Taking tissue samples for genetic analysis

I have caught or found a mink - what next?

As soon as possible (same day if you can), please contact us via the website (https://waterliferecoveryeast.org.uk/report-a-capture-or-road-kill/) or, if you know any of our staff, call or email them directly. We will respond rapidly. Every mink is a source of valuable information, so our preference is to examine and sample the whole animal. We may be able to arrange to collect it - either immediately or, if you are able to freeze it, by arrangement when we next have a staff member or volunteer out your way.

If we cannot arrange to collect the animal (perhaps you live far away from any of us, and cannot freeze it), the next best thing is to ask you to collect a small piece of tissue for DNA analysis and send it to us. The rest of this guide tells you how to do this. It's simple and doesn't take long.

Why do we want DNA samples?

The genetic information locked up in the cells of a mink can tell us so much more than we can derive from looking at the whole animal, and modern molecular techniques can help us unlock that information.

Genetic studies show us how related each mink is to others in the study area. We can detect family relationships, and should be able to say whether an animal was born near where it was caught, or came from afar. As the project develops, we would expect to see increased immigration, and would be able to see how far they travel before encountering a trap. Understanding animal movements, and knowing how many breeding females remain in the project area as our work progresses, will allow us to manage the project better and greatly enhance its chances of success.

Who will do the DNA analysis?

Samples will be sent in batches to Prof. Bill Amos, Cambridge University dept. of Zoology, https://www.zoo.cam.ac.uk/directory/william-amos who will undertake the DNA extraction

and study the samples using a genetic technique known as DNA fingerprinting, using microsatellite DNA. Microsatellites are tiny bits of DNA which are highly variable and give a great deal of information for relatively low cost analyses. They are detected from among the rest of the DNA by the PCR test which has recently been in the headlines for its ability to detect the genetic material of the SARS-CoV-19 virus. The genetic information will be studied using a technique called phylogenetic analysis, which creates genetic trees, a bit like the family trees we can create from our own ancestry studies.

Sample storage

DNA degrades with time, so it is important to preserve tissue samples as soon as possible. This can be done by storing the sample in a desiccating environment, or in a freezer. A tiny amount of skin contains a large amount of DNA. Our preferred sample storage system is to place a small piece of ear for each specimen into a vial (small plastic tube) of pure ethanol. Batches of these vials can be obtained from your local WRE Project Officer, BASC representative if you are in their Eastern Region, or directly from Prof. Amos. It is best to obtain a set of vials before starting your mink trapping operations. The labelled samples can be stored in a cool place until a reasonable number are accumulated and can then be sent off for analysis.

How to take the sample?

By far the quickest and easiest way to obtain a tissue sample is to simply snip off the tip of an ear with a pair of scissors or a sharp knife. Clean the blade(s) beforehand, especially if you have used the same tool on other mink. If you have protective gloves available, wear them.

If possible, dry the ear sample on a clean piece of tissue paper, then place it either in a vial with ethanol (obtainable from the WRE project) or in a small plastic bag (also available from us). Label the vial or bag as described below. If you have used a vial, put it in a plastic bag, and then label the bag, too. Leaking ethanol can dissolve even 'permanent' ink on the tube, so it's a good idea to have a back-up label.

Labelling and record keeping

The *essential* information for each tissue sample is the date and place of capturing or finding the animal, plus your name. Put this information on the sample vial if you are using one (either directly using a permanent marker or via a sticky-backed paper label wrapped around it) and write it in biro on the plastic bag in which you place either the vial or the sample itself.

It's difficult to write much on the vial or plastic bag, so please also write in pencil (because this doesn't dissolve in ethanol, should it leak out) on a piece of paper the following, and place the paper inside the bag:

a. Your name
b. Date of capture/finding
c. Geographic location, such as Ordnance Survey Grid Reference, Latitude and Longitude, or What3Words, if you can find this.
d. Site description e.g. name of river and nearest village (choose a consistent name for each trap location)
e. Gender, if you know how to sex mink
f. Weight and total length, if possible

Once all is complete, if the whole mink it is to be sent for dissection/measurement, bag and label it, then arrange for it to be collected quickly or put it in a freezer, otherwise dispose of it by burial.

Sending in samples

For people who infrequently encounter mink, we will send you a stamped, addressed envelope with a small sealable plastic bag inside for the tissue sample. Just pop it in the post as soon as you can.

For those who catch mink regularly, we can supply you with either envelopes and bags as above, or with ethanol-filled vials. The main advantage of the vials is that the tissue samples are preserved immediately and there's no rush to send them in. We may be able to collect your vials periodically, or you can mail them at, say, three-monthly intervals. Get in touch with us, and we will agree a plan.