but anyone who benefits from the current dammed state of the Rio Grande must share the responsibility for Saltcedars' grip on the river.

Individual landowners can pursue Saltcedar eradication programs on their own property. The US Department of Agriculture, through such programs as the Continuous Conservation Reserve Program (CCRP) and others, can provide landowners with funds to carry out restoration in riparian buffer zones. These programs generally require a cost-share responsibility on the landowner's part but can provide tax breaks as well.

The greatest challenge to eliminating Saltcedar, however, is keeping it from coming back. A landowner might eliminate Saltcedar on his own property only to find it re-encroaching from neighboring lands. Still, with continued effort, isolated pockets of native habitat can be maintained, such as in Bosque del Apache and Santa Ana Pueblo.

Millions, perhaps billions of dollars would be required to make a dent in removing Saltcedar populations from the Forgotten River stretch of the Rio Grande, and at that level of funding the federal government would almost certainly need to be a sponsoring partner. Such an effort would require a collaboration between federal and state agencies, landowners and the public.

In the Forgotten River stretch, a program to involve and/or coordinate with Mexican landowners would have a greater impact. A concerted, long-term, federally-supported Saltcedar elimination campaign could be undertaken that would go a long way toward restoring some economic and ecological value to the Forgotten River.

<u>For more information on landowner conservation programs, contact:</u>

The Resource Conservation and Development Council for the Chihuahuan Desert, based at Sul Ross University in Alpine, Texas.
(915) 837-8247

The USDA Natural Resource Conservation Service office, El Paso
(915) 855-0884
and Alpine: (915) 837-5864

The Forgotten River Advisory Committee and its partners are dedicated to finding ways to ensure that the Rio Grande is recognized and protected for its integrity as a dynamic living system, capable of supporting aquatic life and sustaining riparian habitat. These ways include educating people about the river, commenting on policies that may detrimentally affect the river, and working together and with agencies in the U.S. and Mexico to promote more sustainable policies at the state and national level.

<u>The Forgotten River Advisory Committee:</u>

Rio Grande Restoration
Farflung Adventures
FLO Engineering
Bosque del Apache National Wildlife Refuge
Southwest Environmental Center
Texas Center for Policy Studies
World Wildlife Fund
Consortium for the Rio Grande
El Paso/Trans Pecos Audubon Society
Big Bend National Park
Rio Grande/Rio Bravo Basin Coalition

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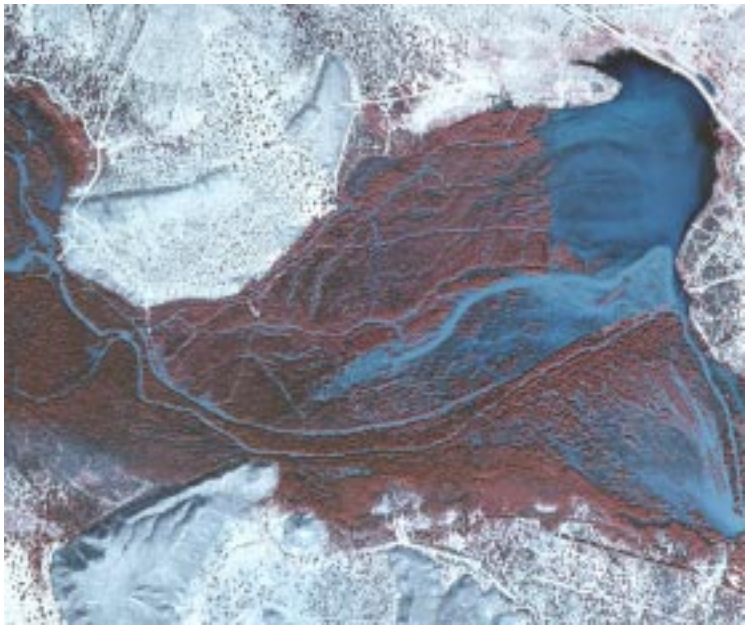

USGS Quad, Indian Hot Springs NW: 10/19/97. Satellite photo of Forgotten River segment, illustrating the extent of Saltcedar damage. Tamarisk monoculture is seen in red while Rio Grande main channel is largely obliterated. Photo courtesy Texas Natural Resource Information Service, via the Bureau of Reclamation.

Can Eliminating Saltcedar Save the Forgotten River?

October, 2001

A newsletter of the Forgotten River Advisory Committee
For people interested in the Rio Grande

The Forgotten River stretch of the Rio Grande trickles through rural west Texas, roughly from below Fort Quitman to the Rio Conchos juncture near Presidio. Traveling the Forgotten River and the counties through which it passes sparks the imagination and conjures images of the Old West. Imagining what the area must have once looked like is all one can do today: as much as the river is impacted by a lack of water, the region is impacted by a lack of economic opportunity. Poverty rates in Hudspeth and Presidio counties hover around 34%, and Presidio's 38% unemployment rate is the highest in the state.

A recent assessment of the region conducted by Fermata, Inc. indicates there is great potential for nature tourism to blossom here, with the appropriate marketing and infrastructure in place. For nature tourism to occur in areas of the Forgotten River, restoration of some of the river's core assets will need to be undertaken as well—core assets that have been largely obliterated by several factors, chief among them a severe infestation of exotic Saltcedar.

