EASTERN COTTONTAILS

By Byron Murray, Lead Instructor, The Outdoor School

"All the world will be your enemy, Prince of a Thousand Enemies and whenever they catch you, they will kill you. But first they must catch you, digger, listener, runner, Prince with the swift warning. Be cunning and full of tricks and your people will never be destroyed." Richard Adams from Watership Down

Left hind foot of an Eastern Cottontail Rabbit
(*Sylvilagus floridanus*)

While our native Eastern Cottontails (Sylvilagus floridanus) do not dig as the European Rabbits (Oryctolagus cuniculus) do in Richard Adams amazing book Watership Down, their foot structure is similar in many ways and it still allows them to run quickly from all of their potential predators.

Over the past year I have been trying to study Eastern Cottontail Rabbit tracks with more intention. I keep seeing the tracks in the sand and soil all along GHTC maintained trails and have been trying to tease out a little more detail from the impressions in the dirt.

I have also wanted to write about some of the specific things I have been looking for when I come across Rabbit tracks. Lately for me, it has been about the individual toes of the Rabbit tracks and their positions on the feet. The toe positions can tell us a lot about which of the feet we may be looking at. Is it a left front or a right front? If we look close, and know what to look for, the toes will tell us. This isn't always necessary if come across a group of Rabbit tracks or even a lengthy trail, with all four limbs clearly laid out bounding down the path. Instead, knowing the individual clues to a specific foot, say a left front, can reveal some more details which may otherwise be invisible.

Let's look at a typical group of Rabbit tracks, in a bounding gait.

The gait in the photo, again, is a bounding gait, meaning that the hind feet (at the top of the image) are landing generally in line with each other beyond the front feet, and then pushing off simultaneously, or just about. Then using the force of the hind feet to propel the Rabbit forward, the animal is airborne for a moment until the front feet touch the ground. Then very quickly after the fronts have touched the ground, the front feet push off, and the Rabbit swings their hind feet on the outside of and beyond the fronts and again the

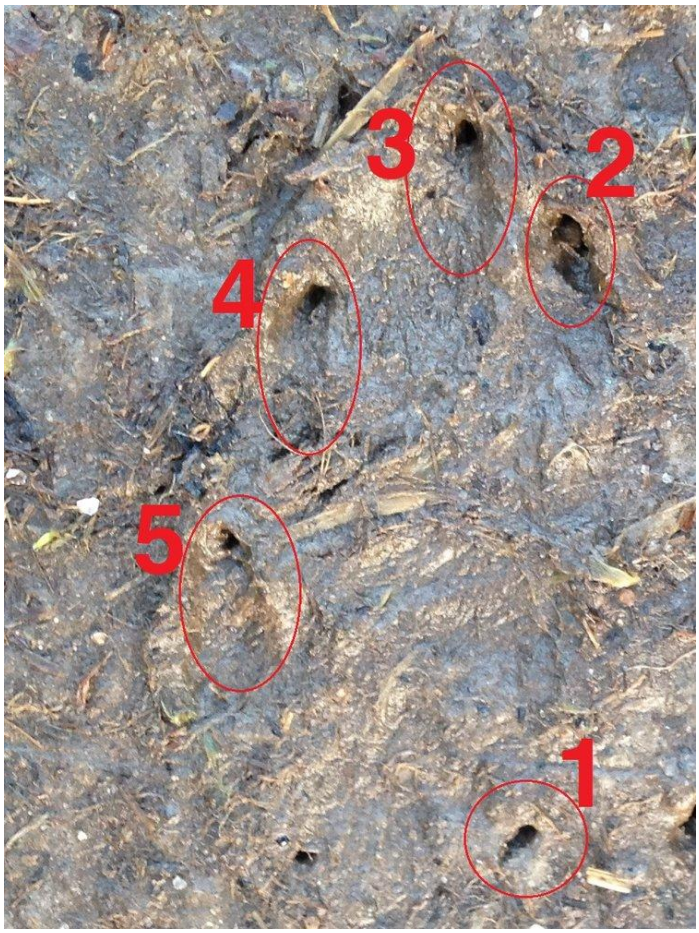
Rabbit is airborne once more until the hinds touch the ground past where the front feet just were.

