

River Basin Management Plans – Groundwater Classification

Groundwater Dependent Terrestrial Ecosystems

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1.0 Purpose

This paper describes the method used to assess the Water Framework Directive (WFD) quantitative status of groundwater bodies with respect to deterioration of groundwater dependent terrestrial ecosystems (GWDTEs) related to groundwater abstraction

2.0 Background

The WFD requires that groundwater bodies be classified as good or poor for chemical status (in relation to a large range of pollution pressures) and for quantitative status (in relation to groundwater abstraction pressures).

The deterioration of GWDTEs is one of four tests developed for groundwater body quantitative classification, based on WFD requirements and guidance provided at an EC and UK level¹. The four tests consider the impacts of groundwater abstraction both on the groundwater body itself, and also on the ecological receptors which depend on it. The worst result from all four tests is taken as the overall quantitative status result for each groundwater body.

The relationship between groundwater and associated ecosystems such as fens and raised bogs is a particularly complex one and one in which only a limited understanding is available to date, both within the UK and the rest of Europe. Research is underway in some areas to help improve understanding of the delivery mechanisms for groundwater to such settings and on the water requirements (dependency with respect to flow, water level and water chemistry) of different flora and fauna species.

With the relatively low density of significant groundwater abstractions and relatively high rainfall rate the potential for impact on designated GWDTE sites in Northern Ireland is reduced compared to other parts of the UK.

Ecologists have identified few impacts associated or likely to be associated with water abstraction on conservation designated sites (Special Protected Areas - SPA, Special Areas of Conservation - SAC, Areas of Special Scientific Interest - ASSI, National Nature Reserve - NNR) in Northern Ireland. Some sites have been identified as possibly being impacted as a result of historic arterial drainage of surface water systems which potentially may still be having an impact on the local water table.

3.0 Classification

This assessment has been undertaken to support the following element of classification:

Quantitative Classification

- Impact on Groundwater Dependent Terrestrial Ecosystems (GWDTEs)

¹ UK Technical Advisory Group on the Water Framework Directive. Paper 11b(ii): Groundwater Quantitative Classification for the purposes of the Water Framework Directive. This paper can be downloaded from the www.wfduk.org web site.

4.0 Assessment Process

The following assessment process was undertaken, managed within a GIS-based project.

In consultation with scientists in the Natural Heritage Directorate of NIEA, a list of sites designated as SPA, SAC, ASSI and NNR was compiled. For each of these sites a desktop review of the local hydrology and hydrogeological setting was undertaken, and an initial assessment was made of possible groundwater dependency. Following this, the local knowledge on such sites was applied through discussions with NIEA Natural Heritage ecologists, to assist with determining likely groundwater dependency and to identify if any obvious groundwater related (quality or quantity) impacts were known.

There is a relatively limited understanding of the interaction between groundwater and GWDTEs in Northern Ireland. Reasons for this include:

- the widespread occurrence of glacial deposits;
- the complex bedrock geology pattern; and
- the limited monitoring and investigation of specific sites.

The water requirements for the different dependent ecosystems and their various ecological communities have not yet been adequately assessed. In addition, a high quality dataset of groundwater abstraction volumes is not currently available for Northern Ireland although the recent introduction of abstraction licensing should address this before the next River Basin Management Plan (RBMP) period.

5.0 Outcome

Based upon this initial review process with scientists familiar with the various sites, there is no definite evidence of any significant impact on GWDTEs from quantitative pressures. In addition, as noted earlier, the environmental supporting conditions for such sites have yet to be fully defined. Consequently no groundwater bodies have been placed at poor status on the basis of this test.

Confidence in the assessment can only be placed in the low category.

6.0 River Basin Planning Cycle

There remains uncertainty over the distribution of all groundwater abstractions and volumes abstracted. In addition more work is required to understand local hydrogeological settings with particular respect to the hydraulic connection between aquifers and GWDTEs, and to determine the supporting conditions for different ecological features. With the advancement of abstraction licensing and application of research from Europe, UK and Ireland, a greater degree of understanding should be available for the next RBMP.

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