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MontGuide

Saltcedar (Tamarisk)

by Robert T. Grubb, former Research Associate, Dept. of Land Resources and Environmental Sciences; Roger L. Sheley, former Noxious Weed Specialist; and Ronald D. Carlstrom, Gallatin County Extension Agent

Revised by Jane Mangold, Extension Invasive Plant Specialist; and Erik Lehnhoff, Assistant Research Professor, Dept. of Land Resources and Environmental Sciences

Describes biology and management techniques for this large shrub or small tree that's a threat to Montana's waterways.

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SALTCEDAR OR TAMARISK

(Tamarix ramosissima, T. chinensis, or *T. gallica)* is a large shrub or small tree that was introduced to North America from the Middle East in the early 1800s. This weed has been used for ornamentals, windbreaks and erosion control. By 1850, saltcedar had escaped from these areas and infested many river systems and drainages in the Southwest – often displacing native vegetation. By 1938, infestations of saltcedar could be found from Florida to California and as far north as Idaho. Saltcedar continues to spread rapidly and currently infests water drainages and wet areas throughout the United States. Saltcedar was first found in Montana around 1960 in the Yellowstone and Big Horn River drainages. Twenty-one counties in Montana have reported the presence of saltcedar (Figure 1). A survey conducted in the 1990s of the major river drainages in southeastern Montana, saltcedar was located on over 250 miles of rivers through several counties. Most of the saltcedar found in Montana is a hybrid of *Tamarix* species.

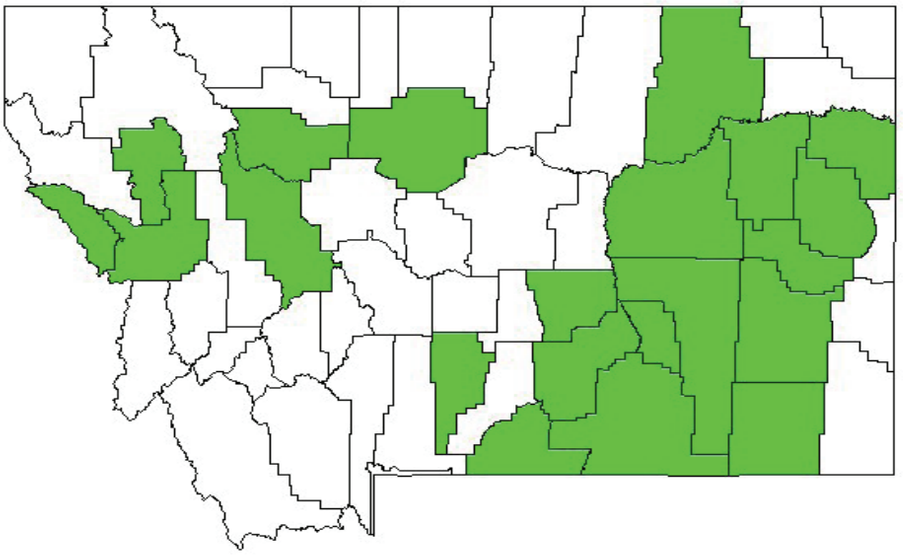

FIGURE 1. Counties in Montana where saltcedar has been reported. Information taken from Invaders Database System (Rice, P.M., INVADERS Database System, http://invader.dbs.umt.edu); Division of Biological Sciences, University of Montana, Missoula, MT, 59812-4824).

Impacts

Some early studies (pre-1990) indicated that saltcedar uses more water than native riparian species, and it was believed to increase water losses through evapotranspiration. Therefore, as it has expanded across the floodplains of western waterways over the past several decades, management has been undertaken to remove saltcedar to save water that would be lost by evapotranspiration. Recent studies have shown, however, that saltcedar does not use more water than native vegetation. Thick stands of saltcedar may present other problems though. High densities of saltcedar can congest river channels and create potential flood hazards. Saltcedar also reduces channel widths by decreasing the water velocity and thereby increasing sediment deposition.

