Mammal Tracks & Sign

A Guide to
North American Species

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STACKPOLE BOOKS
For my mother, Victoria Elbroch, who delivers unrivaled support for me and my work, my grandmother, Liz Gorst, who made sure to walk me in the sea air just after my birth and who has supported this project in so many ways, and in memory of Olaus Murie, whose work in tracking in North America has touched untold thousands, if not millions—including me.
Visual Thinking

One way to develop visualization skills that allows you to become the animal is to switch from linear thinking to visual thinking. For example, rather than thinking to myself, “I left my keys on the kitchen table,” I actually see in my mind’s eye a picture of my keys on the kitchen table. Here are some suggestions for becoming a more visual thinker, fostering imagination, and “seeing” and “feeling” how animals move.

- Practice storytelling—but visualize the story like a movie playing in your imagination, and then voice what you are watching.
- Study something, and then turn away and draw it from memory. I grew up playing a game based on this simple exercise. My mother would lay out a number of items on a tray, my friends and I would take 10 seconds or so to look at everything, and then she would take them away. We would try to list all the things on the tray. It’s even better to reconstruct what you saw with rough sketches, which forces you to include the items’ relationships to one another.
- Watch animals as often as possible—however briefly—and then replay the movements in your mind over and over again, memorizing the gait for future reference. Rent videos, watch nature specials, and visit zoos and sanctuaries—anything that provides visual ammunition.
- Read everything you can find on an animal’s natural history and behavior. The more you know about an animal, the easier it is to see it in your imagination.
- Practice moving like an animal—alone, in a group, on two legs or four. This is especially useful in sand, where you can study the track patterns left behind.
- Role-play trails and how signs were created. Take an extra three seconds each time you think you’ve successfully interpreted a trail to step back and envision the animal creating the sign (e.g., trotting, digging, or biting a tree).
- Take a course in American Sign Language, a language based in space. It will completely alter the way you think.

Now let’s compare the bobcat and the coyote. Bobcats walk. Cats move through the forest slowly and stealthily, pausing and sitting frequently to study their environment, hoping to see or sense potential prey before they themselves are noticed. They may even lay up and wait for prey to come to them. They do not generally cover large distances while hunting. When a prey animal is chosen, they stalk it and then, when close enough, explode with speed that allows them to catch their intended victim before it is aware of them or before it can escape. Their sheathed claws come out and curve down, close in front of the toes—designed to hold their prey.

Now consider the coyote, which hunts in a very different manner. Coyotes trot through the woods, hoping to catch the smell, sound, or sight of potential prey or to startle something into fleecing before them. Coyotes occasionally stalk, and they even eat tremendous amounts of fruit, which doesn’t move at all. But in general, coyotes cruise long distances through the woods, allowing scents and sounds to betray the presence of prey species. When opportunities appear, coyotes run their intended prey down, gripping it and pulling it down with their teeth. Their claws, which are never sheathed, project straight out from their toes and aid in traction while running.

These two very different examples of how animals earn a living in the woods are the result of different adaptations to different niches of the same environment. These different lifestyles and strategies for survival explain the differences in their natural rhythms: Bobcats tend to walk, and coyotes tend to trot. But can coyotes walk? Of course. Can bobcats trot? Yes. Every animal is capable of a variety of gaits and speeds, but each animal has one or two gaits that are most energy efficient for it, and that is what it uses the majority of the time.

Gait Analysis

A gait describes the way an animal moves; it is not a description of a specific track pattern. Each gait has numerous track patterns, depending on the speed and behavior of the animal, as well as the physiology of the species.

Language often complicates matters, with trackers around the world using different words to describe the same thing. This book uses the widely accepted vocabulary coined by Eadweard Muybridge many years ago to describe how animals move. Muybridge began his intensive study and photography of animal gaits when former California governor Leland Stanford asked for his help in settling a wager: whether all four feet of the horse are airborne in midgallop. His terminology provides
visual information about how an animal moves, which is crucial in envisioning and becoming that animal in advanced levels of tracking.

