

## Development of Restoration Performance Curves for Streams in Southern California Using an Integrative Condition Index

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### ABSTRACT

Determining success of stream restoration projects is challenging, due to the disconnection between required monitoring periods and the actual time necessary to achieve ecological success. Performance curves could help address this challenge by illustrating likely developmental trajectories of restored streams. We applied the California Rapid Assessment Method (CRAM), an integrative index of stream condition, in a 10 year chronosequence to create performance curves that project the development of functional streams for 30 years following restoration. CRAM scores for high functioning sites between zero and 10 years were plotted against time since restoration. Best-fit curves were derived using either power functions or polynomial functions, depending on the CRAM metric. We tested the curves' ability to predict conditions for other projects across a range of ages, flow conditions (ephemeral to perennial), and physiographic settings. The curves are able to predict the time required for projects to achieve reference-level scores for the CRAM index and Hydrology and Biotic Structure attributes, but underestimate the time required for projects to achieve reference-level scores for the Physical Structure attribute. Our research demonstrates the potential to use modeled restoration performance curves based on CRAM scores to guide expectations for restoration project performance.

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