Research from the southwestern U.S. indicates that native vegetation may decrease in saltcedar-infested areas, but recent research in Montana shows no differences in plant community composition or species richness, and indicates that species differences may be more associated with water flow regimes being altered by dams than saltcedar invasion. However, saltcedar infestations in Montana are often younger than those in the Southwest and may not have had time to negatively affect plant communities. Where infestations become very dense, saltcedar may prevent native species from reestablishing by exuding salts from

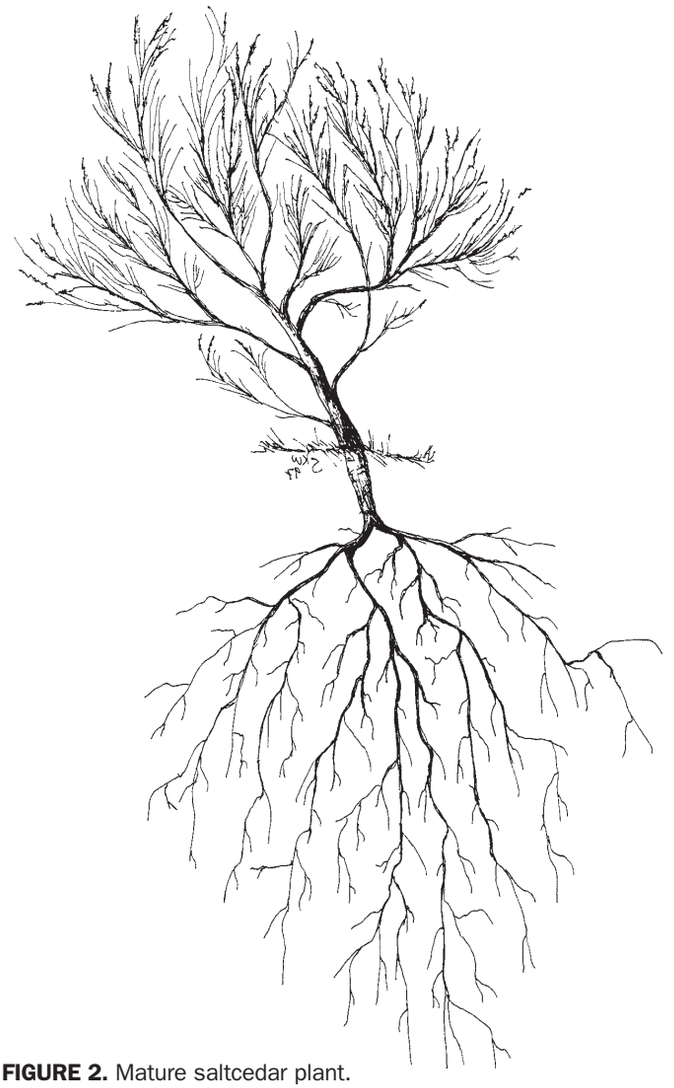

FIGURE 2. Mature saltcedar plant.

the leaves which increases soil salinity. Native species such as cottonwood are more competitive than saltcedar, and if they can establish will eventually overtop and outcompete saltcedar, which is not shade tolerant.

Saltcedar has limited usefulness for animals. Dense stands are unsuitable for many mammals, reptiles, amphibians, and certain groups of birds, such as timber drillers and cavity nesters. However, mixed stands of native vegetation and saltcedar can provide excellent habitat for many species.

Biology

Saltcedar, a member of the Tamaricaceae family, is classified as either a large shrub or a small tree. It has numerous slender branches covered with small scale-like leaves. Saltcedar can grow 30 feet tall and has smooth, reddish-brown bark which becomes furrowed and ridged with age (Figure 3). Saltcedar produces thousands of small white to pink flowers throughout the spring and summer (Figure 4). A mature saltcedar plant can produce half a million seeds each year. Seeds are small with a tuft of hair attached to one end enabling them to float long distances on the wind and water. Seeds are generally short lived and germination can occur within 24 hours of dispersal under suitable conditions. Most seeds live less than a week in warm or hot conditions, but they can remain viable for more than six months under cool dry conditions. In addition to reproduction by seed, saltcedar can reproduce vegetatively from adventitious roots, and individual trees generally send up numerous vegetative shoots, creating large clones.

Management

Two steps are necessary to effectively control saltcedar: 1) the plant must be killed and removed, and 2) reinvasion of the weed must be prevented.

