

# CDOW Lynx Snow-Tracking Volunteer Program

Welcome to the Colorado Division of Wildlife (CDOW) lynx reintroduction project. Lynx released in Colorado, beginning in 1999, were equipped with radio collars to enable CDOW researchers to monitor their location and status. Over time, some of these collars have been lost or are no longer transmitting. Lynx snow-tracking volunteers will be part of a statewide effort to locate these missing lynx by searching for their tracks throughout the western half of the state. It is important to read this training packet carefully and be sure that you understand its contents. The information contained in this packet will help teach you how to recognize lynx tracks when you find them and familiarize you with the procedures to document the tracks and report them to the lynx researchers.

## Volunteer Qualifications

**Experience:** Lynx snow-tracking volunteers should be experienced in winter backcountry traveling and orienteering. Volunteers must be aware of avalanche danger and know how to avoid hypothermia. Volunteers are responsible for their own health and safety while participating in this project and are encouraged to go out in groups of two or more. The CDOW is unable to provide volunteers with training in backcountry safety.

**Time Commitment:** Volunteers for this project will work independently. We appreciate any amount of time you can give. You can look for tracks one day this winter or you can go every weekend. The amount of time you contribute is entirely up to you! Any contribution of time is appreciated and adds to the success of the reintroduction project.

## **Equipment**

Volunteers will need to provide their own equipment. You will need skis or snowshoes, a camera (preferably digital), and a topographic map of the area you are searching for tracks. A form has been provided as part of this packet for recording observations and measurements. You should bring a tape measure (or a ruler) and a pen. Cloth tape measures (usually used for sewing) are lightweight and very useful for taking measurements. They can be purchased in most department stores, arts and crafts or sewing stores. It is also helpful to have a GPS (global positioning system) unit. The information you need to properly recognize lynx tracks is contained in this training manual, but it might be useful to have an additional tracking book to take with you in to the field. There is a bibliography of recommended tracking books on page 8 of this packet.

## Resources for Volunteers

- To get a report of current weather conditions and avalanche danger, you can go to the Colorado state geological survey avalanche forecasting website, <http://geosurvey.state.co.us/avalanche/>.
- For those who would like to learn more about winter backcountry safety, the above website also has a list of avalanche courses and Colorado avalanche education providers. Some of these providers also offer courses on basic winter backcountry safety, survival and first aid. In addition, the Colorado Mountain Club (CMC), [http://www.cmc.org/cmc/site\\_map.html](http://www.cmc.org/cmc/site_map.html), offers courses for its members in basic winter camping, avalanche safety, cross-country skiing, first aid and wilderness survival.
- To find out more general information about lynx reintroduction, you can go to the Division of Wildlife website at <http://wildlife.state.co.us> and click on the “Wildlife Species” link, then “Species of Concern”, then “Mammals”, and then “Lynx”. (Or simply type “Lynx” into the CDOW search engine and choose the first site that comes up). The CDOW lynx page also has a photo gallery of lynx tracks.
- Page 8 of this packet is a bibliography of useful tracking books.
- If you have questions about this packet or the lynx snow-tracking volunteer program – call (970) 375-6708.
- **PLEASE RESPECT PRIVATE PROPERTY RIGHTS. DO NOT ACCESS PRIVATE LAND WITHOUT LANDOWNER PERMISSION.**

## Physical Descriptions and Habitats of Lynx and Bobcat

The lynx is a close relative of the bobcat and the two cats are physically very similar. However, they occupy very different habitats. Here is how to tell them apart:

**Lynx Description:** Lynx typically weigh 15 – 30 lbs (7 - 14 kg). They have very long legs and huge feet. Their fur is primarily gray with some reddish to yellowish brown highlights and only a few dark spots or streaks typically on the fore legs. The underside is whitish and the tail is short or bobbed and is about 4 in (10 cm) long. The ears have black tufts at the tips. Growths of hair called ruffs grow out of the sides of the head, and extend downward below the chin. Ear tufts and ruffs are longer and more pronounced on lynx than bobcat and **the tip of the tail is entirely black, as if it had been dipped in ink.** Lynx appear larger than bobcats due to their longer legs and hair, even though they may weigh the same.

