

Mark Telfer's pitfall trapping protocol

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This 'protocol' is just about *how to* do pitfall trapping. It does not cover the questions of why you're doing pitfall trapping or where.

Before setting pitfall traps, please make arrangements for the sorting and identification of the samples. An awful lot of invertebrates die in pitfall traps and are never identified!

Pitfall traps are usually set in groups of at least 5, ideally 9 or 10. They should be arranged so that they are each a couple of paces from their nearest neighbour, either in a grid pattern or in a line.

Ideally, to sample all the species at a site, traps should be run for 12 months. However, if this is not feasible, then the most important period is from the beginning of April to the end of September. If even that is not feasible, then about 4 weeks in April/May/June and about 4 weeks in July/August/September is a minimum.

Although glass jars are known to be more effective pitfall traps than plastic containers, they are too easy to break. For short-term pitfall trapping (less than 3 months), disposable coffee-cups may be used, but more sturdy plastic cups with snap-on seal-able lids are always preferable, especially for longer-term trapping projects. It is important to record the diameter of the mouth of the pitfall traps used.

Dig pitfall traps in carefully using a trowel or soil corer, minimising disturbance of the ground around the hole. Keep your spoil in a little pile, and after putting the pitfall trap into the hole, level with the surface, use the spoil to infill around the rim so that it is flush. Tip: Put two nested cups into each hole – this makes resetting the traps much easier.

Fill the traps with a dilute solution of vehicle antifreeze: roughly one part antifreeze to one or two parts tap water will do. The antifreeze should be a propylene glycol based product as this is non-toxic to vertebrates, whereas the ethylene glycol based antifreezes are toxic to any livestock, wild mammals or pets which may drink from the pitfalls¹. Fill traps to about a third or half full. Pouring fluids into traps is much easier with a funnel. A couple of drops of washing-up liquid added to each trap reduces surface tension but is not essential.

Make a note of how many traps you have set and where they are. I generally use a few inconspicuous markers and make a little sketch map so I can find the traps again but not

¹ Most vehicle antifreezes are based on ethylene glycol. I checked the ingredients on four brands of antifreeze in local garages and one was based on propylene glycol. Others have found propylene glycol antifreeze more difficult to track down. It is worth trying a plumbers merchant if you cannot find suitable antifreeze in a garage or motorists suppliers.

so that they are obvious to passers-by. It is easier than you would think to lose a few pitfall traps, and once lost they will go on killing until they are brim-full of animals.

To prevent unwanted by-catch of small mammals, reptiles, amphibians and chicks of precocial birds like ptarmigan and stone-curlew (to pick a couple of random examples!), cover the traps with a piece of chicken-wire or fine garden trellis, pegged down around the edges. Butcher's skewers are probably the cheapest kind of pegs. It is still not impossible for vertebrates to get into the trap, but this does reduce by-catch. The risk of trapping vertebrates depends on the site and season; in many places, there is little or no by-catch so it is acceptable to set pitfall traps without chicken-wire covers initially, and put them on later if it becomes clear that they are necessary.

Collecting and re-setting the traps

Reset the traps every 2 – 3 weeks. The longer you leave traps, the more chance of things going wrong (see below). In some environments, more frequent checking will be necessary. To reset the trap, pull out the top cup only; the lower cup prevents the sides of the hole from caving in. Whether you keep each pitfall sample separate or merge the contents of each set depends on the analysis you intend to perform. If in doubt, keep the pitfalls separate. Whichever you do, don't forget to label the traps – best way is to drop a pencil-written label into each trap when you take it up.

If you are using pitfall cups that have snap-on lids, then you can just put the lids on the cups you've removed and re-set the traps with a fresh set of cups. Alternatively, pour the contents of each pitfall trap into a jar with a tight-fitting lid.

What can go wrong?

Quite a lot! Pitfalls will stop working or work less effectively if they fill up with rainwater, fill up with windblown sand or leaves or even fill up with invertebrates, are flooded out, dry out, are interfered with by people, are pushed up by moles, are drunk out of by dogs/foxes/badgers, are pulled up by crows (they then pick out the inverts), or are trampled by livestock. They can also stop working if a twig falls in that allows all the pitfalled inverts to climb out again. Frequently also, the action of wind and rain will erode away the soil from around the rim of the trap so that the trap stands proud from the surface and only a suicidal invertebrate will actually be able to climb into the trap. The more often you re-set the traps, the better.

Sorting catches

Antifreeze does not make for a good long-term storage solution. Tough things like beetles might last well for up to a couple of years, but more dainty invertebrates like spiders and flies will need to be transferred into a 70% alcohol solution within a few months if they are to be kept in good condition. Any vertebrates will also not be properly preserved in the antifreeze and will need to be transferred to 70% alcohol quickly. This is also a chance to separate out all the bits of soil and vegetation that have fallen into the trap.

The most easily available 'alcohol' is IMS (Industrial Methylated Spirits). Some say it makes specimens very brittle and that ethanol is preferable. Ethanol is harder to obtain because of customs and excise regulations

At the same time as transferring the samples into alcohol, it is useful to separate the catch into taxonomic groups, e.g. beetles, spiders, woodlice/millipedes/centipedes, the rest.

To sort samples, empty the contents into a white tray and with good lighting, pick out the invertebrates. Pull out all the big stuff with a pair of any old forceps. A pair of storkbill forceps (made of springy steel) are worth having for picking out the most delicate invertebrates without squashing them. Try D. J. & D. Henshaw, 34 Rounton Rd., Waltham Abbey, Essex EN9 3AR, Tel. 01992 717663, E-mail: djhagro@aol.com. Make a special effort to look for any tiny stuff before you tip the residue away. It is OK to pour the residue down the sink, flush down the toilet, or pour into a soakaway outside.

For secure storage in 70% alcohol, it is best to use leak-proof Sarstedt tubes available from B&S Entomological Services Ltd in Belfast. These are safe for posting without leakage.

Getting catches identified

When sending off samples, please provide the following information:

Dates of trapping period
Locality name and grid reference
Who ran the pitfalls?
Brief habitat information
Number and diameter of pitfall traps.

Any feedback, suggestions or corrections on this document gratefully received:

Mark Telfer

E-mail: mark@carabids.fsnet.co.uk

Equipment checklists

For setting pitfalls:

Trowel or soil corer

Pitfall cups (ideally two for each trap)

Diluted propylene glycol antifreeze

Notebook and pencil or waterproof ink pen to record data

Trap covers

Pegs for trap covers

Funnel (not essential)

Pot of washing-up liquid (not essential)

For collecting/re-setting traps:

Trowel or soil-corer just in case

Diluted propylene glycol antifreeze

Notebook and pencil or waterproof ink pen to record data

Either Snap-on lids for your pitfall cups, and a replacement set of pitfall cups,

Or Jars with watertight lids

Funnel (not essential)

Pot of washing-up liquid (not essential)

For sorting pitfalls:

White tray, or clear plastic tray over a white sheet of paper

Good lighting

Forceps (normal rigid type)

Storksbill forceps (highly desirable)

Alcohol (usually Industrial Methylated Spirits) diluted to 70%

Tubes and caps (a few per pitfall)

Paper and pencil/waterproof ink pen for labelling

Thin card or good quality paper for labelling - pencil labels on poor quality paper can become illegible after a journey through the post, or similar.



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