

## Demonstration Project to Test a New Interdisciplinary Approach to Rehabilitating Salmon Spawning Habitat in the Central Valley

Autumn 2003

This was the fifth quarter of this CALFED project to demonstrate the utility of the Spawning Habitat Integrated Design Approach (SHIRA). In the previous quarter, SHIRA was used to design and implement a river rehabilitation project in the first reach below Camanche Dam. This was the third use of SHIRA on the Mokelumne River. Following on that work, the fifth quarter was spent doing assessment- both site specific assessment of project outcome and adaptive assessment of SHIRA as a rehabilitation framework. Site specific monitoring was largely performed by EBMUD with some participation by our UCD group, and focused on redd counts for the lower Mokelumne River.

The primary thrust of the adaptive assessment for the autumn and winter quarters are the biological criteria used in SHIRA. Even though the existing Habitat Suitability Curves have been highly successful, accurately predicting 95% of post-project redd locations, we hypothesize that HSC that explicitly account for spatial dynamics would make an even stronger predictive tool and even help improve the fundamental understanding for spawning habitat. Thus, a new graduate student, Eve Elkins has taken on the task of assessing spatial relations using our 3 years worth of SHIRA data on the Mokelumne as well as EBMUD's 10-year database. This work is still in its early stage.

Substantial work was performed on analyzing and writing up results from the 2 previously implementation of SHIRA on the Mokelumne. We are in the process of computing a sediment budget for the lower Mokelumne River, based on theoretical equations, our own DEM differencing analyses, and historical cross-section re-surveys. We are also in the process of publishing our SHIRA framework in the peer-reviewed literature. Finally, we have a paper comparing fry production in rehabilitated versus non-rehabilitated control sites in review and one comparing measured versus 2D-model predicted shear stress in preparation.

An important consequence of the first year of this project is that it has lead to the adoption of SHIRA for use on the Trinity River below Lewiston Dam and on the Yuba River below Englebright Dam. On the Trinity River, a baseline pre-project study has been performed and 4 alternative river rehabilitation scenarios are being developed for potential implementation summer 2004. In comparison to the Mokelumne River application of SHIRA, that for the Trinity River involves a significantly bigger reach, biological assessment of multiple fish species and life stages, and assessment of a wider range of flows. On the Yuba River, a baseline study is underway and in this case the emphasis is on large-scale sediment transport and channel change. Each of these three rivers is representative of a broad class of conditions found in California, and together they provide a comprehensive check on the utility of SHIRA for regulated rivers in the state.