

Wildlife DNA Sampling Guide

Instructions for the Wildlife
DNA Sampling Kit



Produced 2014 by the Forensic Working Group (FWG), part of the Partnership for Action against Wildlife Crime (PAW). The Forensic Working Group aims to investigate and promote the practical application of forensic and specialist techniques in the investigation of wildlife crime.

The FWG are grateful for the financial support provided by LUSH for the Wildlife DNA Sampling Kits.

LUSH
FRESH HANDMADE COSMETICS

© Crown copyright 2014.

You may re-use this information (excluding logos) free of charge in any format or medium, under the terms of the Open Government Licence v2. To view this licence, visit www.nationalarchives.gov.uk/doc/open-government-licence/version/2/ or email psi@nationalarchives.gsi.gov.uk.

The material must be acknowledged as Crown copyright with the title and source of the publication specified. Further copies are available from the FWG – see www.pawfwg.org

Wildlife DNA Sampling Guide

This guide has been produced by the PAW Forensic Working Group (FWG) and is designed to accompany the Wildlife DNA Sampling Kit.

1. Introduction

The guidelines contained within this handbook accompany the Wildlife DNA Sampling Kit and should be carefully followed when using the kit to collect non-human DNA samples from a wildlife crime scene. This kit is **not** intended for use in human crime investigations.

It is assumed that users of the kit will already have knowledge of evidence gathering, evidence labelling and subsequent chain of custody. When collecting DNA samples, it is important that strict evidential procedure is maintained.

When to use the kit

This kit is designed for use by wildlife crime investigators, to take non-human forensic DNA samples, in cases where a Crime Scene Investigator (CSI) is unavailable. DNA analysis may be appropriate for the identification of species, individuals, sex and relatedness of animals or plants. Where a DNA sample is required from a live animal, always have the sample taken by a qualified vet.

DNA evidence is easily contaminated and degrades rapidly in environmental conditions, so it is important to collect samples as soon as possible following the discovery of a crime scene. It is also important to consider whether sampling is needed at the scene (e.g. blood evidence on the ground or an immovable object), or whether whole items can be seized, packaged and stored for later examination at the wildlife DNA testing laboratory (e.g. traps, tools, clothing).

Whilst the kit is designed for wildlife sampling it should be remembered that the opportunity to detect wildlife crime is maximised when this sampling forms part of an overall scene examination, with consideration given to identifying or linking those that have committed the crime to the scene. If there is uncertainty regarding the collection, storage or transport of samples, seek advice from your CSI, your wildlife DNA forensic service provider or the PAW Forensics Working Group (contact details at the back of this guide).

2. Health and safety

Due care and attention should be given to health and safety considerations when collecting samples. Certain DNA evidence sources may constitute a health hazard. Basic precautions are outlined below, but it is emphasised that it remains the responsibility of the sample collector to take adequate health and safety precautions when using the kit. Furthermore, forensic laboratories may refuse to accept any items that present an unacceptable risk to their staff.

Basic health and safety precautions

- Always wear the gloves provided in the kit when handling samples;
- Do not eat, smoke, drink or touch the facial area when handling samples, or until your hands have been washed;
- Minimise the risk from sharp items by handling carefully and storing in an appropriate solid container.

3. Contamination

Contamination of DNA samples is a serious issue when collecting and transporting forensic evidence. Although the problem of human contamination is much reduced in the case of wildlife DNA sample collection, it is still necessary to prevent contamination from other biological sources or from any surface that comes into contact with the evidence sample. The following guidelines should be followed to reduce contamination risk:

- Handle items as carefully and as little as possible;
- Always record and store individual samples in separate sealed containers, even if they appear to have come from the same source;
- Wherever possible, use disposable single-use items for evidence collection;
- Ensure any non-disposable materials have been sterilised before use.

4. The kit

Each item within the kit is designed for single use only. If the seal on the item is broken and is not submitted for analysis, discard safely. Individual items within the kit may be replenished from your central supply or directly from the kit provider.

Kit contents:

| Item | Quantity | Use |
|---------------------|----------|--|
| 1. Gloves | 2 pairs | Hand protection, minimise contamination |
| 2. Tweezers | 1 pair | Sample collection |
| 3. Scalpel | 2 | Sample removal |
| 4. Swabs | 6 | Sample collection (wet samples and dry stains) |
| 5. Purified water | 2 tubes | To moisten swabs prior to dry stain collection |
| 6. Evidence bags | 3 | Sample storage and security |
| 7. Collection tubes | 2 | Sample storage |
| 8. Pen | 1 | Labelling |
| 9. Guide booklet | 1 | Information |

5. Sample collection and storage

Sample Type:

Before starting, decide what type of sample you are going to take. The following list shows sample types in order of preference for DNA recovery. Collect the best sample type available.

