

Effects of Tamarisk Beetles on Southwestern Willow Flycatchers and Their Habitats

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The southwestern willow flycatcher (*Empidonax traillii extimus*) is an endangered migratory passerine that breeds in dense, mesic habitats in the southwestern U.S. Occupied areas include native (e.g., willow), exotic (tamarisk), and mixed vegetation. Tamarisk leaf beetles (*Diorhabda* sp.) have moved into areas along the Virgin River occupied by breeding southwestern willow flycatchers and are likely to reach additional breeding areas in the near future. Areas occupied by breeding flycatcher differ from unoccupied areas in having a cooler and more moderate microclimate and denser canopy, suggesting that these characteristics are important to breeding flycatchers. The defoliation caused by tamarisk leaf beetles in areas of exotic or mixed vegetation is likely to alter occupied flycatcher habitat in ways that are detrimental to the reproductive success of breeding flycatchers. Data from breeding flycatchers in St. George, Utah suggest that reproductive success in tamarisk stands in the presence of tamarisk leaf beetles is poor, but that flycatchers may move into nearby, suitable native vegetation in subsequent years. Stands of native vegetation that can serve as refugia for breeding flycatchers may be critical to the persistence of viable flycatcher populations in areas affected by tamarisk leaf beetles.