

# Implementation of the Water Framework Directive – a practical illustration

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## 1 Introduction

Work to implement the Water Framework Directive (WFD) across Europe is now underway in earnest across all member states. In this paper we will consider some of the work being done in Ireland, in particular on the Shannon River Basin, and discuss the practicalities of undertaking the complex and challenging characterisation process.

Ireland has been split into eight River Basin Districts (RBDs) as shown in Figure 1. Three of these are International River Basin Districts as they cover areas in both the North and the South. To facilitate the implementation of the Directive, the Irish Government is promoting the establishment by Local Authorities of river basin management projects, to be carried out by external consultants. To date, the Shannon, South-East, Eastern, Western and North-South Share projects have been awarded with an announcement expected shortly for the South-Western river basin project. The Shannon river basin project is being carried out by Kirk McClure Morton (KMM), consulting engineers and environmental scientists based in Belfast. MWH are providing specialist technical expertise to the team, in particular with respect to the risk assessment techniques underlying the characterisation process.

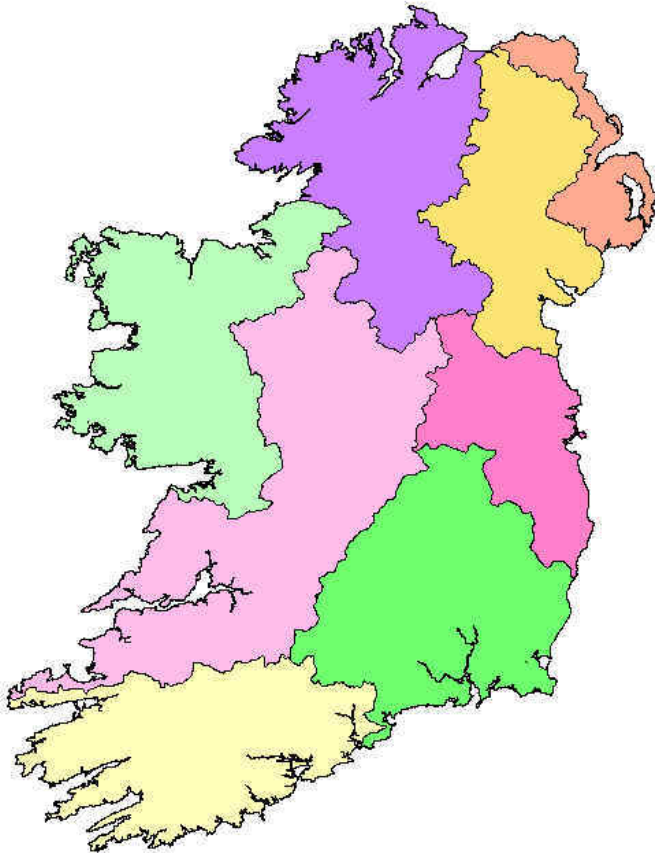


Figure 1 River Basin Districts in Ireland

## 2 Objectives of the Water Framework Directive

The WFD establishes a framework for the protection of all waters, including rivers and lakes, estuaries, coastal waters and groundwater and their dependent wildlife/habitats. The key objective for all surface waters is that they achieve “Good Ecological and Good Chemical Status” (GES) by 2015. For groundwaters the objective is “Good Chemical and Good Quantitative Status”. Under certain circumstances deviation from these objectives may be permitted, either through designating water bodies as Heavily Modified or Artificial or through derogations. A timescale for implementation is contained within the Directive, with a number of key deliverables required. These are outlined in Table 1. Work within the Shannon River Basin Project is currently focused on the characterisation report which is due at the end of 2004. This characterisation report must identify all water bodies which are “at risk” of not achieving GES by 2015.

