

## The Dispersion of *Tamarix ramosissima* on the Quivira National Wildlife Refuge

Jessica L. Miller

### ABSTRACT

*Tamarix ramosissima*, or saltcedar, is an invasive plant now widely spread throughout the United States. Introduced to the United States in the 1800's, this plant has now become a nuisance in the Southwestern states. They have become a large problem on the Quivira National Wildlife Refuge located in central Kansas. The main riparian environment located on this refuge is the Rattlesnake Creek, along which a vast majority of this invasive plant population is now taking over. Because refuge managers are contemplating on implementing an invasive species control program, they are interested in finding out how far along the Rattlesnake Creek saltcedar has spread. The main object of this project was to map the distribution of this invasive plant along the Rattlesnake Creek on the Quivira National Wildlife Refuge. Distribution mapping uncovered the fact that this invasive plant has indeed spread along the Rattlesnake Creek entirely, as well as the fact that predictable patterns of growth are also occurring.

Keywords: *Tamarix ramosissima*, saltcedar, Quivira National Wildlife Refuge

### INTRODUCTION

The plant *Tamarix ramosissima*, also known as tamarisk, or saltcedar, is an invasive plant. *Tamarix ramosissima* is one of five species of *Tamarix* now found in the United States. Saltcedar is now a nuisance in the Southwestern United States, because it absorbs large amounts of water and creates large salt deposits in the surrounding soils. The plant increases soil salinity by taking in the salt in the water and then either secreting it from its salt glands or by losing its leaves (Hart, 1999). These plants cause such a problem because they inhibit the growth of other, native, plant species.

Saltcedar was originally introduced as an ornamental plant in the mid 1800's. According to Hart, the spread of saltcedar began in the 1870's when it was discovered beyond its original area of introduction. However, the greatest amount of spread occurred between 1935 and 1955 (Hart, 1999). Saltcedar is mainly found in Arizona, Colorado, Kansas, New Mexico, Texas, Utah, and Wyoming, (Hart, 1999) but has been found to have spread to Montana, and even as far south as Mexico (DiTomaso, 1996). Saltcedar has very small seeds, which spread primarily by wind or water.

Saltcedar is now a growing problem on the Quivira National Wildlife Refuge near Stafford, Kansas. The main source of water to this refuge is the Rattlesnake Creek, which runs completely through the refuge. Because saltcedar prefers riparian, or streamside environments, a majority of the spread of the plants on the refuge has occurred along the Rattlesnake Creek.

Currently, there is no invasive plant control program set up at Quivira, so the saltcedar populations remain undisturbed. Refuge managers see the spread of these plants as a problem and are

currently trying to minimize the takeover of saltcedar, and eventually rid the refuge of it completely. They are also interested to see how saltcedar has spread through the refuge. The purpose of this research will be to track the spread and dispersion of saltcedar along the Rattlesnake Creek through the Quivira National Wildlife Refuge.

### MATERIALS AND METHODS

The Rattlesnake Creek enters the refuge from the West, runs north for about eight miles, and then exits the refuge at the very Northeast section. Distribution mapping started where the creek enters, and followed until reaching the point at which it leaves. The only material needed for this exercise was a map of the Quivira National Wildlife Refuge. The map was used to mark where saltcedar was located, and how far along the creek they had spread.

### RESULTS

After following the flow of the Rattlesnake Creek from the west boundary of the Quivira National Wildlife Refuge to the east boundary, I found saltcedar has spread along the entire length of the creek, except for when the creek was in close proximity to larger bodies of water, as shown in Figure 1. I also found that plant size, plant spacing, and plant stand size were not consistent. I did find a seemingly predictable pattern of the plant growth. Since the Rattlesnake Creek has many meandering bends, I noticed that a majority of the saltcedar growth occurred on the "inside" of the bend where the least amount of erosion due to water flow occurs. There were a few instances where growth occurred on both

sides of the creek, but the size and number of plants was not substantial, suggesting that they were minor exceptions.



**Figure 1- Map of Quivira National Wildlife Refuge.** This map of Quivira shows the main bodies of water on the refuge, as well as the Rattlesnake Creek. The yellow highlighted areas indicate portions along the Rattlesnake Creek where saltcedar were located. Each square of the grid overlay represents one square mile

## DISCUSSION

Because the spread of saltcedar along the Rattlesnake is substantial, it would be a suggestion that the managers of Quivira National Wildlife Refuge implement an invasive species control program. While portions along the creek are fairly sparse, other areas are quite dense, and as time goes along, the spread may get to a point where the inhibition of plant growth will become even more problematic than it already is. Another observation that was made was that the spread of this plant has occurred beyond the boundaries of the refuge. One concern with this is the re-invasion of saltcedar into the refuge. If one wanted to continue this project, it would be suggested that they start observing growth where the Rattlesnake Creek truly begins, and whether re-

invasion of saltcedar into the refuge would be more likely to occur from upstream or downstream reaches.

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