



EXPEDITION FIELD GUIDE

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**Make sure you have a copy of this with you
in your clipboard each time you go into the field**

A word on track & scat (mis)identification

Identifying tracks and scats with the precision required for a serious scientific research expedition is difficult indeed. There are very few people in the world who can identify scats by sight and even established and experienced field workers have error rates of 50% or more*. Honesty and resisting the pressures of human vanity are key. It is better to lose information than to add misleading information to our sampling.

Always be aware of human nature and the pressures of an expedition environment. Many people will claim to be able to identify tracks accurately, but very few will actually have that skill. Again, species identification by tracks and scats is a difficult skill, mastered only by very few after a lifetime of learning.

Nevertheless we will collect tracks and scat information based on the expedition scientist's instruction. But you must be critical and accurate when doing so. If you are not sure, say so on your datasheet. Always take a picture of tracks and scats you record (with a scale) for verification and further discussion at base. Only records verified by the scientists will be allowed to enter into analysis, so you must make sure that you share your datasheets, notes, thoughts, pictures, etc. with the scientists upon return to base.

Scats that may be from snow leopard must be collected (see below for instructions on how to do this) and will, for the sake of precision (and science is based on precision), be sent for DNA analysis wherever possible. Collecting many signs such as tracks & scats is good as it increases sample size, but extreme care must be taken when there is the slightest doubt about positive identification of animal sign and records, which is where DNA analysis of scats provides irrefutable proof.

So the gist of all this is: do collect track & scat information as instructed and necessary, but be very critical when doing so and even more careful about your conclusions.

*During a Biosphere Expeditions to Oman studying Arabian leopards over 30 scats were collected as likely to belong to Arabian leopard. DNA analysis of these scats showed that only one was in fact from a leopard.



see separate sheets on below for tracks & scats information

Snow leopard (*Panthera uncia*). An adult snow leopard weighs between 35-55 kg, stands about 60 cm tall at the shoulder, and measures 1.8-2.3 m from its head to the tip of the tail, which is up to 1 m long. Male snow leopards are generally about 30% larger than females, but otherwise the two sexes look very much alike and can be difficult to tell apart. Snow leopards have white, yellowish or smoky-grey fur patterned with dark-grey to black spots and rosettes. These markings camouflage them against the rocky slopes, helping them sneak up on prey. Their fur is dense, woolly and up to 12 cm long. The snow leopard uses its very long, thick, furry tail to aid in balancing.



Pallas's cat (*Otocolobus manul* or *Felis manul*), also known as the **manul**, is a small wild cat of Central Asia. It is about the size of a house cat, at 60 cm long, not including its 25 cm tail, and an average weight of 3.6 kg. Its fur is ochre in colour with vertical bars, which are sometimes not visible due to the thick fur. Pallas's cats inhabits the Asian steppes up to altitudes of 4,000 m.



The **Eurasian lynx** (*Lynx lynx*) is a medium-sized cat, ranging in length from 80-130 cm and standing about 70 cm at the shoulder. The tail measures 11-25 cm in length. Males usually weigh from 18 to 30 kg and females weigh 8 to 21 kg. During the summer, the Eurasian lynx has a relatively short, reddish or brown coat, which tends to be more brightly coloured in animals living at the southern end of its range. **Droppings are long, straight or only very slightly twisted and have pointed ends. They have a high fur and feather content and may contain very large bone fragments. May be up to 25 cm long; colour varies according to content. Faeces deposited in regular latrine, but not buried. They are associated with scratching and urine deposits.**



The **grey wolf** (*Canis lupus*). Adult wolves are 105–160 cm in length and 80–85 cm in shoulder height. The tail is around two thirds the length of the head and body, measuring 30–50 cm in length. Wolf weight varies geographically, with Kyrgyz wolves weighing up to 33 kg. **Scats: first meal from a kill will be meat, so first dropping very dark. Middle meal produces light droppings. Last meal produces furball droppings. Bone meal produces white, powdery droppings. Droppings often found in large numbers outside dens along with partially eaten food remains. Twisted, contain hair, are generally grey in colour and 5-20 cm long.**



