



**Natural Resources Conservation Service**  
**CONSERVATION PRACTICE STANDARD**  
**TREE/SHRUB PRUNING**

**Code 660**

**(Ac.)**

**DEFINITION**

The removal of all or parts of selected branches, leaders, or roots from trees and shrubs.

**PURPOSE**

This practice is applied to support one or more of the following purposes:

- Maintain or improve plant productivity, health and vigor, and/or reduce excessive plant pest pressure.
- Develop desired plant structure, foliage or branching density, or rooting length.
- Improve the composition and vigor of understory plants.
- Maintain or improve soil quality and organic matter content.
- Reduce wildfire and/or safety hazards.
- Reduce energy use during field operations.

**CONDITIONS WHERE PRACTICE APPLIES**

This practice applies on any area with trees or shrubs.

**CRITERIA**

**General Criteria Applicable to All Purposes**

The pruning and shearing method and timing will match the limitations of the site and soils, achieve purposed for the specific tree or shrub species, and be conducted in a safe and efficient manner.

Pruning or shearing will not adversely reduce the growth and vigor of the tree or shrub or the intended purpose. Maintain the health and vigor of trees and shrubs by removing the minimum amount of living biomass required to achieve the pruning objective. Maintain recommended crown ratios for the treated species.

Debris and vegetation material left on the site after treatment will not present an unacceptable fire or pest hazard or interfere with the intended purpose and other management activities.

Use proper pruning methods, techniques and timing for each species to achieve the pruning objective.

Use proper pruning procedure(s) and tools to minimize stress and damage to the residual tree or shrub.

Time all pruning and shearing activities to minimize negative impacts on the site, soils, and vegetation.

Do not create conditions (e.g., sap flow from fresh cuts) that will attract detrimental insects or increase the potential for disease.

Schedule the timing of pruning and shearing operations to minimize disturbance to seasonal wildlife activities.

Do not paint or treat pruning cuts, or “top” (pollard) trees or shrubs unless specifically recommended for the intended purpose as described by the International Society of Arboriculture.

Sanitize all equipment after pruning a forest unit, even if there is no apparent disease.

Comply with applicable federal, state and local laws and regulations.

#### **Additional Criteria for Maintaining Health and Vigor**

When pruning diseased wood, disinfect pruning and shearing tools as needed to minimize the spread of pathogens.

When root pruning for maintenance or renovation of existing trees, prune outside the tree drip-line (unless root competition with adjacent crop or forage areas becomes too great) and to a depth appropriate for the species and the site.

For affected species and sites, limit the spread of root-graft transmitted diseases by pruning roots at distances recommended for the species, site, and size of the tree.

#### **Additional Criteria to Maintain or Improve Soil Quality**

Do not burn vegetative residues except where wildfire hazard or threats from diseases and insects are of concern, or other management objectives are best achieved through burning.

Distribute residue throughout the site; however, moving residues away from stems of trees or shrubs is acceptable. Residues may be chipped or mulched to speed incorporation into the soil.

#### **Additional Criteria for Reducing Wildfire and/or Safety Hazards**

When pruning is used to reduce wildfire hazard, or is conducted for other purposes in areas that are susceptible to wildfire, treat woody residue to reduce wildfire risk. Use NRCS Conservation Practice Standard (CPS) *Woody Residue Treatment (Code 384)*.

When pruning for wildfire hazard reduction, the final pruned branch height (at the bole) may need to be higher with trees whose branches droop, to achieve the desired separation between the tree crown and ground vegetation.

#### **Additional Criteria to Reduce Energy Use**

Where alternative pruning methods are available, reduce the total energy consumption associated with pruning by using energy-efficient and cost-effective methods.

### **CONSIDERATIONS**

Pruning and shearing should be timed to minimize disturbance to seasonal wildlife activities. It should also consider the nesting and breeding requirements of arboreal species.

Pruning and shearing tools should be disinfected to prevent the spread of pathogens, even if there is no apparent disease.

To maintain plant growth and sustain vigor, pruning and shearing may be done in two or more timed intervals.

Time pruning and shearing to minimize potential damage to the tree bole and stems.

Debris and other vegetation (biomass) removed may be used to produce energy. Management alternatives should consider the amount of energy required to produce and convert the biomass into energy with the amount produced by the biomass.

Sufficient herbaceous vegetation must be left in the stand following pruning to prevent wind erosion and other natural resource concerns.

In urban areas special considerations need to be given for safety hazards.

Removing the lower limbs provides protection from fire. For some shrubs it may increase browse by resprouting in the lower bole.