I separate all gaits into two large categories: (1) those with continuous, consistent rhythms, created by keeping the spine straight, with most of the motion in the legs, and (2) those with a broken but consistent rhythm, moving in such a way that the whole body is flexed, and motion results from the spine and legs moving together. Animals may move any way they wish, and they certainly will move on occasion in ways that are not described below. However, for the most part, wild mammals of North America stalk, hunt, chase, and hide using the gaits described here.

**Gaits with an Unbroken, Consistent Rhythm**

**Walking**

Walking is a slow gait in which each foot moves independently, and at no point during the cycle of footfalls does the animal lose contact with the ground. Arbitrarily beginning with the right rear foot, that leg moves forward, and just before touching down, the right front foot lifts up and moves forward. For a moment, both feet are off the ground, and then the right rear touches down. The right front continues forward and then touches down. The left rear moves forward, and just before it touches down, the left front picks up and moves forward. For a second time in the cycle of footfalls, there are only two feet in contact with the ground, and then the left rear touches down. The left front continues forward and then touches down. Immediately the cycle begins again, and the right rear picks up and moves forward. Musically, this would sound like 1, 2, 3, 4, 1, 2, 3, 4, 1, 2, 3, 4, ..., where each number is an independent footfall. Note that the rhythm is continuous, and there is no break.

The rear foot may land in any relation to the front track and still be considered a walk. Because the front foot picks up before the rear one touches down, the rear may land exactly where the front had been, called a direct register, or it may even touch down beyond where the front had been, called an overstep.

A good portion of time during each cycle of footfalls, only one leg is lifted from the ground; the other three maintain contact with the ground and support the animal while it is in motion. These three legs act like the legs of a tripod—a very sturdy arrangement—efficiently balancing heavy objects, including wide animals with short legs.

Walking is common among almost all animals. For many wide-bodied animals, such as beavers and bears, it is their natural rhythm, as it is for deer, moose, and members of the cat family. Other species walk when exploring or while traveling in deep substrates, such as snow, to save energy.

A variation of the walk is the stalk. In the stalk, only one limb moves at a time, but the order is the same as for the walk. The right rear moves forward and touches down; the right front moves forward and touches down; then the left rear, followed by the left front. The resulting trail is often an understep walk, which means that the rear tracks in each pair register behind the front tracks.

There are numerous variables to consider when interpreting speed from a trail and track pattern, but one general rule...
holds true for all walking gaits: As an animal walks faster, its rear track moves over and beyond the front track in each pair. Therefore, an understep walk (rear track behind the front track) is probably a slower gait than a direct registering walk (rear track on top of the front track), and both are likely slower than an overstep walk (rear track beyond the front track). A fast walk is also called an amble. Remember, there are other variables to consider as well, such as depth of substrate and physiology of the specific animal. But as a general rule, speed can be inferred by considering the placement of the rear foot in relation to the front.

There are several variations of the walk that add some confusion. For example, raccoons prefer to walk in such a way that the front and hind legs on one side of the body move nearly simultaneously. The resulting track pattern is one in which the tracks are paired—a front and the opposite side’s rear—and they flip-flop from one pair to the next. That is the front sits on the left side in the first set, and on the right side in the second (see the illustrations). However, moving the legs nearly simultaneously is not enough to create such a radically different track pattern. Walker Korby and I have discussed this at length, and he believes that the animals also shift their weight to the hind legs. When I walk this way, it shortens my stride and seems to create similar track patterns, especially when I stretch my arms to their fullest potential.
This variation of the walk can also be altered by adding or subtracting speed. Look at each pair of tracks and note whether the rear track registers ahead of, on the same plane as, or behind the opposite front track, thus giving you an indication of speed in the same way as discussed for typical walking gaits. Raccoons use all three variations. Brown bears and occasionally black are partial to the slowest version, where the hind tracks register behind the opposite fronts. Coatis may use any of the three, and opossums occasionally create similar track patterns.

