

San Juan River - Montezuma County Tamarisk Mapping & Inventory Summary

Inventory Background & Objectives – In 2006, the Tamarisk Coalition completed an inventory of tamarisk infestations in the San Juan River watershed of Montezuma County for the Colorado Water Conservation Board (CWCB). The purpose of this work was to economically provide a clear understanding of the extent of the tamarisk problem in Montezuma County on non-tribal lands. Ute tribal lands are being surveyed separately and will be available through tribal agencies.

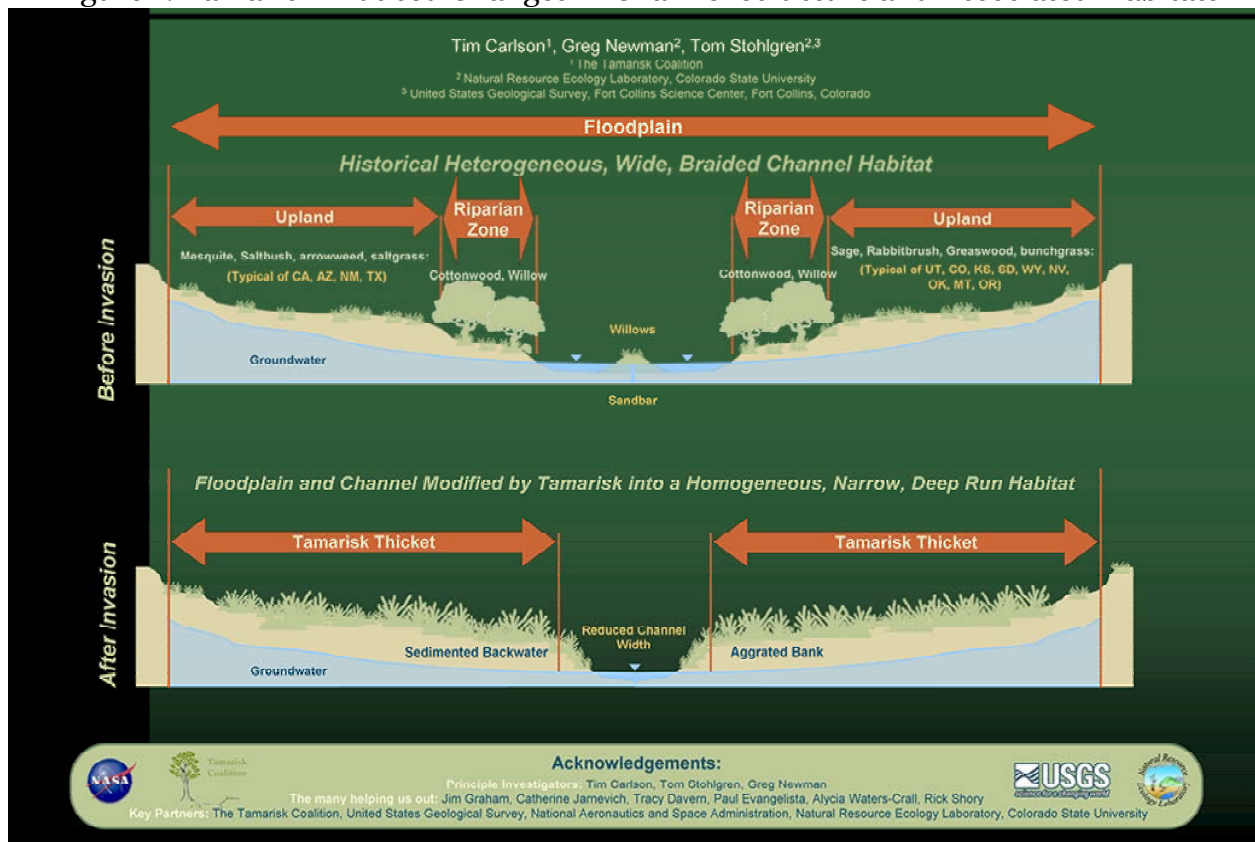
Inventory Approach – Inventory and mapping were coordinated with the U.S. Geological Survey's (USGS) efforts at establishing a national on-line database which would conform to the weed mapping standards developed by the North American Weed Management Association. The basic approach was to use existing aerial photography and satellite imagery and local knowledge available from counties, river districts, soil and water conservation districts, state agencies, Army Corps of Engineers, National Resources Conservation Service, USGS, CSU, and The Nature Conservancy. This information was then “ground-truthed” by a 2-man team to confirm infestation density, maturity, accessibility, presence of native species, and several other site characteristics. GPS data and digital photo records were taken and shape files were developed utilizing GIS capabilities at Mesa State College. Approximately 50 miles on McElmo Creek, 20 miles in Yellow Jacket Canyon, and various areas surrounding Cortez in Montezuma County were surveyed using this approach. This information, in the form of shape files and characteristics data, has been transformed into a digital GIS database which soon will be available on the USGS invasive species website, www.niiss.org.

