



**Department of Environment, Food and Agriculture  
Government Laboratory**

*Rheynn Chymmyltaght, Bee as Eirinys  
Thie-scroodee-stoo yn Reiltys*

**Interim Report on Isle of Man River Water Quality 2009**

Biological and chemical water quality data from 1995 to 2009 are presented, showing the different water quality classes that rivers achieved historically and most recently in 2009. This allows long term trends in water quality to be observed.

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# Department of Environment, Food and Agriculture Government Laboratory

## Isle of Man Interim Report on River Water Quality 2009

### **Introduction**

In order to monitor the quality of river waters, the Government Laboratory's Freshwater Biologist samples 86 sites throughout the Island on a regular basis throughout the year, as well as responding to specific requests or notifications. In addition to providing information generally about pollution of watercourses on the Island, the routine monitoring and other assessments provide data that are vital to the Department of Environment, Food and Agriculture's Environmental Protection Unit responsible for control of pollution including licensing of discharges. The results of the regular monitoring form the basis of this Interim Report. A fully detailed report is planned on a five-yearly basis, the last having been published in 2006 covering the period autumn 2000 to autumn 2005.

River water quality is measured by biological and chemical indicators. The former show the effect of any pollution on wildlife in the river, and can indicate chronic pollution (long term, even at low level) as well as the immediate effect of short-term events. Chemical indicators complement the biological by showing the state of the water at the time of sampling.

Looking to the future it is noted that in order to reduce the committed resources and allow a transfer of manpower from the Government Laboratory to the Department's unit responsible for control of pollution including licensing of discharges into rivers, the scale of monitoring by the Government Laboratory has been reduced by half from the end of the period covered by this Report. In the revised scheme for monitoring a quarter of the existing sites will continue to be monitored fully as hitherto, being those sites identified as either those more at risk of pollution from existing or anticipated activities or development or those in respect of which continuous data are considered to be of particular importance for other purposes. The remainder, namely those that recent monitoring has shown to be stable and which are not considered to be either at particular risk or under stress, will continue to be monitored, but with a reduced frequency and with a streamlined biological assessment, subject to more detailed investigation in the event of any deterioration being detected. As a consequence future annual interim reports and even the planned quinquennial reports will not necessarily provide for direct comparison with this and previous reports.

### **Targets for water quality**

Following enactment of the Water Pollution Act 1993, initial surveys and monitoring of the rivers led to the setting in 2001 of River Quality Objectives. These led to the establishment of key performance indicators (KPIs) for both biological and chemical water quality, requiring 98% of the Island's rivers to be at least 'fair' water quality.

In recognition that the original KPIs actually allowed for none of the rivers to be 'good', potentially giving a false impression of the overall state of the rivers, a second pair of targets were agreed in 2009, to cover the higher quality end of the river water quality spectrum. The additional targets are a minimum of 68% to have at least 'good' biological quality and at least 88% to have at least 'good' chemical quality.

These additional targets are in keeping the more recent approach by the UK Environment Agency, which is now publishing its water quality in terms of 'good or excellent' or 'good or better', with no ready reference to 'fair or better'. The old targets for 'fair or better' have been retained here for the time being because they are still valid measures at the poorer end of the spectrum, whilst also allowing continuity of performance data.

The revised scope of monitoring with its dual approach will not allow calculation of the quality of rivers in the same way as hitherto. New targets for future use are therefore under consideration, but will be designed as far as possible to allow appropriate comparison of the rivers with past assessments.

Data are presented in a rolling 3 year form where possible. However, the data-sets used and the year groupings have been partially dictated by the seasonal sampling runs achieved in each year. Nevertheless, the data presented provide a reasonably comprehensive timeseries of water quality changes for the Island's rivers.