I've watched raccoons creating the fastest version of this walking gait, with the legs moving nearly simultaneously. The animal stretches forward so far with its front and hind feet that it nearly becomes airborne before touching down again and picking up the feet on the opposite side. This is a fast gait, trot speed, and unique to the raccoon. The resulting track pattern is also unique. I refer to these gaits as "2x2 walks" to differentiate them from typical walking gaits.

Trotting

Fast trots are easily differentiated from slow walks, as the front and hind legs of opposite sides move together, as if joined by a cable. Rather than each leg moving independently, as in walks, the two legs move simultaneously, and there is a moment during each cycle of footfalls when the animal loses contact with the earth completely. This vertical component can be seen in any canine, from foxes to domestic dogs—there is a little bounce in their natural rhythm. This means that as the right rear foot shifts forward in the air, so does the left front. Just before the right rear and left front are placed down, the right front and left rear feet push off, maintaining forward momentum. Then the right rear and left front make contact with the ground again, and the cycle begins again. Musically, the beat is a continuous, unbroken 1, 2, 1, 2, 1, 2, ... where each number is two diagonally placed feet landing simultaneously.

The natural rhythm of canines, voles, and short-tailed shrews is the trot. Many other species also use trots as a travel gait, from woodchucks to black bears to members of the cat family, and bighorn sheep tend to trot on flat ground.

Direct register trots, in which rear tracks are superimposed on the front tracks of the same side, are common in many species. Rear tracks land exactly on the recently made front prints, as the front foot and opposite rear pick up just before the alternate pair touches down. The
forward momentum of the animal carries the rear foot directly over the front track. This is commonly seen when trailing canines, woodchucks, voles, short-tailed shrews, and many ungulates.

As with walking, speed can be inferred by the position of the rear foot in relation to the front. Direct register trots are theoretically slower than overstep trots, in which the rear tracks in a given pair register beyond the front tracks. Overstep trots are achieved by species in different ways. The rear foot can move forward only so far before it collides with the front foot on the same side. The two most common overstep trot patterns clearly show how mammals overcome this obstacle. Canines tend toward the side trot, where they continue to move in a trot, but the entire body is angled (also referred to as a crab), with the rear end kicked out to one side. In this way, the rears pass to one side of the fronts to stretch out farther. All the front tracks appear on one side of the trail, and all the rears, beyond the fronts, appear on the other side of the trail.

Direct register trot of a mule deer. (TX)
The Speed of a Red Fox

Inspired by the work of J. D. Henry with red foxes in the Canadian Rockies, I sought to walk with a wild fox where I lived. My first opportunity came while biking one morning on a back road in the Adirondacks. I came across a red fox feeding on a road-killed mammal—what appeared to be a fisher. The fox noticed me and pulled his prize off the road into some spruce trees, but still within view. There he continued to feed, using his back carnassial teeth to shear off manageable chunks and swallowing vigorously. I walked in quite close, and eventually the fox gathered what remained of the carcass and trotted off into the woods. I followed closely, and the fox stopped to look at me several times. Eventually, he trotted through someone’s yard—right in front of the bay window where the family was eating breakfast. I did not follow.

I returned to the spot the next day and encountered the fox on the road. Ditching my bike, I followed him at a distance. He paused once to look over his shoulder at me. I froze, and then he continued, never acknowledging me again during the several hours we spent together. He trotted silently along the pavement, using his ears to locate voles and other small mammals in the tall grasses that lined the road. From time to time he stopped, located the prey, and pounced. He was successful more often than not and gulped down a number of voles.

The real lesson was in the speed of this fox, which trotted almost continuously, with occasional walking steps when adjusting and preparing for a spring. I could not keep up by walking and had to jog slowly to keep the distance between us constant. This can easily be studied with a leashed dog. A trotting dog pulls and jerks the leash, but when a dog walks, it stays at its master’s side.


