

Restoration Highlights

Society for Ecological Restoration Northwest Chapter



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University of Washington Students Present at SER 4th World Conference

Two SER-UW officers presented at the Society for Ecological Restoration International (SER) 4th World Conference on Ecological Restoration August 21-25 in Merida, Mexico.

Eva Dettweiler-Robinson, previously the SER-UW Treasurer, presented her work entitled “Restoring Wyoming big sagebrush following wildfire using nursery-grown stock: Contrasting methods and predicting survival.” Eva describes her work as follows.

“Nursery-grown stock can be used to introduce desired species to a disturbed landscape. Wyoming big sagebrush (*Artemisia tridentata wyomingensis*)-dominated shrub-steppe habitats of the western United States are threatened by land-use change and altered fire regimes associated with expansion of cheatgrass (*Bromus tectorum*) and increased ignition frequency. Wildfire can extirpate *A. tridentata* over large areas because regeneration is limited



by a short-lived seed-bank and limited dispersal ability. Active management is required to restore *A. tridentata* in frequently burned areas of conservation concern.

We compared the survival of container vs. bare-root out-plantings of *A. tridentata* and examined the effectiveness of hydrogel and mycorrhizal treatments in promoting establishment. Plant stress was assessed one year after planting to correlate with long-term survival. Container stock had relatively consistent survival rates (28- 34% survival after three years), while bare-root stock showed variable rates (11-54% survival). Size of container stock did not affect survival, and hydrogel and mycorrhizal treatments did not confer advantage to survival of bare-root seedlings. The proportion of stressed seedlings in Year 1 was negatively correlated with survival from Year 1 to Year 3. In areas that did not burn in a subsequent wildfire, survival in Year 8 was similar to that in Year 3, indicating initial establishment was the greatest barrier to survival. Land managers can use relationships



between initial planting stress and longer-term survival to determine whether supplemental plantings will be needed to reach restoration goals.”

SER-UW’s current President Brooke Cassell presented her research in a paper entitled “Fire history and restoration of high elevation pine-oak forest in the Sierra de Manantlán Biosphere Reserve.” Brooke summarizes her work below.

“Fire is one of the most influential factors in vegetation community and succession in the Sierra de Manantlán Biosphere Reserve, located in the states of Jalisco and Colima, México. A mosaic of low, mixed, and high severity fire regimes characterizes the topographically complex landscape. The ecosystems in the reserve range from mesophyllous mountain forest to higher elevation pine and oak forest. Some species, such as the culturally important *Zea diploperennis* maize and the Rufous Hummingbird (*Selasphorus rufus*), rely on open stands maintained by frequent low-severity fires. Others, such as the threatened jaguar (*Panthera onca*), require dense cloud forest, necessitating a careful approach to maintenance and restoration of the landscape. Increases in fuel loadings and change in the vegetational structure since the Reserve’s establishment in 1986 may have changed the fire regime, resulting in feedback loops.



We are constructing a tree-ring master chronology and reconstructing fire history from fire scarred trees at pine-dominated sites throughout the reserve. We are then analyzing changes to the fire regime following establishment of the reserve and the impacts to vegetational successional patterns, habitat and potential impacts on future fire occurrence and severity. Also, we are examining climatic patterns and their relationship to fire occurrence and severity, allowing for inference about potential climate change impacts.



This research will create a baseline of knowledge about the fire regime and historical range of variability, facilitating scientifically informed land and fire management plans. This will be only the second fire history derived from dendrochronology south of the Tropic of Cancer in the Western Hemisphere and it will contribute to Mexico’s larger goal of defining nationwide fire regimes. ”

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