

Irish Hedgehog Survey – Local Area Survey Volunteer Handbook



Hedgehog. Photo dreamstime.com CC0.

Introduction

The Irish Hedgehog Survey is a project led by researchers in NUI Galway. The aim of the survey is to gather information on the status of the Irish hedgehog population. The local area hedgehog survey will help us understand how hedgehogs use the habitats in our cities, towns and countryside.

This is a citizen science project which means that volunteers play the very important role of collecting the data for the survey. Thank you for taking part in the project. We hope you enjoy it and we look forward to sharing the results with you when the survey is complete.



We are very thankful for the support of our project partners who have facilitated this research. The following organisations have provided funding, administrative and technical support to the Irish Hedgehog Survey which is gratefully acknowledged.



An Roinn Tithíochta,
Rialtais Áitiúil agus Oidhreacht
Department of Housing,
Local Government and Heritage



Comhairle Contae Mhaigh Eo
Mayo County Council



Kilkenny County Council
Comhairle Chontae Chill Chainnigh



Comhairle Cathrach
Bhaile Átha Cliath
Dublin City Council



Comhairle Chontae na Gaillimhe
Galway County Council



WELCOME

Dear Volunteer,

Thank you for signing up to take part in the Irish Hedgehog Survey.

Below you will find the Instructions for selecting survey sites and conducting the survey. It is very important to follow these instructions carefully as data from surveys that do not follow the protocols properly cannot be used.

The survey can be undertaken any time between May and September inclusive in 2021 or 2022. Each survey is carried out over 5 consecutive nights so you will need to identify a 6 day period within this timeframe for you to conduct the survey.

If you have any questions about any aspect of the survey, please contact the survey co-ordinator by email Elaine.oriordan@nuigalway.ie or phone 091 493572.

Before you commit, please consider the key requirements of the survey:

- Do you have time? - You will need to set up the tunnels and then check them **every day for 5 days in a row.**
- The survey must be carried out sometime between **June and the end of September**
- You need a **survey site measuring approx. 1km x 1km** where you can survey
- You must have access and **permission** to survey at the site
- You should **not know** if hedgehogs are present at site

SITE SELECTION

1. Volunteers are requested to complete at least one tracking tunnel survey in an area of their choice. Volunteers may survey a number of different sites if you wish, to help build as clear a picture as possible of hedgehog status across the country. However, unless you have no other commitments, it is unlikely that you could survey more than two squares at the same time because of the time taken to travel to and between squares. But you can survey different squares in the same year or different squares in different years.
2. Each surveyor can choose their own survey site(s). Suitable sites can be in the countryside e.g. farmland or parkland, golf courses and nature reserves. You may also choose to survey in urban or suburban areas for example around parks, gardens, housing estates, church or school grounds, playing pitches, green areas around industrial estates, roadside hedges and verges (where safe).
3. Volunteers should as far as possible choose sites where they do not know if hedgehogs are present or not. If it is several years since a hedgehog was recorded at the site, that is ok to survey, but if you are aware of recent hedgehog sightings, it is best to log those records via the recording scheme and look at another site.

4. Each study site should cover an area approximately 1km^2 . It may be necessary to survey an area smaller than this due to access or geographical constraints, but it should not be less than $500\text{m} \times 500\text{m}$ ($.25\text{km}^2$ or approx. 65 acres).
5. The survey area does not have to be square but should consist of a 'block' shape that would fit within a $1\text{km} \times 1\text{km}$ square i.e. it should not be a long linear feature e.g. a river bank or a network of smaller sites scattered over a larger area. For example:



6. Chosen sites should be practical, safe and convenient so that the full session can be completed. Each survey will take a total of 5 consecutive nights, and each tunnel needs to be visited every day. You will need to set aside time over 6 consecutive days to allow for setting up the survey at the start.
7. Permission must be sought at all times for your survey from the landowner. Preferably each site should be owned by one land owner to reduce the number of access permissions required, though due to the size of the survey site, there may be more than one. (see Landowner Letter in Appendix).
8. Ensure you ask the landowner if there will be animals on site over the survey period, and if they are planning any works (e.g. Mowing/slurry spreading/construction) which may impact your access for the survey.
9. Whilst talking to the landowner, please ask them if they have seen hedgehogs in the last year; record this information on the data sheet (See page 7).
10. Familiarise yourself with the site. Once permission has been granted, walk the site recording suitable locations for placing the tunnels (see below).
11. If you are surveying in a public area, ensure that you get a set of black tunnels from your local co-ordinator. Some tunnels are blue or white in colour but they are more conspicuous and likely to draw unwanted attention.

