

Sub-transmission Lines:

In 2003, two trees in northwestern Ohio caused a power outage that started a "domino effect", resulting in a blackout stretching from Michigan to Maine, leaving millions without power. Before it was known that a tree had caused the outage, the federal government speculated the outage was caused by a terrorist attack, and perhaps was the prelude to a much larger attack. Consequently, in the interest of national security, the federal government enacted regulations and regulatory agencies that strictly dictate the amount of clearance a sub-transmission line needs from encroaching vegetation. In an effort to conform to these regulations, and to insure that our members don't experience any large scale outages, PCS has expanded the scope of work near their sub-transmission lines. In the past, PCS has cleared their sub-transmission lines exactly the same as their three phase primary lines. However, this is no longer adequate. Now, trimming is done to create a minimum of 25' of clearance instead of 15' in non-maintained areas. In maintained areas, PCS will still trim yard trees but is strongly emphasizing the need to remove large growing trees that may be near the sub-transmission lines.



Sub-transmission right-of-way

Summary:

PCS's vegetation management program is designed to provide the maximum amount of reliability for the minimum amount of expense. All while keeping the impact on property owners to a minimum and practicing proper environmental stewardship. It's a challenge to maintain this balance but one that must be met to insure PCS members receive reliable electric power at the lowest price possible. Members can assist us in this endeavor by making sure they plant the right tree in the right place and never plant any tree underneath overhead power lines. Always plant at least ten feet to the side of any power line with trees that mature at a height below 18'. Trees that mature larger than that should be planted at least 20' to the side of overhead power lines. And faster growing large trees like Silver Maple, Willow, and many species of Poplar should be planted at least 30' to the side of overhead power lines. Please see our tree planting guide on our website at www.peoplesrec.com for more information.

People's Cooperative Services Vegetation Management Specifications



People's Cooperative Services

Your Touchstone Energy® Cooperative



3935 Highway 14 East • P.O. Box 339
Rochester, Minnesota 55903-0339
(507) 288-4004 or 1-(800) 214-2694
Fax: (507) 288-9438
Web Site: <http://www.peoplesrec.com>

Introduction:

To deliver a reliable and safe power supply to our members, PCS must control the vegetation within the power line rights-of-ways. Vegetation that grows near power lines can cause outages, damage the power line conductors and equipment, and delay restoration of power in emergency situations like storms. In extreme cases it can even pose an electrocution hazard, particularly in cases where children might climb a tree and end up dangerously close to thousands of volts of electricity. Consequently, PCS has a vegetation management program designed to eliminate these potential problems and dangers.

Maintained Areas:

In an effort to have as minimal of impact as possible on the valued landscapes like yards, cemeteries, and other maintained areas, PCS tries to trim as little as possible off of trees in these situations. There



Growth Marks

are two factors that dictate the extent of trimming necessary in this situation: rate of growth and branch arrangement. Because of the way trees grow they leave a ring (growth marks) around the stem where the end of the limb was the year before. Therefore, to see how much a tree has grown in a given period of time you can simply count the growth marks on the stem. PCS trims to create at least six years of growth between the electrical equipment and the tree. PCS also takes into account proper pruning practices and the concept of directional and/or natural pruning recommended by groups like the National Arbor Day Foundation and the International Society of Arboriculture. Trees should always be pruned at



Trimmed Spruce (maintained area)

a branch junction to promote proper healing of the wound. Trees have cells at these locations that specialize in the quick healing of bark wounds. Therefore, trimmers count back the

appropriate number of growth marks on the stem and then go further back on the stem to an appropriate branch junction and then prune back to this point. Frequently, because of the tree species found in the area and their branch arrangement, the pruning creates about twelve years worth of clearance for growth.

There are trees that need to be removed in maintained areas, hazard and/or danger trees. These trees come in two varieties: the variety that will likely fall on PCS equipment and the variety that grows too quickly to keep it out of the electrical equipment without frequent trimming. The first variety is the one most people recognize. It's a tree that is cracked, decayed or displays some type of structural weakness. The second is the more common however. It's a tree, usually planted, that grows too large and too quickly to be trimmed every six years unless you remove large portions of the canopy. As a result these trees are frequently the sources of outages and a great deal of maintenance expenditures that inevitably drive up electric rates. When a PCS representative, frequently the tree trimming contractor, approaches the Member regarding the removal of these types of trees PCS encourages the Member to permit their removal. This is why it is important to plant the right species of tree for the location and never plant trees directly under the power lines.

Non-maintained Areas:

Non-maintained areas include road ditches, wooded areas, and other areas where the vegetation is naturally occurring. The extent of vegetation control varies with the amount of voltage the PCS equipment has in these areas. There are three basic types of equipment that indicate a difference in voltage. In ascending order of voltage they are: single phase primary, three phase primary, and sub-transmission.

Trimming:

With the exception of the sub-transmission equipment all trimming is done to create a minimum of fifteen feet of clearance between PCS equipment and any deciduous tree limb. Because of the excurrent (column like) growth habit of most coniferous trees the distance between PCS equipment and a coniferous limb can be reduced to only eight feet.



Trimming (non-maintained area)

Brush:

The extent that brush is cleared, or more frequently treated with herbicide, is dependent on the electrical equipment.

Single Phase:

40' wide

Three Phase:

60' wide

Sub-transmission:

60' wide



All species of trees that will mature to a height greater than twenty feet are cleared for the width specified above. Smaller maturing species of trees and shrubs are left undisturbed whenever possible except for the inner half, the portion under the power line, where all of the woody vegetation is removed.

In the vegetation management industry this is referred to as a wire zone/border zone technique. It provides three major advantages:

1. It provides easy access for crews to provide maintenance and restore power in emergency situations.
2. It's the most proactive approach to managing the vegetation by eliminating threatening trees before they are large and costly to remove.
3. It creates three different types of habitat in a small area and significantly enhances biodiversity.

Hazard Trees:

At the edges of the areas cleared for brush there is often times forested area. Within these forested areas, sometimes a great distance from the cleared right-of-way, are trees that will likely fall on PCS equipment because they have a structural defect. These trees, of course, need to be removed. In remote areas or other inaccessible locations, where leaving a structurally weakened tree doesn't pose an immediate danger to pedestrians or traffic, these trees are topped at a height that no longer poses a threat to PCS equipment and treated with herbicide. By leaving these trees standing it creates a nesting snag for cavity nesting birds and mammals.