

Challenges in using fish communities for assessing the ecological integrity of non-perennial rivers

MF Avenant*

Centre for Environmental Management, University of the Free State, Bloemfontein 9300, South Africa

Abstract

Environmental Water Assessments (EWAs) aim to protect the ecological integrity of rivers amidst increasing anthropogenic pressures on freshwater resources, and fish communities are the ecosystem component most commonly included. The Fish Response Assessment Index (FRAI) was developed to assess the integrity of fish communities in South African rivers and is commonly applied in EWA studies. This paper reports on the suitability of the FRAI for the non-perennial Seekoei River and discusses some of the challenges faced. Our relatively long and thorough study on the Seekoei River confirmed the concerns that earlier, snapshot, fish integrity assessments in the Orange River system raised: that the existing fish indices are not ideally suited for these rivers with their naturally low species richness and hardy, generalist fish communities. Other difficulties with the use of a score-based method include prediction of the expected species, calculation of a frequency of occurrence rating, selection of the right sampling times for comparative purposes, loss of habitats and sampling points under different flow conditions, and problems experienced when using accumulated data to try to correct for a situation of having too few sampling points. At this stage a more generalised approach is suggested for the Seekoei River, and ultimately other similar non-perennial systems. This could include a number of community characteristics, such as abundance, species richness, species diversity and evenness, recruitment, fish health and the presence/absence of exotic species.