

Effectiveness of a maximum 25 percent streamflow diversion rate in maintaining aquatic macroinvertebrate communities in small headwater streams in the Northern California redwood region.

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Small water diversions (water drafting) on private timberlands are primarily used for abating road dust during timber harvesting operations in order to comply with the road maintenance requirements of the Forest Practice Rules. Diverted and stored water may also be used for wildland fire suppression. In an effort to avoid instantaneous dewatering of riffles and minimize substantial adverse impacts to headwater stream inhabiting amphibians, California Department of Fish and Wildlife commonly recommends a maximum diversion rate of 25 percent on Class II watercourses.

A pilot project was conducted during the summer of 2015, to better understand headwater stream flow dynamics and determine if the maximum diversion rate limit of 25 percent is effective in maintaining macro invertebrate richness and diversity downstream of drafting sites in Class II watercourses. Two water drafting sites and four associated 1,000-foot stream reaches (in treatment and control pairs) were sampled on private timber company property (Green Diamond Resource Company and Humboldt Redwood Company) in Humboldt County. Micro pressure transducers were deployed to continually monitor the water depths (stage) at multiple locations within each study reach in 15 minute intervals. Multiple flow measurements were made throughout the season for establishing flow relationships with the continuous stage data to assess continuous streamflow over the entire sampling period. At the end of the season, macroinvertebrate samples were collected at treatment and control sites.

Preliminary results indicate that diurnal variation in natural stream flow conditions can exceed 100 percent on streams less than 2 cubic feet per second. In addition, longitudinal spatial variation in natural stream flow between sites on streams less than 2 cubic feet per second commonly exceeded 100 percent as well. Both water drafting sites that used a 25 percent maximum diversion limit were effective at maintaining downstream flows within the natural variability (both diurnal and longitudinal spatial range). Macroinvertebrate samples are currently being processed and analyzed, and will be available by midsummer, 2016.