TRACKING TUNNEL SURVEY PROTOCOL

1. Tunnel numbers - You will need 10 tunnels per survey site which are provided in your survey kit. Please assemble the tunnels according to the instructions on pages 6-8 (creasing, folding and attaching Velcro). One tunnel has been pre-assembled to guide you.
2. It is best to carry the tunnels to the site flat (unfolded) to the site and to set up the paper, ink and bait in situ at each tunnel location.
3. Tunnel positioning - All tunnels are to be placed next to or under linear features or edge habitats (e.g. woodland edges, hedgerows, field margins, Roadside hedges, laneways/paths). Tunnels must be placed evenly across the survey site and at least 100m apart. There should be no more than two tunnels in a single field.
4. As you put the tunnels out, please assign each one a number from 1-10: these tunnel identification numbers will be used to record and collate information during the course of the project. It is essential that you are consistent with these tunnel identification numbers within each seasonal survey period.
5. Record the location of each tunnel in either Latitude & Longitude (WGS84) or by Grid reference. It is a good idea to print off a map/aerial photo of your survey area to take out on fieldwork. Mark the position of each tunnel on the map. You can use a mapping site such as Google Maps, Bing maps, or irish.gridreferencefinder.com to get the co-ordinates.

6. You may use a GPS device or your phone to record the position of tunnels in the field by 'dropping a pin' on google maps or using an app such as ViewRanger. If you need assistance with any of this, please contact Elaine.oriordan@nuigalway.ie
7. Record the habitat features of each tunnel location on the form provided (**page 10**) to include:
 - **Linear feature:** What linear feature or edge habitat have you placed your tunnel alongside?
 - **Immediate habitat:** The habitat in the area where the tunnel is located
 - **Adjacent habitat:** The habitat in the area adjacent or on other side of wall/fence etc.
8. **Setting the tunnels** - Tunnels should be placed flush with the ground to avoid hedgehogs having to climb up into the tunnel. Each tunnel should contain 2 sheets of clean paper (to record footprints), 2 wet 'ink' pads (made up of vegetable oil and powder paint) and baited with dry cat food. (**See page 6-8 for assembly instructions**).
9. Tunnels need to be left in place for 5 consecutive nights and checked daily. It is best to check tunnels early in the day especially if it has been raining to avoid loss of footprints from paper disintegrating in the rain.
10. **Checking tunnels** - Each tunnel needs to be checked EVERY DAY to ensure that it is still in position and to replace any bait that may have been eaten. **Each time** that you go out to check the tunnels, please make sure that you take the following items with you:
 - Enough cat food to rebait all ten tunnels (they may all have been visited by hedgehogs or other animals)
 - Your pot of ink and paintbrush (and maybe spare powder and vegetable oil in case you run out)
 - Enough A4 paper to replace all the footprint papers in every tunnels (20 sheets)
 - Your Day-to-Day Tunnel Record Sheet and a pencil (on page 10)
11. If the tunnel has been moved, please try and find it and put it back in position; if you are not able to find the tunnel, record it as LOST on the record sheet and give it up as lost. If the bait has not been eaten, just leave it as it is.
12. If any footprints are recorded on the paper, remove the paper and replace with a clean sheet of paper. If no footprints are recorded and the paper is still in good condition, then leave it in the tunnel. If the paper is very wet or damaged you should replace it. Top up bait and ink as required and reset tunnel.
13. Each day, you will need to record the following information on to the corresponding data sheet (**found on page 11**).
 - (a) if it contained footprints and from which species
 - (b) whether the bait had been removed (yes / no)
 - (c) note if tunnel was moved, damaged, lost or any other relevant information.

