

Ecology and the Water Framework Directive

The Water Framework Directive (WFD) requires surface water bodies to achieve 'good ecological status'. This Brief gives the Environment Agency's current understanding and position on some of the key ecological issues.

Key issues

- The identification of water bodies to be covered by the Water Framework Directive.
- The definition of 'good ecological status'.
- Exceptions to 'good ecological status' requirements.

Background

The WFD provides a major opportunity to improve the water environment and promote the sustainable use of water for the benefit of both people and wildlife. The WFD aims to prevent further deterioration and to protect and enhance aquatic ecosystems and associated wetlands. Water quality/quantity and habitat structure are all of interest.

Determination of ecological status for surface waters involves the assessment of aquatic plants, invertebrates and fish and the measurement of supporting physical, chemical and hydromorphological parameters.

Surface water bodies will be required to be of at least 'good ecological status' (GES). GES is slightly different from 'high ecological status', which is the reference condition for surface water bodies that are 'totally' or 'nearly totally' undisturbed by human intervention.

The WFD applies to all surface freshwater bodies (including lakes, streams and rivers), groundwaters, estuaries and coastal waters. This contrasts with most existing EU directives (e.g. the Bathing Water Directive) which only apply to specific designated waters.

The definition of 'good ecological status'

Water bodies of 'good ecological status' should have the biological and chemical characteristics that would be expected under sustainable conditions. Clearly, practicality and cost to society have to be considered in achieving this and this principle is inherent in the WFD.

Algae, aquatic and marginal plants, aquatic macro-invertebrates and fish will all be used to assess the ecological status of water bodies. These organisms (or 'biological elements') form communities whose composition is determined by the environmental conditions of the water body. Some classification systems based on community composition already exist (e.g. the General Quality Assessment) and could perhaps be modified for the WFD, while others need to be created.

The WFD states that the biological element most sensitive to the pressures acting on a water body should be used to determine status. For 'good ecological status', the general physical and chemical conditions must be such as to support the biological quality elements consistent with the status.

The status of biological elements will be reported by comparison with 'high ecological status' reference conditions for the 'type' of water body. It must not be assumed that human-induced changes in these measurements are always negative (e.g. increased growth rate and size of fish may occur as a consequence of nutrient enrichment).

Evidence from sites relatively unaffected by human activities exists for some water body types. For example a large range of rivers in the UK have been sampled for macro-invertebrates. However, very little data has been collected for lakes or coastal waters and there is an urgent need to collect new information for a range of sites in these water bodies.

Where 'reference' condition data is not available for water bodies, a combination of modelling, expert opinion and data from similar 'ecoregions' in other EU countries may be required to decide how far our existing 'best' sites are from reference condition. This would be preferable to interpolating the reference condition.

Deviation from reference conditions will need to be decided and agreed at the member state level. Comparisons between member states will then enable boundaries for 'good ecological status' to be defined.

Exceptions to 'good ecological status' requirements

There are exceptions to the requirement to reach 'good ecological status'. For surface waters that have been physically modified, there will be an alternative ecological objective of 'good ecological potential' (e.g. by bank reinforcements for navigation, flood defence structures and dams for water supply). This objective allows for the biological effects resulting from the physical modification, if they are justified by the benefits derived from the use.

There are also opportunities for extensions of deadlines to meet objectives or for lower objectives if it is technically infeasible or disproportionately expensive to meet the 'good ecological status' objective. The possibilities of 'derogations' where there are unforeseen circumstances such as drought or flood periods also exist.

Higher standards may also be set, for instance in 'protected areas'. The objectives from other water-related legislation have to be met and the most stringent applies. For example, the Nitrates Directive applies to Nitrate Vulnerable Zones and the Habitats Directive to Natura 2000 sites.

Intercalibration

Boundaries between high/good and good/moderate status are being established through an intercalibration exercise facilitated by the European Commission to ensure that there is consistency between member states.

The first stage in this intercalibration process is the provision to the Commission (via Joint Research Centre, JRC) of a list of sites on the high/good and good/moderate boundary by April 2004. The information to decide where these boundaries lie depends on the results of biological monitoring systems and the WFD does not require monitoring to be in place until 2006. In the meantime, the draft register of sites is being developed using the best available information.

For many water bodies however, we have little to go on and will be relying on expert opinion or limited monitoring between now and the start of intercalibration using the network of sites in 2005. The good/moderate boundary is of particular importance as the overall aim of the directive to achieve “good ecological status” and the driver for investment will be in those areas deemed to be moderate or less.

For further information, please contact:

Isobel Austin, Environment Agency, Water Framework Directive Communications
Tel: 01491 828520 Email: isobel.austin@environment-agency.gov.uk

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ENVIRONMENT AGENCY



022818

CONTACTS:

ENVIRONMENT AGENCY HEAD OFFICE

Rio House, Waterside Drive, Aztec West, Almondsbury, Bristol BS32 4UD
Tel: 01454 624 400 Fax: 01454 624 409

www.environment-agency.gov.uk

www.environment-agency.wales.gov.uk

ENVIRONMENT AGENCY REGIONAL OFFICES

ANGLIAN

Kingfisher House
Goldhay Way
Orton Goldhay
Peterborough PE2 5ZR
Tel: 01733 371 811
Fax: 01733 231 840

SOUTHERN

Guildbourne House
Chatsworth Road
Worthing
West Sussex BN11 1LD
Tel: 01903 832 000
Fax: 01903 821 832

MIDLANDS

Sapphire East
550 Streetsbrook Road
Solihull B91 1QT
Tel: 0121 711 2324
Fax: 0121 711 5824

SOUTHWEST

Manley House
Kestrel Way
Exeter EX2 7LQ
Tel: 01392 444 000
Fax: 01392 444 238

NORTH EAST

Rivers House
21 Park Square South
Leeds LS1 2QG
Tel: 0113 244 0191
Fax: 0113 246 1889

THAMES

Kings Meadow House
Kings Meadow Road
Reading RG1 8DQ
Tel: 0118 953 5000
Fax: 0118 950 0388

NORTH WEST

PO Box 12
Richard Fairclough House
Knutsford Road
Warrington WA4 1HG
Tel: 01925 653 999
Fax: 01925 415 961

WALES

Tŷ Cambria/Cambria House
29 Newport Road
Cardiff CF24 0TP
Tel: 029 2077 0088
Fax: 029 2079 8555



ENVIRONMENT AGENCY
GENERAL ENQUIRY LINE

0845 9 333 111

ENVIRONMENT AGENCY
FLOODLINE

0845 988 1188

ENVIRONMENT AGENCY
EMERGENCY HOTLINE

0800 80 70 60



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