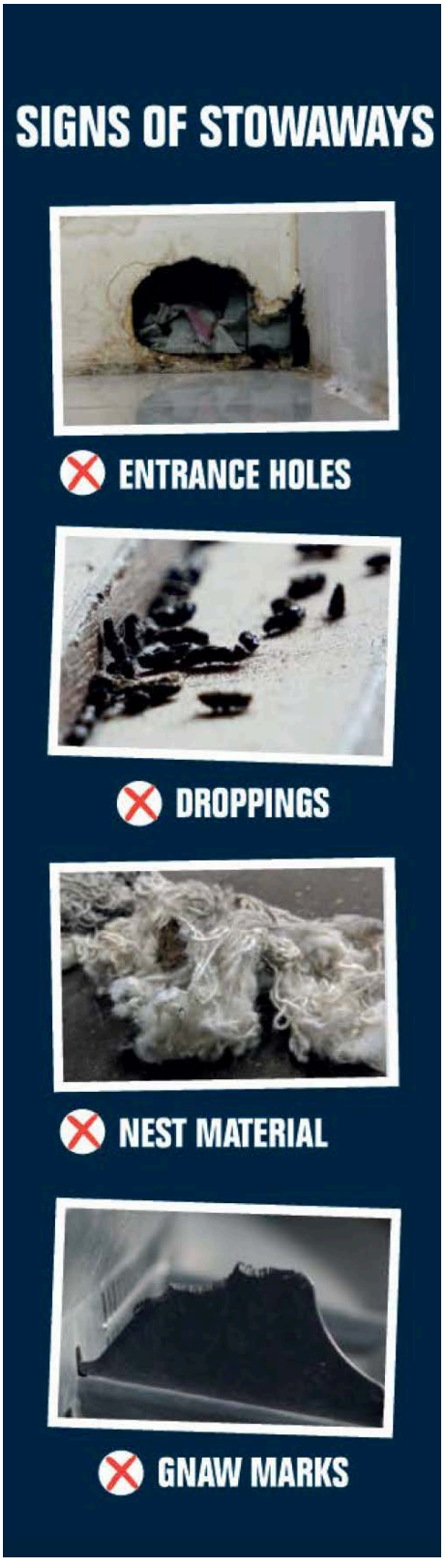
Rodent identification and signs of stowaways

Key features of UK target rodents

Black rat

Brown rat

House mouse



Identifying rodent droppings

Rodent droppings can be very variable (depending on diet), including in colour, but as a guide:

Brown rat	Black rat	House mouse
-13-19mm long, -3-4mm thick -Rounded ends, one end may go to a point (as pictured) -Likely to contain fur -Often located in latrines along tracks, at feeding sites and on prominent rocks	-7-14mm long -3-4mm thick -Tapered ends -Often slightly curved -Likely to contain fur	-4-8mm long -2mm thick -Small and thin -A bit like grains of rice -Strong smell of ammonia.
		

Figure 2.9 Droppings of UK invasive rodents. Images: taken from Morton & Cole 2013

Rabbit or **goat** droppings be mistaken for rat droppings, though they are usually more spherical (particularly rabbit) and uniform. Goat droppings may be more cylindrical but with flatter or round, rather than tapered ends. Breaking up droppings should help (wear gloves): rabbit and goat droppings just contain vegetation, whereas rat droppings are likely to contain fur and a range of food stuffs.

Shrew droppings – typically 2-4mm long and 1-2mm thick, these should be smaller than rat or mouse droppings. However, evidence from St Agnes and Gugh (Isles of Scilly) shows shrew droppings can be much larger than this. They are of a sandy consistency and are largely comprised of insect remains, whereas rodent droppings generally contain a wider array of food sources. Rat droppings usually contain fur as they are extensive groomers.

Vole droppings are fairly uniform, cylindrical and tend to be rounded at both ends. Water vole droppings are 7-10mm long and 3-4mm wide and are those which are most likely to be confused with brown rat droppings. Rat droppings are usually tapered at one end (and are likely to contain fur/wider range of food sources). Droppings from smaller species of voles cannot be distinguished, but their uniform nature may help distinguish them from mouse droppings.

