

THE IMPACT OF MULTIPLE WILDFIRES ON SAGEBRUSH-STEPPE

COMMUNITIES: IMPLCATIONS FOR RESTORATION. [Eva Dettweiler-Robinson¹](#), G. Matt Davies¹, Jonathan D. Bakker¹, Peter W. Dunwiddie¹, Jim Evans², Sonia A. Hall³ and Janelle Downs⁴. ¹School of Forest Resources, University of Washington, Box 354115, Seattle, WA 98195-4115; evadr@u.washington.edu; gmdavies@u.washington.edu; jbakker@u.washington.edu; pdunwidd@u.washington.edu. ²The Nature Conservancy, 1917 1st Ave., Seattle, WA 98101. jevans@TNC.ORG. ³The Nature Conservancy, 6 Yakima St., Ste. 1A, Wenatchee, WA 98801. shall@tnc.org. ⁴Pacific Northwest National Laboratory, P.O. Box 999, Richland, WA 99352. jl.downs@pnl.gov.

Large wildfires burnt the Arid Lands Ecology Reserve (ALE) of the Hanford Reach National Monument in 2000 and 2007. Changes to fire regimes, such as increased frequency and severity, pose a threat to the composition, structure and environmental services of sagebrush-steppe communities. Permanent vegetation plots on ALE were sampled in 1996, 2001 through 2004, and 2009. Plots were originally selected to represent vegetation types across a range of elevations and soils types.

Cover of all plant functional groups declined immediately following the 2000 fire. Most groups exhibited some post-fire recovery, but the 2007 burn resulted in further reductions. Shrub cover showed a continual decline from 1996 values. Species richness increased slightly from 1996 through 2009, largely due to increases in perennial native forbs. Pre-fire vegetation was strongly influenced by elevation and soil type. Fire effects were scale-dependent: repeated fires accentuated differences between broad elevational groups, but plots within these groups became more similar to one another. In 2009, low elevation sites were strongly associated with invasive annuals. *Bromus tectorum* occurred in nearly all plots in 2009 but its abundance was lower than prior to the 2007 fire. Plot trajectories of change suggest that successive fires moved plots increasingly far from their state in 1996. Repeated fires have produced fundamental changes in communities and severely compromised restoration efforts. If ALE is to return to anywhere near its "initial" state further significant intervention will be needed. We will return to ALE in 2010 to continue studying post-fire vegetation dynamics

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