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Demonstration of an integrated watershed assessment using a three-tiered assessment framework

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ABSTRACT

Watersheds are useful templates for wetland protection and land use planning because they integrate cumulative effects that better inform site-specific management decisions. The goal of this study was to demonstrate application of a three-tiered assessment paradigm in the San Gabriel watershed (Los Angeles County, California) that incorporates monitoring at varying spatial scales and intensities. Data on wetland extent and distribution, habitat condition using rapid assessment, and intensive site monitoring were used to show how different levels of assessment can be used together to provide a deeper contextual understanding of overall wetland condition. Wetland sites in the less developed portions of the watershed were of higher overall condition compared to sites located in the more urbanized portions of the watershed. GIS analysis revealed that percent impervious surface is a useful landscape-scale indicator of riverine wetland condition. Furthermore, rapid assessment metrics were significantly correlated with stressors found at sites. Significant correlations also existed between riverine habitat condition, water chemistry, and benthic macroinvertebrate communities across streams in this watershed. This study highlights the following key concepts: (1) application of a multiple indicator approach at different spatial scales and sampling intensities promotes a better understanding of the causal relationships between land use, wetland condition, and anthropogenic stress, (2) a multi-tiered monitoring approach can provide a cost-effective means of integrating wetland status and trends assessments into routine watershed monitoring programs, and (3) a three tiered approach to monitoring provides wetland managers with an effective organizational tool that can be used to prioritize management activities.

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