**Lynx Habitat:** Lynx are most often found in Engelmann spruce and subalpine fir forests. Lynx use downed timber in these forests for security and denning. Forest edges are productive areas that provide food for the lynx’s major prey, the snowshoe hare. Lynx tend to avoid people. They are solitary and primarily nocturnal, although they may be active during the day. Their large and heavily furred feet function like snowshoes, allowing them to use areas of deep snow in winter.

**Bobcat Description:** Bobcats are similar in size to lynx. Their overall color ranges from reddish to yellowish brown with a whitish underside and **are typically quite spotted**. They vary widely in color, but their bobbed tail is a good identifying feature. The tail is about 4 inches (10 cm) long and has a black spot on top near the end, but is **white underneath**. A tuft of black hair sticks up from the tip of each ear. Growths of hair called ruffs grow out of the sides of the head, and extend downward below the chin.

**Bobcat Habitat:** Bobcats are most often found in rocky, broken terrain of foothills and canyons often using rocky ledges. In winter, bobcats cannot gain access to areas of deep, soft snow because they sink while walking.

### Identifying Cat Family (Feline) Tracks

To identify a lynx track, you must first learn to differentiate the tracks of the cat (felid) family (mountain lion, bobcat, lynx) from those of other Colorado mammals, particularly those of the dog (canid) family (coyotes, foxes and domestic dogs). Here are several things to note begin determining what animal made the tracks:

- Note the pattern the set of tracks makes,
- Check the overall shape of the track,
- Count the number of toes and check for evidence of claws,
- Check the shape of the large main interdigital pad in the middle of the track.

Cat and dog tracks show considerable resemblance. (For instance, both have four toes and both are “perfect steppers”, placing the back foot on top of the track made by the front foot. Toe pads are well developed and separated from the center interdigital pad.) However, there are significant differences, clearly noticeable in well defined tracks.

First, canids cannot retract their claws, so claw marks will usually be evident in their tracks. Look closely at the front edge of the prints for any marks left by toenails. The nails in the middle of the foot are often most pronounced than side toes in coyote and fox tracks. If deep snow is involved, toenails may leave narrow grooves in front of the toes as they sink in the snow. Generally, if there are claw marks in the track, it was made by a canid. (There are rare circumstances when claw marks will show in cat tracks, such as tracks going up hill or where the cats were jumping to make quick starts). Please see track drawings on page 10.

Second, canid tracks tend to be longer than they are wide. Cat tracks are basically circular in shape, or wider than they are long.

Third, the interdigital (center) pad in felines has two lobes anteriorly (towards the front) and three lobes posteriorly (towards the back). This anterior bi-lobing is diagnostic of the cat family. (See drawings of tracks on page 10).

Cats are not adapted for long periods of running, only short bursts of speed, but you may find track and trail patterns left by cats that were running or jumping after prey. Please see the drawings and pictures of the different patterns of cat tracks on page 11.

There are three species of cat in Colorado: bobcat, mountain lion and lynx.

## Identifying Lynx Tracks

The lynx is a close relative of the bobcat and the two cats are physically very similar. However, the lynx has larger feet, which appear unusually large for the animal's size and weight. Lynx feet function like snowshoes. Lynx tracks are four to four and a half inches in diameter, and may measure larger than this in soft snow. Lynx prints seldom show distinct toes and foot pads because of the dense fur that completely covers the foot. Thus, lynx tracks often appear as big, round depressions with no detail. Drag marks made by the dense hair may be observed on either side of the prints. When visible, the interdigital pad is relatively small when compared to bobcat and mountain lion. Walking gaits are common, but lynx do trot more than bobcat.

