

## **Dolores River Tamarisk Mapping & Inventory Summary**

**Inventory Background & Objectives** – In 2006, the Tamarisk Coalition completed an inventory of tamarisk infestations on the Dolores River watershed and its main tributaries 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 on the Dolores River.

**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. Over 140 miles on the Dolores River from the CO/UT state line to Disappointment Creek 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](http://www.niiss.org). The San Miguel River, tributary to the Dolores, was not surveyed because it is the site of the state's largest tamarisk control project. The Nature Conservancy is nearly finished with the operation which will restore over 100 miles of riparian habitat along the San Miguel.

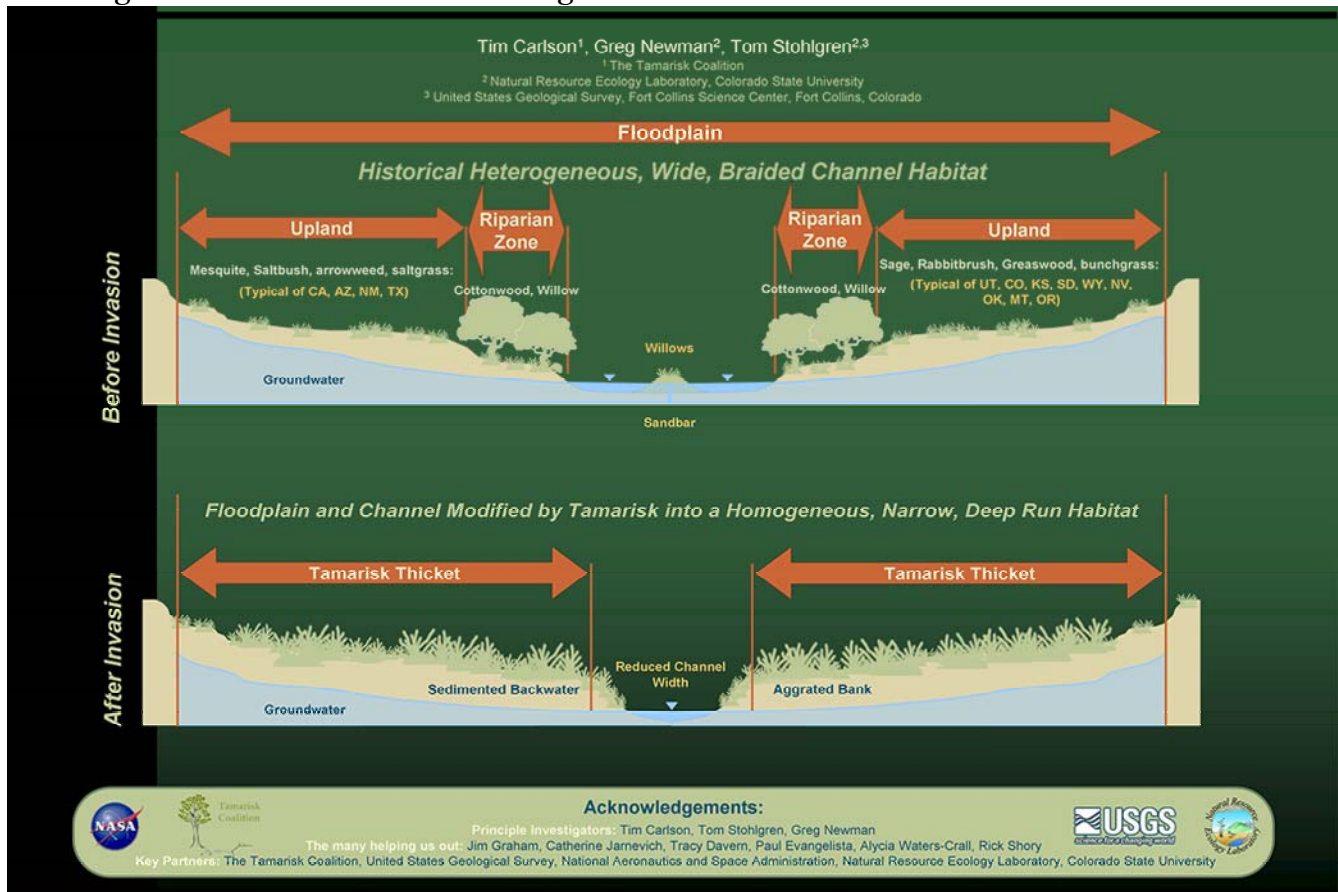
**Finding** – The inventory for the Dolores River and its major tributaries is presented in Tables 1 through 4 (included in folder “Dolores River and Tributary Data Tables 1-4” as an Excel file). Table 1 presents the general mapping data; whereas, Table 2 provides information on estimated current water 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. The Dolores River from the CO/UT state line to Slickrock has over 2,300 total acres of tamarisk infestation at approximately 36% average density. The broadest section of the infestation stretches from the Mesa/Montrose County Boarder to Bedrock, averaging 308 feet in width with a 41% density, and narrowest from the Montrose/San Miguel County Boarder to Slickrock, averaging only 65 feet at 30% density.
2. The major tributaries of the Dolores River have an additional 870 acres of infestation with an average density of approximately 24%.
3. 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 along the Dolores River and its major tributaries, the estimates of current water losses above and beyond what native vegetation would use are approximately:

- a. Dolores River from CO/UT state line to Slickrock = 2,400 acre-feet per year.
- b. Tributaries = 570 acre-feet per year.

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



4. 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. Dolores River from CO/UT state line to Slickrock = 6,800 acre-feet per year.
  - b. Tributaries = 2,400 acre-feet per year.
5. 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 titled "Options for Non-Native Phreatophyte Control" as a PDF file. Estimated costs for the Dolores River and its tributaries within the study area are:

Economic summary

River	Total Costs*	Average Cost per Acre Treated*	Average Cost per Acre-foot of Water Preserved*	Average Cost per Mile*
Dolores River	\$2,480,000	\$1,050	\$1,000	\$23,000
Tributaries	\$740,000	\$850	\$1,300	\$21,000

\* Rounded values from Table 2 (included in folder “Dolores River and Tributary Data Tables 1-4” as an Excel file)

6. If tamarisk control and revegetation occurs on any of these river or tributary sections, the water lost to the atmosphere through evapotranspiration will be saved and will remain within the groundwater and/or surface water regimes.
7. The costs of water retained within the hydrologic system of approximately \$1,300 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.
8. The method used to develop this inventory information is predicted to identify 85 to 90 percent of tamarisk within the Dolores River watershed. 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.