

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

Autumn 2004

This was the ninth quarter of this CALFED project to demonstrate the utility of the Spawning Habitat Integrated Design Approach (SHIRA). In the previous quarter, the fundamental question of design and implementation of slope creation below a dam was addressed through mechanistic model prediction and field experimentation under the guidance of SHIRA. Specific activities included initiation and completion of pre-project site characterization, design scenario development and testing for slope and other effects, final design selection and refinement, construction, and post-project assessment. Given that extensive activity over the summer, the primary goal for the fall was to perform post-project monitoring, conduct analysis of the data collected during the summer, and report results.

Post-project monitoring focused on collecting and analyzing fish utilization information for the experimental site. EBMUD took the lead on surveying redd locations. It appears that the Lower Mokelumne Fish Hatchery took in a very large number of potential spawners, diminishing the potential benefit of the in-channel rehabilitation activity. However, a positive aspect of this is that the experimental site remained density-independent, so individual spawners could choose locations based on physical habitat preferences, not due to population dynamics, which affords a greater opportunity to evaluate the predictive potential of SHIRA under this condition.

Data analysis this quarter focused on assessing the benefits and problems encountered in this 2-year staging of slope creation and downstream distribution. The culmination of this analysis was a poster presentation at the American Geophysical Union conference entitled "The Use of Slope Creation as a Rehabilitation Tool on Regulated Rivers." An important conclusion from the analysis has been that putting the longer term geomorphic goal of slope creation ahead of the shorter term goal of immediate habitat optimization has yielded a much greater amount of high quality spawning habitat in the end. Also, spawner utilization of experimental sites continues to closely mimic that predicted by the 2D modeling approach used in SHIRA, with additional utilization associated with the habitat complexity induced by adding discrete heterogeneity elements, such as LWD and boulders into project sites.

During this quarter, the major outreach effort undertaken in the previous quarter was continued at a high pace. The SHIRA web site at <http://shira.lawr.ucdavis.edu> now presents all of our 2D modeling results and model interpretations for all experimental sites. Any one who is interested in applying SHIRA for themselves now has access to very extensive information so that they can do so and also learn from our existing experience. On this website one can find all technical reports (including CALFED reports), MS theses, and peer reviewed journal articles that we have published. Also, the website includes extensive educational information on river rehabilitation and SHIRA, including a 60-minute video powerpoint presentation that explains in great detail what SHIRA is all about and what lessons we are gleening from these adaptive management experiments. At present, the SHIRA framework is fully documented and illustrated on the website.

Finally, long-term monitoring of the SHIRA demonstration projects is an important necessity in order to see their cost-effectiveness and self-sustainability. A CALFED ERP monitoring proposal was written and submitted for consideration. That is the primary available mechanism for continuing to evaluate this CALFED-sponsored regulated river rehabilitation framework.