### **Biological water quality**

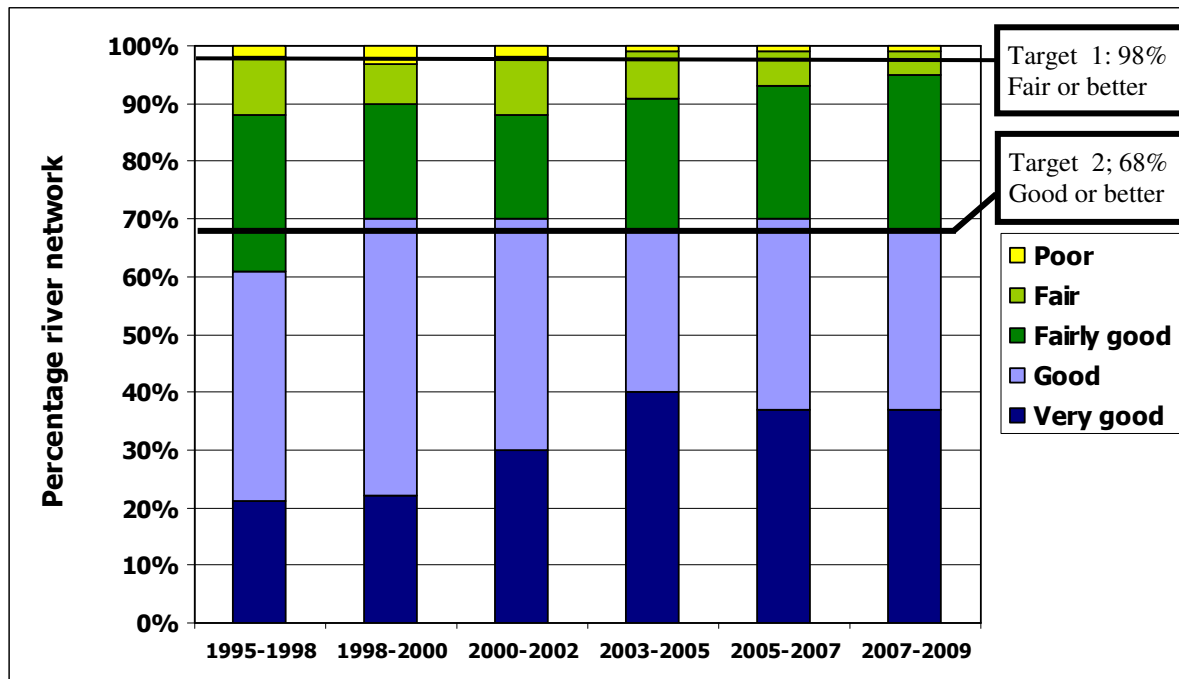
Assessment of biological water quality involves the collection and identification of the invertebrate animal communities in river sites. The presence or absence of certain types of animals indicating very good, good, fairly good, fair, poor or bad water quality, based on the types of water conditions the different organisms can tolerate or require. As some animals can tolerate certain conditions for longer than others, the balance of organisms provides information that can show how recently pollution may have occurred, or if it has been ongoing for some time.

Samples of animals from the river bed are collected at 86 sites twice in the year, and taken back to the Laboratory where they are all sorted and identified. The results are used to compile a quality index for the year for each specific site, using a computer modelling package called RIVPACS, the same as that used for assessing water quality in England, Wales and Northern Ireland. This system averages the results for rolling three year periods to produce the water quality indices. These results are presented in the table and chart that follow.

**Table showing percentage of monitored river length achieving different biological water quality classes**

Water quality class	1995-1998	1998-2000	2000-2002	2003-2005	2005-2007	2007-2009
Very good	21	22	30	40	37	37
Good	40	48	40	28	33	31
Fairly good	27	20	18	23	23	27
Fair	10	7	10	8	6	4
Poor	2	3	2	1	1	1

**Chart showing percentage of monitored rivers achieving different biological water quality classes 1995-2009**



The target of 98% of all monitored rivers on the Island achieving at least fair biological quality has been maintained with 99% of Manx rivers achieving fair or above a biological quality.

Approximately 68% of Manx rivers had good or better biological water quality, supporting diverse invertebrate communities requiring water very low in organic pollution. This figure meets the new target minimum of 68%. Only 1% of Manx rivers were poor, with sparse communities containing only those animals able to tolerate high levels of organic pollution. There were no 'bad' water quality Manx rivers, where rivers exhibit constant extreme pollution.

### **Chemical water quality**

The assessment of chemical water quality involves chemical analysis of various indicators of organic pollution, such as dissolved oxygen, biochemical oxygen demand and ammonia. These parameters only relate to the water at the time of sampling, therefore with fast moving rivers in particular they can only be a measure of the instantaneous state of the water at the time of sampling.

