

A Chemical and Ecological Assessment into Elemental Loading from Ford Crossings in Ashdown Forest, Sussex, United Kingdom

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Numerous studies have identified the issue of road surface runoff as a source of contamination into waterways, but the impact of vehicular wash-off is less well understood. Ford crossings provide pathways for vehicle-derived contaminants emanating from both road surface runoff and vehicular wash-off into a river system. Twyford Lane Ford (Ford 1) and Birchgrove Lane Ford (Ford 2), located ca. 600m apart on a tributary of the River Ouse in Sussex (UK), were the focus of this study. Biomonitoring and chemical assessments of water and sediments have been undertaken to determine any detrimental impacts, such as a lack in biodiversity, resulting from the ford crossings. Sediment concentrations of chromium (Cr³⁺), lead (Pb) and zinc (Zn) were generally elevated at Ford 1, attenuating at sampling points between the fords to then peak at Ford 2. Soil organic matter (SOM) and sediment particle size were seen to have an influence on elemental concentrations. In general, an increase in elemental concentrations was associated with a higher percentage of fine-grained sediments ($\leq 63 \mu\text{m}$). Elevated concentrations of Zn and magnesium (Mg) were identified within water samples taken during a precipitation event following a prolonged dry period. The biomonitoring results found reduced BMWP scores at positions close to the ford crossings, and in proximity to the roadside. Sensitive Ephemeroptera were largely absent at sampling points closest to the fords, which is likely to be associated with elevated Zn (Fig. 1). The results suggest that careful consideration should be applied when selecting crossing points over sensitive waters.

Biography

Phillip is a senior consultant at OHES Environmental Limited with 7 years' experience in environmental science and ecology. He is a Chartered Scientist with the Institution of Environmental Sciences and working toward Chartered Environmentalist. Presently, Phillip is preparing to undertake his second research paper, which will focus of bryophytes as markers for water contamination. His first paper was published in Science of the Total Environment – Vol 738.