

Ecological Society of America Meeting 2007

Title: Patterns, drivers, and functional consequences of local extinctions in a Bay Area serpentine grassland

Authors:

Jae R. Pasari, University of California, Santa Cruz, Dept. of Environmental Studies

Erika S. Zavaleta, University of California, Santa Cruz, Dept. of Environmental Studies

Stuart B. Weiss, Creekside Center for Earth Observation

Citation:

Pasari, J.R., E.S. Zavaleta, and S.B. Weiss. 2007. Patterns, drivers, and functional consequences of local extinctions in a Bay Area serpentine grassland. Ecological Society of America Annual Meeting, August 5-10, San Jose, CA.

Abstract:

Serpentine soils in California provide critical habitat for a large number of serpentine-endemic plants and refuge for other rare and native plants that have been driven from more fertile soils due to extensive invasion by European annual grasses. In the Bay Area, serpentine habitats are threatened by nitrogen deposition from automobile exhaust, which fertilizes the soil and facilitates invasions by non-native grasses. We sampled serpentine plants and soil depth along a gradient of exposure to vehicular emissions (distance to an interstate highway) and found significantly nested species composition ($T < 17.02$, $p < 0.00001$) suggesting a predictable local species extinction order. Further analysis reveals that species loss patterns are influenced by both distance to the vehicular emissions source and soil depth. This analysis will be used to inform the design of an experiment to test the effects of biodiversity changes (including realistic extinction scenarios) on a suite of ecosystem functions in serpentine grasslands. We hypothesize that realistic extinctions and species abundance changes will have a greater effect on ecosystem functions than random extinctions with even abundance treatments because of correlations between extinction vulnerability and functional type. Furthermore, we hypothesize that higher species richness will be required to provide a given level of all ecosystem functions than will be required to achieve the same level for each function individually.

Contact Information:

Jae R. Pasari, UC Santa Cruz, 1156 High Street, Santa Cruz, CA 95064 USA, jpasari@ucsc.edu

Erika S. Zavaleta, UC Santa Cruz, 1156 High Street, Santa Cruz, CA 95064 USA, zavaleta@ucsc.edu, 831-459-5011

Stuart B. Weiss, Creekside Center for Earth Observation, 27 Bishop Lane, Menlo Park, CA 94025 USA, stu@creeksidescience.com, 650-854-9732