

Environmental concerns

Research on the tamarisk leaf beetle has been one of the largest undertakings in biological control to date. More time has gone into assessing the beetle's impact on native, agricultural, and ornamental species than has gone into any other biological control project. However there will always be risk when releasing a foreign organism into a new environment.

Each potential release site is assessed individually for a variety of factors before the U.S. Department of Agriculture will authorize a permit.

One potential environmental impact the beetle may have is on the southwest willow flycatcher, an endangered bird. Because of changes in riparian areas, southwest willow flycatchers do not have many native willows to nest in, and have begun to nest in tamarisk. Research is currently being done on the impacts of releasing the beetle in areas with the southwest willow flycatcher, but permits are not authorized for willow flycatcher habitat that might be harmed by the release of the beetle.



Southwest Willow Flycatcher

Overall control of tamarisk

Release of the beetle is only one method in our current toolkit to combat tamarisk, and it is important to note there is no silver bullet when it comes to the control of tamarisk. Management of tamarisk consists of five components: inventory and mapping, control, revegetation, monitoring, and maintenance. With all five components it is likely that tamarisk control projects will have long-term success.

Partners

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U.S. Geological Survey

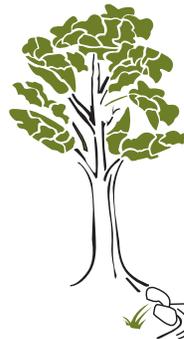
U.S. Department of Agriculture

Forest Service
Natural Resources Conservation Service
Agricultural Research Service
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Colorado Department of Agriculture

Palisade Insectary

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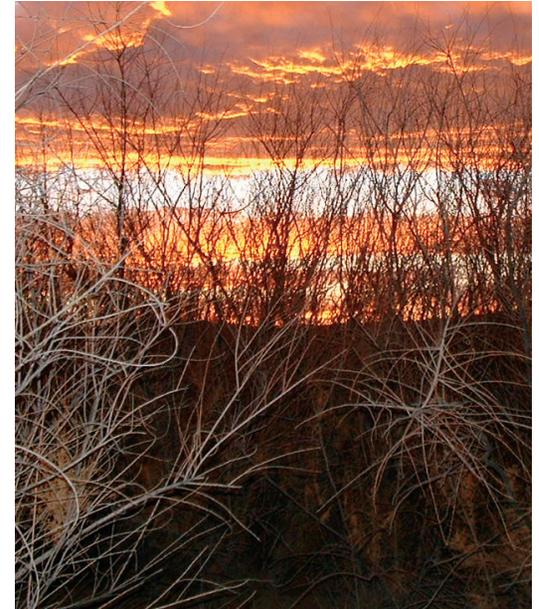
<http://www.tamariskcoalition.org>

a non-profit alliance
working to restore riparian lands

Tamarisk Coalition

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Sunset on tamarisk



Biological control with the tamarisk leaf beetle



—Tamarisk leaf beetle (actual size)

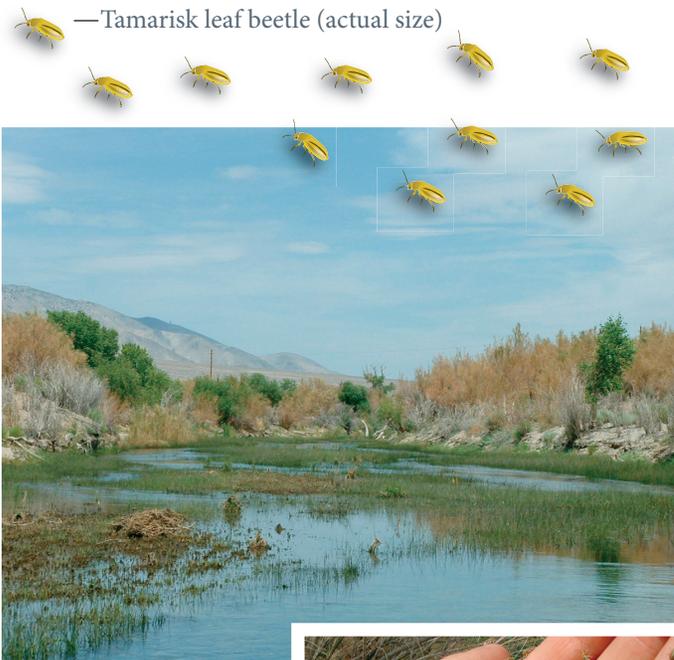
How tamarisk leaf beetles affect tamarisk

Diorhabda elongata, or the tamarisk leaf beetle, feeds on tamarisk by massing on a single plant in the thousands. An adult beetle lays eggs and both adults and larvae defoliate the tamarisk plant. A female beetle can lay as many as 750 eggs in her lifetime, which is 15 times the female beetle's body weight. It takes about a week for the beetles and larvae to defoliate a single tamarisk plant, depending on the size of the plant. When the beetles are done, the larvae travel along the ground, and the adult beetles fly until it finds another tamarisk plant. It will likely take about three years for a colony of beetles to kill a single tamarisk.

Beetle characteristics

Imported from Fukang, China, the Tamarisk leaf beetle can survive in both harsh winter climates, as well as hot summers. The beetle also survives better in latitudes with longer summer days, because days shorter than 14 hours will trigger the beetle to enter hibernation. This makes release of the beetle unsuitable beneath the 37th parallel, or below the southern borders of Colorado and Utah.

Both birds and ants eat the beetle, but the beetle may have a defense mechanism that secretes a chemical to detract predators, ants especially.



Above: A wetlands area where the tamarisk leaf beetle have defoliated tamarisk (brown plants), but have left the natives (green plants) alone.
Right: An entomologist holding tamarisk leaf beetles.



Tamarisk

Riparian lands in the west have been severely impacted by many activities and actions but none so much as the invasive plant tamarisk (*tamarix spp.*, also known as salt cedar).

This deciduous shrub or small tree from Eurasia has displaced native vegetation on approximately 1.6 million acres of land in the Western United States and will continue to spread.

Tamarisk characteristics

- Tamarisk is a tenacious plant that has a deep root system that can reach 100 feet.
- Its leaf litter deposits a salt residue on the soil.
- It quickly resprouts after wildfire.

The problem

Tamarisk thickets have a negative effect on the surrounding environment by

- narrowing and channelizing streams and rivers;
- displacing native vegetation such as cottonwoods, willows, and adjacent dryland plant communities;
- providing poor habitat for livestock, wild animals, and birds;
- increasing wildfire hazards;
- limiting human use of the waterways;
- having a reputation for using more water than the native vegetation it displaces.

What biological control is

Many plants from both Europe and Asia have been brought into the United States for use in a variety of purposes such as use as windbreaks, for erosion control, and as ornamentals in landscaping. When tamarisk was introduced to the United States, none of the 300 insects that feed on the plant in Europe and Asia were intentionally brought with it, and very few native insects will feed on tamarisk. Without natural enemies and with characteristics that allow tamarisk to outperform its native counterparts, tamarisk has vigorously spread and has become invasive throughout most of the Western U.S.

Biological control is the reunification of an organism with its natural enemies. A biological control method identified for tamarisk is a beetle from China that has been feeding on tamarisk for millions of years, just not in the United States.

History of tamarisk biological control

Overseas exploration uncovers several promising agents, including tamarisk leaf beetle.



1986



First open releases approved. 2001

An additional 24 releases approved in the western United States. 2005



1995 Nine years of lab work shows beetle is host specific to tamarisk.



2004 Initial releases show extensive defoliation at Lovelock, Nev., site.