The **red fox** (*Vulpes vulpes*) is present throughout Kyrgyzstan. Habitats include steppe and mountainous areas (up to 4,000 m). Colouration of red foxes ranges from pale yellowish red to deep reddish brown on the upper parts and white, ashy or slaty on the underside. The lower part of the legs is usually black and the tail usually has a white or black tip. Like the scat of many canines, fox scat often has a ropey, tapered, and partly segmented shape. Fresh red fox scat often has a distinct musky scent. Fox scat typically does not have the offensive odour common to domestic dog scat. Fox scats are generally 1-3 cm in diameter and 7-15 cm long.



The **golden jackal** (*Canis aureus*), also called common jackal, is a wolf-like canid that is native to Eurasia. The golden jackal's coat varies in color from a pale creamy yellow in summer to a dark tawny beige in winter. It is smaller and has shorter legs, a shorter tail, a more elongated torso, a less-prominent forehead, and a narrower and more pointed muzzle than the wolf. Jackal scats are similar in size and smell to fox scats, but not usually as ropey.



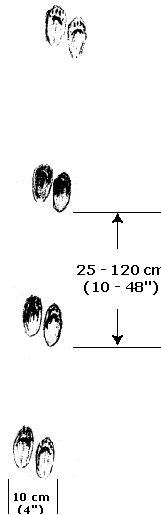
Asian badgers (*Meles leucurus*) are generally smaller than European badgers. The colour varies somewhat over their large range, but most individuals are lighter in colour than the European badger. In general, their colouration is more brownish-grey. Their sides are paler than the ridge of their backs and the dark facial streaks curve up behind the eyes and pass above the ears. The central pale band on the snout is correspondingly shorter and narrower and the white facial characteristics are altogether more brown-tinged.



Front



Hind



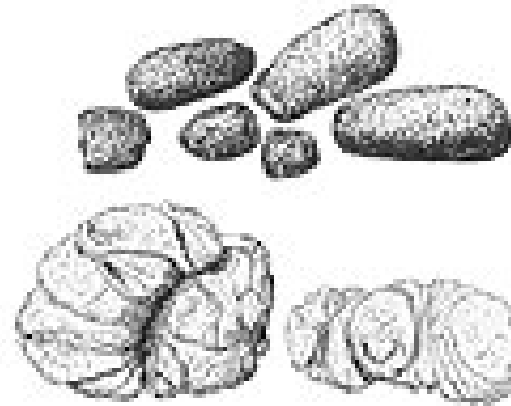
The **stone marten** (*Martes foina*) is typically found in deciduous forest, forest edges and open rocky hillsides (sometimes above the tree line). Males measure 43-59 cm in body length, while females measure 38-47 cm. Range in colouration from dark brown to pale grayish brown. A white or buffy streak can be seen just below the chin running down the neck to the chest. **Faeces of all medium-sized mustelids (marten, stoat, weasel, etc.) are twisted and coiled, irregular and elongated. They may contain fur, feathers, bone fragments, vegetation or fruit stones (see above). Scats usually left in regular latrines. 4-10 cm long.**



The **stoat** or **ermine** (*Mustela erminea*) is a species of *Mustelidae*, distinguished from the least weasel by its larger size and longer tail with a prominent black tip. In summer, the fur is sandy-brown on the back and head and a white below. Inhabits mountains up to 3,000 m. [See stone marten for scat description.](#)



The **least weasel** (*Mustela nivalis*) is long and slender, with a long neck, a flat, narrow head, and short limbs. This animal has large black eyes and large, round ears. The feet have five fingers with sharp claws. Fur color is chocolate brown on the back and white with brown spots on the underparts. [See stone marten for scat description.](#)