Review the estimated cost and projected economic benefits of the project before starting a pruning or shearing project. This includes the economic benefits of pruning for production of knot-free wood or other specialized forest products. Only prune in Douglas-fir, Jeffrey Pine, and Ponderosa Pine stands when the site index exceeds 70 (McArdle) (Meyer).

Do not prune true firs (White, Red, and Shasta) hemlock, and spruce. These species are more prone to invasion by decay-causing fungi.

Pruning any pine limb releases host volatiles (odors) which may attract bark beetles, lps, on small diameter trees (less than 9 inch d.b.h.) and Dendroctinous, spp., such as mountain pine beetle, on large diameter trees (greater than 9 inch d.b.h.). When the threat of beetles is a consideration:

- 1) Timing of the pruning operation will coincide with the periods of lowest beetle activity, normally when temperatures are not conducive to beetle flights (November to March).
- 2) Slash treatment will follow guidance in Forest Stand Improvement Specification (666) to reduce the threat of population increases of beetles.

Pruning may create basal sprouts. These may need to be periodically controlled by any number of methods including cutting, mowing or chemical application.<sup>1</sup>

Pruning should be planned in conjunction with the application of other Conservation Practices and activities including *Forest Stand Improvement* (Code 666), *Fuel Break* (Code 383), etc.

### **Pruning for Christmas Trees**

Pruning can increase the value of plantation trees and reduce the number of unmerchantable culls.

Once pruning occurs it may be required one or more times each year until harvest.

Basal pruning: Delay until no more than one-third of the total foliage on the tree will be cut off to prevent excessive shock.

### **Pruning for Quality Saw Logs**

Under ideal conditions natural pruning removes the limbs providing clean boles. However, because spacing and other considerations are seldom perfect, artificial pruning is required to produce high quality clean bole trees. The greatest need for pruning is in open-grown or poorly stocked stands where lower limbs will persist indefinitely.

Stands should be healthy and vigorous.

Avoid pruning stands on exposed areas prone to windthrow, sites with a high water table or a high incidence of root rot.

Pruning in the spring or periods of active shoot elongation will be avoided. Pruning in pines should be accomplished after the new growth has elongated and hardened.

### **Fuel Hazard Reduction**

Prune to break up the fuel ladder.

Removal of limbs along roads will allow passage of emergency vehicles.

Consider properly cutting portions of the limbs to provide at least 10 feet of ground clearance.

### **Shrub Pruning**

Prune to promote plant health. Cutting at the 2 to 3-foot level will promote new growth and better quality forage for some wildlife browse species.

---

<sup>1</sup> Chemical application recommendations and application rates will be made by a licensed applicator, farm advisor, or others licensed to do so in California.

Prune to direct or control growth, encourage flower and fruit production, repair damage, or achieve a special effect or an artificial form.

Prune to compensate for transplanting. The balance between roots and top is upset when the plant is transplanted. Pruning can restore this balance

Prune to alter, restore, or rejuvenate an established or neglected plant to make it more attractive. On taller shrubs lower limbs can be removed, transforming it in to a multi-stemmed shrub, resembling a small tree, and breaking up the fuel ladder.

### **Other Pruning Considerations**

Removing live branches and foliage decreases tree and shrub energy reserves and ability to photosynthesize. Improper pruning methods that remove too much material, or lead to structural defects and breakage, can impact the health and vigor of trees and shrubs.

Consider the potential impacts of planned vegetative residue treatment methods on soil, water, animal, plant, energy, and air resources (e.g., retaining residues on site vs. removal or burning). Soil quality is improved through inputs of vegetative residue that supply nutrients and organic matter.

If needed, treat vegetative residue to limit threats from diseases or insects, maintain operational capacity, or to speed residue incorporation into soils. Use NRCS CPS *Woody Residue Treatment (Code 384)*.

When pruning for disease or pest control (e.g., mistletoe, blister rust), consider existing tree-to-tree spacing, vertical tree structure, degree of infection, stand age, and site quality. If it is necessary to cut or kill entire trees to limit disease or pest damage, use NRCS CPS *Forest Stand Improvement (Code 666)*.

For species susceptible to sun scald, consider possible damage that may occur to a newly-exposed tree bole or shrub, especially on south-facing slopes.

Consider how to use branches and other plant parts removed during pruning as special forest products, or for other purposes.

For pruning in urban areas for recreation, visual aesthetics and other uses, use established guidelines contained in the Standards of Pruning for Certified Arborists published by the Western Chapter of the International Society of Arborists.

