THE WATER FRAMEWORK DIRECTIVE AND CEN (COMITÉ EUROPEÉN DE NORMALISATION)

Roger Sweeting [1] and Marja Ruoppa [2]

[1] Freshwater Biological Association, The Ferry House, Far Sawrey, Ambleside, Cumbria LA22 OLP, United Kingdom
[2] Finnish Environment Institute, P.O. Box 140, FIN-00251 Helsinki, Finland

Photo: from the Windermere book/FBA

General

EU Directives drive the protection of European surface waters. The most recent and perhaps the most important, **the Water Framework Directive** [WFD (2000/60/EC)], establishes a framework for protection of all water bodies within the EU. The principal environmental objective is to achieve "good ecological and chemical status" of all waters. Classification and monitoring of inland surface, transitional (estuarine) and coastal waters will be based on biological "elements" (plankton, macrophytes, macroinvertebrates and fish) and supporting "elements" (chemical and hydromorphological). In the Water Framework Directive, CEN and ISO standards are specified for classification and monitoring the elements.

The European Committee for Standardization (CEN) was founded in 1961 by the national standards bodies in the European Economic Community and EFTA countries. Now CEN is contributing to the objectives of the EU and the European Economic Area with voluntary standards which promote environmental protection through agreed methodologies. At present CEN has 28 National Members, 8 Associates and 2 "Counsellors" (EU Commission and EFTA Secretariat).

CEN/TC 230 "Water analysis" is the Technical Committee responsible for standardization of biological, chemical and microbiological methods in water. The Technical Committee, Working Groups and Task Groups are shadowed by similar groupings in the National Standards Organizations. The CEN national members develop and vote for the ratification of European Standards. They also must implement EN-standards as national standards, withdrawing any conflicting national standards.

Biological methods are developed in **CEN/TC230/Working Group 2 "Biological and Ecological Assessment Methods"** and its Task Groups (TGs). WG2 is specifically aimed at progressing European ecological assessment methods with the following Task Groups:
- TG1: Invertebrates
- TG3: Aquatic macrophytes and algae
- TG4: Fish monitoring
- TG5: Water body characteristics
- TG6: Quality assurance
- TG7: Marine ecological methods
- Ad hoc Strategy Group

The biological methods for toxicological testing (diagnostic methods), sampling and biodegradability are prepared in ISO (the International Standards Organization) and for chemicals testing in OECD.

There are several research projects associated with the WFD, (e.g. STAR, FAME, REBECCA etc.) as well as a number of Common Implementation Strategy (CIS) Groups set up on behalf of DG Environment. The Working Group has liaisons with these projects and groups in order that the development of mechanisms and methods to carry out the monitoring and diagnosis required can be done seamlessly.

EN-standards available for monitoring biota associated with the Water Framework Directive

According to the WFD, surveillance, operational and investigative monitoring of water bodies shall be based on biological quality elements. Methods used for the monitoring shall conform to the international standards (ie relevant CEN/ISO standards where available).
At present (2004) there are relatively few methods that have acceptance in all member states of the EU.
Only part of biological monitoring requirements has been covered, so far, by CEN and ISO committees.

Table 1. EN-standards currently available for monitoring / WFD

EN 25667-1	Water quality – Sampling - Part 1: Guidance on the design of sampling programmes (ISO 5667-1:1980)	1993
EN 25667-2	Water quality – Sampling – Part 2: Guidance on sampling techniques (ISO 5667-2:1991)	1993
EN ISO 5667-3	Water quality – Sampling guidance on the preservation and handling of samples (ISO 5667-3:1994)	1995
EN 27828	Water quality – Methods of biological sampling - Guidance on handnet sampling of aquatic benthic macroinvertebrates (ISO 7828:1985)	1994
EN 28265	Water quality – Methods of biological sampling – Guidance on the design and use of quantitative samplers for benthic macro-invertebrates on stony substrata in shallow freshwaters (ISO 8265:1988)	1994
EN ISO 9391	Water quality – Sampling in deep waters for macroinvertebrates – Guidance on the use of colonization, qualitative and quantitative samples (ISO 9391:1993)	1995
EN ISO 5667-16	Water quality – Sampling – Part 16: Guidance on biotesting of samples (ISO 5667-16:1998)	1998
EN ISO 8689-1	Water quality - Biological classification of rivers – Part 1: Guidance on the interpretation of biological quality data from surveys of benthic macroinvertebrates in running waters (ISO 8689 -1:2000)	2000
EN ISO 8689-2	Water quality – Biological classification of rivers – Part 2: Guidance on the presentation of biological quality data from surveys of benthic macroinvertebrates (ISO 8689 -1:2000)	2000
EN 13946	Water quality – Guidance standard for the routine sampling and pretreatment of benthic diatoms from rivers	2003
EN 14184	Water quality – Guidance standard for the surveying of aquatic macrophytes in running waters	2003
EN 14011	Water quality – Sampling of fish with electricity	2003

Photo: From the Windermere book/FBA

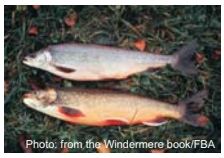
Photo: from the Windermere book/FBA

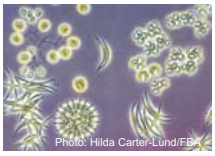
Photo: Hilda Carter-Lund/FBA

Table 2. CEN-standards in progress (July 2004)