Lessons from a Bobcat

Differentiating walks from trots can be challenging. With this in mind, I journaled the trails of a bobcat I found several years ago on a steep hill near my home.

A recent snowstorm had changed to ice and freezing rain just before the temperatures plummeted, allowing a thick crust to form and lock in 2 feet of snow beneath its surface. Nothing but moose and occasionally a deer and myself left visible tracks on that hill for nearly a week, until an inch of fresh powder fell one afternoon and covered everything.

The unique weather conditions and a willing bobcat provided a wondrous opportunity. I came across her trail early the next day and quickly backtracked her to her bed, where she’d waited out the storm. There were few obstacles on the thick crust above the forest floor—no logs or tangles of young saplings—and she moved with little restriction. The pitted crust gave remarkably good traction, and the inch of snow barely influenced her movement.

Following her downhill, I watched as she moved from a direct register walk to an overstep walk and then for a short while to a direct register trot, before returning to a fast overstep walk and finally a slower direct register walk. I took comparison measurements and sketches all the way, hoping that they would illustrate the differences between her walks and trots.

- Front
- Hind
- Hind atop Front Track (direct register)
This unique track pattern is easy to find on coyote, wolf, and red fox trails; gray foxes very rarely side trot.

The second common option is to kick the rear legs out to either side of the front legs, termed a straddle trot. All the canines use this gait, but usually only for short sections of trail, and most often in transition from a direct registering trot to a side trot. However, gray foxes use this gait very often, as do caribou, moose, mule deer, and several shrew species. There is also a third overstep trot that involves gliding the feet over the front tracks with forward momentum, as seen in lizards and occasionally other animals. This last option is rare in mammals.

According to my definition, turtles and other reptiles and amphibians do not trot (some lizards are an exception). Their limbs move in the same way—a front leg and the opposite side's rear leg move simultaneously—but they never leave the ground. I'd suggest the term diagonal walk to differentiate this movement from trotting. This is why it is impossible for a turtle to completely direct register—the right front foot is still on the ground when the right rear comes up behind.

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**Gaits with Broken Rhythms**

**Loping and Galloping**

Lopes and gallops are very similar and are the fastest gaits for animals. Each foot lands independently of the others, as in walks, but in rapid succession. During both gaits, the animal becomes momentarily airborne, just after pushing off with the front legs. But during gallops, there is a second point when the animal is in the air, just after pushing off with the rear legs. It is difficult to catch this second, short flight when watching an animal move, and it is difficult to decipher when interpreting track patterns on the ground.

There are two variations on the order in which the feet touch the ground during lopes and gallops. If they land in a circular fashion—left front, right front, right rear, left rear—it is a rotary lope or gallop. If the order cuts across the body—left front, right front, left rear, right rear—it is called a transverse lope or gallop. Musically, there is a four-beat as each foot falls independently, followed by a pause: 1, 2, 3, 4, pause, 1, 2, 3, 4.
Similar to walks and trots, the placement of the rear track in relation to the front track is a factor in speed interpretation. In this case, consider how the pair of front tracks is placed in relation to the pair of rear tracks. As the pair of rear tracks moves beyond the pair of front tracks, this indicates a faster lope or gallop. Also note the distance between the groups of four tracks. In general, the greater the length spanned by the four tracks in a series and the shorter the distance between groups of four tracks, called the stride, the faster the animal is moving. At all-out speeds, some mammals leave track patterns that casually look like trots—in that the tracks are placed regularly and in a straight line. But each mark is a single track, and careful measurements can differentiate between the two.

Two particular lopes are characteristic of the weasel family: the 3×4 lope and the 2×2 lope. The 3×4 lope is a rotary lope, in which a front and rear foot on the same side of the body may land in the same space, giving the impression of only three tracks in a set rather than four. Milton Hildebrand's research showed that weasels still have a front foot on the ground when the first rear foot touches down; therefore, this gait is a true lope.

