

Tamarisk Frequently Asked Questions

Riparian lands in the Western U.S. have been severely impacted by many human-related actions, but none so much as the introduction of tamarisk, an invasive, non-native plant. Tamarisk plants can hoard light, water and nutrients; impact natural systems; and potentially destroy native wildlife habitat.

The Colorado River Corridor has been out of balance for several decades, and tamarisk has spread to such an extent that it has effectively altered the natural functions and processes of the ecosystem. The issue is widespread and complex, and there are no easy answers or solutions. This FAQ seeks to answer the most commonly asked questions.

| **What is tamarisk?**

Tamarisk (also known as salt cedar) is a deciduous shrub or small tree from Eurasia. Tamarisk can grow as high as 25 feet tall. The bark on saplings and young branches is purplish or reddish-brown. Leaves are scale-like, alternate, with salt-secreting glands. Flowers are small and the petals are reddish, pinkish, or white. Each plant can produce as many as 500,000 seeds annually. The seeds are dispersed by wind, water, and animals. Seeds are small with a tuft of hair attached to one end enabling them to float long distances through wind and water. Seeds are short-lived and can germinate within 24 hours after dispersal, sometimes while still floating on the water.

| **How did it get here?**

Eight species of Tamarisk were first brought to North America in the 1800s from Southern Europe or the eastern Mediterranean region (DiTomaso 1998) and planted as ornamentals. Later, tamarisk was used as windbreaks, and to stabilize river banks. *Tamarix* species escaped cultivation and are now widespread throughout the United States, with denser infestations in the Southwest.

| **Why is it considered a problem?**

Tamarisk negatively impacts riparian ecosystems in a number of ways.

- Tamarisk populations grow in dense thickets, with as many as 3,000 plants per acre, which can prevent the establishment of native vegetation (e.g., cottonwoods willows sage, grasses, and forbs).
- Due to the depth of their extensive root systems tamarisk draw more salts from the groundwater than native vegetation. These salts are excreted through tamarisk leaf glands and deposited on the ground with the leaf litter. This can result in a substantial rise in soil salinity and prevent the germination of many native plants.

- Tamarisk invasions extensively degrade terrestrial habitat which leads to a loss of wildlife biodiversity in the stream corridor.
- Dense tamarisk stands affect livestock by reducing forage and preventing access to surface water.
- Tamarisk seeds and leaves are of little nutritional value to most wildlife and livestock.
- Dense tamarisk stands on stream banks accumulate sediment in their extensive root systems, gradually narrowing stream channels and increasing flooding potential. These changes in stream morphology can impact critical habitat for endangered fish.
- The high amount of leaf litter that tamarisk produces increases the frequency and intensity of wildfires. These fires kill native vegetation such as cottonwoods and willows but stimulate tamarisk growth.
- Aesthetic values of the stream corridor are degraded by solid stands of tamarisk that exclude diverse vegetation and limit wildlife and bird viewing opportunities.
- Tamarisk block access to streams for recreation (e.g., boating, fishing, hunting, bird watching).
- Dense tamarisk stands on stream banks accumulate sediment in their extensive root systems, gradually narrowing stream channels and increasing flooding potential.
- Tamarisk has a reputation for using significantly more water than the native vegetation that it displaces. This non-beneficial user of the West's limited water resources has been reported to dry up springs, wetlands, and riparian areas by lowering water tables.

What is the urgency in dealing with tamarisk (why now)?

Unfortunately, tamarisk has displaced native vegetation on approximately 1.6 million acres of land in the Western United States and continues to spread. It is also a phreatophyte (or a plant that takes its water from the water table). Studies have shown that a mature tamarisk can uptake nearly 200 gallons of water a day. Although native trees in wet riparian areas can use more or less the same amount of water, they do not grow in as densely as the tamarisk. Due to this, the West is probably losing from 2- 4.5 million acre-feet of water per year because of tamarisk. This is enough water to supply more than 20 million people with water for one year or to irrigate over 1,000,000 acres of land.

