

# NATURAL RESOURCES CONSERVATION SERVICE CONSERVATION PRACTICE SPECIFICATION

## TREE AND SHRUB PRUNING

(Acre)  
CODE 660A

### GENERAL SPECIFICATION

Procedures, technical details and other information listed below provides additional guidance for carrying out selected components of the practice standard. This material supplements the requirements and considerations listed in the conservation practice standard.

#### Planning Considerations

On forest and woodlands in New Mexico the New Mexico Energy, Minerals and Natural Resources Department provides technical assistance through the local district foresters. A landowner harvesting over 25 acres per year must obtain a state permit from the district forester and have a regeneration plan. The local district forester can produce the regeneration plan or a consultant can do the work. The local district forester maintains a list of state certified consultant foresters. Tree and Shrub Pruning is usually an integral component of a forest and woodland management plan. Always check with the local district forester when making site-specific specifications on forestland.

Pruning is generally considered to be the removal of all or parts of selected branches or leaders from trees and shrubs.

#### PURPOSES

- Improve the appearance of trees or shrubs, e.g., ornamental plants and Christmas trees.
- Improve the quality of wood products.
- Improve the production of plant products, e.g., nuts, fruits, boughs and tips.
- Reduce fire and/or safety hazards.

- Improve the growth and vigor of understory plants.
- Increase or decrease the foliage and branching density for other specific intents, e.g., wind and snow control, noise abatement, access control, and visual screens.

#### CONDITIONS WHERE PRACTICE APPLIES

On any area with trees and shrubs needing pruning.

#### CRITERIA

The main reasons for pruning ornamental and shade trees include safety, health, and aesthetics. In addition, pruning can be used to stimulate fruit production and increase the value of timber.

**Pruning for safety** is removing branches that could fall and cause injury or property damage, trimming branches that interfere with lines of sight on streets or driveways, and removing branches that grow into utility lines. Safety pruning can be largely avoided by carefully choosing species that will not grow beyond the space available to them, and have strength and form characteristics that are suited to the site.

**Pruning for health** is removing diseased or insect-infested wood, thinning the crown to increase airflow and reduce some pest problems, and removing crossing and rubbing branches. Pruning can best be used to encourage trees to develop a strong structure and reduce the likelihood of damage during severe weather. Pruning can also be used to remove broken or damaged limbs and encourage wound closure.

**Pruning for aesthetics** is enhancing the natural form and character of trees or stimulating flower production. Pruning for form can be especially

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important on open-grown trees that do very little self-pruning.

The pruning and shearing method and timing will match the limitations of the site and soils, achieve purposes 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 for the intended purpose.

Debris and vegetative 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 objectives.

Comply with applicable laws and regulations including pre-activity permits, permissions, or notifications.

Comply with applicable laws and regulations, including New Mexico Best Management Practices (BMPs).

## CONSIDERATIONS

### General Considerations on Pruning

Time pruning and shearing too least disturb seasonal wildlife activities.

Economic analysis is recommended before starting extensive pruning and shearing projects.

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

All woody plants shed branches in response to shading and competition. Branches that do not produce enough carbohydrates from photosynthesis to sustain themselves die and are eventually shed; the resulting wounds are sealed by woundwood (callus). Wind and/or accumulations of snow and ice may break off branches that are poorly attached. Branches removed by such natural forces often result in large, ragged wounds that rarely seal.

Pruning as a cultural practice can be used to supplement or replace these natural processes and increase the strength and longevity of plants.

Trees have many forms, but the most common types are pyramidal (excurrent) or spherical (decurent). Trees with pyramidal crowns, e.g., most conifers, have a strong central stem and lateral branches that are more or less horizontal and do not compete with the central stem for dominance. Trees with

spherical crowns, e.g., most hardwoods, have many lateral branches that may compete for dominance.

To reduce the need for pruning it is best to consider a tree's natural form. It is very difficult to impose an unnatural form on a tree without a commitment to constant maintenance.

### General Considerations on Pruning Techniques

Proper pruning cuts are made at a node, the point at which one branch or twig attaches to another. In the spring of the year growth begins at buds, and twigs grow until a new node is formed. The length of a branch between nodes is called an internode. The most common types of pruning are; crown thinning, crown raising, and crown reduction.

