

New methods reveal the relationships between riparian vegetation, retention-capacity, and standing stocks of CPOM in streams.

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One benefit of riparian revegetation is it delivers CPOM (Coarse Particulate Organic Matter) to streams and hence resources of food and living space for aquatic species. However, revegetation of cleared stream banks has not obviously increased CPOM loadings. One reason may be that streams have lost retentive capacity, i.e. the capacity to trap and retain CPOM within the channel. In this study, we explicitly tested how changes in CPOM inputs (riparian vegetation) and channel characteristics (retentive capacity) affect CPOM loadings. We predicted positive relations between riparian vegetation, retentive capacity, and CPOM loadings. We surveyed riparian width (GIS data), retentive capacity and CPOM at 36 sites (length 100 m) in Victoria. CPOM loadings (gm^{-2}) were estimated from 35 random benthic samples per site. Retentive capacity was surveyed using transects (15/site) to estimate the amount (m) of retentive structure (e.g. large wood, cobbles/boulders) per metre of transect. This measure of retentive capacity is more intuitive and easily comparable between streams than existing measures of retention, e.g. average distances that leaves drift before being retained. Channel retention was also surveyed for 300 m upstream of each site. Supply and retentive capacity both affected CPOM loadings but the results were context-dependent. As expected, CPOM loadings were lowest at sites with poor local retention, but also at sites with high retention but low supply. CPOM loadings were highest at sites with high local retentive capacity and supply, but also at sites where low retentive capacity upstream of the site increases the longitudinal supply of CPOM. Our findings demonstrate that retentive capacity can have large effects on CPOM stocks. Restoring retentive capacity may complement revegetation efforts, and our rapid survey method will be useful to prioritise resources to sites and rivers where increasing vegetation and/or retention-capacity is likely to increase CPOM.



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