



SLOVENSKI STANDARD

SIST EN 14184:2003

01-december-2003

Kakovost vode - Navodilo za pregledovanje vodnih makrofitov v tekočih vodah

Water quality - Guidance standard for the surveying of aquatic macrophytes in running waters

Wasserbeschaffenheit - Anleitung für die Untersuchung aquatischer Makrophyten in Fließgewässern

Qualité de l'eau - Guide pour l'étude des macrophytes aquatiques dans les cours d'eaux

Ta slovenski standard je istoveten z: **EN 14184:2003**

SIST EN 14184:2003
<https://standards.iteh.ai/catalog/standards/sist/d1786656-8934-4292-8266-c6314114a6ab/sist-en-14184-2003>

ICS:

13.060.10	Voda iz naravnih virov	Water of natural resources
13.060.70	Preiskava bioloških lastnosti vode	Examination of biological properties of water

SIST EN 14184:2003

en

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EUROPEAN STANDARD

EN 14184

NORME EUROPÉENNE

EUROPÄISCHE NORM

September 2003

ICS 13.060.70

English version

Water quality - Guidance standard for the surveying of aquatic macrophytes in running waters

Qualité de l'eau - Guide pour l'étude des macrophytes
aquatiques dans les cours d'eaux

Wasserbeschaffenheit - Anleitung für die Untersuchung
aquatischer Makrophyten in Fließgewässern

This European Standard was approved by CEN on 1 August 2003.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and United Kingdom.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Foreword

This document (EN 14184:2003) has been prepared by Technical Committee CEN/TC 230 "Water analysis", the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by March 2004, and conflicting national standards shall be withdrawn at the latest by March 2004.

WARNING — Working in or around water is inherently dangerous. Persons using this standard should be familiar with normal laboratory practice. This standard does not purport to address all of the safety problems, if any, associated with its use. It is the responsibility of the user to establish appropriate safety and health practices and to ensure compliance with any national regulatory conditions.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and the United Kingdom.

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Introduction

Macrophytes are an important component of aquatic ecosystems and can be used to facilitate the monitoring of ecological status. The requirement for the use of macrophytes in monitoring is inherent in numerous European and national directives (e.g. Council Directive establishing a framework for a community action in the field of water policy [Water Framework Directive “WFD”(2000/60/EC)], Urban Waste Water Treatment Directive (91/271/EEC), Nitrates Directive (91/676/EEC), Austrian Standard ÖNORM M6232, *Loi sur l'eau de 1992 (KKK)*, *Système d'Evaluation de la Qualité des Milieux aquatiques (SEQ)*, etc).

In addition to their important ecological role, the use of macrophytes as indicators of ecological quality in running waters is based on the fact that certain species and species groups are indicators for specific running water types and are adversely affected by anthropogenic impact. In certain situations the lack of macrophytes is also characteristic for certain types of running water habitats. For example, in deeper rivers macrophytes may be absent due to the habitat limitations imposed by water depth, current flow velocity, turbidity, etc. Therefore, the lack of macrophytes is also characteristic for certain types of running water habitats.

A wide range of sampling and survey methodologies has been developed for specific applications including conservation, drainage impact, management, ecological habitat, enhancement etc. The methodology of this guidance standard is recommended specifically for the surveying of macrophytes in running freshwaters, of natural and artificial character, for the purpose of monitoring ecological status. It could be used, however, as the basis for investigative monitoring of water quality or other applications.

According to the precise usage to which this European Standard is to be put, it is essential for specifiers and users to mutually agree on any necessary variations or optional procedural details prior to use.

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1 Scope

This European Standard specifies a method for surveying aquatic macrophytes in running waters for the purpose of assessing ecological status, using these organisms as elements of biological quality. The information provided by this method includes the composition and abundance of the aquatic macrophyte flora.

The general principles of the approach described in this European Standard may also be applied when monitoring water bodies in the fluvial corridor of a river, such as side channels and oxbows.

It is recognised that for a complete assessment of ecological status, other elements of biological quality should also be assessed.

2 Normative references

Non applicable.

3 Terms and definitions

For the purposes of this European Standard, the following terms and definitions apply.

3.1

aquatic macrophytes

larger plants of fresh water which are easily seen with the naked eye, including all aquatic vascular plants, bryophytes, stoneworts (Characeae) and macro-algal growths

3.2

bank

permanent side of a river or island, which is above the normal water level and only submerged during periods of high river flow

NOTE

In the context of this standard, bank species include macrophytes that overhang the channel but are rooted in the bank.