There are significant differences between lynx tracks and bobcat or mountain lion tracks. The primary difference between lynx and bobcat tracks is size. Lynx tracks are noticeably larger than those of the bobcat even though the average weights of the two species are similar (see table of cat track measurements below). Lynx tracks are similar in size to those of the mountain lion.

Bobcat and mountain lion tracks are usually much more distinct than lynx tracks, as their feet are not covered in thick fur. Bobcat tracks are crisp and delicate in appearance, and details can often be seen clearly. Unlike the indistinct lynx tracks, the bi-lobed anterior edge of the interdigital pad is usually apparent. As with the bobcat, mountain lion tracks are fairly clear. The weight of the lion may obliterate the bi-lobing on the front of the interdigital pad but the 3-lobed trailing edge of the interdigital pad is often clear. Mountain lions also sink deeper in the snow because of their greater weight whereas lynx generally sink no more than 8 inches (20 cm) regardless of overall snow depth. In addition, a mountain lion has a slightly wider straddle and longer stride than a lynx. Finally, mountain lions sometimes leave a drag mark from their tails in deep snow, whereas this is impossible for lynx due to their much shorter tail (see the drawings of tracks in the packet).

## Cat Track Measurements

<b>Species</b>	<b>Width</b> Measured at broadest point of print	<b>Length</b> Not including claws	<b>Stride</b> Distance from where one footprint appears in the trail to the next point that a print made by the same foot appears	<b>Straddle</b> Measured perpendicular to the line of travel at the widest point of a trail or group of prints
Bobcat	1.8 – 2.5 in 4.6 - 6.4 cm	1.8 - 2.5 in 4.6 - 6.4 cm	8 - 16 in 20 – 41 cm	4 - 7 in 10 - 18 cm
Lynx	3.5 – 4.8 in 8.9 – 12 cm	3.5 – 4.5 in 8.9 – 11 cm	12 – 28 in 30 - 72 cm	6 - 9 in 15 - 23 cm
Mountain Lion	3.3 – 4.8 in 8.4 – 12 cm	3 – 4.3 in 7.6 - 11cm	13 – 32 in 33 - 81cm	8 – 12 in 20 - 30 cm

## **Where to Look for Lynx Tracks**

Lynx tracks might be found anywhere in Colorado above 9,000 feet elevation. The most promising locations would be on north-facing slopes in conifer forests. You might pay special attention to game trails or human trails as lynx will often cross or follow these paths.

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## **Documenting Your Search and Filling Out the Lynx Tracking Field Survey Form**

- Draw the route you took while tracking on your topo map. This will allow us to keep track of the areas that have been searched for tracks. Please draw your search route even if you do not find tracks. When you have finished volunteering, turn in a photocopy of the map or maps you used depicting the routes you searched.
- When you find tracks, put the ruler next to the tracks and take a photo. If you do not have a ruler, put a standard sized object (such as a ballpoint pen) in the photo next to the tracks. Do not use items that vary in size – such as your own foot etc. Place the item as close to the track as possible. It is critical to take a photo to document the track.
- On the Field Survey Form (sample on page 9), fill out the following:
  - GPS reading (if available) of the location of the tracks and/or estimate your location and mark the location of the tracks on your topo map.
  - Vegetation and landscape characteristics where the track was found (e.g., tree species, on a steep slope etc.).
  - Snow conditions, especially the condition of the surface of the snow the track is in, and current weather conditions. Also note whether the track is in shade or sun.
  - Note whether or not you saw snowshoe hare tracks in the area (see drawings of snowshoe hare tracks on page 12).
  - Measure the tracks using the following procedure:
    - For individual footprints, measure the length and width. The length of the print is measured from the leading edge of a toe pad print to the trailing point of the print. Claws, if visible, are not included because their length may change with the animal's activities. Width is measured at the broadest point of the print. If present, measure the length and width of 3 individual tracks (see the diagram on the Field Survey Form). If the tracks are in deep or soft snow, this measurement may be difficult to make accurately. Estimate as best you can.
    - Next, measure the stride. Stride is the distance from where one footprint

appears in a trail to the next point that a footprint made by the same foot appears. This measurement must be recorded from the same point on the first print to the same point on the next print. For example, from leading edge to leading edge. (See the diagram on the Field Survey Form).

