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Water quality - Guidance standard on monitoring freshwater pearl mussel (*Margaritifera margaritifera*) populations and their environment

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

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Water quality - Guidance standard on monitoring freshwater pearl mussel (*Margaritifera margaritifera*) populations and their environment

Qualité de l'eau - Norme guide sur le suivi des
populations de moules perlières d'eau douce
(*Margaritifera margaritifera*) et de leur environnement

Wasserbeschaffenheit - Anleitung für das Monitoring
von Populationen der Flussperlmuschel (*Margaritifera
Margaritifera*) und ihrer Umwelt

This European Standard was approved by CEN on 4 December 2016.

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COMITÉ EUROPÉEN DE NORMALISATION
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European foreword

This document (EN 16859:2017) 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of an identical text or by endorsement, at the latest by August 2017, and conflicting national standards shall be withdrawn at the latest by August 2017.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

According to the CEN-CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Introduction

This European Standard provides guidance on monitoring populations of freshwater pearl mussel *Margaritifera margaritifera* and the environmental features on which this species depends. Pearl mussels are endangered throughout their Holarctic range as a result of intensive land-use, pollution, river engineering, abstraction, declining populations of host fish, and exploitation by pearl fishers [1], [2], [3]. Throughout this document, use of the term *Margaritifera* refers only to the species *Margaritifera margaritifera* (Linnaeus, 1758). Within the EU, *Margaritifera* is protected under national legislation as well as by the EC Habitats Directive (Council Directive 92/43/EEC) which requires Special Areas of Conservation to be designated to safeguard this species. The presence of a population of *Margaritifera* with full juvenile recruitment is the sign of a healthy functioning river [4].

Margaritifera has a well-documented but complicated life history, with a larval glochidial stage dependent on a salmonid host. The larvae encyst within the host fish gills following release of glochidia in summer or early autumn. There they overwinter and grow before dropping off in the following spring or early summer. The few that survive initially remain buried in the river-bed substrate for several years where they interact with interstitial water. Older mussels typically have their siphons exposed to filter within the open water. The glochidial and juvenile stages are more demanding of a high-quality environment than adult mussels, emphasizing the importance of defining and maintaining appropriate ecological conditions for the young stages [5].

Margaritifera lives for an unusually long time – over 100 years in much of its range – but life spans can be much shorter at the southern extreme of its range and much longer at the northern extreme. A lack of recruitment of young mussels leads to populations becoming unsustainable, but these problems can be masked by the continued survival of older mussels for many years long after successful recruitment has ended. The requirement for a host salmonid fish to carry the mussel larval stage presents an added challenge in maintaining the condition of freshwater pearl mussel populations.

Although *Margaritifera* is highly demanding in river substrate and water quality, it occurs in a wide range of catchments from small, siliceous, oligotrophic rivers, often with a lake upstream, to large lowland mineral systems. This standard strives to encompass the range of latitudinal and geological factors that affect *Margaritifera* across its range. It is essential to take into consideration the unique pressures on each individual population when setting priorities for monitoring.

NOTE A limited number of key references are given in the Bibliography. A comprehensive list can be consulted by using the following link to the website of the Freshwater Biological Association – <http://www.fba.org.uk/cen-pearl-mussel-standard-development-reference-list>

The applications of the standard include the provision of site-level data that will contribute to reporting under the Habitats Directive, Article 17, undertaking environmental impact assessment, and restoring pearl mussel populations.

WARNING — Safety issues are paramount when surveying rivers. Surveyors should conform to EU and national Health and Safety legislation, and any additional guidelines appropriate for working in or near rivers.

IMPORTANT — Freshwater pearl mussel surveys are carried out under licence, and the methods used should be fully compliant with any conditions imposed.

1 Scope

This European Standard provides guidance on methods for monitoring freshwater pearl mussel (*Margaritifera margaritifera*) populations and the environmental characteristics important for maintaining populations in favourable condition. The standard is based on best practice developed and used by *Margaritifera* experts in Europe, and describes approaches that individual countries have adopted for survey, data analysis and condition assessment. While it is recommended that the causes for pearl mussel decline should be urgently investigated, standard methods for restoring populations are beyond the scope of this document.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN ISO 14688-1:2002, *Geotechnical investigation and testing - Identification and classification of soil - Part 1: Identification and description (ISO 14688-1:2002)*

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