

Light, Nutrients and Macroinvertebrates

Thermal responses to riparian thinning in redwood headwater streams at multiple spatial scales

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Land managers presently thin second-growth forests in the redwoods of coastal northern California and are now interested in applying these thinning treatments to riparian forests. We evaluated the effects of riparian thinning treatments, using a Before-After Control-Impact, or BACI, design on riparian shade and light conditions and the influences on stream temperature in three redwood headwater stream networks. Preliminary results indicate riparian thinning treatments decreased riparian shade by an average of 25 percent, increased solar radiation by an average of three times, and increased average summer maximum stream temperature by 1.7 degrees Celsius. Local increases in temperature extended further downstream between 100-600 meters and were evident at multiple spatial scales. These initial data suggest that more subtle changes in shade and light associated with riparian thinning treatments can affect thermal conditions of these headwater streams both locally and further downstream. However, the magnitude of these thermal responses and their spatial extent vary with the amount of shade lost. These data provide important information for managers considering riparian management activities in the redwoods.