The 2×2 lope is a transverse lope, although other than the order of footfalls, the body mechanics are similar to those of a 3×4 lope. In the essay "Lessons from a Fisher," I discuss watching a fisher up close, and though he switched from a 3×4 to a 2×2 lope right before my eyes, it wasn't apparent until I looked at the trail. The same fluid arcing motion is used for both gaits. What is unique about the 2×2 lope is that the front feet pick up and the rear feet land exactly where the fronts had been, creating a trail of...
paired tracks in which each set of two is actually a set of four—the front feet registering first, and the rear feet registering directly on top of them. Meadow voles and smaller shrews use this gait in deep snow. Based on Hildebrand’s research on the 3×4 lope, I am assuming that a front foot is still in contact with the ground when the first rear foot touches down. If not, then technically, this gait would be a gallop.

**Hopping and Bounding**

The hopping and bounding gaits of rabbits and many rodents are differentiated from lopes and gallops, in that the rear feet land and push off simultaneously, or nearly so. This is evident in the trail, as the rear tracks appear parallel to each other. Any local park should present ample opportunities to study squirrels using these gaits. Hops are similar to lopes, in that there is one moment when the animal is airborne during each cycle of footfalls, just after the rear feet push off. Bounds parallel gallops, in that...
there are two times when the animal is airborne during each cycle of footfalls, first after the front feet push off, and again after the rear feet push off.

The difference between hop and bound track patterns is the relationship between the rear and front tracks. When hopping, the front feet of an animal land either together or one after the other, followed by the rear feet touching down together behind the front feet. Then the front feet pick up, followed by a push and liftoff from the rear feet. The animal is airborne until the front feet touch down again, and the cycle repeats. Hopping is less common than bounding, but it can be observed in short-tailed shrews, large voles, muskrats, and southern flying squirrels.

Hopping and bounding begin in the same way, with the front feet landing either as a pair or one after the other, but in bounds, the rear feet move forward, beyond, and to either side of the front feet. The front feet pick up as the rear feet pass to the outside, and there is a moment when the animal loses contact with the ground before the rears come down and push off again. This push-off is followed by a second moment in the air, before the front feet touch down and the cycle begins again. Numerous species bound, including squirrels, chipmunks, and cottontails.

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**Hop Variations**

- large voles
- short-tailed shrews
- muskrats
- southern flying squirrels, other squirrels

**Bound Variations**

- rabbits
- rabbits, carnivores, ungulates
- rodents in marmots, tree squirrels, deep snow ground squirrels, chipmunks, red squirrels

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Pronk
An unusual gait used by mule deer, pronghorn, elk and occasionally other mammals is the pronk. In this bouncing gait, an animal pushes off with all four feet at the same time and then lands on all four feet simultaneously. Mammals moving in this way appear to be using pogo sticks. Leonard Lee Rue writes that a possible benefit of this gait may be that the animal can radically change direction whenever touching down, responding to external stimuli quickly.

Bipedal Motion
Kangaroo rats, and occasionally other species, require us to include several gaits usually used to describe bird movements: the bipedal hop and the bipedal skip. These gaits are used when mammals move on their hind legs only and do not touch down with the front feet at all.

Bipedal Hopping
Both hopping and skipping involve trails in which the hind tracks are paired, rather than falling independently at regular intervals, as in the previously described gaits. In hopping trails, paired hind tracks appear right next to each other, or nearly so. This pattern is possible because both hind feet hit the ground simultaneously. Technically, the feet would truly hit simultaneously only if they were placed exactly next to each other or the animal were coming straight down. However, for our purposes, simultaneously means at the same time or nearly so.
**Bipedal Skipping**