- Finally, measure the straddle. Straddle is the width between tracks. The straddle is measured from outside edge of a left track to outside edge of a right track. Note that these tracks will not be side by side. To aid in the measurement of the width, draw a line between the outside edges of a stride, e.g., 2 left hind feet. Then measure from your line to the outside edge on the print in between, in this case the right hind print (see the diagram on the Field Survey Form). Take measurements of the stride and straddle from 2 sets of prints if possible.
- Draw the pattern that the full set of tracks made in the snow. Add your measurements to the drawing in addition to filling in the provided measurement tables.

If you think that tracks could have been made by lynx, but you are not certain, report the tracks anyway. Reading tracks is not easy. The tracks you find might not fit the descriptions given exactly. It is better to report a track that is not from a lynx than for us to miss finding one of the lynx because an unclear track was not reported.

Once you have completed this procedure – contact the lynx volunteer program as soon as possible to report the tracks. **Call Eric Odell, Species Conservation Coordinator, at (970) 472-4340 or email him at [eric.odell@state.co.us](mailto:eric.odell@state.co.us).**

**When you find tracks please do not follow them!! Following lynx tracks may scare a lynx off a kill. Every lynx is critical in reestablishment of a healthy population in Colorado. Please respect the needs of the lynx and avoid tracking them once you find tracks.**

## **Wolverine: Tracks and Description**

Although the primary purpose of this volunteer effort is to locate lynx tracks, it would also be useful to document any wolverine tracks found. Few people have seen this elusive animal, which is exceedingly scarce south of Canada. The wolverine is rarely seen in Colorado and researchers have little information about them in the state. Since volunteers will already be out looking for lynx tracks – it wouldn't hurt to look for wolverine tracks at the same time. The following is a description of wolverine tracks:

**Description:** The wolverine shape is often said to resemble a very small bear. Wolverines are brown in color with contrasting stripes of light brown, yellow, or orange on the sides of the body that join at the tail and one band across the top of the head. The two stripes are somewhat skunk-like. Their tails are bushy and short in relation to the length of the body although much longer than the tails of bears. Wolverines weigh from 15 - 25lbs.

**Tracks:** Wolverine tracks reveal the five toes characteristic of the weasel family, although the small toe does not always show (see page 13). The size of the track varies with the size of the animal and the condition of the snow. In deep snow there will only be a series of deep holes. The tracks of the wolverine are very robust and wide. You can confuse the width of the wolverine track and trail with only four other mammals; the wolf, lynx, mountain lion, and possibly bear. However, the shape of the track is different. The wolverine's interdigital pad is shaped somewhat like a chevron (an upside down V). Also, the front feet of wolverines have small, oval-shaped heel pads separate from and behind the interdigital pad, that may show in prints. The tracks are distinct in winter because the feet are not well furred. The wolverine trail tends to wind around and can often be erratic, often alternating between walking and bounding.

## **Literature Cited**

The following are books on animal tracking that were used in the compilation of this training packet:

Halfpenny, J. C. and Biesiot, E. A.. (1986). *A field guide to mammal tracking in North America*. Second Edition. Boulder, Colorado. Johnson Printing Company.

Halfpenny, J. C. (2001). *Scats and tracks of the rocky mountains*. Second Edition. Guilford, Connecticut. The Globe Pequot Press.

Murie, O. J. (1974). *A field guide to animal tracks*. Second Edition. New York, New York. Peterson Field Guide Series, No. 2. Houghton Mifflin Company.

Smith, R. P. (1949). *Animal tracks and signs of North America*. Harrisburg, Pennsylvania. Stackpole Books.

