

Framework for Prioritizing Regulated River Restoration

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Abstract. A key management concern in the Pacific US states is the assessment of interdisciplinary problems, such as spawning habitat self-sustainability. Nevertheless, existing assessment tools have yet to reflect the links between flow components, geomorphic processes, and habitat conditions. The goal of this project is to develop and test a method, rooted in the quantification of hydrogeomorphic-ecologic links governing spawning habitat quality, to assess the potential persistence of restored functions on a regulated river prior to rehabilitation. Flow regime component metrics and associated geomorphic descriptors are assembled into four conditions of spawning habitat health well supported by the primary literature. Three rivers with distinct hydrographs – the Mokelumne, Cosumnes, and Yuba Rivers – have been selected to test the method. Preliminary work involved statistical analysis of post-dam flow functionality with respect to the pre-dam hydrograph, which is assumed to have functional flow components. The field campaign requires surveying of the cross-section geometry of a sampling of spawning riffles downstream of water-supply dams for evaluation of armoring, geometry relations, shear stress, and duration of transport regimes. Data from previous studies of the Cosumnes River were used to calculate the geomorphic parameters for confirmation or negation of the conditions. Confirmation of the conditions indicates the promotion of spawning habitat health (i.e., high flow alteration – low geomorphic functionality). Negation of the conditions indicates that required geomorphic functions for the habitat may or may not be provided, independently of flow alteration (i.e., high flow alteration – high geomorphic functionality), revealing geomorphic-unit scale processes that promote spawning habitat health.