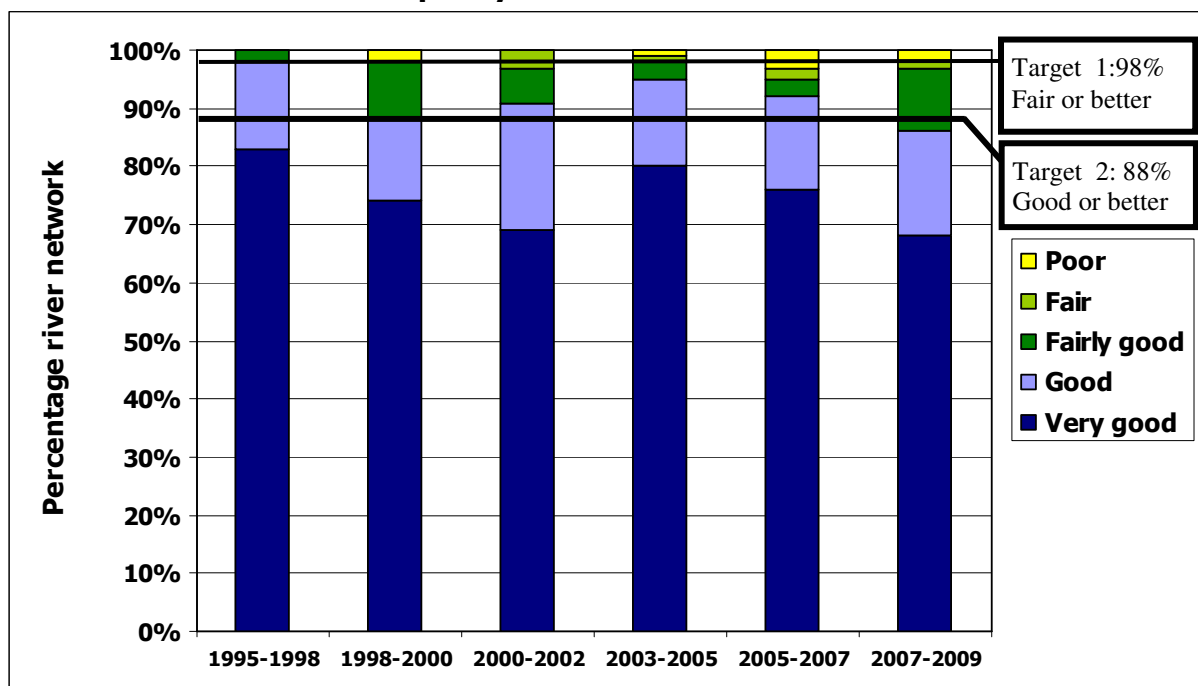
Chemical parameters are nevertheless important indicators of the state of the river, and in particular provide a quantitative measure of levels of pollution. They also provide a means of assessing the contribution of discharges into rivers to pollution levels in the river.

The results of the routine monitoring at 86 sites three times in the year are used to compile a quality index for the year for each site, in a similar manner to the biological quality index. The resultant assessments are presented in the following table and chart, compared with the same data from previous periods.

**Table showing percentage of monitored river length achieving different chemical water quality classes**

Water quality class	1995-1998	1998-2000	2000-2002	2003-2005	2005-2007	2007-2009
Very good	83	74	69	80	76	68
Good	15	14	22	15	16	18
Fairly good	2	10	6	3	3	11
Fair	0	0	3	1	2	1
Poor	0	2	0	1	3	2

**Chart showing percentage of monitored rivers achieving different chemical water quality classes 1995 – 2009**



The target of 98% of all monitored rivers on the island achieving at least fair chemical quality has been achieved in the latest chemical monitoring. In the period up to and including 2009, 98% of Manx rivers were of fair or better chemical quality. This represents a slight increase from the previous period, which fell short of the target with only 97% of rivers of at least fair quality.

86% of Manx rivers were good or better quality, overall failing to achieve the new target minimum of 88%, indicating that some of the better rivers are under stress. Furthermore, a study of the data since 2000-2002 shows that in respect of the highest rating of 'very good' there has been a continued and significant drop in the proportion of rivers meeting that standard for chemical quality, which highlights a slight deterioration in several of our highest quality rivers. Whilst some recent wet summers undoubtedly will have increased the leaching and run-off of pollutants from the land in general, the degradation also appears to reflect increasing pressure on our rivers from the ever increasing building and development over this time period.

## **Conclusions**

Overall, taking into account both biological and chemical indicators, river water quality in the Isle of Man remains relatively high. The latest figures show that, on balance, the high level of water quality reported for the period to 2008 has been maintained, with the Island's rivers in the main being high quality aquatic environments supporting diverse animal life, and generally of a higher standard than those found in much of the U.K.

Nonetheless, the gradual deterioration of some of our highest quality rivers is of concern, and indicates a need for increased care and vigilance by businesses and the public to avoid pollution. This requires awareness by all that activities on land, including development whether for residential, industrial or agricultural purposes, have the potential to have a significant negative impact on waterways into which the land drains.

Although reduced, on the basis of recent patterns of pollution, the revised level of routine monitoring adopted for the future should enable the availability of sufficient data to inform and support the environmental protection activities of the Department. However, any unexpected degradation in the rivers is likely to trigger an immediate need for a higher level of monitoring activity.

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