In skipping trails, tracks are also paired, but each hind foot lands completely independently of the other. Looking at the trail pattern, a hop becomes a skip when one hind track registers completely in front of the other hind track. When a kangaroo rat moves in this way, it stays very low to the ground and takes very long strides. Hind feet rotate forward, one foot strikes down, and as the body moves forward over this foot, the second foot touches down. The momentum continues, propelling the body forward over the second foot while the first foot lifts up behind the animal. Continuing forward, the second foot joins the first behind the animal and lifts off, and together they rotate forward for another cycle. Momentum is more horizontal, and very little energy is wasted with vertical rise.
Interpretation

Each time an animal shifts from its natural rhythm, there is a reason, and thus an opportunity for us to ask why. Certain gaits can be associated with specific moods, behaviors, or intentions. This is why journaling the three perspectives is so important. You begin to associate certain gaits and track patterns with specific environmental conditions. You'll know if the animal is out in the open, and potentially uncomfortable, or in deep cover, possibly hunting. And if you really get to know an area and its inhabitants, you may be able to determine whether an animal is out of its usual territory or you've discovered a transient or trespasser.

Successful interpretation of track patterns comes with experience and patience. I suggest that you journal every gait for a species and begin to assign possible interpretations or behaviors to each track pattern. Be flexible in your thinking, and remember that you are bound to be wrong as often as you are right, at least in the beginning. The more natural history information you have about a species and the more time you spend trailing that particular animal, the better prepared you are for this process. Regardless of experience, there will always be trails that perplex and confound you. Accept the fact that tracking is not a perfect science but a lifetime of learning.

Use yourself as an example to better grasp the approach to trail interpretation. You have your typical walking gait and speed and resulting track pattern. Should you be late for work or focused on a specific destination, your pace and track pattern would change. If you were hungry and stood in the midst of five great restaurants, you'd likely wander a bit and then move with determination once you'd decided where to dine. You'd jump if you were scared and run if your life were threatened. The list of possibilities

Coyote Trails and Possible Interpretations

Understep walk. Extreme rest: I have found this pattern around dens, especially when a coyote shifts from one bedding spot to another. Extreme attention/after: This is also the gait used when stalking prey very slowly—like a cat. It could also be used to sneak away if the coyote felt at great risk and wanted to avoid detection. Exhaustion.

Direct register walk. This gait is more often a reflection of substrate or grade rather than mood or behavior. In deep substrates, coyotes direct register walk when traveling. However, Jon Young points out that in specific locales, coyotes use this gait to travel about. He explains that the potential dangers in an environment, such as a high density of cougars, influence when, where, and how coyotes move.

Overstep walk. This is the typical walking gait for canines. Exploration: Often coyotes shift from a trot to a walk when investigating and pinpointing an odor they cross in the woods. They'll walk around scenting out apples buried in early snow, investigating squirrel activity, and checking another coyote's scent post. Ease. Coyotes walk when they feel relatively safe, often in the company of others or in areas with good visibility and where scents carry far and well. They feel most at ease in the heart of their own territory. Scenting and communication: Coyotes may shift to a walk in order to scent, before moving on. A great deal of social exchange is done while walking, but many gaits are used. Movement in the immediate area of dens is usually done in a walk. Well fed: A coyote who is not actively hunting may walk. Caution: A cautious coyote walks.

Understep trot. This is a rare gait. I have seen this pattern as a result of playing with others—like a slow prance.

Direct register trot. This is the natural rhythm of the coyote. Hunting and patrolling: Coyotes move through their range in a trot. Awareness: Coyotes are actively investigating their surroundings in this gait. Comfort: (continued on page 72)
Although the animal is keenly aware, this gait shows little stress or discomfort. This is the usual gait for moving about the home range.

**Overstep trot.** This is an uncommon gait for coyotes. **Dominance:** I have seen this gait used in pack communication on several occasions. I believe that the vertical “hop” of this gait may be involved in a visual communication of dominance. **Stress:** Dan Gardogui noted this gait and track pattern in females trying to keep up with the insatiable appetites of their maturing pups, and in coyotes skirting wolf territories.