### Considerations on Crown Thinning

Crown thinning, primarily for hardwoods, is the selective removal of branches to increase light penetration and air movement throughout the crown of a tree. The intent is to maintain or develop a tree's structure and form. To avoid unnecessary stress and prevent excessive production of epicormic sprouts, no more than one-quarter of the living crown should be removed at a time. If it is necessary to remove more, it should be done over successive years.

Branches with strong U-shaped angles of attachment should be retained. Branches with narrow, V-shaped angles of attachment often form included bark and should be removed. Included bark forms when two branches grow at sharply acute angles to one another, producing a wedge of inward-rolled bark between them. Included bark prevents strong attachment of branches, often causing a crack at the point below where the branches meet. Codominant stems that are approximately the same size and arise from the same position often form included bark. Removing some of the lateral branches from a codominant stem can reduce its growth enough to allow the other stem to become dominant.

Lateral branches should be no more than one-half to three-quarters of the diameter of the stem at the point of attachment. Avoid producing "lion's tails," tufts of branches and foliage at the ends of branches, caused by removing all inner lateral branches and foliage. Lion's tails can result in

sunscalding, abundant epicormic sprouts, and weak branch structure and breakage.

Branches that rub or cross another branch should be removed.

Conifers that have branches in whorls and pyramidal crowns rarely need crown thinning except to restore a dominant leader. Occasionally, the leader of a tree may be damaged and multiple branches may become codominant. Select the strongest leader and remove competing branches to prevent the development of codominant stems.

### **Considerations on Crown Raising**

Crown raising is the practice of removing branches from the bottom of the crown of a tree to provide clearance for pedestrians, vehicles, buildings, lines of site, or to develop a clear stem for timber production. Also, removing lower branches on white pines can prevent blister rust. For street trees the minimum clearance is often specified by municipal ordinance. After pruning, the ratio of the living crown to total tree height should be at least two-thirds (e.g., a 12 m tree should have living branches on at least the upper 8 m). The above ratio is appropriate for timber production. It is not necessary to prune above 8 feet in height for clear wood lumber production.

On young trees "temporary" branches may be retained along the stem to encourage taper and protect trees from vandalism and sunscald. Less vigorous shoots should be selected as temporary branches and should be about 10 to 15 cm apart along the stem. They should be pruned annually to slow their growth and should be removed eventually.

### **Considerations on Crown Reduction**

Crown reduction pruning is most often used when a tree has grown too large for its permitted space. This method, sometimes called drop crotch pruning, is preferred to topping because it results in a more natural appearance, increases the time before pruning is needed again, and minimizes stress (see drop crotch cuts in the next section).

### **Considerations on Pruning Cuts**

Pruning cuts should be made so that only branch tissue is removed and stem tissue is not damaged. At the point where the branch attaches to the stem, branch and stem tissues remain separate, but are contiguous.

If only branch tissues are cut when pruning, the stem tissues of the tree will probably not become decayed, and the wound will seal more effectively.

### **Consideration on pruning living branches**

To find the proper place to cut a branch, look for the branch collar that grows from the stem tissue at the underside of the base of the branch. On the upper surface, there is usually a branch bark ridge that runs (more or less) parallel to the branch angle, along the stem of the tree. A proper pruning cut does not damage either the branch bark ridge or the branch collar. A proper cut begins just outside the branch bark ridge and angles down and away from the stem of the tree, avoiding injury to the branch collar. Make the cut as close as possible to the stem in the branch axial, but outside the branch bark ridge, so that stem tissue is not injured and the wound can seal in the shortest time possible. If the cut is too far from the stem, leaving a branch stub, the branch tissue usually dies and woundwood forms from the stem tissue. Wound closure is delayed because the woundwood must seal over the stub that was left.

The quality of pruning cuts can be evaluated by examining pruning wounds after one growing season. A concentric ring of woundwood will form from proper pruning cuts. Flush cuts made inside the branch bark ridge or branch collar, result in pronounced development of woundwood on the sides of the pruning wounds with very little woundwood forming on the top or bottom. As described above, stub cuts result in the death of the remaining branch and woundwood forms around the base from stem tissues.

When pruning small branches with hand pruners, make sure the tools are sharp enough to cut the branches cleanly without tearing. Branches large enough to require saws should be supported with one hand while the cuts are made. If the branch is too large to support, make a three-step pruning cut to prevent bark ripping.

Step 1. The first cut is a shallow notch made on the underside of the branch, outside the branch collar. This cut will prevent a falling branch from tearing the stem tissue as it pulls away from the tree.

