This document has been accepted by the Academy Standards Board (ASB) for development as an American National Standard (ANS). For information about ASB and their process please refer to asb.aafs.org. This document is being made available at this stage of the process so that the forensic science community and interested stakeholders can be more fully aware of the efforts and work products of the Organization of Scientific Area Committees for Forensic Science (OSAC). The documents were prepared with input from OSAC Legal Resource Committee, Quality Infrastructure Committee, and Human Factors Committees, as well as the relevant Scientific Area Committee. The content of the documents listed below is subject to change during the standards development process within ASB, and may not represent the contents of the final published standard. All stakeholder groups or individuals, are strongly encouraged to submit technical comments on this draft document during the ASB's open comment period. Technical comments will not be accepted if submitted to the OSAC Scientific Area Committee or Subcommittees.

Wildlife Forensics General Standards

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Wildlife Forensics General Standards

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. 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.

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Foreword

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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

The following referenced documents are indispensable for the application of this document.

American Society of Crime Laboratory Directors/Laboratory Accreditation Board. 2011. ASCLD/LAB- International Supplemental Requirements for the Accreditation of Forensic Testing Laboratories.

American National Standards Institute - American Society for Quality (ANSI-ASQ) National Accreditation Board ISO/IEC 17025 Accreditation and Supplemental Requirements for Forensic Testing. Document 11, July 10, 2012.

International Organization for Standardization. 2005. ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories.

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

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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 of the analysis.

3.9 reference material Biological specimens of known identity or data derived from them.

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, and is therefore valid for comparative purposes. Voucher specimens are of known identity, and are curated with geographic, field collection, and life history data.

4 Standards

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.

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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.

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4.3.2 Analytical procedures shall be based on peer-reviewed studies and 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. 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 the most 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.

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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.

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Annex A
(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 does not imply endorsement by the authors of this document.

1] American Society of Crime Lab Directors/Laboratory Accreditation Board. 2011. ASCLD/LAB-International Supplemental Requirements for the Accreditation of Forensic Testing Laboratories.

2] Dror, I. E., Charlton, D. and Peron, A. E. 2006. Contextual information renders experts vulnerable to making erroneous identifications. Forensic Science International 156:74-78.

3] Forensic Quality Services. 2008. Forensic Requirements for Accreditation (FRA-1:2008/1).

4] International Laboratory Accreditation Cooperation. 2014. ILAC Guide 19: Modules in a Forensic Science Process.

5] International Organization for Standardization. 2005. ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories.

6] Moore, M. K. and Kornfield, I. L. 2012. Best practices in wildlife forensic DNA. In, Wildlife forensics: methods and applications, 1st ed. Edited by J. E. Huffman and J. R. Wallace, pp. 201-236. Chichester: Wiley-Blackwell.

7] National Research Council/National Academy of Sciences. 2009. Strengthening Forensic Science in the United States: A Path Forward. National Research Council, Washington, DC.

8] Ogden, R. 2010. Forensic science, genetics and wildlife biology: getting the right mix for a wildlife DNA forensics lab. Forensic Science, Medicine, and Pathology 6:172-179.

9] Scientific Working Group for Wildlife Forensic Sciences. 2012. SWGWILD Standards and Guidelines v2.0. Available from http://www.wildlifeforensicscience.org/swgwild/.

10] Walker, D. N. and Adrian, W. J. (eds) 2012. Wildlife Forensic Field Manual. 4th edition. Association of Midwest Fish and Game Law Enforcement Officers, Colorado Division of Wildlife, Denver, Colorado.

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