

Rangeland Revegetation Revisited: Are short-term trends indicative of long-term outcomes?

In recent decades, dozens of studies have attempted to re-introduce plant species into rangeland dominated by invasive plants. The re-introduced plants have proven capable of establishing, but because they are rarely monitored for more than a few years, it is unknown if they have a high likelihood of persisting and suppressing invaders for the long-term. We periodically measured re-introduced species, invasive plants and other associated species for nine years at one site and 15 years at a second site in western Montana. At one site, three grass species re-introduced from seed maintained high densities for three or more years, but then all or nearly all individuals died. At the second site, three other grass species proliferated after remaining relatively sparse for six or more years. At least two of these three grasses greatly suppressed the dominant invader (*Centaurea maculosa*). For example, our most likely parameter estimate suggests *Thinopyrum intermedium* reduced *C. maculosa* biomass by 93% 15 years after seeding. These results show seeded species sometimes persist and suppress invaders for long periods, but short-term data cannot predict if, when, or where this will happen. In some cases, data from three and less years after seeding falsely suggested seeded species would persist. In other cases, data from as late as six years after seeding falsely suggested seeded populations would remain fairly small and not suppress the invader. Because short-term data are unreliable and long-term data are scarce, it remains unclear whether successfully established seeded populations have a high likelihood of persisting, growing, and reducing rangeland invaders for the long-term. Additional long-term data are needed to identify effective traits, species and practices for re-vegetating invaded rangelands.