An assessment of the channel morphological changes in the Lourens River, Western Cape

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Abstract

The Lourens River in the Western Cape Province of South Africa has been degraded to a great extent by forestry, agricultural activities, and a mixture of residential, industrial, urban and recreational developments that replaced the natural vegetation. The river has shown recent signs of localised channel morphological changes in the form of bed and bank erosion, channel widening and narrowing, in-channel deposition, bar formation and channel migration. This paper examines the extent to which channel discharge changes and riparian alien invasion contributed to the observed channel instability in the Lourens River. Data collected from a 90 m stretch of channel included cross-sectional profiles, riparian vegetation composition and channel discharge velocities. The riparian zone consisted mainly of herbaceous ground-storey alien plants and alien tree species that were unable to withstand flood flows and was associated with bank erosion. However, channel change occurred primarily in the upper section of the study reach. Analysis of the discharge velocity indicated that the cumulative effect of a wide range of intermediate discharges experienced in the winter of 2001 created high velocities that resulted in channel process and channel form changes. It is concluded that channel instability in the Lourens River was in part controlled by channel discharge and riparian vegetation changes.

Keywords: Lourens River, channel discharge, flooding effects, riparian vegetation, alien invasion, channel form changes