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Wildlife Forensics General Standards

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Foreword

These minimum standards and recommendations are not intended to replace standards in ISO 17025 or additional forensic laboratory standards, but are designed to guide laboratories which are working toward meeting those standards. Notes throughout this document offer clarifications and examples of how a lab may meet a specific standard.

All hyperlinks and web addresses shown in this document are current as of the publication date of this standard.

Keywords: *wildlife forensics, taxonomic identification, reference collections, evidence handling, good laboratory practice*

Abstract: This document provides minimum standards and recommendations for practicing wildlife forensic analysts. This document covers good laboratory practices, evidence handling, and training as well as considerations of taxonomy and reference collections that are specific to wildlife forensic science.

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Wildlife Forensics General Standards

1 Scope

This document provides minimum standards and recommendations for practicing wildlife forensic analysts. This document covers good laboratory practices, evidence handling, and training as well as considerations of taxonomy and reference collections that are specific to wildlife forensic science.

These minimum standards and recommendations are not intended to replace standards in ISO 17025 or additional forensic laboratory standards, but are designed to guide laboratories which are working toward meeting those standards. Notes throughout this document offer clarifications and examples of how a lab may meet a specific standard.

2 Normative References

There are no normative reference documents, Annex C, Bibliography, contains informative references.

3 Terms and Definitions

For purposes of this document, the following definitions apply.

3.1

accuracy

The degree of conformity of a measured quantity to its actual (true) value.

3.2

administrative review

An evaluation of the report and supporting documentation for consistency with laboratory policies and for editorial correctness.

3.3

analyst

A qualified individual who conducts and/or directs the analysis of forensic casework samples, interprets data, reaches conclusions, and/or issues reports concerning conclusions.

3.4

chain of custody

The chronological documentation, showing custody, control, transfer, storage, and disposition of evidence.

3.5

competency

Demonstrated and documented ability of an individual to perform assigned work in a discipline or subdiscipline, in accordance with a laboratory's technical procedures and training manuals, before the performance of independent casework.

**3.6
curated collection**

An assemblage of biological reference materials acquired and maintained with associated data according to explicit quality control standards.

**3.7
laboratory**

The entity providing the analysis, including the staff and the physical facility.

**3.8
performance check**

A quality assurance measure to assess the functionality of laboratory instruments and equipment that affect the accuracy or validity of forensic sample analysis.

**3.9
reference material**

Biological sample collected from a known individual or from known individuals; often for the purpose of comparison to samples of unknown origin.

**3.10
standard operating procedure
SOP**

Written documentation maintained by the laboratory including laboratory policies, technical protocols and methods for specific forensic analyses.

**3.11
taxonomic authorities**

Literature references accepted by the relevant scientific community and providing the classification of species for a group of organisms.

**3.12
taxonomic identification**

Analyses to establish the taxonomic classification of the sample. These analyses are based on class characters diagnostic for the taxonomic level in question.

**3.13
technical review**

An evaluation of reports, notes, data, and other documents according to laboratory guidelines specific to the scope of analyses performed. Technical review should ensure that the data support the conclusions stated in the report.

**3.14
validation**

A process by which a procedure is evaluated to determine its efficacy and reliability for forensic casework analysis.

**3.15
voucher specimen**

Biological specimen that is typical of its species in accordance with the relevant taxonomic

authority. Voucher specimens are of known identity, and are curated with geographic, field collection, and life history data.

4 Requirements

4.1 Training and Personnel

4.1.1 Each laboratory conducting wildlife forensic analyses shall have a documented ethical code by which staff must abide.

4.1.2 Training, research, and experience appropriate to all analysts and technical reviewers shall be documented and retained.

4.1.3 All members of the laboratory who handle evidence shall have training in the following before assuming independent duties:

- a. chain of custody,
- b. evidence handling,
- c. ethics,
- d. cognitive bias, and
- e. safety.

4.1.4 All analysts should have training in relevant laws and expert witness testimony before undertaking independent casework.

4.1.5 Training of analysts shall include a review of the relevant internal and developmental validation studies.

4.1.6 Training of analysts shall include the demonstration of competency before undertaking independent casework.

4.2 Evidence Handling

4.2.1 Laboratories shall have standard operating procedures (SOPs) for the receipt, handling, storage, and/or disposal of evidence in order to prevent evidence loss, contamination, and tampering.

4.2.2 A chain of custody shall be documented, showing manner of evidence transfer to and within the laboratory, and dates and signatures of all personnel who had custody of the evidence.

4.2.3 Evidence examined shall be marked with a unique identifier and the analyst's signature, initials, or equivalent.

4.2.4 When possible, a portion of each evidence sample shall be retained to enable future analysis.

4.2.5 Evidence subject to major modification shall be photographed prior to alteration.

Note: Examples of a major modification are parts being removed or skeletonization.

4.2.6 When physically altering evidence for the purpose of analysis, careful consideration shall be given to the effects the alteration(s) may have on possible subsequent analyses.

