

## **Category I: Hydrology, Climatology & Hydraulics**

### **Investigating the Role of Large Woody Materials to Aid River Rehabilitation in a Regulated California River**

#### **PRINCIPAL INVESTIGATOR**

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#### **EXECUTIVE SUMMARY**

Large woody materials (LWM) are pieces of wood floating down a river or snagged along the bank and are integral components of healthy ecosystems in natural rivers. Thus far, research on LWM dynamics related to stream flow and ecological benefits has occurred primarily in the Pacific Northwest, which is a temperate climate zone that supports large conifers. In contrast, very little LWM research has occurred in California's Mediterranean climate zone, where smaller, softer-wood trees dominate the landscape. Based on ecological observations, scientists now understand that LWM should be re-introduced to regulated rivers to provide habitat heterogeneity as an integral part of river rehabilitation. Most river rehabilitation projects in California incorporate little to no LWM in current designs, except as hardened bank protection, and those that do have little science to guide them. As regulated river rehabilitation techniques mature, it is necessary to incorporate LWM components into these projects.

The overall goal of this research is to investigate the role of LWM in the Mediterranean climate zone of California, and to link the relevance of LWM dynamics to rehabilitation in regulated rivers. The research proposed herein will be conducted in the Mokelumne River basin, with one facet addressing historical and present day upland LWM supply as captured by Pardee Dam, and a second facet evaluating historical and present day LWM hydraulic structure abundance and distribution in the reach directly below Camanche Dam. The primary products of this study will be; (1) a scientific conceptual model of LWM for regulated rivers in Mediterranean California, and (2) a decision-making framework that will enable river managers to include scientifically based LWM structures into rehabilitation designs, thereby enhancing stream complexity and habitat diversity and creating robust ecosystem health. Additionally, these tools will be used to guide the East Bay Municipal Utilities District's rehabilitation of the Mokelumne River and they will be broadly shared with government agencies, stakeholders, and the general public.