Tamarisk Leaf Beetle Species and Habitat Analysis with Management Implications for the Middle Rio Grande, NM

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The introduction and proliferation of tamarisk leaf beetle (*Diorhabda* spp.) [TLB] for the biological control of tamarisk (*Tamarix* spp.) since 2001 has initiated landscape-scale compositional shifts in riparian vegetation communities and altered habitat conditions. TLB populations in the Middle Rio Grande have increased from 2015 through 2018 with overall effects on tamarisk dominated habitat. This increase is mainly due the presence of the Northern TLB (*Diorhabda carinulata)* that arrived in 2012 and the Subtropical TLB *(Diorhabda sublineata)* that expanded range into New Mexico from Texas in 2015.

The biocontrol of tamarisk may result in a reduction of habitat and population decline for the Southwestern Willow Flycatcher (*Empidonax traillii extimus*) [flycatcher] and/or Yellow-billed Cuckoo (*Coccyzus americanus*) [cuckoo]. Moreover, reductions in tamarisk vegetative cover may result in increased Russian olive (*Elaeagnus angustifolia*) abundance and additional management problems.

In 2017, the study was initiated to analyze TLB related changes to tamarisk-dominated habitat, examine specific locations the study area over time using remote sensing (RS), and field monitoring of vegetative and avian communities. Vegetation data was collected at 30 selected locations in 2017; avian population data was collected in 2018; and TLB data was collected in both 2017 and 2018. Data was collected in order to understand baseline conditions, ongoing effects of TLB use, and provide a reference to post-treatment patterns and dynamics related to vegetation composition and structure, and associated habitat conditions. The study documents system responses related to riparian habitat structure and plant community alterations (based upon TLB use over time), as well as resulting possible changes to avian species richness and density. The ongoing monitoring of riparian systems altered by TLB is critical to understand management implications to vegetation and the avian community, especially the flycatcher.