



**GREAT
RIVER
ENERGY™**

Planting around power lines

Program overview

At Great River Energy, it is our mission to provide member-owners with affordable, reliable energy in harmony with a sustainable environment.

To achieve our mission, we maintain transmission line rights of way to provide reliable and safe electric service. The right of way must be accessible for constructing, maintaining and repairing our transmission lines.

Great River Energy's preferred method of maintaining its transmission system is to promote a clear right of way. A very desirable way of doing this is to establish a native and pollinator-friendly habitat.

Native habitat around transmission facilities

Where transmission facilities are located, native plantings offer important benefits for the utility and the property owner:

- For the utility, native plantings make it easier to access the power lines for maintenance and emergency repairs. It also eliminates the risk of a tree contacting the power line, which is a risk to both safety and reliability.
- For the property owner, the hardiness of the plants makes the landscaping easy to maintain.



Great River Energy prefers a clear right of way along its transmission system. Our preferred way to do that is to plant prairie or pollinator-friendly habitat. For more information on pollinator habitat, visit greatriverenergy.com/pollinators.



**Know what's below.
Call before you dig.**

811 Call before you dig

811 know what's below. Call before you dig. Before you dig, you must have your underground lines located. IT'S THE LAW. Call 811, contact your state's one-call service or schedule your appointment online. You must schedule an appointment at least three days before digging.

Minnesota: 651.454.0002, MN 800.252.1166; gopherstateonecall.org

Wisconsin: 800.242.8511; diggershotline.com

Understanding clear zones and trees

Great River Energy works with landowners to maintain a clear right of way. Without proper planning, even a small tree can grow rapidly near the power line, threatening public safety and reliability, and will eventually have to be removed. For example:

- During storms, falling limbs or trees can bring down power lines, creating dangerous situations and causing power outages.
- Even trees that are not touching a power line can cause serious and fatal accidents or injuries. Read about “arc flashing” in the Q & A on the back.
- Trees are a common cause of power outages. Even with regular tree pruning, electric utility companies respond to many service calls because of problems with trees, adding to the overall cost of electrical service.
- Overgrown trees can block the path of construction vehicles that need access to the transmission lines for maintenance and emergency repairs.

For these reasons, it is important to establish the right plant species in the right place.

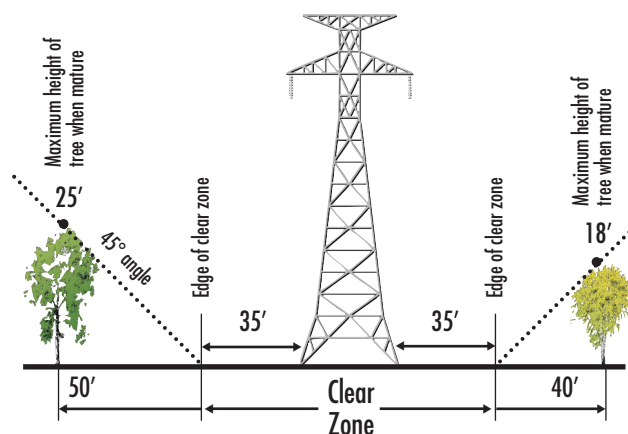
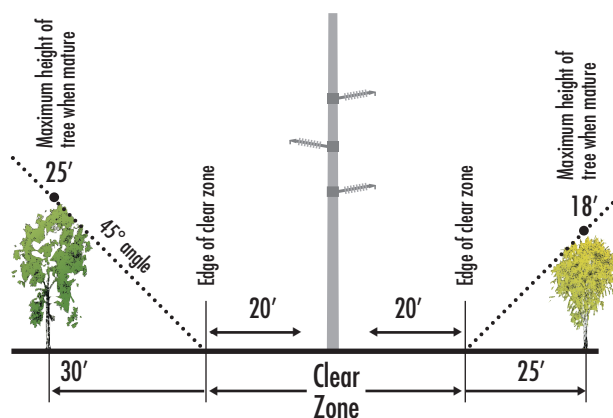
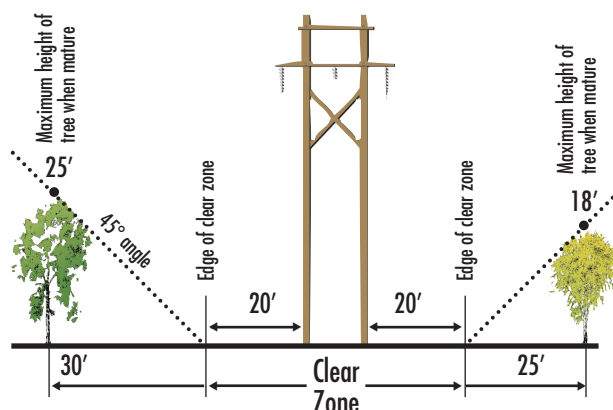
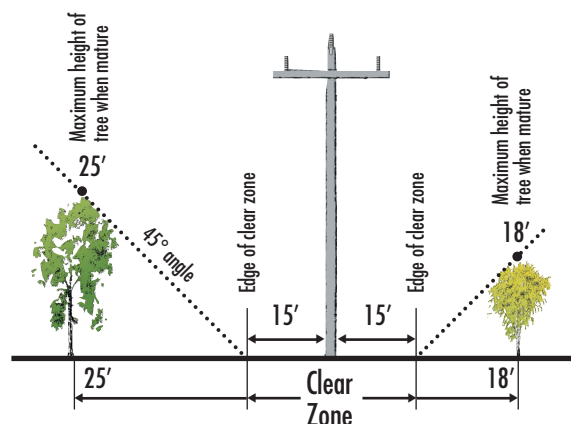
What You CAN Plant and Where—

A clear area along the power line route, or a clear zone, should be maintained at all times.

