Review

Freshwater conservation planning in South Africa: Milestones to date and catalysts for implementation

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Abstract

Since the 1970s, at approximately 10-year intervals, 4 national-scale freshwater conservation plans have been developed for South Africa. These 4 plans reflect different but broadly advancing approaches to conservation planning. We provide an overview of 3 historical plans and a more detailed discussion of the most recent plan which is based on a systematic approach. The main principles of systematic conservation planning, namely, to achieve representation, persistence and efficiency, are introduced. We then describe how these principles were used to develop National Freshwater Ecosystem Priority Areas (FEPAs) for the whole of South Africa. A strong implementation orientation influenced the development of FEPAs. End users were engaged throughout the planning process and map products were designed with user needs as well as relevant policy and legal contexts in mind. We believe that the process that was followed in developing FEPAs marks a new level of implementation-driven planning. Remaining constraints to effective implementation now lie mainly on the side of the receiving environment – i.e. the operating environments of those agencies with mandates to manage and conserve freshwater ecosystems. To this end we highlight 4 potential catalysts for effective implementation in the receiving environment, namely, absorptive capacity, multi-party cooperation, science extension and adaptive management. We conclude by calling for a new and broad research initiative linked to implementing FEPAs.

Keywords: absorptive capacity, biodiversity surrogates, cooperation, efficiency, persistence, representation

Introduction

Freshwater is both an essential and a finite natural resource and constitutes only 2.5% of the water on Earth. Less than 0.3% of all freshwater can be found in rivers, lakes and the atmosphere (Shiklomanov, 1993), yet the quality and availability of freshwater affect every aspect of human endeavour. Without the multitude of goods and services derived from freshwater ecosystems, human societies will cease to thrive if not to survive (Daily, 1997). The use of freshwater ecosystems by people and the ability of these systems to provide services are interlinked, prompting the need for wise stewardship; the use and conservation of freshwaters have to be carefully balanced.

A central principle of conservation science is to set aside representative samples of ecosystems to act as biodiversity banks or proactive protection against future modifications. Systematic conservation planning has, over the last 30 years, evolved into a widely accepted framework for identifying and prioritising ecosystems for protection to minimise the loss of biodiversity and ecosystem services (Pressey and Bottrill, 2009). Traditionally, freshwater ecosystems have received poor attention from systematic conservation planning exercises, often relying on incidental inclusion within a protected or conservation area, the design of which has been driven by terrestrial biodiversity features (Abell et al., 2007; Roux et al., 2008b). However, since the early 2000s systematic conservation planning for freshwater ecosystems and species has emerged and grown purposefully to become a new and applied branch of conservation biology (see reviews by Nel et al., 2009; Linke et al., 2011).

To date, South Africa has featured as one of a few growth centres globally for freshwater conservation planning. Thanks to the sustained commitment over the past 8 years of national organisations such as the Water Research Commission, CSIR, South African National Biodiversity Institute and the Departments of Water Affairs and Environmental Affairs, research and implementation efforts have now culminated, through a multi-year cooperative initiative, in the publication of spatially explicit priority areas for conserving rivers, wetlands and estuaries for the whole of South Africa (Nel et al., 2011a). These areas are referred to as Freshwater Ecosystem Priority Areas (FEPAs).

In this paper we reflect on the state of freshwater conservation in South Africa in terms of technical planning advances as well as the institutional mainstreaming of planning outcomes. We limit our discussion to national-scale plans, starting with a brief overview of historical freshwater conservation plans and a more detailed presentation of post-2000 developments. Integral to the most recent approach is a strong focus on the need to implement conservation plans. To this end we highlight a number of challenges and strengths in achieving such implementation, with the aim of providing direction for sustaining the current momentum in implementation-focused freshwater conservation efforts in South Africa.

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