

EFFECTS OF HERBICIDE AND SEEDING TREATMENTS ON RESTORATION OF ROADSIDE VEGETATION: LIMITATIONS OF SHORT-TERM STUDIES

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Abstract: Restoration ecologists have studied various strategies to establish native vegetation in road corridors, e.g., use of herbicides, application of native seed mixes, transplanting native species, and more. However, because of logistical constraints, studies are often limited to less than 5-year time spans, and it is possible that restoration treatments require more time to become evident. In this study, we re-sampled prairie vegetation along reconstructed roadsides in Glacier National Park (GNP) 5 and 10 years after treatments were initiated, and compared our results to an earlier study where the same study sites were sampled 3 years after initiation of treatments. We used a split-plot study design to investigate the effects of two treatments -- application of a broadleaf herbicide (clopyralid) and a native seed mix -- on aerial coverage of prairie flora along roadsides in the St. Mary Valley region of GNP. Positive effects of these treatments observed after 3 years (increased coverage of native graminoids from seeding, and reduced coverage of alien forbs from herbicide) were also evident in the 10-year analysis. However, two undesirable patterns associated with herbicide treatment observed in the earlier study (decreased coverage of native forbs and increased coverage of exotic graminoids) did not persist. In fact, significant herbicide x year interactions occurred for both native forbs and exotic graminoids. Mean coverage of native forbs increased 6.6% in sprayed plots, but declined 3.5% in unsprayed plots. Coverage of exotic graminoids declined 14.1% in sprayed plots, but declined only slightly (2.2%) in unsprayed plots. Though application of herbicide likely reduced coverage of some native forb species, our results suggest that clopyralid-based herbicides may have generally positive effects for establishing prairie vegetation in roadside corridors. In addition, this study suggests that short-term (<5-year) study designs may not adequately predict longer-term effects of revegetation treatments.