Earth Stewardship Science Research Institute

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Diversity of Invertebrates in temporary wetlands of the Eastern Cape Karoo Region earmarked for shale gas exploration

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Introduction

Temporary freshwater bodies 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 (Ravenga *et al*, 2005). Historically, temporary water bodies of of South Africa have been poorly investigated (Riato et al, 2014). Resource use by human communities (such as the proposed shale gas exploitation in the Karoo, water drawing for agriculture, livestock pollution and domestic use) is without knowledge of the effects of these activities on community dynamics of invertebrates nor do we know impacts on physicochemistry in these freshwater bodies (Henri *et al*, 2014; Riato *et al*, 2014). Understanding the ecological processes that structure invertebrate communities in these systems is necessary in order to come up with measures to sustainably utilise and conserve them.

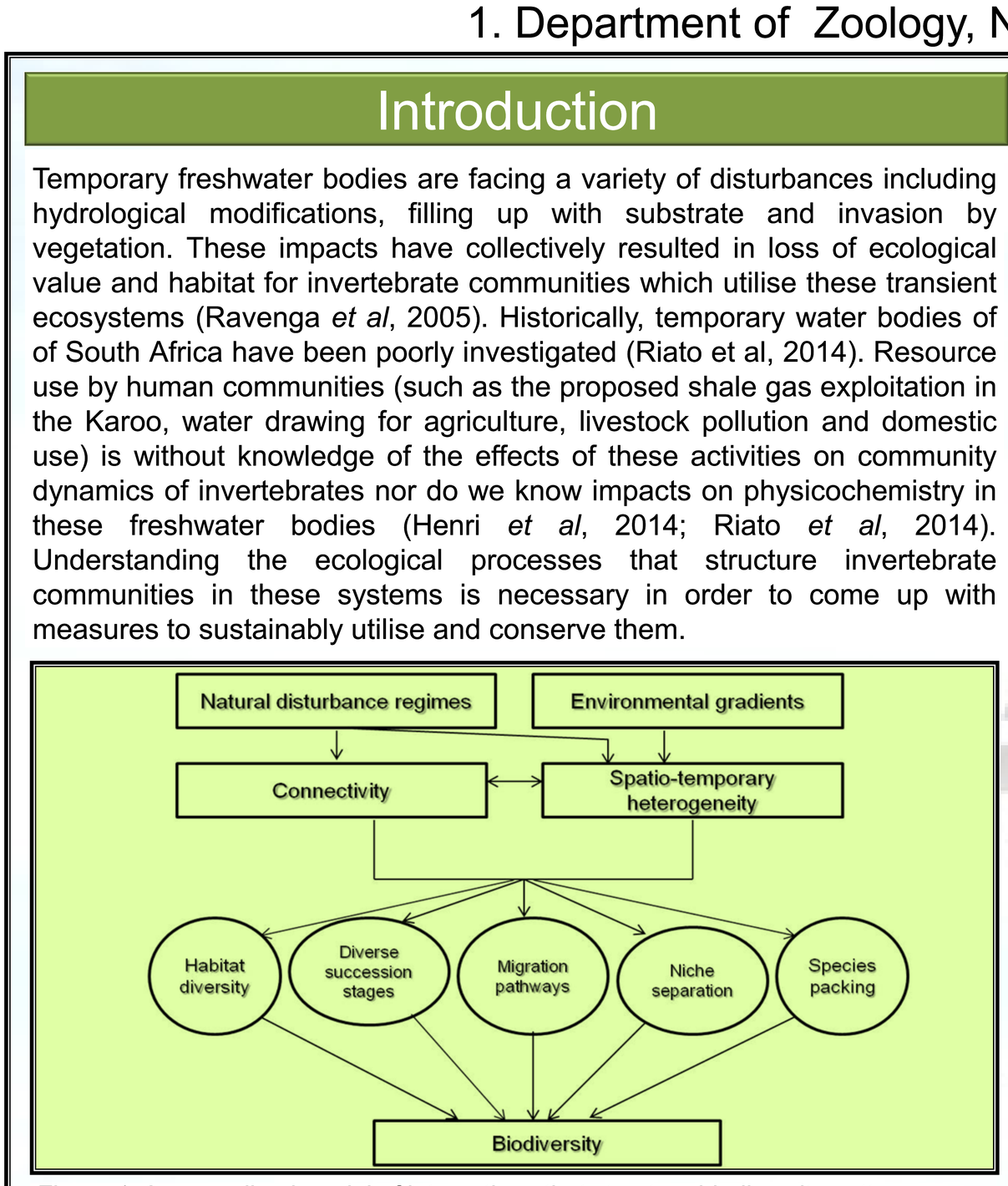
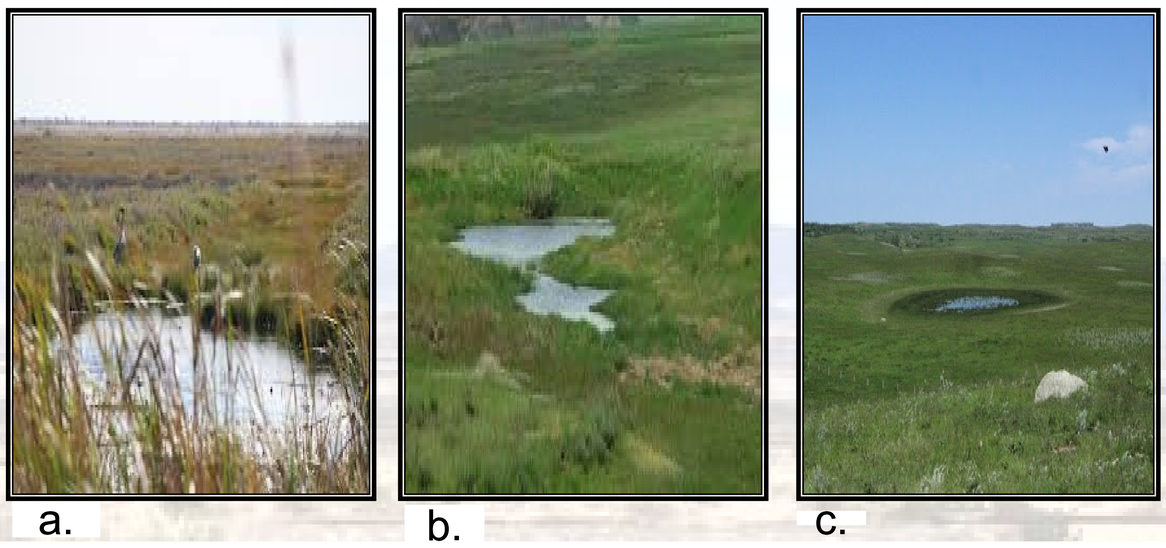


