

The Politics and Science of Tamarisk

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Abstract—*Tamarisk* is a woody invasive weed of riparian areas which has galvanized an amazing array of scientists, politicians, ranchers, farmers, tribal people, and many other interested parties because of its devastating impacts on natural ecosystems and valuable water ways in the west. Rarely has a single plant become such a catalyst for so many people to use as a “poster child” for a variety of interesting issues. Among these issues are water resource issues, soil quality, land use issues, wildlife habitats, access to federal funds to support local community initiatives, and support for research on a plant with an amazing ability to invade and alter natural habitats. This collective effort to understand and manage a major water robbing plant in riparian ecosystems is due to the efforts of many people, many organizations, and to the vision provided by a group such as the tamarisk coalition. The science of tamarisk is currently focused primarily on genetic diversity, biological, chemical, and mechanical control, mapping of tamarisk infestations, flooding impacts on tamarisk dynamics, wildlife impacts, and ecosystem restoration. Because tamarisk is spreading at such a large scale, significant resources will be required to halt the negative impacts caused where it invades.

Political action by congress and many agencies suggest that the necessary resources to support tamarisk science, education, and management may help in the battle to control this invasive weed. Tamarisk is providing a novel and revealing project around which both rural and urban citizens can rally for economic, environmental, and recreational benefits.

The Problem

The plant genus *Tamarix* includes several weedy species that have proven to be very successful invaders of prime riparian habitats in much of the western United States. They primarily invade the banks of rivers, streams, and reservoirs, but in some places they are moving into adjacent upland areas where they displace native vegetation. These foreign plants originated in Eurasia and Africa in semi-arid environments where their unusual biological characteristics developed. There are approximately 54 species in the genus *Tamarix*; of these approximately 10 have been introduced into the United States. It now appears that several of these species can interbreed to form new hybrid forms of saltcedar. Since they were introduced to the United States, they have been able to colonize millions of acres due to their aggressive invasive abilities and a lack of natural enemies which might have kept their spread in check.

The most commonly encountered *Tamarix* plants include *Tamarix ramosissima* (saltcedar), *T. chinensis* (Chinese tamarisk), and *T. parviflora* (smallflower tamarisk). Of these, *Tamarix ramosissima* is the most widespread and the weed which attracts the most research attention although saltcedar and Chinese tamarisk appear to be very closely related.

The negative impacts of salt cedar have been documented by various researchers in various regions where salt cedar has successfully colonized significant amounts of riparian ecosystems. These negative impacts include the following:

1. Luxury water consumption by this invasive weed is cited as a universal threat across the region to sustainable stream and river flows, to reliable water supplies for irrigation in agriculture, and for water demands by increasing urbanization which is occurring in many areas where salt cedar is found. Salt cedar can have a profound negative impact on stream and underground hydrology, to the point where streams or reservoirs can dry up due to water use by salt cedar.
2. Salt cedar, which was originally introduced for stream bank stabilization, has often done too good a job of stabilizing stream banks to the point where channel characteristics have been dramatically altered. In severe cases, flood plains surrounding streams have silted in due to the impediment salt cedar presents to flowing water, thereby forcing the streams into ever narrower channels. In some unusual cases, salt cedar becomes so dense that water flow ceases.
3. Salt cedar accumulates salt in its scale-like leaves, and when they drop to the soil surface, these leaves increase the salt contents of surface soil layers to the

point where many native species cannot germinate or thrive.

4. Salt cedar commonly creates dense monoculture stands which exclude desirable native species, thereby altering riparian biodiversity and adversely impacting recreational use of riparian areas for hunting, fishing, and camping. Heavy salt cedar stands can be prone to intense fires which can themselves alter the plant community. Once salt cedar becomes established, it is very difficult for other desirable species to penetrate and dominate such degraded plant communities.

The Politics of Salt Cedar

Many scientists and people knowledgeable about riparian ecosystems have known for more than 20 years that salt cedar was an aggressive invader that presents serious challenges for management. Over the past 4 years, many people have helped make politicians and policy makers aware of the threats salt cedar poses to both rural and urban populations. Much of the increased political interest in salt cedar is driven by drought, water conservation, and water law concerns. Managing salt cedar in infested water ways is seen as a cost effective way to improve water use efficiency while improving the environment of riparian ecosystems. Groups such as the Tamarisk Coalition from Grand Junction, CO, have helped educate and inform members of congress of the seriousness of the salt cedar issue. In particular, Tim Carlson of the Tamarisk Coalition has been instrumental in educating people at many levels about salt cedar issues, and in bringing different groups together to attack salt cedar. Researchers and citizens from Texas and New Mexico have also had a major impact on getting politicians to support salt cedar legislation. Both houses of congress have now passed salt cedar management legislation and once funding is appropriated to support these efforts, up to \$100,000,000 may be available to support management and research efforts on salt cedar. Because of its strong negative impact on water issues, salt cedar has become a “poster child weed” for an amazing coalition of groups and organizations who all hope to work together to battle salt cedar. While some states have dedicated commendable dollars to combat salt cedar, management at a regional level will require substantially bigger sums of financial support. Ongoing political activities must be targeted at getting funding appropriated to support salt cedar management and research activities.

In the weed science community, increased interest in salt cedar research and management has been evident in the 2004 Salt Cedar Symposium sponsored by the Western Society of Weed Science in Colorado Springs, CO. Many of the PowerPoint presentations from this symposium will be posted at the www.invasivespecies.gov website. In March of 2004, Team Tamarisk held a workshop in Albuquerque, NM, to bring together researchers and land managers at a national level to discuss and coordinate salt cedar mapping and management activities. The compiled results of this important meeting, attended by nearly 400 people, is now available at their web site.

The national Weed Science Society of America has appointed a special “salt cedar committee” to coordinate research, education, and management options developed by the weed science community. Our activities include collaborations with plant ecologists, precision mapping experts, biocontrol experts, and molecular biology scientists who bring special skills to the complex family of species in the genus *Tamarix*. Integrated multi-scale mapping of salt cedar in the United States is being coordinated through the USGS program of Dr. Tom Stohlgren in Ft. Collins, CO. This effort is a web based effort to allow people to input salt cedar monitoring data into a centralized data base showing where salt cedar occurs. Researchers from Colorado State University and the Denver Botanical Gardens have teamed up with the Colorado state weed coordinator Eric Lane to launch an ambitious salt cedar project on the upper Arkansas River, where the integrated effects of mechanical, chemical, biological, and ecological control will be evaluated over several years. While each of these four major control tactics has its strengths and weaknesses, it likely will require an integrated approach to provide long term salt cedar management. In the process, it will be important to support on going salt cedar research with the hope of developing new tools to combat this invasive weed.

Selected informative salt cedar web sites:

<http://www.invasivespecies.gov/education/workshop-Jun96/index.html>

<http://www.tamariskcoalition.org/>

<http://www.montana.edu/wwwpb/pubs/mt9710.html>

<http://invasivespecies.gov/profiles/saltcedar.shtml>

<http://www.invasivespecies.gov/teamtam/>

<http://squall.nrel.colostate.edu/cwis438/tmap/index.html>