

CONSEQUENCES OF TAMARISK LEAF BEETLE (*DIORHABDA* spp.) BIOCONTROL IN SOUTHWESTERN SPRING AND STREAMSIDE RIPARIAN HABITATS

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Abstract. Species of the non-native shrub/tree *Tamarix* were first introduced into the U.S. in the early 1800s as an ornamental, then it became a popular erosion control agent, and by the early 1900s it had proliferated out-of-control and become a recognized and generally reviled invasive species. Since its introduction, *Tamarix* and its two-dominant species, *T. ramosissima* and *T. chinensis* and their hybrids have become a naturalized part of the landscape and are commonly found at springs and stream courses from near sea level to over 2500 m elevation. In 2001 the Department of Agriculture (DOA) unveiled and released an astonishingly effective biocontrol agent, the tamarisk leaf beetle *Diorhabda* spp. This biocontrol effort can be perceived as either an environmental disaster of major consequences to southwestern riparian and spring wildlife populations or celebrated as an example of astute biological ingenuity in fighting invasive species. Until the exotic beetle began its repeat defoliation the *Tamarix*-dominated association provided a unique and remarkably productive habitat type for native wildlife. A review of over 50 wildlife-focused publications demonstrates that *Tamarix*-dominated naturalized habitat supports more avian species than the native species-dominated habitats. Of a total of 140 species of lowland nesting birds in the southwestern United States normally found during the spring and summer months, 110 have been recorded in *Tamarix*-dominated, 100 in mesquite, 79 in cottonwood-willow and 66 in mixed deciduous habitat types. Now, in the shadow of the rapid spread and largely unanticipated success of the *Diorhabda* biocontrol, *Tamarix* is on a large-scale trajectory of decline. This has significantly reduced breeding habitat and cover for many species that have adapted to *Tamarix*, such as the endangered Southwestern Willow Flycatchers (*Empidonax tralii extimus*) and several other species of obligate riparian vertebrates. While biocontrol appears to be satisfying the long-desired eradication of this invasive species much more quickly than expected, after almost two decades of beetle activity within the thousands of acres of dead and dying *Tamarix*, recolonization of the land is almost exclusively limited to a mixture of native and non-native grasses and herbaceous cover with the conspicuous absence of woody species. Thus, at least in the short-term, the biocontrol effort has resulted in the loss of significant acres of wildlife-producing habitat without replacement or adequate DOA plans for revegetation. Defoliated spring sites are likely to be some of the first areas where active habitat restoration efforts will result in successful re-establishment of native obligate riparian woody vegetation.

¹ This paper is a condensation of two chapters by S.W. Carothers and R.R. Johnson in the upcoming Department of Agriculture General Technical Report Riparian Research and Management: Past, Present, Future