Step 2. The second cut should be outside the first cut, all the way through the branch, leaving a short stub.

Step 3. The stub is then cut just outside the branch bark ridge/branch collar, completing the operation.

### **Considerations on pruning dead branches**

Prune dead branches in much the same way as live branches. Making the correct cut is usually easy because the branch collar and the branch bark ridge can be distinguished from the dead branch, because they continue to grow. Make the pruning cut just outside of the ring of woundwood tissue that has formed; being careful not to cause unnecessary injury. Large dead branches should be supported with one hand or cut with the three-step method, just as live branches. Cutting large living branches with the three-step method is more critical because of the greater likelihood of bark ripping.

### **Considerations on drop crotch cuts**

A proper cut begins just above the branch bark ridge and extends through the stem parallel to the branch bark ridge. Usually, the stem being removed is too large to be supported with one hand, so the following three cut method should be used.

Step 1. With the first cut, make a notch on the side of the stem away from the branch to be retained, well above the branch crotch.

Step 2. Begin the second cut inside the branch crotch, staying well above the branch bark ridge, and cut through the stem above the notch.

Step 3. Cut the remaining stub just inside the branch bark ridge through the stem parallel to the branch bark ridge.

To prevent the abundant growth of epicormic sprouts on the stem below the cut, or dieback of the stem to a lower lateral branch, make the cut at a lateral branch that is at least one-third of the diameter of the stem at their union.

### **Considerations on when to prune**

**Conifers** may be pruned any time of year, but pruning during the dormant season may minimize sap and resin flow from cut branches.

**Hardwood trees and shrubs without showy flowers:** prune in the dormant season to easily visualize the structure of the tree, to maximize wound closure in the growing season after pruning, to reduce the chance of transmitting disease, and to discourage excessive sap flow from wounds. Recent

wounds and the chemical scents they emit can actually attract insects that spread tree disease. In particular, wounded elm wood is known to attract bark beetles that harbor spores of the Dutch elm disease fungus, and open wounds on oaks are known to attract beetles that spread the oak wilt fungus. Take care to prune these trees during the correct time of year to prevent spread of these fatal diseases.

Contact your local tree disease specialist to find out when to prune these tree species in your area. Usually, the best time is during the late fall and winter.

**Flowering trees and shrubs:** should also be pruned during the dormant season for the same reasons stated above; however, to preserve the current year's flower crop, prune according to the following schedule:

- ◆ Trees and shrubs that flower in early spring (redbud, dogwood, etc.) should be pruned immediately after flowering (flower buds arise the year before they flush, and will form on the new growth).
- ◆ Many flowering trees are susceptible to fireblight, a bacterial disease that can be spread by pruning. These trees, including many varieties of crabapple, hawthorn, pear, mountain ash, flowering quince and pyracantha, should be pruned during the dormant season. Check with your county extension agent or a horticulturist for additional information.
- ◆ Trees and shrubs that flower in the summer or fall always should be pruned during the dormant season (flower buds will form on new twigs during the next growing season, and the flowers will flush normally).

**Dead branches:** can be removed any time of the year.

### **Considerations on Pruning Tools**

Proper tools are essential for satisfactory pruning. The choice of which tool to use depends largely on the size of branches to be pruned and the amount of pruning to be done. If possible, test a tool before you buy it to ensure it suits your specific needs. As with most things, higher quality often equates to higher cost.

Generally speaking, the smaller a branch is when pruned, the sooner the wound created will seal.

**Hand pruners** are used to prune small branches (under 2.5 cm diameter) and many different kinds are available. Hand pruners can be grouped into **by-pass or anvil styles** based on the blade configuration. **Anvil style** pruners have a straight blade that cuts the branch against a small anvil or block as the handles are squeezed. **By-pass** pruners use a curved cutting blade that slides past a broader lower blade, much like a scissors. To prevent unnecessary tearing or crushing of tissues, it is best to use a by-pass style pruner. Left- or right-handed types can be purchased.

Slightly larger branches that cannot be cut with a hand pruner may be cut with **small pruning saws** (up to 10 cm) or **lopping shears** (up to 7 cm diameter) with larger cutting surfaces and greater leverage. Lopping shears are also available in by-pass and anvil styles.

For branches too large to be cut with a hand pruner or lopping shears, **pruning saws** must be used. Pruning saws differ greatly in handle styles, the length and shape of the blade, and the layout and type of teeth. Most have tempered metal blades that retain their sharpness for many pruning cuts. Unlike most other saws, pruning saws are often designed to cut on the "pull-stroke."