Sheldon, I. (1997). *Animal tracks of the rockies*. Canada. Lone Pine Publishing.

## **Selected Reading**

The following are additional reading for those interested in learning more about animal tracking:

Bang, P. and Dahlstrom, P. (1972). *Collins guide to animal tracks and signs*. London. Collins and Sons.

Brunner, J. (1909). *Tracks and tracking*. New York, New York. Outing Publishing Company.

Forrest, L. R. (1988). *Field guide to tracking animals in snow*. Harrisburg, Pennsylvania. Stackpole Books.

Halfpenny, J. C. (1997). *Tracking: mastering the basics*. A Naturalist World. Videocassette.

Halfpenny, J. C., Thompson, R. W., Morse, S. C., Holden T., and Rezendes P. (1996). Snow Tracking. In *American marten, fisher, lynx and wolverine: Survey methods for their detection*, ed. Zielinski and Kucera, 91-163. General Technical Report PSW-GTR-157. Berkeley: USDA Forest Service, Pacific Southwest Research Station.

Rezendes, P. (1992). *Tracking and the art of seeing: How to read animal tracks and sign*. Charlotte, North Carolina. Camden House Publishing.

Seton, E. T. (1958). *Animal tracks and hunters signs*. New York, New York. Doubleday Publishing.

# Lynx Tracking Field Survey Form

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Time of Day: \_\_\_\_\_

Location of Track: \_\_\_\_\_

GPS Reading of Location: Longitude: \_\_\_\_\_ Latitude \_\_\_\_\_

Habitat: \_\_\_\_\_

Snow surface conditions: \_\_\_\_\_

Depth: \_\_\_\_\_

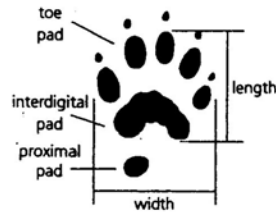
Weather Conditions: \_\_\_\_\_

Units Used in Measurements: \_\_\_\_\_

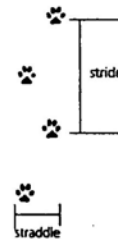
Snowshoe Hare tracks seen? \_\_\_\_\_

**Track Measurements:**

Prints	Length of Print	Width of Print
#1		
#2		
#3		



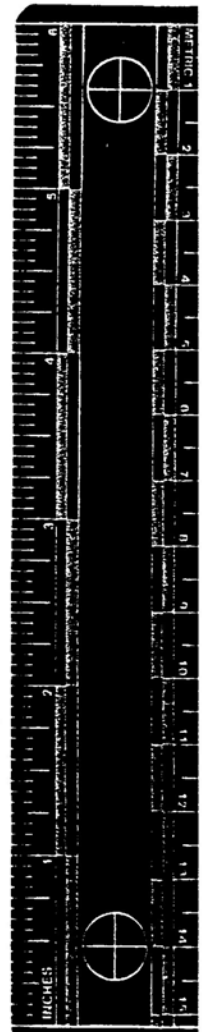
Set of Prints	Measurement of Stride	Measurement of Straddle
#1		
#2		



**Sketch Tracks and Trails:**

Drawing of Trail Made by Set of Tracks:  
(Include depiction of stride and straddle measurements.)

Drawing of Individual Track:



Figures on this page from: Halfpenny and Telander, 1998. *Scats and Tracks of the Rocky Mountains*. A Falcon Guide. Helena: Falcon Publishing