Winter

Summer

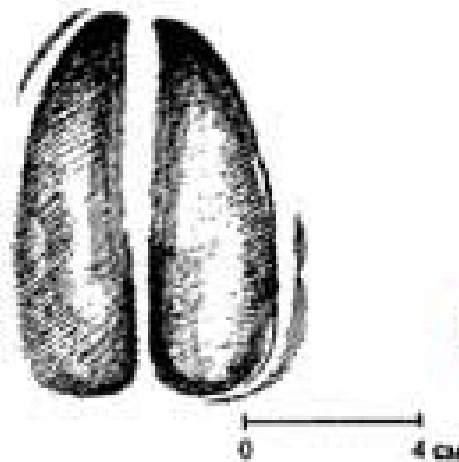
Red deer (*Cervus elaphus*) are generally found in mountainous regions, where they spend its summers in alpine meadows. It is one of the largest deer species. Adults tend to be reddish-brown in their summer coats. Only the stags have antlers, which start growing in the spring and are shed each year. **Snow leopard prey animal.** Large droppings: 2-2.5 centimetres x 1.3-1.8 centimetres; initially black and shiny, gradually becoming duller and more dark brown; cylindrical/acorn-shaped, often pointed at one end, rounded or slightly concave at the other. But beware - just like humans, scat is extremely dependent on what was eaten. Soft foods will produce soft droppings. Hard foods, hard droppings.



The **roe deer** (*Capreolus capreolus*) is a relatively small deer with a body length of 95-135 cm, a shoulder height of 65-75 cm and a weight of 15-35 kg. It has rather short, erect antlers and a reddish body with a grey face. Its hide is golden red in summer, darkening to brown or even black in winter, with lighter undersides and a white rump patch; the tail is very short (2-3 cm) and barely visible. Only the males have antlers. Roe deer live in woods, although they may venture into grasslands and sparse forests. **Snow leopard prey animal.** Thumb mark and point in most droppings.



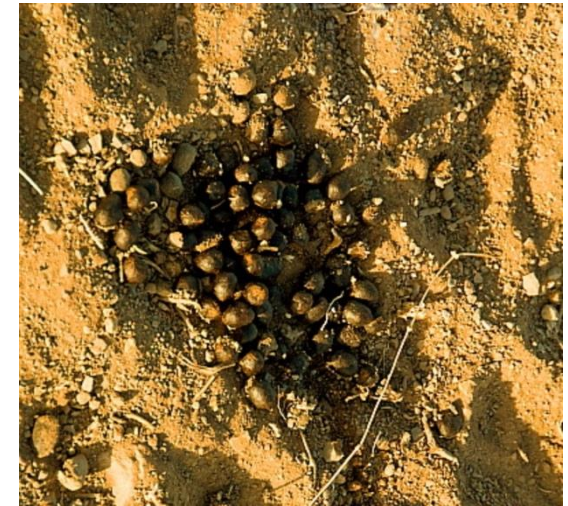
The **Siberian ibex** (*Capra sibirica*) is usually found in mountainous regions and alpine meadows. Individual sizes vary greatly from heights between 67–110 cm and weights between 35–130 kg. Typical colouration is a light tan with lighter undersides. Both sexes have beards and horns, though the male's beard is more pronounced. While the female's horns are small, those of a mature male can grow to a length of 130 cm and also have large ridges. Horns, unlike antlers, are never shed and grow continuously. **Snow leopard prey animal. Complete dropping, which does not break into sections - you have to tease it apart.**