Wood mouse and yellow-necked mouse droppings look short and thick compared to house mouse droppings.

Invertebrate droppings

Invertebrates, e.g. **rose chafer beetles** may produce piles of frass that could be mistaken for a rat latrine (right). However, their droppings are likely to be more prolific and uniform.

DNA testing can be done to confirm species. Droppings should be photographed *in situ* and then *all* of them should be collected, not just a sample. See the resource section '**Rodents - trapping and using bait legally**' and the document called '**Necropsy, measuring and sexing rodents',** for more details.

RODENT FOOTPRINTS AND NESTS

Rat prints in sand (above left), mud (above right) compared to tracking plate (below)

Nests and other signs

If you encounter baby rodents in a nest, install a trail camera to confirm the species, and take further action accordingly.

Black rat

Brown rat burrow and nest

House mouse

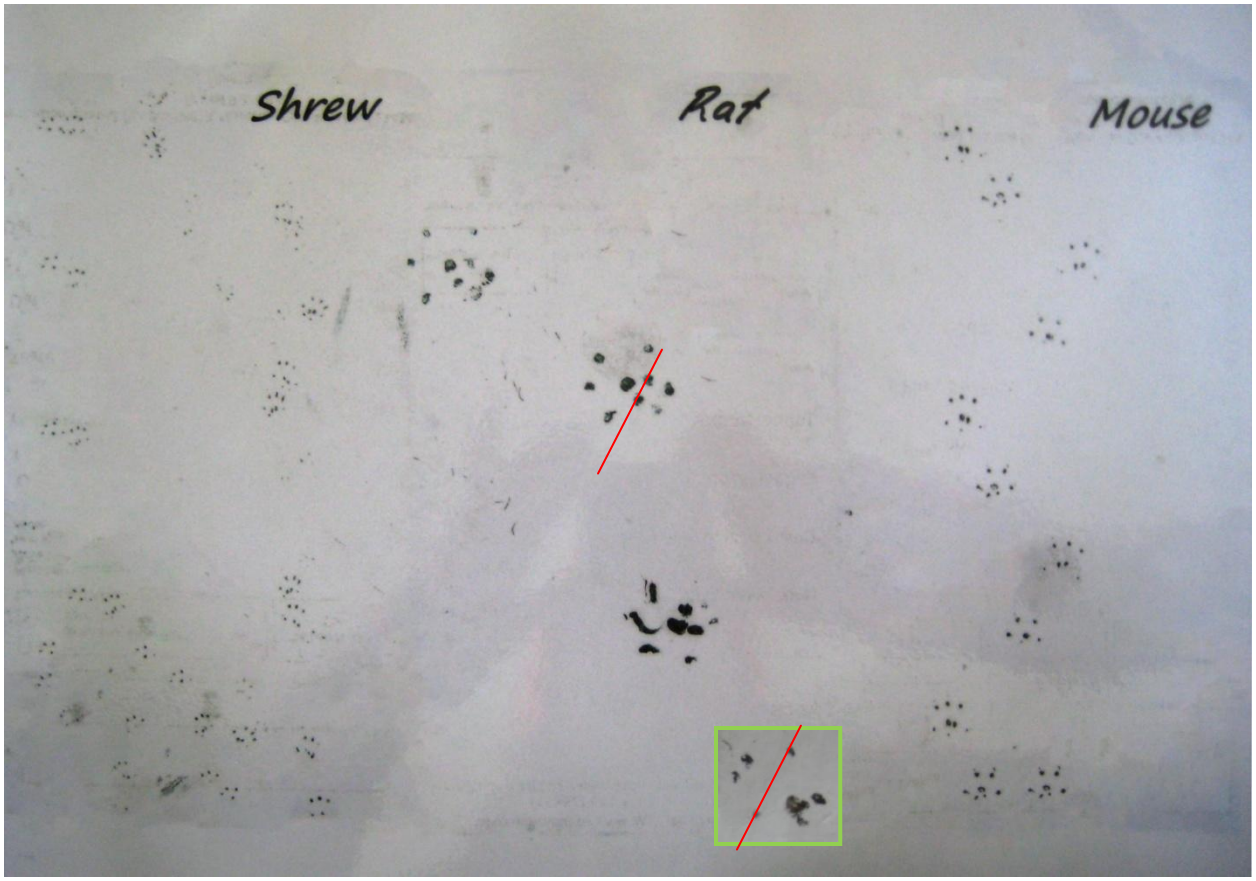
UK invasive rodent nests and burrows

Burrow system of brown rat on coastal cliffs.
Search for other signs around the entrances to a burrow system, such as droppings.

Footprints

Black rat	Brown rat	House mouse
4 toes on front feet, 5 on rear 28-34mm long Clear split in hind foot central pad	4 toes on front feet, 5 on rear 30-42mm long Solid hind foot central pad	4 toes on front feet, 5 on rear 15-23mm long.
 (not to scale)		

Footprints of UK invasive rodent species. Note that the footprints of black rats shown here are similar to those which would be left on tracking tunnel plate, while those of the brown rat and house mouse are similar to those that would be left in a soft substrate such as mud, which allows more detail to be seen www.pestdetective.org.nz is a good resource for identifying sign.



