

## Stream-Aquifer-Phreatophyte Interactions along a Tamarisk-dominated Segment of the Lower Colorado River

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Invasive vegetation species such as Tamarisk (*Tamarix spp.*) and Russian olive (*Eleagnus angustifolia*) have spread throughout the Western US water systems and rivers, out-competing and replacing native species such as Cottonwoods (*Populus spp.*) and Willows (*Salix spp.*) in the Upper Colorado Basin and different varieties of Mesquite (*Prosopis spp.*) and other desert trees and shrubs in the floodplains of the Lower Colorado Basin. Tamarisk in particular is a significant water user and in the Lower Colorado Basin, it grows in medium to dense stands covering large areas of the generally wider floodplains. This poses operational challenges for the management of the river, due to the connection between river flows and water levels with fluxes into the floodplain groundwater system resulting from riparian vegetation evapotranspiration demands. The Department of Interior is responsible for managing the Colorado River Compact. Fully understanding riparian evapotranspiration (ET) will assist the Bureau of Reclamation in improving river water management and reducing losses within the system. In this study, the spatially distributed evapotranspiration is estimated over a Tamarisk-dominated riparian ecosystem along the Lower Colorado River, using 20 Landsat TM5 images during 2008. In addition, groundwater electrical conductivity and elevation is measured at fifteen observations wells located in the riparian area of the Cibola National Wildlife Refuge. Groundwater and ET data are analyzed in conjunction with the Colorado River stage measurements in order to identify effects of groundwater quality and availability on water consumption of tamarisk and to find out if the river is acting as a source or sink during the study period.