14. Any sheets with any footprints needs to be labelled with: (a) Your initials; (b) the site name; (c) the tunnel number; and (d) the date. Keep these sheets in a safe place. Allow them to dry out if wet.
15. At the end of the survey, all footprint papers and data sheets should be returned to the survey co-ordinator by post or email: Elaine O’Riordan, Zoology, Room 217 Martin Ryan Building, NUI Galway, Galway. Elaine.oriordan@hotmail.com.
16. Tunnel removal - After the tunnels have been out for 5 nights, collect and return them to your local co-ordinator so that they can be used elsewhere in your area. Please wipe down the tunnels with a damp cloth but don’t use strong smelling detergents which may deter hedgehogs.

How to assemble your footprint tunnels

You will be supplied with most of the materials you need for the survey. If you are the first surveyor to receive the kit, you will need to assemble the tunnels according to the instructions below. One of the tunnels will be assembled in advance so you know what they should look like.

If you are missing any of the materials required, please contact the survey co-ordinator by email Elaine.oriordan@nuigalway.ie or phone 086 3335272

Surveyor kit

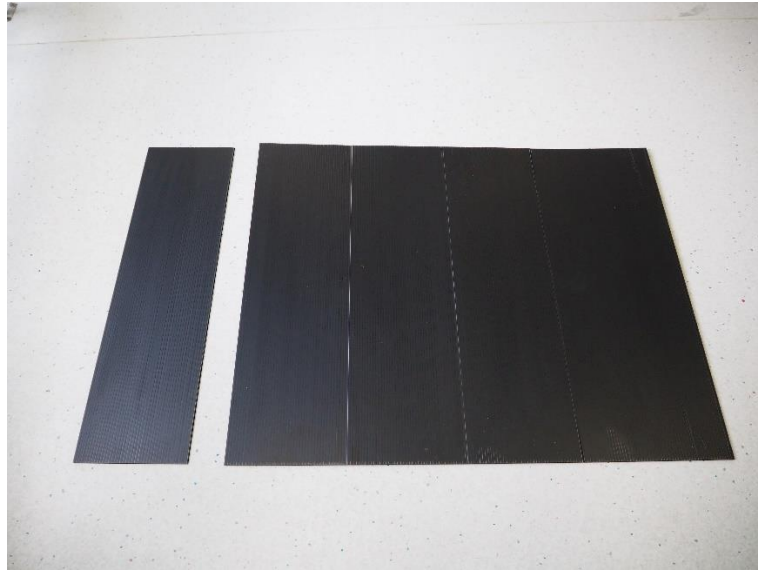
- 10 corrugated plastic footprint tunnels each consisting of a sheet measuring 100cm x 81cm for the tunnel body and a baseboard measuring 22cm x 81cm
- 1 roll of Masking tape
- 100 sheets of A4 plain white paper
- 80 thumb tacks (8 per tunnel)
- 21 x 5cm strips Velcro (3 per tunnel)
- Black powdered poster paint.
- 20 tent pegs (2 per tunnel)
- 10 laminated ‘do not disturb’ signs to stick on tunnels.
- Bait – dry cat food.

Required

- Sharp knife, vegetable oil, jam jar for mixing paint and paintbrush not supplied.