## Dog vs. Cat Family Front Print Comparisons

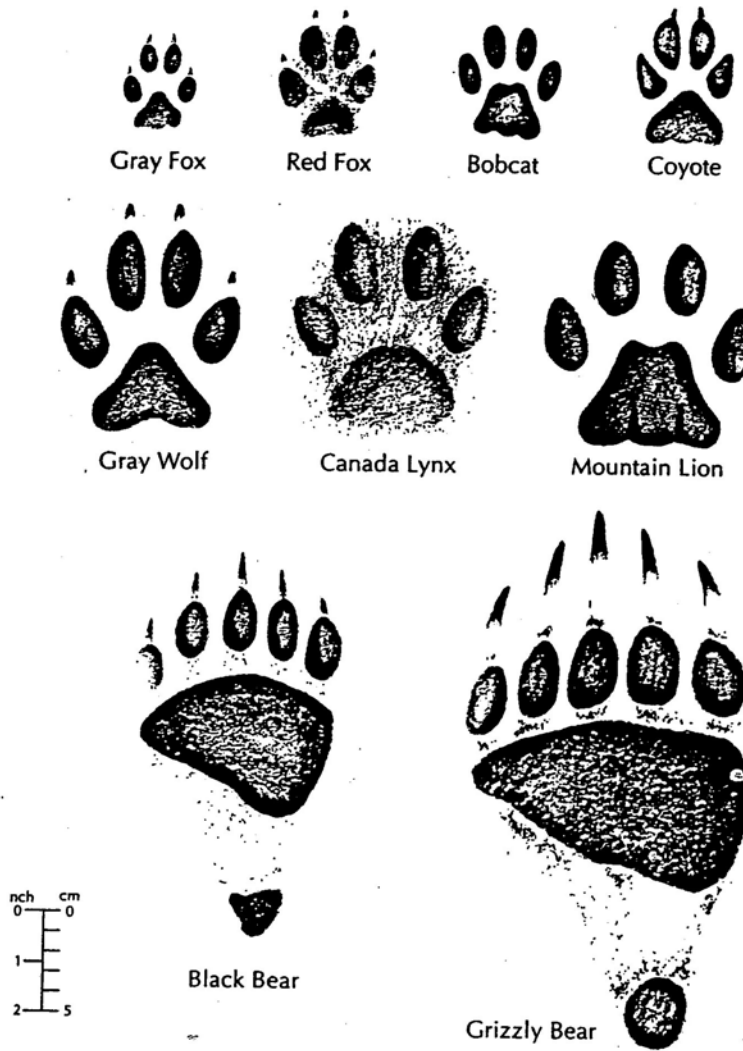
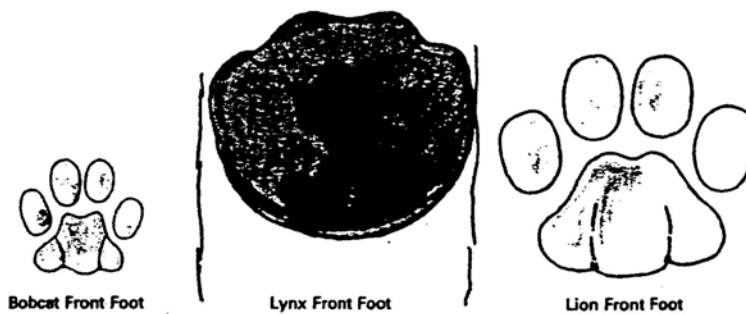


Figure from: Sheldon, 1997. *Animal Tracks of the Rockies*. Canada: Lone Pine Publishing.