4.2.7 Evidence and derived data shall be:

- a. stored in a controlled and secured manner, and
- b. analyzed in a controlled and secured manner.

Note: Controlled access includes secure evidence storage, restricted entry to forensic analytical spaces, and digital data protection. Access to analytical and evidence areas by non-forensic personnel should be with escort or under supervision at all times.

4.3 Equipment and Methods

4.3.1 Before use in analyzing casework samples, critical instruments, as defined by the laboratory shall be:

- a. subjected to performance checks, and
- b. subjected to calibrations, as recommended by the manufacturer.

4.3.2 Analytical procedures shall be based on peer-reviewed studies and /or validated prior to use in casework.

4.3.3 Validation studies shall be documented and records retained.

4.3.4 Statistical methods and any related assumptions that may affect the conclusions shall be documented in the case file.

4.4 Reference Materials and Collections

4.4.1 Laboratories conducting wildlife forensic analyses shall maintain or have access to curated collections in order to obtain appropriate vouchers and reference materials.

4.4.2 Protocols covering curation and preservation of each type of biological reference material held by the laboratory and used for taxonomic identification shall include, at minimum:

- a. documentation and curation procedures,
- b. protection of materials from degradation,
- c. reference to taxonomic authorities, and
- d. collection management.

4.4.3 Specimens and databases used in casework shall be uniquely identified, and documented in the case file.

4.4.4 The identity of reference material shall be confirmed before the material is used in casework before materials used in casework involving taxonomic or individual identification. Confirmation shall be made in one of the following ways: through reference to voucher specimens at hand, to specimens in a curated collection, or to the professional literature.

4.4.5 The provenance and taxonomic identity of reference material or DNA sequences used for comparison to evidence items shall be documented.

4.5 Taxonomy

4.5.1 Taxonomic identification reports shall include currently accepted scientific names.

Note: To ensure that current scientific names are used, each laboratory should maintain an updated list of the taxonomic authorities used.

4.5.2 Each analyst shall be prepared to address taxonomic status (including synonymies and taxonomic revisions).

4.5.3 Subspecies determination of non-domesticated taxa shall only be attempted with accurate and current data concerning geographic origin.

4.5.4 Assumptions of geographic origin used in taxonomic identification shall be documented in the case file.

4.6 Case Documentation

4.6.1 The case file shall at minimum include:

- a. chain of custody,
- b. submittal request,
- c. bench notes,
- d. location of electronic data,
- e. documentation of technical and administrative reviews, and
- f. the final report.

Note: Other pertinent documents may include emails, records of other external communications regarding the case, shipping and receiving documentation, and photographic documentation of the evidence or packaging.

4.6.2 Bench notes shall be contemporaneous and contain sufficient detail to enable another analyst competent in the reporting subject to independently analyze the data and arrive at the same conclusion.

4.6.3 The analyst(s) and reviewers shall be identified in the case file.

4.6.4 Each case file and report shall be technically reviewed by another scientist competent in the reporting subject, and the review shall be documented in the case file.

4.6.5 Technical review shall verify the following elements, at minimum:

- a. protocols are cited and followed;
- b. bench notes use the proper format (page numbering and labeling);
- c. conclusions of the analyst are supported by the data.

4.6.6 The case file and report shall be administratively reviewed before the report is issued to check for clerical errors and assure proper format, and this review shall be documented in the case file.

Note: The administrative review should be carried out by a person other than the author.

5 Conformance

This standard has no conformance requirements.

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Annex A **(informative)**

Foundational Principles

This document provides minimum standards and recommendations for practicing wildlife forensic analysts.

Over the last three decades the introduction and application of various methodologies and technologies and the expansion of methodological advancements among disciplines in forensic science, have allowed conceptual queries commonly addressed involving crimes with human victims to be asked and tested for crimes involving wildlife and plant evidence ^[5].

This document is intended to cover good laboratory practices, case documentation, evidence handling, and training, as well as considerations of taxonomy and reference collections that are specific to wildlife forensic science references 1-15 in Annex B, Bibliography.

This document applies to any laboratory/analyst performing wildlife forensics in any setting; ie. a dedicated forensic laboratory or academia. It should be noted that this is not a stand-alone document. There are numerous additional standards that pertain to each specific discipline that need to be followed as well; ANSI/ASB standard No. 18, 020-028.

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Annex B (informative)

Bibliography

This is not meant to be an all-inclusive list as the group recognizes other publications on this subject may exist. At the time these standards were drafted, these were the publications available to the working group members for reference. Additionally, any mention of a particular software tool or vendor as part of this bibliography is purely incidental, and any inclusion do not imply endorsement by the authors of this document.

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¹ Available from:

http://des.wa.gov/sites/default/files/public/documents/About/1063/RFP/Add7_Item4ASCLD.pdf

² International Organization for Standardization, BIBC II, Chemin de Blandonnet 8, CP 401, 1214 Vernier, Geneva, Switzerland, www.iso.org.



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