Method

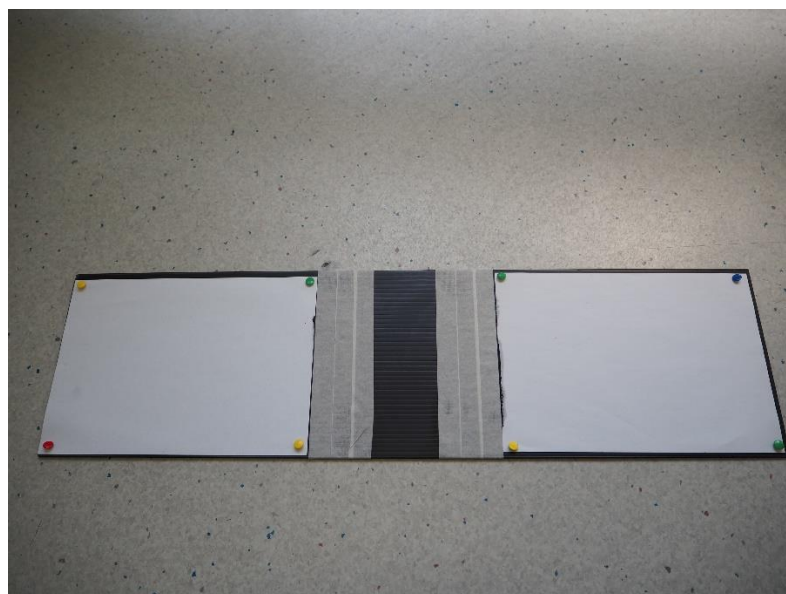
1. Lay the large corriboard sheet flat and measure out 3 x 23cm wide panels and score the length of the board with a coin, key or back of knife to allow them to fold as indicated in the diagram below.
2. Fold the sheet into a triangular tunnel and stick down the overlap with 3 strips of velcro.



3. As the overlap is slightly wider than the side of the tunnel, you may trim this to fit if you wish.



4. Use the drawing pins to attach a sheet of paper to either end of the base board.
5. Attach 2 or 3 strips of masking tape across the base board in front of paper to make the ink pads.



6. To make the ink, take a portion of the powder paint (about 2 table spoons) and place in a jam jar or similar container (with lid for transport). Mix about 2 tablespoons of vegetable oil into the powdered paint.
7. Paint a generous coating of paint onto the masking tape.
8. Place bait in centre of base board between ink pads.



9. Slide base board into tunnel.
10. Place tunnel in survey location making sure that the entrance is flush with the ground.
11. Secure tunnel in place with tent pegs at entrance or push through overlap (make hole and push pegs through baseboard and floor of tunnel).



Design based on that developed by researchers at Nottingham Trent University and the Mammal Society in the UK:

Yarnell, R. W., Pacheco, M., Williams, B., Neumann, J. L., Rymer, D. J. & Baker, P. J. (2014) Using occupancy analysis to validate the use of footprint tunnels as a method for monitoring the hedgehog *Erinaceus europaeus*. *Mammal Review*, 44(3-4), 234-238.

Tunnel information

Surveyor Name:		Site Name:		Ask Landowner	
		Area/County:		Have hedgehogs been seen here? Yes/No/Unknown Are there badgers in the area? Yes/No/Unknown	
Tunnel Number	Grid Reference or Co-ordinates	Linear feature	Immediate habitat/land use	Adjacent habitat/land use	Notes
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					

Linear Features: Hedgerow, treeline, wall, solid fence, wire/post and rail fence, drain/ditch, building, field margin

Habitat/land use: Mixed or broadleaf woodland; Coniferous (plantation) woodland; Scrub; Agricultural Grassland (grazing, silage, meadow); Arable crops; Other grasslands (parkland); Amenity (highly maintained) grassland (lawn, playing pitches, golf course); Coast (rocky shore, sandy shore, sand dunes, cliffs, salt marsh, lagoon); Freshwater (lake, pond, river, stream); Bog; Built land (industrial or commercial buildings; housing estate, farm yard; road, car park, derelict site); Garden

Local Area Survey Recording Sheet

Surveyor Name:			Site name				Survey start date:			
							Survey end date:			
Tunnel number	Day 1		Day 2		Day 3		Day 4		Day 5	
	Footprints	Bait taken?	Footprints	Bait taken?	Footprints	Bait taken?	Footprints	Bait taken?	Footprints	Bait taken?
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										

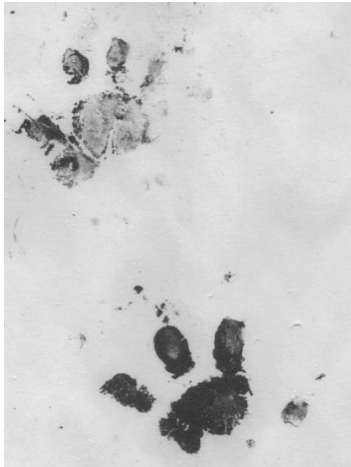
Bait Taken: ✕ or ✓

Footprints: Hedgehog; Cat; Rodent; Bird; Unknown; None (-)

Footprint Guide

The most common species you may find in your tunnel are shown here but you may find something else. Please scan or photograph your footprints and upload with the online form or email them to elaine.oriordan@nuigalway.ie. approximate

Footprints measurements are approximate. Images courtesy of London Wildlife Trust.



