

Effects of Land Use on River Water Quality and Benthic Macroinvertebrate Communities in Marinduque Island, The Philippines

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ABSTRACT

River and stream ecosystems are among the most critical ecosystems. They provide many vital resources for social, economic, and political development. In addition, rivers and streams are of great environmental value because they serve as aquatic life habitats, mediate climate regulation, and are natural purifiers of freshwater. However, low research priority is given to freshwater ecosystems, particularly in the Philippines. Multiple stressors, such as rapid population growth, industrialization, resource exploitation, agriculture, and climate change, significantly impact rivers and streams. This study aims to assess stream water quality and benthic macroinvertebrate communities to monitor water quality in response to different land use types on Marinduque Island. Sixteen streams and wadeable rivers along a disturbance gradient related to land use (forested, agricultural, recreational, and mixed land use types) 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. Several macroinvertebrate-based community metrics and indices will be tested, such as abundance, richness, macroinvertebrate density and diversity, functional feeding, and tolerance to water quality. This study will provide a local-scale bioassessment of streams and rivers using benthic macroinvertebrates as a cost-effective assessment and monitoring tool to evaluate the freshwater ecosystem health in the

Province of Marinduque to help address water resource conservation and sustainable management in the province.

Keywords: benthic macroinvertebrates, ecosystem health, land use, Marinduque island, tropical stream