Figure 1. A generalised model of interactions that structure biodiversity patterns in aquatic ecosystems: Source: Ward, 1998.



Figures 2.a, b, c. Temporary wetlands. The Karoo region has numerous of these water bodies often called temporary wetlands because they typically hold water only for some time during the year. Some hold water for some months (a) or for a few weeks (b) after summer rains. Most of the year they dry (c) because of evaporation and water absorption into the ground.

Why Invertebrates ?

Aquatic invertebrates are particularly sensitive to organic and various other compounds. They have the capacity to integrate these effects during their lifetime, thus any alteration is reflected in the changes of the species present and abundances of the aquatic invertebrates. The Karoo region is renowned as a centre of endemism, and it is likely that several aquatic invertebrates found in this survey may fall in this category or represent species yet to be described.

Figure 3. From left to right: caddis fly larva, pouch snail, stonefly larva, leech, dobsonfly larva, mayfly larva. Source: Moser, 2010.

Study area

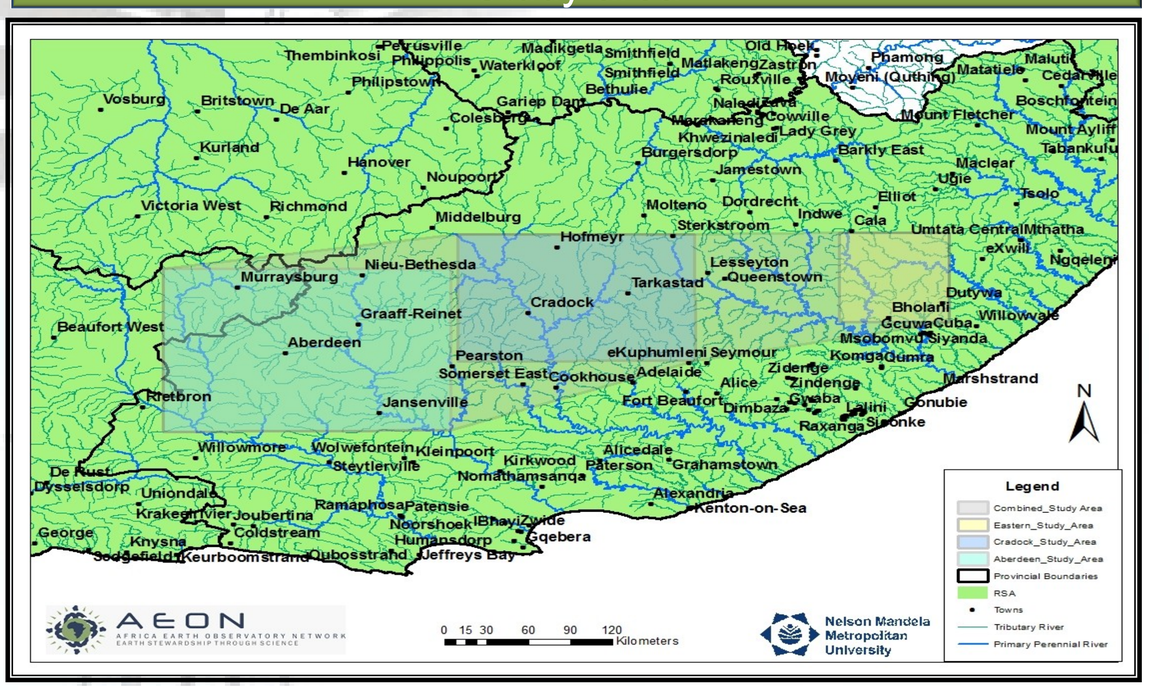


Figure 4. Map of the study area

Expected Research outputs

- Baseline information on invertebrate diversity of the current (relatively unaltered) Karoo temporary wetlands. This information can be used in the future to monitor the status of invertebrate populations and species against environmental change, which may be caused by human or natural impacts.
- A doctoral thesis submitted for examination for award of a PhD degree.
- Publication of results in peer reviewed journals.

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