

Hair-Tube Transects Practice Notes

The hair-tube transect method described here is the standard method suggested by Gumell *et al* (2001) in the Forestry Commission Practice Note "*Practical Techniques for Surveying and monitoring Squirrels*".

Your Local Squirrel Group transect co-ordinator will tell you which sites need surveying. To find out who to contact, please get in touch with the Scottish Squirrel Survey Co-ordinator (details below).

Mapping

Your Local Squirrel Group transect co-ordinator should have obtained stock maps from the local Forestry Commission District Office. If the forest is privately owned, then the best available habitat maps should be used (forest maps, estate maps, or other.) If none is available, then use an OS map of small scale and, with the help of foresters/rangers/estate managers, mark in approximate habitat boundaries. Habitat boundaries need to distinguish between areas of different species make-up and between blocks of cone-bearing vs. non-cone-bearing stage. Individual heavily-fruited trees with potential for attracting local concentration of squirrels will also need to be noted and mapped. (A simple system of habitat mapping is given in the appendix at the end of this note.)

Omit the following areas from the total area to be surveyed

- Clear-fell
- Open ground / open water
- Young plantings <15 years
- Birchwoods without squirrel food species (oak, hazel, beech, conifers)
- Areas of low scrubby shrubs with no squirrel food species

Calculate number of transects required for the remaining area using the table below.

The Transects

Each transect should have 20 tubes set out at 100m. apart (pool small woods) and should between them pass through a representative cross-section of the different habitat types of the site as a whole. They also need to sample the whole geographical area of the forest. The following table summarises the minimum number of transects for the size of woodland.

Size of Woodland (hectares)	Number of Transects
>100 to 500 ha	5 transects
>500 to 1,000	5 + 1 per each additional full 100ha
>1,000ha	10

The lines need not be straight. A convenient layout is to have 2 rows of 10 tubes, so that the surveyor starts and ends the transect at the same entry point to the forest.

Measurements should be by tape-measure or measuring wheel ideally; pacing can be used if you are confident that your paces can measure accurately. Don't guess. Planted tree-rows are probably the best guide to the route of the transect; low dead branches and scrub can be cleared for easy accessibility. If there is no obvious tree-row or minor path, then a compass will have to be used in order to accurately place each successive hair-tube, with a note kept of the compass-bearing so that the tubes can be found again.

Siting and Fixing the Tube

Equipment:

1. Map of the area of forest where your transect is to go (c. 1:10,000 is useful)
2. Tape measure, measuring wheel or GPS handset (make sure it's charged)
3. Compass
4. 20 hair-tubes, with 2 small holes drilled at each end for attaching fixing-wire
5. Typing correction fluid or marker pen to label tubes
6. 40 sticky blocks, made up by sandwiching a square of "correx" or light wood between 2 squares of 25mm double-sided adhesive tape (stock ref: 465 from NBT Jeaton), keeping surface backing tape in place
7. Heavy-gauge plastic-coated garden wire (or similar)
8. Pliers with wire-cutter
9. Secateurs or similar for cutting away small brush.
10. Bait
11. Record sheet or field note-book
12. Soft pencils (pens can be unreliable in the damp)

To position tubes:

1. At each 100m. mark, choose a suitable tree for siting the hair-tube. This may be a broad trunk with a flattish side, allowing the squirrel to approach the end without leaving the tree's trunk, or the tube can be fixed across a split stem or supported on side-branches.
2. Look for an accessible and secure place to put the tube at chest height or above. Make sure the shortest surveyor in the team is able to reach the tube easily.
3. Make sure you allow easy approach for a cautious squirrel. The squirrel should be able to put its head into the end of the tube to inspect it without actually having to touch the tube: this allows it to build up confidence before it decides to enter the tube, and is especially important for red squirrels which tend to be more timid than greys.
4. The tube should be fixed in place with heavy-duty plastic-coated garden wire (or similar). Pliers are needed to twist the wire to ensure a firm fixing. The tube must be level and should not wobble when stepped on by a squirrel.
5. The tree should be clearly marked with coloured tape, coloured spraypaint, or other method as agreed with the forest manager. In places that are frequented by the public, it is sometimes necessary to mark a nearby tree instead, so as not to draw attention to the tube. The marker should then be placed on the side of the alternative tree nearest the tube tree, to assist locating the tube.
6. The tube should be numbered (e.g. C9, for the ninth tube on transect C). Typing correction fluid is useful for clear, weatherproof marking. Mark the position on the habitat map. If you have access to GPS, then co-ordinates and transect trails can be saved. On the record sheet, mark the co-ordinates and the species of tree used.
7. Scatter a handful of bait in the tube, and, for square cross-section tubing, some on top. When tubes are first placed in a new site, also broadcast the bait on branches and on the ground for about a 5m. radius, to make the tube more obvious to passing squirrels (and other animals, unfortunately).
8. Recommended bait is a mixed yellow maize (highly visible in the forest and has feeding remains characteristic of squirrels), peanuts &/or sunflower seeds (better at attracting red squirrels than maize) and 3 hazel nuts in their shells (one on top of the tube and 2 inside). If the tube is not quite level, a small dump of moss can be used to stop bait sliding out. Some people have used peanut butter to secure the bait in place, or even as bait, as it is less easily removed by non-target animals, as are hazel nuts. Some bait should be right at the centre of the tube, to draw the squirrel right in. We are trying to collect hair from the centre of the back of the animal.
9. Make sure the tube is clean and **dry**. Remove the backing paper from one side the sticky block "sandwich", and press firmly in place on the inside of the "roof" of the tube, 3cms in from the end. When secure, remove backing paper from surface of block, making sure you do not contaminate it with clothing fibres or vegetation fibres. This **should not be done in the wet**, as the block will not stick adequately either to the tube or to the squirrel-fur.