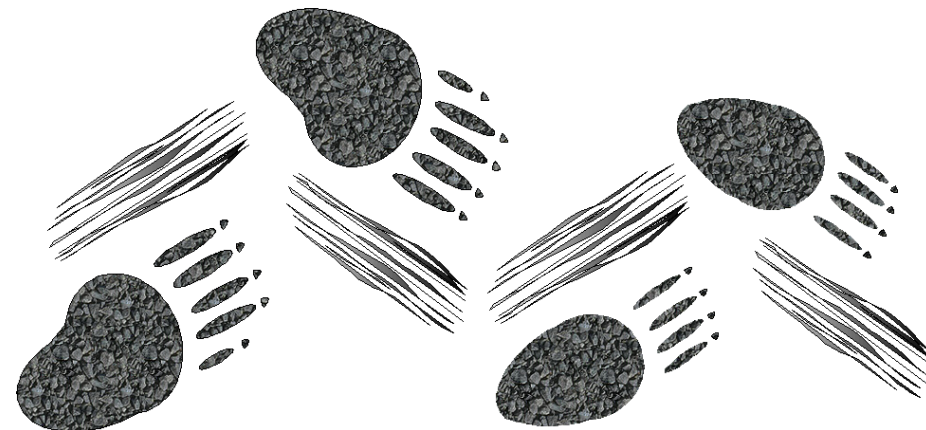
The **argali** (*Ovis ammon*) is a mountain sheep. Individuals are counter-shaded, ranging from light tan to dark grey above, and nearly white below. The curled horns of the males are the largest of any wild sheep, and can reach 190 cm in length per side. Females also sport horns, but these do not curl beyond half circle and are considerably less robust than those of the male. **Snow leopard prey animal. Typical sheep droppings are deer-like, but not all droppings have thumb mark and point. The complete dropping breaks into sections and is bigger and wavier than ibex.**



Length 3-4 cm,
smaller than roe deer



The **goitered gazelle** (*Gazella subgutturosa*) owes its name to the enlargements on the larynxes of the males, which amplify the volume of their rutting calls. The animals have a hide that ranges from light brown to sand-colored, and a light underside. They grow to a size of approximately 50 to 65 cm and a body weight of 30 to 40 kg. The males display lyre-shaped horns which bend backwards, while the females are hornless. They are primarily solitary or on the move in small groups during the spring and summer, in autumn and winter they consolidate into large herds of up to many hundreds of animals. **Snow leopard prey animal.** Typical gazelle droppings are deer-like, but smaller and not all droppings have thumb mark and point.



The **Indian crested porcupine** (*Hystrix indica*) is a large rodent, weighing 11–18 kg. The body (from nose to base of the tail) measures between 70 and 90 cm with the tail adding an additional 8–10 cm. It is covered in multiple layers of modified hair called quills, with longer, thinner quills covering a layer of shorter, thicker ones. The quills are brown or black with alternating white and black bands. **Snow leopard prey animal.**



The **Tolai hare** (*Lepus tolai*) is a species of hare found in Central Asia, Mongolia, and Northern and Central China. It inhabits semi-desert, steppes, rocky habitats and forest meadows. The Tolai hare is a little bit smaller than hares in Europe. In the mountains, it is found up to 4,000 m altitude. **Snow leopard prey animal.** Scat is usually very fibrous, very clean, very round, usually pale coloured.



Red marmots (*Marmota caudata*) are most common in the mountain meadow, which are often grazed by domestic sheep, goats and yaks. The head of the red marmots is flattened and the neck is short. The large eyes are close to the top of the head, allowing the animal to see the terrain above ground while remaining inside the burrow. Ears are small and barely extend beyond the fur. Long whiskers are located on cheeks, lower jaw, around the nose and eyes. **Snow leopard prey animal.**



The **large-eared pika** (*Ochotona macrotis*) is native to mountainous regions of Central Asia. It has brownish-grey fur tinged with ochre. The forehead, cheeks and shoulder region have a reddish tinge, which is more obvious in summer. The underparts are greyish-white. An adult large-eared pika is 15-20 cm. Its minimum altitude is about 2,300 m. The large-eared pika does not make a burrow, but lives in crevices among the shattered rock and scree found in mountainous regions. **Snow leopard prey animal.**

Other **wildlife** species present are

Long-eared hedgehog (*Hemiechinus auritus*)
 A variety of small mammals
 (shrews, mice, voles, jirds, muskrat, rats)



