

## **Are narrow vegetated riparian buffer strips functioning as a barrier against sediment and phosphorus transport in Scotland?**

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Riparian buffers in the agricultural environment of the UK are typically narrow (<2-5 m), unmanaged barriers comprising wild vegetation. Recent legislation in Scotland (General Binding Rules for Agriculture, 2008) further endorses narrow buffer strips by not allowing cropping or agrochemical inputs 2 m from watercourses. The creation of such a barrier brings great benefits for separating agricultural activities from the watercourse, for example stopping pesticide spray drift. However, we question how well the soils in such narrow barriers can continue to operate as interception and storage zones for sediments and nutrients. Our premise is that a wider buffer has better protection against (i) nutrients and sediments crossing the buffer, (ii) soil saturation of nutrients leading to leaching (especially P) and (iii) other functions not tested in this study (biodiversity and flood water storage).

We undertook a survey of buffer strip properties in regions of Scotland with contrasting agricultural management, geology and climate and hence differences in erosion risk and nutrient status. Locations on low order streams (1<sup>st</sup> to 3<sup>rd</sup>) were visited after being picked randomly. Characteristics recorded were: the presence and design of buffers, site potential for, and evidence of, soil erosion into and across the buffer. Soil cores were taken from buffers and adjacent fields for analyses of bulk density (a surrogate of infiltration capacity), water extractable nutrients and particulate nutrients (associated with digestion of the sub-silt size fraction of soil solids under a simulated erosion disaggregation test).

Our findings will help to determine the efficacy of a general principle of narrow vegetated buffer strips promoted everywhere, as compared to a system of enhanced protection (for example a wider buffer) in areas most at risk of nutrient and sediment transport to streams, with no buffers in low risk areas. Both the general narrow buffers and the targeted wider buffers approach could ultimately take a similar area of land out of production and therefore be comparable economically, but have different efficacies for diffuse pollution.