The front legs are smaller and relatively shorter while the hind legs are larger and longer and provide the propulsive force for the bounding gait. Because the hind legs have more power than the fronts there is a longer leap when the hinds push off, thus a greater distance between the hinds to the next pair of front tracks, then say the fronts to the next pair of hind tracks.

I hope I have made sense of the bounding gate. These things come with time learning and time observing, or "dirt time" so be patient with yourself and keep at it.

For now, let's look at the characteristics of Rabbit feet and toes to get on the same page around nomenclature that I'll be using from here on out.

Rabbits are mammals. They share the same 5-digited common ancestor as all modern tetrapods (four-footed animals). The ancestral forebears likely had 5 toes on both front and back feet. Some mammals lost some of their toes along their evolutionary path, and some even lost some of their feet, like Pinnipeds (Seals), Whales and other Cetaceans. We kept our five digits, but Rabbits lost some. On a Rabbits front feet there are 5 toes but the first toe is greatly reduced. It may be that this toe has been retained through the evolutionary process, but no longer has a function or use (which is known as "vestigial"). On their hind feet there are only 4 toes and no vestigial toes. This is helpful to understand when looking at tracks of Rabbits because sometimes we can see those vestigial toes. Below is a photo of a track created by the left front of an Eastern Cottontail Rabbit.



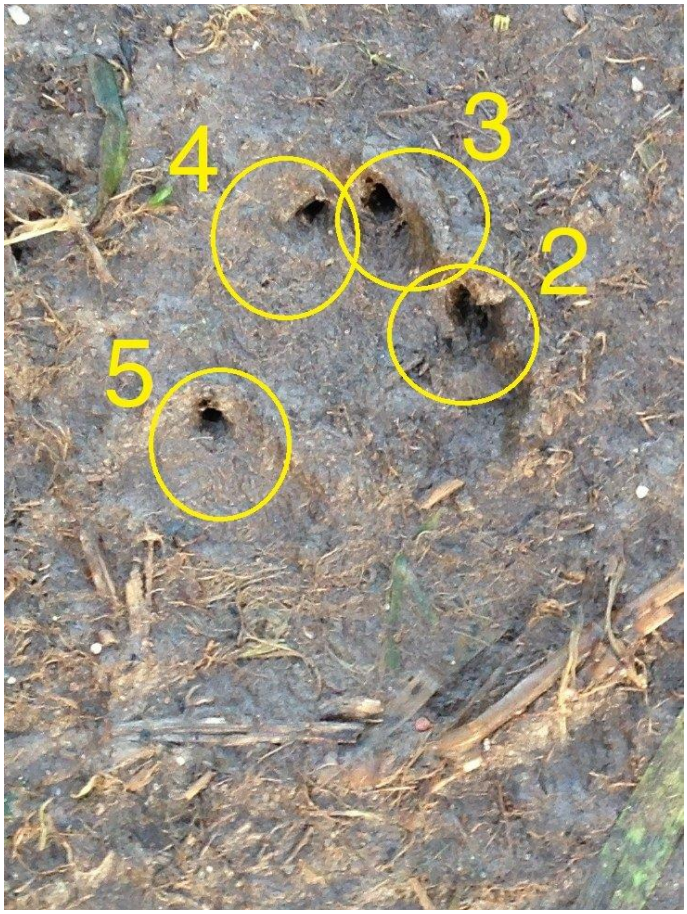
I have circled and numbered the toes. If you look at the toes you can see that the toes are pretty asymmetrical with some toes extending further than others. Toe 1 is a really small, but still has a claw which registers in the mud. Toes 2, 3, 4, and 5 all make a sort of inverted, and backward "J" shape and by looking for this "J" shape we can start to tell right and left front feet on Rabbits and Hares.