The **Turkestan red pika** (*Ochotona rutila*) is a species of mammal in the Ochotonidae family. It is found in Kazakhstan, Kyrgyzstan, Tajikistan, Uzbekistan, possibly Afghanistan, and possibly China. It prefers rocky habitats and is found mostly in the Pamir, Kirgiz, Gissar, and Tien Shan mountain ranges. The "red" in its common name comes from the rusty color of the back of its summer coat. It is also known as the "silent" pika because it does not make an alarm whistle or other vocal noises. Like other pikas, the Turkestan red pika is herbivorous. However, unlike most other pikas, it is averse to coming out into open meadows and does most of its feeding on plants growing among the rocks. **Snow leopard prey animal.**

Livestock species present are:

Horse
 Cow
 Sheep
 Goat
 Yak



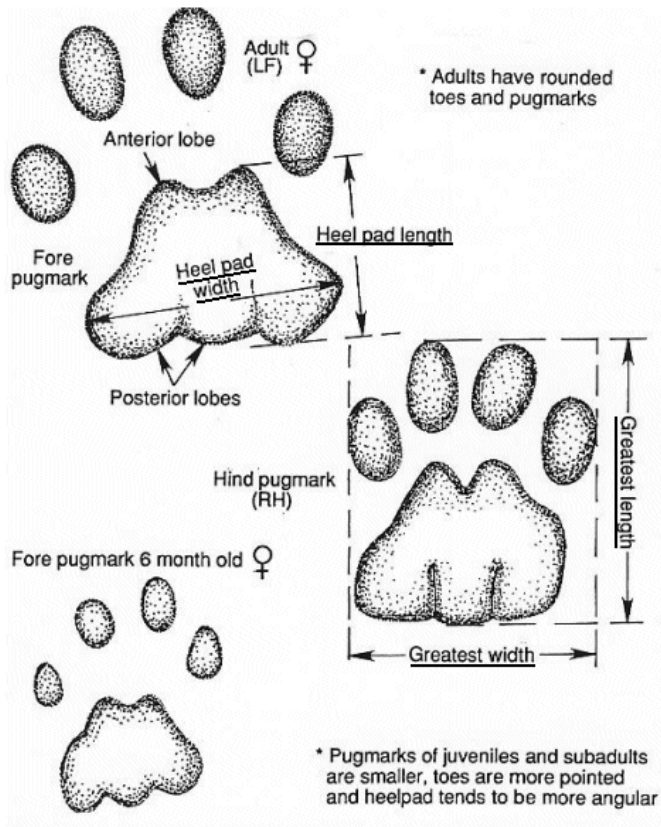
The **Mongolian five-toed jerboa** or **Siberian jerboa** (*Allactaga sibirica*). Head-torso-length 13-17 cm, tail length 18-23 cm, weight 82-104 g. Distributed in deserts (excluding sand deserts) and dry plane and mountain steppes (up to 3,500 m).

SNOW LEOPARD SIGN

Because snow leopards are so difficult to see, researchers rely on other signs of snow leopard presence to study them. Using these signs, snow leopards make sure they stay out of each other's way or, during the breeding season, males and females can find each other. Below are some drawings on what snow leopard sign looks like. **Ignore the width, length and height text below. This is for another type of methodology.**

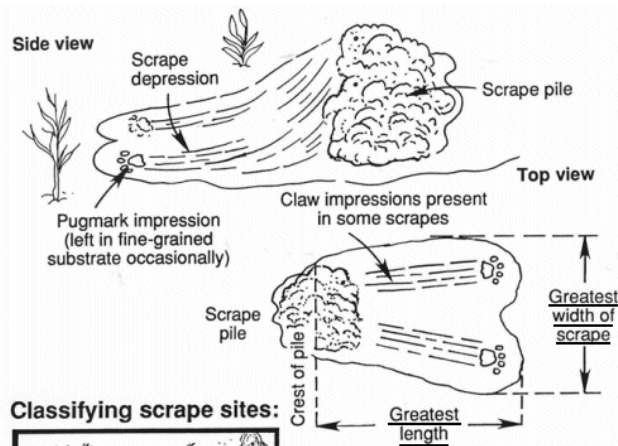
Tracks (or pugmarks)

These can be left in the snow or mud. They are very difficult to identify. Make sure you take a photo (with a scale).

