other infrastructure, etc., as applicable.
- Description of existing land use and vegetative cover.
- Description of site preparation methods to be used and application dates.
- Description of mitigations for compaction, erosion, soil organic matter removal, and any other anticipated site impacts.
- State whether site preparation is for natural or artificial regeneration. If artificial, provide the planned date for tree planting, timed appropriately relative to site preparation.
- Details on undesirable plant species to be treated and control methods to be used.
- Description of contingency plans in case of flooding or other disturbances that impact implementation schedules or mitigations.
- References to other conservation practice specifications, if applicable.

OPERATION AND MAINTENANCE

Operation

Site preparation operations will comply with all local, State, and Federal laws and ordinances, and with State's forestry best management practices for water quality.

For site preparation using herbicides, the operator will develop a safety plan for individuals exposed to chemicals, including telephone numbers and addresses of emergency treatment centers and the telephone number for the nearest poison control center. The National Pesticide Information Center (NPIC) telephone number in Corvallis, Oregon, may also be given for nonemergency information: 1-800-858-7384, Monday to Friday, 6:30 a.m. to 4:30 p.m. Pacific Time. The national Chemical Transportation Emergency Center (CHEMTRAC) telephone number is 1-800-424-9300.

- Follow label requirements for mixing/loading setbacks from wells, intermittent streams and rivers, natural or impounded ponds and lakes, and reservoirs.
- Post signs, according to label directions and/or Federal, State, Tribal, and local laws, around fields that have been treated. Follow restricted entry intervals.
- Dispose of herbicides and herbicide containers in accordance with label directions and adhere to Federal, State, Tribal, and local regulations.
- Read and follow label directions and maintain appropriate material safety data sheets (MSDS).
- Calibrate application equipment according to recommendations before each seasonal use and with each major chemical and site change.
- Replace worn nozzle tips, cracked hoses, and faulty gauges on spray equipment.
- Herbicide application records shall be kept in accordance with USDA Agricultural Marketing Service's Pesticide Recordkeeping Program and State-specific requirements.

Determine the success of the practice by evaluating post-treatment conditions and verifying that they are suitable for the establishment of desired trees and shrubs.

Maintenance

Following initial application, some regrowth, sprouting, or reoccurrence of undesirable plants may be expected. Spot treatment of individual plants or areas needing retreatment should be completed as needed while woody vegetation is small and can be most successfully treated, during the lifespan of this

practice. This includes maintaining erosion control measures as necessary and controlling access by vehicles, wildlife, or livestock, to support successful establishment of this practice.

REFERENCES

33 U.S.C. Section 1344. Public Law 92-500, the Clean Water Act (1972), Section 404(f) . See also: 33 CFR Part 323.4 and 40 CFR Part 232.3

Black, H.C. 1992. Silvicultural Approaches to Animal Damage Management In Pacific Northwest Forests. Gen. Tech. Rep. PNW-GTR-287. USDA, Forest Service, Pacific Northwest Research Station. Portland, OR.

Cleary, B.D., R.D Greaves, and R.K. Hermann. 1978. Regenerating Oregon's Forests. Oregon State University Extension Service. Corvallis, OR.

Harrington, C.A., S.H. Schoenholtz. 2005. Productivity of Western Forests: A Forest Products Focus. Gen. Tech. Rep. PNW-GTR-642. USDA Forest Service, Pacific Northwest Research Station. Portland, OR.

Lof, M., D.C. Dey, R.M. Navarro, D.F. Jacobs. 2012. Mechanical site preparation for forest restoration. *New Forests* 43:825–848. Scientific Journal.

PAN Europe. 2017. Integrated Weed Management. Alternative Methods in Weed Management to the Use of Glyphosate and Other Herbicides. Brussels, Belgium. https://www.pan-europe.info/sites/pan-europe.info/files/public/resources/reports/Alternative%20methods%20in%20weed%20managment%20to%20glyphosate_PAN%20Europe_III.pdf

Skaggs, R.W., S. Tian, G.M. Chescheir, A. Devendra, M.S. Youssef. 2016. Forest drainage. In: Amatya et al. (eds.), *Forest Hydrology: Processes, Management and Assessment*. CABI Publishers, U.K. 124-140. 17 p.

USDA. Forest Service. 1990. *Agriculture Handbook 654, Silvics of North America: Volume 1*. Washington, D.C.