Size comparison of rat, house mouse and shrew prints:

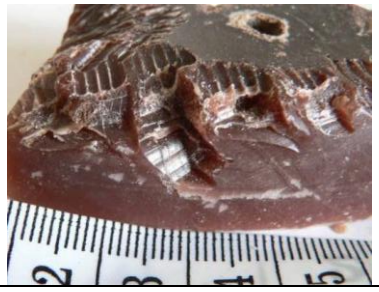
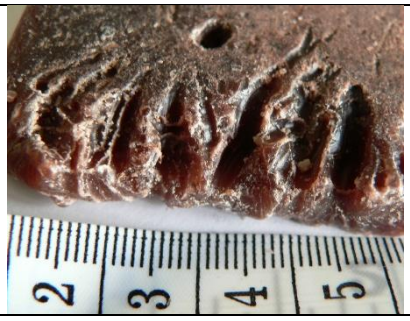
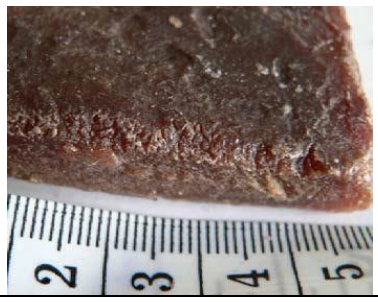
Rat prints are similar in size to squirrel prints, but can be distinguished by drawing a line between the first and last toes. In rat foot prints the line will pass through the central pad, but this is not the case for squirrels (inset image in green box).

Rodent Teeth marks

Black rat / Brown rat	Mouse
• Marks consist of two parallel grooves • 1mm wide per groove (2mm per mark) • 'Messy' eaters – chew in all directions	• Marks consist of two parallel grooves • 0.5mm wide per groove (1mm per mark) • 'Neat' eaters – often chew around edge
	

Rodent teeth marks All photos © WMIL

N.B. Distinguishing between mouse species or voles and mice is not possible (the bottom mouse image is a wood mouse, the top a house mouse). Incorporating lures into wax/resin which are unlikely to be attractive to non-target species such as voles (e.g. meaty gravy) could be helpful if interference with detection devices is a problem, but this has not been widely tested to date.

Rabbits can have split incisors, making four parallel grooves that are similar to rat sign. There would be two large bite marks from the bottom teeth (larger than the 1mm groove for a rat) per four grooves.	**Birds** tend to leave deep gouges which start at a point and are triangular. They are often curved rather than straight. They may also leave peck marks.	**Shrew** marks are very distinctive, with tiny, pin-like scratches less than 0.5mm wide. They may have a triangular shape as individual grooves build up over time.
		