Several methods have been investigated to control saltcedar. These include burning, mowing, chopping, disking, root plowing, herbicides, and combinations of these methods. In many cases, only temporary suppression of plant growth will be obtained, unless all of the subsurface root crown is destroyed. Remaining root crowns regrow vigorously and will require retreatment.

FIGURE 3. Stem, leaves and bark of saltcedar.

Controlling young, small saltcedar usually involves applying herbicides to foliage, cut stumps, or basal bark. Light infestations of saltcedar in areas without native shrubs and trees may be treated with a foliar application of imazapyr (Arsenal®) at a rate of one pint/acre plus glyphosate (Roundup®) at a rate of two quarts/acre. These herbicides are non-selective and can damage native vegetation. They are not recommended in areas where native vegetation may be affected. In such cases, a cut-stump or basal bark treatment may be a better option.

The cut-stump method involves cutting the stems within two inches of the soil surface using a chainsaw or mechanical sheers, applying herbicide on and around the perimeter of the stump within a few minutes, and retreating any resprouts four to 12 months following initial treatment. The cut-stump method is most effective on larger stems and is typically performed in the fall. Triclopyr can be applied to the cut stumps as undiluted PathfinderII® or a 50 percent solution of Garlon®. Imazapyr (Arsenal®) is effective when applied to cut stumps at a rate of 12 ounces/gallon of water. Undiluted glyphsate (Rodeo® or Roundup®) can be applied to the cut stumps as well.

FIGURE 4. Saltcedar flower

Basal bark treatment involves applying herbicide to the lowest 18 inches of intact stems. Herbicides must be applied to the entire circumference of every stem in order to be effective. This method works best on stems smaller than five or six inches in diameter. Triclopyr can be applied as undiluted PathfinderII® or a 20-30 percent solution of Garlon® or Remedy®. Because saltcedar generally grows in wet areas, caution should be used when applying herbicides to keep them out of ground and/or surface water. Triclopyr and imazapyr should not be applied directly to open water or below the mean high water mark. Use caution when applying to permeable soils where a shallow water table is present to avoid groundwater contamination. Please read and follow the chemical label when applying herbicides to manage saltcedar.

Root plowing is a mechanical tool that has been successful in managing saltcedar infestations. It is quite disruptive, however, and should only be used in severe infestations and as part of an overall site reclamation project. Root plowing involves pulling a plow, set 12 to 18 inches below the soil surface, through an infestation to cut the root crowns. Some roots may be up to three feet deep due to deposition of sediment on top of the plant, so plows may have to be set quite deep. If the root crown is removed, the plant will not be able to sprout again and form new plants. For root plowing to be effective, the above-ground vegetation should be piled and burned to prevent resprouting of shoots. If properly performed, root plowing can achieve 90 percent control of saltcedar stands in the field. Root plowing during hot and dry weather can improve the effectiveness of this control method.

Changing the level of ground water may control saltcedar as well as other riparian vegetation. Dropping the water table has reduced saltcedar stands along the Gila River in Arizona. Submergence for 28 months has provided 99 percent control of saltcedar where plants were inundated for one entire growing season, and over half of the next two growing seasons.

The Mediterranean tamarisk beetle *(Diorhabda elongata)* has been very effective in controlling saltcedar in the southwestern U.S. However, further transport and release of the beetles have been suspended due to concerns over potential effects to the critical habitat of the federally-listed endangered southwestern willow flycatcher, which nests in saltcedar. The tamarisk beetle has established on the Bighorn River and Reservoir in northern Wyoming, and repeated defoliation by the beetle has led to some saltcedar mortality. As of 2009, beetle numbers in Wyoming had decreased due, in part, to rising reservoir levels and seasonal fluctuations which drown overwintering adults. The beetle has been released in Montana, but has not yet established in sufficient numbers, perhaps due to high levels of predation, increased plant resource availability, or other factors currently being researched. An additional biocontrol agent, the stem galling moth *Amblypalpis tamaricella,* is also being researched, as it may be able to avoid predation by spending most of its life inside saltcedar stems.

Other invasive plants, like houndstongue, Canada thistle and whitetop, often invade a site following saltcedar control. For that reason, follow-up monitoring to control other invasives and/or reinvading saltcedar is critical. Depending on the site and degree of infestation, revegetation with appropriate desirable vegetation may be necessary.

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Illustrations by Susan Kezie-Webb.

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