

## **APPENDIX B**

**Metrics used to describe characteristics of benthic macroinvertebrate assemblages including those used for the coastal southern California index of biotic integrity**

BMI Metric	Description	Response to Impairment <sup>1</sup>
<b>Richness Measures</b>		
1. Taxonomic	Total number of individual taxa.	Decrease
2. EPT <sup>2</sup>	Number of taxa in the orders Ephemeroptera (mayfly), Plecoptera (stonefly) and Trichoptera (caddisfly)	Decrease
3. Ephemeroptera	Number of mayfly taxa	Decrease
4. Plecoptera	Number of stonefly taxa	Decrease
5. Trichoptera	Number of caddisfly taxa	Decrease
6. Coleoptera <sup>2</sup>	Number of beetle taxa	Decrease
7. Predator <sup>2</sup>	Number of predator taxa	Decrease
<b>Composition Measures</b>		
8. EPT Index (%)	Percent composition of mayfly, stonefly and caddisfly larvae	Decrease
9. Sensitive EPT Index (%)	Percent composition of mayfly, stonefly and caddisfly larvae with CTVs less than 4.	Decrease
10. Shannon Diversity Index	General measure of sample diversity that incorporates richness and evenness.	Decrease
11. Non-insect Taxa (%) <sup>2</sup>	Percentage of taxa not within the class Insecta	Increase
<b>Tolerance/Intolerance Measures</b>		
12. California Tolerance Value (CTV)	CTVs between 0 and 10 weighted for abundance of individuals designated as pollution tolerant (higher values) and intolerant (lower values).	Increase
13. Intolerant Organisms (%) <sup>2</sup>	Percentage of organisms that are highly intolerant to water and/ or habitat quality impairment as indicated by CTVs of 0, 1 or 2.	Decrease
14. Tolerant Taxa (%) <sup>2</sup>	Percentage of taxa that are highly tolerant to water and/ or habitat quality impairment as indicated by CTVs of 8, 9 or 10.	Increase
<b>Functional Feeding Groups (FFG)</b>		
15. % Collector-gatherers (cg)	Percentage of macroinvertebrates that collect or gather material.	Increase
16. % Collector-filterers (cf)	Percentage of macroinvertebrates that filter suspended material from the water column.	Increase
17. % Collectors <sup>2</sup>	Percentage of macroinvertebrates that collect and filter suspended material from the water column.	Increase
18. % Scrapers (sc)	Percentage of macroinvertebrates that graze upon periphyton.	Variable
19. % Predators (p)	Percentage of macroinvertebrates that prey on living organisms.	Decrease
20. % Shredders (sh)	Percentage of macroinvertebrates that shred leaf litter.	Decrease
21. % Others (ot)	Percentage of macroinvertebrates that occupy an FFG not described above.	Variable
<b>Other</b>		
22. Abundance	Estimate of the number of organisms in a sample based on the proportion of organisms subsampled.	Variable
23. Biovolume (ml)	Volumetric displacement of organisms subsampled.	Variable

<sup>1</sup> The responses indicated are generalized and can follow natural gradients associated with elevation, water temperature and substrate composition.

<sup>2</sup> Metrics used for index of biotic integrity.