Teeth marks of common non-target species. All photos © WMIL

Rodent identification

Key features of UK target rodents

	Brown rat	Black rat	House mouse
Senses	Acute smell, touch and hearing	Acute smell, taste, touch and hearing	Acute sight, smell and hearing: Large eyes
Habitat preference	Associated with water (but live in range of habitats). Move along edges of structures, rather than out in the open	Associated with forests and vegetated areas (but live in range of habitats): tracks and runs on the ground are common despite arboreal preferences	Full range of habitats (commonly associated with humans)
Swimming ability	Excellent swimmers up to 4 km	Known to swim up to 750m	Excellent swimmers up to 500 m
Climbing ability	Agile (but less so than black rats) Can jump up to 1m	Incredibly and often unbelievably agile (and skilful) – can jump up to 1m	Agile and can jump up to 0.5m
Activity	Predominately nocturnal – may be seen in day	Predominately nocturnal –but can be seen in day	Predominately nocturnal – but often seen in day, esp. in summer
Behaviour	Neophobic (wary of new things)	Neophobic (but less so than brown rats)	Not neophobic (investigate new things)
Breeding habitat	Extensive burrow nesters	Nest in trees or under vegetation	Burrow and cavity nesters (wood piles, banks, buildings)
Nesting materials	Grass, newspaper, cardboard, leaves, feathers	Usually vegetation (twigs, leaves) or feathers, but can use paper/card	Vegetation, feathers, human materials (e.g. newspaper)
Life span	12 to 24 months	12 to 18 months	12 to 18 months
Home range	0.1 to 3 ha depending on food availability/ habitat quality	0.1 to 1 ha depending on food availability/ habitat quality	0.5 to 2.5 ha
Feeding	Often cache food in burrows. Omnivorous, opportunistic. Eat 30g/day	Often cache food. Eat 15g/day	Omnivorous, opportunistic. Do not need a water source.
Breeding cycle	Can breed all year round	Can breed all year round	Can breed all year round
Gestation Weaning & Sexual maturity	24 days 28 days 2-3 months	20-22 days 21-28 days 3 months	19-21 days 20-23 days 6-8 weeks
Number of young	3-10 (usually 6-8)	3-10 (usually 5-6)	2-12 (usually 6-8)
Other	Small groups live in colonies: young males evicted as they mature or when the colony becomes overcrowded	Do not live in colonies (unless in urban areas): prefer to disperse throughout the available area	Can be found in environments with no water (obtain water requirements from food)

Identifying features of the key target species

	Brown rat ***Rattus norvegicus***	**Black rat** ***Rattus rattus***	**House mouse** ***Mus musculus***
Tail	Heavy short tail: no longer than head-body Pale underside	Long scaly tail ≤ 250mm: no shorter than head-body Uniform colour	Long tail, 50-100mm: similar to head-body length Uniform colour
Ears	Small ears: do not cover eyes 14-22mm Obvious hairs extend beyond edge of ear	Large ears: cover eyes when pulled down 19-26mm Fine hairs do not extend beyond edge of ear	Large, round ears 12-15mm
Hind feet	Pale 30-42mm long	Dark, hairy 28-38mm long	Small, thin, grey 15-19mm long
Body & head-body length	Long, stout body Up to 275mm	Long, slender body Up to 230mm	Slender body 70-100mm
Average weight	450g (can be up to 600g)	Up to 350g	10-25g
Colouration	Brown back with long, dark guard hairs Pale grey belly	**Three colour morphs** ***rattus:*** black back, dark grey belly ***alexandrinus:*** brown back, pale grey belly ***frugivorous:*** brown back, white or cream belly	Dull brownish grey back Grey, brown or white belly
Nipples	12	10-12, usually 10	10-12

Sightings & corpses

'Black' rats can look very similar to 'brown' rats: most black rats are not black. Although black rats are not common in the UK, they are associated with ships (another common name for them is the