Integrated river basin management, driven by the European Union Water Framework Directive, aims to improve the ecological status of all waterbodies. Implementation of riparian buffer strips is seen as a key mitigation option for helping to abate losses of sediment and associated nutrients to watercourses. There is, however, substantial uncertainty regarding riparian buffer performance. Previous assessments have used a range of techniques and study durations, challenging the comparability of these studies and the scope for synthesis to inform evolving water policy.

Against the above context, this study is exploring the scope for using a consistent dual-signature synthetic tracer technology for assessing riparian buffer efficacy for sediment trapping on the basis of width. Synthetic tracer grains (fluorescent/magnetic) were developed following particle size and density analysis of topsoils on fields served by riparian buffers at 12 experimental sites across England, to ensure that their properties hydraulically match those of the target soils. The technique involves seeding the fields with synthetic tracer and positioning high strength magnets (11,000 gauss) within the riparian buffers at the fixed width buffer options (2m, 4m, 6m) currently offered by agri-environment schemes. Magnetic susceptibility readings are collected before and immediately after tracer injection, as well as at the end of the experiments, to provide information on soil/synthetic tracer loss to the riparian buffer features over the winter monitoring period (2010/2011). On this basis, the trials are providing temporally-lumped information on buffer performance for sediment trapping over the winter months responsible for the bulk of sediment loss to watercourses.