

Development of a multimetric biotic index to monitor the water quality of selected streams and wadeable rivers in Marinduque Island, Philippines

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ABSTRACT

River and stream ecosystems are among the most critical ecosystems as they provide a myriad of vital resources for social, economic, and political development. They are of great environmental value that serves as habitats for biological life, mediates climate regulation, and natural purifier of freshwater. However, low priority is given to freshwater ecosystems such as in the Philippines. Also, rivers and streams are significantly affected by multiple stressors such as rapid population growth, industrialization, resource exploitation, agriculture, and climate change. This study aims to develop a multimetric biotic index for assessing and monitoring water quality in selected wadeable streams in Marinduque Island. Eight wadeable streams along a disturbance gradient related to land use (i.e., forested, tourism, agriculture, mining) will be evaluated. Specifically, this study will assess the effects of land use on (1) water quality and (2) the community composition of benthic macroinvertebrates, and (3) develop a multimetric biotic index based on local benthic macroinvertebrates to monitor stream health. Several benthic macroinvertebrate metrics will be tested for inclusion in the biotic index. These include abundance, richness, composition, habit, functional feeding, and tolerance to stress. A scoring system based on percentile assignments from all the considered metrics will determine the stream's corresponding condition: *excellent*, *good*, *fair*, *poor*, and *very poor*.

Keywords: benthic macroinvertebrates, freshwater ecosystems, land use, wadeable streams