

Revegetation obstacles following tamarisk control: Cheatgrass invasion and herbicide residues (Session 1) Stephanie Gieck¹, A.A. Sher¹, S. Nissen², E. Lane³, C. Brown², and A. Norton²

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Abstract:

Although much is known about tamarisk removal, few quantitative studies exist to document challenges to restoration post-control. Each of the most popular control methods, i.e. mechanical removal and herbicide application, is likely to pose unique challenges, particularly for re-vegetation. For example, it is assumed that mechanical removal of tamarisk is likely to lead to further invasion by other weeds, whereas aerial applications of effective pesticides (such as imazapyr) will impede other weeds but are also likely to leave residues that prevent establishment of desirable species. To address these issues, we have established a restoration study near Florence, CO, where we have applied three different control methods to tamarisk infestations. Treatments included aerial application of imazapyr, mechanical control, mechanical control with spot applications, and reference (untouched) plots. 20m wide plots/strips of each of these were replicated five times in each of three locations along drainages infested by tamarisk. Within the mechanical control plots, we also investigated the effect of preparing the seed bed with tilling. After one growing season, we quantified the levels of re-infestation by *Bromus tectorum*, as a part of a long-term study. Within the chemical control plots, we measured soil residues of imazapyr after spraying and used these levels to develop a greenhouse bioassay to test response of common restoration species at different half-lives. Despite predictions otherwise, we observed the highest levels of *B. tectorum* in undisturbed plots, with mechanical removal of tamarisk and tillage appearing to reduce re-invasion in one of the sites. As expected, soil residues of imazapyr had dramatic effects on all native species tested, suggesting a high sensitivity even for those species that are commonly used after chemical control. These preliminary results may have important implications for management of sites after tamarisk removal, and demonstrate that existing paradigms may not apply to all locations.