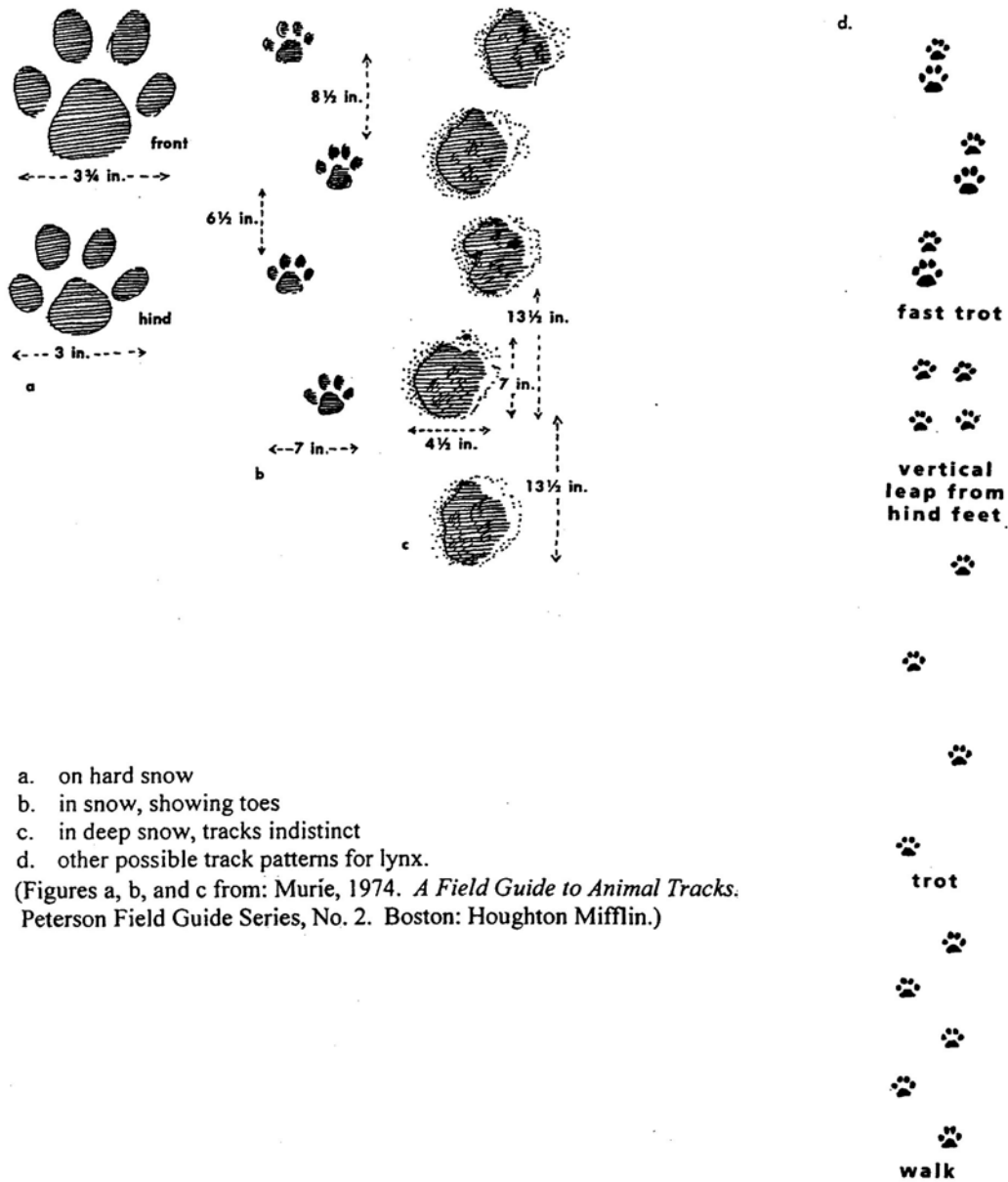
## Cat Family Front Print Comparisons



- Claws generally don't show
- Prints are round or wide
- Two lobes on front of pad
- Common gait is a walk

Figure from: Halfpenny and Biesiot, 1986. *A Field Guide to Mammal Tracking in North America*. Boulder: Johnson Books.

## Lynx Tracks and Gait Patterns



- a. on hard snow
- b. in snow, showing toes
- c. in deep snow, tracks indistinct
- d. other possible track patterns for lynx.

(Figures a, b, and c from: Murie, 1974. *A Field Guide to Animal Tracks*. Peterson Field Guide Series, No. 2. Boston: Houghton Mifflin.)

