Appendix E: Rapid Bioassessment Physical Habitat Metrics

The California Stream Bioassessment Procedure (CSBP) [1] assesses physical habitat through ten parameters [2], described below. The parameters are scored by condition category into Poor (0-5), Marginal (6-10), Suboptimal (11-15), and Optimal (16-20). The scores for all ten parameters are added for a total possible score of 200. The final score determines the physical condition of the site: Poor (0-50), Marginal (51-100), Suboptimal (101-150), Optimal (151-200).

1. **Epifaunal Substrate** – The relative quantity and variety of natural structures in the stream, such as cobble (riffles), large rocks, fallen trees, logs and branches, and undercut banks available for refuge, feeding, rearing or sites for spawning and nursery functions of aquatic macrofauna.
2. **Embeddedness** – The extent to which rocks (cobble, and boulders) and snags are covered or sunken into the smaller sized gravel, silt, sand, or mud of the stream bottom.
3. **Velocity/Depth** – The diversity of velocity and depth regimes throughout the stream reach. The best streams in most high-gradient regions will have all four patterns present: (1) slow-deep areas called pools, (2) slow-shallow areas called glides, (3) fast-deep areas called runs, and (4) fast-shallow areas called riffles.
4. **Sediment Deposition** – Measures the amount of sediment that has accumulated in pools and the changes that have occurred to the stream bottom as a result of deposition.
5. **Channel Flow Status** – Measures the degree to which the channel is filled with water. The flow status will change as the channel enlarges (e.g., aggrading stream beds with actively widening channels) or as flow decreases as a result of dams and other obstructions, diversions for irrigation, or drought.
6. **Channel Alteration** – Measures large-scale changes in the shape of the stream channel. Many streams in urban and agricultural areas have been straightened, deepened, or diverted into concrete channels, often for flood control or irrigation purposes.
7. **Frequency of Riffles** –The pool-riffle ratio which decreases in value as the sequence of riffles increases in the stream reach.
8. **Bank Stability Measures** –Whether the stream banks are eroded (or have the potential for erosion).
9. **Vegetative Protection** – Measures the amount of vegetative protection afforded to the stream bank and the near-stream portion of the riparian zone.
10. **Riparian Vegetation Zone Width** – Measures the width of natural vegetation from the edge of the stream bank out through the riparian zone.

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[1] California Department of Fish & Game. 1999. California Stream Bioassessment Procedure. Available at: http://www.dfg.ca.gov/abl/Field/professionals.PDF

[2] California Department of Fish & Game. 1999. Physical Habitat Quality, California Stream Bioassessment Procedure. Available at: http://www.dfg.ca.gov/abl/Field/rbp_physical_habitat_table.PDF