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## Diversity of invertebrates in temporary water bodies of the Eastern Cape Karoo region earmarked for shale gas exploration

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Temporary freshwater bodies (endorheic pans) are facing a variety of disturbances including hydrological modifications, filling up with substrate and invasion by vegetation. These impacts have collectively resulted in loss of ecological value and habitat for invertebrate communities which utilise these transient ecosystems. Historically, the water bodies of the Karoo semiarid region have been poorly investigated. It is likely that they contain several invertebrate species that are still unknown to science and potential micro-endemics restricted to small isolated areas. Resource use by human communities (such as the proposed shale gas exploitation in the Karoo, water drawing for agriculture and domestic use) is without knowledge of the effects of these activities on community dynamics of invertebrate species in these temporary water bodies. Understanding of invertebrate species ecology, i.e. life history, population size and distribution as well as knowledge of the social component that interacts with this environment are fundamental requirements for the design and implementation of effective conservation strategies. We therefore need to understand the effect of the duration of hydroperiod, physicochemical parameters, dispersal patterns, system connectivity and anthropogenic influence so as to come up with measures to sustainably utilise and conserve these systems. The study will address the following objectives;

- 1.To establish the diversity of invertebrate communities in the temporary water bodies (pools & streams) in the Eastern Cape Karoo region
- 2.To determine the physical and chemical factors that structure invertebrate communities in the ephemeral water bodies.
- 3.To determine the dispersal vectors for invertebrates in the ephemeral communities.
- 4.To determine the effect of the hydroperiod on ephemeral invertebrate communities, with emphasis on production of resting stages.
- 5.To synthesise gathered information so as to establish baseline knowledge to be used as benchmark for monitoring and conservation once shale gas exploration begins.

The study findings will generate scientific data and provide baseline information that will guide future monitoring and management processes, should shale gas extraction eventually happen in the region.

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