

Landscape distribution of woody riparian vegetation on floodplains of the regulated Dolores River, SW Colorado

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River regulation on western rivers has, in many cases, led to an increase in the total cover of woody riparian vegetation in floodplain forests. This overall increase is observed in spite of the fact that the dominant tree of western riparian zones, the cottonwood (*Populus* spp.), has declined in many river reaches. In its place, tamarisk, Russian olive and native willows have increased their cover on the landscape, hypothesized by most workers to be a result of the loss of high spring run-off flows due to dam regulation. While major changes in flow management are unlikely on most rivers, active removal of tamarisk either by mechanical means or as a result of defoliation by the biocontrol agent *Diorhabda llongate* are leading to a new set of rapid changes on the riparian landscape. More understanding of the current pattern of woody vegetation distribution would help us plan for future changes, and give us a better chance of aiding desirable woody species in re-colonizing sites previously dominated by tamarisk. We conducted a study quantifying woody canopy types and understory plant community composition and structure and associated abiotic environmental variables along 154 km of a regulated reach of the Dolores River, Colorado. As part of this study, we sought to understand the distribution of the dominant woody species across the width of the floodplain on six sub-reaches of the river. On each reach, 5 line-intercept transects were established perpendicular to the river, and running across the width of the floodplain. Along these transects changes in elevation were measured, along with the beginning and ending points of the dominant woody species (*Salix* spp., *Tamarix* spp, *Populus* spp) and other common species assemblages. There were significant differences (Pseudo F 3.37, $p=0.0006$) in the floodplain plant communities among river reaches, arising mainly as a result of floodplain width and total elevation change. On average, cover by willows was significantly greater ($p<.05$) than either tamarisk or cottonwood. The location of each species on the floodplain, as indicated by its position on the transect, give an indication of how much niche overlap might exist among these species. While differences among starting distance were not significant ($p>.05$), differences among farthest distance from the river were significant ($p<.05$). Pairwise comparisons indicate that both willow and tamarisk ($p=.006$) and willow and cottonwood ($p=.007$) occupy significantly different portions of the floodplain, while tamarisk and cottonwood do not ($p=.35$). These results indicate that on the Dolores River willows occupy a different niche than either tamarisk or cottonwood, and that the tamarisk has mainly invaded cottonwood habitat. Current conditions on the Dolores, with dense stands of willow and reed canary grass on the river banks, are not conducive to the establishment of other woody riparian vegetation, and the loss of tamarisk would appear unlikely to lead to a subsequent increase in other woody riparian species without major intervention.