Developing Watershed-Wide Instream Flow Criteria Using a Rapid Approach to Inform Water Management Decisions

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BACKGROUND
Over-allocation of freshwater resources, climate change, and limited information create complex challenges for freshwater ecosystem management. To inform water management decisions and protect fish and wildlife, the Department is developing a rapid instream flow assessment approach by incorporating traditional site-specific methods and recently developed regional and watershed level flow assessment tools to identify instream flow regime prescriptions for California watersheds.

ANALYSIS APPROACH
The flow criteria resulting from our varied analyses can be tailored to the specific ecological management goals for a stream or watershed allowing for a diversity of water management applications depending on the individual or combined management goals of species, habitat, and ecological integrity.

Low-Flow Threshold
The Low-Flow Threshold is a flow floor based on Natural Flow. When instream flow falls below this threshold, fish and wildlife may be particularly sensitive to stressors.

Natural Flows
Natural Flow is monthly streamflow data by water month type. These data are the input dataset for these analyses.

Flow Variation
Annual and interannual variation in flows is critical to long-term ecological functioning. This is an example of natural stream variation in Varanda Creek (left) at a lower flow (left) and a higher flow (right).

Potential Flow Criteria
The flow criteria resulting from our varied analyses can be tailored to the specific ecological management goals for a stream or watershed allowing for a diversity of water management applications depending on the individual or combined management goals of species, habitat, and ecological integrity.

Ecosystem Baseflows
A monthly baseflow to protect aquatic resources. Baseflows are calculated as a percentage of monthly and annual Natural Flows.

Functional Flows
Functional Flows perform key ecological and geomorphic functions. Metrics of key Functional Flows can help protect important seasonal variation.

Potential Ecological Flow Regime
Additional Data
Further develop the flow regime by adding other data. Water quality data, Geology, Species-specific data, and Other.

Potential Salmonid Flow Regime
Salmonid Passage Flows
These flows provide enough water for salmonids to cross riffles, which are typically the shallowest part of a channel. Based on species body depth criteria.

Salmonid Habitat Optimum Flows
One optimal discharge to provide access to preferred habitat for select salmonid species and life stages for a stream reach.

REFERENCES