ABSTRACTS

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RELATING FISH ASSEMBLAGES TO ENVIRONMENTAL PATTERNS AT THREE MULTI-STATE SCALES

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Key challenges to studying and managing riverscapes include understanding how factors measured at various spatial-scales influence aquatic biota and developing accurate predictive models where study data are limited. Currently fish zones, physiographic regions, ecoregions, and river basins are commonly used for classifying fish faunas. All these classifications reduce the apparent variability occurring at a large scale, but also include considerable heterogeneity. We analyzed a 780-site data set obtained from the U.S. Environmental Protection Agency's EMAP western survey. First, we detennined fish clusters at three spatial scales in the western U.S., i.e., all 12 conte1minous states, all western mountains, Pacific Northwest mountains. We next detem1ined that the predictor variables for those clusters changed with spatial scale. For example, longitude, dams and temperature were the best predictors for all sites, longitude, dams and catchment area were the top predictors for mountain sites, and lati-tude, turbidity, and canopy density ranked highest for Pacific Northwest mountains. The best three variable models included site. basin, and ecoregion predictor variables. However, basin, ecoregion, state, and abiotic site variables alone only accounted for half of the mean within-group similarity demonstrated by the fish clusters. We conclude that using large quantitative fish assemblage data sets linked with quantitative physical and chemical habitat data and landscape data to predict fish assemblage patterns is preferable to using preexisting
landscape classifications.