Year	Requirement
2003	Transpose Directive into domestic law Identify <b>river basin districts</b> and the <b>competent authorities</b> that will be empowered to implement the Directive
2004	<b>Characterise</b> river basin districts <b>Assess impacts</b> on river basin districts Complete <b>economic analysis</b> of water use Establish a <b>register of protected areas</b>
2006	Establish <b>environmental monitoring programme</b> Publish work programme for producing first River Basin Management Plans (RBMPs)
2007	Publish interim overview of significant water management issues
2008	Publish draft RBMPs for consultation
2009	Publish <b>finalised RBMPs</b> Finalise <b>programme of measures</b> to meet objectives
2012	Ensure all measures are fully operational Publish timescale and work programme for 2 <sup>nd</sup> RBMP
2013	Review characterisation and impact assessment for each river basin district Review economic analysis of water use Publish interim overview of significant water management issues
2014	Publish 2 <sup>nd</sup> draft RBMPs for consultation
2015	<b>Achieve environmental objectives specified in 1<sup>st</sup> RBMP</b> Finalise and publish 2 <sup>nd</sup> RBMP with revised programme of measures
2021	Achieve environmental objectives specified in 2 <sup>nd</sup> RBMP Publish 3 <sup>rd</sup> RBMP
2027	Achieve environmental objectives specified in 3 <sup>rd</sup> RBMP Publish 4 <sup>th</sup> RBMP

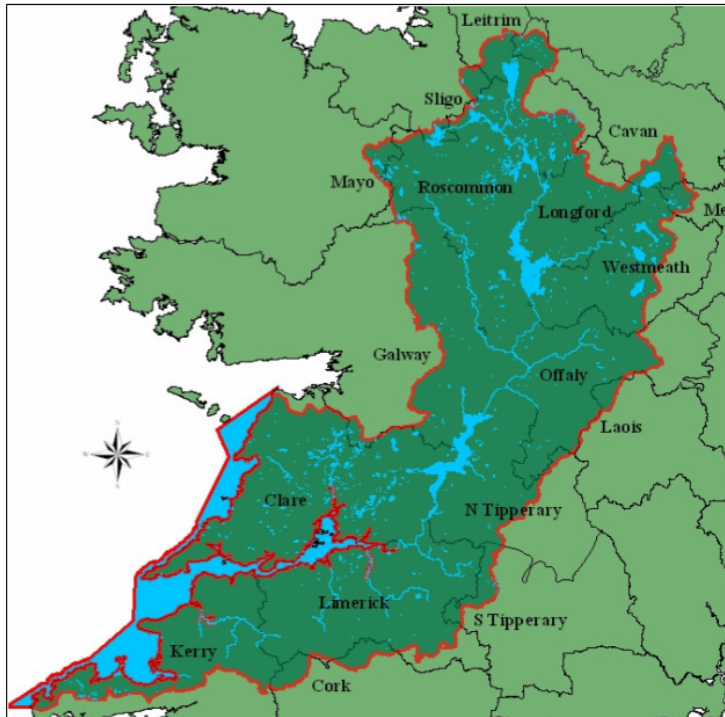
**Table 1 Timescale for implementation of WFD**

## 3 The Shannon River Basin District

The Shannon is the largest river basin in Ireland covering an area of over 18,000 km<sup>2</sup> as shown in Figure 2. Some six square kilometres of the river basin are located in County Fermanagh, Northern Ireland, hence the designation of the Shannon as an International River Basin District.

Agriculture is the principal activity in the catchment with grassland being the dominant use. Approximately 3% of the catchment is afforested and 8% of the catchment is covered by peat bogs, which have been extensively developed since the 1940s for the production of milled

peat to fuel the generation of electricity in local power stations. The River Shannon discharges into the Shannon Estuary at Limerick, with the estuary extending a further 100km to its mouth at Loop Head. There are ports at Foynes and Limerick and several industrial jetties within the estuary.



**Figure 2 Shannon River Basin District**

The Shannon River Basin District Project is the main vehicle for delivering the objectives of the WFD within the Shannon RBD between January 2003 and December 2006. The project will provide the basis for an integrated River Basin Management System that will include provision and implementation of:

- A comprehensive water quality monitoring system for all waters within the River Basin District
- A computerised GIS Management System
- A programme of appropriate abatement measures
- A public awareness and consultation programme
- An Environmental Management System

#### **4 Project Activities**

The main focus of activity at present is undertaking the risk assessment which will identify those water bodies at risk of not achieving the objectives specified in the Directive. This will then be incorporated into the characterisation report which is to be submitted to Europe. Underpinning this work are a number of key activities, as discussed below.

#### 4.1 Water Body Identification

The primary unit of management within the river basin district is a water body. The water body should be a coherent sub-unit within the river basin whose status can be clearly defined and compared to the objectives of the Directive. There is therefore an implicit requirement that each individual water body must be monitored as part of a comprehensive sampling programme. Opportunities may exist however for grouping of water bodies of similar typology and thus reducing the sampling activity required.

