

Riparian and Upland Vegetation on the Kings River Experimental Watershed, Sierra Nevada, California¹

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Abstract

The Kings River Experimental Watershed (KREW) is a watershed-level study on headwater streams in the Sierra Nevada, California. Eight perennial streams, from 1500 m (4920 ft) to 2490 m (8170 ft) elevation, have been instrumented and collecting data since 2002. Component research areas of the study include stream flow, water chemistry, sediment, soil chemistry, stream invertebrates, stream algae, riparian and upland vegetation and meteorology. The KREW is part of a larger project called the Kings River Project (KRP). The KRP is a collaboration between the Pacific Southwest Research Station and the Sierra National Forest, with the objective of restoring pre-European-settlement forest conditions in the Forest. To achieve this objective, KRP will implement prescribed fire and uneven-aged management across the landscape, depending on the needs of component studies, and the condition of the land. Treatments for KREW will comprise prescribed fire, mechanical thinning, and a thin/burn combination, and will begin in the fall of 2006. Data collection will therefore include pre-, interim- and post-treatment periods. The vegetation component of KREW is designed to address the effects of these treatments on the herbaceous, shrub and canopy communities of the watersheds. In particular, effects on riparian versus upland communities will be quantified and compared, to assess the effects of fire on riparian vegetation. The arid environment of the southern Sierra creates comparatively narrow riparian bands along streams, usually less than 2 m wide. The role riparian zones play in protecting the stream from disturbance such as fire and logging as been well-studied. However, those studies come primarily from regions with wide, dense riparian zones, such as the Pacific Northwest, and information from the more narrow riparian bands of the Sierra is lacking. Currently, 114 upland and 56 riparian, permanent transects have been established and are censused every summer. Pre-treatment data will be analyzed to determine plant community importance values by transect, to correlate with variables such as stream proximity, as well as provide a background characterization for the vegetation on each watershed. As of August, 2005, 308 taxa have been collected from the eight watersheds and identified to species. Data will be analyzed to determine what proportions of these species are in riparian versus upland communities. Ultimately, post-treatment data will be compared with pre-treatment data to describe changes in the vegetation according to different treatments. This information will help land managers determine how to best approach the endeavor of restoration of the plant community to a pre-settlement state.

¹ Poster presented at the National Silvicultural Workshop, June 6-10, 2005, Tahoe City, California.

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