

Cost-effective targeting of buffer strips for phosphorus mitigation: the case of Rescobie Loch

Bedru Balana, Manuel Lago, Andy Vinten, Bill Slee, Nikki Baggaley, Marie Castellazzi, Eleonore Guillem, Martyn Futter, Marc Stutter
The Macaulay Land Use Research Institute, UK

The European Community Water Frame Directive requires Member States to set water quality objectives and identify cost-effective mitigation measures to achieve good ecological status for all waters in Europe. This requires control of both point and diffuse pollution. Agricultural sediments and diffuse phosphorus (P) pollution are among the key contributors in affecting water quality. Measures targeting 'transport controls', such as buffer strips, are among the principal options of P pollution mitigation. However, the costs and effectiveness of such measures vary significantly in the landscape.

Taking the case study of Rescobie Loch in Lunan catchment, Angus, Scotland, this study aims to investigate the optimal targeting of buffer strips for P mitigation and how placement of buffers influence costs and effectiveness. For this purpose an integrated economic, hydrologic, and GIS modelling framework is being developed.

The modelling results show that: (1) Lower P reduction target can be achieved cost-effectively by establishing 2 m width buffers on selected fields; (2) For higher P reduction targets cost-effectiveness increases by targeting both the spatial configuration of fields and buffer width variability; and (3) For higher P reduction targets the marginal abatement cost increases at an increasing rate.