Repeat for the sticky block for the other end of the tube. *This should be the last thing you do before leaving the tube.* Keep the backing paper.

Volunteers may assist with setting out the tubes, or may just be involved in re-baiting, checking, collecting the stickies and replacing them. If someone else has set up the transect, you will need to make sure you have all the information required to find the tubes before setting out on the transects.

Checking the Tubes and Rebaiting

Equipment:

1. Map of your study area with positions and map references of tube-positions marked on it.
2. Compass (if you need to take a bearing to find the next tube.)
3. Pliers and coated wire to repair any fixings that have come loose.
4. Bait
5. A supply of sticky block "sandwiches" already made up.
6. Backing paper to wrap the sticky blocks you remove from the tubes, or a marked up sheet of backing paper with a separate sheet to cover it.
7. Small plastic bags or envelopes.
8. Recording sheet or field note-book
9. Soft pencils

At each tube:

1. Check and record whether bait has been taken, and whether any of the maize has characteristic "squirrelled" appearance (embryo scooped out and the rest discarded). Keep a note of these observations.
2. Check for hairs on the sticky blocks. If hair present, remove the blocks carefully, making sure that you do not contaminate them or damage the hairs. Either:
 - Stick the pair back-to-back, wrap them in backing paper, label with the Forest Name, Transect Number, Tube Number, Date and your Initials, and place them in a small envelope or plastic bag (one bag per tube to avoid contamination between tubes).
 - Or, using a sheet of backing paper from address labels or similar, you can make up a page for each transect marked out with square "boxes" labelled with the Tube Number and A or B. In this case, do not stick the blocks back-to-back but stick them into the appropriate "boxes" A and B on the sheet. The sheet should be labelled, using a permanent marker, with the Forest Name, Transect Number and Date and your Name. Cover the sheet with a second backing sheet to protect the hairs. Place whole thing in protective folder.
3. If no hair is present, leave the blocks in place. If you are not sure, collect them in. Make a note of any missing stickies.
4. Replenish bait. If squirrels are clearly finding your tubes, there is no need to broadcast bait so widely. (Play it by ear.)
5. Secure tube if loose.
6. Make sure that *the last thing you do is to fix the new stickies* in place carefully.
7. Repeat this whole process 3 more times over the course of about 2 weeks. On the final visit, remove the tubes from the trees, along with any wire. Only leave marker tapes out if agreed first with the forest manager. (They could be needed for a subsequent survey.)

Setting Up and Carrying Out the Transects

Safety

Basic precautions for observer safety should be practised.

- Inform the woodland manager or other relevant personnel when you intend to be in the woods.

- Tell someone at the office or at home where you are going (leave a map reference) and when you expect to be back. Make sure you call them to let them know you are back.
- Take a mobile phone, making sure it is charged, and in case of signal failure, a hill-walker's whistle. (Turn your mobile phone OFF unless you need to make a call.)
- Working in pairs is encouraged.

Further suggestions for risk assessment and safety precautions are appended.

Clothing

Sturdy footwear and clothing. Take waterproofs.

Weather

Recording forms should include space to record the basic features of the weather: temperature, wind, precipitation, cloud cover. General descriptions are fine.

Reporting

Once you have completed 4 repetitions of a particular transect, complete and return copies of your recording forms to your Local Squirrel Group's transect co-ordinator along with the stickies as soon as possible.

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