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CSA W214:21
National Standard of Canada

Environmental DNA (eDNA) reporting requirements and terminology

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Preface

This is the first edition of CSA W214, *Environmental DNA (eDNA) reporting requirements and terminology.*

Users of this Standard are reminded that additional eDNA study design, methodology, and reporting requirements may be specified by federal, provincial/territorial, municipal, or other authorities, or by a project owner, depending on the larger study objectives. This Standard should not be considered as a replacement for the requirements contained in any

a) applicable federal, territorial, or provincial statute;
b) regulation, licence, or permit issued pursuant to an applicable statute; or
c) contract that an owner has with a contractor.

CSA Group acknowledges that the development of this Standard was made possible, in part, by the financial support of the Standards Council of Canada (SCC).

This Standard was prepared by the Technical Committee on eDNA Terminology and Reporting Requirements, under the jurisdiction of the Strategic Steering Committee on Natural Resources, and has been formally approved by the Technical Committee.

This Standard has been developed in compliance with Standards Council of Canada requirements for National Standards of Canada. It has been published as a National Standard of Canada by CSA Group.

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0 Introduction

0.1 Overview

Environmental DNA (eDNA) methods are used routinely around the world and have revolutionized the assessment and survey of environmental resources. eDNA methods reveal important information regarding target taxa with high efficiency and sensitivity while reducing disturbance to species and their ecosystems compared to conventional methods. The results are typically used to inform conservation and management decisions and activities undertaken by regulatory agencies, consultants, environmental management professionals, natural resource developers and operators, First Nations, Inuit, and the Métis.

This Standard defines minimum requirements for the reporting of methods, data, and results, including possible sources of error associated with biological surveys, assays, and monitoring that incorporate eDNA methods. Compliance with this Standard will ensure that sufficient information about eDNA studies is conveyed to support data transparency, reproducibility, and review. This Standard will also improve confidence in eDNA results and their interpretations, and enhance the comparability between multiple studies and between eDNA practitioners. Minimum reporting requirements will support eDNA data collation, data mining, and meta-analytical approaches for addressing larger-scale environmental questions.

This Standard also provides definitions of specific terms used in the planning and reporting of eDNA studies. The consistent and unambiguous use of clearly defined terms will support a mutual understanding of eDNA approaches and methodologies.

Despite a diversity of approaches, eDNA methods are applied in the context of several common steps within a linear workflow. The workflow typically includes

a) survey design;
b) sample collection, labelling, handling, and preservation;
c) nucleic acid extraction;
d) analysis; and
e) overall survey analysis and interpretation.

While the selection of the methods used within each workflow element is based on overall survey project goals and objectives, clear documentation of the potential sources of error or bias within each element will increase confidence in the reliability of the approach and the conclusions.

0.2 Considerations

This Standard is organized according to the eDNA-based workflow progression specified in Clause 0.1. Within each workflow element, considerations are divided into

a) global considerations; and
b) specific considerations, where appropriate.