3.3

channel

the course of a river or stream

NOTE

In the context of this standard, this includes only the in-stream part, *i.e.* that which is under water most of the time although it may be exposed temporarily under conditions of dry-weather flow or for longer periods under certain natural (climatic, geological) conditions.

3.4

belt transect

a defined band across a river or stream at right angles to the bank

NOTE

This may be virtual or physically delineated within which the aquatic vegetation is analysed (species composition, abundance, cover).

3.5

ecological status

an expression of the quality of the structure and functioning of aquatic ecosystems, expressed by comparing the prevailing conditions with reference conditions

NOTE

As classified in accordance with Annex V of the EC Water Framework Directive (2000/60/EC).

EN 14184:2003 (E)**3.6****helophyte**

a plant that is usually rooted under water with emergent shoots, typically growing in marginal or marshy areas

3.7**hydrophyte**

an aquatic plant that is usually rooted under water with floating or submerged leaves, or totally free floating at the water surface

3.8**reference site (RefS)**

a length of river representing the reference conditions for a given ecological type of river

3.9**reference conditions**

conditions reflecting a totally undisturbed state, lacking human impact, or near-natural with only minor evidence of distortion

NOTE Reference conditions may be defined using field sites or, where necessary, using expert judgement or predictive modelling techniques.

3.10**representative site (RepS)**

a length of river reach representative of the ecological quality that characterizes that reach

3.11**river reach**

a major sub-division of a river, defined by physical, hydrological and chemical characteristics that distinguishes it from other parts of the river upstream and downstream

3.12**river survey stretch, survey section**

a short length of river for which community composition and abundance of aquatic species is determined, usually by semi-quantitative methods for assessment of ecological status and/or other purposes based on quantitative methods

4 Principle

This European Standard describes the methodological approach for determining the ecological status of river reaches using aquatic macrophytes. The status of a river reach is assessed by surveying a representative site (RepS) and measuring its deviation from the natural conditions of a river reach of a similar ecological type. If natural conditions in river reaches no longer exist to serve as a background, or a reference site (RefS), it is necessary to reconstruct this background based upon whatever records exist.

The presence of aquatic macrophyte taxa in the channels of defined river lengths is recorded. Macrophyte abundance, measured in terms of the spatial extension of taxa or macrophyte beds, and/or the relative abundance of macrophyte taxa, and/or macrophyte biovolume or biomass, is assessed by different methods adapted to the scale and purpose of the study.

Numerical derivatives of the macrophyte composition and abundance in a surveyed river length can be used to identify the divergence from type-specific "natural" conditions.

Concerning sampling of macrophytes, some information is given in EN 27828 and EN ISO 9391.

Table 1 — Aims and methods of survey

AIMS	METHODS	SCALES	COMMENTS
Floristic list	Floristic surveys on : selected reaches or contiguous reaches Phytosociology	10 m to 5 000 m Homogeneous minimal area depending on community type	Quick, depends on surveyor knowledge Reasonable cost but often imprecise Time and money consuming Some scientists think that associations do not exist.
General distribution map	Field or air surveys + GIS Selected reaches --> generalisation Contiguous reaches – > transcription	Large scale Possibly large scale Small to medium scale, including time effect	Technology, air survey is imprecise Problem of generalisation Time-consuming
Cover measurement /estimation	Pin-point method + transects Quadrats (+ transects) Light attenuation	100 to 500 points within a reach Submersible light sensors	Time-consuming, precise for abundant species, not for scarce ones More precise than pin-point method, with a slightly stronger effort Technology. Precise, but problem of algae deposition
Volume measurement /estimation	Pin-point-method, Field measurements	Quoting depth, thickness of plant layer Identification of each macrophyte stand	Time consuming, for functional ecology Time consuming, for functional ecology
Local map/DGPS Biomass	Transect + field drawing Cropping	from 5 m to 10m transect belt to very small areas GPS large scale	Time consuming, for functional ecology Problem of sorting plant material, destructive method

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5 Equipment

5.1 General

- Binoculars;
- Maps, with scales compatible with the objectives of the survey;
- Waterproof recording sheets, indelible pens/pencils and clipboard in a clear cover;
- Plastic bags, small specimen tubes and waterproof labels;
- Tape measure calibrated in metres, marking stakes and mallet;
- Hand lens, x10 magnification;
- Identification keys and field guides;
- Wading suit;
- Polarising sunglasses;
- Camera with polarising lens;
- Global Positioning System (GPS)-instrument;