

Restoration Ecology

THE JOURNAL OF THE SOCIETY FOR ECOLOGICAL RESTORATION

RESEARCH ARTICLE

Impact of invasive plant control on soil loss: a case study on Robinson Crusoe Island

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Author contributions: Both authors conceived and designed the research, and set up the experiments; JC analyzed the data; both authors monitored the data, and wrote and edited the manuscript.

Coordinating Editor: James Aronson



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Abstract

Mechanical and chemical controls are the most common methods used to detain the advance of plant invasions. In some areas, clear-cutting of invasive plants produces soil loss, one of the worst impacts on ecosystems. It has been argued that cutting invasive plants in small areas with root retention could be an adequate control management strategy to deal with this problem. In this study, the soil loss in small gaps after cutting two invasive woody species with root retention is compared with the soil loss in the invasive surrounding scrubland. On Robinson Crusoe Island, 15 small canopy gaps of 36 m² were created in an area covered with invasive species. The gaps had three slope ranks including 15–20°, 20–25°, and 25–35°. Annual soil loss was measured both in these gaps and the invasive scrubland over 1 year with graduate erosion pins. In spite of the small size of clear-cutting areas, we found erosion to be severe, to extremely severe, after plan control with root retention inside the small gaps with slope ranks between 25 and 35°. On the other hand, in slopes less than 25° soil loss was similar in the small clear-cut gaps and invasive scrublands. Thus, we recommend precaution if the intention is to avoid erosion through clear-cutting control with root retention in fragile soils and slope areas,

even in small areas.

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