Within the inverted backwards "J" shape, I also look for the positions of toe 2 and toe 3. They are close to each other, but toe 3 is generally higher on the horizon of the toes than toe 2 or toe 4. This pointedness was what I first starting seeing when I initially began noticing the Eastern Cottontail Rabbit tracks in the mud. This pointedness in the foot can also be useful to determine the direction of travel when you only have a partial track or are missing the rest of the bound. Keep an eye out for it as you begin looking for Rabbit trails in mud or snow.

Again the front tracks are also smaller than the hind tracks as the front feet are smaller than the hind feet, as mentioned to earlier. These large hind feet give that propulsion which allows the Rabbits to move quickly and powerfully across the landscape, enabling them to run, play, and hopefully to escape any potential predators.

Next I want to take a good look at the structure of the hind feet and the position of the toes, specifically toes 3 and 4. Remember that the hind feet only have four toes, and we start counting from the inside out, and even though toe 1 is no longer there, we still count the same way, starting from the inside of the foot counting up as we move along towards the outside of the foot.

Note how toes 3 and 4 are pretty even along the leading edge of the hind track. This seems to be pretty consistent in what I have seen and I use this as an indicator of a hind foot if the track is only partially visible in the substrate. Sometimes the foot will not register in harder substrate, but the claws usually do.



Lastly, I wanted to offer an image of the skeletal structure of Rabbit feet so that there is a better understanding what makes up the structure of the foot.

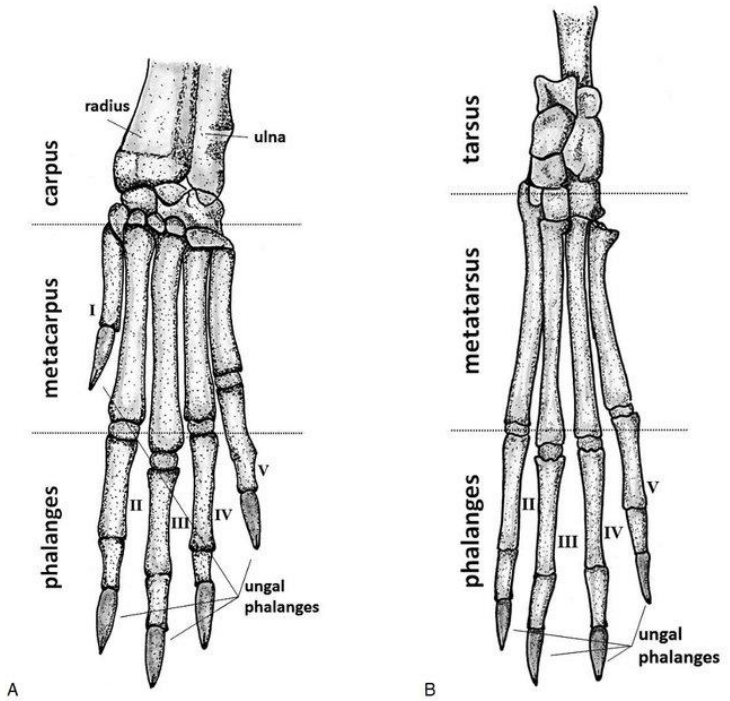


Figure 2: Dorsal view of the bone anatomy of rabbit feet: left front (A) and hind (B), showing 5 and 4 digits respectively. Drawings of feet after illustrations by Bensley, 1944.

When out on a hike through Guelph and beyond, take a look at the tracks of the Eastern Cottontail Rabbits who we share the trails with. By taking the time to better understand their movements, and the structures which allow them to move how they do, we can start to see and understand their roles on the land. This seemingly mundane neighbour is still a world of mystery and wonder for me, and I appreciate all the Rabbits have taught me in the world of tracking. May their cunning and quickness keep them for generations to come.

Byron Murray is a lead instructor of youth and adult programs at the Guelph Outdoor School where he has been working since 2013. He also hosts the radio show and podcast "to know the land" which can be heard on CFRU 93.3 fm every Monday at 6pm or found online at www.toknowtheland.com.