**Straddle trot.** In coyotes, this is a transition gait found only in short sections of trail. However, it shows that the animal is not alarmed or reacting to something in its environment, in which case a transition gait would be skipped altogether.

**Side trot.** **Travel mode:** This gait may indicate that a coyote has a destination in mind and has picked up the pace slightly. It is often seen on easier travel routes, such as beaches, roads, and trail systems. **Increased awareness:** This gait is often used when coyotes are exposed and away from cover, or between areas of cover, but not yet in full alarm. Trespassing coyotes might also pick up their pace when moving through another pack's territory.

**Extended direct register trot.** **Eager/excited:** John McCarter reported finding this gait when coyotes had just found a carcass or a moose dying of brain worm, or some other bonanza. The extended trot pattern looks very much like the standard direct register trot, but the strides are nearly twice as long, often around 40 inches.

**Slow lope.** **Play and communication:** The “rocking horse” lope uses tremendous energy and is often found in coyote interactions. Sticks are sometimes picked up and carried for short distances in this gait. Motion is often erratic and circular. **Hunting in tall grass:** Jon Young has watched coyotes use this gait while hunting cotton tails in high grass. **Safety:** A coyote using the gait is not alarmed.

**Lope.** **Discomfort and fear:** The coyote has picked up the pace to move out of the area for some reason. A coyote may lope when it is exposed between areas of cover or when it is trespassing. **Transition:** A coyote that is not in immediate peril but still alarmed may transition from a trot to a lope to a gallop. **Play/excitement:** Often, faster gait in mammal species show fear, but the same gaits can always be interpreted in the opposite way. Playing coyotes lope, as do coyotes that are eager and excited—a similar interpretation to the extended trot. **Hunting:** Coyotes sometimes run prey to exhaustion, although this is more likely done at a gallop.

**Bound.** **Alarm and fear:** Frightened coyotes use this gait to move from stationary or a slow gait to full speed. **Chasing:** This coyote has just taken up pursuit of prey, a trespasser, or a playmate. **Deep substrates:** Bounds are also used to increase the speed of travel in deep snow—In this case, all four tracks are made in the same hole.

**Gallop.** **Fear:** Coyotes run from what they fear most. **Hunting:** Coyotes run down their prey, twisting and turning in pursuit. There is less time between footfalls than in the stretch gallop, allowing the coyote to react quickly to changes in direction.

**Stretch gallop.** **Extreme fear:** This coyote has lowered its awareness of the area in exchange for putting distance between itself and a sound, predator, or location as fast as possible. **Hunting:** A coyote stretches fully and invests everything to capture prey, which in turn replenishes its energy supply. Most often, prey twist and turn when closely pursued, so it is difficult to maintain the highest speed through turns; look for regular gallops as the coyote closes in.

Patterns created by rolling, lunging, attacking, holding onto prey, or other specific behaviors, as well as the various interpretations of coyotes in varied habitats and conditions across North America must be learned in the field and with experience.
the day. You'll find essays on specific track patterns and behaviors throughout the Species Accounts portion of this chapter, as well as other helpful hints.

# Measuring Tracks and Trails

A ruler is a wonderful tool to help you build confidence in your perceptive and intuitive skills. Measurements aid in identification and are useful for scientific documentation of species in your area; they can also be shared in research or used to compare species characteristics. Tape

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- **O** = Front
- **•** = Hind
- **○** = Hind atop Front Track (direct register)

2 x 2 Walks  Understep Walks  Direct Register Walks  Overset Walks  Direct Register Trots  Overset Trots

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The Coyote trails provided below, assuming that the natural rhythm for your animal would be interpreted in the same way as the natural rhythm of the coyote, regardless of whether they are different gaits. Then work your way from there. These interpretations are only a starting point; add your own, and change what feels wrong for your area. Before you know it, you'll be interpreting behaviors from track patterns, in addition to identifying the animal.

There are also specific track patterns that are easily interpreted. Deer "point" to food, many mammals "t-up" when they pause (see page 147), and animals often sit down during...