

Modeling invasive species using remote sensing: an example using *Tamarix*

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Abstract:

Determining the species-environment relationship is an important question in ecology, especially in invasion ecology. Determining which factors in the environment affect the distribution and abundance of an invasive species is important for early detection and rapid response. The main objective of this study was to develop a methodology that can be used to find the potential habitat and percent cover of *Tamarix sp.*, an invasive riparian tree, using a combination of remote sensing, field data, and predictive modeling. We examined two different geographic locales that *Tamarix sp.* inhabits to evaluate the consistency of predictor variables over a larger geographic region. We used regression techniques that model spatial relationships between field data, environmental variables and Landsat TM images. Our overall accuracy in predicting the presence or absence of *Tamarix sp.* was as high as 97%. Likewise, up to 89% of the variation in the foliar cover of *Tamarix sp.* could be explained by predictor variables. Variables selected in the models were not the same for the two geographic regions suggesting that locally derived models may improve regional assessments of plant invasions.