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Application of EPA's Healthy Watersheds Initiative Concepts Enhances Protection of California's Streams and Watersheds

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Abstract

California's freshwater resources face tremendous pressures from population growth and uncertain water availability that are expected to increase over the coming decades. To make effective resource allocation decisions, agencies need objective tools to help prioritize protection and remediation. Ecological condition indicators have great potential to fill this role. California has made steady progress over the last decade to integrate biological condition indicators into its water resource assessment and management. However, the potential of biological condition indicators to transform water resource management would be greatly enhanced by the ability to interpret patterns of biological condition in the context of non-biological watershed features and processes. California's Healthy Streams Partnership recently collaborated with the US EPA's Healthy Watersheds Initiative (HWI) to adapt the HWI's watershed assessment approach for integrating diverse measures of watershed condition (e.g., hydrology, geomorphology, water quality, landscape) in California streams. The California effort built on previous work by the HWI and its partners, but adapted the framework to take advantage of other related statewide efforts. The California implementation of HWI had two key modifications, a focus on parameters related to fundamental ecological processes (not strictly condition based) and the differentiation of structural indicators (e.g., landscape condition, hydrologic condition) from ecological condition indicators (biological condition, habitat condition, water quality). This allows a broad scale assessment of potential function, restoration opportunity, and vulnerability. California's adaptation also explicitly incorporated indicators of the relative confidence of the different measures of watershed condition and excluded portions of the state that did not meet minimum criteria for applicability of biological indicators. The resulting framework provides California's water resource managers with a tool for predicting general watershed health throughout the state. These predictions can serve as the basis for monitoring resource allocation, prioritization of watersheds for restoration and protection, more informed permitting and enforcement decisions and more effective communication among resource agencies and stakeholders. The approach allows users to selectively emphasize different components of watershed health depending on the application of the data and components of the framework can be updated/upgraded as our knowledge and data accuracy improves.