

Net economic benefits of perennial pepperweed (*Lepidium latifolium* L.) management

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Abstract Perennial pepperweed (*Lepidium latifolium* L.) has invaded riparian areas and other sites with moist soils in the western U.S. Where these sites have been occupied, it is now moving outward and invading arid lands that are a considerable distance away from water. Perennial pepperweed damages ecosystems by germinating earlier than native plants, thus exhausting soil nutrients and water reserves. This harms native plant populations, reducing their numbers and the species diversity within the region. Without control of perennial pepperweed, changes to riparian areas and rangelands are degrading and, among other effects, create negative economic impacts to agriculture. In this presentation, estimates of foregone net revenues from weed-infested lands are compared with the costs of controlling perennial pepperweed to assess the impacts on agriculture. Comparison of foregone net revenues with control costs determines the net benefits of invasive weed control to the farmer and rancher. Using data from a case study and this assessment method, it is shown that

foregone net revenues are substantial and increase over time. We find that after 15 years the foregone haying benefits range between \$100,000 and \$120,000 and for grazing the foregone benefits range between \$30,000 and \$40,000 if no invasive weed management is employed. The payback period for implementing weed control on hay land ranges between 3½ to 5 years and greater than 14 years for grazed rangeland. Based on this research and using this evaluation technique, a land manager can decide when or whether to implement a perennial pepperweed control program by considering the foregone net revenues of weed-infested lands and not just the costs to control perennial pepperweed. These methods may be used to analyse the economic impacts other invasive species.

Nomenclature Perennial pepperweed, *Lepidium latifolium* L., LEPLA.

Keywords Economic impacts, cost-benefit analysis, break-even analysis, invasive weeds, weed control, expansion rate, agriculture, GIS, GPS.