### **Endangered Species Considerations**

If during the Environmental Assessment NRCS determines that installation of this practice, along with any others proposed, will have an effect on any federal or state listed Rare, Threatened or Endangered species or their habitat, NRCS will advise the client of the requirements of the Endangered Species Act and recommend alternative conservation treatments that avoid the adverse effects. Further assistance will be provided only if the client selects one of the alternative conservation treatments for installation; or with concurrence of the client, NRCS initiates consultations concerning the listed species with the U.S. Fish and Wildlife Service, National Marine Fisheries Service and/or California Department of Fish and Game.

## **PLANS AND SPECIFICATIONS**

Prepare plans and specifications for applying this practice for each site, including design and installation requirements for achieving the intended purpose. Locate the area to be pruned on the conservation plan map, and document the purpose(s) for pruning in the conservation plan.

At a minimum, specifications and implementation requirements shall include:

- Location,
- Objective(s) for pruning,
- Site limitations,
- Species to be treated,
- Treatment method by species or vegetation type,
- Equipment to be used,
- Number of trees/shrubs per acre to be treated,

- Minimum and maximum amount of live branch and foliage to be cut or removed,
- Season of year for treatment,
- Timing relative to considerations for disease, insects, and wildlife impacts,
- Mitigation measures, if needed, to reduce wildfire hazard or the potential for disease and insect pests.

Provide pruning guides when available.

## OPERATION AND MAINTENANCE

Periodically inspect plant condition and conduct additional treatment or mitigation if needed; e.g. additional pruning, pest management, nutrient management or forest stand improvement.

Control locally invasive and noxious plants that may establish due to increased light penetration.

## REFERENCES

9624-2815-MTDC. *Pruning in Timbered Stands*. USDA-Forest Service, Technology & Development Program. Missoula, MO. 1996.

Bedker, P.J., J.G. O'Brien, and M.M. Mielke. 1995. Revised 2012. How to Prune Trees. Available at [http://na.fs.fed.us/spfo/pubs/howtos/ht\\_prune/htprune-rev-2012-screen.pdf](http://na.fs.fed.us/spfo/pubs/howtos/ht_prune/htprune-rev-2012-screen.pdf) (verified 17 March 2014). NA-FR-01-95. USDA-Forest Service, Northeastern Area State and Private Forestry.

Gilman, E.F., and A. Bisson. 2007. Developing a Preventive Pruning Program in your Community: Mature Trees. Available at [http://hort.ifas.ufl.edu/woody/documents/ch\\_13\\_mw06.pdf](http://hort.ifas.ufl.edu/woody/documents/ch_13_mw06.pdf) (verified 17 March 2014). Publication ENH 1063. Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida, Gainesville, FL.

Hanley, D.P., and S. Reutebuch. 2005. Conifer Pruning Basics for Family Forest Landowners. Available at <http://cru.cahe.wsu.edu/CEPublications/eb1984/EB1984.pdf> (verified 17 March 2014). Extension Bulletin 1984. Washington State Univ. Extension, Pullman, WA.

McArdle, R.E.; Meyer, W.H.; Bruce, D. 1961. The Yield of Douglas fir in the Pacific Northwest. 2nd rev. Tech. Bull. 201. Washington, DC: U.S. Department of Agriculture. 65 p.

Meyer, Walter H. 1961. Yield of Even Aged Ponderosa Pine. Technical Bulletin No. 630. Washington, DC: U.S. Department of Agriculture.

Ortho Books. *All About Pruning*. The Solaris Group. San Ramon, CA. 1989.

Owen, J.H. 2009. Shaping Fraser Fir Christmas Trees. Available at [http://www.ces.ncsu.edu/fletcher/programs/xmas/production-mountains/shaping-fraser-fir-christmas-trees\\_070609.pdf](http://www.ces.ncsu.edu/fletcher/programs/xmas/production-mountains/shaping-fraser-fir-christmas-trees_070609.pdf) (verified 17 March 2014). Cooperative Extension Service, North Carolina State University, Raleigh, NC.

Shigo, A. and Marx, H. G. *Compartmentalization of Decay (Part A, B, C)*. INF-NE-405. USDA-Forest Service, Northeast Experiment Station. PA. 1977.

van der Hoeven, G.A. 1977. All About Pruning. Available at <http://www.ksre.ksu.edu/bookstore/pubs/c550.pdf> (verified 17 March 2014). KSU Horticulture Report C-550. Kansas State University Agricultural Experiment Station and Cooperative Extension Service, Manhattan, KS.

Windell, K. 1996. Pruning in timbered stands. USDA Forest Service Tech. Report 9624-2815, Missoula Technology and Development Center, Missoula, MT.