Gelbard, J. L. and J. Belnap. 2003. Roads as conduits for exotic plant invasions in semiarid landscape. Conservation Biology 17:420–432.

Abstract: Roads are believed to be a major contributing factor to the ongoing spread of exotic plants. We examined the effect of road improvement and environmental variables on exotic and native plant diversity in roadside verges and adjacent semiarid grassland, shrubland, and woodland communities of southern Utah (U.S.A.). We measured the cover of exotic and native species in roadside verges and both the richness and cover of exotic and native species in adjacent interior communities (50 m beyond the edge of the road cut) along 42 roads stratified by level of road improvement (paved, improved surface, graded, and four-wheel drive track). In roadside verges along paved roads, the cover of *Bromus tectorum* was three times as great (27%) as in verges along four-wheel-drive tracks (9%). The cover of five common exotic forb species tended to be lower in verges along four-wheel-drive tracks than in verges along more improved roads. The richness and cover of exotic species were both more than 50% greater, and the richness of native species was 30% lower, at interior sites adjacent to paved roads than at those adjacent to four-wheel-drive tracks. In addition, environmental variables relating to dominant vegetation, disturbance, and topography were significantly correlated with exotic and native species richness and cover. Improved roads can act as conduits for the invasion of adjacent ecosystems by converting natural habitats to those highly vulnerable to invasion. However, variation in dominant vegetation, soil moisture, nutrient levels, soil depth, disturbance, and topography may render interior communities differentially susceptible to invasions originating from roadside verges. Plant communities that are both physically invasible (e.g., characterized by deep or fertile soils) and disturbed appear most vulnerable. Decision-makers considering whether to build, improve, and maintain roads should take into account the potential spread of exotic plants.