Abundance, characteristics, and movement of woody debris in four Basque streams

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With 4 figures and 6 tables in the text

Abstract: We studied the amount, size and dynamics of woody debris in 4 reaches of the Agüera stream catchment (northern Iberian Peninsula): three sites (1st-, 2nd- and 3rd-order) surrounded by deciduous forests, and one 1st-order site under a plantation of Eucalyptus globulus. From July 1995 to February 1997, on six occasions, all wood pieces larger than 1 cm in diameter were measured; logs (diameter > 5 cm) were tagged and their positions recorded. The volume of wood was relatively low and decreased downstream: 13,700 cm$^3$/m$^2$ at the headwater deciduous site, 490 cm$^3$/m$^2$ in the 2nd-order reach, and 100 cm$^3$/m$^2$ in the 3rd-order reach. The woody standing crop at the headwaters within eucalyptus plantations was only 960 cm$^3$/m$^2$. The average size of individual pieces decreased downstream. The mobility of logs was lowest in the headwaters: 47% of the logs tagged in the 1st-order reaches moved during the year, 86% in the 2nd-order reach, and 76% in the 3rd-order reach. Temporal variations were small and associated with sporadic events such as floods or human activities. Mid and low reaches of Basque streams have few old-growth riparian forests, and most fallen logs are removed; this results in low amounts of wood, thus limiting the role of woody debris in organic matter retention or habitat diversity. Similarly, plantations of eucalyptus seem to result in low volume and small size of woody debris in the headwaters.

Introduction

Large woody debris (LWD) influences the structure and function of streams (Harmon et al. 1986, Bisson et al. 1987), promotes channel stability and retention, increases substrate diversity, and affects sediment distribution; it also provides habitat for some invertebrates (Anderson et al. 1978, Benke et al. 1985), and fishes (Elliott 1986). Fine woody debris (FWD) is usually less

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