

■ Careers

Animal Tracking and Animal Behavior

Wild animals are often elusive. From tracker/hunters to modern scientists much of what we learn about secretive creatures results from our ability to “read” the sign left when the animal passed. Different societies call reading sign either tracking or trailing. Whatever the name used, this ancient skill was the foundation of modern science.

The first trackers were naturalists who named the first footprint, tested the first hypothesis, such as “I’ll wait at the water hole and kill supper”; or developed the first correlations, “little foot, little animal; big foot, big animal”; and learned animal behaviors. As naturalists, the first trackers were the first scientists, although they did not call themselves scientists—they simply survived! The first hypothesis was tested, not with the goal of receiving a monetary raise or obtaining tenure, but with the need to continue the gene pool by feeding one’s children. Some trackers were good. But the genes of the others are not present in the gene pool today.

Today, for most of us, tracking is not an everyday necessity guaranteeing our survival, but tracking still plays an important role in the success of scientists. I track to learn about animals, their identities, what they are doing, and their interactions with their environment—in short, to obtain the information we need for the sciences of behavior and ecology.

The tracking pyramid forms the perceptual basis for knowledge acquisition. The corners of the pyramid are track identification, sign identification, and gait identification. Knowledge gained at the foundation leads to the apex: story interpretation—the final version of what a given trail is *telling the tracker*.

For example, foot anatomy reveals the identity of the track maker. The stride (distance from a point where a foot touches the ground to where the same point on the same foot touches the ground again) shows the body size of a walking animal. The pattern of tracks on the ground reveals gaits other than walking, and in gaits such as trots, lopes, and gallops the stride now reveals relative speed. Taken with other signs, gait patterns explain animal behaviors.

The tracker might read the typical hunting sequence for a wolf pursuing an elk like this: First, along the walking trail of a wolf, the stride averages 90 cm (35 in) indicating that the mechanical distance from the hip to shoulder rotation points (that portion of the body directly responsible for movement) is 90 cm (35 in), big enough for an adult male.

Next, the stride shortens with the hind foot striking the ground posterior to the front footprint indicating the animal has slowed considerably. Nearby elk tracks reveal the wolf slowed to stalk an elk.

A burst of speed is revealed by groups of four footprints (two front, two hind) with a stride that measures about 600 cm (20 ft). The wolf has broken into full gallop and its trail converges with the trail of an elk. Scuffed ground and blood reveal a “take-down.” A short distance away a pile of bones and hair bodes well for the wolves. Today, the wolves are well fed—tomorrow the elk may get away.

I often detect reproductive behavior by following the trails of animals. Footprints in the late January snow reveal a pair of wolves. While the trail passes on one side of a leafless deciduous shrub, yellow snow on the other side smells of urine.

Careful examination reveals two sets of three footprints melted deeper into the snow. In the melted footprints, each of the wolves stood longer than in the rest of the footprints made while walking. Three footprints indicates the wolves raised their hind legs to urinate.

The urine stain associated with one set of footprints is directly to the side of the melted hind foot indicating a female. The urine stain associated with the other set of three tracks is forward and out to the side of the melted hind foot, a male urinated here. In wolf packs only the top male and female wolves raise their legs to urinate, therefore this is the trail of an alpha pair.

While the urine stain appears to be on the other side of the shrub, its position reveals that the wolves were trying to urinate high on the shrub, but the shrub did not intersect much of the urine. The purpose of the attempt to place urine high is to allow the wind to waft the odor around advertising, “This is my territory.”

Careful examination of the urine stains reveals a few small drops of blood in the stain made by the female. The female wolf may be in *estrus* (reproductively ready for mating), or she might be injured, perhaps by the kick of an elk. Further tracking to additional scent marks reveals the female does not have blood in every urine stain indicating early estrus and supporting the hypothesis that she is about ready to mate. A wounded female would probably have blood in every urine mark.

One full-moon night in January at West Thumb, Yellowstone National Park, I watched from a knoll. Looking across Yellowstone Lake, I spotted a coyote heading for my tent camp. Later I returned to my camp to discover my metal cooking pots, which I had carefully washed after supper and set by my tent, were gone.

Perplexed and gazing at the snow in the moon light, I spotted coyote tracks. Earlier I had given little thought to the night roamer approaching my tent, but evidence now suggested coyote mischief. The light of the moon was adequate to trail the canid out on to the lake ice.

As I followed the trail, it became obvious that the all the front feet were displaced from the trail to the left side. Quadrupedal animals have their eyes placed further to the side than humans. The side placement allows for greater peripheral vision and by turning the body slightly to the side, the animal can see where it is going and who is following it.

However, the frost forming in the tracks revealed that the coyote had left our camp soon after we did and, because of the time lapse, there was no reason to be looking behind at a pursuer. Why had it used a side gait? Then, I realized that holding my cooking pot in its mouth would interfere with its front feet. Turning to the side would allow the coyote to carry my pot with ease. My case against the coyote strengthened.

About a half mile out on the ice, I spotted my pot. Picking up my pot, I cursed the little mischief maker and went back for a good night's sleep.

The next morning, while cooking breakfast and reflecting on my night visitor, I smelled something acrid—urine, hot urine. The smell emanated from my oatmeal pot. The coyote had left another sign, a scent mark! It was the coyote's way of saying I was in his territory.

The link between tracking and behavior is strong. Knowing behavior helps reveal the stories animals write with their tracks and, conversely, following a trail reveals behavioral interactions of the track maker. From social interactions to reproduction to hunting to play, the trail holds a record available after the passing of the animal. The record would be lost were it not for the tracker, naturalist, behavioralist, ecologist, scientist. The record revealed by the trail may even persist millions of years as revealed by dinosaur tracks which tell about dinosaur behavior during a few minutes in the life of a creature that none have ever seen.

Tracking is a powerful technique, born of ancient times but which, as a modern science, still captures our imagination and provides scientific knowledge. Tracking is easy and takes but just a pencil, paper, and a ruler to become a tracker. Prepare ahead of time with a book or video, take good field notes, and soon animals will be revealing their stories to you.

Further Resources

- Elbroch, M. 2003. *Mammal Tracks and Sign: A Guide to North American Species*. Mechanicsburg, PA: Stackpole Books.
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- Halfpenny, J. C. 1997. *Tracking: Mastering the Basics*. (Video.) A Naturalist's World, www.tracknature.com, PO Box 989, Gardiner, MT 59030.
- Halfpenny, J. C. 1998. *Scats and Tracks of the Rocky Mountains*. Helena, MT: Falcon Publishing Inc.

- Murie, O. 1952. *A Field Guide to Animal Tracks*. Peterson Field Guide Series, no. 9. Boston: Houghton Mifflin Company.
- Rezendes, P. 1992. *Tracking and the Art of Seeing: How to Read Animal Tracks and Sign*. Charlotte, VT: Camden House Publishing, Inc.
- Seton, E. T. 1958. *Animal Tracks and Hunter Signs*. NY: Doubleday & Company. (Also available as the First Laurentian Library edition 1978. Macmillan Company of Canada, 70 Bond Street, Toronto, Ontario M5B 1X3.)

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