

## LAND-USE COVERAGE AS AN INDICATOR OF RIPARIAN QUALITY

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Diego Fernández<sup>1\*</sup>  
José Barquín<sup>1</sup>  
Mario Álvarez-Cabria<sup>1</sup>  
Francisco J. Peñas<sup>1</sup>

<sup>1</sup>: Environmental Hydraulics Institute "IH Cantabria", Universidad de Cantabria. PCTCAN. C/ Isabel Torres 15. 39011 Santander, Spain. Tel: +34 942 201616; fax: +34 942 266361.

\*Corresponding author: fernandezgd@unican.es

## **Abstract**

Sustaining or restoring riparian quality is essential for maintaining or achieving good stream health and to guarantee the ecological functions that natural riparian areas provide naturally. Therefore, quantifying riparian quality is a fundamental step on identifying river stretches for conservation and/or restoration. Most of the existing methods assessing riparian quality concentrate on field surveys of a given river reach length, what becomes very laborious when trying to evaluate whole catchments or long river corridors. Remote sensing data are an efficient alternative to evaluate riparian quality over large areas, but riparian managers still do not have easy access to datasets with enough spatial resolution to carry out this task properly. Moreover, riparian quality assessment reaches higher scores the more riparian vegetation looks like forested areas, while human-maintained land-uses typically represent physical and functional discontinuities along river corridors that underscore riparian quality. In this study we have developed a modelling framework for using land-use coverage as an indicator of riparian quality. To determine the optimal framework we have compared the performance of linear and non-linear models and also the results obtained when using land-use coverage data at different spatial scales. Riparian quality field data has been obtained using two well-established Spanish field assessment indices: Qualitat del Bosc de Ribera (QBR) and Riparian Quality Index (RQI), while land-use cover has been obtained from periodically-updated and freely-available land-use datasets (Corine Land Cover - CLC and Spanish Land Cover Information System - SIOSE). Hydromorphological pressures affecting riparian vegetation have also been included in the analyses to determine its relative weight to determine riparian quality. Results have shown that establishing land-cover thresholds for each riparian quality class is a difficult task. However, it is possible to model riparian quality from riparian land-use composition for entire river networks, obtaining better results when using non-linear models and higher resolution data. Specifically, SIOSE (1:25,000) has provided acceptable results, while CLC (1:100,000) is inappropriate because it oversimplifies riparian land-use composition. Forest coverage highly determines riparian quality estimated in the field, while land-use coverage related to human activity, especially urban areas or agricultural land, have also an important but smaller role. On the contrary, the presence of hydromorphological pressures does not seem to be a strong predictor of field estimated riparian quality.

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