What methods have been used to control tamarisk?

Chemical methods involve cutting the stump of a tamarisk two inches above the soil surface and treating it with herbicide within minutes. Another herbicide can be applied near the base of the trunk when the bark is not wet or frozen. Tamarisk foliage can also be sprayed with herbicide in the fall. Unfortunately, re-growth often appears with any of these methods and re-treatment is necessary to kill the shrub.

Mechanical controls include mowing, cutting and root plowing. However, these methods rarely kill the plant and often stimulate shrubby re-growth. Tamarisk is also adapted to fire and recovers more quickly than native riparian species after a burn because it sprouts vigorously from the root crown.

Biological controls use living organisms to suppress tamarisk. The extensive invasion of tamarisk has justified the search for a suitable biological control agent. The tamarisk or saltcedar leaf beetle, *Diorhabda elongata*, has been tested for 15 years and has been released at test locations in the western U.S.

What is the role of the beetles (biocontrol)?

Beetles are a biological control used in efforts to reduce or eradicate tamarisk. The beetles are a natural control agent from areas in the world where tamarisk originated. After much study, the beetles were brought to the U.S. in an attempt to stem the tide of the tamarisk invasion. Beetles and larva consume the foliage of the tamarisk plant, thus reducing chlorophyll production and photosynthesis, which reduces the food (starches and sugars) that is made for the plant. This process should weaken and potentially kill the plant over time.

When and how were the beetles released?

Tamarisk biological control began in the 1970s with the study of potential control insects by USDA-ARS (United States Department of Agriculture - Agricultural Research Service). Quarantine testing of insects began in 1992. Approval to begin field testing was given in 1999 and the beetles were released in outdoor cages in research areas at 10 sites in 6 states (CA, NV, UT, CO, WY & TX). In 2001, the beetles were released from the cages at these 10 sites.

In 2004, A.P.H.I.S (Animal and Plant Health Inspection Service, USDA) personnel opened the Delta, UT, site to the collection of the tamarisk beetles and larva for Utah agencies and organizations and subsequent release of collected beetles and larva within Utah. Beetles and larva could be moved and released on private and certain state lands (no federal lands). Individuals with knowledge of biological control, from Grand County, Utah collected beetles and larva from the Delta site and distributed them to approved sites in Grand County, with two sites receiving two separate releases in 2004.

How long will it take for the beetles to kill off the tamarisk?

To “kill off” a tamarisk plant without chemicals or removal of the total plant and roots from the ground is difficult. However, repeated defoliation of the plant leads to a reduction in photosynthesis and thus food for the plant/roots. With each defoliation a decrease, or die off, of some of the root mass should occur. If this happens repeatedly and the plant isn’t allowed to grow new foliage and retain it for an extended length of time, it is possible to kill the plant. Studies suggest that a tamarisk tree can be killed within 3-5 years of beetle infestation. Time estimates vary depending on the size of the plant and its root mass, how often it’s defoliated, and the resilience of the individual plant.

Will these beetles eat other types of vegetation?

Extensive testing was undertaken and some non-target feeding was seen on *Frankenia*. Tamarisk and Frankenia are members of different plant families within the same order (*Tamarricales*). Studies suggest that the larvae can feed and develop on *Frankenia* but adult beetles are much less attracted to this plant, and lay eggs less frequently on Frankenia than on tamarisk. The second generation of beetles is even less likely to lay eggs on Frankenia.

Are there any predators that could control the beetle population?

Birds have been known to feed on the beetles and there are reports of a wasp that parasitizes the beetle. However, when an insect only feeds on one plant and when that plant population is reduced or eliminated, the population of that insect drops off dramatically. Should the beetles significantly reduce the tamarisk population locally then the beetles themselves will die off.

Are there other areas where the beetle is being used to control tamarisk?

There are the six states where initial studies and releases took place (CA, NV, UT, CO, WY & TX). There are a number of sites in Utah where the beetle has been released since 2004. In August 2005, there were also 24 sites in Colorado, Idaho, Kansas, Montana, Oregon, South Dakota and Wyoming where releases took place. There may have been more releases at these and other sites since.