CEN/TC230/WG2/TG1 N 72 E	Water quality – Guidance standard for surveying of **benthic macroinvertebrates** in lentic waters
CEN/TC230/WG2/TG1 N 90	Water quality – Guidance on the scope and selection of benthic **macroinvertebrate** sampling methods in freshwaters
CEN/TC230/WG2/TG1 N 91	Water quality – Guidance on the design, operation and performance characteristics of sampling devices for evaluation of benthic **macroinvertebrate** populations in freshwaters
CEN/TC230/WG2/TG1 N 92	Water quality – Guidance on field and laboratory procedures for processing samples of benthic **macroinvertebrates** from inland freshwaters
CEN/TC230/WG2/TG1 N 77	Water quality – Guidance standard for the sampling of **zooplankton** from standing waters
CEN/TC230/WG2/TG1 N 89	Water quality – Guidance on the sampling and processing of the pupal exuviae of ***Chironomidae*** (Order *Diptera*) for ecological assessment
CEN/TC230/WG2/TG3	Water quality – Guidance standard for the survey, sampling and laboratory analysis of **phytobenthos** in shallow running waters
CEN/TC230/WG2/TG3 N 83	Water quality – Guidance standard for the routine analysis of **phytoplankton** abundance and composition using inverted microscopy (Utermöhl technique)
CEN/TC230/WG2/TG3 N 80	Water quality – Guidance standard for the surveying **macrophytes** in lakes
CEN/TC230/WG2/TG3 prEN 14407	Water quality – Guidance standard for the identification, enumeration and interpretation of **benthic diatom** samples from running waters
CEN/TC230/WG2/TG4 prEN 14757	Water quality – Sampling of **fish** with multi-mesh gillnets
CEN/TC230/WG2/TG4 prEN 14962	Water quality – Guidance on the scope and selection of **fish** sampling methods.
CEN/TC230/WG2/TG5 prEN 14614	Water quality – Guidance standard for assessing the **hydromorphological** features of rivers
CEN/TC230/WG2/TG6 prEN 14996	Water quality – Guidance on **assuring the quality** of biological and ecological assessments in the aquatic environment
CEN/TC230/WG2/TG7 prEN/ISO 16665	Water quality – Guidelines for quantitative investigations of **marine soft-bottom benthic fauna** in the marine environment (ISO/DIS 16665)
CEN/TC230/WG2/TG7 ISO/CD 19493	Water quality – Guidance on **marine biological surveys** of littoral and sublittoral hard bottom

Most of the standards produced up to now have been developed collaboratively between ISO and CEN, but because of the regional nature of the WFD, many of those being developed at present in CEN may not be adopted by ISO. Twelve EN-standards are available (Table 1) and 16 methods are currently being developed (Table 2) to support the classification and monitoring needs of the WFD. The time taken to develop a standard from the first formal agreement on the work item to the final publication is normally about three years.

Needs for future standardization in CEN

There is still a considerable amount of surveillance and operational monitoring to be addressed through method development by CEN. The directive also requires investigative (diagnostic) monitoring to be carried out in areas where water quality status differs from that which is expected. Those methods are mainly prepared within ISO but there is a mechanism through which (Vienna agreement) they can also be accepted as EN-standards. Once again all participating national standards bodies are consulted on this proposed acceptance before any formal decision is made.

CEN/TC230/WG2 / Ad hoc group. This group is responsible for formulating the plans for the Working Group. In its Strategy it has listed 15 methods in which informal collation of existing knowledge and practice is being carried out as a precursor to the development of new CEN methods.

These include:
- An umbrella standard in the field of application of existing aquatic invertebrate sampling methods
- Invertebrate field and laboratory methods following sampling
- Guidance on pro-rata multi-habitat-sampling of benthic invertebrates from wadeable rivers
- A guidance standard on the design of multimetric indices
- A European trophic scoring system for macrophytes
- A lake macrophyte survey methodology
- Phytobenthos standard method for lakes
- Phytoplankton sampling
- Phytoplankton biovolume assessment
- Fish sampling methods: hydroacoustics and vertical gillnets
- A broad-based lake habitat survey system
- A method for the integrated assessment of river hydromorphology
- The usability and development of biological identification guides
- The design and analysis of inter-laboratory calibration studies for ecological assessment
- The assessment of performance characteristics in ecological assessments

Environmental legislation relating to water quality in the European Union can only be as good as the ecological assessment methods that are used to support it. In order to achieve agreement throughout Europe, the use of CEN procedures provides an effective, formally recognized system that can deliver this.

Contacts:
www.cenorm.be

CEN/TC 230/WG2 Biological and Ecological Assessment Methods

Convenor/Chairman: Roger Sweeting
Freshwater Biological Association
Ferry House, Far Sawrey
Ambleside, Cumbria, LA22 0LP. UK
(chiefexec@fba.org.uk)

Secretariat: Peter Hale
Environment and Heritage Service
(Water Management)
17 Antrim Road
LISBURN, Co Antrim
Northern Ireland BT28 3AL.UK
(peter.hale@doeni.gov.uk)

Graphic design Sirkka Vuoristo