**Chain saws** are preferred when pruning branches larger than about 10 cm. only qualified individuals should use Chainsaws. To avoid the need to cut branches greater than 10 cm diameter, prune when branches are small.

**Pole pruners** must be used to cut branches beyond reach. Generally, pruning heads can cut branches up to 4.4 cm diameter and are available in the by-pass and anvil styles. Once again, the by-pass type is preferred. For cutting larger branches, saw blades could be fastened directly to the pruning head or a separate saw head can be purchased.

Because of the danger of electrocution, pole pruners should not be used near utility lines except by qualified utility line clearance personnel.

To ensure that satisfactory cuts are made and to reduce fatigue, keep your pruning tools sharp and in good working condition. Hand pruners, lopping shears, and pole pruners should be periodically

sharpened with a sharpening stone. Replacement blades are available for many styles.

Pruning saws should be professionally sharpened or periodically replaced. To reduce cost, many styles have replaceable blades.

### Considerations on tool sanitation

Tools should be clean and sanitized as well as sharp. Although sanitizing tools may be inconvenient and seldom practiced, doing so may prevent the spread of disease from infected to healthy trees on contaminated tools. Tools become contaminated when they come into contact with fungi, bacteria, viruses and other microorganisms that cause disease in trees. Most pathogens need some way of entering the tree to cause disease, and fresh wounds are perfect places for infections to begin. Microorganisms on tool surfaces are easily introduced into susceptible trees when subsequent cuts are made. The need for sanitizing tools can be greatly reduced by pruning during the dormant season.

If sanitizing is necessary it should be practiced as follows: Before each branch is cut, sanitize pruning tools with either 70% denatured alcohol, or with liquid household bleach diluted 1 to 9 with water (1 part bleach, 9 parts water). Tools should be immersed in the solution, preferably for 1-2 minutes, and wood particles should be wiped from all cutting surfaces. Bleach is corrosive to metal surfaces, so tools should be thoroughly cleaned with soap and water after each use.

### Considerations on treating wounds

Tree sap, gums, and resins are the natural means by which trees combat invasion by pathogens. Although unsightly, sap flow from pruning wounds is not generally harmful; however, excessive "bleeding" can weaken trees.

When oaks or elms are wounded during a critical time of year (usually spring for oaks or throughout the growing season for elms) – either from storms, other unforeseen mechanical wounds, or from necessary branch removals -- some type of wound dressing should be applied to the wound. Do this immediately after the wound is created. In most other instances, wound dressings are unnecessary, and may even be detrimental.

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Wound dressings will not stop decay or cure infectious diseases. They may actually interfere with the protective benefits of tree gums and resins, and prevent wound surfaces from closing as quickly as they might under natural conditions. The only benefit of wound dressings is to prevent introduction of pathogens in the specific cases of Dutch elm disease and oak wilt.

### PLANS AND SPECIFICATIONS

Specifications for applying this practice shall be prepared for each site and recorded using approved specification sheets, job sheets, technical notes, and narrative statements in the conservation plan or other acceptable documentation.

### REFERENCES

ANSI Z133.1. 1994. Safety standards. American national standard for tree care operators. Washington, DC: American National Standards Institute.

ANSI A300. 1995. Standard practices for tree, shrub, and other woody plant maintenance. Washington, DC: American National Standards Institute.

Fazio, J. R. ed. 1992. Don't top trees. Tree City USA Bulletin No. 8. Nebraska City, NE: The National Arbor Day Foundation.

Harris, R.W. 1994. Clarifying certain pruning terminology: thinning, heading, pollarding. Journal of Arboriculture 20:50-54.

ISA Performance Guidelines Committee. 1994. Tree-pruning guidelines. Savoy, IL: International Society of Arboriculture.

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Shigo, A. 1989. Tree pruning: a worldwide photo guide. Durham, NH: Shigo Trees, Associates.

### INTERNET REFERENCES

<http://www.pueblo.gsa.gov/press/nfcpubs/prune.txt>

Specifications for revegetation of landings and trails should include selection of non-invasive species, timing, and method of application.

### OPERATION AND MAINTENANCE

Periodically inspect plant condition and take corrective actions as necessary, e.g., additional pruning, pest management, nutrient management, and forest stand improvement.

Contact the local NRCS conservationist immediately when unexpected problems, questions arise during practice installation.