1. Tissue (preferably muscle)
2. Blood
3. Saliva (swabbed from mouth)
4. Hair
5. Teeth
6. Bone
7. Saliva (swabbed from environment)
8. Faeces
9. Vomit

Collection Procedures

Decide whether the exhibit can be removed, stored and transported so that evidential integrity is maintained, contamination is avoided and DNA is preserved. Wherever possible, wet samples should be frozen, therefore freezer space should be considered. Dry samples should be stored cool and dry. Seek advice if you are unsure how best to collect and store DNA evidence.

If the exhibit can be removed safely: label, preserve correctly and transport the whole exhibit to the laboratory.

If the exhibit cannot be removed safely: take a DNA sample following the collection and storage instructions given below.

| DNA source | Sample collection | Storage |
|------------|--|---------|
| 1. Tissue | Wear gloves. Remove a small piece of fresh tissue (1 cm ³) using the scalpel and tweezers and place into a collection tube. Close the lid onto the collection tube and place the tube into an evidence bag. Seal the bag and record sample details and continuity information. | Freeze |
| 2. Blood | Wear gloves. At least two swabs are needed for each independent evidence item: Swab 1 = Control swab Swab 2 = Sample swab Swab 3 = 2nd sample swab (for dry samples) Swab 1 This is a control swab to test for contaminant DNA present on the swab or in the purified water. Moisten the swab head in purified water, replace in tube, seal, label. Swab 2 For fresh, wet blood, soak a small amount (1 or 2 drops) onto the swab head. Replace in tube, seal, label. For dried blood, moisten the swab head in purified water then rub the swab across the dried blood. Replace into swab tube, seal and label. Swab 3 (dry samples only) On the area just rubbed with a moist sample swab, use a fresh, dry sample swab to rub the area – soaking up remaining moisture from the area sampled. | Freeze |

| DNA source | Sample collection | Storage |
|--------------------------------|--|---------------------|
| | Replace the swab into collection tube, seal and label. Place all sealed swabs into an evidence bag, seal the bag and record sample details and continuity information. | |
| 3. Saliva (swabbed from mouth) | Live animals: a mouth swab must be taken by a vet. Dead animals: do not use a mouth swab, recover tissue instead. | Freeze |
| 4. Hair | Wear gloves, use tweezers. Pluck/collect about 20 hairs so that the follicle (root) remains attached. Handle hairs by the tip, not the root. Place hairs in a collection tube, close lid, place tube in an evidence bag, seal and label. | Freeze or store dry |
| 5. Teeth | Wear gloves. Place teeth into a collection tube, close lid, place tube in an evidence bag, seal and label. | Freeze or store dry |
| 6. Bone | Follow instructions for teeth. | Freeze or store dry |
| 7. Saliva (surface transfer) | For the case of surface transfer of saliva (e.g. from a dog to a coursed hare). Follow swabbing instructions for blood. | Freeze |
| 8. Faeces | Wear gloves, place faeces into a collection tube, do not fill more than halfway. The surface layer contains the target DNA, therefore ensure that the outside of the faeces is sampled. Close lid, place tube in evidence bag, seal and label. | Freeze |
| 9. Vomit | Wear gloves. Place a sample of the stomach contents into a collection tube. Include any obvious items of interest within the vomit, e.g. hairs, body tissue etc. Close lid, place tube in evidence bag, seal and label. | Freeze |

6. Sample delivery for laboratory analysis

Prior to delivery of samples, the receiving laboratory should be contacted to discuss the nature of the sample and the exact purpose of the testing. Transfer of samples should follow instructions from the laboratory and include use of appropriate forms. If in doubt over correct procedure, contact the receiving laboratory or seek advice from the PAW Forensic Working Group.

Contacts

The following contact details are for members of the PAW Forensic Working Group who have specialist knowledge in wildlife DNA analysis for wildlife crime investigations.

Dr Lucy WEBSTER

Wildlife DNA Forensics Unit
Science and Advice for Scottish Agriculture (SASA)
Tel: 07557197316
wildlifeforensics@sasa.gsi.gov.uk

Dr Rob OGDEN

TRACE Wildlife Forensic Network
rob.ogden@tracenetwork.org

Chris CONYERS

Crop and Food Security
The Food and Environment Research Agency (FERA)
Tel: 01904 462578
chris.conyers@fera.gsi.gov.uk

To obtain a Wildlife DNA Sampling kit:

Kam DHILLON MBE

Bedfordshire Police (Beds Cambs Herts SSU)
kam.dhillon@bedfordshire.pnn.police.uk

More information about the work of the FWG can be found at
www.pawfwg.org

Information on this site includes:

- Details of current forensic tests available for wildlife crime investigations with laboratory contact information
- Spreadsheets of wildlife related investigations involving forensic methods
- Details of the Forensic Analysis Fund
- Royal College of Veterinary Surgeons recognised specialists in zoo and wildlife medicine contacts list