

# Ecological impacts of small dams on South African rivers

## Part 2: Biotic response – abundance and composition of macroinvertebrate communities

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### Abstract

This paper investigates the cumulative impacts of small dams on invertebrate communities in 2 regions of South Africa – the Western Cape and Mpumalanga. Previous research found reduced discharge, increased total dissolved salts, and a decrease in average score per taxon (ASPT; collected using SASS4 methods) at sites with high density of small dams in their catchment. These changes in ASPT are investigated using the invertebrate abundance data available in the River Health Programme. Multivariate analyses found differences in invertebrate communities in rivers with high densities of small dams in their catchment in foothill-gravel streams (in both Western Cape and Mpumalanga) and in foothill-cobble streams (in Western Cape only). Opportunistic taxa that are tolerant of pollution, and capable of exploiting various habitats, and those that prefer slower currents increased in numbers, while other taxa that are sensitive to pollution and disturbance declined in numbers. Some regional differences were noted possibly reflecting climatic differences between the regions. Since the results of this study are correlative, it highlights the need for a systematic (by sites and seasons) and detailed (at species level) collection of data to verify the results of cumulative effects of small dams. This can further the development of a framework for small-dam construction and management that will limit their impact on river catchments.

**Keywords:** cumulative impacts, reduced low flows, environmental water quality, Ephemeroptera, Trichoptera