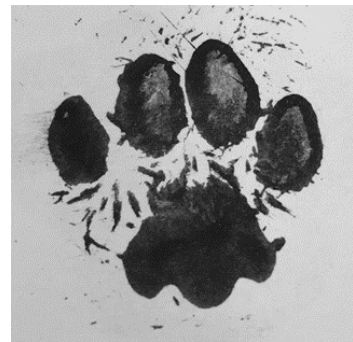
Hedgehog

W 25mm L 35mm



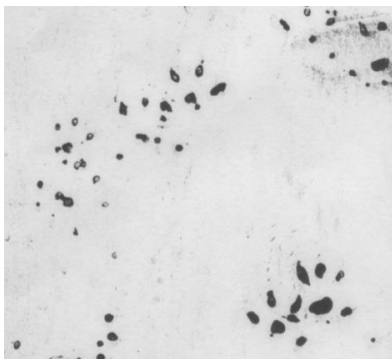
Fox

W 45mm L 50mm



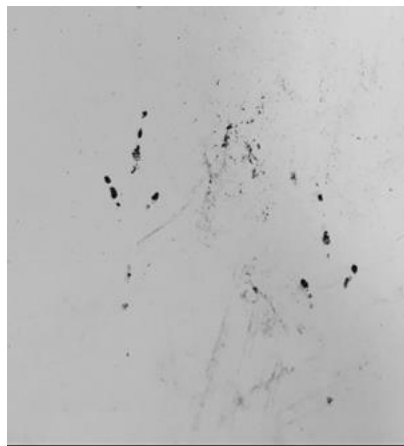
Cat

W 30mm L 30 – 35mm



Rodent (rat/mouse)

Tiny L 10-30m



Bird

Variable in size



Squirrel

W 25mm L 35mm

HEALTH AND SAFETY

The following information provides notes on good practice when undertaking fieldwork. As a volunteer you are under no obligation to participate in the survey or monitoring programme and you can cease taking part in the survey at any point. You are responsible for your own health and safety and should never put yourself or others in a position that could be dangerous. Before undertaking any activities, every surveyor must consider the particular health and safety hazards associated with their individual survey sites and whether their individual circumstances and medical conditions expose them to particular hazards. You should think about what precautions should be taken against any risks. If at any point you have concerns about your own health and safety or that of others, you are strongly advised not to undertake/continue the activity.

Volunteers should pass on health and safety information provided here to other people helping them with the hedgehog survey

Mobile telephones. It is advisable to carry a mobile telephone, which may be useful in case of an emergency. Please note that mobile telephones may not work in some remote areas, and are only of any use if you are conscious and capable of operating them. Ensure the phone has sufficient battery for the duration of the work.

Access permission. Always obtain permission from the relevant landowners or tenant to enter any private land before commencing fieldwork. Do not continue fieldwork if access permission is later revoked. A letter confirming your participation in the Irish Hedgehog Survey is provided in this pack which you should print and give to landowners.

Lone working. Lone working is to be discouraged as far as possible. If you must work alone, you should always give details of your whereabouts to a responsible person. This should include: date and time of departure, method of travel to and around the site, proposed itinerary, expected time of leaving the site and return to base, and vehicle identification details. This person should be told who to contact if you fail to make scheduled contact or if you do not return and at what time to raise the alarm. You should 'check in' with the contact regularly, and at an agreed time on completion of the work.

