Diffuse Pollution Risk Assessment Summary (Freshwater)

1. Summary

Diffuse pollution arises from widespread activities, with no discrete source, and hence it is difficult to control and regulate.

The WFD requires the assessment of the risk of waters not meeting good ecological status, and this assessment calls for a wider range of pollutants to be evaluated than have previously been addressed in Northern Ireland. Previous work has identified various types of pollution that pose threats to Northern Ireland's waters. For example, EHS proposals for a strategy to control nutrient enrichment in 1999 identified diffuse pollution from agriculture as a particular threat and also identified the need to quantify the risk from septic tanks. In the past, a holistic approach has not been applied to the threats posed by diffuse pollution in Northern Ireland. In order to address some of these gaps, a modelling approach has been adopted and a screening tool method developed. This method was applied across all of Northern Ireland and considered a wide range of pollutants.

The diffuse pollution risk assessment is based primarily on impact data[1], where available, supplemented by a screening tool method that identifies waterbodies at risk from significant diffuse pollution pressures. UKTAG guidance was not produced in this area, but the general principles of risk assessment have been followed[2]. The screening tool was used to predict the risk only for areas without a broad suite of impact data.

2. Screening Tool Method

A SNIFFER project was commissioned to develop a Diffuse Pollution Screening Tool[3]. This was a joint project between EHS and Scottish Environmental Protection Agency (SEPA). The first phase of the project consisted of a model selection process. A group of experts on a range of diffuse pollution issues, including representatives from Department of Agriculture and Rural Development (DARD), EHS, SEPA and Forest Research, attended a workshop at which modelling methodologies were selected. The screening tool method uses a suite of models to assess the risks from diffuse pollution to freshwater surface waters. Some of the outputs were also used in the risk assessment for groundwaters[4].

The screening tool method inputs currently available environmental and agricultural data into the models. This includes intrinsic landscape factors such as land cover, climate, geology and topography, along with specific management practice information, for example, Pesticide Usage Survey data and Agricultural Census data. Phase two of the project constructed a database in which the key data sets were integrated and summarised on a regular grid with a resolution of 1km^2. This was

[1] http://www.ehsni.gov.uk/pubs/publications/RA_Impacts.pdf
[2] http://www.wfduk.org/tag_guidance/Article_05/Folder.2004-02-16.5332/WP7a%2801%29 Draft Guidance on general principles for risk assessment %28PR2v6.19-01-04%29/view
[3] Link to SNIFFER R&D reports when available
[4] http://www.ehsni.gov.uk/pubs/publications/RA_Groundwater.pdf

followed by a stage of the project in which models were implemented. A series of model calculations were performed on the environmental data for each 1km^2 to provide a measure of pollution load. Pollution loads for a water body catchment may be calculated by the addition of 1km^2 values contained within it. By combining a load value with an estimate of surface water discharge, or flow, pollutant concentration may be calculated**.** This allows load values to be converted to concentration values. Pollutant concentration values were calculated for each water body.

3. Risk Analysis

Modelled pollutant concentration values were compared with threshold values above which it was considered that waterbodies may be at risk of failing to meet good ecological status. These were taken from UKTAG guidance[4] and expert opinion.

Each water body was classified for risk for each polluting substance using the screening tool. These were compared and the highest risk category was allocated to each water body. For example, if one pollutant was classified as 'probably not at risk' (2a) and another was classified as 'probably at risk' (1b), then 1b was assigned to the water body.

Risk categories derived from the screening tool methodology were then applied to those water bodies where impact data were lacking. The screening tool was also used to assist in attributing impacts to diffuse source pressures. This enabled all water bodies to be assigned a risk category for diffuse pollution.

4. Data Gaps and Future Work

This first characterisation of diffuse pollution pressures and impacts under the WFD has helped to identify information gaps, and, in particular, will contribute to the development of future monitoring programmes. The main emphasis will be on obtaining better monitoring data for areas where the screening tool alone has identified risks. In addition, there is a need to further validate and calibrate the models for the Northern Ireland situation, and potentially develop a series of scenarios to investigate the effects of changes to land use and management.

[4] http://www.wfduk.org/tag_guidance/Article_05/Folder.2004-02-16.5332/TAG2003 WP 7f %2801%29/view and lakes (to be added when available)