Work to identify water bodies in Ireland is on-going, however the following points may be noted.

##### Groundwater Bodies

There are currently 97 groundwater bodies within the Shannon RBD. Delineation was based on rock type which was then categorised by aquifer potential. Further analysis focusing on rock formation and thus yields and drawdown potential then resulted in the final 97 water bodies.

##### Surface water bodies

In line with European guidance, first order streams (i.e. the headwaters of a river) will not be considered as separate water bodies. Additionally, only second order streams with a catchment area of greater than 10km<sup>2</sup> will be considered as water bodies. Work to date has identified 883 river water bodies within the Shannon. This number will be reduced following “typing”, or classification according to typology, of the water bodies. There are likely to be 12 – 16 typologies within the Shannon

There are 50 lakes within the Shannon RBD with an area of greater than 50ha. These will each be considered as separate water bodies and their status reported to Europe. The remaining 1,200 lakes within the RBD will be grouped according to typology for management purposes.

There are 9 coastal water bodies and 13 transitional water bodies within the Shannon as shown in Figure 3.

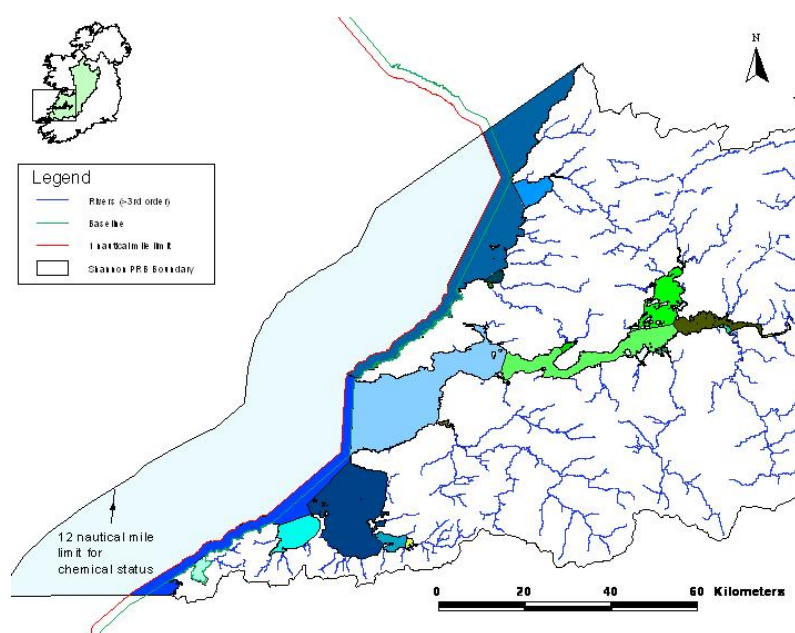


Figure 3 Coastal and transitional water bodies within the Shannon RBD

## 4.2 *Heavily Modified and Artificial Water Bodies*

As stated earlier, the aim of the Directive is that all surface waters achieve “Good Ecological And Chemical Status” by 2015. However, the Directive also recognises that particular water bodies may not be capable of achieving this status due to the impact of physical modifications carried out to allow certain beneficial uses such as water storage and navigation. For these water bodies a revised objective of “Good Ecological Potential” is set. This objective takes account of the constraints imposed by the use-value of modifications to the physical structure of the water body and is equivalent to achieving good ecological status in similar but unmodified water bodies. Such water bodies must be designated as either “Artificial” or “Heavily Modified” as appropriate under the terms of Article 4(3) of the Directive.

The critical point underlying the identification of a water body as Heavily Modified is that it must be the modifications which are causing the failure to achieve GES. A water body may be modified and it may be unable to achieve GES but if this failure is due to other factors then designation as Heavily Modified is not appropriate.

Work to provisionally identify Artificial and Heavily Modified water bodies within the Shannon is at an advanced stage, and consensus has been reached with the relevant stakeholders regarding the approach to be taken.

There are a number of canals associated with the RBD, the majority of which are Artificial as defined by the terms of the Directive

*a surface water body which has been created in a location where no significant surface water existed before and which has not been created by the direct physical alteration of an existing water body or movement or realignment of an existing water body.*

These water bodies will therefore be identified as Artificial in the characterisation report and their objective set as Good Ecological Potential.

