Guidance note on the VWT fur snagging device for pine martens

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The system employing a stretched spring to trap dorsal hairs of visiting pine martens was first described by us in:

Messenger, J. E. and Birks, J. D. S. 2000 Monitoring the very rare: pine marten populations in England and Wales. *in* H. I. Griffiths editor. Mustelids in a modern world. Management and conservation aspects of small carnivore: human interactions. Backhuys, Leiden. Netherlands.

The relevant section of the paper is quoted below:

> "Samples of hair from unknown species can now be identified by microscopic examination of casts of the hair in a suitable medium such as gelatine (Teerink, 1991). Furthermore, hair can be subjected to DNA analysis, especially if a follicle is still attached. The VWT has developed a technique for collecting hair samples from pine martens as they visit specially designed baiting stations. The bait station takes the form of a wooden tunnel constructed from four 18" (500 mm) long pieces of 6" x 1" (150 mm x 25 mm) treated soft wood (see Fig. 1). This produces a tunnel of internal dimensions of 4" (100 mm) x 6" (150 mm) (width x height). One end of the tunnel is blocked with a piece of 1" (25mm) galvanised weld-mesh (Sentinel Ltd., UK). Across the other end, half way up the opening, a galvanised metal spring (3" x 9/16" x 0.054 extension spring, zinc plated - Eliza Tinsley & Co. Ltd., Cradley Heath, UK) is attached horizontally so that its coils are just apart. One end of the spring is fixed using a small metal staple and the other end rests on the point of a L-shaped hook constructed from 3 mm brass rod. The hook is fitted through a small hole in the side of the tunnel body and held in place by bending the protruding end over (which allows for some rotational adjustment to its position). The hook and spring are set so that the spring is dislodged as an animal withdraws from the tunnel backwards after having entered to pick up bait at the far end. As the spring becomes detached at one end the coils snap shut, trapping a few guard hairs. Tests with captive pine martens showed that between 20-30 hairs were normally trapped and that this caused no obvious discomfort to the animal (some individuals raided four bait stations in quick succession). These bait stations have been field tested in Ireland and shown to work with wild pine martens. The use of a spring to collect fur has advantages over adhesives which, during trials, were found to either lose their "stickiness" quite quickly or become fouled with dust and other debris. A modification of this system, useful where disturbance from less agile species such as badgers is a problem, is to fix the bait stations away from the ground. In this case, the floor section of the tunnel can be 8" (200 mm) longer to form a platform at the entrance end.
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> One clear advantage of this system is that the bait stations are relatively cheap to build. As a result it may be possible to use them at a higher density than, for example, photographic systems. Even so, poor contact rates may still cause difficulties. During 1996, the VWT operated these devices for a total of 2,940 unit nights in an area from which reports of pine marten sightings are received regularly: Gwydyr Forest, North Wales. Interference from non-target species can be a problem, however, as these devices need to be reset after each event. During the trials in North Wales, we obtained samples of fur from polecat and badger, but none identified as being from pine marten."

The system was developed principally with a view to using snagged fur samples for microscopic scale pattern identification techniques. However, recent developments in the use of genetic techniques mean that "single event" fur snag samples offering DNA from one individual may have more value than those systems that operate continuously and so may sample fur from a range of individuals and possibly from different taxa. In view of the renewed interest in this design, this note has been produced to clarify some of the construction features and to suggest minor modifications.

Tunnel – The wood can be 'Tanalised' (a CCA pressure-treatment process) which should prevent any deterioration for several decades. A later modification (as shown in the photographs below) is the addition of a 15-20mm wooden batten fitted across the top of the tunnel entrance to discourage animals from trying to pass over rather than under the spring. A 32mm hole bored in the floor at the far end was used to retain eggs when these were used as bait.

Spring – This spring may no longer be available from the quoted supplier and in any case, outside the UK local suppliers may need to be sought. We described the spring as 'galvanised' although it is actually zinc electroplated. Some zinc plating is too thin and rusting occurs within a few months. It might be worth checking this before investing time, money and effort in building and deploying these devices. Below are the specifications of the spring, although it may be that other springs with different specifications will work as well:

Overall length including end loops	80mm - 84mm
Length of coils (closed)	55mm - 57mm
Number of coils	34
Diameter of coils	14.2mm
Diameter of wire	1.65mm - 1.70mm *
Length of coils (stretched in tunnel)	c.73mm
Gap between coils when stretched	0.43mm - 0.52mm
Force required to stretch to 73mm	c.21N

* This is greater than the manufacturer's stated size (1.37mm), which possibly is measured prior to zinc plating.

Hook – We used standard brass brazing rod available from welding suppliers, as this was both very hard and rustless. Both of these characteristics are required if the spring loop is to slide freely off the hook. Stainless steel rod may be just as effective. The hook is not a true 90º L-shape as an angle slightly greater than this allows the spring loop to slide off more easily. Of course if the hole through which the hook is inserted is not perpendicular to the sides then this will affect the set-up. Care must be taken not to damage the hook end during manufacture and any burrs must be carefully cleaned off. We fashioned the hook using an engineer's vice fitted with smooth faced jaws and a small hammer. The smallest trace of a persistent copper-based grease (such as "Copper Slip" – available from automotive suppliers) on the hook will help make the spring loop slide off. The hook on each snag tunnel will need to be adjusted after assembly, using smooth-jawed pliers, to ensure that it is operating properly. When setting, make sure that the spring loop sits on the tip of the hook so that it has little distance to slide before coming off. When set-up correctly the spring will slide off with only moderate pressure. If the hook angle is too great the spring may "creep" off the hook over a period of several minutes so check this in the workshop. The hook is the critical component of this system and so great attention must be given to setting it up right.

Deploying and servicing – In Wales we eventually used only the off-ground versions because non-target species such as polecats *Mustela putorius* were a problem. The entire wooden tunnel could be fixed very securely to a tree trunk using plain 3mm steel farm fencing wire, and a height above ground of about 1.5m seemed to keep non-target species away. On the ground we always weighed down the tunnel with available rocks or timber to make it feel steady and to stop large, non-target species dislodging it. We used a variety of baits but mostly chicken, eggs and tinned fish. A short wooden pole with wire prongs fitted to one end was made to make the insertion and removal of bait from the far end much easier and with less human scent deposited in the tunnel.

Maintenance – The spring and hook are the only items requiring regular maintenance. Some electrolytic corrosion may occur where the spring loop rests on the hook. Regular sparing use of 'Copper Slip' should prevent this. The spring may also develop a patina of 'white rust' (zinc oxide) in some conditions. A small soft-wire brush (the sort used for cleaning suede leather shoes) can be used to clean any corrosion from the hook and the spring.

Fur snagging tunnel with off-ground floor extension

Close-up of hook and spring

John Messenger and Johnny Birks 9th August 2004