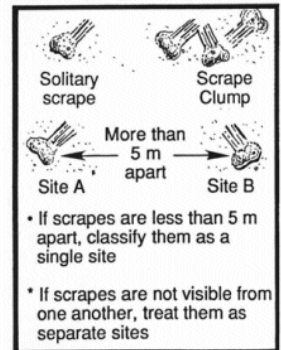


Scrapes

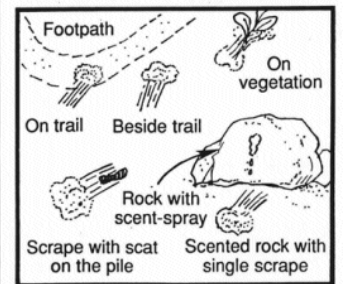
Snow leopards scrape their back legs in loose soil leaving a small depression with a mound of soil next to it.



Classifying scrape sites:

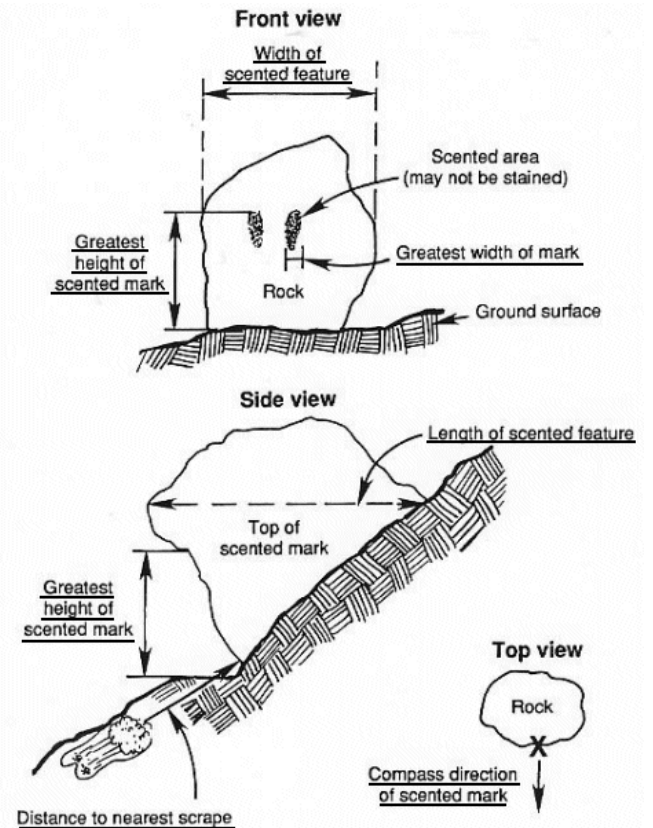


Describing scrape placement:



Scent marking site

Snow leopards mark rocks, bushes and boulders with pungent spray from a scent gland near the tail. Cheek rubbing spreads the scent.



COLLECTING SNOW LEOPARD SCAT (you need this for the datasheet “Recording Mammals”)



IDENTIFICATION: Like other felids, snow leopard scats tend to be uniform in diameter (1.8 cm average diameter, comprised of several slightly constricted “cords” or connected blocky segments up to 8-10 cm). The scat usually has blunt ends, compared to canid scats that tend to be tapered on both or at least one end, of irregular diameter and without any obvious constrictions. Note, however, that snow leopards may also deposit small, fox-like or “token” scats for marking purposes.

Snow leopard scats are often, but not always deposited on or near scrapes or near a scented rock, along wildlife trails (especially at bends), and near kill remains. Record the presence or absence of such sign when collecting scats.

There is a large amount of field-identification error. Scientists have observed up to 50% misidentification of red fox scat as snow leopard, even by experienced biologists, so don't worry if you get this wrong. DNA will provide the answer, so it is important that when there are multiple intact scats in a site (for example, scrape site) that you collect a sample of all intact scats.