Flow in the River Shannon has been controlled for over 200 years to aid navigation and there are therefore a number of locks and weirs present in the river. In the late 1920s further modifications were put in place to facilitate the ESB hydroelectric power station at Ardnacrusha. This included the construction of a dam at Parteen Villa which diverts much of the flow downstream of Lough Derg away from the River Shannon and through the power station, before re-entering the Shannon just upstream of Limerick City. Although the main function of the weirs on the Shannon is to aid navigation, they are also operated in such a way as to facilitate the operation of Ardnacrusha power station.

In addition to these physical alterations, the activities associated with the worked peatlands in the catchment have the potential to alter the hydrology and the morphology of the catchment, through radically changing the run-off characteristics of the area and amending the natural course and channel of affected tributaries. Also, drainage works carried out by the Office of Public Works (OPW) in the past to ameliorate the potential for flooding may have resulted in alterations to the hydromorphology.

Activities within the estuary associated with shipping traffic, such as dredging and dumping of spoil also have the potential to alter the hydromorphology of the water body.

Following consideration of the activities discussed above, the preliminary conclusion is that few areas of the Shannon RBD are at risk of failing to achieve GES as a result of changes in hydromorphology.

### **4.3 Risk Assessment Process**

The key strategy underlying the risk assessment process is a clear link between Pressures and Impacts. Therefore, for each defined pressure, it is important to clarify both pathway and impact. Where data is available it can be used to refine the risk assessment process however in many cases the required data may not exist. The risk assessment concentrates on categorising water bodies in terms of;

- 1a. Water Bodies definitely at significant risk of failing to achieve GES
- 1b/2a Water Bodies probably at risk of failing to achieve GES but for which more detailed risk assessments and/or data collection is required
- 2b Water Bodies not at risk of failing to achieve GES.

Water bodies in categories 1a and 2b will be identified by the end of 2004. Water bodies in the middle category will require further investigation throughout 2005 and 2006, possibly through a focused monitoring programme.

Work is currently underway in Ireland to determine methodologies for each of the risk assessments required by the Directive. This work is a collaborative process across all river basin projects to ensure that a coherent and consistent approach is taken throughout the country and there are no variations between RBDs. The Shannon river basin project is responsible for determining the risk assessment methodology for coastal and transitional waters. This methodology is based on the work carried out by the UK Technical Advisory Group (UK TAG) regarding this task, adapted where necessary to the specific circumstances found in Ireland. Preliminary results indicate that few of the coastal and transitional water bodies in the Shannon are likely to fall into category 1a above (definitely at risk) but that a number may be categorised as 1b/2a and hence require further investigation.

### **4.4 Public Participation**

The involvement of the public in the river basin planning process is a fundamental tenet of the Directive. The Shannon River basin project is therefore ensuring that local communities and stakeholders are kept informed of progress and allowed the opportunity to make their views known.

In January and February of 2004, a series of public meetings were held throughout the catchment, at locations designed to ensure that no-one had to travel more than 30km to a meeting. At these events the project team was introduced and an overview given of the project and its main aims and objectives. However, one aim was to receive, rather than solely provide, information and so the events were designed in such a way as to promote opportunities for the public to discuss issues of concern to them and to allow the project team to collect information on local matters.

A web site has been set up ([www.shannonrbd.com](http://www.shannonrbd.com)) which acts as a forum for both the dissemination and collection of information. In addition to regular updates on project progress, the web site provides an opportunity for feedback through a comments page.

## **5 Future workload**

Following finalisation of the risk assessment methodologies, the characterisation reports for the Irish river basins will be prepared. In the interests of consistency and ease of use it has been decided to produce a single report for the whole of Ireland with maps for each individual

river basin. This report is due to be finalised in December 2004, with submission to Europe in March 2005.

A key component of the river basin projects is the formation of a monitoring programme designed to assess the status of the river basin districts and identify areas where measures may be necessary in order to improve status. It is intended that the conclusions from the risk assessment process will form one input into this programme.

The final output from the river basin district projects will be available in 2006 and will be used to generate the River Basin Management Plans which will be submitted to Europe in 2009.