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An investigation into pan hydrology and ecology in the Makuleke concession, Northern Kruger, South Africa

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Abstract

This research was undertaken to assess the validity and applicability of the pan systems' current Ramsar classification. In areas of the Ramsar classification scheme where the classification was considered lacking, a regional classification was offered based on the fieldwork and lab work analysis. Physical variables such as soil moisture content, combustible organic carbon content and soil particle size distribution surrounding the pan systems were measured during the wet and dry periods of the fieldwork sampling. Aquatic invertebrates were selected for the study as they are known to be good indicators of ecosystem health. The macro aquatic invertebrates were sampled within the pan systems over the wet and the dry periods. The investigation showed that the pan systems supported mainly tolerant macro aquatic invertebrate species as expected, however sample sites Mapimbi and Nwambi due to their access to the water table were able to support sensitive aquatic invertebrate species. The use of these pan systems by the macro aquatic invertebrates was then compared to the water quality found within the pans. Water quality in the pans was affected by the types of inflow they received and how regularly this inflow occurred. The data for the physical and ecological assessment of the pan systems was then considered and related to the current use of the Ramsar classification scheme. The results showed that the current Ramsar classification scheme does not capture all of the ecological, water quality and morphological properties of the systems. The classification too does not allow for environmental changes within the systems. This research proposes a regional or localized classification scheme to be used in conjunction with the international Ramsar classification scheme. The combined use of the international and regional classifications allowed for the seven systems within the network of wetlands in the Makuleke area to be distinguished as individual systems with unique properties that can be defined locally and not conformed under an international umbrella-type classification scheme.

Key Words: Classification, Wetlands, Aquatic Invertebrates