As long as the proper clear zones are maintained, shrubs, low-growing plants and many other shrubs/ornamentals that remain short at maturity can safely be planted along the outermost edges of the right of way.

Great River Energy requires a minimum 15 to 35 foot-wide clear zone on both sides of any transmission line as measured from the center of where the overhead conductor is located. Follow the guidelines in the diagrams (right) and refer to the back to learn about utility safety and maintenance practices.

For safety and reliability, a minimum 15 feet to 30 feet of clear zone is required on both sides of a power line. A tree should never be planted closer than its height at maturity to the edge of the clear zone. For example, a tree that will mature to a height of 18 feet must be planted at least 18 feet from the edge of the clear zone. As voltage goes up, the clear zone area increases. These diagrams show a variety of power pole structures and how much clearance is needed.



NOTE: These are Great River Energy's policies, but your local electric cooperative, municipal or investor-owned utility may have their own set of management practices, which may differ from the right-of-way practices of Great River Energy. Be sure to contact the specific owner of the power line before planting.

If you have any questions about compatible plant species or where you can plant a tree or shrub near a power line, contact your electric provider or Great River Energy before planting.

If a landowner plants in a transmission right of way, they do so at their own risk and will not be compensated where Great River Energy has the legal right to remove vegetation.

Facts about power lines and structures

Electric power lines have been part of the landscape for more than a century, delivering the power we need to our homes, farms and businesses.

These power lines include transmission lines, such as those Great River Energy builds, and distribution lines from your local electric utility to your home or business.

Q. What is the difference between transmission and distribution power lines?

A. Transmission lines deliver large or "bulk" amounts of electricity from power plants to electric substations. Think of transmission lines as the interstate and state highways of the electrical system. Distribution lines deliver smaller amounts of electricity directly to homes, farms and businesses. Think of them as the county highways and local streets of the electrical system.

Q. What are volts?

A. The force or electrical pressure of an electrical current is measured in volts. The voltage at which a transmission line operates is expressed in kilovolts (kV). One kV equals 1,000 volts. Any line that operates at over 100 kV is considered a high-voltage transmission line by the State of Minnesota. Lines operating below 100 kV are either considered sub-transmission lines or distribution lines.



69-kV/115-kV transmission structure



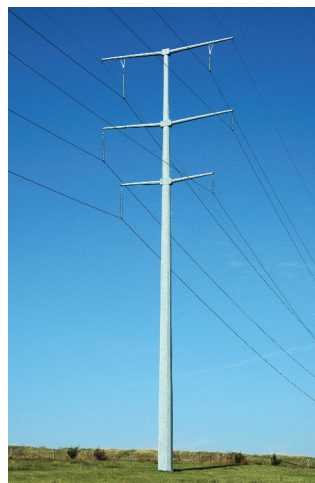
69-kV/115-kV transmission structure with distribution underbuild



Distribution structure



230-kV/345-kV H-frame transmission structure



230-kV/345-kV steel transmission structure



230-kV/345-kV lattice transmission structure

Electric utility safety and maintenance practice

Since 1996, three large-scale electric grid failures in the U.S. and Canada were caused in part by trees, including the 2003 east coast blackout that affected 50 million people. The federal government has since developed mandatory reliability standards including strict requirements for vegetation management practices to help prevent problems caused by tree contact with high voltage transmission lines. In turn, utilities have enhanced their vegetation management programs and have taken a more proactive approach to maintaining clear zones.

To ensure safe, reliable operation of transmission lines, Great River Energy inspects lines regularly by air and by ground for:

- Trees that are dead, weak or leaning and have the potential to contact the power line
- Equipment needing repair or replacement
- Anything that might jeopardize safe, reliable operation of the power line

Q. Will you enter my property to remove or prune my trees?

A. Sometimes, yes. Occasionally crews may have to enter your property to remove or prune trees or to perform other maintenance work. In the event of an emergency, quick and direct access may be necessary for repair. Great River Energy typically uses existing field entrances or access roads and makes every effort to avoid damaging property. We (or one of our contractors) will make a reasonable effort to contact you first. However, in some situations, it may not be possible to contact you before entering your property.

To maintain a safe and reliable system, utilities closely follow industry standards, such as those outlined in the National Electrical Safety Code (NESC) and requirements of the North American Electric Reliability Corporation (NERC).

REMOVING A TREE VERSUS PRUNING IT

Now that utilities are taking a more proactive approach to maintaining their rights of way, trees that have the potential to become hazards are most often removed rather than pruned. Trees do not even need to touch a power line to cause an arc flash (see Q & A).

Q. Do you use herbicides?

A. Where conditions permit and with the property owner's permission, Great River Energy also uses herbicides as an effective and economical method of controlling tree and brush growth. Great River Energy's herbicide application methods follow U.S. Environmental Protection Agency and state agency regulations. Herbicides are applied by licensed applicators.

Q. What is arc flashing? Why can't a tree come close to a power line as long as it doesn't actually touch it?

A. When trees or other objects are close to a power line an "arc flash" can occur. An arc flash is a short circuit through air that can flash over from an energized conductor (like a power line) to trees, people or other objects (anything that conducts electricity) and generates an arc of electricity in the air connecting the two. Arc flashes produce intense heat and light, and can cause serious or fatal injuries, widespread power outages and/or fires.

For more information on Great River Energy's vegetation management practices, or examples of native prairie plants visit greatriverenergy.com/pollinators



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