Saltcedar (*Tamarix*) is an invasive exotic shrub or small tree, introduced to the U.S. from Eurasia in the early 1800's. It is estimated that over one million acres of Saltcedar have spread along rivers and streams in the South and West. To many who have had to deal with

Saltcedar stand, Bosque del Apache NWR
Photo courtesy Gina Dello Russo

Tamarisk, the image of Saltcedar is a prolific, water-slurping, salt-producing plant that has replaced native Cottonwood and Willow trees so extensively and effectively that it is often the dominant riparian species where it is found. Saltcedar reduces biodiversity, lowers water tables, and has little economic or ecological value.

Early efforts at biocontrol of Saltcedar were stalled briefly when the Southwest Willow flycatcher, a Saltcedar nester, was placed on the endangered species list. However, studies show that the flycatcher's nesting preference has more to do with the fact that Saltcedar has become the dominant species in much of the bird's range. Replacing Saltcedar monocultures with diverse habitats of native species could not only restore the flycatcher's historic nesting grounds, but also attract a greater variety of birds and other wildlife necessary to improve viewing opportunities for nature tourists.

Furthermore, since a mature Saltcedar can consume as much as 200 gallons of water a day, clearing large stands in some areas has had a dramatic positive effect on the water table, often restoring entire wetlands. While clearing Saltcedar has not been shown to increase downstream surface water flows, riparian habitat could be vastly improved, and alterations in the river system caused by Saltcedar may be reversed.

Achieving true restoration in the Forgotten River stretch would ideally involve more than simply removing Saltcedar. The system historically benefited from periodic flood flows that supplied the inundation needed for germination of native trees and contributed backwater ponds for migratory and native waterfowl. The construction of Elephant Butte Reservoir largely halted natural flooding, however, and water in the Forgotten River stretch is mostly composed of return flows from El Paso/ Juarez municipal use and irrigation downstream of the sister cities. Due to extreme competition for water supplies—both surface and groundwater—in this region and elsewhere, securing additional flows for ecosystem restoration would be a protracted and difficult endeavor.

Some Bureau of Reclamation and IBWC personnel believe that significant flow (at least 200,000 acre feet) makes it all the way through the system from Fort Quitman to the Conchos confluence. However, the type of flooding regime that might be needed to restore riparian habitat is less dependent on continuous flow than on timed releases, and there is no infrastructure in place to hold and release these flows.

What about buying water rights to boost flows? Even if funds were available, and even if all current water rights holders in this stretch were to sell their rights, there is not enough to provide a significant amount of additional instream flow (less than 30,000 acre feet), and no way to fulfill these rights at a particular time and place as they are "run-of-river" flows. In other words, the right can't be exercised unless the water is in the stream.

Elimination of Saltcedar would at least initiate the restoration process. Several projects in New Mexico and Texas to eliminate Saltcedar and restore riparian vegetation have been successful. Costs vary according to the methods used. Mechanical removal of the tree is probably the most expensive, with costs ranging from $600 to $825 per acre, but this is the most ecologically safe alternative. Renting and operating equipment, as well as labor costs, are generally the highest expenditures.

Mechanical removal targets only Saltcedar and does not introduce chemicals into the environment. Bosque del Apache National Wildlife Refuge in

Restored area on Bosque del Apache NWR
Photo courtesy Gina Dello Russo

Socorro, New Mexico and Santa Ana Pueblo, near Albuquerque, have both used this method. Mechanical removal involves a combination of root plowing, burning brush, controlling re-sprouts and replanting native Cottonwood and Willow. Lajitas Resort, near Big Bend, has also used mechanical means to remove some 200 acres of Saltcedar and plant native woody and herbaceous species.

Efforts at chemical control of Saltcedar have been carried out in the Upper Pecos River, involving a variety of herbicides. Imazapyr (brand name Arsenal) and glyphosate (Rodeo and Roundup) are most commonly used. Chemical control is cheaper (estimates range from $85 to $200 per acre), requires much less labor, and kills a larger percentage of plants. However, while the herbicides used are generally non-toxic (at least in short-term tests) to organisms, they also kill all other plants they come into contact with. Aerial spraying and the potential for drift may be a concern in areas where Saltcedar is interspersed with other native species, and along waterways, though Rodeo is approved for use near aquatic sites.

Bio Control shows some promise. The Saltcedar is kept in check in its native range by insects such as the Chinese leaf beetle (*Diorhahda elongata*). After being tested in field cages in 1999, this species is now being released into the environment in Texas and Colorado for use as a biocontrol agent against Saltcedar. Scientists have high hopes that the beetle will act to limit Saltcedar's success, though it is not expected to eliminate the plant entirely. There appears to be no immediate concern that this beetle, itself an exotic species, will prey on other native vegetation or have a detrimental impact on local ecosystems. Only time will tell if the beetle can inflict enough damage to beat back Saltcedar throughout the region.

Who should be involved in Saltcedar removal and restoration? Saltcedar affects landowners, management agencies, wildlife, and communities in many segments of the Rio Grande. The plant's rapid expansion may be a result of good intentions with unintended consequences,