(Figure d from: Halfpenny and Telander, 1998. *Scats and Tracks of the Rocky Mountains*. A Falcon Guide. Helena: Falcon Publishing)

### ***Snowshoe Hare Tracks:***

The snowshoe hare is the primary prey of the lynx in Colorado. If you see snowshoe hare tracks while you are out looking for lynx tracks – note that information in the space provided on the field survey form. The following is a description of snowshoe hare tracks:

Like all rabbits and hares, the most common track of a snowshoe hare is the hopping track. When snowshoe hares are hopping, they leave groups of four prints in a triangular pattern. These groups can be long if a rabbit is running quickly. A hare track's most distinctive feature is that the hind print is much larger than the front print. Five toes are present on the front foot, but the fifth toe rarely registers in prints. Most of the time individual toes do not show. Snowshoe tracks are usually indistinct because the toes are completely covered in hair. The hopping stride varies from 3-6 feet (90-180 cm.)

### **Snowshoe Hare Tracks and Gait Patterns**



*hind*



*fore*



*hopping*

Figures on this page courtesy of: Sheldon, 1997.  
*Animal Tracks of the Rockies*. Canada: Lone Pine Publishing.

## Wolverine Tracks and Gait Patterns

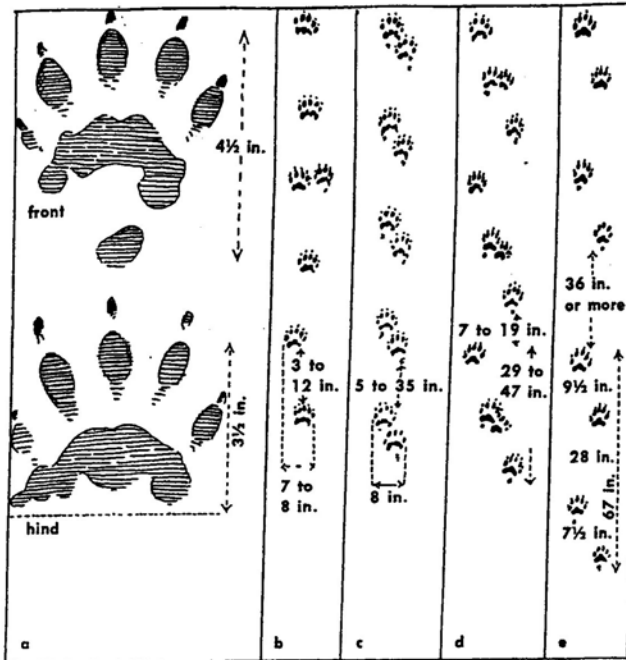


Figure from: Murie, 1974. *A Field Guide to Animal Tracks*. Peterson Field Guide Series, No. 2. Boston: Houghton Mifflin.

- a. typical tracks showing all five toes
- b. walking or trotting gait
- c. slightly faster gait
- d. an easy lope
- e. a gallop

## Mustelid Family Comparisons

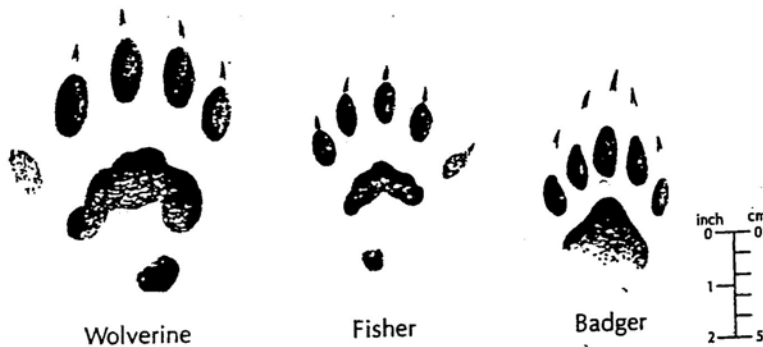


Figure from: Sheldon, 1997. *Animal Tracks of the Rockies*. Canada: Lone Pine Publishing.