Weather Get a detailed weather forecast for your area before you go. Useful websites include www.Met.ie and www.yr.no. Take note of severe weather warnings and do not attempt to conduct fieldwork in dangerous weather conditions.

If rain is forecast, ensure you have appropriate rain gear including waterproof jacket and leggings and boots with a good grip. Make sure your survey equipment and phone are in plastic bags to keep them dry. In general in Ireland, you should assume it is going to rain.

Working in warm weather poses risks for dehydration, heat stroke and sunburn. Ensure you have plenty drinking water to keep hydrated, take regular breaks as necessary and wear high factor sun screen and appropriate clothing.

Working in remote areas. If going to a remote place, then always leave a note of your whereabouts with a responsible person. This should include: date and time of departure, method of travel to and around the site, proposed itinerary, expected time of leaving the site and return to base, and vehicle identification details. The person to whom these details are given should be told who to contact if you do not return and at what time to raise the alarm. If possible, do not work alone.

Working near waterbodies or in wetlands. Fieldworkers working near waterbodies or in wetlands should never work alone.

Livestock and agricultural machinery. Take special care when entering areas with livestock, especially cattle, rams and horses. Do not enter fields containing bulls and be especially cautious with farm dogs. Rutting deer can also be aggressive in the autumn. Avoid undertaking fieldwork in close proximity to working agricultural machinery or forestry operations.

Parking. Take care to park sensibly, preferably off-road. Ensure that entrances are not blocked.

Terrain. Take special care when carrying out fieldwork along watercourses, cliff edges, or in areas that contain boggy ground, reedbeds or loose rocks. Wear bright-coloured clothing when carrying out fieldwork along busy roads. Do not cross potentially hazardous sites, such as quarries, ravines and railway lines and do not attempt to climb steep slopes, walls or fences. Please heed warning signs and do not enter land that has been deliberately obstructed by fencing or barbed wire.

Human confrontation. Consider your personal safety when conducting fieldwork within the vicinity of known or likely trouble spots. Avoid confrontation with landowners, land workers or members of the public. Consider the privacy of residents when performing early-morning survey work in residential areas. Carry some form of identification to confirm the activities you are undertaking. If you have any concerns about your personal safety, cease fieldwork immediately.

Diseases. Fieldworkers may be exposed to disease during survey work. If a disease is suspected, then it is important to inform your doctor that you may have been exposed to diseases associated with outdoor activities. Typical diseases that may be encountered are:

- **Tetanus** may result from the infection of even minor wounds and scratches with *Clostridium tetani*, a common micro-organism in soil.
- **Weil's disease** (leptospirosis) that can be fatal if left untreated. The organism is carried by rats and excreted in their urine, and persists in water such as in puddles and slow-moving rivers in rat-infested places. Thus visits to sites where rats might occur may pose a risk.
- **Lyme disease**, a bacterial disease transmitted by animal ticks associated with rank vegetation, which leads to severe symptoms if left untreated. A variety of animals act as hosts for the bacteria, including sheep, deer and pheasants. For more information, see <http://www.ticktalkireland.org/>
- **Tick-borne Encephalitis**, a viral disease carried by animal ticks. Warm forested areas with heavy undergrowth give the greatest risk from ticks in late spring and summer.

Minimising the risk of such diseases requires straightforward actions. For example:

- Immunisation against Tetanus and Poliomyelitis.

- Remove ticks from the skin as soon as possible: wear light-coloured clothing so that ticks are visible, tuck trouser bottoms into socks so that ticks cannot attach or climb up the leg, and make regular checks of skin and hair.
- Hands should be thoroughly cleaned after fieldwork. Cigarettes can also transfer the infection from hands to mouth.
- During fieldwork, cuts and abrasions should be kept covered by a dressing.

Medical conditions: Field workers receiving special medical treatment, such as a course of injections, or suffering from medical conditions eg. diabetes, allergies, rare blood groups etc. are reminded of the advisability of carrying a card or some other indication of special medical requirements. Where applicable, sufficient additional medicines, etc., should also be carried during field work.

Pregnant surveyors should ensure the work is manageable and safe and should pay particular attention to hand hygiene when handling survey equipment.