COLLECTION IN THE FIELD:

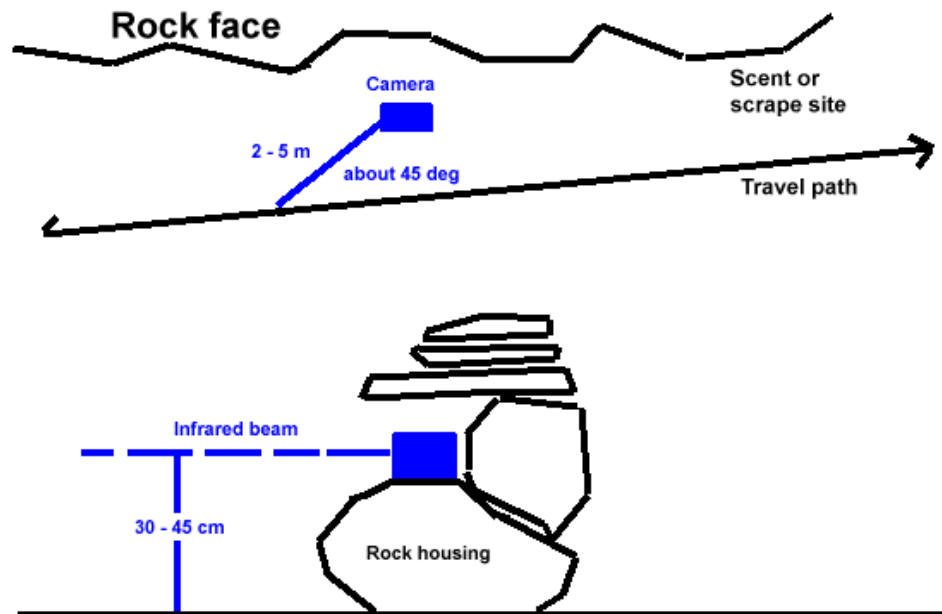
- Do not touch, disturb or kick the scat before you sample it.
 - Using the lid spatula, from areas of the scat not directly in the sun, break off pieces from the outside of the scat and only put a small amount of these pieces (about the volume of five peas – see above) into the tube. If there is a wet mucous layer on the scat, collect this (this is gut lining, which is especially good for DNA analysis).
 - When done, pour 96% ethanol into the tube until the sample is covered completely. Only unscrew the tube briefly and make sure the spatula does not touch anything but air until you screw the lid on again.
 - Finally, label the collection tube and record data as described on the “Recording Mammals” datasheet.
-
- **Collect a sample from each intact scat found at each site (one tube per scat, do not mix scat inside tubes!).**
 - **Only use the lid spatula to collect samples from the same scat (never mix scats).**
 - **Make sure the spatula does not touch anything except scat and air when in use.**
 - **Always wear gloves to prevent cross-contamination. Do not handle scats with bare hands.**
 - **Never mix scats, open the tube lid before sampling or let the spatula touch anything but scat and air.**

CAMERA TRAP SET-UP

Good sites are along ridgelines or valley bottoms, or the approaches to scrape or scent sites (because snow leopards visit these regularly and spend time investigating smells and other signs there).

You need to

- find relatively flat ground to avoid blind areas within the sensor's zone of detection
- clear the area of vegetation that could interfere or trigger the camera
- set up the camera 2-5 m from where you expect the cat to walk
- set up the camera 35-45 cm above ground level
- orientate the camera north or south (not east or west) to avoid interference as the sun rises or sets
- ideally shadow (not block!) the sensor by building a housing (see picture 2) with a flat rock or similar (this will also prevent snow from blocking the lens or sensor)
- build the housing so that it looks sort of natural (see picture 2)
- make sure that the housing or camera cannot be moved by wind or other factors



Picture 1: camera set-up.



Picture 2: camera trap in action (courtesy of Snow Leopard Conservancy)