Finding – The inventory for the major tributaries in Montezuma County is presented in Tables 1 through 4 (included in folder “Montezuma County Data Tables 1-4” as an Excel file). Table 1 presents the general mapping data; whereas, Tables 2 provides information on estimated current water and future water losses associated with the tamarisk infestations and the estimated costs for tamarisk control and revegetation. Tables 3 and 4 provide detailed information on each infested area and its unique attributes. These water losses and cost estimates are based on the most recent research and statistical analysis available through the USDA, NOAA, USGS, CSU, National Invasive Species Council, Tamarisk Coalition, and others. The following represents our findings:

1. McElmo Creek and Yellow Jacket Canyon have approximately 1,800 total acres of tamarisk infestation at 29% average density. Areas surrounding Cortez support an additional 250 acres of tamarisk infestation at approximately 19% density.
2. Current water losses are based on the amount of water tamarisk is currently using under observed densities minus the water that would be used by native plants. Figure 1 represents the differences in vegetative cover with and without tamarisk and illustrates how tamarisk will occupy an area much greater than the riparian zone which typically would support cottonwoods and willows, also phreatophytes. The significant water losses occur as tamarisk occupies upland areas within the floodplain that would normally have dryland xeric vegetation such as grasses, sage, rabbit brush, etc. Based on the percentage of upland tamarisk infestations in Montezuma County, the estimates of current water losses above and beyond what native vegetation would use are:
 - a. McElmo Creek = 1,100 acre-feet per year.
 - b. Yellow Jacket Canyon = 280 acre-feet per year
 - c. Areas North, South, East and West of Cortez = 150 acre-feet per year.

3. Future water losses assume an infilling of the existing infestation areas that will likely occur over the next several decades based on similar conditions observed in other states (NM, UT, and NV). Future water losses from infilling only (no expansion from existing infested areas) are estimated to be:
 - a. McElmo Creek = 4,100 acre-feet per year.
 - b. Yellow Jacket Canyon = 950 acre-feet per year
 - c. Areas North, South, East and West of Cortez = 750 acre-feet per year

Figure 1: Tamarisk Induced Changes in Channel Structure and Associated Habitats



4. Costs for tamarisk control and revegetation are based on current work being performed by the National Invasive Species Council on an economic model that incorporates *Integrated Pest Management* practices with planning, design, control, revegetation, monitoring, and maintenance activities. This information is contained in the folder “Options for Non-Native Phreatophyte Control” as a PDF file. Estimated costs for Montezuma County are:

Economic summary

River	Total Costs*	Average Cost per Acre Treated*	Average Cost per Acre-foot of Water Preserved*	Average Cost per Mile*
Montezuma County	\$1,660,000	\$800	\$1,050	N/A

* Rounded values from Tables 2 (included in folder “Montezuma County Data Tables 1-4” as an Excel file)

5. If tamarisk control and revegetation occurs on any of these tributary sections, the water lost to the atmosphere through evapotranspiration will be saved and will remain within the groundwater and/or surface water regimes.
6. The costs of water retained within the hydrologic system of approximately \$1,000 per acre-foot should be compared to the value placed on the purchase of senior water rights because tamarisk is always using water even during a drought.
7. The method used to develop this inventory information is predicted to identify 85 to 90 percent of tamarisk within Montezuma County. The remaining percentage represents small pockets of infestations that are scattered throughout the region. Because these outlying infestations are not included in the cost development, approximately a 20% contingency should be added to these cost values to account for their identification and remediation.
8. Tamarisk infestation information for tribal lands is not included in this mapping inventory. The Colorado Department of Agriculture's Palisade Insectary conducted a survey which found approximately 4,000 acres of tamarisk at an average density of 40%. More detailed information will be available through the Ute Mountain Ute Agency.