

River Styles, a Geomorphic Approach to Catchment Characterization: Implications for River Rehabilitation in Bega Catchment, New South Wales, Australia

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ABSTRACT

Geomorphologically derived river styles provide an integrative framework for examining the interactions of biophysical processes in rivers throughout a drainage basin. Nine styles of river character and behavior are identified in Bega catchment, on the south coast of New South Wales, Australia. Headwater streams above the escarpment drain into gorges in the escarpment zone. In different subcatchments at the base of the escarpment, there are three different river styles, namely cut-and-fill, vertically accreted floodplains, and fans. Downstream of these river styles, in the rounded foothills of the catchment, throughput and transfer river styles convey sediments to the lowland plain. In one mid-catchment setting, a floodout traps sediment. Finally, along the lowland plain of Bega River, there is a floodplain accumulation river style. Downstream patterns of river styles in differing subcatchments of the Bega River basin are differentiated into three types, reflecting river adjustments to valley width, slope, and responses to human disturbance.

Analysis of the character and condition of each river style in Bega catchment, and their downstream patterns, are used to provide a biophysical basis to prioritize river management strategies. These reach-scale strategies are prioritized within an integrative catchment framework. Conserving near-intact sections of the catchment is the first priority. Second, those parts of the catchment that have natural recovery potential are targeted. Finally, rehabilitation priorities are considered for highly degraded reaches. At these sites, erosion and sedimentation problems may reflect irreversible changes to river structure.

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DOI: 10.1007/s002670010052