What happens after the beetles have defoliated the tamarisk?

Once the tamarisk has been defoliated it can no longer photosynthesize and eventually this will kill the tree. Estimates vary and can depend on several variables including the vigor of the tree and the duration of exposure to the beetle. Recent observations from the Delta, Utah release site indicate that a tree can be killed within 3-5 years of beetle infestation.

What will happen when the trees die?

Natural revegetation has been seen in some areas where tamarisk has been removed and certainly is expected in other areas should the tamarisk be killed. Revegetation may be required in some areas and is being planned for by the various agencies involved with this process. However, if the tamarisk and the dead leaf material on the ground are not removed, it may prove very difficult for natives to establish themselves due to the salinity of the soils created by tamarisk.

What will replace the tamarisk?

It depends on the site-specific conditions. Native vegetation may replace the non-native tamarisk in some areas, and weedy species may replace the tamarisk in others. There is also an expectation that there will be some sprouting from seed sources for as long as any tamarisk exists along the Colorado River. Monitoring will be required to document what species naturally replace the tamarisk, as well as to identify areas that may need additional treatment or revegetation efforts.

How will this affect wildlife habitat?

Studies have shown that the diversity of wildlife is much higher in native habitat than in non-native habitat. Wildlife biologists believe that the removal of non-natives such as tamarisk and the restoration of native habitat will enhance the overall quality of the wildlife habitat.

How long will it take to get rid of tamarisk?

Land managers have been working on tamarisk removal projects along rivers in the West for decades and progress to date has been slow. However with the advent of the potential region-wide beetle kill of tamarisk, the process will probably proceed at a much faster rate. The current goal is to eventually achieve 70-85% removal of the existing population and replacement with native vegetation. This process will require many years before we see any significant change.

Will we ever get rid of the tamarisk completely?

Probably not. Tamarisk has become naturalized here in the western U.S. and total eradication efforts are now considered unfeasible (too costly and time-consuming).

What will happen with tamarisk-infested areas in 10 to 15 years?

The latest estimates from land managers and researchers is that the beetle will probably contribute to the browning out and eventual mortality of 70-85% of tamarisk in infested areas over the next several years. Several factors may affect this scenario. Will the beetle thrive and survive long enough to impact the tamarisk to this degree? Will other factors come into play that will either accelerate this time frame or impede the progress of the beetle? Monitoring efforts are necessary to provide feedback and direct follow-up efforts.

Where will the money come from to fund the restoration process?

Past and present restoration projects have been funded through private donations, grants, and in many cases agency budgets. However, in October 2006, President Bush signed a tamarisk control law that authorizes spending \$15 million annually to help eradicate tamarisk and support restoration efforts. Several federal and state agencies, non-profit organizations and private entities have recently joined together to secure this federal funding, in order to undertake this monumental task of restoring the Colorado River Corridor.

Who is responsible for removing the tamarisk and restoring the native habitat along the riverways?

The riverways traverse both public and private lands. Private landowners have a responsibility to remove tamarisk, in any area where it is listed as a noxious weed. Government agencies are required through their own mandates to control noxious weeds on federal lands. It is hoped that through a coordinated effort, a more systematic approach will be taken to restoring native habitat in targeted areas along the riverways.

Is there a plan in place for restoration efforts along the riverways?

Restoration efforts along the riverways have been and continue to be conducted by federal, state agencies, private entities and non-profit organizations. Multiagency groups have formed in Colorado and Utah to work collaboratively on riverside restoration strategic plans. Some of these plans have been completed and are now in the implementation process.

How can I help?

Join the collaborative effort. Become informed. Contribute to the cause by donating money, writing grants, and volunteering for tamarisk removal and revegetation projects..... Tell others!

Where can I get additional information?

Visit websites such as The Tamarisk Coalition at: www.tamariskcoalition.org, the University of Utah Extension Service at: <http://extension.usu.edu> or pick-up brochures available from the above offices.