

Fish assemblage patterns as a tool to aid conservation in the Olifants River catchment (East), South Africa

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Abstract

South Africa has committed to address freshwater conservation at the catchment scale, using a combination of landscape-level and species-level features as surrogates of freshwater biodiversity. To support this work, we examined fishes in the Olifants River catchment, where multiple anthropogenic pressures affect streams. Patterns in fish assemblage data across 88 sites were analysed and related to landscape environmental variables using statistical techniques of multivariate ordination, cluster analysis, and regression tree analysis. We identified 6 distinct fish assemblage types, which were separated by altitude and human influence, primarily dry-land cropping and dams. In the upper reaches of the catchment, we identified a faunal shift from *Barbus neefi*, which occurred in less impacted sites, to *B. anoplus* and *Tilapia sparrmanii*, which were favored in cropland and mixed cropland/urban settings, respectively. The fish assemblage of the middle section of the catchment was not unique, but supported one species, *Chiloglanis pretoriae*, that could be considered a focal species for conservation. The low altitude, high-runoff section of the catchment supported the most species. However, species richness increased in association with dams, through the addition of species that are more tolerant of flow and physicochemical modifications. Thus, species richness may not be an optimal conservation target for this system. Rather, a series of indicators will be necessary to track and measure conservation success in the Olifants catchment.

Keywords: focal species, dams, species richness, land use, conservation planning