



## **A community-level, mesoscale analysis of fish assemblage structure in shoreline habitats of a large river using multivariate regression trees**

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Despite the numerous advantages over traditional methods ascribed to community-level analyses, including the ability to rapidly predict the abundance of multiple species and the integration of complex biological interactions, very few applications to the mesoscale of river habitats can be found in the extant literature. Most previous work has been based on single species, species-by-species modelling or reduced dimensionality approaches. Community-level analyses have especially good properties for improving the understanding of habitat associations in large rivers where biological interactions are most intense and applications of the mesohabitat concept relatively sparse. This chapter seeks to identify quantitative relationships between key environmental variables and community structure using a particular type of community-level technique known as multivariate regression trees in order to test the ecological basis for applications of the mesohabitat concept in large rivers. Mesohabitats were mapped and their environmental characteristics recorded along a reach of the San Pedro River, Chile, which is inhabited by a highly endemic fish community. A representative portion of the mesohabitats were selected for fish sampling and multivariate regression trees produced to predict community structure based on combinations of environmental variables. The analyses showed that fish assemblages were distinct at the mesoscale, with flow depth, bank materials, cover and woody debris the key predictor variables. The results support the application of the mesohabitat concept in this geographical context and establish a basis for predicting the community structure of any mesohabitat along the reach.